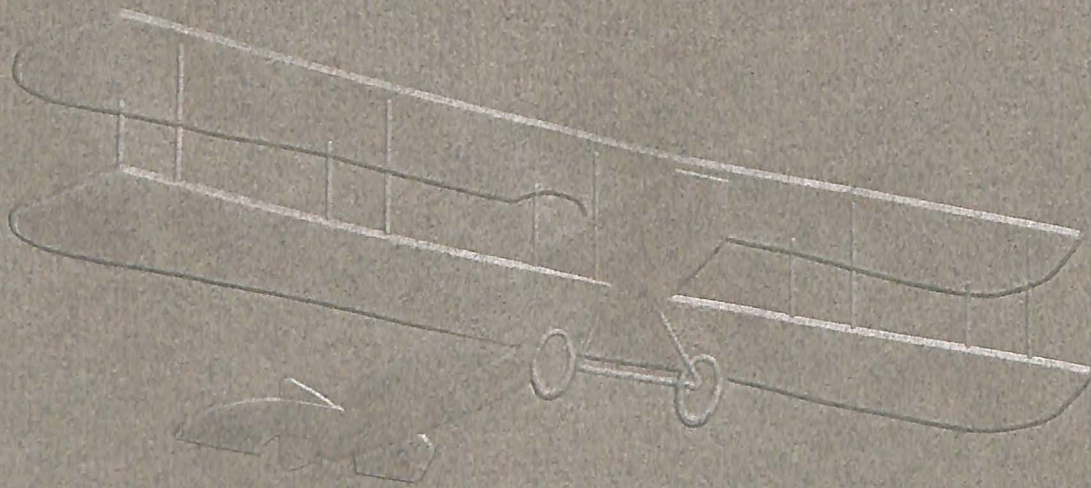


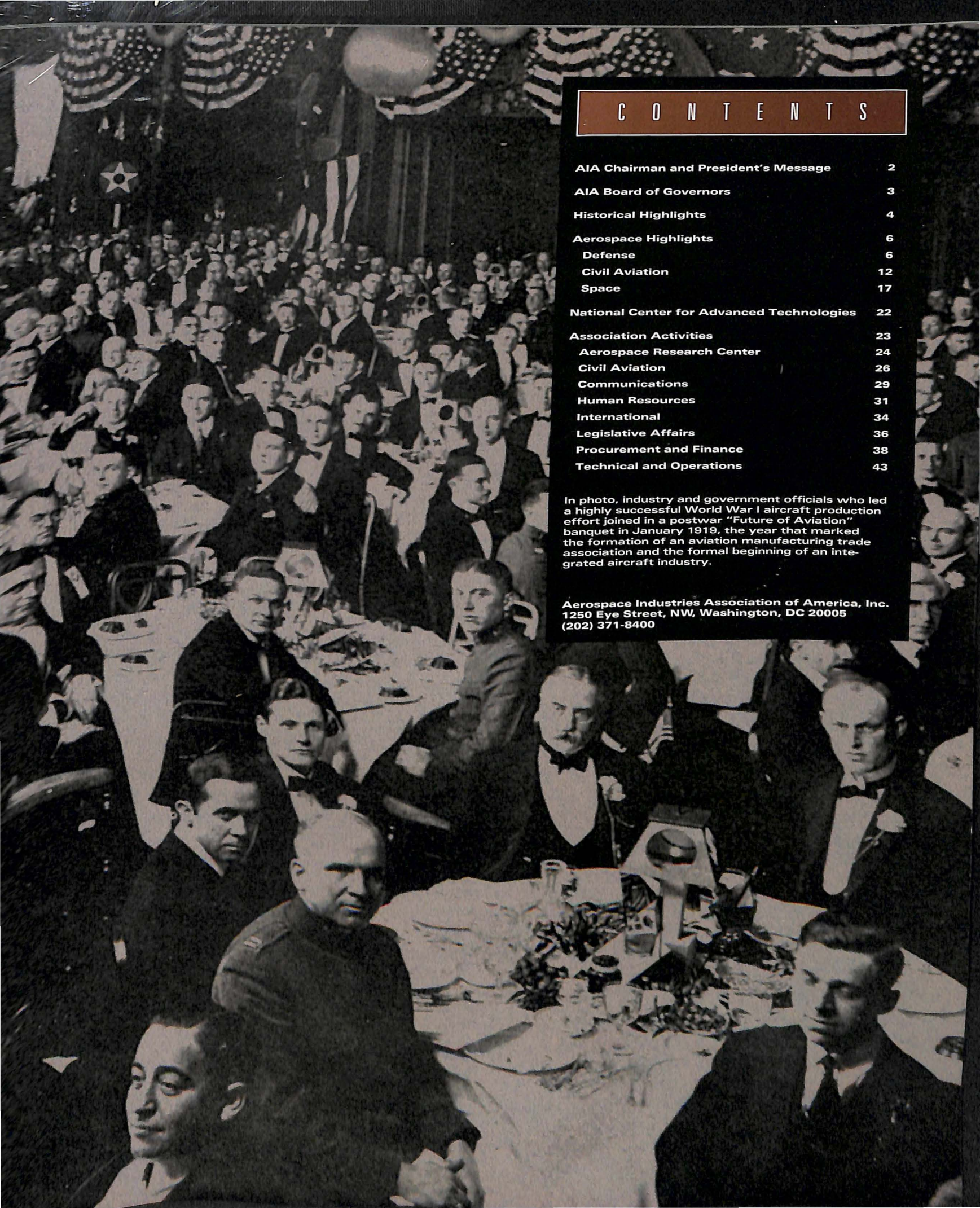
75
YEARS
OF
SUCCESS



AEROSPACE
INDUSTRIES
ASSOCIATION
ANNUAL REPORT

1993





C O N T E N T S

AIA Chairman and President's Message	2
AIA Board of Governors	3
Historical Highlights	4
Aerospace Highlights	6
Defense	6
Civil Aviation	12
Space	17
National Center for Advanced Technologies	22
Association Activities	23
Aerospace Research Center	24
Civil Aviation	26
Communications	29
Human Resources	31
International	34
Legislative Affairs	36
Procurement and Finance	38
Technical and Operations	43

In photo, industry and government officials who led a highly successful World War I aircraft production effort joined in a postwar "Future of Aviation" banquet in January 1919, the year that marked the formation of an aviation manufacturing trade association and the formal beginning of an integrated aircraft industry.

Aerospace Industries Association of America, Inc.
1250 Eye Street, NW, Washington, DC 20005
(202) 371-8400

CHAIRMAN AND PRESIDENT'S

M E S S A G E



Richard A. Linder,
Chairman



Don Fuqua,
President

In 1993, the aerospace industry was forced to reduce its labor force by another 131,000 people, bringing to 422,000 the number laid off since 1989. Those statistics provide a graphic example of the industry's rate of downsizing, a consequence of declining defense production coupled with temporarily depressed activity in the commercial aircraft manufacturing segment of the industry.

Overall sales—the principal indicator of activity and employment—dropped \$14 billion, or 10 percent, below the level of the previous year, the largest single year reduction on record. Military sales were down as the defense restructuring program rounded out its eighth year, but the greatest decline among the industry's various product categories was in civil aircraft.

New orders for aerospace products and services fell by 23 percent to \$80 billion, less than half the new business received in 1989. The backlog dipped to \$188 billion, more than \$50 billion below the 1989 peak.

The bright spot of the year was once again the industry's performance in international trade—even though, statistically, our export sales fell well below the previous year's level. The decline is not an indicator of fading competitiveness but is rather due to a shrinking global aerospace market induced by continuing recession among many of the world's foremost trading nations. With \$37.1 billion in export sales and a positive trade balance of \$25 billion, the industry achieved a more than satisfying result in a sluggish market.

The industry's net profit climbed appreciably to \$5.5 billion, ironically because of enforced downsizing and the belt-tightening measures it demands; the profit gain was due largely to a variety of cost-cutting efficiencies and some sales of assets.

For the industry as a whole, AIA sees a sales curve that will dip further for the next two or three years, then flatten out as commercial aircraft sales begin to pick up. Beyond 2000, the picture brightens: projections indicate record levels of jetliner sales and respectable levels of military and space sales as the U.S. defense and space programs stabilize.

The industry's challenge for the remaining years of the century is to maintain its financial health and technical capabilities in the face of declining workload. We hope to offset the activity losses caused by defense restructuring with increased exports in a post-recession global market and with a greater share of the U.S. military maintenance and modernization work now performed largely by government depots.

Such offsets would enable our companies to keep more of their skilled people working, more of their suppliers active, and more of their production/ R&D facilities "warm," allowing them to weather the difficult nineties with their unique capabilities largely intact. That's important—not just to the industry but the nation.

Richard A. Linder

Don Fuqua



Renso L. Caporali, Chairman and Chief Executive Officer, Grumman Corporation



Phillip W. Farmer, President and Chief Operating Officer, Harris Corporation



Don Fuqua, President, Aerospace Industries Association



Sam F. Iacobellis, Executive Vice President and Deputy Chairman for Major Programs, Rockwell International Corporation



Richard A. Linder, President, Electronic Systems Group, Westinghouse Electric Corporation



John F. McDonnell, Chairman and Chief Executive Officer, McDonnell Douglas Corporation



D. Larry Moore, President and Chief Operating Officer, Honeywell Inc.



Daniel M. Tellep, Chairman and Chief Executive Officer, Lockheed Corporation

OFFICERS

Richard A. Linder, Chairman

Renso L. Caporali, Vice Chairman

Don Fuqua, President

George F. Copsey, Secretary-Treasurer

EXECUTIVE COMMITTEE

Renso L. Caporali, Chairman and Chief Executive Officer, Grumman Corporation

Phillip W. Farmer, President and Chief Operating Officer, Harris Corporation

Don Fuqua, President, Aerospace Industries Association

Sam F. Iacobellis, Executive Vice President and Deputy Chairman for Major Programs, Rockwell International Corporation

Richard A. Linder, President, Electronic Systems Group, Westinghouse Electric Corporation

John F. McDonnell, Chairman and Chief Executive Officer, McDonnell Douglas Corporation

D. Larry Moore, President and Chief Operating Officer, Honeywell Inc.

Daniel M. Tellep, Chairman and Chief Executive Officer, Lockheed Corporation

MEMBERS

C. Michael Armstrong, Chairman and Chief Executive Officer, General Motors Hughes Electronics

Norman R. Augustine, Chairman and Chief Executive Officer, Martin Marietta Corporation

Jim O. Bean, Deputy Group President, Coltec Industries Inc

Max E. Bleck, President, Raytheon Company

Daniel P. Burnham, President, AlliedSignal Aerospace

Hudson B. Drake, Senior Vice President, Teledyne, Inc., and President, Aerospace & Electronics Segment

Louis J. Giuliano, Senior Vice President, ITT, and President and Chief Executive Officer, ITT Defense and Electronics Inc.

Timothy W. Hannemann, Executive Vice President and General Manager, Space and Electronics Group, TRW Inc.

James F. Hardymon, Chairman of the Board, President and Chief Executive Officer, Textron Inc.

Keith A. Hasty, President and Chief Executive Officer, Best Foam Fabricators, Inc.

Stephen L. Hayes, President, Parker Berte Aerospace Group, and Vice President, Parker Hannifin Corporation

William F. Hayes, Executive Vice President, Texas Instruments Incorporated

E. Gene Keiffer, Chairman of the Board and Chief Executive Officer, E-Systems, Inc.

Kent Kresa, Chairman, President and Chief Executive Officer, Northrop Corporation

William C. Lowe, Chairman and Chief Executive Officer, Gulfstream Aerospace Corporation

James R. Mellor, President and Chief Executive Officer, General Dynamics Corporation

Eugene F. Murphy, President and Chief Executive Officer, GE Aerospace, and Senior Vice President, General Electric Company

John R. Myers, President and Chief Executive Officer, Thiokol Corporation

William F. Paul, Senior Vice President, Government Affairs, United Technologies Corporation

Roger I. Ramseier, President, Aerojet, A Segment of GenCorp

Richard Schwartz, President, Hercules Aerospace, and Senior Vice President, Hercules Incorporated

Frank A. Shrontz, Chairman-Chief Executive Officer, The Boeing Company

Harry C. Stonecipher, Chairman, President and Chief Executive Officer, Sundstrand Corporation

Gordon L. Williams, President and Chief Executive Officer, Vought Aircraft Company

Sam B. Williams, President and Chairman, Williams International

A N N I V E R S A R Y



THE JENNY The Curtiss JN-4 training plane was the most widely produced American design of World War I and the mainstay of the U.S. civil and military aviation in the 1920s.



THE DC-3 A milestone development that spurred the growth of passenger transportation, the 21-passenger Douglas DC-3 was introduced in 1935.



THE PRODUCTION MIRACLE OF WORLD WAR II Barely out of its adolescence, the U.S. aircraft industry incredibly produced more than 277,000 planes in the four-year span 1942-45. In photo, B-24s under construction at Consolidated Vultee Aircraft Corporation.

On September 30, 1993, Aerospace Industries Association (AIA) began its 75th year of service to U.S. manufacturers of aviation and space products.

It was on that date in 1919 that AIA began life as the Aeronautical Chamber of Commerce, an organization incorporated in the state of New York "to encourage the growth and understanding of all things pertaining to aeronautics and to develop new and useful devices therein or auxiliary thereto; to promote the use of aircraft as a means of commerce or sport or pleasure; and to foster the development of the aircraft industry and kindred trades."

The establishment of the trade association represented a significant milestone in aviation history because it triggered the coalescence of a number of independent plane builders into a fledgling industry whose members exchanged ideas and technical information and worked together on matters of common interest.

Prior to 1919, there was little that could be called an aircraft "industry" in the United States. When World War I began, there were only a handful of American companies building airplanes and their aggregate design and development capability was minimal. The U.S. aircraft production capacity was almost non-existent; only 6 of the 16 companies awarded mobilization contracts had ever produced as many as 10 airplanes—not 10 a year, but 10 total.

During World War I, the government mobilized a makeshift aircraft industry, an amalgam of quickly expanded aviation companies, automotive companies, woodworking companies such as furniture makers and sash-and-door manufacturers, and machine shops that produced metal fittings for the wooden airframes. Unbelievably, they managed to produce 29,000 airplanes in a year and a half, more than any other nation, but only one American design was produced in quantity: the Curtiss JN-4 trainer.

In 1919, the automotive and woodworking companies went back to their prewar occupations. With 9,000 surplus JN-4s available, there was little market for new airplanes and the 31 remaining companies

of the postwar aircraft industry faced a difficult struggle for survival. But, with modest government funding for military aircraft development, the burgeoning industry displayed, in that first postwar year, the talent for design innovation that would ultimately gain for the U.S. acknowledged leadership among the world's aircraft industries. It was the start of 75 years of success.

Though lagging far behind its European rivals at the outset, the U.S. industry achieved parity by the end of the 1920s and forged ahead in the 1930s, notably with the development of the DC-3 that made possible affordable, high volume air transportation.

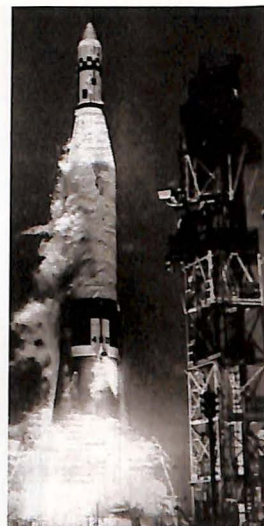
In the 1940s, the industry accomplished the production miracle of World War II, building 277,000 military aircraft in 1942-45. Then, in a postwar era characterized by few military production contracts, the industry turned its attention to new types of airline transports and a series of advanced jet-powered military prototypes. Some of those prototypes evolved into the production mainstays of the U.S. air services in the 1950s, while the industry broadened its technological front with development of a wide variety of missile systems and the first American-built jetliners.

The 1960s marked a period of dramatic technological advance in defense systems, airline transport development, and the new field of space operations, wherein an American government/industry team produced the greatest technological achievement of the century, the landings of a dozen men on the Moon.

In the quarter-century since the first Apollo lunar landing, the U.S. aerospace industry has maintained its world technological leadership in defense, space, and commercial aviation despite increasingly strong competition from abroad and a post-Cold War decline in defense production. On the eve of the 75th anniversary, AIA and the companies it represents are engaged in a restructuring effort toward a necessarily smaller industry that will nonetheless be financially healthy, competitively strong, and technologically preeminent, well-positioned to take on the broad challenges of the new century.

In the 1950s the industry inherited a new defense responsibility and a new product line as the Department of Defense deployed a broad variety of missile systems, including the principal deterrent weapon, the ICBM. In photo, the first U.S. ICBM type, the Atlas.

THE MISSILE ERA



TO THE MOON In the 1960s, the industry further broadened its activities with development and fabrication of space systems, including the greatest technological achievement of the century: development of the Saturn V / Apollo launch vehicle and spacecraft that sent a dozen Americans to the Moon. In photo, Apollo 11 astronaut Edwin "Buzz" Aldrin becomes the second man on the Moon.

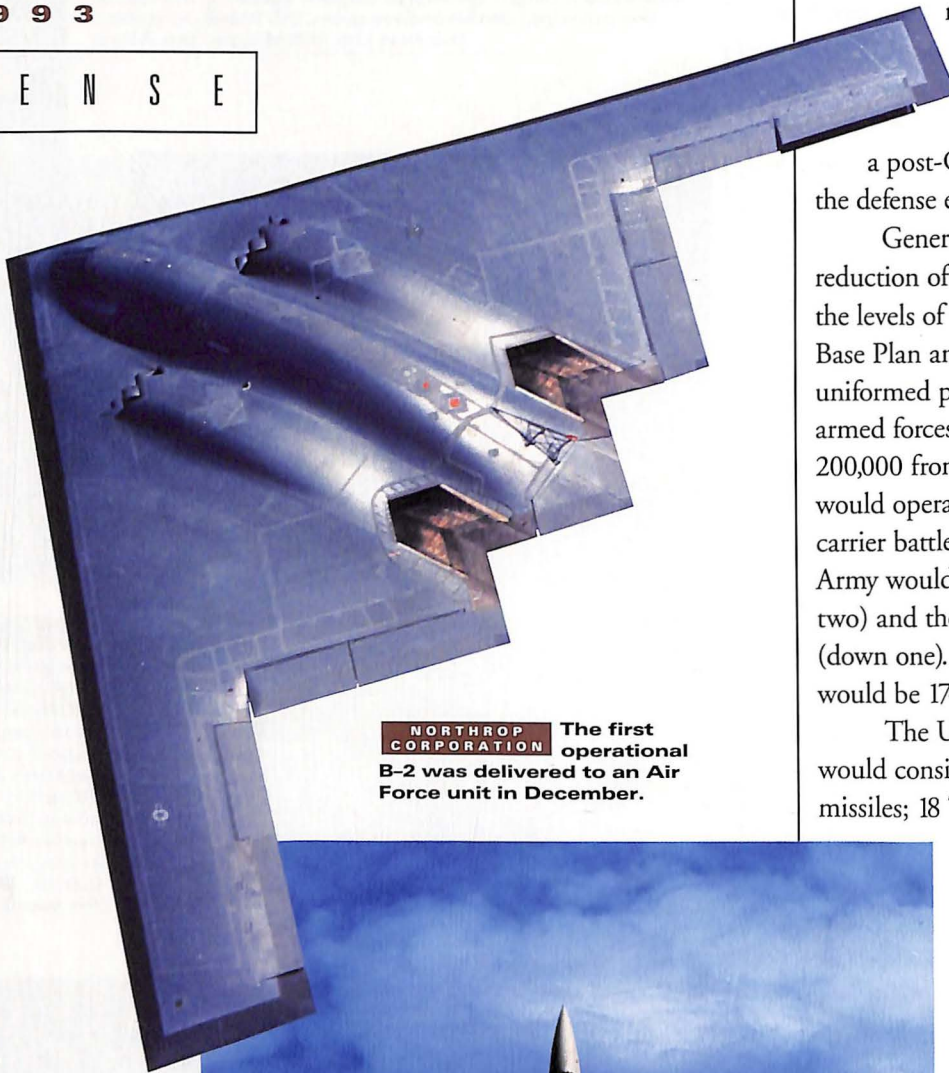


THE SHUTTLE ERA Development of the first reusable spacecraft, the Space Shuttle, highlighted a broad industry advance—in the 1970s and 1980s—in military/civil aviation, missilery, and space.

THE 75TH YEAR The Air Force YF-22 advanced tactical fighter demonstrator symbolizes U.S. world leadership in aerospace technology advancement as the industry rounds out 75 years of success.

**AEROSPACE
HIGHLIGHTS
1993**

D E F E N S E



NORTHROP CORPORATION The first operational B-2 was delivered to an Air Force unit in December.

For the Department of Defense (DoD), a highlight of the year was the September 1 release of the Bottom-Up Review report, which outlines the Clinton administration's plan for a post-Cold War restructuring of the defense establishment.

Generally, the plan contemplates reduction of active force strengths below the levels of the Bush administration's Base Plan announced in 1992. The total uniformed personnel strength of the armed forces would be 1.4 million (down 200,000 from the Bush plan); the Navy would operate 11 aircraft carriers and carrier battle groups (down one), the Army would have 10 divisions (down two) and the Air Force 13 fighter wings (down one). Marine Corps strength would be 174,000 (down 15,000).

The U.S. strategic nuclear force would consist of 500 Minuteman III missiles; 18 Trident submarines equipped with Trident C-4 and D-5 missiles; up to 94 B-52H bombers equipped with cruise missiles; and 20 B-2 bombers. The revised force structure would be attained in 1999, the strategic force by 2003.

For the aerospace/defense industry, in its eighth year of adjusting to the defense restructuring effort, it was a year of sharply reduced production activity as defense sales declined for the sixth straight year. There were, however, a number of solid accomplishments in development and production of advanced defense systems.

Among DoD's aircraft programs, the Northrop-developed Air Force B-2 bomber officially became operational when the first B-2 was delivered to Whiteman Air Force Base, Missouri, on



DUPONT COMPANY DuPont Fibers developed a Thermoplastic Tow Placement Stiffened Skin Composite Part for aircraft structures.



NORTHROP CORPORATION Employing the tow placement advanced manufacturing technique, a computerized robot uses ribbons of graphite to build an aircraft inlet; the Navy/Marine Corps F/A-18E/F strike fighter will be the first operational aircraft with components made from tow-placed composites.



LOCKHEED FORT WORTH COMPANY/THE BOEING COMPANY The Air Force's F-22 developmental advanced tactical fighter passed a Preliminary Design Review in April. In photo, the F-22 (center) is pictured with Lockheed's F-16 and F-117A fighters.

December 17. Testing of the B-2 continued; by year-end, the seven aircraft in the program had accumulated more than 1500 test hours. Testing, initiated in 1990, was to continue into 1997.

The Air Force's F-22 advanced tactical fighter passed its Preliminary Design Review (PDR) on April 30. The next planned milestone is the Critical Design Review (CDR)/final design approval slated for mid-to-late 1994.

Pentagon officials indicated that four Air Force wings will eventually be equipped with F-22s, suggesting a total "buy" of about 450 aircraft over more than 20 years.

The F-22 is being developed by Lockheed Corporation and The Boeing Company.

In other aircraft developments:

The Navy F/A-18E/F strike fighter passed its PDR in July; the CDR was planned for spring/summer 1994. The F/A-18E/F is being developed by an industry team headed by McDonnell Douglas Corporation and Northrop Corporation.

In August, the Air Force/McDonnell Douglas C-17 airlifter accomplished a testing milestone when a static test fuselage/wing segment successfully withstood loads up to 150 percent of the design load limit. In June, McDonnell Douglas delivered the first C-17 to an operational unit of the USAF's Air Mobility Command.

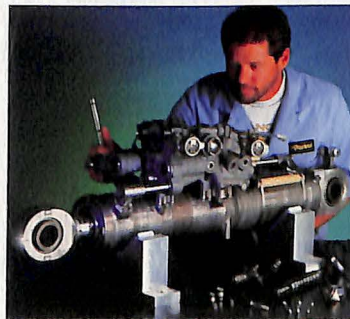
In May, the Defense Acquisition Board approved low-rate production for the Air Force/Grumman JSTARS (Joint Surveillance Target Attack Radar System), a modified Boeing 707 airframe with advanced target detection and classification equipment. In December, two E-8A JSTARS test aircraft completed verification testing.



LOCKHEED FORT WORTH COMPANY/ GENERAL ELECTRIC COMPANY A joint USAF/industry program resulted in a successful operational concept demonstration of an F-16 aircraft modified with a MATV (Multi-Axis Thrust Vectoring) engine nozzle.



GRUMMAN CORPORATION In May, the Defense Acquisition Board approved low-rate production for the Air Force E-8C Joint Surveillance Target Attack Radar System; in photo, three of the 18 consoles within the Boeing 707 airframe.



PARKER HANNIFIN CORPORATION In production at Parker Berteau Aerospace is the horizontal tail-integrated servoactuator for the F-22 fighter.



KAMAN AEROSPACE CORPORATION The company's SH-2G multi-mission aircraft entered service with the Naval Reserve.

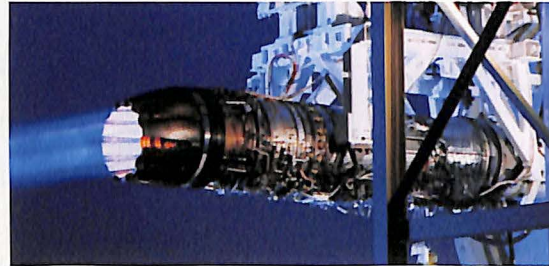
Undergoing test at Edwards Air Force Base, California, is GEAE's AVEN (Axisymmetric Vectoring Exhaust Nozzle) mounted on an F110 military aircraft engine.

GENERAL ELECTRIC AIRCRAFT ENGINES



In development and targeted for first flight of a production configuration Air Force F-22 in 1996 is the F-119-PW-100 engine, which features a pitch vectoring exhaust nozzle.

UNITED TECHNOLOGIES PRATT & WHITNEY



In September, Boeing Defense & Space Group announced completion of the first Air Force B-52H conventional mission upgrade, which involves modifications to allow accommodation of Have Nap and Harpoon air-to-surface missiles and other advancements to give the B-52H a conventional warfare capability.

Assembly of the first YRAH-66 Comanche scout/attack helicopter began in December. A Boeing/Sikorsky team is building three prototype Comanches under Army contract for flight evaluations beginning in 1995.

In June, the Army AH-64 Apache Longbow helicopter completed a series of firing tests of Hellfire missiles, demonstrating a capability to fire both the laser-guided Hellfire and a new Launch Transient Test Vehicle Hellfire. In December, the Army and prime contractor McDonnell Douglas successfully concluded a series of tests on the Longbow's IDM (Improved Data Modem) that allows Apache crews to communicate digital targeting data with compatible air and ground systems.

Lockheed Fort Worth Company delivered to the USAF the first upgraded Block 50D F-16 fighter in May. The company had orders for more than 100 Block 50D (General Electric F110-GE-129 engines) and Block 52D (Pratt & Whitney F100-PW-229 engines) upgrades.

Among missile programs, the AFM-137 TSSAM (Tri-Service Standoff Attack Missile), intended as a long-range weapon for use against a variety of targets, continued in developmental flight test. An advanced technology system planned for initial operational service about 1998, TSSAM is being developed in both air-launched and ground-launched versions. TSSAM prime contractor is Northrop Corporation.



BOEING/SIKORSKY Assembly of the first YRAH-66 Comanche scout/attack helicopter began in December. Boeing Defense & Space Group's Helicopters Division and United Technologies Sikorsky division are building three prototypes for initial flights in 1995.



MCDONNELL DOUGLAS HELICOPTER COMPANY In June, the Army AH-64 Apache Longbow helicopter completed a series of firing tests of standard and advanced Hellfire missiles. The Hellfire is manufactured by Rockwell's Tactical Systems Division.

In September, the McDonnell Douglas-built AMRAAM (Advanced Medium Range Air-to-Air Missile) completed a series of live fire tests and was approved by the Navy for Initial Operating Capability aboard F/A-18 aircraft. AMRAAM was already operational on USAF F-15s and F-16s.

Operational since 1986, the Air Force Peacekeeper ICBM continued to undergo test in a follow-on operational evaluation program that involves two full-scale flights a year from Vandenberg Air Force Base, California, to the Kwajalein Missile Range in the Marshall Islands. Peacekeepers made two successful 1993 flights in March and July. Martin Marietta Corporation is assembly and test contractor; the missile's four stages are built by Thiokol, GenCorp Aerojet, Hercules Incorporated, and Rockwell Rocketdyne.

Development continued on two new missile programs, the JSOW (Joint Stand Off Weapon) and the JDAM (Joint Direct Attack Munition). Both are part of the Air Force's SEAD (Suppression of Enemy Air Defenses) program intended to neutralize enemy air defense systems. JSOW is a 40-mile-range glide bomb to be used by USAF and Navy aircraft beginning in the late 1990s. JDAM is a shorter-range guided bomb directed to its target by signals from the space-based Global Positioning System (GPS). Texas Instruments Incorporated is JSOW prime contractor. Rockwell International, GPS manufacturer, and The Boeing Company are teaming on JDAM development.

In other missile activity:
The Army's Javelin "fire and forget" man-portable antitank weapon began operational evaluation testing in the spring. Low rate



BELL HELICOPTER TEXTRON In October, the Army took delivery of the first two TH-67 Creek training helicopters; Bell won a competition to produce 102 of the helicopters.



ROCKWELL INTERNATIONAL In production at Rockwell's Tactical Systems Division is the AGM-130 low-cost precision guided standoff weapon used by the USAF and international forces, shown under the wing of an F-15E.

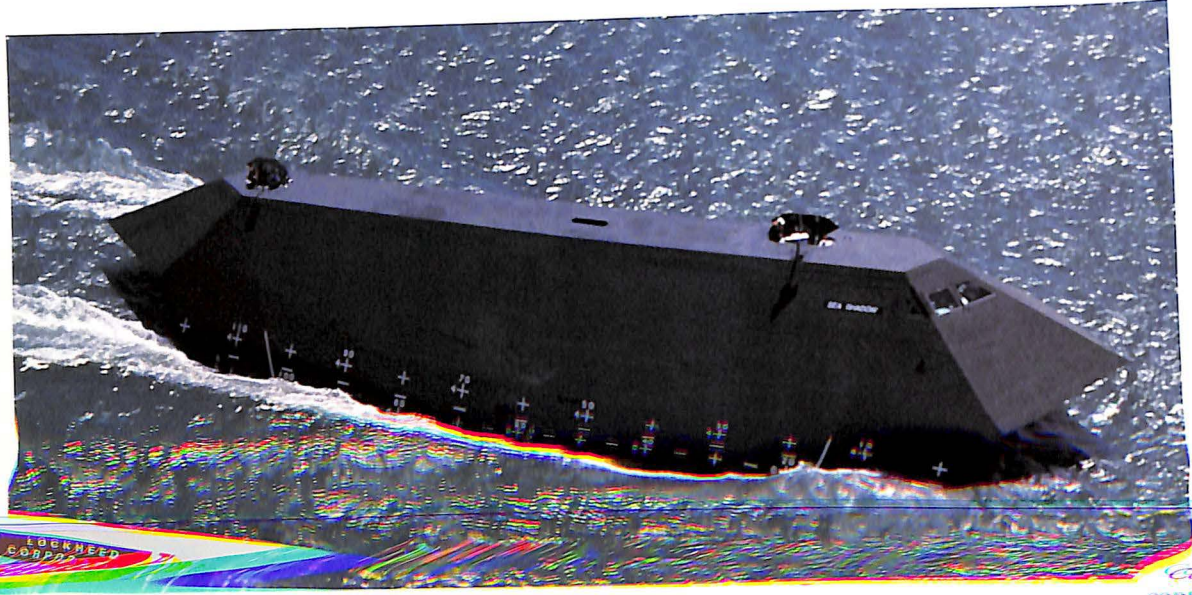
ITT FEDERAL SERVICES CORPORATION The Air Force Peacekeeper ICBM made two successful flights in March and July, part of a follow-on operational evaluation program. ITT is Western Range Technical services contractor; Martin Marietta is prime contractor for Peacekeeper assembly and test.



RAYTHEON COMPANY Undergoing test against a drone target at White Sands Missile Range is the Army Patriot Pac 3 missile.



LORAL VOUGHT SYSTEMS CORPORATION In technology demonstration status was the LOSAT (Line of Sight Anti-Tank) missile system. In photo, the new, lighter LOSAT vehicle that offers easier transportability and greater firepower.



initial production of the Javelin was approved by the Department of Defense, and in December the Army Missile Command awarded a contract for long lead time items to the joint venture co-producers, Texas Instruments and Martin Marietta.

In December, the Army selected Westinghouse Electric Corporation as the contractor for solid-

LOOKHEED CORP. The company is employing its stealth technology in a joint program with the Navy, operating the Navy-owned Sea Shadow technology demonstration platform to explore advanced concepts for surface ship design.

state amplifier modules for the antiballistic missile Ground Based Radar (GBR). Raytheon Company is prime contractor for the GBR.

The Air Force Materiel Command reported that the Martin Marietta-built AGM-142 Have Nap air-to-ground missile demonstrated superior performance in two



MARTIN MARIETTA CORPORATION Navy technician deploys a towed array sonar aboard the USS Arleigh Burke; produced by the company's Aero & Naval Systems division, the array is a mile-long tube packed with sensitive listening devices.

September test flights launched from a B-52 bomber. Martin Marietta is co-producer of the weapon system with Israel's Rafael.

In May, Hughes Missile Systems Company won an Army assignment to advance LEAP (Lightweight Exoatmospheric Projectile) technology toward eventual development of an advanced antiballistic missile.

The Army's LOSAT (Line-of-Sight Anti-Tank) program continued in technology demonstration status. Loral Vought Systems is LOSAT prime contractor.

In August, the Army's Aviation and Troop Command awarded contracts to Raytheon Company's Missile Systems Division and Westinghouse Electronic Systems Group for demonstration/validation of a new Airborne Standoff Minefield



WESTINGHOUSE ELECTRONIC SYSTEMS Using nothing more than a screw driver, a company engineer assembles multi-chip packages, without solder, for an electronic module of the Comanche helicopter's mission computer cluster, demonstrating the Westinghouse-developed Solder-Free Interconnect technology.



MARTIN MARIETTA CORPORATION A quality control technician inspects sensors on the TADS/PNVS system that enable Army AH-64 Apache helicopters to fly low level missions at night or in bad weather.

D E F E N S E

Detection System (ASTAMIDS). To be mounted on a manned/unmanned aerial vehicle, the system is to include a minefield sensor, software and processor, a data link, and a mobile display station.

In a July test at the Army's White Sands Missile Range in New Mexico, a TGSM (Terminally Guided Submunition) dropped from an aircraft, successfully demonstrated its ability to search for, acquire, and attack an armored target. The TGMS is being developed by a French/German/United Kingdom/U.S. consortium; Martin Marietta is the U.S. company.

In development by Northrop Corporation was the BAT (Brilliant Anti-Tank) submunition, an Army weapon that can be employed on a number of carrier vehicles, such as the TSSAM (Tri-Service Standoff Attack Missile), the ATACMS (Army Tactical Missile System), and the Multiple Launch Rocket System.

In development by Textron Defense Systems was the WAM (Wide Area Mine), a weapon that employs acoustic and seismic sensors to detect, track, and attack enemy helicopters; an alternative version is designed for use as an antitank weapon. An Army production decision is slated for 1996.

In November, Loral Vought Systems' ERINT (Extended Range Interceptor) missile successfully intercepted a Storm tactical ballistic missile in a test at White Sands Missile Range.



TRW INC. The Army's FAAD C2 (Forward Area Air Defense Command and Control) system, developed by TRW's Systems Integration Group, gathers battlefield intelligence and air defense targeting data and distributes it to commanders and two-man gunner teams.



TEXTRON DEFENSE SYSTEMS In development is the WAM (Wide Area Mine), an acoustic/seismic system for detecting and attacking tanks and low-flying helicopters.



ITT DEFENSE AND ELECTRONICS Representative of a line of night vision systems manufactured by the ITT Electro-Optical Products Division is the F4949 Aviator's Night Vision Imaging System.



LORAL VOUCHT SYSTEMS The air transportable HIMARS (High Mobility Artillery Rocket System), for use with the Army's Multiple Launch Rocket System, was unveiled in October.

**A E R O S P A C E
H I G H L I G H T S
1 9 9 3**

C I V I L A V I A T I O N



BOEING COMMERCIAL AIRPLANE GROUP At year-end, the first B-777 advanced technology jetliner neared final assembly. First deliveries are planned for 1995.



HONEYWELL INC. At Honeywell's Air Transport Systems, engineers check the resolution of a new-generation flat panel cockpit display developed for the Boeing 777.



MCDONNELL DOUGLAS CORPORATION A fall milestone for Douglas Aircraft Company: rollout of the 100th MD-11, the third built for China Airlines.



MCDONNELL DOUGLAS CORPORATION In February, the MD-90-30 entered flight test status. The MD-90-30, planned for certification in October 1994, is a 153-passenger stretched version of the MD-80. An extended range MD-90-50 is being offered for 1995 delivery.

For the world's airlines, 1993 was a year remarkably similar to its predecessor. Despite increasing traffic, it was a year of heavy losses occasioned by a variety of factors: sluggish economies in most major nations, high operating costs despite cost-cutting measures, increased tax burdens, higher interest charges, and overcapacity among most major carriers, which led to reduced load factors and fare wars.

Speaking for the U.S. scheduled airlines, the Air Transport Association issued a preliminary statement that the industry would lose more than \$1 billion in 1993. This actually represented a substantial improvement over 1992, when the U.S. airlines lost \$4 billion, but it brought total losses for the four years

of the 1990s to almost \$11 billion.

The year's combined losses for the member airlines of the International Air Transport Association (IATA) were expected to reach about \$2.5 billion, according to a preliminary estimate by IATA. That would mean an aggregate loss for the 1990s of some \$14 billion.

The continuing financial difficulties of the airlines, and the resulting necessity of canceling or deferring jetliner orders, were reflected in data on the aircraft manufacturing industry's sales of commercial transports (which are based on deliveries). Manufacturers delivered 414 transports in 1993, compared with 567 in the previous year. Transport sales for 1993 totaled \$24.2 billion, down from the all-time record of \$28.8 billion in 1992.

The backlog of orders for jetliners (as of September 30, 1993, the latest date for which data were available) was 1,323 aircraft worth a total \$82.6 billion; those figures compare with 1,493 aircraft valued at \$96.7 billion at the end of 1992.

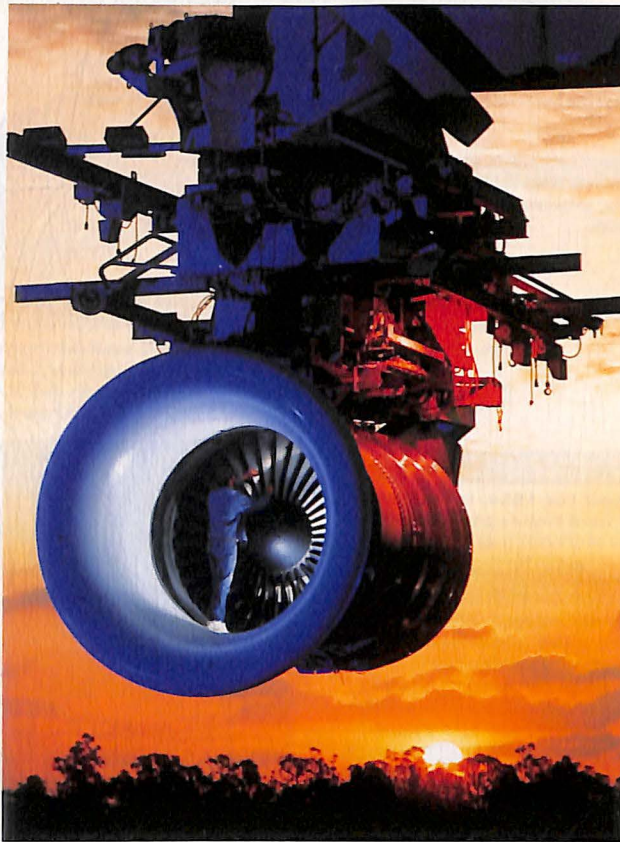
Civil aircraft sales as a whole (including helicopters and general

aviation planes) were similarly depressed. The industry delivered 1,515 aircraft of all types, down from 1,790 in 1992; total dollar value declined to \$26.1 billion, down from \$30.7 billion. Helicopter production totaled 251 units (down from 324) valued at \$73 million (down from \$142 million). General aviation planes delivered numbered 850, down from 899 and the lowest number in post-World War II history; dollar value was \$1.8 billion, approximately the same as in 1992.

As of September 30, 1993, Boeing Commercial Airplane Group had orders on the books for 1,109 transport aircraft. The largest component of the Boeing backlog was 425 orders for the B-737 short-to-medium range twinjet. Other aircraft on order included 237 B-757s, 170 B-747s, 145 767s, and 130 of the new B-777.

An advanced technology, high capacity, long-range twinjet, the Boeing 777 was launched in 1990. By year-end 1993, the first 777 was nearing final assembly with December initiation of a four-week "final body join" involving mating of the four major fuselage segments, the wing-body section, and the tail section. First 777 deliveries are planned for 1995.

Flight testing of 777 engines got under way in November when Pratt & Whitney's PW4084 engine made its first flight aboard a Boeing 747 test bed. At year-end General Electric Aircraft Engines' GE90 was also flying as one of four 747 engines. The third 777 type of power-plant—the Rolls Royce Trent 800—was undergoing ground testing.



UNITED TECHNOLOGIES PRATT & WHITNEY In October, the 68,000 pound thrust PW4168 engine made its first flight aboard the Airbus A330. Shown being readied for ground testing, the engine received FAA certification in August.



ROHR, INC. In production at Rohr are nacelle systems for the GECF6-80C2 engine; in photo, a core cowl is test fitted with an engine.



LORD CORPORATION Lord Mechanical Products division introduced a Tuned Vibration Absorber (TVA). Placed on a vibrating structure, such as an aircraft fuselage, a system of TVAs acts as an "energy sink" to reduce vibratory motion and associated cabin noise.



GENERAL ELECTRIC AIRCRAFT ENGINES The GE90 high thrust turbofan engine, one of three power plant types for the Boeing 777, made its first flight in December on a Boeing 747 test bed. Pratt & Whitney's PW4084, another 777 power plant, started flight testing in November.

GULFSTREAM AEROSPACE CORPORATION

In September, production began on the Gulfstream V, planned for first flight in 1995 and initial deliveries in 1996.

In production, with first deliveries planned for 1994, is the MD Explorer civil helicopter, which features the NOTAR (no tail rotor) anti-torque system.

MCDONNELL DOUGLAS HELICOPTER COMPANY



Newest of the Cessna

TEXTRON INC. CESSNA

Citation line of business aircraft, the Citation X, was rolled out in September and flown in November.



RAYTHEON COMPANY

The Hawker 1000 program was acquired by Raytheon Corporate Jets, Inc.; about 30 of the midsize business jets were in service at year-end.

In November, Boeing launched another new jetliner program with an order for 63 737-300X transports from Southwest Airlines. The new generation 737-300X features a larger wing and more powerful General Electric CFM56-3XS engines, providing intercontinental range and increased speed. First deliveries to Southwest are slated for 1997.

In other Boeing highlight activity, the company delivered the 1,000th airplane of the 747 series in September. The 747-400F freighter received its Federal Aviation Administration certification in October.

McDonnell Douglas transport orders (as of September 30) totaled 214 aircraft, including 69 MD-11 long-range trijets and 145 of the MD-80/90 series twinjets. The company delivered more than 30 MD-11s in 1993, bringing the total delivered to more than 100, and some 40 MD-80s.

The new MD-90 entered flight test status in February. Featuring improved fuel efficiency over the MD-80 series, the initial model MD-90-30 is a stretched version of the MD-80 seating 153 passengers. Type certification is targeted for October 1994.

McDonnell Douglas Helicopter Company's MD Explorer civil helicopter was in flight test status during 1993. In December, the third production prototype made its flight debut. The company expected to start deliveries early in 1994 of the Explorer, which features the NOTAR (no tail rotor) design.



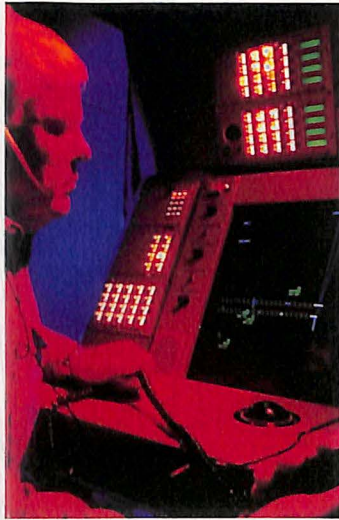
Textron Inc. Cessna delivered the first of its CitationJet business aircraft in January; by year-end Cessna had orders for almost 100 CitationJets. Newest of the Citation line, the mid-size Citation X was rolled out in September and flown in November; the company expects certification in 1995.

In September, Gulfstream Aerospace Corporation started "cutting metal" on its latest corporate jet, the Gulfstream V, designed to fly nonstop from New York to Tokyo. Company plans called for roll-out of the first Gulfstream V in early 1995, flight tests later in 1995, and initial deliveries in 1996. Gulfstream Aerospace reported that its backlog of orders for the jet had reached close to \$1 billion.

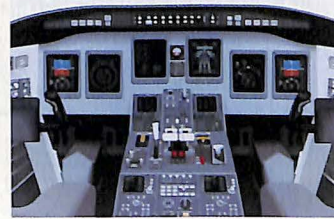
In February the administration announced its intention of substantially boosting funding for NASA aeronautical research and technology development. The plan called for increases totaling some \$600 million over the four fiscal years 1994-97 "to expand NASA aeronautics research in support of the aviation industry and enhancement of the safety and capacity of the national airspace system."

Areas of special focus include research on advanced subsonic transports to increase the competitiveness of U.S. manufacturers; establishing a technology base for an economic supersonic passenger transport; and short-haul aircraft research. Work continued on the NASA/industry High Speed Research (HSR) program, intended to address the highest priority, highest risk

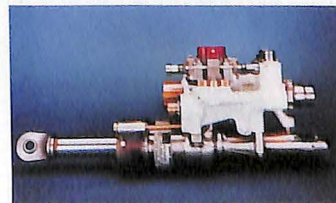
ALLIEDSIGNAL AEROSPACE In production for the FAA at AlliedSignal Communications Systems is the Precision Runway Monitor, which allows air traffic controllers to safely reduce spacing between aircraft landing in low visibility weather.



ROCKWELL INTERNATIONAL Developed by Collins Commercial Avionics is the Pro Line 4 avionics system. The advanced flight deck features six large CRT displays that offer primary flight, multifunction display, and EICAS (Engine Indication and Crew Alerting System) information.



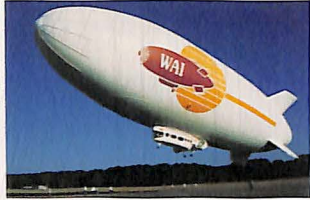
B. H. AIRCRAFT COMPANY, INC. Among critical core components being manufactured by B.H. Aircraft is this heat shield for the Pratt & Whitney JT8D engine.



DOWTY AEROSPACE In production at Dowty Aerospace Los Angeles is a fly-by-wire rudder control system for the Saab 2000 regional airliner.

In development and limited production at Harris Electronic Systems Sector is a Voice Switching and Control System for FAA air traffic controllers.

HARRIS CORPORATION



WESTINGHOUSE ELECTRONIC SYSTEMS A 320-hour, 97-flight program led to FAA issuance of a type certificate for the Westinghouse Sentinel 1000-001.



GRUMMAN CORPORATION Among a number of diversification projects, Grumman is conducting concept definition studies in a federally funded program aimed at development of a maglev, a 300-plus mile-per-hour magnetically levitated train.

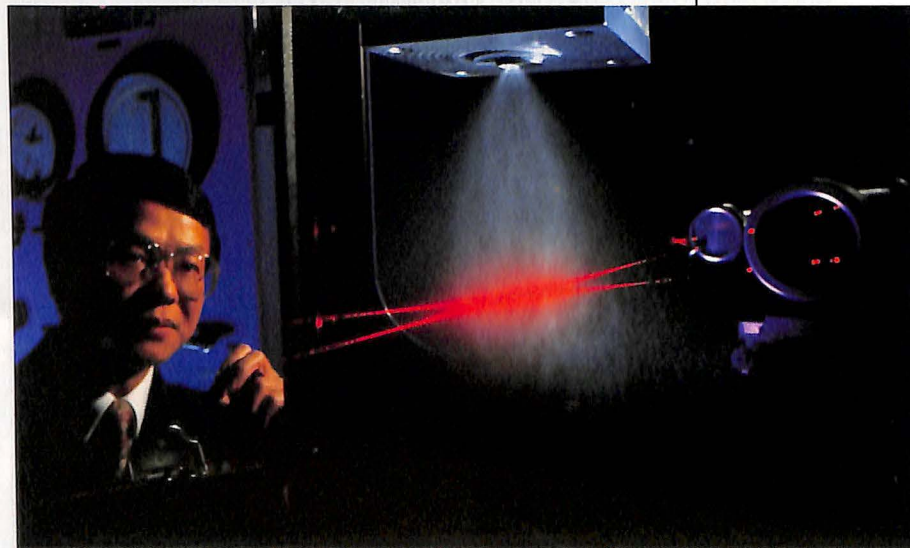


E-SYSTEMS INC. Targeted for both civil and military use, E-Systems' Vista Flight Net was developed to enhance weather and flight information functions at flight service stations.



ITT CANNON In production at ITT Cannon are the company-developed ARINC 600 and 404 rack and panel avionics connectors.

COLTEC INDUSTRIES INC Delavan Gas Turbine Products Division is developing advanced injectors for cleaner combustion in turbine engines; in photo, a researcher is using laser diagnostic equipment to evaluate spray nozzle performance.



technologies needed for a supersonic jetliner that could be flying by 2005; the industry team members include The Boeing Company, McDonnell Douglas Corporation, General Electric Aircraft Engines, and Pratt & Whitney. The HSR program moved into Phase 2 (design studies, component and structural testing) in October. NASA planned to seek approval for a 1996 start on development of an experimental supersonic commercial transport and a full-scale engine.

NASA, manufacturers, and airlines were participating in the FAA-led program to develop technology for an integrated CNS/ATM (communications, navigation, surveillance/air traffic management) system based on signals from satellites of the DoD-developed Global Positioning System (Rockwell International produces the satellites).

In September, NASA's Langley Research Center, flying its transport research 737 aircraft, concluded a series of automatic landings using only satellite guidance without help from the plane's flight management system. Also in September, the FAA and Honeywell Inc., using a company Gulfstream, demonstrated GPS approach capabilities down to 200 feet in Category 1 weather at Washington (D.C.) National Airport.

In June, Westinghouse Electric Corporation announced the first sale—to the Republic of Turkey—of its MSSA (Multi-Sensor Surveillance Aircraft),

designed for law enforcement activities, border surveillance, and emergency response. The MSSA program is a joint venture with Pilatus Britten-Norman (PBN). The aircraft is a PBN Islander fitted with a Westinghouse radar, infrared optical system, and a video/data link.

AEROSPACE HIGHLIGHTS 1993

SPACE

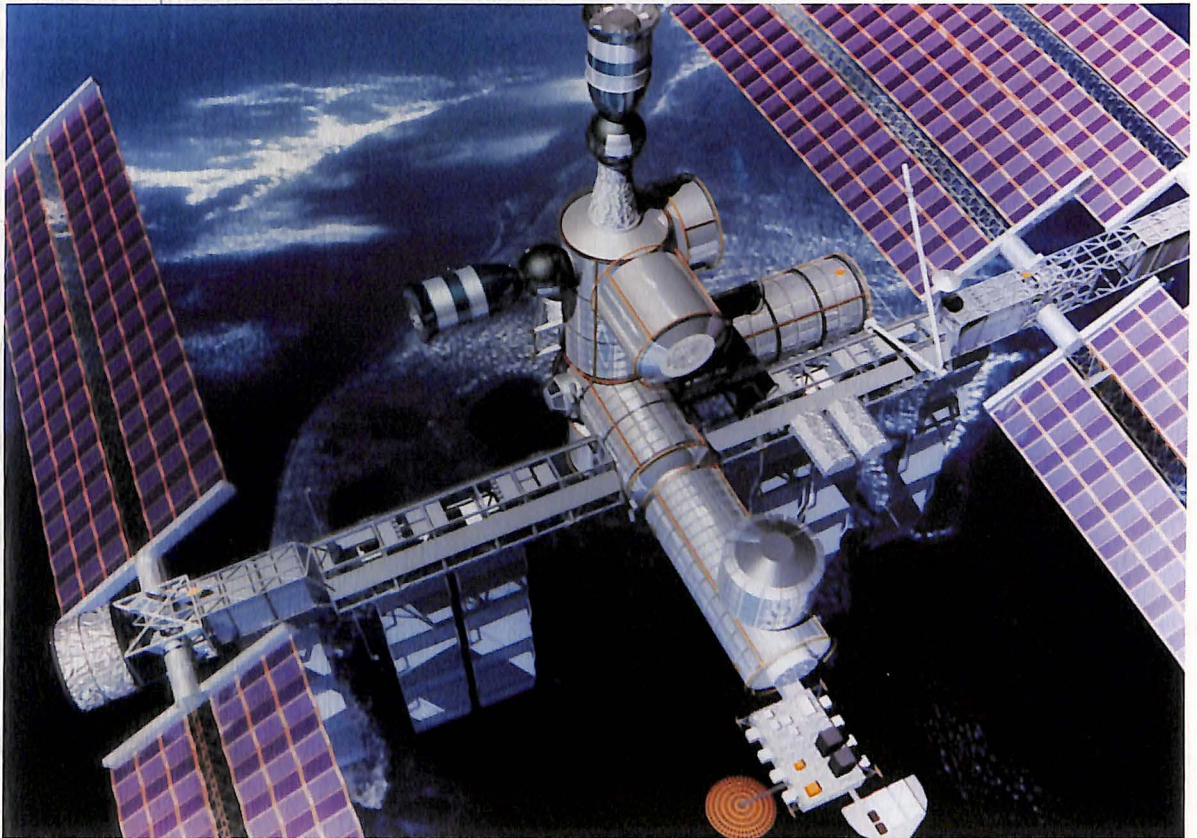
For NASA, the year 1993 was highlighted by several developments in the space station program, among them another major redesign and the acquisition of a new international partner, the Russian Space Agency (RSA).

In June, after a 90-day redesign effort undertaken at the direction of President Clinton, NASA submitted a report listing three design options for effecting major economies by reconfiguring the station and streamlining its management. In the same month, the president proposed to the Congress that NASA proceed with Space Station Alpha, a new version that retains much of the capability of the Freedom design but offers substantial cost reductions.

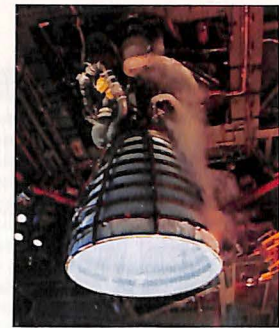
In December, following Clinton administration discussions with officials of the Russian Federation, the direction of Station Alpha took another turn when the participating nations—the U.S., Canada, Japan, and nine member nations of the European Space Agency—agreed to invite Russia to join the international team. On December 16, at a Moscow meeting of the U.S./Russian Joint Commission, Russia accepted the invitation.

Under the agreement, NASA and the RSA will team on a Phase I program, beginning in 1994, involving flights of astronauts/cosmonauts aboard each other's spacecraft, including up to 10 Space Shuttle flights to the Russian *Mir* space station; a joint program of

THE BOEING COMPANY In June, the Clinton administration accepted a new version of the space station known as Station Alpha, to be further modified to incorporate Russian technology under a December international agreement. Boeing Defense and Space Group is prime contractor.



ROCKWELL INTERNATIONAL A technician monitors temperatures of the thermal vacuum chamber at Rockwell's Space Station Assembly and Test Facility. Rockwell's Rocketdyne Division has a NASA contract to build the space station's electrical power system.



ROCKWELL INTERNATIONAL NASA's Space Shuttle flew seven successful missions in 1993. In photo, a test run of the Space Shuttle Main Engine (SSME) illustrating the transparently clean combustion of the engine's propellants. Rocketdyne is SSME contractor.

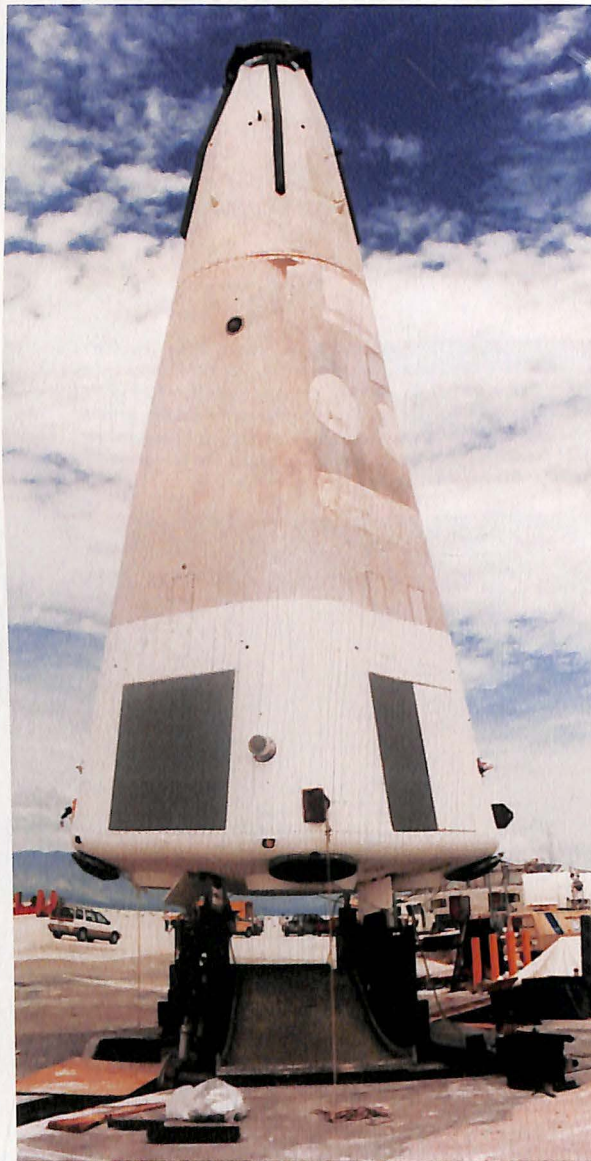


THIokol CORPORATION A Space Shuttle booster segment undergoes inspection at Thiokol; four of these 250,000-pound segments make up each of the Shuttle's two solid rocket boosters.

Under contract **MCDONNELL DOUGLAS AEROSPACE**
 to the Ballistic Missile Defense Organization, McDonnell Douglas conducted static and flight tests of the company-developed Delta Clipper Experimental (DC-X) to demonstrate the feasibility of single-stage-to-orbit (SSTO) technology. The suborbital DC-X is a one-third scale version of an SSTO that could deliver 20,000 pounds to Earth orbit.



In September, **HERCULES INCORPORATED**
 Hercules Aerospace Company and the USAF's Phillips Laboratory successfully completed the final qualification test of the Titan IV Solid Rocket Motor Upgrade (SRMU). Hercules designed and developed the SRMU as a subcontractor to Martin Marietta.



scientific and technological research; and upgrade/life extension of the *Mir*.

In Phase II, U.S. and Russian components will be combined to create a human-tended orbital research facility that will later become the core around which the international space station will be constructed (Phase III). NASA did not spell out a new timetable but noted that Russian involvement "will permit earlier station operations."

In line with the plan to streamline space station management, NASA announced in September that a single NASA center—Johnson Space Center—would direct the program and a single prime contractor—Boeing Defense and Space Group—would supplant the earlier developmental approach involving three industry work teams. McDonnell Douglas Astronautics and Rocketdyne Division of Rockwell International became principal subcontractors.

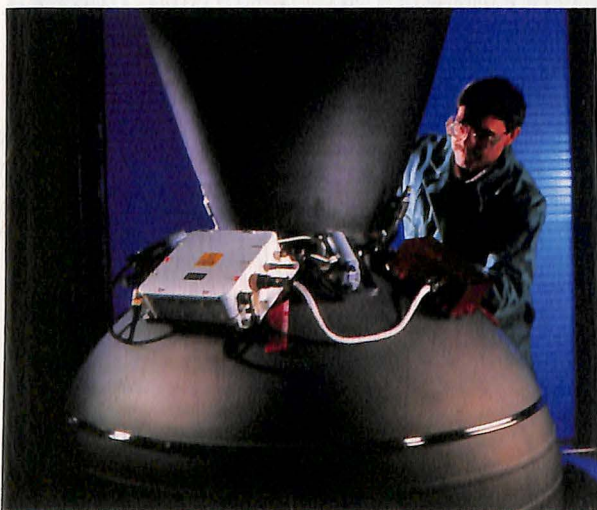
NASA's operational highlight of 1993 came on the final Space Shuttle flight of the year, STS-61, the spectacular and highly successful December servicing mission to the Hubble Space Telescope (HST). Astronauts aboard the Orbiter *Endeavor* conducted five EVAs (extra-vehicular activities) to install corrective optics for the telescope's primary mirror,

replace the solar arrays, and substitute several updated items of equipment in the telescope system. The HST was redeployed, and subsequent tests confirmed that the telescope's blurred vision had been corrected. The Hubble Space Telescope was developed by Lockheed Missiles & Space Company (spacecraft) and Perkin-Elmer Company (optics); the latter

company was subsequently acquired by Hughes Space and Communications Company, a subsidiary of GM Hughes Electronics.

STS-61 was the seventh Shuttle mission of 1993. The others included:

- STS-54 in January, which accomplished the deployment of the sixth in the



THIokol CORPORATION In photo, a Thiokol STAR 48V satellite placement motor undergoes final inspection at the company's Elkton (Maryland) Division. The STAR 48V was developed for the Conestoga launch vehicle in support of NASA's COMET (Commercial Experiment Transporter) program.



MARTIN MARIETTA CORPORATION In production at Martin Marietta's Denver plant is the Titan IV Air Force launch vehicle.

TRW-built series of NASA Tracking and Data Relay Satellites and operation of an astronomical observation payload.

■ STS-55 in April, which carried the ATLAS-2 (Atmospheric Laboratory for Applications and Science). ATLAS-2, with seven instruments for studying atmospheric chemistry, solar energy and the processes of ozone depletion, marked the fourth step in the spaceborne segment of Mission to Planet Earth.

■ STS-56 in April/May, devoted primarily to operation of the Germany-sponsored Spacelab D2 mission, involved a wide range of microgravity experiments.

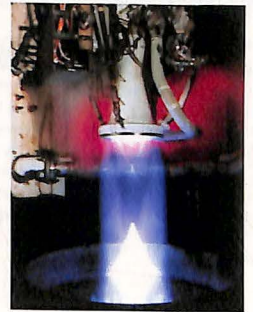
■ STS-57 in June, during which the crew of Orbiter *Endeavor* captured and returned to Earth for study the European Space Agency's Eureka satellite, which had spent 11 months in orbit researching materials science, space science, and radiobiology. On the same mission, the privately developed SPACEHAB system made its flight debut. SPACEHAB is an "augmentation module" that fits into the Orbiter's cargo bay and provides additional rack space for crew tending of experiments in a pressurized environment.



MARTIN MARIETTA CORPORATION At year-end, Martin Marietta Manned Space Systems awaited a NASA go-ahead for development of a Superlightweight External Tank for the Space Shuttle; substitution of aluminum-lithium components could reduce the weight of the 66,000 pound (empty) tank by 8,000 pounds. In photo, a full-scale aluminum-lithium quarter dome assembly developed by the company.

DIGITAL EQUIPMENT CORPORATION DEC developed an ultra-high-performance 21064 microprocessor, the first product implementation of Alpha AXP, Digital's 64-bit RISC computing architecture.

Shown undergoing test is **UNITED TECHNOLOGIES PRATT & WHITNEY** Pratt & Whitney's RL10A-5 rocket engine, power plant for the DC-X technology demonstration vehicle.



AMERICAN PACIFIC CORPORATION A pioneer in the use of ammonium perchlorate as a rocket fuel component, AMPAC built a new perchlorates production complex in southern Utah (shown). At the same site is a new plant for manufacture of sodium azide, the inflation chemical in automotive safety bags and fire suppression products.



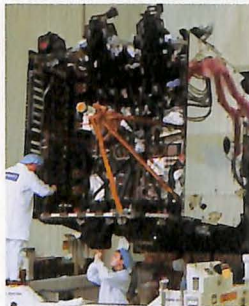
GENCORP AEROJET Aerojet signed an agreement with TRUD, a Russian aerospace organization, that allows Aerojet to adapt and market the NK-33 rocket engine (pictured) and future derivatives for use on U.S. commercial launch vehicles.



HUGHES SPACE AND COMMUNICATIONS COMPANY In December, Hughes launched a UHF Follow-On (UHFFO) satellite, one of nine being built by the company to replace the existing Fleet Satellite Communications and Leasat satellites. In photo, the second UHFFO undergoes test.



HUGHES SPACE AND COMMUNICATIONS COMPANY In May, an Ariane launch vehicle boosted Hughes' Astra IC satellite, which will provide direct-to-home broadcasting services across Europe under the sponsorship of Société Européenne des Satellites. In photo, a pre-launch view of Hughes technicians adjusting the satellite's thermal blankets.



HUGHES SPACE AND COMMUNICATIONS COMPANY In June, an Ariane rocket orbited the Hughes-built Galaxy IV, a high power satellite operated by Hughes Communications, Inc. (HCI). HSC and HSI are units of GM Hughes Electronics.

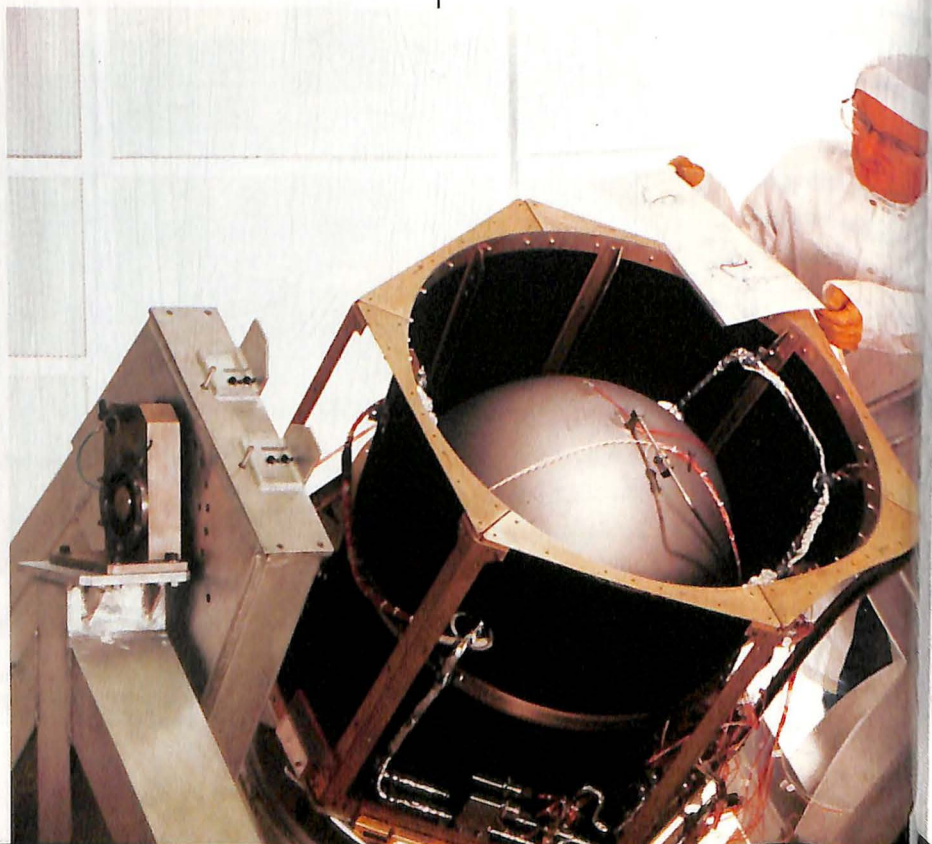
TRW INC. Shown undergoing test is a company-developed pulse-tube cryocooler designed to increase reliability and producibility in spaceborne coolers.

■ STS-51 in September, which deployed and later recaptured the ORFEUS Shuttle Pallet Satellite, an astronomical observatory that investigated such subjects as the nature of the matter that exists in the space between stars, the life cycles of stars, and the Sun-Earth energy relationship.

■ STS-58 in October, the Spacelab Life Sciences-2 mission dedicated to advancement of knowledge on how the human body adapts in a weightless condition, a study expected to provide new insight on medical problems experienced on Earth.

In other NASA activity, the Voyager 1 spacecraft, having traveled some 5 billion miles from the Sun since its launch in 1978, detected on several occasions in 1993 radio waves believed to come from the heliopause, the long-sought boundary that separates the solar system from interstellar space. Voyager 1 and its companion Voyager 2 are expected to provide information toward delineating the boundary.

In September, the McDonnell Douglas Delta Clipper Experimental (DC-X) prototype SSTO (single stage to orbit launch vehicle) successfully completed its third test flight of the year,



reaching a height of 1,200 feet, moving laterally 350 feet, then touching down. Subsequently, the company suspended tests when the Ballistic Missile Defense Organization was unable to continue funding the program.

In military space flight activity, the Air Force's Global Positioning System (GPS) achieved initial operational capability and global three-dimensional navigation coverage in June, when a McDonnell Douglas Delta II launch vehicle sent the 21st GPS Navstar satellite into geosynchronous transfer orbit. In October, the Delta II sent another Navstar to orbit, marking the 45th straight successful Delta flight over seven years.

Among other DoD space activities:

- In April, Los Alamos National Laboratory launched the ALEXIS (Array of Low-Energy X-Ray Imaging Sensors) satellite

intended to demonstrate technology for monitoring nuclear weapons proliferation.

- In July, a General Dynamics-built Atlas II launched a DSCS III (Defense Satellite Communications System) payload, the third of a constellation designed to provide secure super-high-frequency communications links for DoD and other government agencies. The satellites are built by Martin Marietta Astro Space.

- In September, a commercial General Dynamics Atlas I boosted a Navy UHF follow-on communications satellite into orbit. The satellite was one of nine UHFFO satellites being built by Hughes Space and Communications Company to replace the Fleet Satellite Communications and Leasat satellites now serving the fleet.



TRW INC. A technician at TRW's Space & Electronics Group puts the finishing touches on the thruster assemblies of a company-developed lightweight spacecraft that will carry NASA's TOMS-EP (Total Ozone Mapping Spectrometer-Earth Probe) in 1994 for accurate measurements of Earth's ozone layer.



GENERAL DYNAMICS CORPORATION In December, the company's newest and most powerful launch vehicle, Atlas IIAS, launched AT&T's Telstar 401 communications satellite.



MARTIN MARIETTA CORPORATION Undergoing test at Martin Marietta is a pair of robotic systems designed for 21st century Mars exploration. In foreground is a wheeled rover and in background a "walking beam" rover.

NATIONAL CENTER FOR ADVANCED

TECHNOLOGIES

ACCELERATING TECHNOLOGY TRANSITION TO PRODUCTS

The National Center for Advanced Technologies (NCAT) was incorporated in 1989 as a non-profit foundation to coordinate and implement the Aerospace Industries Association's Key Technologies for the Year 2000 Program. Expertise is drawn from technical experts from industry, government, and university sources.

NCAT also taps the technical experts available from other trade and professional associations such as American Institute of Aeronautics and Astronautics (AIAA), Association for Manufacturing Technology (AMT), Electronic Industries Association (EIA), Institute of Electrical and Electronics Engineers (IEEE), National Association of Manufacturers (NAM), National Security Industrial Association (NSIA), American Defense Preparedness Association (ADPA), and Society of Manufacturing Engineers (SME).

NCAT's program was originally designed to produce cooperative efforts on national consensus plans for eleven

elected key technologies. A technology team was formed in each technology area. The teams produced nine roadmaps and seven national technology strategic plans. The current completion status of the technology strategic plans is as follows: Advanced Composite Materials-9/'91; Advanced Metallic Structures-8/'93; Advanced Sensors-12/'92; Airbreathing Propulsion-2/'92; Artificial Intelligence-6/'91; Computational Science-(no strategic plan expected); Optical Information Processing-(Early '94); Rocket Propulsion-8/'90; Software Development-12/'91; Superconductivity (no strategic plan expected); and Ultra-Reliable Electronic Systems-3/'92. The roadmap teams gave a bottom up view of the future. A group of senior officials from government, universities, and industry, the Aerospace Technology Policy Forum, was formed to provide a top down view to the technology development community and has met twelve times since July 1988.

In 1993, NCAT initiated several Demonstrations of Engineering and Manufacturing Operations (DEMOS) to accelerate technology transition to products. Four DEMOs are now active,

or prospective, cooperative R&D programs with participants from government, industry, and academia. These active DEMOs are Advanced Computational/Analyses Methods (now called Multi-Disciplinary Analysis and Design Industrial Consortium, MADIC); Smart Engines Two (efforts underway); Remote Sensing, and, another possible DEMO is fuselage manufacturing, which might include composites as well as metals.

NCAT works in support of the Department of Defense's (DoD's) Director of Science Research and Engineering on the Science and Technology Thrust 7, Technology for Affordability, the objective of which is to develop a government/industry consensus on the strategies and actions necessary to implement affordable technologies in DoD programs. Cooperative working groups were established to consider practices in Integrated Product and Process Development (IPPD) for electronics, multi-use manufacturing, and simplified contracting for advanced technology demonstrations (ATDs), using IPPD. On October 6, 1993, NCAT held a seminar titled "Technology for Affordability: Transition to Products" to discuss newly



J. Clifford Schoep
President
National Center for
Advanced
Technologies

created white papers on these subjects.

Another area being given considerable attention is dual-use or multi-use technology. An example of a dual-use technology would be a high efficiency electric motor currently under development for the electric car, which could also be used for tanks or aircraft.

NCAT is also working to help educate and train the workforce of tomorrow. In cooperation with the National Technological University (NTU) and Georgia Institute of Technology, NCAT has developed an overview management course on Affordability through IPPD. This course was offered by NTU to its subscribers via satellite during the last six months of 1993 and will be available to the general public on video tape.

In the four years since NCAT was formed, the organization has become a nationally recognized leader in the technology development field. Its innovative approach toward bringing together experts from industry, government, and academia has become a widely copied format for other institutions working in complementary areas.



Sandy Carney-Talley
Assistant Vice
President
Policy and
Planning

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.

subcontract awards to meet goals set by DoD and NASA.

SAFETY, HEALTH, & ENVIRONMENT

Finding low or non-polluting materials and processes that meet stringent environmental regulations and yet meet product performance and safe worker requirements is a major challenge to the aerospace industry. Also, the costs of environmental remediation are necessary business costs.

SPACE POLICY

Industry supports a balanced government investment to assure access to space for a balanced human and robotic space program, encourages space initiatives that yield rapid, less costly results, and promotes dual use space technologies to encourage U.S. commercial development.

REGULATORY REFORM

The present government regulations need to be zero-based and rewritten and maintained by a single council acting on behalf of all government agencies. The goals of rewriting must include shortening and simplifying, providing rationale for policy statements, clarity, flexibility for the user, and controls to limit growth.

NATIONALIZATION OF AEROSPACE

The lack of a clear defense industrial base policy is leading to the de facto nationalization of the high-tech aerospace industrial base. Government reliance on unbridled public/private competition for depot maintenance, on an uneven playing field, is resulting in the loss of full-service, private sector capabilities essential to a healthy base.

ECONOMIC STABILITY

The aerospace industry is currently undergoing a structural change, and it is important to the vitality of the industry, the economy, and our national security in the year

2000 that the process of change be supported by federal policies that create some measure of stability. In this critical period, government policies should foster investment, the blending of defense and commercial technologies, exports, diversification into new markets, and greater program certainty than now exists.

INTERNATIONAL COMPETITIVENESS

To maintain U.S. preeminence in a period of increased competition and consolidation in the global aerospace marketplace, we must promote U.S. aerospace products worldwide, pursue more equitable rules for fair trade, assure export financing, and minimize existing impediments to exports.

AIR TRANSPORT SYSTEM

The recommendations of the National Commission to Ensure a Strong and Competitive Airline Industry address areas that can have positive effects on the financially ailing civil aviation industry. These recom-

mendations must be supported by industry and government.

ACQUISITION REFORM

It is time for cultural change in government acquisition. As the defense budget shrinks, all non-value-added costs must be eliminated to ensure that scarce resources are not wasted and to ensure the future viability of the national technology and industrial base.

INDUSTRIAL BASE

A key concern during defense downsizing is ensuring an adequate industrial base to protect national security interests. Both industry and government must give continued attention to numerous, related building blocks which are part of a healthy, responsive industry.

SMALL DISADVANTAGED BUSINESSES

The aerospace industry is playing a spearhead role in making Small Disadvantaged Businesses (SDBs) an integral part of the industrial base by continuing increases in SDB

- AIA Senior Staff:**
 Ron Fuqua, President
 George F. Copsey, Secretary/Treasurer
 Sandra Carney-Talley, Assistant Vice President, Policy and Planning
 Roy J. Haugh, Vice President, Procurement and Finance
 Herbert E. Hetu, Vice President, Communications
 Del L. Johnson, Vice President, International
 Virginia C. Lopez, Executive Director, Research Center
 Daniel J. Nauer, Vice President, Human Resources
 Robert E. Robeson, Vice President, Civil Aviation
 Stan Siegel, Vice President, Technical and Operations
 Thomas N. Tate, Vice President, Legislative Affairs

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.

STUDIES

In April the Research Center published a report on the U.S. civil aircraft industry and some of the cost drivers threatening its competitiveness. *Keeping America Competitive in the International Civil Aircraft Market* offered policy suggestions including working to achieve a single airworthiness certification standard and an industry/government partnership approach to new technology development.

A June report, *The Troubled Airline Industry: Its Impact on Aircraft Manufacturers and the U. S. Economy*, examined the important connection between the health of the air carriers and civil aircraft manufacturers.

In mid-November, the Research Center published the first in a three-part series. *After the Cold War: The U.S. Aerospace Industry in the International Marketplace* reviewed the industry's trade position and its international

cooperative relationships. Trends suggest the ability to sustain export growth will become more difficult for U.S. aerospace companies.

MID-YEAR REVIEW

"A Mid-Year Review of Aerospace Industry Performance," in the October *AIA Newsletter*, revealed that industry sales peaked in 1991 and are unlikely to reach that level again anytime soon. First-half 1993 sales were 10 percent below those of the same period a year earlier, and total new orders and backlog were down. A bright spot: commercial transport orders strengthened in the second quarter.

FACTS & PERSPECTIVE

Research staff publish reports and analyses in a "Facts & Perspective" supplement to the *AIA Newsletter*.

■ In March, the center published "Trends in European Space Activities."

■ In April, "The Development of International Capabilities in Space" focused on programs in other countries of the world. The report

concludes that national space budgets are not growing but nations are expanding their investments in key technology areas.

■ In October, staff reported on the first government-published measure of aircraft industry labor productivity. A Research Center commentary, "Measuring Productivity in High-Technology Industries," critiqued the use of a single index to measure efficiency in a high-technology industry.

AIAA INDUSTRY UPDATE

Research staff began contributing quarterly reports on industry trends to *Aerospace America*, the magazine of the American Institute of Aeronautics and Astronautics (AIAA). The first "Industry Update" reviewed the industry's recent performance and suggested government policies and market strategies that will have the greatest positive influence on future business. AIAA and

AIA also signed an agreement whereby AIAA will market AIA's *Aerospace Facts & Figures 1993/94* to the institute's membership of aerospace professionals.

FACTS & FIGURES

The 41st edition of AIA's statistical handbook, *Aerospace Facts & Figures*, was published. It contains over 140 statistical tables showing trends over time in the U.S. aerospace industry. The Research Center handles sales of over 1,300 handbooks throughout the year.

YEAR-END REVIEW AND FORECAST

In December, AIA released the Research Center's annual *Year-End Review and Forecast*. The report projected 1993 and 1994 aerospace sales and employment.

AEROSPACE EMPLOYMENT SURVEY

The annual *Aerospace Industry Employment Survey* showed that employment reductions that began in 1990 accelerated in 1992. The aerospace labor force shrank in

1992 to 1.05 million. Employers projected employment to fall to 942,000 by year-end 1993—the first time the number of aerospace jobs has fallen below one million since 1978.

SPECIAL PROJECTS AND ANALYSES

Research Center staff prepared these special reports and analyses:

- Testimony for the International Trade Commission investigation into the competitiveness of the large civil aircraft industry. Testimony was based upon the center's report on the civil aircraft industry.

- Material on the civil aircraft sector for an industry

briefing to officials of the Department of Commerce and other federal agencies.

- Compilation of data on U.S. aerospace trade with China including related employment and potential sales. Data were used in preparing letters on the issue of Most Favored Nation trade status for China.

- An article for *World Aerospace Technology* on "Technology Trends in U.S. Aerospace: The Influence of the Market."

SURVEYS

Research Center staff worked with Procurement and Finance Council staff and members to improve an ongoing

survey of the government's handling of contractor progress payments. Other survey topics were re-procurement technical data packages, inventor awards programs, space technology investments, property management benchmarking, and the government's refusal to pay for non-conforming supplies under fixed-price contracts.

STATISTICAL AND INFORMATION SERVICES

The Research Center maintains 22 statistical series which are published on an annual, monthly, or quarterly basis and are grouped by the categories of general statistics,

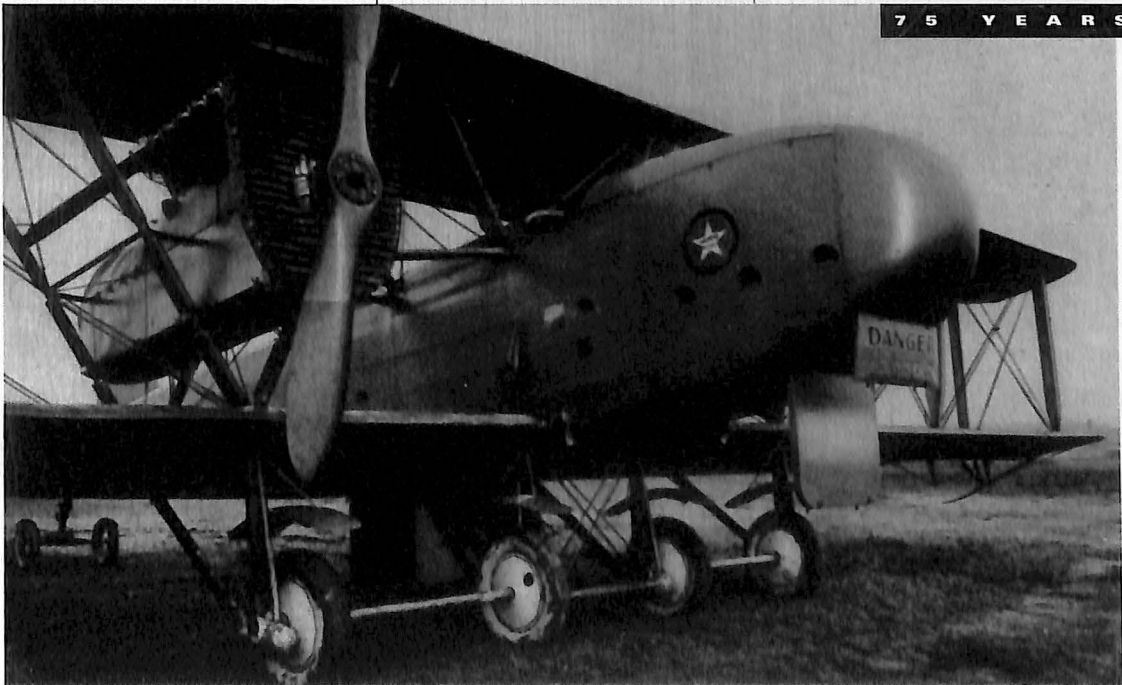


Virginia C. Lopez
Executive Director
Research Center

employment, production, and foreign trade. Staff regularly respond to inquiries about these statistics and also provide general industry information and background. The center's statistics provide the basis for quarterly "Aerospace Indicators" summaries in the *AIA Newsletter*.

AIA LIBRARY

The AIA librarian is responsible for cataloging and maintaining the association's records and reference materials. As a source of information on the industry, the library is tapped by analysts and industry scholars.



7 5 Y E A R S O F S U C C E S S

The 1919 Martin Mail Plane, adapted for Post Office use from a bomber design developed by the Glenn L. Martin Company, Cleveland, Ohio.

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.

CIVIL AVIATION

Working through the Civil Aviation Council (CAC) and its committees, the Office of Civil Aviation continued to give high priority to rule making activities concerning aircraft certification, regulatory harmonization, and aircraft trade issues. The CAC reviewed committee activities, directed that an action plan be developed to secure a revision of draft regulations for the Fastener Quality Act, and reviewed industry's role in setting priorities for safety-related research at the Federal Aviation Administration (FAA). CAC will review an action plan for presentation to FAA, and as directed by the AIA Board of Governors, also addressed the issue of European certification of repair stations.

GATT URUGUAY ROUND

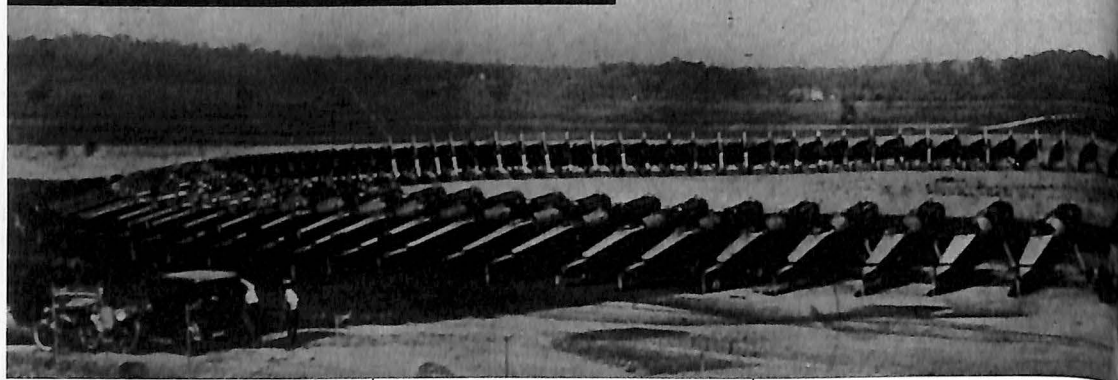
The Uruguay Round of trade negotiations was concluded on December 15, 1993. The U.S. negotiators were supported in Geneva by aerospace industry representatives who

were in continuous contact with senior management. Coordinated industry advice was provided at the CEO level to top administration officials, including President Clinton and Ambassador Kantor. The U.S. aerospace industry had three main objectives in these negotiations:

contains many provisions that strengthen and improve discipline on aerospace subsidies.

- To obtain coverage under the enhanced multilateral dispute settlement procedures. This has been a key objective as it enables enforcement of international obligations more expeditiously.

75 YEARS OF SUCCESS



- That civil aviation products continue to be covered under the applicable GATT Subsidies Code. All civil aircraft products, including airplanes, engines, helicopters, parts, and components, will continue to be subject to the same high level of international discipline on subsidies that applies to all other industries. This new agreement

- That there be no agreement made to establish separate subsidy provisions to the disadvantage of the U.S. aerospace industry and its 900,000 workers, a concern that was heightened with the late introduction of a controversial proposal by the chairman of the GATT Aircraft Committee.



Robert E. Robeson
Vice President
Civil Aviation



S. Mike Hudson
Allison Gas Turbine
Division
General Motors
Corporation
Chairman,
Civil Aviation
Council

Conclusion of the Uruguay Round does not require a revised GATT Aircraft Agreement, but the committee may consider improvements in the existing agreement.

EUROPEAN CERTIFICATION OF REPAIR STATIONS (JAR 145)

In 1993, the European Joint Aviation Authorities (JAA) approved Joint Aviation Requirement (JAR) 145, which would require JAA certification

as of January 1, 1994, for all repair stations performing work on aircraft on the registries of JAA countries. As a result of intensive work by AIA, an interim agreement was reached under which the JAA will recognize FAA approvals, while the FAA steps up efforts to certify qualified European applicants to work on U.S.-registered aircraft. The CAC



Peter L. Gallimore
The Boeing
Company
Chairman,
Manufacturing
Integrity
Committee



Marty Guthrie
Parker Hannifin
Corporation
Chairman,
Commercial
Support
Committee



Webster C. Heath
McDonnell
Douglas
Corporation
Chairman,
Transport
Committee



Ernie Hinterkeuser
Pratt & Whitney
United
Technologies
Corporation
Chairman, Airplane
Noise Control
Committee

Manufacturing, Maintenance, and Repair Committee then shifted its focus to ensure completion of bilateral agreements with individual JAA member countries that will provide a basis for mutual recognition of repair certifications.

RETROACTIVE FAA APPROVAL OF PARTS IN INVENTORY

The FAA Parts Approval Action Team (PAAT) was established in the fall of 1992

certain categories of technically unapproved civil aviation parts that could qualify for retroactive FAA approval. The number of these unapproved parts and the degree to which safety is compromised by their existence cannot be determined. Throughout 1993, industry worked closely with the FAA on this matter, and AIA's Office of Civil Aviation played a leading role in this effort. Under PAAT Phases I and II, "fast track" procedures

developed to ensure that the PMA process would be rigorous and promote aviation safety.

AIRPLANE NOISE CONTROL COMMITTEE (ANCC)

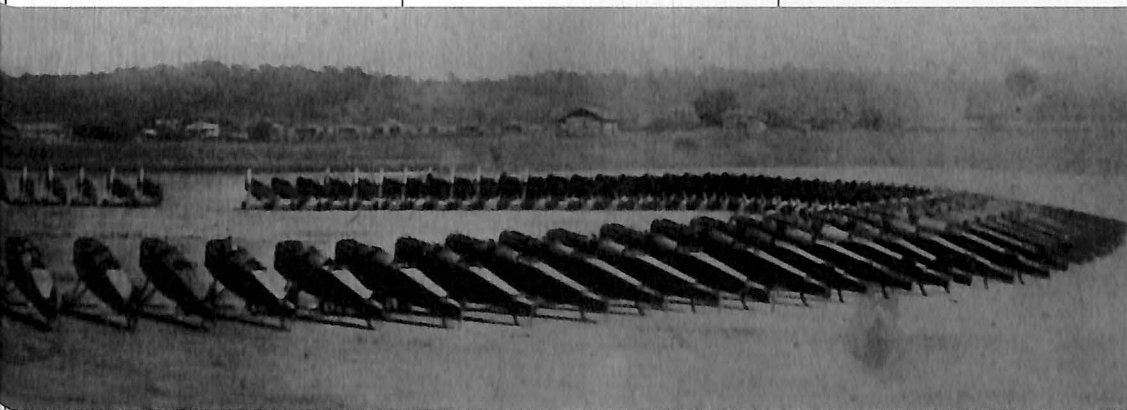
The ANCC continued its efforts in the areas of aircraft noise certification, assessment of airport noise climate, noise abatement measures, technological developments, the relationship between noise and

monitored new NASA/FAA Subsonic Noise Reduction Research Program activities; and commented on a proposed European Community (EC) Directive on aircraft noise and on JAA/FAA proposed noise certification requirements.

ANCC also opposed a petition to the FAA that would require the FAA to issue mandatory Notices to Airmen (NOTAMs) prohibiting operation of aircraft over areas declared noise sensitive by community groups.

COMMERCIAL CUSTOMER SUPPORT COMMITTEE (CCSC)

In 1993 CCSC expanded its role to include all substantive issues involving civil product support or having an effect on AIA members' customers worldwide. Toward that objective, the CCSC met with the Air Transport Association (ATA) Engineering Maintenance and Material Committee and established annual meetings to coordinate joint action on industry issues. Presentations on AIA organization and activities were made to the airline associations in Latin America and Europe. Other activities included efforts



Wingless and tailless, one week's World War I production of DeHavilland-4 "battle planes" awaits crating at the Moraine City, Ohio, plant of Dayton Wright Airplane Company.

to develop policies and procedures to enhance compliance with FAA regulatory requirements. The FAA has determined that in addition to unapproved parts that raise safety concerns, there are

were developed for granting Parts Manufacturer Approvals (PMA) to qualified suppliers lacking FAA production approval. A program was

emissions, and airport traffic and fleet mix scenarios. The ANCC sponsored an Aircraft Noise Design Effects Study (ANDES) to assess the economic burden of increased noise stringency requirements;



Barry N. Rohm
Allison Gas Turbine
Division
General Motors
Corporation
Chairman,
Propulsion
Committee



Susan M. Walsh
Pratt & Whitney
United
Technologies
Corporation
Chairman,
Committee on
Industry and
Regulatory Affairs



Robert E. Warren
Sikorsky
United
Technologies
Corporation
Chairman,
Rotorcraft
Committee

to improve industry just-in-time inventory management capabilities, bar-coding of parts, and integration of technical digital standards.

**COMMITTEE
ON INDUSTRY AND
REGULATORY
AFFAIRS (CIRA)**

CIRA concentrated on the Uruguay Round of Trade Negotiations and the negotiations to multilateralize the U.S.-EC agreement governing large civil aircraft. CIRA also continued to provide advice to the administration concerning the Large Aircraft Sector Understanding, which governs official export financing for large transports and engines.

**MANUFACTURING,
MAINTENANCE,
AND REPAIR
COMMITTEE (MMRC)**

The charter of the Manufacturing Integrity Committee was revised to include repair station approvals, and the committee was renamed to reflect its expanded scope. Major projects addressed new European certification requirements governing repair stations, the FAA Part Manufacturer Approval

procedures, unapproved parts, FAA suppliers surveillance and control of parts suppliers, FAA registration of distributors, and modernization of production certificate requirements.

**PROPULSION
COMMITTEE (PC)**

The PC continued work on harmonization of FAA and JAA engine certification requirements for Fire Precautions, Bird Ingestion, Rain/Hail Ingestion, Rotor Integrity, and Overtorque Test. A PC working group assisted the FAA in drafting a joint working agreement on procedures for validation of imported engines. The Continued Airworthiness Assessment Methodology (CAAM) project met with the FAA in

May, 1993, and presented findings from its final report covering methodology for use by FAA and industry to identify, prioritize, and resolve safety related issues occurring on aircraft propulsion systems.

**ROTORCRAFT
COMMITTEE (RC)**

The RC completed an initial effort to ensure that minimal differences would exist between U.S. and European airworthiness standards for normal and transport category rotorcraft. The JAA approved the regulations on June 6, 1993. The remainder of the year was devoted to completion of the FAA regulatory package that would result in harmonization of the U.S. and European standards.

**TRANSPORT
COMMITTEE (TC)**

The TC concentrated on developing coordinated industry positions on several European Joint Aviation Requirements (JARs), including operations and flight in icing conditions, and provided comments to the FAA and JAA on harmonization of flight test requirements and requirements governing rejected take-off. Work continued on a long term project concerning replacement of halon. The Thrust Reverser Project Group also continued to develop reliability safety criteria and controllability criteria and completed a controllability demonstration.



Thomas-Morse Aircraft Corporation, Ithaca, New York, was a "full-service" company that built flying machines and engines and also trained pilots. The airplane pictured is a Thomas-Morse D-5 Tractor.

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.

AIA President Don Fuqua remains the lead spokesman for the aerospace industry, delivering 24 major speeches in 1993 and participating in 57 news media interviews.

On October 22, AIA and *Aviation Week and Space Technology* magazine cosponsored "Joint Venture for the Future," a forum to discuss the mutual responsibilities of government and industry to preserve the U.S. industrial and technology base. Participants included Kent H. Hughes, associate deputy secretary of commerce; Senator Robert C. Smith (R-NH), ranking member, Senate Armed Services Committee (SASC) Defense Technology, Acquisition and Industrial Base Subcommittee, and member, SASC Military Readiness and Defense Infrastructure Subcommittee; Dr. Gordon M. Adams, associate director for national security and international affairs, Office of Management and Budget; Dr. Renso L. Caporali, chairman and CEO, Grumman Corporation; Dr. Sheila E. Widnall, secretary of the Air Force; Representative Glen

Browder (D-AL), member, House Armed Services Committee (HASC), and chairman of the Depot Caucus; General Ronald W. Yates, USAF, commander of the Air Force Materiel Command; Dan A. Colussy, chairman, president, and CEO, UNC Incorporated; and Nicholas M. Torelli, president, TEI, and former deputy assistant secretary of defense for production resources. *Aviation Week's* staff served as panel moderators and gave opening and closing remarks. The forum was attended by 95 representatives from industry, government, and Capitol Hill and 27 news media representatives.

At the 29th Annual Year-end Aerospace Review and Forecast Luncheon on December 15, Fuqua delivered the state of the industry address. More than 365 people attended, including 165 news media and 34 government public affairs representatives, 104 industry representatives, and 59 representatives from aerospace-related organizations and AIA.

MEDIA RELATIONS

AIA is an important information source for the aerospace industry. In 1993 news media interest focused on how the new administration's activities could affect the aerospace industry, nationalization of the aerospace industry, international issues, and diversification.

In 1993 AIA distributed 54 news releases and 16 statements. These releases included 14 concerning Research Center statistics and studies, eight on AIA testimony before Congress, and four about Fuqua's *Washington Pipeline* column in the *AIA Newsletter*. The statements commented on a variety of issues, including executive compensation, the DoD "Bottom Up Review," and the report by the National Commission to Ensure a Strong Competitive Airline Industry.

AIA responded to 842 news media inquiries, arranged 390 staff interviews, and held four press breakfasts in 1993, including a briefing on the Research Center's study *The U.S. Civil Aircraft Industry: Can It Retain Leadership?*

MEMBER RELATIONS

AIA continues to facilitate activities of the Communications Council and networks of communicators.

"Change in Washington, The Impact on the Aerospace Industry" was the theme of the spring 1993 Communications Council meeting in Washington, DC. Discussions centered on the political climate in Washington, the future of the airlines and aerospace industry, President Clinton's defense budget, and nationalization of the aerospace industry.

The fall 1993 Communications Council meeting was held in Napa, California, with "diversification" as the theme. Members were briefed on the downsizing of California's aerospace industry, advocacy of business aircraft, diversification, the health of the airlines, and AIA member company diversification and conversion efforts.

At the Seventh Annual Speechwriters and Editors Roundtable in December, attendees were briefed on industry's agenda for Congress, opportunities in the international marketplace, and depot maintenance/nationalization of the aerospace industry.



Herbert E. Hetu
Vice President
Communications



Tommy L. Wilson
Loral Vought
Systems
Corporation
Chairman,
Communications
Council

Walter Shapiro, White House correspondent for *Esquire* magazine, was the luncheon speaker. A panel of speechwriters representing the Commerce Department, DoD, and a former White House speechwriter, discussed key communications challenges facing the Clinton administration.

The Washington PR Representatives continue to meet on a monthly basis. In October, members met with Geoffrey Vincent, acting associate administrator for public affairs, NASA, and discussed industry's support of NASA public affairs.

The Communications Council formed a Task Group on Nationalization of the Aerospace Industry to support the CEO Ad Hoc Committee.

The Security Review Task Group revised AIA's *Security & Policy Handbook*, now in its second edition. The handbook is designed to help companies understand Department of Defense requirements for getting information cleared for public presentation and to clarify and shorten a sometimes confusing and lengthy process.

The *AIA Directory of Member Company Public Information Representatives*

and the *AIA Member Company Product Directory* were updated and distributed to the news media, and industry and government public affairs representatives.

AIA's membership program is comprised of two elements: new membership and membership retention. AIA recognizes the importance of increasing AIA membership and will continue to provide non-members with information on AIA and its activities.

EDITORIAL PRODUCTS— AIA NEWSLETTER

Now in its sixth year, the *AIA Newsletter* focuses on non-competitive issues of interest to the aerospace industry. The newsletter is distributed

10 times yearly to AIA members, Congress, government agencies and departments, financial institutions, the news media, and universities. Circulation is approximately 14,000.

ANNUAL REPORT

"Aerospace and the Environment" was the theme of the 1992 Annual Report. The theme was chosen to reflect AIA's conscientious stewardship of the environment, employee safety and health, and compliance with environmental and health and safety laws and regulations.

OTHER EDITORIAL PRODUCTS

The Office of Communications supports

other AIA departments by fulfilling a wide variety of publishing and production needs with its desktop publishing system. These include graphic design and production services for brochures, reports, presentations, studies, and *Preview*, the employee publication.

AIA 75TH ANNIVERSARY

"Seventy-five Years of Success" is the theme for AIA's 75th Anniversary. The Office of Communications is actively involved in planning association activities for the 75th Anniversary, including a spring 1994 reception at the National Air & Space Museum in Washington, DC.

7 5 Y E A R S O F S U C C E S S



Orville Wright (left), consulting engineer for the Dayton Wright Airplane company, poses with the company's chief of flight test, Howard M. Rinehart, by a DeHavilland-4.

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.

HUMAN RESOURCES COUNCIL

The Human Resources Council recently reviewed council and committee structure, programs, and future goals and identified five human resources issues that, if not properly attended to, could adversely affect our business: Labor Management Relations; Workforce Administration; Protected Classes-Equal Employment Opportunity (EEO), Americans with Disabilities Act (ADA), Workforce Diversity; Education and Training; and Employee Involvement. We will establish a committee to focus attention on protected classes and have established ad hoc task groups to monitor developments in the other four areas of concern.

We recommended the Environmental and Safety and Health Committees be given higher visibility in AIA's organizational structure by removing both committees from Human Resources Council responsibility.

COMPENSATION PRACTICES COMMITTEE—MANAGING COMPENSATION COSTS

Downsizing, consolidations, and mergers present many challenges to the Compensation Practices Committee including integrating divergent pay and benefits plans; developing single compensation philosophies from many; and justifying radical changes from previously established pay/benefit programs to our customers, unions, the general public, and the community.

EXECUTIVE COMPENSATION

Executive compensation is under fire: the impact of the Financial Accounting Standards Board (FASB) changes on long-term incentives (stock options and stock grants); increased interest by the Securities and Exchange Commission (SEC); Congress, and shareholder groups/institutional investors in executive pay controls and reporting; and the impact of the Omnibus Budget Reconciliation Act of 1993 on

executive pay and benefits. These issues are being worked by the Executive Compensation Subcommittee.

NON-TRADITIONAL PAY

Developments in non-traditional pay practices being considered for possible adoption by members include: recognition and reward for team performance vs. individual recognition and reward; the effect of changing technology and practices such as non-traditional work periods (flex-time, flex-week, family leave) and work at home on labor unions' traditional jurisdiction; incentive pay and "pay at risk" philosophy expanding beyond the executive level; and "job rated" vs. "people rated" pay strategies, e.g., skill/knowledge-based pay plans, broad banding, etc.

COMPENSATION SURVEYS

The annual summit survey of executive compensation will continue to be funded by voluntary annual contributions from members. This year we halved the cost by changing consultants.

Recognizing that certain benefits practices information is readily available from other sources, we terminated two AIA tri-annual surveys.

INDUSTRIAL SECURITY COMMITTEE—THE NATIONAL INDUSTRIAL SECURITY PROGRAM

The National Industrial Security Program (NISP) continues to demand the attention and energy of AIA since a major step toward effective implementation of NISP will require early integration of the new policy's rules and regulations with the Defense and Federal Acquisition Regulations (D/FAR).

AIA's commitment to NISP consists of an advisory committee of CEOs prepared to enter the process at the highest level of government in the event of impasse. The NISP implementing working group has many high-level AIA security personnel preparing the NISP operating manual (NISPOM).

PRESIDENTIAL REVIEW DIRECTIVE NO. 29

Presidential Review Directive (PRD) No. 29 is a major step in the right direction for reducing and simplifying the government's security

classification program. AIA stands behind PRD No. 29 because it will:

- Reduce the number of classification categories from 10 to 5;
- Reduce classification levels to Top Secret and Secret;
- Require agencies to account for program security costs;
- Require special access programs to meet specific criteria; and,
- Establish an information security Policy Advisory Council with government and non-government representatives.

JOINT SECURITY COMMISSION

A government/industry joint Security Commission was established to review all government security systems and procedures; to give political velocity to the ongoing work of NISP and PRD No. 29; to transition from absolute risk avoidance to prudent risk management; and, to oversee implementation of their recommendations through June 1, 1994. AIA has a major role with the commission since the one industry representative is Harry Volz, Grumman Corporation, one of the early NISP developers.



Daniel J. Nauer
Vice President
Human Resources



Larry G. McKean
The Boeing Company
Chairman, Human Resources Council



John MacDonald
McDonnell Douglas Corporation
Industrial Security Committee



Bob Parke
Hughes Aircraft Company
General Motors
Hughes Electronics
General Motors Corporation
Chairman,
Compensation Practices Committee



Phil Schull
E-Systems, Inc.
Occupational Safety & Health Committee



Wayne Simpson
General Electric Company
Chairman,
Environmental Affairs Committee

TEMPEST, OPERATIONS SECURITY (OPSEC), AND SYSTEMS SECURITY ENGINEERING (SSE)

Tempest, Operations Security (OPSEC), and Systems Security Engineering (SSE) requirements are still imposed on contractors even though not threat justified. These redundant security requirements will be superseded by the NISP; however, we are seeking their immediate demise through Council of Defense and Space Industry Associations (CODSIA)-coordinated position papers.

Other key security issues of concern to the contractor community are: obtaining good threat information, proprietary information protection, developing ways to reduce workplace violence, and providing executive protection.

ENVIRONMENTAL AFFAIRS AND OCCUPATIONAL SAFETY AND HEALTH—ADVANCED COMPOSITE MATERIALS STUDY

In the fall of 1993, an AIA task group of safety professionals put the finishing touches on a study of the uses of advanced composite materials within the aerospace industry. In early 1994, a final report

will be issued which will summarize the industry's uses of these materials and makes recommendations on work practices depending on composite type and manufacturing operation. Because the industry's use of composite materials will likely increase, this report was put together to gain a better understanding of effective work practice controls for use in composite manufacturing operations.

In a similar effort, several AIA task groups are working with the Suppliers of Advanced Composite Materials Association (SACMA) to examine several safety issues relating to the use of composites. One task group is examining a proposed test method to identify gases given off from composite resin systems. Another task group is attempting to specify the environmental and safety information that should accompany new composite materials to potential users of the materials.

THE AEROSPACE CTG

The Aerospace Control Techniques Guideline (CTG) and the Aerospace National Emissions Standard for Hazardous Air Pollutants (NESHAP), when published in early 1994, will determine how

aerospace facilities will be regulated for their air emissions from paints, solvents, and coatings. Since 1990, an AIA task group has been working with other affected parties and the Environmental Protection Agency's Office of Air Quality Planning and Standards to develop the two documents.

AIRCRAFT ENGINE TEST CELL STUDY

Another AIA task group has worked since 1991 with EPA to put together a study of existing technologies that might be used to reduce nitrogen oxide emissions from the operation of enclosed aircraft engine test cells. In the fall of 1993 EPA completed the first draft of its study and AIA submitted comments on the draft. Upon further review by other federal agencies and the environmental community, the study is slated to be presented to the U.S. Congress in late 1994.

HALON REPLACEMENT IN AVIATION

Halons are the chief fire fighting chemicals used in aviation. Because they are also ozone-depleting chemicals with a ban on production as of December 31, 1993, the aviation community faces a daunting

challenge to find a replacement for halons. To initiate a long-range plan to address that challenge, AIA co-hosted, with the U.S. Air Force and the Halon Alternatives Research Corporation, an "International Symposium on Halon Replacement in Aviation" in February 1993, in Reston, Virginia. Over 100 domestic and foreign representatives from aircraft manufacturers, airlines, chemical companies, and regulatory agencies attended the symposium. Industry task groups formed during the symposium are working closely with the U.S. Air Force and the FAA to develop a chemical replacement for halon use in aviation, and to also ensure that existing stocks of halons are

available until all halon systems have been retired from service.

EIGHTH ANNUAL AEROSPACE HAZARDOUS MATERIALS MANAGEMENT CONFERENCE

AIA and AlliedSignal Aerospace hosted the Eighth Annual Aerospace Hazardous Materials Management Conference October 26–28, in Chandler, Arizona. Approximately 350 representatives from the aerospace industry, its various customers, and government regulators attended the conference. Interest in this annual conference reflects the growing importance of environmental requirements to manufacturing and the

growing list of environmental restrictions on aviation operations. The meeting serves as the yearly focal point within the aerospace industry for the exchange of environmental technology information.

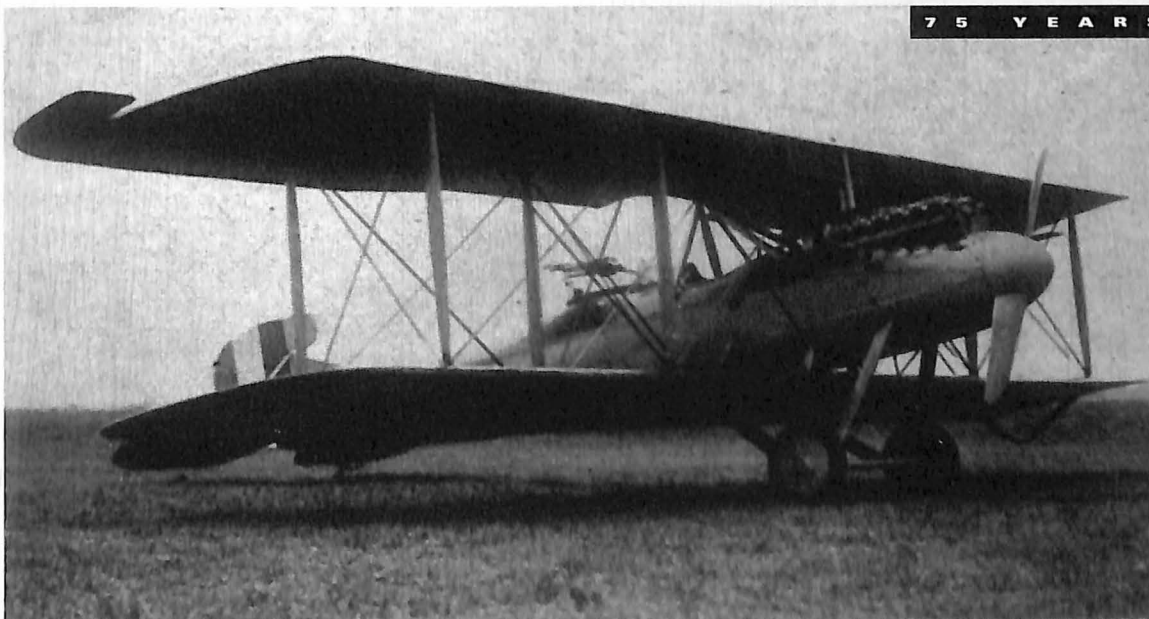
In 1994, the Ninth Annual Aerospace Hazardous Materials Management Conference will be hosted by Martin Marietta Astronautics and AIA in Denver, Colorado, September 28–30.

COORDINATION OF AIA'S ENVIRONMENTAL AND SAFETY EFFORTS

To ensure that AIA environmental and safety efforts are coordinated and to foster information exchange among

AIA committees, AIA holds a monthly AIA staff meeting. Also co-hosted monthly by AIA and the Air Transport Association is the Aviation Environmental Roundtable (AER). The AER is held monthly to disseminate information relating to environmental and safety issues and projects. It is routinely attended by several other aviation associations, as well as Washington, DC-based representatives from AIA companies.

7 5 Y E A R S O F S U C C E S S



American companies built 15,600 Liberty engines in World War I in eight and 12 cylinder versions; among the plane types powered by the Liberty was the L-W-F Model G shown, a product of L-W-F Engineering Company, Inc., College Point, New York.

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

INTERNATIONAL

Aerospace industries throughout the world continued to confront severe economic pressure in 1993 as airlines faced financial difficulties and defense budgets in most industrial countries declined. Competition has intensified in the international marketplace. The Clinton administration made clear its commitment to working with industry to support U.S. exports in general, and showed particular interest in promoting aerospace sales.

AIA's International Council geared up to meet the global challenge and to bring to the new administration and Congress specific suggestions for policy changes and programs which could improve U.S. aerospace export potential. To do so, it continued five standing committees: Defense Trade, Commercial Trade, International Exhibitions (Export Trade Certificate), Export Controls, and Legislative.

DEFENSE TRADE

The Clinton administration came into office seeming to espouse a moderate

policy on defense trade. It had concurred with several major arms transfers before the election. It supported the previous administration's commitment to terminate the practice of imposing recoupment charges for non-recurring costs (mostly research and development) on exports of defense products. At AIA encouragement, it included defense products in a cable to all ambassadors instructing them to support U.S. industry representatives in their efforts to sell U.S. products.

During the year the committee worked with the administration to emphasize the importance of an export finance mechanism for defense products; AIA's efforts found some support, but the administration indicated that it would not be willing to fund such a program before FY 1995. A method was established to help assure consultation between the Department of Defense (DoD) and industry on the subject of how DoD will dispose of its growing inventory of excess defense equipment without disrupting industry efforts at marketing new products. A working

group was set up to meet with the U.S. Air Force to explore issues of particular importance to that service.

At year-end the administration was working to enunciate a formal policy on conventional arms transfers. As part of that process, AIA testified before the House Foreign Affairs Committee, arguing that an affirmative defense trade policy could be consistent with efforts by the government to encourage multilateral agreements to restrain arms races and to prevent proliferation of conventional and non-conventional weapons.

COMMERCIAL TRADE

In cooperation with the Civil Aviation Council, the Commercial Trade Committee closely monitored the negotiations for the North American Free Trade Agreement (NAFTA) and the Uruguay Round in the General Agreement on Tariffs and Trade (GATT). The resulting NAFTA treaty was one that AIA could support, and the council prepared briefing materials on why

the agreement would be of general benefit to the industry. Pressure was maintained on the executive branch to include aerospace in any revised subsidies code.

AIA worked with the administration drafters of the first annual report by the Trade Promotion Coordinating Committee (TPCC) to explain particular aerospace concerns. Resultant sections on export controls and trade advocacy were quite satisfactory to AIA, as was the report's willingness to concede that defense trade was an economic, as well as a national security issue.

A committee working group also provided information to industry and government to help support the administration's request to Congress to extend Most Favored Nation (MFN) trading status to China. A new working group is seeking to improve government-industry cooperation in promoting U.S. sales of air traffic control equipment.

INTERNATIONAL EXHIBITIONS

The Export Trade Certificate Committee, which provides a legal umbrella under which AIA members can cooperate with respect to international trade shows, explained



Joel L. Johnson
Vice President
International



W. Frank Parker
ITT Defense and
Electronics Inc.
Chairman,
International
Council



Patrick A. Briggs
Textron Inc.
Vice Chairman,
International
Council



Debi Davis
Martin Marietta
Corporation
Chairperson,
Export Controls
Committee



Raymond Garcia
Rockwell
International
Corporation
Chairman,
Commercial
Trade Committee



James Hickey
Raytheon
Company
Chairman,
Legislative
Committee



Richard Milburn
Grumman
Corporation
Chairman,
Export Trade
Certificate
Committee



Bob Ramsey
Lockheed
Corporation
Chairman,
Defense Trade
Committee

to the new administration the importance of government-industry cooperation at such shows. Secretary of Commerce Ron Brown served as the president's representative to the Paris Air Show, and AIA member companies sponsored a dinner for him and the new ambassador to France, Pamela Harriman.

DoD agreed to provide aircraft for use by AIA member companies at both the Paris and Dubai Air Shows, but did not participate directly in the shows. AIA worked with DoD and the Services to standardize and formalize leasing practices regulations and the contractor-provided support for military air crews, and requested that DoD extend the policy to equipment used for national demonstrations. The committee also strongly urged DoD to use the legislative authority provided by Congress in 1992, which would allow direct participation in air shows. In particular, AIA requested DoD to provide a significant presence at the Singapore and Farnborough shows in 1994.

EXPORT CONTROLS

The Export Controls Committee works to reduce unilateral export controls, and to improve the administration of the controls, unilateral and multilateral. The committee strongly urged the executive branch to formulate a policy on missile proliferation which would not obstruct U.S. companies' efforts to assist friendly countries in their civilian space launch programs. The policy enunciated by the president on September 27, 1993, generally followed that approach.

AIA continued to speak out against unilateral controls, such as those imposed on commercial satellites to China, arguing that such controls were ineffectual, shifted markets to our competitors, and were not required under U.S. law. AIA also pressed to continue the process of removing dual-use products from the U.S.

munitions list, such as commercial satellites, and control them under the Commodity Control List (CCL) administered by the Commerce Department.

To assist with export control administration, AIA urged the administration to publish a revised International Traffic in Arms Regulations (ITAR), which had been prepared in the previous administration with AIA assistance. The new ITAR was published in July. In turn, the committee prepared a revised draft Customs Handbook to implement the new ITAR, and is awaiting Customs action so that AIA can publish our own handbook for use by companies. The committee also prepared an Export Restrictions Matrix for use by industry and government which summarizes all U.S. export controls on foreign countries.

LEGISLATIVE

The principal objectives of the Legislative Committee in 1993 were to obtain legislation authorizing and appropriating funds for a defense export finance guarantee facility, and to eliminate the section of the Arms Export Control Act. After considerable effort, an authorization for a \$1 billion guarantee program, requiring \$25 million in budget authority, was included in the defense authorization bill. While a similar provision was contained in the Senate appropriations bill, the House did not have a similar provision, and the issue was dropped in conference. It is possible that a reprogramming or supplemental appropriation will still allow the program to get under way in fiscal 1994. The administration did request legislation on recoupment, and this issue was still pending at year-end.



7 5 Y E A R S O F S U C C E S S

Billed as the "fastest aeroplane in the world" in 1919 was the Curtiss Model 18-T triplane; developed by The Curtiss Aeroplane and Motor Corporation at Garden City, New York, the 18-T reached 165 miles per hour.

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

NATIONALIZATION OF THE INDUSTRY

The term "depot maintenance" embraces far more than routine maintenance; it includes overhaul, modifications, conversions, system upgrades, and service life extension programs. Many of these jobs amount to remanufacture of systems removed from line operations. AIA's position, therefore, is that the group most qualified for that work is the industry that built the systems.

AIA worked closely with the Congress and the Department of Defense (DoD) to promote better understanding of the impact of downsizing on the defense industrial base. Industry worked with Capitol Hill in formulating a provision, included in the FY 1994 Department of Defense Authorization Act, that established a Government-Industry Depot Task Force.

Congress directed the task force to review the current depot maintenance system; identify the rationale used by DoD to support a decision to provide for the performance of depot work by DoD, evaluate the manner of determining core workload requirements for DoD, and compare rates and prices for workloads performed by DoD and the private sector.

The task force was also charged with examining the balance of the workload assigned government and industry; the preservation of the industrial base; and determinations of depot-level activities to be performed by either government or industry. The Government-Industry Task Force report is to be presented to Congress by April 1, 1994.

AIA nominated four member company candidates to represent industry on the task force: Robert Denien, Grumman; Fred Zimmer, Rockwell; Kenneth Cannestra, Lockheed; and Edward Biggers, Hughes.

OMNIBUS BUDGET RECONCILIATION ACT OF 1993

During the debate on the budget, AIA met with congressional staff of the House Ways and Means Committee and the Senate Finance Committee on a variety of issues, among them, incorporation of a provision in the Omnibus Budget Reconciliation Act of 1993 that would reauthorize the expired 1992 R&D tax credit; the R&D tax credit was reauthorized until June 1995 and made retroactive to June 1992. AIA also supported legislation introduced by Senator Jack Danforth (D-MO) that would separate defense and commercial expenditures for aerospace companies in order to provide incentive to firms to move toward more commercial research and development.

Another issue of concern to AIA was the repeal of the Foreign Sales Corporation 50 percent penalty on foreign trade income on military property. This tax was discussed further before the House Subcommittee on

Miscellaneous Revenue, by AIA Tax Matters Chairman Douglas McPherson, Martin Marietta, on June 24, 1993. The repeal was not included in the final package.

DEFENSE EXPORT FINANCING

AIA worked with Congress and the administration to encourage assistance in promoting defense exports. The FY 1994 DoD authorization bill included an amendment that authorizes the establishment of a defense export financing program. The amendment, added by Senator Dirk Kempthorne (R-ID), required \$25 million in budget authority to support \$1 billion in guarantee authority. NATO countries, plus Israel, Japan, Australia, and South Korea, would be eligible for the program. Funding for the program was authorized to be taken from R&D accounts. AIA was unsuccessful in obtaining an appropriation for the program, but it appeared possible that DoD might be able to use existing funds to establish the program.



Thomas N. Tate
Vice President
Legislative Affairs

NATIONAL COMMISSION TO ENSURE A STRONG COMPETITIVE AIRLINE INDUSTRY

The National Airline Commission officially presented its report to the president and Congress in August. The commission's mandate was to "investigate, study, and make policy recommendations about the financial health and future competitiveness of the U.S. airline and aerospace industries." United Technologies Chairman and CEO, Robert F. Daniell, was a member of the commission, which was chaired by former Virginia Governor Gerald L. Baliles.

During the course of its investigation, the commission heard from leaders representing all aspects of the airline and aerospace industries. AIA President Don Fuqua appeared before the commission on three occasions.

In its final report, the commission acknowledged the aerospace industry's leading role as a technology driver, employer of highly skilled workers, and manufacturing exporter. Recommendations were included in the report to aid the manufacturing sector.

CIVIL AVIATION

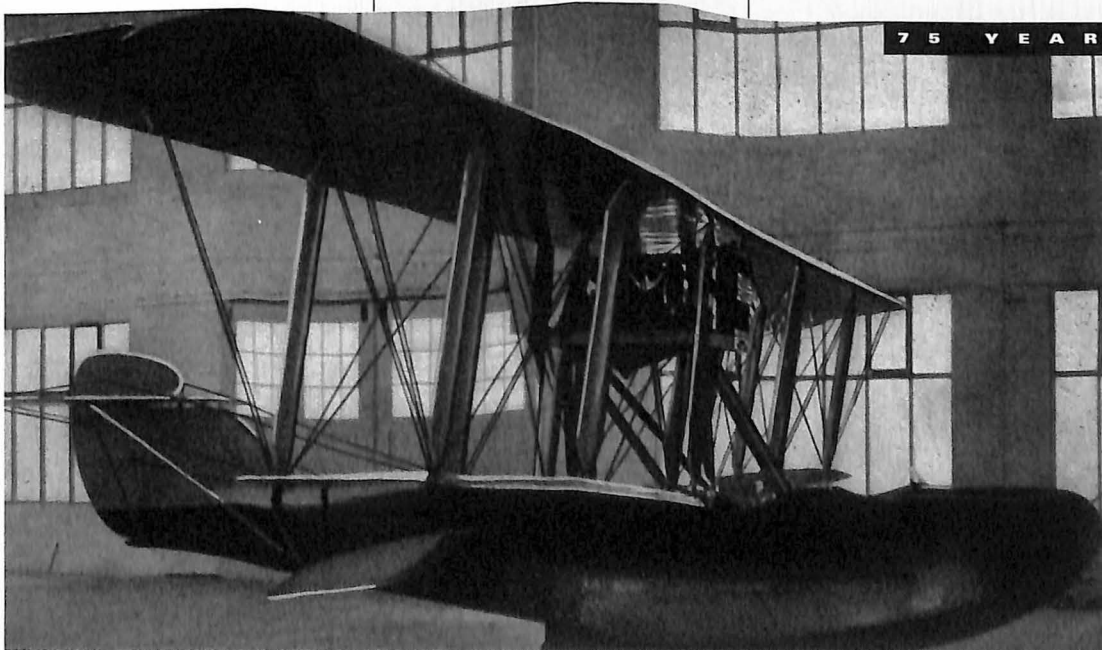
AIA testified before Congress on commercial air-

craft business matters on several occasions in 1993. At a hearing on advanced aircraft technology, National Center for Advanced Technologies Vice Chairman John Swihart appeared on behalf of AIA and outlined the challenges industry faces in developing new technologies.

Robert E. Robeson, Jr., AIA's vice president, civil aviation, appeared before the House Aviation Subcommittee to comment on a study produced by the General Accounting Office regarding the FAA's ability to certify new technology.

In October, AIA was represented by the vice president and general counsel of The

Boeing Company, Theodore J. Collins, at a House hearing on the General Aviation Revitalization Act. In addition to expressing the industry's support for the legislation, Collins apprised Congress of the *Piper Aircraft Corporation v. Cleveland* case. He requested the Federal Aviation Act be amended to clarify congressional intent that FAA is the entity authorized to certify safe aircraft design and that the states are not free to reject FAA's design decisions.



75 YEARS OF SUCCESS

Introduced in 1919 was the Boeing B-1 Commercial Flying boat, built by Boeing Airplane Company, Seattle, Washington.

PROCUREMENT AND FINANCE

C O U N C I L

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.

The Procurement and Finance Council Executive Committee is the principal interface between the AIA Board of Governors and the council's eight committees and the Controllers' Forum. All of the issues worked during the year by the committees were keyed to one or more of AIA's Top Ten Issues, which encompass the broad objectives of the Board of Governors.

The AIA Executive Committee, at its periodic meetings, reviewed the committees' agendas to ensure they were focused on those issues of most importance to the AIA member companies and also

to ensure inter-council coordination. Many of the concerns, such as environmental matters, cut across a number of functional areas (e.g., specifications and standards, safety and health, cost principles, legal considerations, and others), underlining the need for and continuing coordination in developing credible industry positions.

In 1993, many of the old issues were carried forward and the acquisition reform effort came into full bloom concurrently in Congress, the White House, the Department of Defense (DoD), and industry. The following committee sum-

maries highlight the areas of most significant involvement in 1993 and illustrate the cross-cutting nature of many issues.

PROCUREMENT TECHNIQUES COMMITTEE (PTC)

The most significant challenges faced by the Procurement Techniques Committee (PTC) were in environmental risk mitigation, National Aeronautics and Space Administration (NASA) contracting, Defense Contract Management Command (DCMC) initiatives, public/private depot competitions, and acquisition reform.

ENVIRONMENTAL

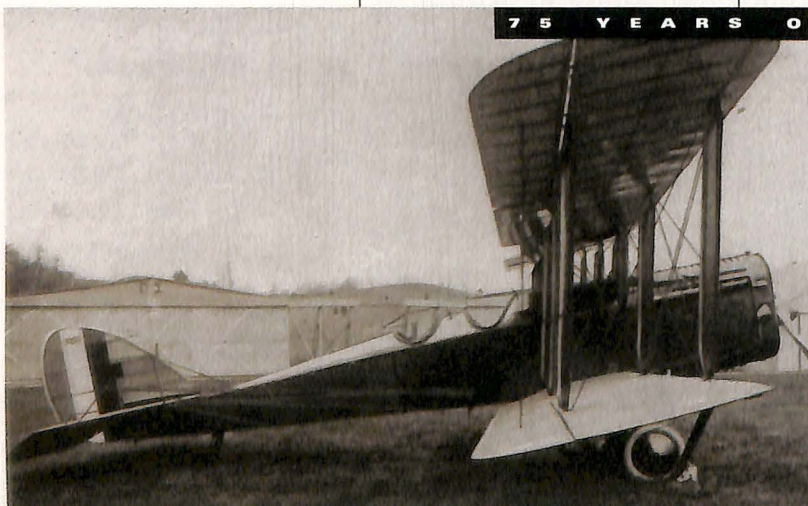
The PTC continued to chair the inter-council task force, which developed National Aerospace Standard 411 for hazardous materials management and worked with DoD to change its inconsistent implementation of Section 326 of the 1993 DoD Authorization Act, which prohibits the services from specifying the use of ozone-depleting substances in contracts.

NASA CONTRACTING

A PTC task group on NASA contracting issues worked to ensure that the revised NASA award fee policy would be fair and reasonable to industry; presented a number of workable alternatives to NASA to address the potential termination liability issues; and presented rationale to NASA and congressional members that helped to put a hold on proposed legislation that would have shifted liability risks for NASA R&D contract performance totally to industry under a revised inspection and correction of defects clause.

DCMC

The PTC conceived and implemented periodic scheduled meetings between AIA leadership and DCMC to



7 5 Y E A R S O F S U C C E S S

**Dayton Wright
Airplane Company's
1919 Liberty-powered
Nine-hour Cruiser
made it possible to
fly non-stop from
New York to Chicago.**



LeRoy J. Haugh
Vice President
Procurement and
Finance



Jack Harding
Raytheon
Company
Chairman,
Procurement and
Finance Council



David Buchanan
Martin Marietta
Corporation
Chairman,
Controllers' Forum



Charles Cruik
Rockwell
International
Corporation
Chairman,
Washington
Procurement
Committee



Samuel J. Hand
General Electric
Company
Chairman, Cost
Principles
Committee



Mark Hausmann
Textron Inc.
Chairman, Facilities
and Property
Committee



Nicholas Kuzemka
Lockheed
Corporation
Chairman,
Procurement
Techniques
Committee



Darryl J. Lee
Thiokol
Corporation
Chairman, Legal
Committee

improve communications and cooperative relationships. The first two sessions, held in July and November, resulted in subgroup efforts in overhead management and environmental support, and a much improved "teamwork" environment.

PUBLIC/PRIVATE DEPOT COMPETITION

The PTC worked with Product Support and the Washington Procurement Committee to develop short and long-term strategies in support of the AIA ad hoc CEO committee effort to change the DoD policy for allocation of depot support work between government and industry.

ACQUISITION REFORM

The PTC, a leader in the continuing multi-association industry effort to achieve significant acquisition reform, developed and presented eight "radical" reform recommendations to Colleen Preston, USD(A) Deputy for Acquisition Reform.

LEGAL COMMITTEE (LEG)—SECTION 800 PANEL PARTICIPATION

The committee provided significant input to the Section

800 Panel, helped formulate many of the recommendations for procurement reform, and continued to track closely the Section 800 Panel initiatives.

FALSE CLAIMS ACT— QUI TAM PROVISIONS

The proposed Grassley Bill would make drastic changes in the False Claims Act and significantly expand the potential for *qui tam* suits. The Legal Committee worked closely with an ad hoc group of general counsels, led by Henry Hubschman of General Electric, to press for modification and clarification of the more troubling aspects of the proposed bill.

ENVIRONMENTAL MATTERS

Legal Committee involvement included coordination and comment on regulations and proposals involving ozone-depleting chemicals, the DCMC pilot environmental audit program, and preparation for additional discussions regarding any environmental cost principle the government might propose.

DOWNSIZING— ANTITRUST ISSUES

The committee became more involved in the legal con-

siderations (particularly anti-trust) raised by the downsizing of the aerospace and defense industries, and engaged various guest speakers during the year to obtain additional expertise regarding these problems.

PROPOSED NASA DRUG AND ALCOHOL FREE WORKPLACE RULE

The committee reviewed the proposed NASA rule and recommended revisions that would comply fully with the recently passed NASA Employee Drug Testing Act and still address the various concerns regarding effective implementation by aerospace contractors.

AMICUS BRIEFS

The Legal Committee established a quick reaction procedure to expedite handling the increasing number of requests.

MEMBERSHIP INITIATIVES

The committee made a concerted and successful effort to increase participation by AIA member companies.

COST PRINCIPLES COMMITTEE (CPC)

Federal agencies, and DoD in particular, continued to review the allowability of certain costs, partly at least in response to media and congressional pressures. The concept of "ordinary and necessary" costs of doing business is often replaced by a presumption of unallowability that the contractor must overcome. Much of the CPC's effort in 1993 was devoted to preserving or ensuring the allowability of several of these types of costs.

ENVIRONMENTAL CLEANUP COSTS

CPC followed very closely developments related to a proposed draft environmental cost principle, the joint DCMC/Defense Contract Audit Agency (DCAA) Environmental Initiative Task Force Pilot Cost Allowance Program, and the DCAA Audit Guidance on the allowability of environmental costs. Industry considers environmental cleanup costs as part of doing business and that the current cost principles adequately cover cost allowability and recoverability.



Robert A. Walsh
AlliedSignal
Aerospace
Chairman,
Intellectual
Property
Committee



Doug McPherson
Martin Marietta
Corporation
Chairman, Tax
Matters Committee



Frederick B. Whitney
The Boeing
Company
Chairman,
Economic
Advisory
Committee

DOWNSIZING/ RESTRUCTURING COSTS

As a result of CPC efforts, DoD clarified its policy that certain restructuring costs are recoverable on novated government contracts. *Inter alia*, the clarification states that "it is in the government's best interest to encourage contractors to consolidate and restructure to reduce operating costs and thereby reduce contract costs."

OVERHEAD COST

DCMC launched a proactive effort aimed at "analysis, evaluation, assessment and negotiation of contractor overhead costs."

CPC will continue to work with DCMC to correct misunderstandings resulting from overhead rate fluctuations caused mainly by shrinking direct cost bases.

PENALTIES ON UNALLOWABLE COSTS

Committee efforts in 1992 resulted in a major improvement to the legislation governing penalties on unallowable costs (Public Law 102-484). In 1993, the CPC helped guide the implementing regulation (interim Defense Federal Acquisition Regulation

Supplement ARS 252.231-7001) to coincide closely with the legislative language.

COST ACCOUNTING STANDARDS BOARD (CASB) ACTIVITIES

CPC continued to be highly responsive to Cost Accounting Standards Board (CASB) requests, and provided written responses to several CASB papers covering revised cost accounting standard thresholds, measurement and allocation of pension costs, disclosure statements, and organizational costs.

FACILITIES AND PROPERTY (F&P) COMMITTEE— SPECIAL TOOLING

The Facilities and Property (F&P) Committee obtained the approval of the Defense Acquisition Regulation Council for the fourth annual class deviation to the 1989 version of the clause in Federal Acquisition Regulation (FAR) 52.245-17. This continues the multi-million dollar cost avoidance to industry by eliminating the requirement to weigh and measure tooling subject to the clause. Additionally, the financial responsibility for lost or damaged government-owned

tooling, which would be shifted to the contractor under this clause, remains with the government under the deviation.

SUMMARY RECORDS

The committee prepared a FAR change to authorize the use of summary records for the management of equipment and tooling assets under \$1,500 (subsequently increased to \$5,000) unit cost. Recurring costs savings estimated by a majority of member companies exceed \$50 million annually.

FEDERAL ACQUISITION REVIEW PART 45 REWRITE

A working group of member company representatives completed the rewrite over a seven-month period, providing a well coordinated and researched product that offers substantial cost savings to both government and industry without compromising fundamental controls required to protect the interests of the taxpayers.

COMMERCIAL GOVERNMENT FURNISHED MATERIAL (GFM)

The committee was successful in getting a revision to the FAR that will strengthen the prohibition against furnish-

ing off-the-shelf commercially available material to contractors as GFM. This will reduce contractors' property management and audit expenses, while increasing recovery of general and administrative expense, profit, and material handling by incorporating this material in the cost base during pricing. The Office of the Secretary of Defense (OSD) issued a memorandum in August 1993 directing that general purpose components not be provided to contractors as GFM.

DEMILITARIZATION

In August of 1992, DCMC promulgated new demilitarization coding requirements which added significant cost (as high as \$1 million per site) and risk to contractors' management of government property. Even though there was no regulatory or contractual coverage, DCMC commenced selective enforcement by proposing to reject inventory schedules and disapprove property systems unless contractors complied with the new requirements. Thanks to the persistence of the F&P Committee, implementation has been suspended.

**PROPERTY
ADMINISTRATION
MANUAL REVISION**

The F&P Committee completed a detailed review of DoD and DCMC property administration manuals and made recommendations to conform them to the FAR/DFARS. The committee also reviewed Section 14 of the DCAA Contract Audit Manual and made several recommendations for improvement. The suggested changes were accepted by DCAA, reducing the potential for negative audit findings with respect to contract property.

The F&P Committee also supported the acquisition reform effort and developed a significant recommendation to replace the current micromanagement process required by FAR Part 45. The committee

suggested a flexibly structured process that could be tailored for each business unit; achieved the revision of numerous reporting and accounting thresholds to reduce the cost of property management and government oversight; and succeeded in getting DoD to rescind the DFARS requirement that inventory schedule certifications be signed by a representative authorized to sign government contracts, thus significantly streamlining the schedule submittal process.

The F&P Committee noted its special thanks to James J. Jaeger, Martin Marietta, whose sincere dedication and creative contributions, continued despite serious illness, were very important to the 1993 successes.

**INTELLECTUAL
PROPERTY
COMMITTEE (IPC)**

The issue that commanded particular Intellectual Property Committee (IPC) attention in 1993 was the continuation and completion of the joint government/industry effort to draft regulations on rights in technical data. The Defense Procurement Improvement Act of 1984 directed DoD to promulgate data rights regulations that would balance the interests of DoD and the private sector. After several years of unsuccessful attempts by DoD, AIA turned to Congress to help resolve the impasse, and Congress established the Government-Industry

Technical Data Advisory Committee by Section 807 of the FY 1992 DoD Authorization Act.

At year-end 1993, the committee's report and draft regulation were ready to be presented to the Secretary of Defense and published for public comment. While the industry members feel there are still some further improvements that should be made to sharpen the regulation, they are generally pleased with the current draft. Several key issues, notably the proprietary treatment of data developed at indirect expense, elimination of the "required for performance" criterion, and separate treatment for computer software, have been resolved in a manner that clearly reflects the basic intent to protect the rights of the developer.

7 5 Y E A R S O F S U C C E S S



Among aircraft engines of 1918-20 vintage were the Liberty Eight and Twelve (cylinders), the Curtiss K-6 and K-12 Vee-type aluminum engines, and the 8-cylinder Thomas Engine Number One. In photo, the power plant assembly floor at Curtiss' Hammondsport, New York, factory.

ECONOMIC ADVISORY COMMITTEE (EAC)

The Economic Advisory Committee (EAC) continued its efforts with the Defense Finance and Accounting Service (DFAS) to improve the timeliness of contract payments, including financing (progress) payments. While DFAS is still unable to meet DoD payment standards, AIA is pressing for system enhancements to track payment performance, spot trends, and make faster corrective actions. The committee is following actions closely related to the consolidation of the Albuquerque payment office into the Columbus operation. Outstanding performance by Albuquerque will be hard to match at Columbus, which still must overcome significant system deficiencies in its payment capabilities.

In a related area, the EAC continued to support the ad hoc committee of CEOs working with DoD towards simplifying contract financing procedures. Industry's objective is to substitute some form of commercial-based contract financing for the present system of progress payments based on costs. Meanwhile, a provision in the FY '94 DoD Appropriations Act lowered the

progress payment rate by 10 percent to 75 percent. The EAC will work to get this back up to at least 80 percent while it continues to press for a more simplified method.

TAX MATTERS COMMITTEE (TMC)—RESEARCH AND DEVELOPMENT TAX CREDIT

The TMC continued its effort to make the credit permanent with certain modifications. S.666 was introduced by Senators Danforth and Baucus to make the credit permanent and sever defense activities from commercial activities. Since defense activities are decreasing, commercial activities are penalized if the base period for calculating incremental increases includes both defense and commercial activities. However, the credit was extended without any changes until June 30, 1995.

FOREIGN SALES CORPORATION

AIA testified before the Subcommittee on Select Revenue Measures of the House Ways and Means Committee for the repeal of Section 923(a)(5) of the Internal Revenue Code, which limits the tax benefits to companies that sell military products to

foreign customers to 50 percent of the benefits available to other exporters. Senator Durenberger introduced S.1093 to repeal Section 923(a)(5).

TAXING LONG-TERM CONTRACTS

The TMC continued to pursue with the Internal Revenue Service (IRS) and the Congress, equitable changes to the percentage of completion method (PCM). PCM replaced the completed contract method of accounting and requires payment of taxes on progress payments received for costs incurred, long before profits are realized or even known. However, unless industry can identify revenue to offset what Congress sees as a revenue loss if PCM were changed, there does not appear to be much reason to hope for change.

WASHINGTON PROCUREMENT COMMITTEE (WPC)

The Washington Procurement Committee's (WPC) primary focus is legislative issues that affect government procurement policy, but it also works high-profile regulatory issues that require a concerted effort in Washington. In 1993, WPC established a new system of "issue coordi-

nators" for each of the P&F Council's top ten issues in order to coordinate the Washington-based activity of other AIA committees.

WPC played a leading role in defeating House and Senate legislation that would have placed further limitations on depot-level maintenance and modification work that could be performed in the private sector. In their stead, AIA supported, and the Congress approved, legislation that created a task force to assess the issue and recommend an equitable mix of public and private sector activity.

Working with the PTC and P&F Executive Committee, WPC succeeded in improving NASA's final regulations on cost-plus-award-fee contracting. The proposed rule would have allowed "negative fees" on cost reimbursable R&D contracts and would have successfully opposed legislation and regulations that would have required companies to virtually guarantee the technical success of high risk R&D projects. The proposed rule would also have imposed a penalty of the lesser of 50 percent of the cost of rectifying a project failure or 10 percent of the contract's value.

TECHNICAL AND OPERATIONS

COUNCIL

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.

COMPETITIVE TECHNOLOGIES COMMITTEE ACTIVITIES

The Competitive Technologies Committee (CTC) has been actively supporting the publication of NCAT Strategic Plans for Key Technologies. The National Advanced Metallic Structures Strategic Plan was circulated in final draft and sent to the Technical and Operations Council in mid-October. The CTC is now actively supporting NCAT in its Demonstration of Engineering and Manufacturing Operations (DEMO) activities.

Members of the CTC participated in the second NCAT sponsored Industry/Government Dialogue meeting on October 6, 1993, in Washington, DC Briefings for this meeting were used in the NCAT-sponsored video series *Technology For Affordability Through Integrated Product*

and Process Development, which was presented through the National Technological University and in cooperation with the Georgia Institute of Technology.

The CTC is also supporting NCAT in guiding their Technology for Affordability activity for the DoD in the area of dual-use or multi-use manufacturing. NCAT, working with DoD and industry, will review current and proposed system requirements for dual-use technologies.

MANUFACTURING TECHNOLOGY (MANTECH) PROGRAM

Traditionally, the Manufacturing Technology (ManTech) Program has been used to bridge the gap between R&D innovations and full-scale production applications. The AIA Manufacturing Committee (MC) expressed concern to the Department of Defense (DoD) that ManTech would become a science and research program when responsibility for ManTech was changed from Production Logistics to

Research and Engineering.

In October, 1993, DoD expanded the definition of ManTech to include manufacturing science, changing the name to Manufacturing Science and Technology (MS&T), and requested a proposal on how industry could input into the MS&T planning process. An AIA Manufacturing Committee (MC) proposal has been approved.

MANUFACTURING COMMITTEE INPUT TO THE DOD TECHNOLOGY REINVESTMENT PROGRAM (TRP)

The Manufacturing Committee (MC) developed a defense conversion concept that would take existing capacity that is currently under utilized and convert that capacity into teaching factories. Within these



75 YEARS OF SUCCESS

Gallaudet Aircraft Corporation, East Greenwich, Rhode Island, developed the amphibious Gallaudet Light Bomber for the Navy in 1918-19.



Stan Siegel
Vice President
Technical and
Operations



Jerome P. Mullin
Sundstrand
Corporation
Chairman,
Technical and
Operations Council



Dennis M. Ahern
Westinghouse
Electric
Corporation
Chairman,
Embedded
Computer
Software
Committee



Dean Allen
Lockheed
Corporation
Chairman,
Information
Technology
Committee



Jon R. Allen
Lockheed Fort
Worth Company
Lockheed
Corporation
Chairman,
National Aerospace
Standards
Committee



Edward I. Bangsund
The Boeing
Company
Chairman,
Space Committee



Hal W. Campen
Aerojet,
A Segment
of GenCorp
Chairman,
Competitive
Technologies
Committee

teaching factories, medium and small businesses from both the defense and private sectors would learn the state of the art in high tech manufacturing methods and processes. The concept was briefed to Senator Bingaman's staff and the Director, Defense and Research Engineering, who endorsed the initiative.

The DoD Technology Reinvestment Program (TRP) allowed for this initiative in its alternate deployment pilot project area for a possible allocation of \$181 million. A number of AIA companies have teamed with states, academic institutions, and national laboratories to submit proposals on this initiative.

AGILE AND LEAN MANUFACTURING

In developing the National Defense Manufacturing Technology Plan, the DoD contracted with the Iacocca Institute of Lehigh University to establish a "vision" of the twenty-first century manufacturing enterprise: "Agile Manufacturing." Follow-on Agile efforts are performed by industry-led focus groups with strong AIA member company participation in leadership roles and focus groups.

In 1993, the Air Force began an initiative with its aircraft manufacturers and the Massachusetts Institute of Technology (MIT) to develop the lean manufacturing initiative (LAI) that will result in a quantitative analysis of the aircraft industry. The Manufacturing Committee is the coordinating forum for both initiatives.

SMALL DISADVANTAGED BUSINESS (SDB) UPDATE

NASA centers have been imposing mandatory SDB subcontracting goals in their Request for Proposals (RFPs) and have increased their reporting requirements. In August, 1993, NASA officials met with AIA and committed to develop procedures for industry input to developing goals before issuance of an RFP. NASA and the SDB Development Panel developed a consistent, single reporting system to provide necessary subcontracting information. For FY 1993, NASA and its contractors surpassed its SDB 8 percent contracting and subcontracting goal by 5 percent.

On August 11, 1993, the Secretary of Defense announced the selection of 46

prime contractors to receive a total of \$30 million for direct reimbursement as mentors to provide assistance to 74 SDBs as protégés. Through the third quarter of FY 1993, DoD reported that subcontract awards to SDBs were 4.1 percent, up from 3.8 percent for FY 1992, and NASA reported that awards to SDBs were 76 percent, up from 7.2 percent for FY 1992.

PROCESS ORIENTED CONTRACT ADMINISTRATION SERVICES AND THE SMALL BUSINESS PROGRAM

Member companies small business programs are evaluated by auditing voluminous paperwork generated by purchase orders against reporting forms and subcontract plans. A new initiative on contractor oversight undertaken by the Defense Contract Management Command (DCMC) and the Defense Logistics Agency (DLA) is Process Oriented Contract Administration (PROCAS), developed to identify and approve the contractor's processes. A government and industry ad hoc committee has developed a program to implement the PROCAS approach.

ELECTRONIC DATA INTERCHANGE (EDI) INITIATIVE

With the downsizing of the aerospace industry, EDI is an important tool for the materiel management function. DoD is requiring EDI relationships with prime contractors, and is developing its own guide for transactions.

A review by the Materiel Management Committee determined that EDI needs to be addressed by AIA, as DoD and other industries are using EDI in contracts, finance, technical management, quality assurance, engineering/design, and materiel management.

AIR FORCE BAN ON OZONE DEPLETING SUBSTANCES (ODS)

AIA Manufacturing Committee representatives addressed a draft Air Force policy concerning an Air Force ban effective October 1, 1993, on the purchase of ODS and equipment that requires them. AIA expressed its concerns that if the ban is implemented as defined, the defense industrial base could be seriously impaired in producing weapon systems. A working relationship with the Air Force was

developed that produced a less onerous policy to industries.

QUALITY ASSURANCE

The AIA Quality Assurance Committee continued to work with the DoD in the areas of standards revisions and process improvement. In addition to the major activities described below, ongoing projects included the review of revisions to military standards in the areas of metrology and non-destructive testing.

ADOPTION OF COMMERCIAL QUALITY STANDARDS

The committee has been involved with the Department of Commerce to establish a National Voluntary Laboratory Accreditation Program for the certification of calibration and

metrology laboratories. This program will be patterned after the National Conference of Standards Laboratories format, and will supplant current military requirements.

INTERNATIONAL QUALITY STANDARDS

The Quality Assurance Committee worked with the DoD toward the reconciliation of international quality standards with military standards. The international standards are known as the ISO 9000 series. Related to the integration of the ISO protocols is the issue of certification of quality systems.

Certification can be a requirement under the ISO program, and the absence of an internationally recognized U.S. certifying organization poses a potential trade barrier.

While DoD has been reluctant to adopt the international standards, it has issued a policy letter stating that use of the standards is an acceptable option. DoD has established a government/industry task group to develop a guidance handbook for use when the ISO standard is made a contractual item.

NIST COMMERCE CONFORMITY ASSESSMENT PROGRAM

The National Institute of Standards and Technology (NIST) has proposed a Conformity Assessment Systems Evaluation program to enable the government to provide assurance of the competence of individual assessment organizations and follow-on certification covering laboratory testing, product certification, and qual-

ity systems. The Committee responded to NIST, urging consideration be given to establishing one government recognized evaluation program, and suggested a study be performed to determine the viability of the approaches to conformity assessment and certification. Rule making is still under review.

COMPUTER SECURITY AND ENCRYPTION

The Federal Bureau of Investigation and the National Security Agency have urged the administration to adopt legislation requiring implanting an integrated circuit in all U.S. manufactured encryption equipment. A major concern of industry is the potential for the communications and computing structure of the United



7 5 Y E A R S O F S U C C E S S

Named for noted designer Grover Loening, the Loening Monoplane was developed by Wright Aeronautical Corporation in 1919 to meet an Army need for a high-speed, two-seat, "scout" plane.

States to be constructed with government access built in. The Information Technology Committee is coordinating with other interest groups in opposition to the proposed legislation and is developing a paper to communicate industry's viewpoint to Congress.

**CONTRACTOR
INTEGRATED
TECHNICAL
INFORMATION
SERVICES (CITIS)**

The Information Technology Committee submitted comments to the DoD on the proposed CITIS standard MIL-S-974. CITIS objectives include automating government repositories for technical data, access to contractors data bases both techni-

cal and business, and the use of digital formats throughout the acquisition process. During development, a concern of industry was how government would be able to access proprietary data. This concern was addressed in the revised standard. A final document was approved by the Services and became effective in October.

**NETWORK
INTERCONNECTIONS**

At the conclusion of a project to test the operational capability of the Government Open Systems Interconnection Protocol, and based on findings indicating a lack of network interconnections, the Information Technology Committee initiated a project

to encourage the development of a data infrastructure for the transmission of high volume technical information.

PRODUCT SUPPORT

1993 activities focused on the critical issue of depot maintenance and the private sector's role-to-be in the defense industrial base. Private sector downsizing was not matched by DoD. DoD investments continued, with a dangerous imbalance developing. DoD competition under an unfair public-private competition process intensified the crisis. Concerned, AIA established a CEO-level ad hoc committee to address preservation of critical industry capabilities. AIA objectives are to: pursue a

national defense aerospace industrial base policy relying on private industry; eliminate excess government depot capacity; prevent duplication of industry capabilities by the government; eliminate unfair public-private competition; and, provide a vision for the operation of the future industrial base.

Visibility of the issues was raised through continuous education of administration leaders, Congress, the press, and DoD activities. Other significant 1993 activities within product support include AIA participation on the DoD Joint Aviation Logistics Board, formation of a DoD/FAA/ Industry group to address DoD policies on the sale of surplus

7 5 Y E A R S O F S U C C E S S

**Built by Boeing Airplane
Company was the Model
C.L.4-S Naval Training
Seaplane, an advanced
1919 version of a World
War I design.**





Louis R. Della Salle
Grumman Corporation
Chairman, Electronics Systems Committee



Gerald E. Ennis
McDonnell Douglas Aerospace
McDonnell Douglas Corporation
Chairman, Manufacturing



Thomas K. Fleming
Bell Helicopter Textron Inc.
Chairman, Product Support Committee



Anthony J. Gentile
Coltec Industries Inc.
Chairman, Engineering Division



Jerry Jaeb
The Boeing Company
Chairman, Materials and Structures Committee



John G. Johnson
Harris Corporation
Chairman, Technical Management Committee



Martin J. Kane
Raytheon Company
Chairman, Materiel Management Committee

equipment and parts, and continued annual AIA/Tri-Service Technical Publications Workshops addressing the conversion of technical data to digital format.

SPACE COMMITTEE LIAISON WITH NASA

The Space Committee periodically meets with NASA's Office of Advanced Concepts and Technology (OACT) to relate NASA's future technology activities with industry. The Space Committee interacts with the administrator of OACT and acts as NASA's entry to the aerospace industry. The administrator has agreed to provide the committee visibility into NASA activities and will seek its insight on specific technology areas, technology processes, and NASA technology program content.

NATIONAL FACILITIES STUDY

NASA/DoD are cooperating in a Space R&D Facilities study to address future national aerospace needs. AIA is acting as the facilitator between NASA/DoD and member companies to develop a catalogue of existing space R&D and space operations facilities. AIA has identified industry concerns regarding the release

of proprietary data, the distribution and protection of survey data, and the overhead cost to assemble the data or to provide plant tours.

AIA SPACE PAPERS

The Space Committee developed a series of papers to inform the new members of the administration and Congress of the importance of maintaining a viable space infrastructure. These papers address such topics as shaping a 21st century space agenda, humans in space, space impact on long term economic growth, benefits and inspiration of a space program, and a call for action.

SPACE TRANSPORTATION STUDY

The Office of Science and Technology Policy (OSTP) directed DoD and NASA to conduct a space transportation study concerning national policy for space launch vehicles, and asked AIA to participate in the study. AIA's first effort was a consideration of the study's "Terms of Reference" including the early planning for the conduct of the study. Future participation will be to provide advice and to be the focal point for aerospace industry support of the DoD/NASA study efforts.

PROCESS ACTION TEAM ON MILITARY SPECIFICATIONS AND STANDARDS

The Office of the Secretary of Defense for Acquisition Reform (OSD/AR) directed a Process Action Team (PAT) to consider means to reduce cost by using commercial specifications and standards and to simplify the use of government standards. The AIA Technical Management Committee suggested that the PAT team efforts could be improved by separating the process specifications from the product or part specification and that more consideration be given to those statutory/regulatory requirements and management standards which add no value to the product yet increase overhead expenses. The AIA Technical Management Committee also recommended that OSD/AR recognize that commercial practices and commercial products are mutually independent matters.

MIL-STD-499B SYSTEMS ENGINEERING

AIA has opposed the full imposition of this standard on contracts since its implementation would drive up cost.

Acting with CODSIA, AIA recommended that the document be used during the proposal phase to require the development of a Systems Engineering Master Plan (SEMP). Once the SEMP has been developed and agreed to by both the contractor and government, it would replace the MIL-STD-499B as the contractual agreement.

CONTRACTOR TEST

AIA has been asked to work with DLA/DCMC and the Services to revise DLA 8210, Contractor Flight Operations. A series of flight test mishaps have raised a major concern within DoD as to whether the processes and procedures being used in flight test operations are appropriate.

AIA will propose that National Aerospace Standard (NAS) 3603 be used as an alternative to the directive. NAS 3603 was developed by the Flight Test Operations Group.

INTERNATIONAL STANDARDIZATION

Mr. Fuqua has been reappointed as the chairman of the International Standards Organization's Technical Committee 20, the international standardization commit-



Robert E. Morris
General Electric
Company
Chairman,
Industrial
Modernization
Committee



Len Schneeberger
Sundstrand
Corporation
Chairman, Spare
Parts Committee



Richard E. Tracey
Hughes Aircraft
Company
General Motors
Hughes Electronics
General Motors
Corporation
Chairman, Quality
Assurance



Richard E. Weich
Sikorsky
United
Technologies
Corporation
Chairman, Service
Publications
Committee

tee for aerospace, for the period 1993-1998. AIA also provides the secretariat for the committee. The next committee meeting is scheduled for April, 1994, in Beijing, China. TC 20 established a liaison with the European Association of Aerospace Manufacturers (AECMA) in response to a major AECMA program to develop European aerospace standards, especially in the area of part standards.

The newly established TC 20 subcommittee (SC) 14, Space Systems and Operations, held their organizational meeting in April, 1993. Six participating members (China, France, Italy, Japan, Russia, and the United States) and one observer member, Canada, attended the meeting. A member of the U.S. delegation was elected chairman. Also, TC 20 approved a new subcommittee (SC) 15 on airframe bearings. This subcommittee replaces an ISO Joint Working Group.

SOFTWARE ISSUES

Currently, two approaches are used by the Air Force for software capability evaluations. To determine a single approach, the Air Force formed a PAT, on which AIA's Embedded Computer Software

Committee is represented. The PAT developed a new software evaluation method which is scheduled for publication in the fall of 1993.

The Navy has formed an Industry Reuse Advisory Group (IRAG) to work with a DoD Software Reuse Management Group. AIA's Embedded Computer Software Committee members are represented, and the focus of the effort is the managerial aspects of software reuse.

NATIONAL AEROSPACE STANDARDS

The National Aerospace Standards Committee (NASC) continually maintains the cur-

rent body of more than 3,000 standards and develops new ones as they are needed by the aerospace industry. During 1993, the NASC revised 240 standards and reaffirmed 18 standards. In addition, one new standard, NAS 411, Hazardous Materials Management Program, was developed in conjunction with the Procurement Techniques Committee.

ENVIRONMENTAL CONCERNS WITH MATERIALS

Materials and processes which cause environmental problems are a concern of both AIA's Materials and Structures Committee (MSC) and NASC.

The MSC holds an annual workshop where engineers relate how their companies are complying with impending deadlines for phasing out many widely used materials.

FAA CIRCULAR ON TITANIUM ROTATING ELEMENTS

The Materials and Structures Committee provided recommendations to the FAA on the manufacture of titanium alloy rotating parts of aircraft turbine engines. The FAA will use the information in an advisory circular designed to explain compliance standards for FAA materials suitability and durability.



Described as "America's largest airplane" in 1920, the three-engine, 107-foot wingspan Model H Giant was built by L-W-F Engineering Company.



**Aerospace
Industries
Association**

1250 Eye Street, NW, Washington, DC 20003

