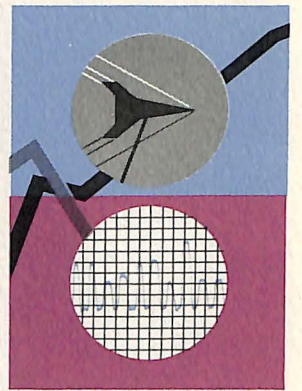
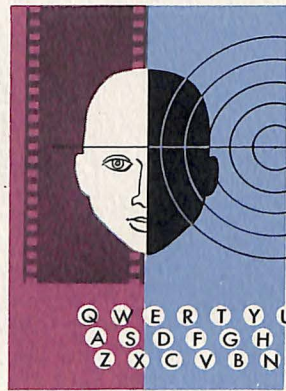
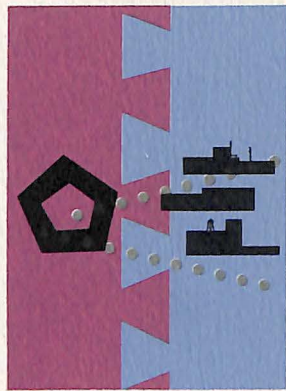
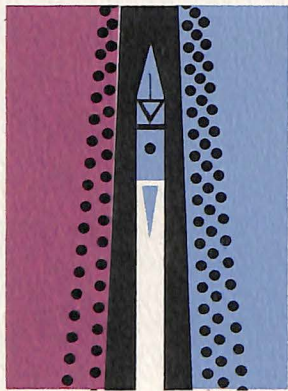
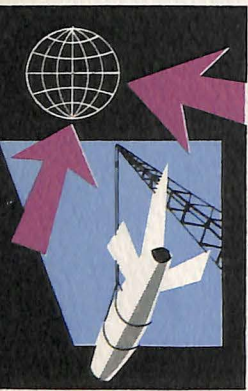




1960

annual report





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 OF AMERICA, INCORPORATED

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A STATEMENT OF POLICY

The aerospace industry recognizes the responsibility which rests upon it for the creation, in partnership with the Government, of the air and space defenses and deterrent capabilities of the Nation and the peaceful conquest of space. Fulfillment of this responsibility imposes a requirement on this industry for unprecedented contributions in the fields of science and technology.

Industry must relentlessly explore new horizons of science which hold the key to future advances. It must provide the technological foundations upon which our defense capabilities and space efforts are based. It must maintain the vigor, industrial creativity and facilities in-being required to produce the equipment and weapons necessary to preserve our civilian and military leadership in air and space. It must place major emphasis on all aspects of operations which will continue to promote efficiency and reduce costs.

Attainment of these goals requires the most effective use of the capabilities, the human resources and the proven experience of a pioneering and progressive industry, directed by experienced, flexible and imaginative management, and incorporating—

- The highest levels of scientific investigation;
- Technological facilities adequate for continuity in advanced research, development and production;
- Teams, in-being, of scientific, technological and skilled labor;
- Economic stability to assure the fullest contributions by each element to national security and progress.

The aerospace industry pledges the fullest application of its resources, skills and knowledge in maintaining this industrial, scientific and technological strength which today, as never before in history, is vital to the future of all free men.



TO THE MEMBERSHIP



During the AIA fiscal year, which ended October 31, 1960, the aerospace industry took long strides in its most urgent mission—that of helping to assure the United States leadership in military strength and in the conquest of space.

In this period, the industry not only delivered new weapons of great potency, but constant testing and refinement brought a much higher degree of reliability and effectiveness to our operational types. Research and development progress has been of a high order, and even more powerful and efficient weapons will soon be forthcoming. In space, notable successes were scored during the year by the United States Government/industry team—successes which overshadowed the Russian efforts in most particulars.

Also, American prestige was greatly enhanced by the lengthening of our commanding lead in jet transportation as the number of U. S.-built turbine-powered airliners in service on the world's airways approached the 500 mark. Substantial gains also were made in both the utility aircraft and helicopter segments of the industry.

Importantly, the strengthening of our military position comes at a time when world relationships have deteriorated badly and the Communist bid for expansion and influence has reached new heights. The truculence and boasts and threats of the Soviet Union at the recent United Nations meetings in New York make it abundantly clear that we must continue to speak and act from a position of strength if the safety of this Nation and the free world is to be assured.

It is to this end that the principal efforts of this industry are dedicated, and will continue to be dedicated in the future. Because this mission is of transcendent importance, the aerospace industry will continue to make every effort to increase its efficiency, reduce its costs and clear from its path any roadblocks which may delay or hamper the defense programs which have been entrusted to it for prosecution.

Improvement of delivery schedules, elimination of duplicating efforts, standardization, improved procurement practices and procedures, improved methods and techniques of development and manufacture, and continuing efforts to increase reliability and reduce costs have been the major activities of the AIA's committees, operating under the direction of its five services and three councils. The detailed record of

the achievement of these committees, which are comprised of more than 1600 of the top executives in the industry, dealing with the matters under their jurisdiction, is contained elsewhere in this report. The important thing is that these committee activities have been motivated and their efforts directed toward one primary goal—improving the industry's ability to develop and manufacture its products on schedule and at a minimum cost. This is not a one-shot performance, but rather is a continuing activity which must be pursued diligently if the industry is to efficiently and economically discharge its responsibilities to the national defense.

The Industry Speaks Out

In the past year, this Association and its membership have spoken forthrightly in behalf of measures designed to increase effectiveness, and against others which might have adverse effects. These have included legislation, regulation, practices and procedures. We will continue to voice our opinions on such matters affecting the industry's needs, because we conceive it to be in the national interest that we do so. We believe it to be of especial importance that we keep the Congress and its cognizant committees informed on the role of this industry in national defense and what is necessary to fulfill our responsibilities. With a full understanding of industry's problems, Congress will be able to act more constructively in the field of essential legislation.

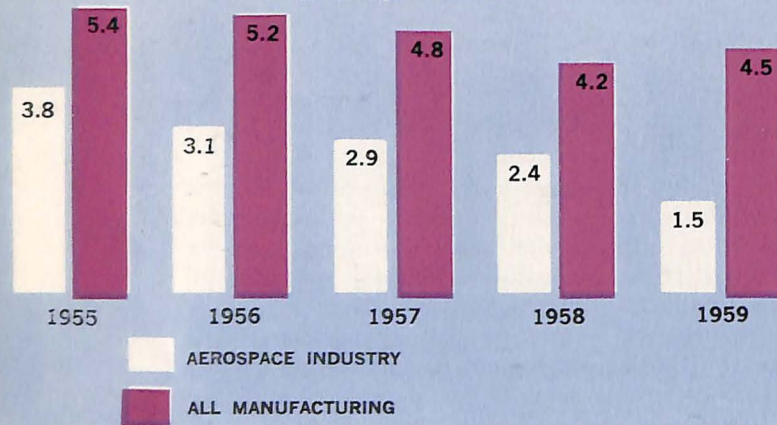
Pending for early consideration next year are matters of great interest to this industry. Among them are proposals for reorganization of the Department of Defense and the National Aeronautics and Space Administration. Decisions will be made on defense policy affecting both domestic and foreign procurement of aerospace materiel. Also under consideration will be legislative proposals and administrative policies dealing with almost every aspect of the procurement process. Industry will be heard on all matters that we believe will affect our ability to meet or improve our research and production schedules, and to aid in our continuing cost reduction efforts.

The Effects of Change

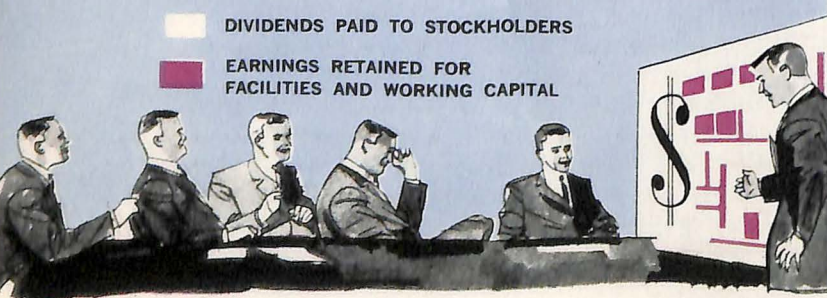
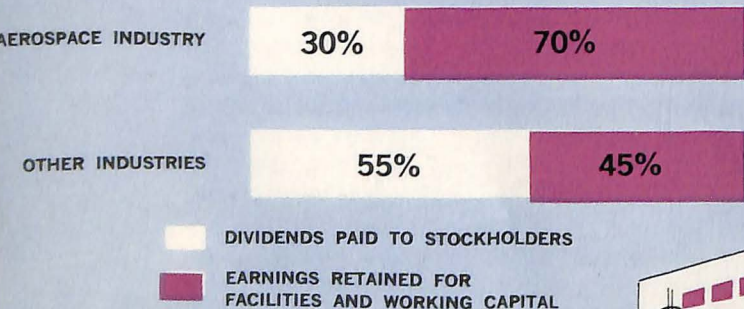
The aerospace industry has continued its efforts to adjust to fundamental changes in its own composition, in its products, its methods of operation, its manpower requirements and in its plants and facilities.

Total plant area requirements have been halved in the last three years and they will be halved again in the next three years. There has been high obsolescence in other facilities. To keep abreast of changing requirements and scientific advances, the industry alone has had to acquire almost \$2.0 billion worth of new facilities in the past five years. These expensive new research and development and fabrication facilities must be financed from company earnings, yet earn-

EARNINGS (Percentage of Sales)



EARNINGS UTILIZATION



ings have fallen steadily. As a percentage of sales, earnings have dropped from 3.8 in 1955 to 1.5 in 1959, and as a percentage of net worth, from 21.4 in 1955 to 8.0 in 1959. These are industry-wide statistics. Individual company performance can be considerably different.

Paralleling the reduction in floor space requirements has been the decline in the employment level, especially in the "production" workers category. Since mid-1957, the post-World War II production peak when more than 900,000 people were on the industry's payrolls, the aerospace labor force had shrunk to 657,000 in mid-1960—a trend that is expected to continue. Despite the over-all decline in the employment level, there has been a gradual increase during this same period in the number of scientific and engineering personnel employed by the industry. It is anticipated that the ratio of engineering to production workers will continue to increase as the industry evolves more and more into a research and development type of activity, as compared to a production type of operation.

The impact of such radical changes quite obviously is having a profound effect on the nature and composition of the industry, as well as its individual members. The progress made, to date, in absorbing these changing requirements and conditions has been outstanding, but only through dynamic and aggressive management can the industry and its member companies hope to continue to reorganize for the future and at the same time meet its current commitments, both of which are essential for national security.

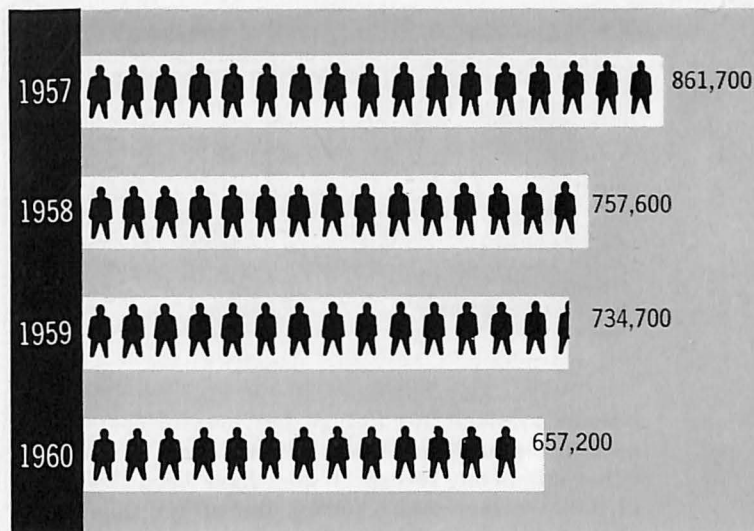
Increments of Aerospace Progress

Substantial accomplishment in military materiel development, test and operations can be reported for the year. In the high-priority ballistic missile program, Atlas and Titan have repeatedly met test requirements, targeting in at ranges of from 5,000 to 9,000 miles. The new Polaris, which can be launched against distant targets from underneath the ocean surface, will be operational much earlier than expected. The next generation of the intercontinental ballistic missile—the solid-fueled Minuteman—is in assembly and will have its first launching before the end of the calendar year.

In manned aircraft, which still are the backbone of the Nation's forces in-being and which constitute 63 per cent of current aerospace weapons expenditures, improved performance is attested by the capture of world speed and altitude records by U. S. military jets during this report period.

The recent decision, and funding, to expand and speed the B-70 strategic bomber program is of great importance to our future military stance, as are the decisions to modernize military airlift and to advance Army aviation capabilities.

In space, notable successes were scored by the United States Government/industry teams. In the last



Employment statistics in the aerospace industry provide graphic evidence of the rapidly changing nature of the industry from volume production to short production runs of highly sophisticated weapons. Peak employment since World War II was reached in 1957 with 861,700 workers. Latest statistics show only 657,200 workers, a drop of 24 per cent in three years. The aerospace industry will continue to require only highly skilled workers, engineers and scientists.

twelve months, the United States has placed seven new satellites in orbit and has successfully recovered two space capsules, one in flight. The only notable reported Soviet success was recovery of its "space zoo." Of the 17 satellites presently in earth or solar orbits, 15 are American and only two Russian. Eight of our space devices are still transmitting a great variety of scientific data, while none of the Russian devices is transmitting.

Increase in Aerospace Exports

A bright spot in the aerospace industry's record for the year has been a big increase in exports of both civil and military equipment. During the first seven months of the fiscal year, as reported by the AIA Export Committee, the increase was 88.8 per cent over the same period of last year. This followed a decline from 1956 through 1959 of 27.4 per cent.

This growth, due in large part to turbine-powered transports delivered to foreign countries, brought the total for the year to over \$1.4 billion. This is the highest ever attained by the industry, except in the war years of 1943 and 1944.

A significant development in increasing commercial exports during the year has been the export financing extended on a programmed basis by the Export-Import Bank. The effects of these loans extended to foreign airlines for purchase of American-built turbine aircraft were beginning to be felt as the year drew to a close. There is also the possibility that such loans may



become available for foreign purchase of spare parts, used transports and utility aircraft and helicopters. Other stimulants to export sales have been the easing of dollar balances abroad and the proven superiority of American-built jet transports.

Supersonic Transport

During the year there was much deliberation on the question of whether the United States should produce a supersonic transport as the next step in air transportation. Although this subject has been under speculation for years, it was given added impetus by developments both at home and abroad. In May, the House Committee on Science and Astronautics held extensive hearings on the subject, and witness after witness from both industry and Government expressed strong opinions that such a transport should be produced.

The cost of such a project would be enormous—too great for any one aircraft manufacturer, or even a combination of manufacturers, to assume. There was general agreement among the expert witnesses at the hearings that it would have to be a “team” effort, involving the Government and a broad segment of the aerospace industry.

The Aerospace Industries Association believes that a supersonic transport should be developed. It is the next logical step in public convenience and necessity. This country must produce such a craft to maintain world leadership in airline transport, with all the prestige and benefits this holds for the Government, the public and American industry.

Cooperation with Other Organizations

During the year, as in the past, AIA has worked closely with a large number of national organizations. These range from allied and general industrial associations to aviation, educational, professional and veterans groups.

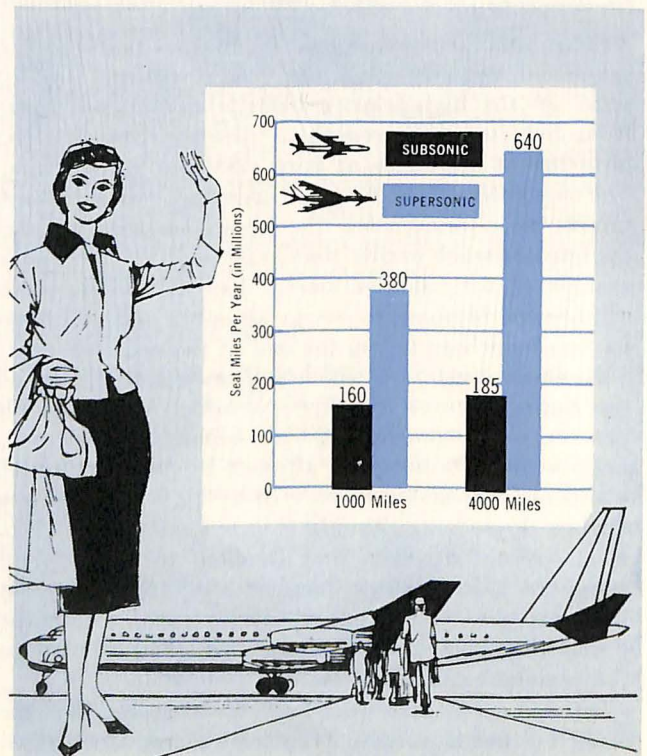
Most important have been the cooperation and coordination with industry associations. These have been in various groups—those concerned with industry in general and those concerned primarily with segments of specialized industry whose products are indispensable to the aerospace industry.

An example is the Chamber of Commerce of the United States, which represents all major classifications of business and general industry. Here, cooperation has been chiefly concerned with policies and activities of importance to broader industrial fronts. Another is the Advisory Council on Federal Reports which is broadly representative of American industry in the Government reporting field and NSIA which deals with common defense interests of a broad segment of industry.

In another group are those associations dealing with single segments of the aerospace industry. Because AIA covers the entire field of common interest of the aerospace industry, it is especially important that it work with these divisional organizations. At the same time that it preserves the interrelated operations of its own services and committees, it works against duplication of effort and for agreement with these allied groups.

An example is the Electronic Industries Associa-

The Mach 3 (2,000 mph) airliner will offer substantial gains in productivity—the number of seat miles available for passengers. Compiled on a utilization rate of 3,000 hours per year over trip distances of 1,000 miles, a subsonic transport would produce about 160 million seat-miles per year. The supersonic transport, capable of seating 150 passengers, would produce 380 million seat miles. Over distances of 4,000 miles, the subsonic plane would have available 185 million seat miles while the supersonic transport could offer 640 million seat miles. The great increase in speed permits more flights in the same length of time.



tion, which is one of the largest of the divisional industry groups. In this cooperation, the two associations coordinate in matters of reports and statistics, procurement and finance, legislative interest, electronics technology, spare parts, materials procurement and standardization.

AIA also works with the professional societies, particularly the Institute of the Aerospace Sciences and the Society of Automotive Engineers, in the technical and engineering fields dealing with such matters as standards, advancement of the aeronautical and related sciences, and other matters of particular interest to the scientific and engineering community.

AIA Committee Activities

AIA continues to serve as an important channel of communication between industry and its major customer—the various departments and agencies of the United States Government. Throughout the year, there has been an increasing flow of reports on governmental activities and decisions to the membership and, at the same time, greater efforts have been placed on providing interested governmental bodies with the industry's views on matters of mutual interest.

AIA committees and service staffs have worked closely with the National Aeronautics and Space Administration, the Federal Aviation Agency, the Department of Defense and the military services to develop policies, procedures and regulations which will eliminate delays, clarify programs and reduce costs. We have also worked out with them valuable new standards of materials, operations, reports and publications which are saving time and money and increasing efficiency. Our committee and staff work during the past year has been at an all-time high, with results that are measurable in both time and money for our customers, for the taxpayers and for the aerospace industry.

The balance of this report contains the record of achievement and activity of the committees, services and councils which conduct AIA's affairs. Several examples will serve to illustrate the wide variety of activities in which AIA has participated and contributed during the past year.

An outstanding accomplishment was the joint report of five technical committees of AIA setting forth scientific achievements which must be realized in the next few years if this Nation and the free world are to assume leadership in air and space. This is the seventh *AIA Forecast of Technical Requirements*, which covers Environmental Trends, System Trends, Equipment Requirements, Material Requirements, Manufacturing Process Requirements and Testing.

More than 200 aerospace industry experts, all members of these committees, collaborated to assemble this report. The purpose of the forecast is to set out specialized technical guidelines for Defense and other

Government agencies and for other industries serving the aerospace industry.

Another example of the work with the military came last winter when the Department of Defense accepted the aircraft and missile parts standards developed by the National Aircraft Standards Committee of AIA. It is estimated this action will save time and money and will improve the efficiency of weapons procurement. The Defense directive applied these standards to all services and their contractors, as well as the aerospace industry.

Still another example was the adoption by the USAF Air Materiel Command of the AMC Industrial Reports Register, which was worked out with the AIA's Government Reports Committee. It was estimated that the register will save as much as 25 per cent of the hours formerly required in reporting.

In the field of labor relations, the Association continued to provide individual members with surveys on fringe benefits, which have been extremely valuable in the member companies' collective bargaining activities. As a result of the activity undertaken in this field, the Department of Labor, in December last year, indefinitely postponed a minimum wage proceeding for the aircraft industry under the Walsh-Healey Act. It is conservatively estimated that, if these proceedings had been finalized, it would have increased aircraft and missile labor costs from 50 to 100 million dollars annually.

Negotiations with motor van carriers by AIA have resulted in material reductions in the rates applicable to movements of industrial high-value materials and employee personal effects. Rates on high-value industrial material were reduced approximately 15%. A 5% reduction in charges applicable to volume loads of personal effects was established. An unreasonable charge for servicing home appliances—such as that required in the transfer of automatic washing machines, refrigerators, TV sets, etc., from one residence to another—was removed through the efforts of AIA. This alone accounted for direct savings of one million dollars annually for the Department of Defense, in addition to lesser savings for aerospace contractors.

A more detailed report on the activities and accomplishments of the various committees comprising the five services and three councils of the AIA will be found on the subsequent pages.

Respectfully submitted,



ORVAL R. COOK
President
Aerospace Industries Association



AIA ORGANIZATION AND FUNCTIONS

The Aerospace Industries Association of America, Inc., is the national trade association of the manufacturers of aircraft, guided missiles, spacecraft, propulsion, navigation, and guidance systems, accessories, parts, materials and components used in the construction and operation of complete aircraft, missiles and spacecraft. Its organization includes all major airframe, missile, spacecraft and engine producers and many major suppliers of aircraft, missile and electronic equipment.

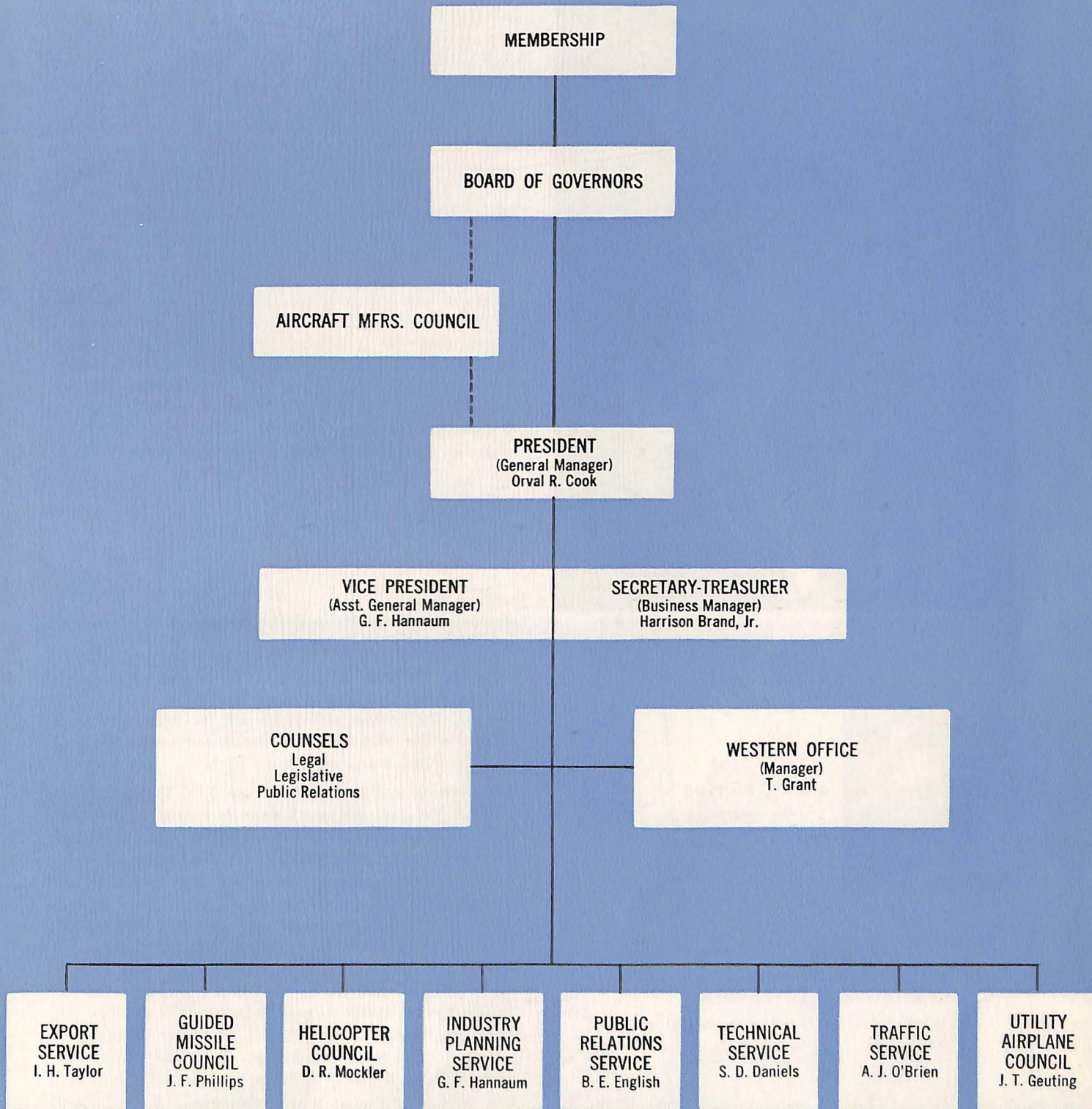
AIA is concerned with the industry-wide aspects of aerospace research, development and production. It represents the industry's viewpoints and interests to the Government, the Congress, the military services, allied and other industries and to the many segments of the public. It is cognizant of legislation and regulations that might affect the aerospace industry. It attempts to work out cooperatively among its members and with appropriate agencies and organizations the solutions to problems of common interest.

Policy direction of the Association's activities is vested in a Board of Governors which is composed of the chief executive officers of various member companies. Under this policy, AIA activities are carried on by committees and councils representing every phase of aircraft, propulsion systems, missiles, spacecraft and associated components and accessories production and their industry management. Each committee consists of high level company representatives especially qualified in the various fields of responsibility.

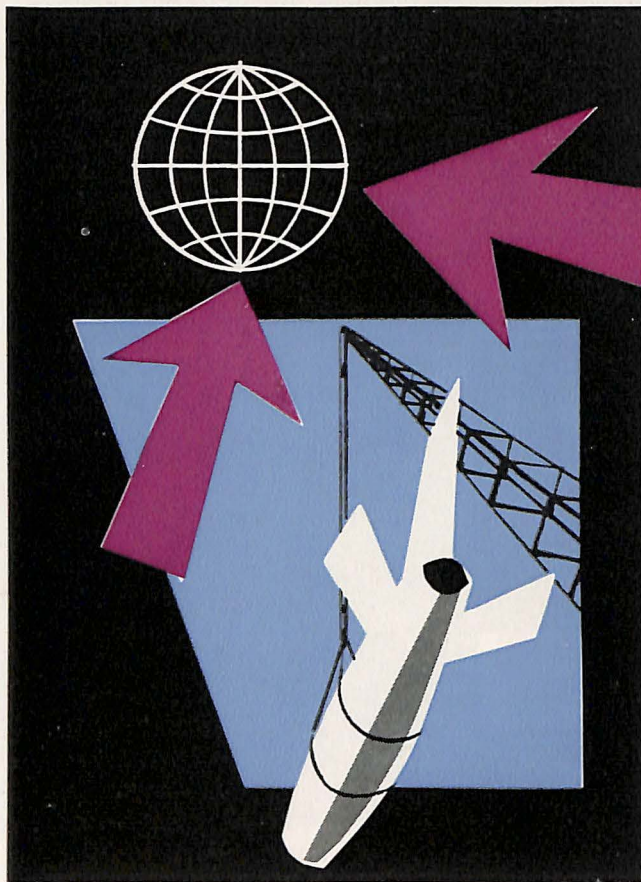
Through its eight Services and Councils, its 18 main Committees and various working committees, subcommittees and panels, the Association provides facilities for handling the multitude of technical, financial, legal, tax, public and industrial relations, patent, traffic, maintenance support and other problems. The helicopter and utility airplane and guided missile interests of the Association are banded under councils, each of which has staff service.

AIA is made up of 112 members, including 89 voting members and 23 affiliates.

Chief executive officer is the President, who also is General Manager. The Western Office and the eight services, including the Guided Missile Council, the Utility Airplane Council and the Helicopter Council, operate under direction of the President. The Secretary-treasurer acts as business manager and handles all membership, financial and security matters.



EXPORT SERVICE



ALEX T. BURTON

*North American
Aviation, Inc.
Chairman, Export
Committee*

EXPORT COMMITTEE

Export Advisory Committee
International Finance Committee
Military Program Support Committee
Trade Development Committee

Aerospace Exports and the National Economy

By a combination of fortunate circumstances—superior products, effective sales efforts, liberalized international financing and greater dollar availability abroad, increasing deliveries of jet transport and several other factors—U.S. aerospace industry's exports reached a new peacetime high.

Following a sharp decline from 1956 through 1959 of 27.4 per cent, aerospace exports soared in the first seven months of 1960 to a total of \$839.2 million, an increase of some 89 per cent over the same period of 1959. Conservative estimates are that aeronautical exports will climb to about \$1.4 billion by year-end 1960. Almost all aerospace categories contributed to this sharp advance through June. Jet transport deliveries were up over 300 per cent in units (11 to 46) and 1050 per cent in value (\$19.2 million to \$221.2 million), and utility aircraft advanced 79 per cent in units and 81 per cent in value. There are 68 turbine-powered transports (valued at about \$203 million) scheduled for overseas delivery next year and no indication of a decline in other categories.

Aviation exports, including the estimate for 1960, add up to \$17.5 billion since the start of World War II. Significant progress in this area is best illustrated

by the fact that, in 1929, foreign deliveries totaled \$9.1 million; by 1939, exports had reached \$117.8 million; in 1949, some \$283 million; in 1959, \$769.5 million; and the outlook for 1961 is for another \$1 billion-plus year. The contribution of our industry's exports to the national economy is clearly indicated by the fact that, in 1959, exports accounted for almost 7 per cent of the industry's total sales and, in 1960, they may exceed 12 per cent. Translated in terms of employment, this would maintain upwards of 100,000 employed annually throughout the United States. Further, export sales have contributed substantially to correction of the U.S. imbalance of international payments.

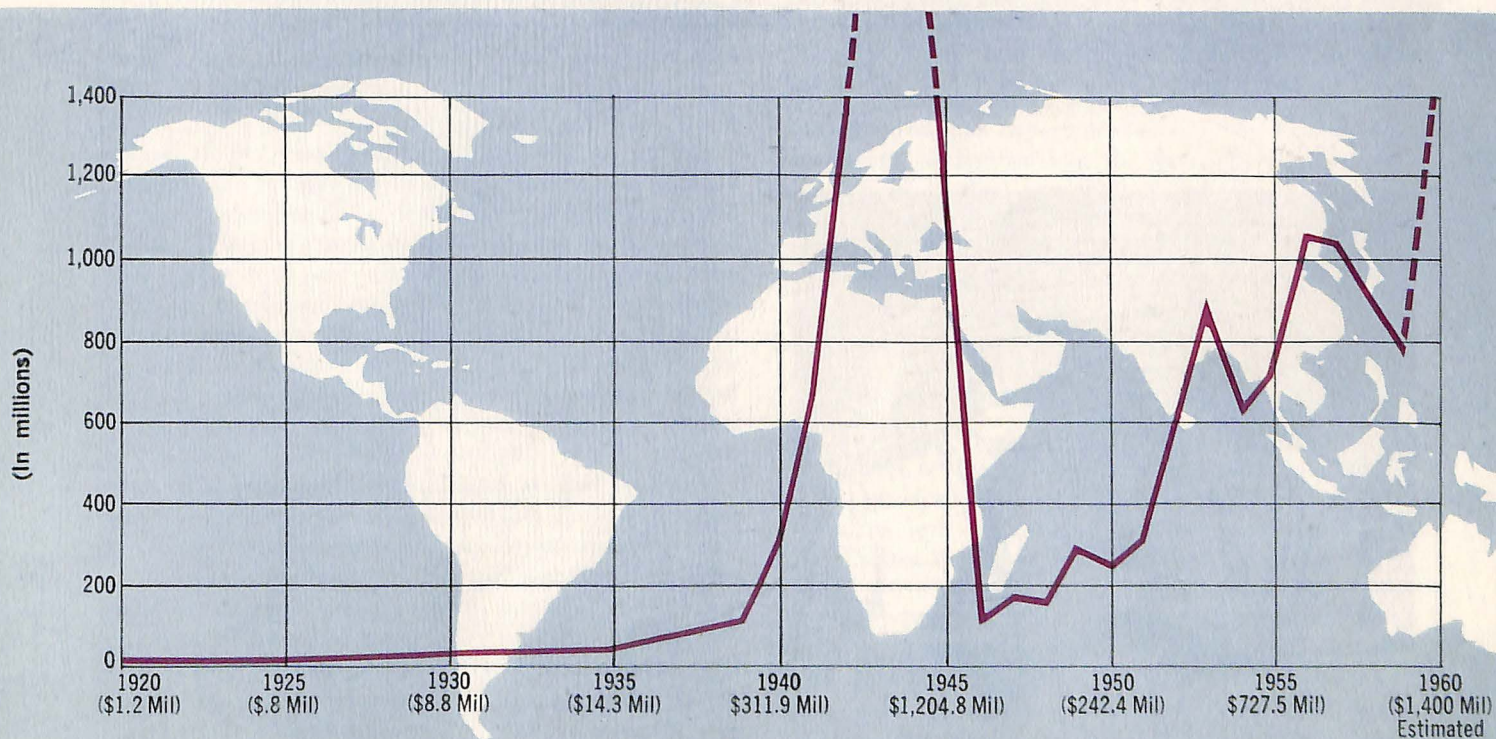
From the taxpayer-national defense angle, the high level of aeronautical exports substantially contributes, at no extra expense, to the posture of the country's leading defense industry. This comes about in many ways—the profits from exports are, in major part, plowed back into company investment in research and development projects; the use, on a rental basis, of Government-owned defense tooling for the production of civil counterparts of military aircraft further reduces the defense investment of public monies. One leading company reported a \$160-million-dollar saving to the taxpayer in develop-

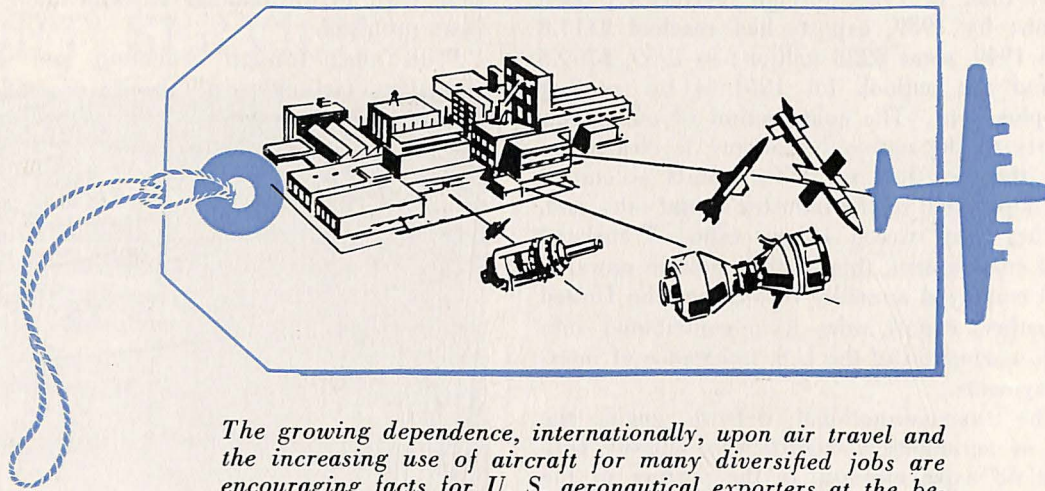
ment cost, in the manner described, on a single defense program.

With most foreign economic and governmental regulatory factors greatly improved and tending toward further improvement, the record of exports in 1960 should not be greatly diminished in 1961. These estimates of achievement, while based on the official record of "hardware" exports, do not take into consideration the industry's unrecorded "invisible" exports—foreign technical assistance contracts and returns from overseas manufacturing license agreements—which run into many additional millions of dollars.

Competition from foreign sources is noticeable. However, according to a recent U.S. Government survey, giving further credence to the expressed confidence in the continued strength of American aviation exports, 85 per cent of the transport aircraft in use throughout the world (excluding Russia) were of American manufacture—4,222 U.S. out of a total of 5,217. The study further pointed out that, of the 614 aircraft on order by commercial carriers (including Russian) as of January, 1960, only 12 (or 2 per cent) were of Soviet manufacture. Such figures as these irrefutably measure the preference which the world has for American aircraft.

UNITED STATES AVIATION EXPORTS





The growing dependence, internationally, upon air travel and the increasing use of aircraft for many diversified jobs are encouraging facts for U. S. aeronautical exporters at the beginning of this new decade.

Aerospace Industry Cooperatively Attacks Export Problems:

Thirty-five exporting manufacturing members, comprising the Export Committee, meet in symposium at least twice a year. Its five subordinate working committees, representing all AIA member companies with export interests, deal with noncompetitive export matters of broad interest. Through the Committee's efforts, accomplishments with respect to industry's unresolved export impediments are achieved largely through an educational process, principally with the Government agencies concerned making determinations if foreign governments are involved.

Many of these efforts are in the area of "foreign relations," including receptions and meetings sponsored by the Export Committee in honor of official

foreign military and civil aviation missions. During the past six years, the AIA Export Committee has sponsored receptions and meetings attended by some 2,700 persons from 61 countries. However, most of the Committee's work, and that of the Export Service staff personnel, is with the Departments of State, Commerce, Defense, the Military Services, Export-Import Bank, FAA, ICA, DLF, as well as commercial banks, insurance companies, AIA foreign counterpart aviation associations abroad, foreign attaches, foreign airlines, the World Bank and its subsidiaries. Now in its forty-first year of service, the export promotional capability of AIA has cumulatively attained a very broad scope.

Export Financing Liberalization:

A principal factor in overseas sales is the type of financing terms available.

During the last few years, the Export-Import Bank, backstopped in many cases by substantial commercial bank participation, has made a considerable contribution to the growth of the industry's civil aviation sales abroad through the liberalization of its terms and conditions of financing. The Bank, hampered by relatively few mandatory restraints in its legislative charter, is able to keep pace with competitive foreign financing terms and to maintain conformity with the international economic and political interests of the country.

The AIA International Finance Committee is continually presenting the industry's requirements in international financing to the Eximbank which gives sympathetic consideration to all reasonable proposals. If well founded, export financing assistance is usually forthcoming. Similarly, frequent, informal joint meetings, arranged by the Committee with Government and private international financing organizations, have served a productive purpose and have, on occasion, uncovered new sources of acceptable financing.



Surplus Transport Aircraft (Airline):

Most of the activity of the Trade Development Committee has been connected with the problem posed by the thousands of piston-engined transport aircraft being displaced in airline inventories by the new turbine-powered equipment. As world-wide traffic has registered a phenomenal growth during the past year, the surplus transport problem, as a result, has not and may not develop to an acute stage. The new jets are remarkably effective traffic generators. Hence, the earlier piston types, which are economically usable for passenger or cargo carriage, are being pressed back into service while others, which cannot "earn their keep" competitively, are gradually being permanently withdrawn from operation.

Export Licensing Problems Impede Exports:

The problems of export licensing under the regulations of the Departments of State and Commerce have become intensified during 1960. Hardware clearances, but more particularly unclassified technical data and manufacturing license agreements, are often too long delayed by paper work far in excess of security requirements and their attendant policing possibility. These retarding factors seriously impede even the earliest stages of negotiations with international customers and represent a real hazard to the conclusion of export sales. There are two distinct Government

philosophies and procedures (State and Commerce) dealing with export licensing and other controls. These must be unified, rationalized, clarified and simplified, as between State, Commerce and Department of Defense, if U. S. aviation exporters are to enjoy parity with their international competitors. The AIA Military Program Support Committee has continued to work toward their solution. The cooperative (Government-industry) revision to sections of the *International Traffic in Arms* in March, 1960, provided some small degree of relief to industry. However, a stronger and more consolidated industry position was adopted later in 1960 when these licensing problems were brought directly to higher echelons in the Department of Defense and other Government agencies directly or indirectly concerned with the control of aviation exports.

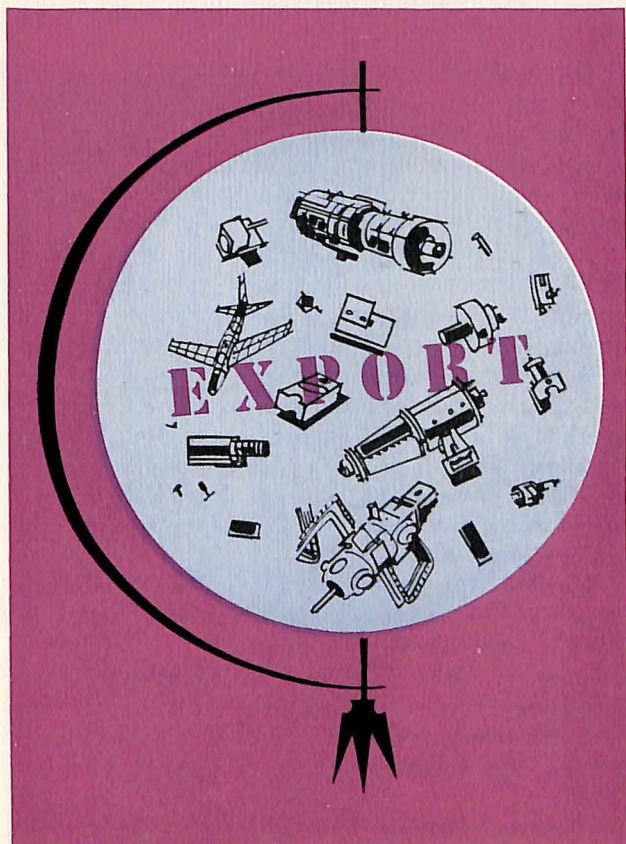
Export Trade Expansion Cooperation:

Serving the national interest in many phases, our industry has also supported and complemented the U. S. Government's greatly accelerated international trade expansion program. In furtherance of the Reciprocal Trade Agreements Program and in the interest of this large segment of American industry, AIA Export filed a tariff brief, supporting the position of the U.S. Government representatives in their negotiations in Geneva during 1960 under the GATT.

The AIA Export Service was the focal point for twenty-six member manufacturing companies who participated in the Aeronautical Export Promotion Conference (October 4) sponsored by the Secretary of Commerce. This national project, designed to improve and enhance the international trading position of the United States, afforded an exceptional opportunity for industry to forcefully bring before Government its principal export obstacles. The Commerce Department conference was the first official effort of this type to further aeronautical exports in such a comprehensive manner. AIA Export has, during the last several years, worked towards accomplishments of a truly effective aerospace industry-Government cooperative export expansion program which is now in full swing.

Government Export Promotion Assistance:

The fruition of AIA Export's work in appraising Government of the nature of the assistance required by the aerospace industry in furtherance of its foreign sales efforts took shape about two years ago. The U.S. Foreign Service (Department of State) has frequently been directed to give high priority to the industry's foreign trade promotional requirements. Similarly, FAA's overseas offices have been alerted. These and many other steps of a like nature have produced notable results which have contributed materially to the record export sales during 1960. This program is in many respects, being augmented.



GUIDED MISSILE COUNCIL



D. M. HELLER
*The Bendix Corporation
Chairman, Guided
Missile Council*

Development of missile weaponry has accelerated this country's reach into space. Through efforts in meeting the urgent challenge of long-range military missile requirements, the military-industry team has been able to greatly expand and enhance sciences and technologies fundamental to the space age.

While missile technologies have led us only to the brink of the space age, successes in the past twelve months in all categories of missile firings and space probes indicate graphically that our learning curve is sharpening. For example, approximately 70 per cent of the major missile programs in the Department of Defense are concerned with space flight. This is indicative of the extent to which the military services and other Government agencies depend on their industry partners to translate national requirements into national capabilities.

However, the importance of continuing efforts to improve missile weapon systems for operations within Earth's atmospheric envelope must not be ignored. Missiles of both ICBM and IRBM categories with greatly abbreviated reaction time and extended range, and lower-cost, solid-propellant missiles will begin coming into defense inventory in quantity after mid-1962.

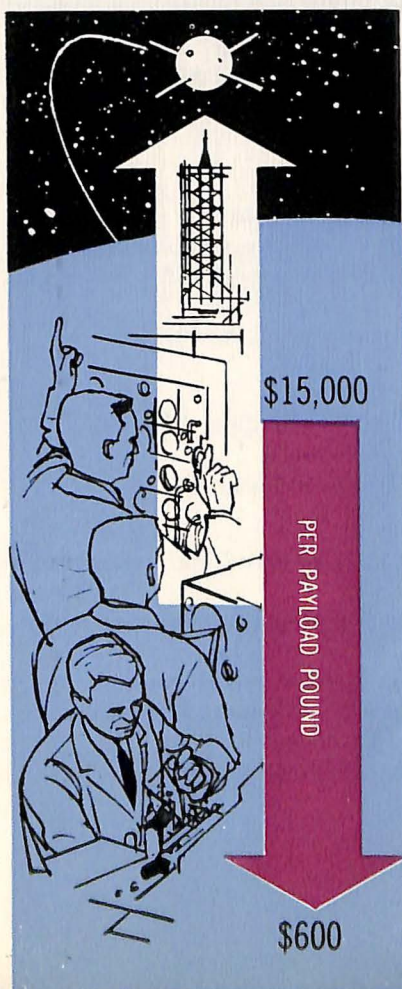
Due to industry's foundation in ballistic missile

technologies based on the military requirement, the Nation has made good progress toward realizing its initial objectives in space. We have demonstrated through the Discoverer program industry's exceptional ability in the exacting job of boosting educated satellites into precise orbits, of stabilizing and commanding these vehicles in orbit, of communicating with them, and of recovering capsules ejected from orbit.

So far, industry has barely scratched the surface of missile and rocket research. The mission of the military-industry team is to develop superior weapon systems, including military space systems.

If our missile weapon systems are to be fail-safe, and if this Nation is to put networks of productive mani-purpose satellites into orbits, industry must insure the uninterrupted operation of the complex electronic and mechanical equipment of these vehicles. Current experience with electronic gear in space indi-

Vehicle cost for placing a satellite into a 300-mile orbit today is about \$15,000 for each pound of payload. A vehicle now being developed can reduce this cost to \$600 per payload pound. A consistent, well-financed program of research and development is necessary to reduce the over-all costs of space exploration.



cates that industry must continually improve the reliability factor. The most pressing requirement in the missile area, therefore, is the enlargement of our reliability quotient.

During 1960, the Council held two national meetings at Government missile and space vehicle establishments—The Pacific Missile Range of the Navy Department at Pt. Mugu, California, and the Wallops Island Virginia Station of the National Aeronautics and Space Administration.

Increasing interest and stability in guided missile activities of the industry have become more evident during 1960. Many senior industry members have been active in the Council, which now includes—among its 31 members—two company presidents and nineteen company vice presidents. Increasing stability of the missile manufacturing industry is evidenced by the negligible variation in the number of companies with prime contracts and/or other missile activities who comprise the Guided Missile Council.

Reliability:

At the request of the Air Force Air Research and Development Command, the Guided Missile Council members, during 1960, reviewed the "Reliability in Missiles Program" prepared by the ARDC, and submitted their comments to the ARDC for incorporation in recommendations for its use. This project was an extension of previous GMC action in connection with the Reliability Monitoring Program of the Department of Defense.

Exchange of Information on Testing of Components:

Following up the efforts of the Guided Missile Committee, the Council offered its services to the Department of Defense in the establishment of a system for the exchange of guided missile component testing data being set up by the Army, Navy, and Air Force. The Council stressed the need of companies for expeditious availability of such data as would be distributed by the service centers.

Construction at Missile Bases:

In conjunction with other AIA activities, the Guided Missile Council considered the seriousness of the delays in the readiness dates of bases being built for the operation of ballistic missiles. In particular, it concerned itself with highlighting the difference in wages paid under the provisions of the Walsh-Healy Act, as one of the factors contributing to the construction delays.

Solid and Liquid Rockets:

The Council provided aid to the AIA Rocket Committee in developing ideas whereby improvements in rocket propulsion systems for guided missiles might be affected.



WILLIAM HUMMEL
*North American
 Aviation, Inc.
 Chairman, Government
 Reports Committee*



H. W. HAYNES
*Boeing Airplane
 Company
 Chairman, Procurement
 and Finance Committee*



MORGAN R. MOONEY
*United Aircraft
 Corporation
 Chairman, Industrial
 Relations Advisory
 Committee*



W. R. ROBERTSON
*Chance Vought
 Aircraft, Inc.
 Chairman, Patent
 Committee*



RUSSELL E. WHITE
*General Electric
 Company
 Chairman, Industrial
 Security Committee*



ROBERT NELSEN
*General Electric
 Company
 Chairman, Service
 Publications Committee*



F. J. MILLER
*Bell Helicopter
 Company
 Chairman, Spare Parts
 Committee*

GOVERNMENT REPORTS COMMITTEE

Electronic Data Processing
 Facilities and Properties
 Program Progress Reporting
 Aeronautical Manufacturers Planning Reports (AMPR)
 Records Management

INDUSTRIAL RELATIONS ADVISORY COMMITTEE

Safety
 Unemployment Insurance
 Wage and Salary

INDUSTRIAL SECURITY COMMITTEE

PROCUREMENT AND FINANCE COMMITTEE

Contract Cost Principles
 General Research Cost
 Procurement Legislation
 Patent Provisions of the Space Act
 Depreciation
 Settlement of Terminated Contracts
 Indemnification Against Nuclear & Other Unusually
 Hazardous Risks
 Technical Data and Proprietary Rights
 State Taxation on Government Owned Property
 Record Retention
 Duty Free Entry of Canadian Supplies
 Facilities Policy
 Foreign Licensing Rights

PATENT COMMITTEE

Technical Data and Proprietary Rights
 Procurement Regulations of the Space Administration
 Patent Policies of the Federal Aviation Agency
 Multiple Source of Supply

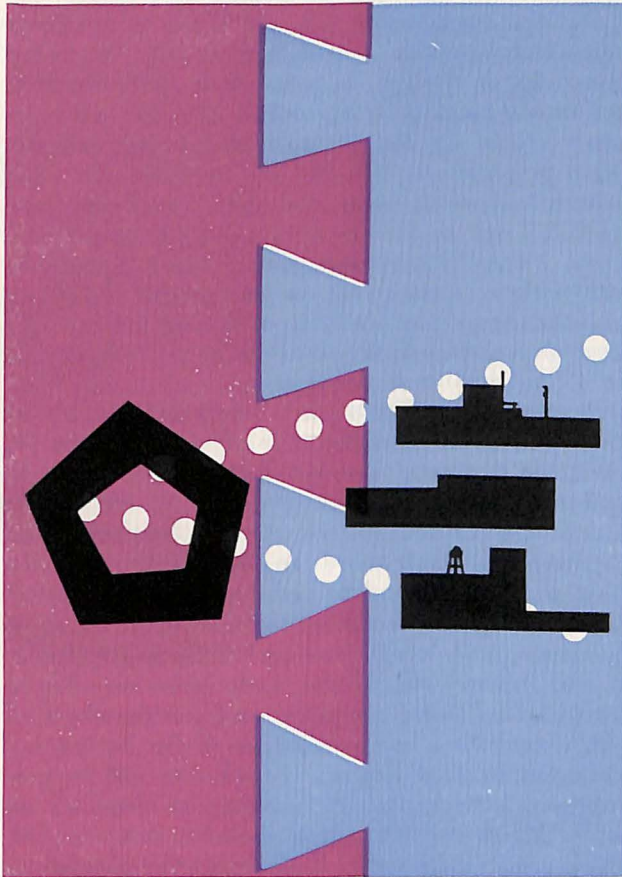
SERVICE PUBLICATIONS COMMITTEE

Maintenance of Missile Weapon Systems
 Illustrated Parts Breakdowns for Aeronautical Articles
 Vendor Handbook Data Procurement for Air Force and
 Navy
 Retroactive Changes Procedures of the Services
 Technical Manual Standardization
 Data Processing of Handbooks
 ATA Service Publications Specification ATA-100
 Simplification of Flight Handbooks
 Contractor Printing of Technical Manuals

SPARE PARTS COMMITTEE

Federal Cataloging and Prescreening Data Requirements
 Logistics Study Group
 Uniform Technical Documentation Provisioning Require-
 ments
 Spare Parts Provisioning Policies and Documents
 Ground Support Equipment Provisioning Documents
 Replacement Parts Sales Problems
 Parts Breakdowns for Aeronautical Articles

INDUSTRY PLANNING SERVICE



The Industry Planning Service deals with important problems affecting the business and administrative operations of the aerospace industry. It maintains close liaison with the military services, National Aeronautics and Space Administration, and other governmental agencies in connection with the multitude of laws, regulations, directives and specifications which affect the business activities of the industry. The work of this Service is done by the following committees.

Procurement and Finance Committee:

This Committee is charged with the responsibility for activities of the Association pertaining to financial, tax, contractual, accounting and general procurement problems of the industry. Only one meeting of the main committee is held each year, but many projects within its sphere of interest are activated, explored and acted upon through a number of small task groups created for the purpose of handling particular problems.

Procurement Legislation: Several bills introduced in the 86th Congress pertained to the policies and procedures of the Department of Defense and the military services in the procurement area. Consolidated opinions of the industry on this subject were

made known to the Department of Defense and to the Congress through the efforts of a task group established for this purpose. Although no legislation in this area was enacted during the 86th Congress, it is expected that several bills will be introduced when the 87th Congress convenes in January. The views of this Association will again be made known with respect to such measures or others which might be introduced in the 87th Congress.

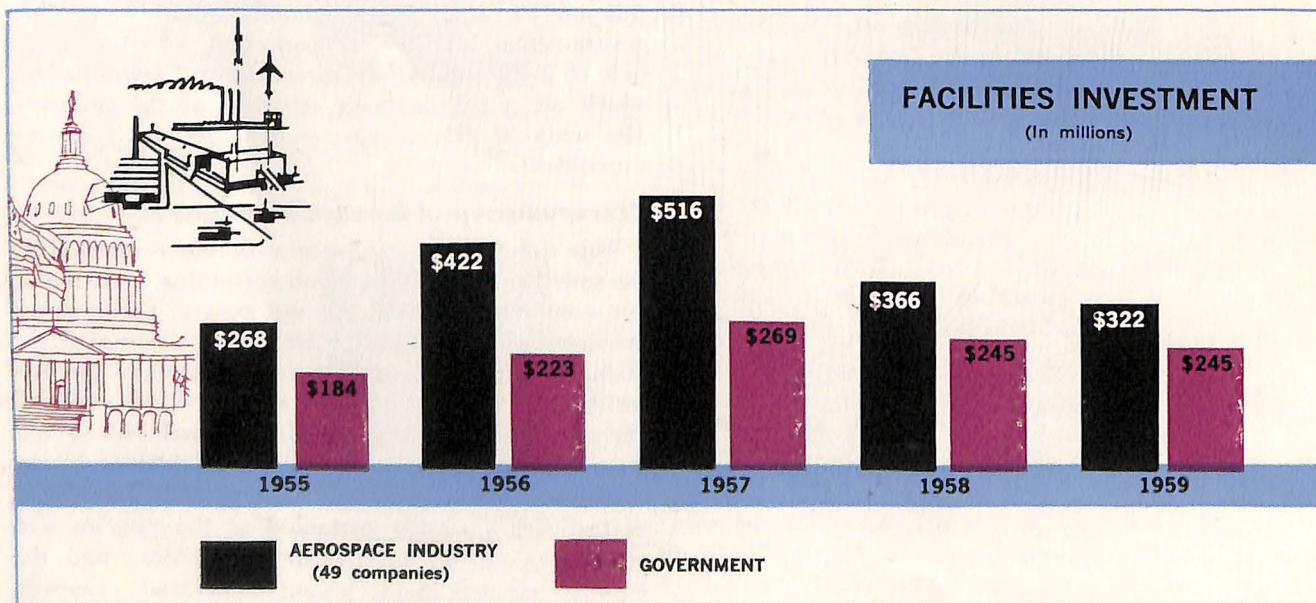
Indemnification Against Unusually Hazardous Risks: One of the most important problems with which the member companies of this Association are concerned pertains to the risks involved in the performance of many of its major defense contracts. Because of the multitude, and extra hazardous nature of these projects, adequate insurance coverage generally is not available. As a result, contractors are constantly forced to place all their assets in jeopardy, and their very existence is endangered should there be a catastrophe resulting in property damage or personal injury to third parties traceable to performance of a Government contract.

Although this Association has cooperated with the Department of Defense and interested industry groups—including the insurance industry—in the preparation of suitable legislation for indemnifying defense contractors against losses or damages sustained in hazardous operation, the 86th Congress adjourned without providing adequate protection in this area. It is expected, however, that when the 87th Congress convenes, the DOD will again urge the enactment of suitable legislation on this subject.

Similar legislation is needed in order that the National Aeronautics and Space Administration may

indemnify its contractors against such losses and damages. A bill, similar to that sponsored by the Department of Defense, was pending in the 86th Congress. In addition, as a part of the omnibus Space Act amendments bill, there was a provision which would provide indemnification authority to the Space Administration in connection with research and development contracts only. The over-all legislation sought by the separate NASA bill and the DOD proposal on this subject provides for such indemnification in connection with production contracts, as well as for research and development contracts. The Procurement and Finance Committee will continue to work with the Department of Defense and the Space Administration in connection with these proposals. Early enactment of both during the 87th Congress is anticipated.

Renegotiation: When the Renegotiation Act of 1951 was again extended, this time until June 30, 1962, the Congress authorized investigations to be made of the procurement processes by the Senate and House Committees on Armed Services. The Congress also authorized an investigation of the practices, policies, and procedures of the Renegotiation Board to be made by the Congressional Joint Committee on Internal Revenue Taxation. The studies by the Senate and House Committees on Armed Services have been completed and the reports filed with Congress. The investigation of the Joint Committee on Internal Revenue Taxation is still in progress, with its report expected to be filed on or before March 31, 1961. It is expected that the AIA Procurement and Finance Committee will make known to this congressional committee the views of this Asso-



ciation with respect to improvements in the policies, practices, and procedures of the Renegotiation Board.

Depreciation: An important subject of concern to the member companies of the aerospace industry is the depreciation policy of the Government for tax purposes and for contract pricing purposes. During each of the last two national emergencies, provisions have been made in the tax law for accelerated amortization of defense facilities certified as necessary for the furtherance of the defense program. Statutory authority with respect to such certification expired on December 31, 1959.

Although the Internal Revenue Code of 1954 liberalized to some extent the methods of computing depreciation deduction for tax purposes and these have now been accepted for contract cost purposes, such new methods are really only a first step in the direction of a realistic depreciation policy.

Most of the plants and facilities built or acquired only a few years ago are no longer adequate for modern aerospace production. In this industry, obsolescence is a major factor. Accordingly, efforts will continue to be made by this Association to establish for tax and contract pricing purposes a depreciation policy providing for the recovery of costs of facilities used in defense work at a much faster rate than is currently permitted. Such a policy will inevitably result in more modern facilities in defense, as well as in other industries. It would also reduce the need for the Government to supply such facilities or to enact emergency legislation as was done with respect to World War II and the Korean War.

Facilities: Depreciation policies, at least those applied to the aerospace industry, have been inadequate as an incentive for defense contractors to provide their own facilities. As a result, it has been necessary for the Government to fill the gap. Nevertheless, the member companies of this Association have plowed back approximately 70% of all earnings in order to provide the necessary facilities for the performance of defense contracts. Until the depreciation policies of the Government are made more liberal, there will still be a necessity for the Government to provide certain facilities for use in the performance of defense contracts. Because of the lack of an equitable depreciation policy and the low earnings as a percentage of sales in this industry, it has not only used a good portion of its prior earnings for facilities purposes, but has also been forced to borrow in financial markets to the extent of its ability. Accordingly, the Procurement and Finance Committee will continue to urge that, to the extent its members are unable to provide needed facilities, such facilities must be provided by the Government.

Contract Cost Principles: After approximately ten years of effort on the part of the Department of Defense, a complete revision of Section XV of the Armed Services Procurement Regulation was issued

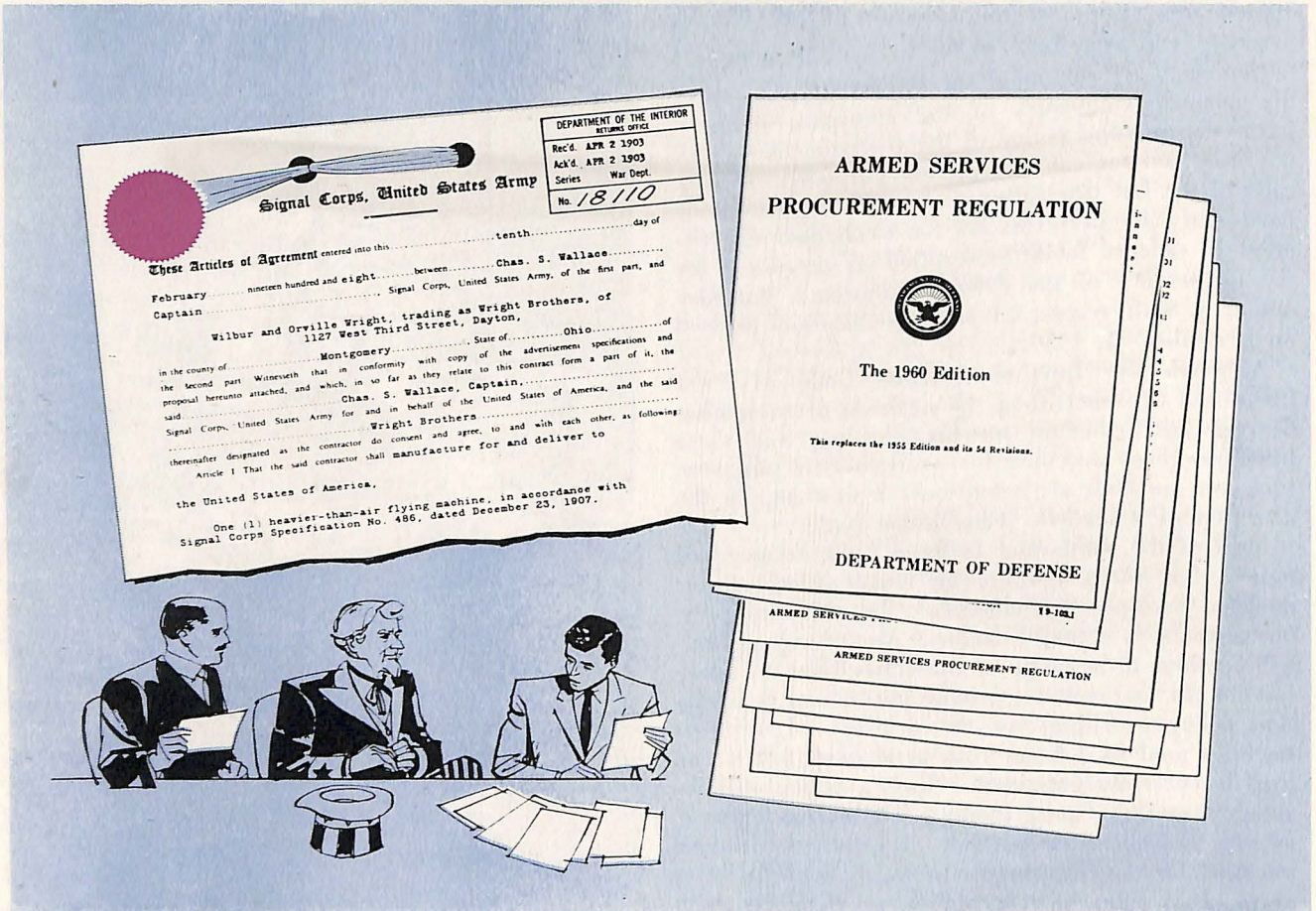


The Congress is examining Government contracting principles involving proprietary rights with the view of improving the system to a more equitable basis.

on November 2, 1959. As revised, these contract cost principles are applicable to all types of contracts, not only in the negotiation thereof, but in the settlement of any contract terminated for the convenience of the Government.

A task group of the Procurement and Finance Committee will continue in existence for the purpose of reviewing the effect of this new comprehensive set of cost principles and, at an appropriate time, make recommendations to the Department of Defense on any changes that may be considered necessary.

Although these cost principles set the standards for allowance and disallowance of costs incurred in the performance of defense contracts, there is one particular item of cost which deserves special mention. This is the extent to which a company-initiated, defense-related research and development expense will be allowed through overhead as a cost on Government contracts. The rapid strides that have been made in the development of missile systems and space probes and the necessity for continued and accelerated



The technique of doing business today is far more complex than in the days of the Wright Brothers' first aircraft contract. Today's weapons have a myriad of sub-systems, components, accessories, etc. But the concept should remain the same.

scientific advances, requires that industry place a greater emphasis upon research.

In recognition of this necessity, the recently-issued contract cost principles of the DOD make special provision for the allowability of reasonable expenditures for research and development. There has been some dissatisfaction with respect to the treatment of this item as an expense in the performance of Government contracts. However, it is hoped, as more experience is gained with a fuller recognition on the part of the military services as to the increasing need for research, that more equitable treatment will be afforded to this item. The Procurement and Finance Committee is keeping this matter under close surveillance.

Settlement of Terminated Contracts: Firm, fast, and fair settlements of contracts which are terminated for the convenience of the Government are important to this industry. This is true especially when a large project is cancelled affecting large segments of this industry. The Procurement and Finance Committee

has continued its surveillance of the policies and procedures of the Department of Defense and the military services in this area. Although certain problems still remain unsolved and practices and procedures need improvement, a close working relationship between the DOD and industry exists, with efforts being made by both to resolve the issues involved and to improve settlement procedures.

Contract Finance Problems: As a result of a change in Department of Defense policy concerning reimbursement of costs incurred under cost reimbursement type contracts, it has been necessary for AIA member companies to go to the financial market in order to partially finance the performance of such contracts. In certain instances, contractors have been allowed an additional profit to cover the cost of obtaining outside financing, but this policy has been severely criticized by the General Accounting Office and certain members of the Congress. Although a return to the former policy of 100% reimbursement of costs as incurred is preferable to this industry, resis-

tance exists on the part of one of the military services. The Procurement and Finance Committee will continue to seek a return to such policy.

Patent Committee:

Proprietary Rights in Technical Data: Member companies of the AIA continue to experience considerable difficulty with respect to the regulations pertaining to the furnishing of proprietary data to the military services. Because of this, an effort has been made to have the Department of Defense adopt certain changes to Part 2 of Section IX of the Armed Services Procurement Regulation, which contains the rules for the furnishing of information with respect to the manufacture, servicing, and operation of defense items.

In cooperation with the AIA Procurement and Finance Committee, the Patent Committee collected and organized considerable data delineating industry's experience under the existing regulation. This material has been used in making presentations to the Department of Defense as a basis for qualifying the need to modify the provisions of the regulation. Indications are that, in the near future, the DOD will release a draft of a proposed revision of Part 2 of ASPR Section IX to industry for review. Soon thereafter, it is anticipated that a more equitable version of the regulation will be issued.

Patent Policies: Working together, the Patent Committee and the Procurement and Finance Committee have sought the adoption of amendments to the patent provisions of the National Aeronautics and Space Act. The provisions of that Act require that, unless the NASA Administrator grants a waiver, title to all inventions made or first reduced to practice in connection with a contract or a proposed contract with NASA shall be vested in the Government.

During the second session of the 86th Congress, after lengthy and instructive hearings on the part of the House Committee on Science & Astronautics, the House of Representatives approved a bill which would substantially improve the patent rights of contractors dealing with the National Aeronautics and Space Administration. While the measure did not pass the Senate during the 86th Congress, it is expected that it will again be introduced when the 87th Congress convenes. Prompt enactment will be sought by this Association. It should be noted, however, that, although the amendments to the patent policies of NASA contained in the proposal are not completely satisfactory to this industry, the measure will be supported by this industry.

Following the House Committee on Science and Astronautics hearings with respect to the patent provisions in the Space Act and a report calling for a more equitable policy, several bills—even more restrictive in nature—were introduced. Although none of these bills was enacted by the 86th Congress,

it is expected that there will be a major effort during the 87th Congress to enact a Federal patent policy for application uniformly throughout the Government services. It is the consensus of industry that the patent policies thus far proposed for enactment are considered to be inimical, not only to inventors and contractors with the Government, but also to the economy as a whole. The Patent Committee, in conjunction with the Procurement and Finance Committee, will continue to resist the enactment of restrictive legislation in this area.

Government Reports Committee:

The Government Reports Committee represents AIA in negotiations with all Government agencies on the simplification, standardization, or elimination of Government reporting requirements proposed and in existence. National meetings are held twice a year with representatives of the Bureau of the Budget, all levels of the Department of Defense, and other Federal agencies to develop working relationships to provide Government comprehensive reports and procedures at minimum cost both to industry and Government.

Subcommittees, composed of industry experts, are established as required to prepare industry views regarding proposed reporting forms that are not considered to develop the required information, or where significant economies, through simplification, could be realized. Economies in paper work procedures are achieved through cooperation with the military services in the drafting of new reporting requirements, or in revisions to existing data systems.

The Government Reports Committee efforts during the past three years culminated in 1960 with the publication of "Register of Industrial Reporting Requirements" by the Air Materiel Command. This document, unique among the military services, lists every report which may be required of contractors to any element of the Air Materiel Command. The Association has contributed to this effort by making available a cross-index and finding guide. In a number of instances, companies have succeeded in eliminating the imposition of reporting requirements by demonstrating to the requesting office that the proposed report is not listed in the register.

The Government Reports Committee is actively cooperating with other commands in the Air Force, and with the Army and Navy, toward the establishment of similar registers.

The U.S. House of Representatives Subcommittee on Census and Government Statistics, upon request, was supplied with an analysis of the extent of military reporting requirements. This analysis led to a congressional recommendation that more attention be given to attendant costs to companies of reporting procedures before new and additional requirements are imposed. The Government Reports Committee,

in collaboration with similar committees in other industries, is working with the military services for adoption of this congressional recommendation within executive agencies.

The Committee has continued its developmental activity in the area of measuring program progress. During the year, a joint ARDC-AMC Program Progress reporting manual was issued reflecting many of the Committee's recommendations for improving, at lower cost, information needed by these commands.

Statistics on the volume of production of aerospace products and consolidated corporate financial summaries are available through the Government Reports Committee. The Committee and staff are looked to by the various Government agencies for authoritative statistics on developments in the industry. Corporate analysts and investment houses are regularly provided statistical information. Staff suggestions to Government agencies make considerable contributions toward maintaining the accuracy of census and other Government statistical series in behalf of our industry.

Maintenance Support:

Activities in the areas of spare parts, service publications, field service, aerospace support equipment, contract maintenance, training aids and training equipment, because of their co-relationship, are grouped together under Maintenance Support in Industry Planning Service.

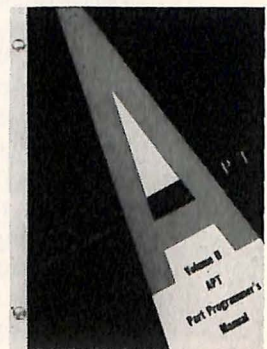
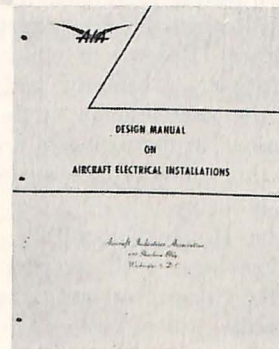
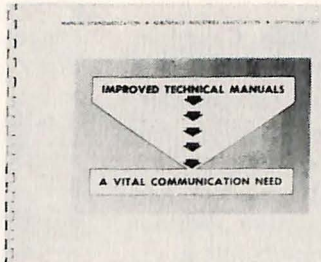
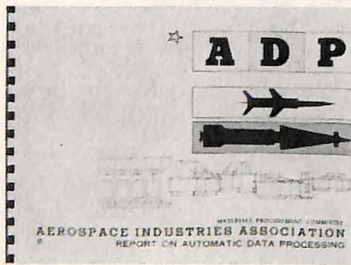
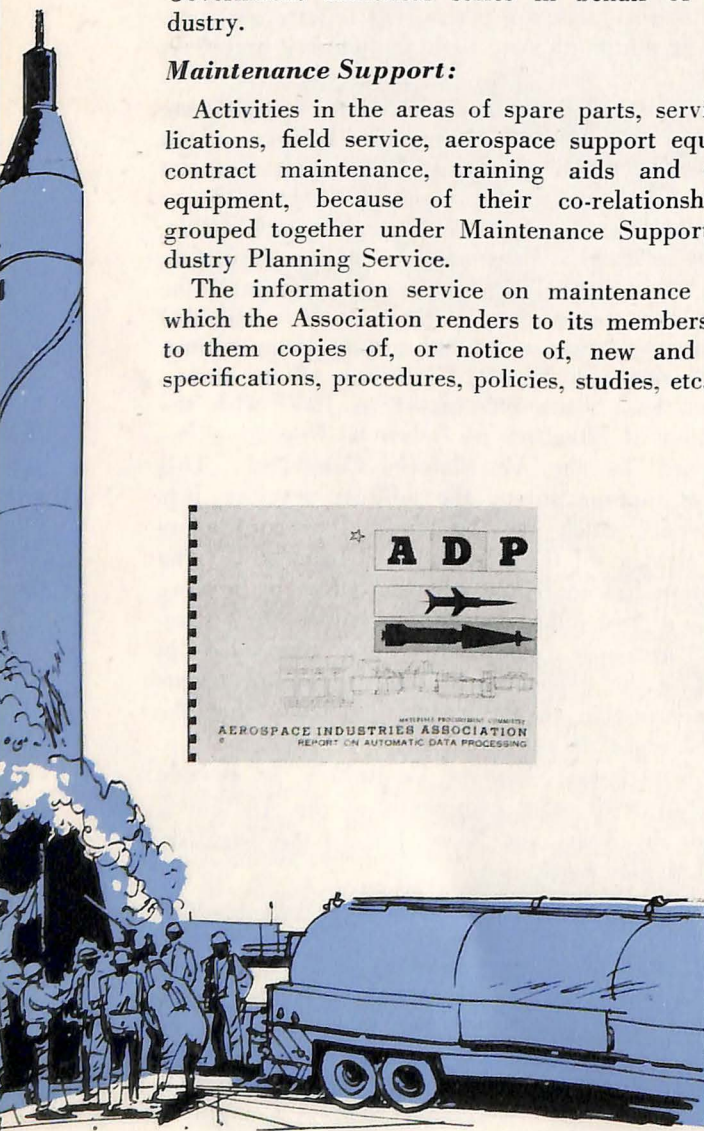
The information service on maintenance support which the Association renders to its members brings to them copies of, or notice of, new and revised specifications, procedures, policies, studies, etc., which

affect the Government/industry relationship. Committee members report that this reporting service is most important to them, for it often precedes by months the availability of the same information through complex channels of Government.

It is particularly gratifying to report that AIA's recommendation for solution of an Air Force problem on support equipment was adopted, and that the DOD plans to extend the project to all military services. The problem was to eliminate the procurement of new designs of support equipment which duplicate equipment already in the Air Force inventory. Aerospace industry experts considered existing supply-type documents inadequate for the purpose, and urged the establishment of a catalog whereby existing equipment could be used for multiple purposes and not be subject to duplication. This year, The Technical Information File (MIL-HDBK-300-USAF) is now in use throughout industry and the Air Force.

Service Publications Committee:

Technical manuals are the main line of communication between the equipment manufacturer, the Government and airline personnel who are responsible for operation, test, launch, maintenance and overhaul of the equipment produced by this industry. The volume of technical manuals of the military services has increased four-fold in the last ten years, primarily because of the increased complexity of missiles and related equipment. The cost of manuals produced for the military runs to hundreds of millions of dollars annually. AIA's committee of ninety service publications managers deals constantly with the handbook people of all the military services, the NASA and the



ATA. Testimony to the invaluable advice and work performed by this group is noted by a Government spokesman who recently described this AIA Committee as the greatest group of specialists in technical publications in the world.

Committee action brings about economies and handbook improvements in the following ways:

1. Through the coordinated review of proposed specifications and revisions received from the Government and ATA resulting in more workable procedures, elimination of causes of delay and expense, and lessening of contractor/customer contractual negotiations on waivers.
2. Through the initiation of Committee study projects and the resulting recommendations to industry and to the military services.
3. Through the interchange of information in Committee-sponsored Government/industry meetings, and information supplied on developments in equipment and the graphic arts employed in publication preparation. Some examples are:

Cost Cutting Techniques: Ever since its establishment, Committee meetings have been programmed for presentation by members on cost cutting techniques developed by the members. These techniques range from short cuts in the graphic arts, to cost saving use of portable tape recorders and photographic equipment, to specialized subjects such as evaluation of technical writers in the hiring process. Films and presentations describing new machines and equipment are also programmed.

Contractor Printing of Technical Manuals: The Committee is on record, with the military services and other cognizant Government representatives, request-

ing that the printing of technical manuals be accomplished through the contractors. Costly delays are often encountered when the contractor does not have the responsibility for manual printing. Deadline dates cannot be met, unreasonable cut-off dates must be established, or contractors must support the operation by providing interim copies.

Technical Manual Standardization: As urged by the Committee, and in which it is participating, the Department of Defense has inaugurated a manual standardization project. The project undoubtedly will reduce the number of technical manual specifications and requirements. Such standardization of military services' requirements will inevitably result in substantial dollar savings and earlier availability of manuals.

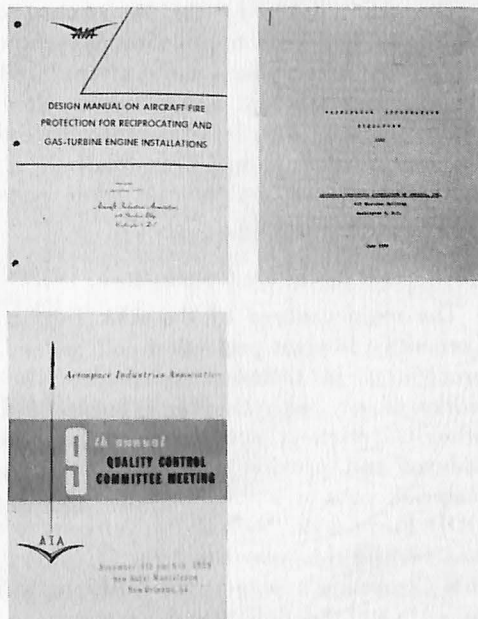
Guide for Procurement of Vendor Handbook Data: The Committee has recognized that one of its most vexing problems involves the procurement of vendor handbook data. The Committee's first suggested improvements were helpful to Government and contractors in setting up better timing, procedures and the establishment of specific requirements. Now the Committee has announced the issuance of its "Proposed Guide for the Preparation of a Procurement Document to Obtain Vendor Handbook Data." This guide should be helpful to the military in consolidating the procurement package delineating requirements for handbook data, or formal handbooks to obtain proposals or for fulfilling contract requirements.

Spare Parts Committee:

The Spare Parts Committee is concerned with the policies, procedures and practices for the selection and ordering of spare parts, special tooling, test and aerospace support equipment, training aids and training equipment. Its membership includes 125 spare parts managerial personnel in all segments of the industry. Through continual reviews and recommendations relating to proposed regulations, the Committee efforts are directed toward improving military requirements prior to official release. Due to this coordination, many causes for delays can be eliminated. As a result, improved logistics support operations and cost savings accrue to both industry and Government.

Provisioning Procedures: The Committee regularly participates with the military services in the revision of their procedures for selecting and ordering spare parts and aerospace support equipment. During the past year, it worked with the Air Force in simplifying data requirements necessary for the development and production of aerospace support equipment and systems. These requirements will place management of aerospace support equipment on the same level of rapid reaction time as is now maintained for the weapons themselves.

It also worked with the Bureau of Naval Weapons,



submitting recommendations used in establishing simplified support documents applicable to both aeronautical and ordnance requirements. This consolidation of procedures is expected to result in substantial savings to both the industry and the Navy.

An official policy, designing Air Force-industry channels for coordinating ballistic missile support documentation, was recently issued in response to a Committee recommendation citing the lack of standardization in instructions and the growth of conflicting contractual requirements.

DOD Uniform Provisioning Format Regulations: The Department of Defense invited Committee participation and is utilizing its recommendations in revising instructions for uniform provisioning documentation format. In addition, Committee members are currently canvassing the industry to determine the extent of the rapid growth of provisioning data requirements beyond the scope of the current DOD uniform instructions, particularly in the ballistic missile provisioning areas. After its evaluation, the survey will be referred to the Department of Defense for remedial action.

The prime contractor in a re-entry vehicle program for the U. S. Air Force last year placed 35,000 purchase orders with other firms totalling more than \$26,000,000, the major portion of contract dollars received by the prime contractor. Of the 35,000 orders, more than 25,000 went to small business firms and more than half the \$26,000,000 total was paid to them. The aerospace industry is utilizing all of the skills and talents available in the U. S. industrial complex to speed its aircraft, missile and space projects.



Military/industry Logistics Study Group: In August, the Department of Defense released a document entitled "Glossary of Terms and Data Configurations for Logistics Data Processing." This represents a joint effort of the AIA group to develop a standard logistics language for data interchange between contractors and their military customers utilizing electronic data processing in lieu of reports, lists and other paper work.

Industrial Relations Advisory Committee:

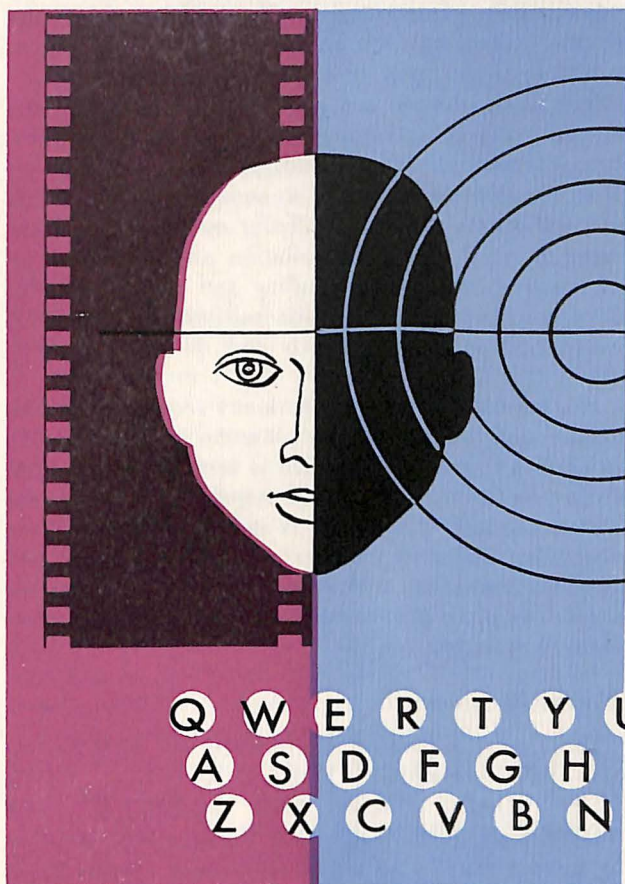
The exchange of non-competitive information by members of our Industrial Relations Committee on manpower and industrial relations problems has proved to be of immense value. For example, it is impossible to put any dollar evaluation on Committee-developed programs such as the reduction of the cost of absenteeism; the reduction of accidents and their costs; and the reduction in the cost of turnover at all levels. Nor can the Association properly define the value to individual members of the surveys made by AIA staff on fringe benefits covering industry practices on such items as vacations; sick leave; company-paid holidays; overtime; shift differentials; paid rest periods; paid lunch periods; odd workweek bonuses and premiums; report time; call-in time; injury time; wash-up and other non-worked time; wage incentive, etc., and miscellaneous bonus programs; flight pay bonus; pay for absences from work for miscellaneous reasons; pay for absences from work for union business; supplemental unemployment benefits and severance or separation pay; other miscellaneous benefits; smoking privileges; unemployment insurance rates; workmen's compensation costs; and, wage plans.

The action taken by the Department of Labor in December last year to indefinitely postpone a minimum wage proceeding for the aircraft industry under the Walsh-Healey Act is a direct result of this Committee's efforts. It is conservatively estimated that if these proceedings had been finalized, it would have increased aircraft and missile labor costs from \$50-\$100 million annually.

Industrial Security Committee:

The main concern of the AIA Industrial Security Committee is plant protection policies and operational procedures in the security field. The Committee works closely with the Department of Defense and other Government agencies to improve security procedures and provide better protection for classified material. As a result of this Committee's efforts, DOD Form 254 "Security Requirements Check List" was revised this year and now incorporates many of this Committee's suggestions. Although it is difficult to estimate the dollar and cents saving which will result from the use of this revised form, we believe that the cost savings will be substantial.

PUBLIC RELATIONS SERVICE



KEN ELLINGTON
*Republic Aviation
Corporation
Chairman, Public
Relations Advisory
Committee*

PUBLIC RELATIONS ADVISORY COMMITTEE

Executive Committee
Editorial Subcommittee
Aviation Education Subcommittee
Shows and Exhibits Subcommittee
Noise Abatement Subcommittee

The Public Relations program has encompassed an especially broad front. Increasingly, our industry's manufacturing and research activities have been subject to close congressional scrutiny. As a result, the Public Relations Advisory Committee, through AIA staff has been involved in the delineation of industry viewpoint on legislative matters and there have been unusually heavy demands for information due to the increasing pace of scientific and technological change in the industry.

In addition to providing the communications channel for presenting industry's views to the public, increasing emphasis has been devoted to providing the membership with developments—especially those originating in Congress and in the Department of Defense—that affect the management and conduct of the industry's affairs. In this connection, sixty memoranda have been prepared and distributed dealing with legislative and budgetary matters alone.

With considerable emphasis being placed by the Association on the world export markets, efforts have been made through various AIA publications to emphasize the fact that American aviation equipment still dominates the airlines of the world. Liaison with the foreign press, both public and trade, has increased.

Assistance has been accorded the utility aircraft segment of the industry in the development of their burgeoning markets for business and executive flying, in the corollary needs for airports, and improved air traffic control systems and communications. Similarly, public relations assistance was given the helicopter segment of our industry in its aim to obtain review and revision of antiquated state and local laws which take no cognizance of helicopter capabilities, and which seriously affect commercial operation to the detriment of public interest and need for these vehicles.

The major emphasis of the Public Relations program during the year has been in delineation of the changing nature of the industry, the changing nature of its products, and the increasing cost of aerospace research, development and manufacture. Because of the complex nature of these problems, there is little general public interest. As a consequence, Public Relations efforts primarily have been directed toward specific audiences to increase their understanding of these difficult areas.

During the year, AIA Public Relations operations have taken full advantage of cooperation with other organizations in advancement of common aims. Staff has worked closely with the Air Transport Association and the Air Line Pilots Association in the establishment of the National Aircraft Noise Abatement Council. NANAC aims are to foster a better understanding of noise associated with commercial aircraft operations, and to act as a coordinating agency for industry efforts in the area of aerospace noise reduction programs.

The staff and the Public Relations Advisory Committee have also worked closely with the National Aviation Education Council in all elements of the Materials of Instruction Program, with the aim of increasing general student and teacher awareness of the role of the aerospace industry and its contribution to both U. S. and world economy and cultural progress.

The Shows and Exhibits subcommittee has been particularly busy this past year in the dissemination of information concerning proposed air shows and exhibits, both local and national in scope, planned for 1961 and subsequent years.

Staff has worked closely with the public relations and information staffs of the military services and other Government agencies. Aid has been extended in helping their programs in consonance with that of this Association.

Information:

General information requests received by Public Relations Service continued to increase during the first ten months of 1960. Approximately 12,000 requests were processed during the reporting period, representing an increase of about ten per cent over 1959.

These requests were made from among primary and secondary student levels, teachers, librarians, economists and writers. In addition, there has been a gen-

eral upsurge in requests for bulk quantities of aviation education aids for aviation workshops, colleges with summer sessions, aviation clubs and various youth organizations. Our office of Research Analysis has become increasingly an external information source, as well as performing an internal use function.

Staff has gathered, analysed and disseminated data on many aspects of aviation to member companies, press, investment analysts and graduate students. Because the Defense Budget is so complex, and its detail data difficult to obtain, particular emphasis has been placed by staff on the compilation and extracting of information on Defense spending and contracting, the procurement programs of the military services and the over-all military research and development program.

This service grew out of the many requests from the market analysts, long-range planners and economists for certain types of data which is useful to them. Our Market Research information request list has grown 20% in the last six months. A survey is under way to obtain the names of member company personnel engaged in marketing analyses and long-range planning in order to place proper emphasis on AIA's marketing research services.

Motion Pictures:

The four low-cost films produced by AIA during 1956-1957—"DESIGN FOR SURVIVAL," "THE HIGH ROAD," "MEN AND MISSILES," and "POWER IN THE AIR," used by television stations throughout the Nation's fifty states and Puerto Rico, and eminently successful among the Nation's schools and colleges—were withdrawn from distribution, July 1, 1960.

Out of the 298 television market areas, these films were used in 253. As of July 1, 1960, total reported showings by 261 television stations reached 834 and an estimated audience upwards of 68 million. How many stations used the four films without reporting cannot be estimated.

In addition, since these films were offered to schools beginning two years ago, there have been 1,316 showings prior to July 1. This represents as many showings as the available supply of prints would allow. These films have been shown and highly praised by a number of technical colleges and universities, military organizations, technical societies, and service organizations such as The American Legion.

Speeches:

During 1960, the President of AIA and various executives of the staff have made several addresses of national interest as well as numerous reports before private groups and Government agencies. Among them were such topics as: Government-industry roles and responsibilities, status of the aerospace industry, de-

fense spending and the outlook for industry, and the industry and education.

Background Memoranda:

During the past year, staff has issued numerous background memoranda covering virtually all aspects of the problems confronting the industry as well as detailed analysis of such subjects as: selected excerpts from congressional hearings, the Year-End Statement of the aerospace industry, aviation aspects of the Federal budget, etc.

Publicity:

During the ten-month reporting period beginning November 1959, Public Relations Service has issued 54 news releases and an additional 14 releases tailored for radio and television newscast. Circulated among some 2,100 writers and editors in the fields of aviation and finance is *Letter to Aviation Writers*. This publication, issued monthly, finds very wide acceptance among various media writers, and features reports on industry employment, wages, aircraft deliveries, defense and missile programs and civil export activity.

In January, 1959, *Aerospace* became the official name of the publication which for the past 15 years was known as *Planes*. Circulation today is approximately 50,000. The basic circulation list remains about the same, with copies going to members of Congress, editorial writers of some 600 newspapers, and selected financial management and labor groups, approximately 10,000 libraries, as well as other selected segments of the public and of Government.

The magazine-type inserts, comprising the center four pages of *Aerospace* are effective in dealing with complicated subjects for our primary audiences, as well as stimulating press response. Articles during the year have been aimed at explaining industry's position on a wide variety of subjects, ranging from proprietary rights to recapitulation of the activities of the Federal Aviation Agency in its first year of operation. Both of these articles were signed by members of Congress. An insert article that drew wide press and congressional attention was an adaptation of the remarks by Deputy Defense Secretary James H. Douglas before the AIA Board of Governors' meeting. The article, "Aerospace Industry—A Study in Change," explained the mutual problems of industry and Government.

Booklets:

Aerospace Year Book: The 1960 edition was published March 15, in the same format as the 1959 edition. Reflecting a substantial improvement over previous issues, the 1960 edition contained 478 pages. The 1961 edition of the *Year Book* will be published February 1, 1961.

U. S. Aircraft, Missiles and Spacecraft—1960: Under its new title, excerpted pages of the *Aerospace Year Book* once again were published by the AIA for the National Aviation Education Council. The booklet was comprised of 156 pages, plus a 3-color cover. AIA purchased 2,500 copies for distribution to the press and other selected groups. NAEC ordered 12,500 copies and to date has sold 7,600. Expected sales by year-end 1960 will reach approximately 11,000.

Aerospace Facts and Figures—1960: Published in its same format, the booklet emphasized missiles and space programs. As in the past, primary costs for publishing this annual statistical and textual report of the industry were underwritten in the first 2,000 copies. The 1961 edition of *Facts and Figures*, as in prior years, will be published on May 15.

Annual Report: 6,000 copies of the *Annual Report* were published and distributed to Congress, other Government officials, selected AIA committee executives and to the press.

Aerospace Forecast of Technical Requirements—1960: Due to the increasing importance of this technical document prepared by AIA Technical Service committees, Public Relations Service has undertaken editorial advice to the authors, increased the circulation of the document, and furnished a substantial portion of its publishing budget. The document, prepared by five technical committees representing the combined expert opinion of some 200 of our industry's top engineers, serves as an important advisory to the membership, Government agencies, and subcontractors.

The text for a new space booklet outlining industry's role in the development of vehicles for the exploration of space has been completed. It will be published shortly after the first of the year. A newly-revised edition of *Plane Views* is being prepared for distribution through NAEC. Copy is being prepared by AIA staff; illustrations will be "Plane Views" taken from *Aerospace*.





TOM SALTER
*Cessna Aircraft
 Company
 Chairman, Aircraft
 Technical Committee*



MILO F. MCCAMMON
*The Bendix Corporation
 Chairman, Manufacturing
 Committee*



I. KALIKOW
*General Electric
 Company
 Chairman, Accessory &
 Equipment Technical
 Committee*



E. D. CARTER
*The Martin Company
 Chairman, Materials
 Procurement Committee*



N. V. PETROU
*Westinghouse Electric
 Corporation
 Chairman, Electronic
 Equipment Technical
 Committee*



CHANDLER C. ROSS
*Aerojet-General
 Corporation
 Chairman, Propulsion
 Technical Committee*



P. M. PROPNETT
*Convair
 Corporation
 Chairman, Flight
 Operations Committee*



PAUL E. ALLEN
*Beech Aircraft
 Corporation
 Chairman, Quality
 Control Committee*

AIRCRAFT TECHNICAL COMMITTEE

- Aerospace Research & Testing Committee
 - Dynamics & Aeroelasticity Research
 - Flight Test Telemetry
- Airworthiness Requirements Committee
 - Helicopter
 - Personal Aircraft
 - Transport
 - Powerplant Installation
- Engineering Contract Requirements Committee
 - Drafting

ACCESSORY & EQUIPMENT TECHNICAL COMMITTEE

- Administrative Engineering Committee
 - Company Specifications
 - Drafting for Numerical Control Machines
 - Drafting Practices
 - Microfilm
- Proprietary Rights

ELECTRONIC EQUIPMENT TECHNICAL COMMITTEE

- Electronic Parts Committee
 - Connectors
 - Electron Tubes
 - Relays
 - Semiconductor Devices
 - Wire
- Electronic Equipment Specifications Committee
 - Radio Noise Interference
 - Drafting
 - Reliability

FLIGHT OPERATIONS COMMITTEE

MANUFACTURING COMMITTEE

- Aerospace Manufacturing Engineering Committee
- Manufacturing Conservation Committee
- Manufacturing Equipment Committee
 - Numerical Control
- Manufacturing Test Equipment Committee
 - Numerical Tooling
- Preservation & Packaging Committee

MATERIALS PROCUREMENT COMMITTEE

- Economics
- Government Regulations
- Inter-Committee Relations
- Materials Management

PROPULSION TECHNICAL COMMITTEE

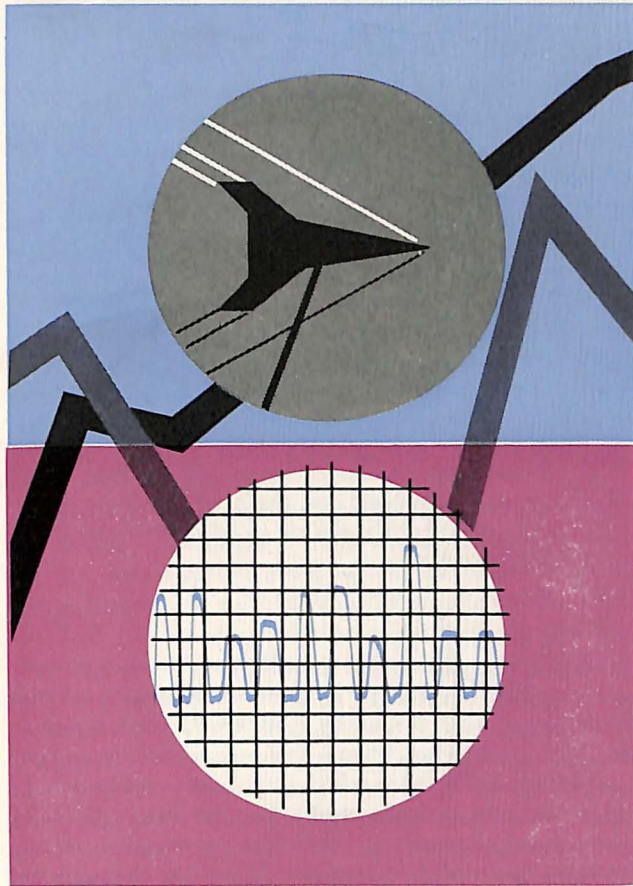
- Engine Committee
 - Powerplant Airworthiness
 - Turbine & Jet Engine Requirements
- Propeller Committee
- Rocket Committee
 - Liquid Propellant Division
 - Accessory Components
 - Propellants
 - Solid Propellant Division

- Drafting
- Reliability

QUALITY CONTROL COMMITTEE

- Measurement Standards & Calibration
- Reliability Functions

TECHNICAL SERVICE



Astonishing technological advances in the aerospace industry have been made in the past five years. These advances hold a rich promise for immediate military applications and later for commercial adaptation. Their timely application hinges on the ability of management to translate technical breakthroughs into inventory hardware. But modern weapons have become so complex that there is no single company, military service or other Government agency capable of producing a complete system.

The key perhaps, to a successful weapons program, a new engine, or an electronic device, is a delicate balance between management and technology of industry on the one hand, and the military necessity and requirement on the other. Fulcrum in maintaining this balance for our industry is the Association's Technical Service. With its twenty-three standing committees, as well as numerous ad hoc groups and panels, in the fields of engineering, manufacturing, quality control, flight operations, subcontracting and purchasing, Technical Service is an effective liaison in the definition and solution of industry-Government problems which relate technical gains with management capability.

The activities and accomplishments of the twenty-

three technical committees which follow in detail, represent the work of nearly 1,000 engineering executives throughout industry whose primary concern is increasing manufacturing efficiency—eliminating costly duplication of time and experience in aerospace product development—thus improving the quality of the product at less cost to the buyer.

Aircraft Technical Committee:

The Aircraft Technical Committee is composed of principal engineering executives from member companies engaged in the design and production of aircraft. Its primary responsibility has been the determination of financial support for technical activities, the source of industry comment on matters of engineering policy, and the direction of its working committee programs through the Aerospace Research and Testing Committee, Airworthiness Requirements Committee, Engineering Contract Requirements Committee, and the National Aerospace Standards Committee.

During the past year, the principal effort of this Committee was a critical analysis of the Technical Service organization.

Airworthiness Requirements Committee: The most important single action taken by the Airworthiness Requirements Committee was review of a number of airworthiness proposals submitted by the FAA in its Annual Airworthiness Conference. This involved formulation of industry positions on each proposal and a week-long meeting with FAA to discuss them. Many additional airworthiness proposals have been advanced by both FAA and AIA during the year, particularly in the helicopter and general aviation fields, and discussions with FAA relative to these matters are continuing.

Aerospace Research and Testing Committee: Engineering requirements determined by ARTC are presented in two forms—generalized statements of developmental requirements based upon analysis of future industry products, and detailed specifications defining the characteristics of materials, processes or equipment for which a vital need exists today. Best illustrating the first case is the "Aerospace Forecast of Technical Requirements." This report, developed and published for six years under the auspices of ARTC, now is the combined product of five AIA committees and encompasses the majority of technical areas represented in member companies. Its distribution includes more than one thousand military, Government and associated industry organizations. Exemplifying the second aspect, the ARTC has acted upon a long-felt need for less expensive, more readily handled finishes. Six "target" specifications for non-hydrocarbon paints and solvents have been published and are serving as guides for a large number of finish producers in the development of new water- and latex-based paints to suit aerospace requirements.



As the aerospace industry moves deeper into the missile and spacecraft era, the need for engineering and other highly skilled technicians must inevitably increase.

During the past twelve months, twenty-three cooperative studies devoted to solution of mutual problems were completed. These ranged from joint product-evaluation programs through test procedure standardization to the development of industry recommendations for military-sponsored research. Results of such programs, published as AIA reports, usually see immediate use within member companies through the exchange of data as soon as developed. Costs associated with these investigations are reduced in direct proportion to the number of participating companies, permitting significant over-all savings to the industry. ARTC frequently determines the availability of specialized testing facilities in order to provide opportunity for subcontracting of advanced research program support, when suitable equipment is not available "in-house." The latest such survey now being completed will summarize existing facilities in industrial and governmental agencies for the simulation of space environments.

One of these studies bears particular mention, as it illustrates the mechanism of advice to the Department of Defense on behalf of industry. Recognizing a critical limitation in the availability of thermophysical data on aerospace materials, the ARTC has outlined for DOD a comprehensive program of research to fill this technological gap. Detailed work statements, submitted to the Office of Defense Research and Engineering, will be used as blueprints for contractual programs to be established during the forthcoming year.

Engineering Contract Requirements Committee: This is a working-level technical committee responsible for representing the aircraft and missile manufactur-

ers on problems involving contractual requirements for which engineering has responsibility, engineering data requirements and engineering change negotiation procedure.

Major efforts of the Committee during 1960 have been with the Air Force to insure timely release of revision and amendments to the weapon system specifications coordinated late in 1959. Release of the USAF reliability specification revision was complicated by the existence of AF Ballistics Missiles Division Exhibit 58-10 on the same subject. Efforts to obtain Air Force concurrence to consolidate reliability requirements into one document appear successful.

A continuing effort has been to assist the Armed Forces Supply Support Center (AFSSC) in aligning their standardization projects to serve the best interests of both industry and the military. These efforts will continue and will encompass such subjects as reliability, design data, and approval requirements for non-standard equipment.

Revisions to several military publications have been coordinated, including guided missile general specifications, detail specification format, military document for selection of specifications and standards, Navy BuWeps general specification for aircraft, ground support equipment specification, and Air Force motion picture requirements.

The ECRC Microfilm Panel's primary activity last year was directed toward reviewing and revising the new family of microfilm and associated electronic accounting machine card specifications to obtain greater clarity, better workability and lower cost. Government acceptances of the Microfilm Panel suggestions have been exceptional.

ECRC efforts are currently being planned to: coordinate weapon system specifications with Navy BuWeps; interest DOD in philosophy of management by exception in approval of non-standards (surveillance); standardize reliability requirements; consolidate several existing environmental criteria and testing specifications; organize design data requirements; and, coordinate additional existing specifications in need of revision.

National Aerospace Standards Committee: The major part of the NASC program is concerned with utility and component parts as well as materials and processes in their application to airframe and missile design and production. The end products of the NASC effort are reliable standard specifications and drawings issued by industry as NAS documents or by the military services in their Government series of publications.

Early this year the Department of Defense issued a policy directive calling for the adoption of industry-developed standards when they meet defense needs. The usefulness of industry standards, represented by the NAS (National Aerospace Standards) series, will be increased by this DOD directive, thereby promoting

greater and more economical use of standard parts and materials.

During the past year approximately 115 NAS standards were issued or revised, new standards developed for low-height light-weight nuts, weight savings as much as 60% over the NAS679 and as much as 72% over the old AN nuts.

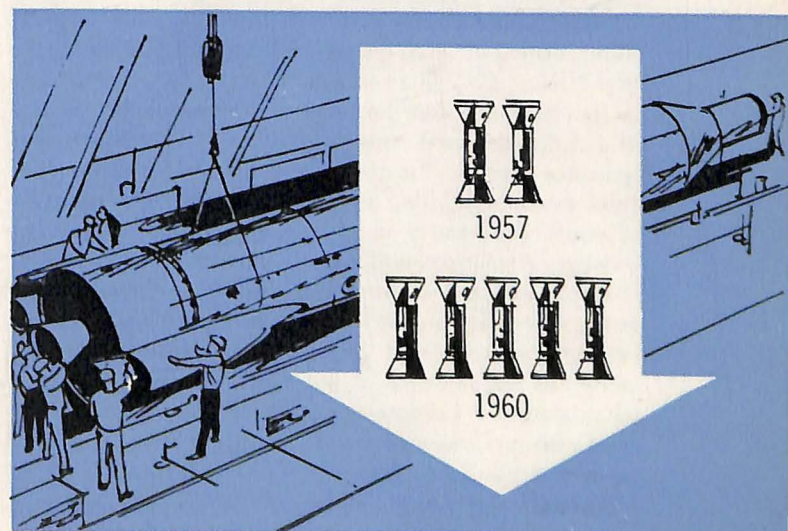
During 1960, approximately 119 military specifications and standards were coordinated with the aerospace industry through NASC. Requests for aerospace review of military specification drafts are now received from several Government activities. Through its projects, surveys, and military contacts, the NASC is serving industry by promoting realistic standards, specifications and drawings for aircraft and missile use.

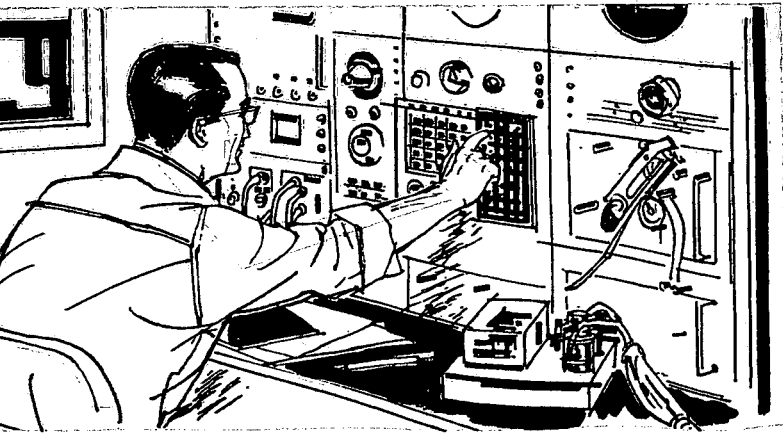
Accessory & Equipment Technical Committee:

Twenty-five companies developing and manufacturing accessories and equipment used in the operation or support of aircraft, missiles, and spacecraft, except those predominantly electronic in nature, are members of this Committee.

In view of increased emphasis on the weapon system concept and its administration during the past few years, the activities of this Committee have been directed toward participation in joint industry efforts.

Space power costs are being sharply reduced. Five rocket engines for powering intermediate range ballistic missiles are being delivered today for the same price as two engines less than three years ago. A gigantic rocket now under development, which will be ready the latter part of this decade, will cost 60 per cent less per pound of thrust than the cost of rocket engines being delivered today. These cost reductions, along with greatly improved power and reliability, are due to advances the aerospace industry is making in technology and management.





The design and manufacturing techniques required in building electronic devices for modern aerospace weapons have become so complicated that there is little need for unskilled and semi-skilled employees. But the need for higher skills continues to increase.

These activities have been largely in the fields of specifications, standardization and related efforts.

Special attention has been given to the problem of proprietary rights in such documents as the Armed Services Procurement Regulations and MIL-D-70327 "Drawings, Engineering and Associated Lists."

The Committee has also been active in proposed specifications for microfilming of drawings, related documents thereto, and in the use of this technique. Considerable effort, jointly with other AIA committees, was devoted to a suitable revision of MIL-D-70327.

Electronic Equipment Technical Committee:

Twenty of the twenty-five companies represented on the AIA Board of Governors are represented on EETC by their Chief Electronic Engineer. In addition, eight other principal AIA member companies are members of EETC.

As the Space Age increases the complexities of aircraft, missiles and spacecraft, better electronic systems are needed. Electronic guidance, control, navigation, communication, and ordnance systems are now of equal importance to air and space vehicles as propulsion, structures and aerodynamics.

The growing need for microminiature electronic systems, possessing greater reliability and longer life in extreme environments, is demanding research and development into entirely-new design and manufacturing techniques for components and systems. EETC promotes discussions and actions to speed these new concepts and assure U. S. leadership in space.

Through conferences and special presentations, Committee members exchange information and seek coop-

erative solutions to technical problems confronting management in such areas as: engineering management development techniques and goals; space environments; how prime can best control subcontractor technically; mechanized design techniques; design review procedures; and molecular electronics.

Special presentations by key military representatives provided valuable information exchange and focused attention on problem areas and possible solutions. These included: Electromagnetic compatibility of weapon systems, new electronic design concepts for space requirements, and DOD planning which indicates future trends in military electronics.

This was the first year the EETC participated in preparation of the AIA Forecast of Technical Requirements.

The EETC has also participated, along with other main technical committees, in broad policy direction of engineering matters of concern to several or all engineering committees, including Joint Drafting Panel, weapon system specification coordination, and weapon systems reliability.

Electronic Equipment Specification Committee: Probably the most significant accomplishment of this Committee, in 1960, has been the initiation of a long-range program to achieve uniform electronic design requirements by the various military procurement agencies. The military adopted EETC recommendations for objectives, operations and organization of this program, which have promise of greatly increasing engineering efficiency and economy for companies having contracts with several military services.

During the year, EESC also provided constructive recommendations to military services with regard to updating and improving specifications for environmental requirements and test, engineering contract requirements, drafting practices, antenna systems and radio noise interference.

The Committee's close liaison with the military provides a better understanding of military requirements, and makes industry "know-how" readily available to military specification writers.

Electronic Parts Committee: EPC is studying new micro-electronics design concepts which have the capability of reducing complexity and tremendously increasing reliability.

EPC has a continuing program to provide parts manufacturers and military research groups information concerning improved and new parts requirements for advanced systems. In addition, the Committee has issued semiconductor design objectives for both manufacturers and the military. This is especially important since there are no acceptable military specifications in this rapidly-developing area.

The Committee also provides direction of its subordinate panels and projects on semiconductor devices, connectors, gyros, micro-miniature components, wire and relays.

Flight Operations Committee:

During the past year, the Flight Operations Committee has taken significant action in efforts to reduce the collision potential between flight test aircraft and other airspace users. Ten recommendations, which AIA feels will materially lessen this hazard, have been forwarded to the FAA Administrator. The Committee has similarly prepared and submitted detailed recommendations to the Administrator which the Association believes will materially reduce flight test costs.

Manufacturing Committee:

Production executives of manufacturing member companies constitute the Manufacturing Committee, which functions as a policy body in directing efforts of its working committees.

During the past year, with the growing importance of numerically controlled machines for aerospace production, the Committee has been studying the problem of how best to structure its working committees in recognition of this fact.

Manufacturing Conservation Committee: The Manufacturing Conservation Committee continues its interchange of proven conservation practices to assist in obtaining the most effective and economical use of material. Conservation coordinators of forty-one member companies comprise the Committee.

The AIA Conservation Handbook continues to be in demand. Almost a thousand copies have been distributed. The handbook is available to, and is used by, many non-member companies and Government agencies.

Manufacturing Equipment Committee: Now comprised of representatives from thirty-eight member companies, this Committee was enlarged to embrace producers of aircraft, missiles, accessories and equipment, and power plants. Considerably increased emphasis was placed on the scope of activities in the field of numerical control systems falling under the cognizance of its subordinate Numerical Control Panel (NCP).

The Committee has 27 active projects dealing with a variety of surveys and studies pointed toward equipment standards, performance specifications for advanced types of numerical controlled machines, advanced types of equipment for thin wall tube bending, automatic inspection of machine parts, automatic fabrication of wire harnesses and fusion welding of thin sheet high-strength materials.

During 1960, twenty-eight projects were completed which, in documented form, provided six new NAS specifications for machine tools, three MEC reference specifications, eight survey reports and eleven documented study summaries.

Typical of the NAS standards published during the year were the revised NAS 912 and 914 for spar mills

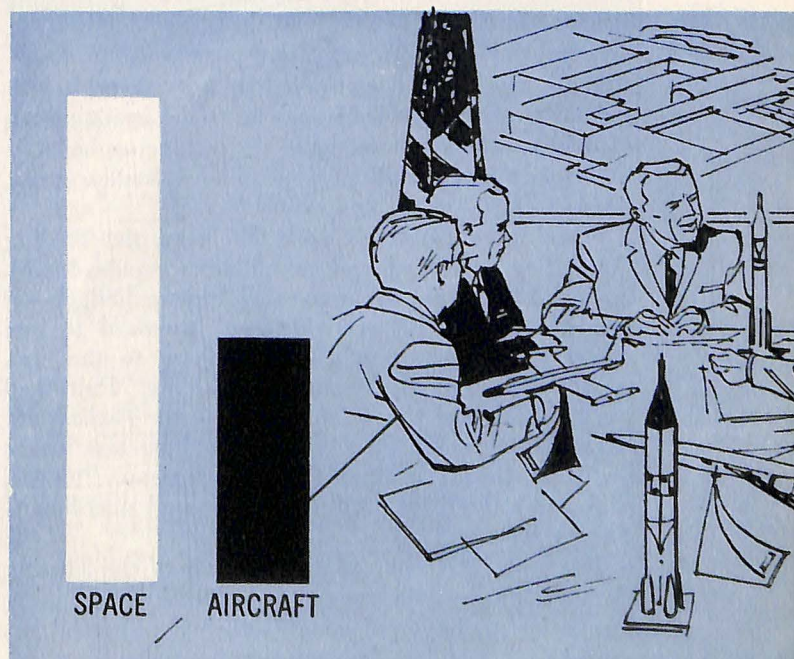
and profile mills. Of the several MEC reference specifications issued, the document covering three categories of furnaces and ovens is a comprehensive reference source for procuring brazing and heat treating equipment for advanced aerospace vehicles.

The Air Force is acting to fund two MEC-recommended research projects on impact rubber forming of high-strength materials and computing techniques which will permit the use of lower cost computers for processing data from engineering drawings into instructions for numerically controlled machines. MEC was also instrumental in coordinating the Air Force's Machine Tool Modernization and Replacement Program. Considerable effort was also put forth in supporting the activities of the Materials Advisory Board.

MEC/Numerical Control Panel: During the past year, the membership of the NCP increased from 28 to 32 participants.

Perhaps one of the most important activities under the cognizance of the NCP is the Automatically Programmed Tools (APT) project. July of 1960 witnessed the issuance of the APT II, PHASE II package consisting of 40,000 computer instructions, which boosted

The growing stature of space programs is graphically shown by a study in the 1960 edition of Aerospace Facts and Figures. Obligations for space research and development in Fiscal Year 1961 will amount to about \$900 million, double the amount to be obligated for research and development on military aircraft and related equipment. The space research fund, however, contains a relatively small amount for the purchase of hardware while the aircraft fund is solely for research and development. The bulk of space research and development is done by aerospace companies.



the capability and reliability of the data processing system for a high percentage of two-dimensional and three-dimensional part geometries.

At the present time, the Panel is working on 13 projects dealing with various aspects of standards affecting numerical control systems, data processing techniques and system performance investigations. Typical of ten projects completed over the past year was the issuance of NAS 943, which established standards for Class IV input control media for numerically controlled machines. This standard will result in reduced costs for operating materials, data processing and machine control systems. It will also provide interchangeability between certain machine tools in-plant or between companies.

A three-part project on applications analysis was undertaken to define future applications of numerical control on riveting, turning and welding equipment.

Another completed study undertook to determine the feasibility of NC applications to equipment for dimensional checking of machine parts. These data will be further applied to developing machine performance specifications for advanced types of inspection equipment.

Also published during 1960 was the latest revision to NAS 938 Machine Axis Nomenclature Standard. Developed jointly by AIA, EIA, and NMTBA, this document provides standard nomenclature for use by aerospace companies, machine manufacturers, supporting industry, data processing service centers and many others. International acceptance of the standard is expected.

Tooling Committee: During 1960, the Tooling Committee issued revisions to specifications for standard drills developed in conjunction with the Metal Cutting Tool Institute (MCTI). Use of these specifications for procurement of drills, especially those used for high-strength materials, has resulted in a measurable cost reduction. Other projects undertook the investigation of drilling and other methods for producing holes in high-strength materials as applied to assembly operations.

Working cooperatively with the Navy, the Tooling Committee developed and submitted a standard tooling exhibit for use in forecasting tooling budgets on new contracts. The availability of standard tooling contract terminology will be beneficial to the contractor and customer organization alike. Published during 1959 was the TC's Handbook on Tooling for Brazed Honeycomb Structures. This document makes available to all companies non-proprietary tooling practices utilized for production of brazed steel honeycomb structures.

The year 1960 also saw the issuance of the Tooling Committee's interim report on educational requirements for tooling and manufacturing research personnel.

TC/Numerical Tooling Panel: Since its formation, the Numerical Tooling Panel has initiated ten projects encompassing a wide range of tooling problems, from original planning to inspection of the end product.

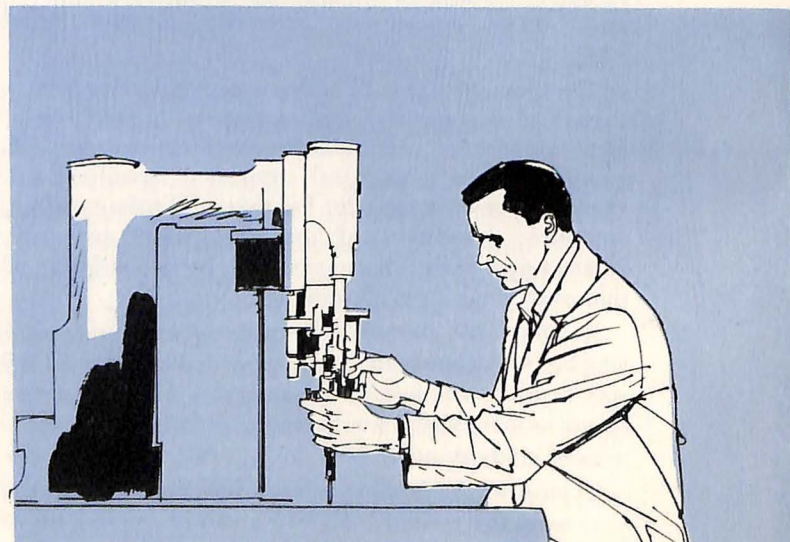
One completed project provided an insight into the current practices of twenty-three AIA companies in the placement and accomplishment of twenty-four functional responsibilities necessary for implementing the numerical control process into tooling and production organizations.

A second completed survey pointed up the need for accelerated activity in the development of equipment and techniques for verifying the accuracy of machine control media and for the inspection of parts and tools made on numerically controlled machines.

Another project covers the improvement needed in part programming techniques, language and procedures. It was instrumental in the development and publication of the APT dictionary.

Manufacturing Test Equipment Committee: Forty-three AIA companies and their divisions now participate in the activities of the working committee responsible in the field of manufacturing test equipment. In the year completed, the MTEC concluded six study projects pointed at resolving common problems concerned with the calibration and use of all types of test equipment, utilized for product verification and testing.

One of these reports provides documented state-of-the-art data and basic economic factors on the application of automatic test equipment. A second provides an updated reference specification for design of all types of production test gear. A third completed report provides a treatise on testing procedures and



equipment for semi-conductors and transistorized circuits. 1960 also saw the publication of NAS 944 which establishes standard symbols for hydraulic test equipment drafting.

There are fourteen additional projects, investigations and surveys dealing with test equipment of mechanical, hydraulic, electrical and electronic variety. Specific areas being covered include: Standardization of filters for hydraulic fluids and fuels, a catalog of standard materials and off-the-shelf equipment used in test gear, a joint project on establishment of industry standards for high potential and megger testing, an updating of the report on Minimum Requirements for Calibration Laboratories, an investigation into techniques and practices used for pressure testing with gas, a survey of present and expected future parameters and capabilities for pressure and flow measurements and a survey to determine methods and techniques for trouble shooting in-plant test equipment.

Preservation and Packaging Committee: In the fields of protection and preservation, the Committee continues to serve with growing effectiveness the interests of the aerospace industry and its commercial and military patrons. Composed of fifty-five members representing companies engaged in airframe, engine and accessory manufacture, ninety-eight companies and divisions profit from the Committee's activities.

Two new projects have been established to define and resolve packaging problem areas unique to solid and to liquid propellant system components. Another project defines objectives and sets minimum criteria for standardizing the packaging of some commodities by suppliers to aerospace industries, to improve protection and utility, and to lower costs. At the suggestion of an Air Force research agency, a project has been established to define fruitful areas of research for packaging support of operations in outer space.

The Committee has cooperated with the military services in the 5th Joint Military-Industry Packaging and Handling Symposium and in regional events, such as the Ballistic Missile Packaging and Handling Symposium held at San Bernardino. Members were also active in the development of the Missile Packaging Course inaugurated at the Joint Military Packaging Training Center.

Materials Procurement Committee:

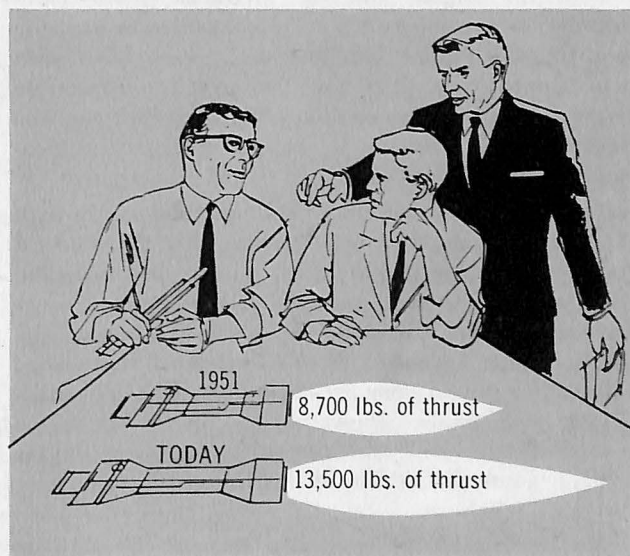
The Materials Procurement Committee membership includes materiel directors of member companies whose interests are focused primarily in the area of subcontracting and materials management. An important area of this Committee's work is concerned with improving opportunities for participation of competent small business in defense subcontracts.

During the past year, the Committee has continued its active cooperation with the Government in common problem areas; for example, the intensive Air Force

study of effective subcontract management during this past year. Subjects covered by this study and in which the Committee was active included: make-or-buy policy, review of documentation procedures and practices of military prime contractors' purchasing and subcontracting systems, source selection, acceptable pricing, secondary administration and problems of subcontract audit. Through these joint efforts, as well as internal Committee programs, the emphasis this year has been on the tightening of controls to minimize cost in the subcontract field.

Propulsion Technical Committee:

The Propulsion Technical Committee is comprised of engineering executives from companies engaged in research, development and production of engines, rockets or propellers of their own design for which they have received Government contracts, or type certificates from the Federal Aviation Agency.



Turbojet engines have a tremendous growth potential designed into them by aerospace engineers. A turbojet engine developed in 1951 produced 8,700 pounds of thrust. Today this engine, basically the same, produces 13,500 pounds of thrust, weighs less and uses less fuel. This same engine, with a turbofan modification, can produce 17,000 pounds of thrust, almost double the power of the original model.

The PTC is concerned with weapon system and space programs, and recommendations to reduce costs to the propulsion industry and to the Government. Because of the many differing requirements of military agencies NASA, etc., for engines or rockets of similar characteristics, the PTC has recommended the establishment of a Propulsion Coordinating Council. This Council, which would include representatives from DOD and NASA, would be responsible for achieving uniformity of propulsion requirements.

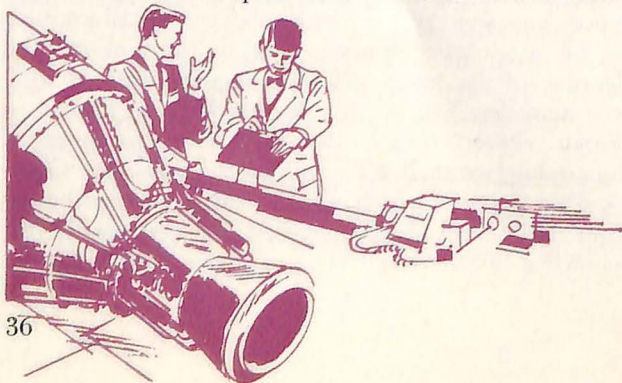
The Committee is also concerned with the trend of Government toward the building up of research laboratories, for the design and development of propulsion items, to the point of production. If this trend is not curbed, it will inevitably lead to diversification of interests of the engine and rocket manufacturers, resulting in the loss of technical capability of companies who have pioneered in this field.

Engine Committee: During the past year, the Committee submitted recommendations to the military services for the amendment of certain turbojet engine specifications which would reflect more realistic requirements. It has also recommended adoption of a tabular method of presenting engine performance data. These recommendations, if adopted, would reduce costs through the elimination of unnecessary testing and the simplification of performance data presentations furnished to airframe designers and the Government.

Both the engine and the airframe power plant installation specialists have recommended a revision to turboprop engine specifications, which have been in existence since 1954, and the need for a separate series of specifications dealing with turboshaft engines. Recommended changes to ramjet engine specifications have also been submitted to the Government.

The Engine Committee has continued, through the second year, its negotiations with the Federal Aviation Agency in an effort to provide so-called "contingency" (one-engine-out) ratings for helicopter turbine engines, considered an absolute necessity by the helicopter industry. Establishment of the special ratings has waited upon an engine test schedule which would be mutually acceptable to FAA and engine manufacturers, and which would not boost engine costs beyond the realm of feasibility for helicopter use.

Rocket Committee: Specialists from the liquid propellant rocket manufacturers, in conjunction with specialists from the missile manufacturers, coordinated in the compilation of a handbook of authentic data for controlling contamination in liquid rocket propulsion systems. This AIA publication, entitled "Handbook for Contamination Control of Liquid Rocket Propulsion Systems," was released in March, 1960, and 1,000 copies have been distributed to industry and Government. Because of the urgent need for the material contained in the Handbook, it is now planned to recommend that it be adopted as a Government document.



Drafting Practices Panels:

The AIA Drafting Practices Panels were established in 1954 to deal with subjects in the areas of engineering drawings and related data. Four panels, representing the airframe and missiles, accessories and equipment, electronic equipment and propulsion segments of the industry, provide two representatives each on the AIA Joint Drafting Panel, which, in turn, coordinates the joint AIA effort with the Government and other associations and societies. Membership is generally at the chief draftsman level.

The AIA has, through this activity, sponsored the coordination efforts of several associations and societies to provide a single set of comments for DOD use on a revision of MIL-D-70327, the "Unified Drafting Document." It is hoped that final coordination between industry and Department of Defense representatives will be accomplished before the year ends. Since mid-July, 1960, the Drafting Practices Panels have been working toward this objective.

Quality Control Committee:

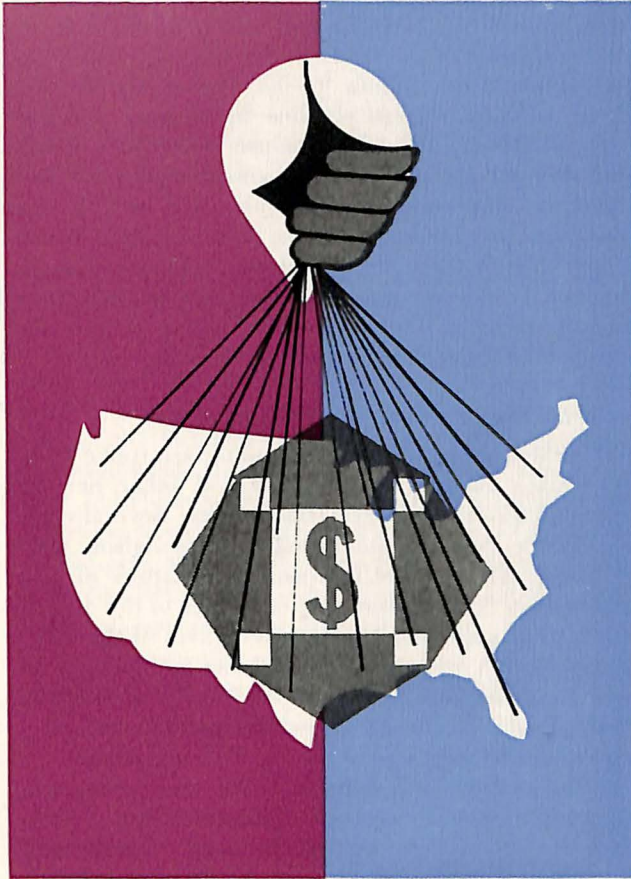
The Quality Control Committee is concerned with the review of quality control policy directives and general inspection specifications of the Department of Defense, FAA, NASA and the military services. It also collects, classifies and issues information to advance quality control and reliability techniques. Quality control administrators of the forty larger AIA member companies comprise the Committee, while a total of 173 companies and divisions profit from the Committee's activities.

Through special panels, the Committee maintains liaison with quality control administrators of DOD, Army, Navy, Air Force, FAA and NASA. Recommendations to the Department of Defense, during 1960, on general quality control problem areas and on establishment of universal material deficiency and failure data reporting codes were favorably received.

The Committee has fostered improvements in the over-all measurement capabilities of the Nation by participating in six Measurement Research Conferences sponsored by the National Bureau of Standards. The conferences sought answers to measurement problems besetting science and industry relating to microwave power, microwave attenuation, pulse voltages, gears, small internal diameters, infrared, temperatures and humidity. In another joint effort with ASTM and Naval Ordnance Laboratory, the Committee assisted in development of much-needed radiographic standards for thin-wall steel castings.

The Committee's Reliability Panel prepared a statement on the reliability functions of a typical quality control department and also participated with other technical committees of AIA drafting recommendations for improvement of current military reliability specifications.

TRAFFIC SERVICE



E. W. DUNN
*Lockheed Aircraft
Corporation
Chairman, Eastern
Traffic Committee*



C. E. UMPHRESS
*North American
Aviation, Inc.
Western Traffic
Committee*

TRAFFIC COMMITTEE

- Eastern Traffic Committee
- Rate and Classification Committee
- Western Traffic Committee
- Rate and Classification Committee

Historically, the primary objective of the Traffic Service has been to secure for its members the lowest reasonable commercial carrier rates consistent with adequate and efficient carrier service. The year just ended was marked by actions which successfully contributed to the attainment of that objective. However, with the added emphasis which is being given to the production of missiles, space vehicles, and atomic weapons, the role of the aerospace traffic manager is changing, and with it, the type of service demanded of and being provided by Traffic Service. The maintenance of a reasonable rate structure, applicable to the components moving into production lines, continues to be an important facet of the duties of the aerospace traffic managers. However, the aerospace age presents a host of new areas of activities with accompanying problems, in connection with which Traffic Service answers a demand which cannot be met by aerospace traffic and transportation organizations acting alone and independently of one another.

How Traffic Service Functions:

The AIA Traffic Service functions through two general committees, each composed of the principal traffic officers of member companies located in the eastern and western half of the United States, as the case may

Agency on matters related to coordinated positions taken with commercial carrier rate and classification bureaus. In this area of activity, the position of the aerospace industry was established at AIA Traffic committee meetings, or by means of Traffic bulletins.

Additional Activities of Traffic Service:

A large percentage of the work of Traffic Service relates to coordinated activity with the Federal traffic agencies. However, much of its enterprise is devoted to serving as an adjunct to the separate member traffic organizations in areas where an industry-wide approach will accomplish results not obtainable from the independent action of individual members. Additionally, Traffic Service provides the medium, through its committees, where traffic officers may secure the benefits to be obtained from interchange of ideas in open discussion. The following examples illustrate the activity of Traffic Service in this area during the year just ended:

- Traffic Service intervened in an action before the Interstate Commerce Commission, in opposition to an attempt by rail and motor common carriers to materially reduce the amount of dollar damages recoverable by AIA members for loss or damage to super alloy material and parts occurring while in the custody of carriers. AIA exceptions have been filed to the recommended order of the I.C.C. Hearing Examiner in this case. A final decision is pending.
- Action by the Traffic committees accomplished cancellation by numerous motor van carriers of tariff rules and regulations which discriminated against industrial shippers of personal effects. The cancelled rules prohibited industrial shippers from securing the benefits of the lower charges applicable to the combined lots of personal effects for two or more employees transported by carriers concurrently on the same vehicle between the same points. This benefit was available to all other shippers of multiple lots.
- Subsequent to the action related above, and following the filing of a complaint with the Interstate Commerce Commission by a dissident carrier, Traffic Service appeared before the I.C.C. in defense of the cancellation of the onerous tariff provisions. A final decision is pending in this case; however, the I.C.C. Hearing Examiner has recommended adoption of the position advocated by AIA.
- Traffic Service accomplished reductions ranging from 5 to 10 per cent in the general tariff charges of motor van carriers applicable to the transportation of volume movements of employees' personal effects and industrial materials, primarily electronics.
- Traffic Service appeared before the House

Transportation and Aeronautics Subcommittee in opposition to H.R. 9280 and H.R. 9281, bills which would remove existing inhibitions against ownership or operation of motor or water carriers by railroads and result in a stifling of competition.

- Traffic Service instituted a procedure with the Railway Express Agency to provide an armed surveillance air express service, which subsequently was approved by the Department of Defense for the movement of classified material. Heretofore, members' air shipments of SECRET material were required to be accompanied by a plant courier, an expensive procedure necessitating diversion of trained production employees from their regular duties.

- A recurring item on the agenda for Traffic committee meetings during the past year has related to the interchange of ideas among committee members. Discussions in this area related to problems such as those surrounding the transportation of extreme dimension shipments in connection with missile and space programs and the extent to which traffic organizations of members can contribute to the over-all effectiveness of other departments, such as Design, Engineering, Price Estimating, Accounting and Contracts.

In considering the emphasis which the AIA Traffic committees have placed on the rates, services and charges of motor van carriers throughout the past year, it is well to keep in mind that a major portion of the transportation budgets of both the aerospace industry and the military departments is expended for the movement of personal effects. In FY 1960, the Department of Defense bill for such service amounted to \$100,200,000. This sum represented approximately 25 per cent of the total DOD domestic freight transportation bill for that year of \$398,600,000, and was its largest single freight transportation expense. It accounted for an expenditure about half again as large as the total combined military bill for the movement of ammunition and petroleum and was approximately four times the sum expended by DOD for the transportation of aircraft parts. During the same period, AIA members expended in excess of \$10,000,000 for the transportation of their employees' household goods.

Program for the Future:

While in no way limiting the emphasis on the other activities of Traffic Service, the following activities will be accented during the coming year: interchange of ideas among committee members, analysis of measures to be taken to increase a traffic department's contribution to reductions in over-all production costs, and the progression of present programs-in-being which will secure reasonable charges and reliable commercial air carrier service for the transportation of household goods.

HELICOPTER COUNCIL



J. E. LEONARD
*Cessna Aircraft
Company
Chairman, Helicopter
Council*



JOSEPH MASHMAN
*Bell Helicopter
Company
Chairman, Heliport
Committee*

The Helicopter Council was formed 13 years ago to serve the distinctive needs of those AIA members either exclusively or closely identified with rotorcraft development and production. The present membership of ten companies, with one application awaiting Board approval, meets on call of the chairman to consider matters of mutual interest and to determine action to be taken by the staff to meet the problems at hand. Member companies are represented by their president or the executive officer in charge of the helicopter activity.

The majority of commercial applications of the helicopter are routine business operations carried out by 193 operators in the United States and Canada, using 705 rotorcraft, as listed in the latest Council survey, a listing undergoing periodic revision.

Military uses of the helicopter are almost endless in variety, including rescue work. Rotorcraft are now in use with every branch of the armed forces. They can swiftly deliver ammunition to forward areas, carrying the wounded back to the hospital areas, tow mired trucks, tanks—even beached naval vessels.

With full military application of the helicopter an accepted factor, the greatest potential for the future growth of rotorcraft necessarily lies in the commercial field of air commerce, executive transportation, air

carriers and charter operations.

However, before the helicopter potential can be fully realized, it is of primary importance that heliports are built, and to do this, forward looking legislation is required by municipalities and state governments. Zoning laws must be updated, land acquisition must be facilitated, air space for helicopters must be separately regulated, and airports—which are expected to generate much of the helicopter traffic—must set aside areas for helicopter operations, maintenance and parking.

The Council office and staff provides, in many instances, the only contact point and source of information on matters pertaining to heliport planning, helicopter operational characteristics, legal procedures in regulatory measures and answers to a myriad of queries from military and civilian authorities bearing upon one or another of the aircraft's unique operational characteristics.

Among a total of more than fifty documents available and widely distributed are many originated by Council staff and unavailable elsewhere, such as the first directory of heliports located in the United States and Canada; state directory of commercial helicopter operators; helicopter designation chart; listing of helicopters owned and operated for executive or corporate use, etc. A recent survey by the Council revealed that of 1,662 helicopters operated in 63 foreign countries, 1,370—or 82 percent—were of American origin.

With a product seriously handicapped by the existence of legal restrictions adopted in the years prior to its development, the Council conducts a continuous educational campaign as to the take-off, flight, hovering and landing capabilities of the helicopter and

works closely with public officials in the revision of ordinances prohibiting, for example, flight over specific areas at less than 1,000-foot altitude. Major cities throughout the United States working with the Council in the solution of this and similar problems include Baltimore, Chicago, Detroit, Fort Worth, Los Angeles, New Orleans, Philadelphia, Seattle and St. Louis, as well as officials of many states. Close liaison is maintained with the staff and members of the National Association of State Aviation Officials in the furtherance of this objective.

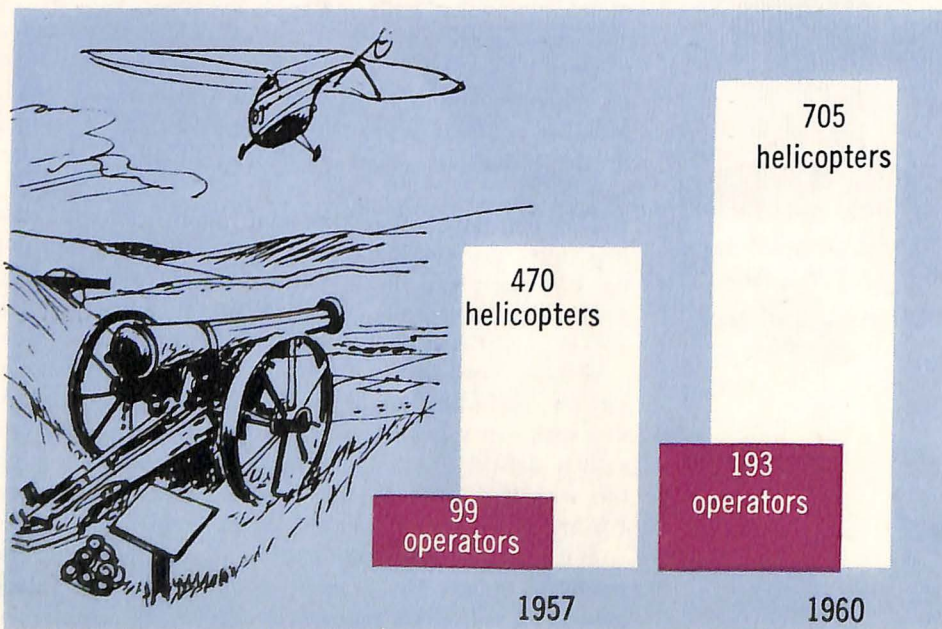
The co-operation of national groups of major stature has been developed by the Council, as evidenced by The American Legion's adoption of the following Resolution to "Encourage Utilization of Helicopters":

WHEREAS, The helicopter has proved itself a useful and versatile vehicle for both military and peaceful uses; and

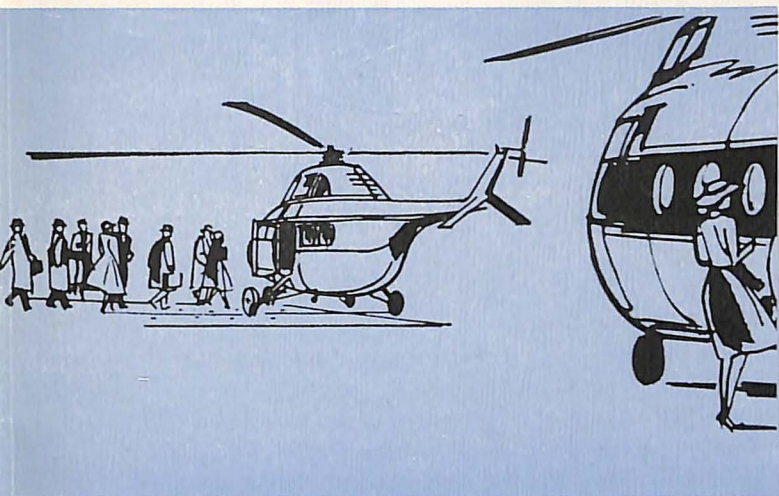
WHEREAS, There is need for increased emphasis on the many services the helicopter offers to enhance our way of life;

NOW, THEREFORE, BE IT RESOLVED, By The American Legion in National Convention assembled in Miami Beach, Florida, October 17-20, 1960, does reaffirm the principles and objectives of Resolution No. 639 adopted by the 40th National Convention to the end that we promote and encourage the development and use of helicopters and the passage of necessary ordinances and regulations as will permit their efficient operation.

The Council's over-all educational efforts were given a major assist when the Federal Aviation Agency



Number of commercial helicopter operators in the U. S. and Canada has nearly doubled in the past three years, and the helicopters in commercial service have increased from 470 in 1957 to 705 in 1960. New uses for the versatile helicopter are being discovered, with jobs ranging from placing powerline poles to carrying tourists across the terrain covered in Pickett's charge at the battle of Gettysburg.



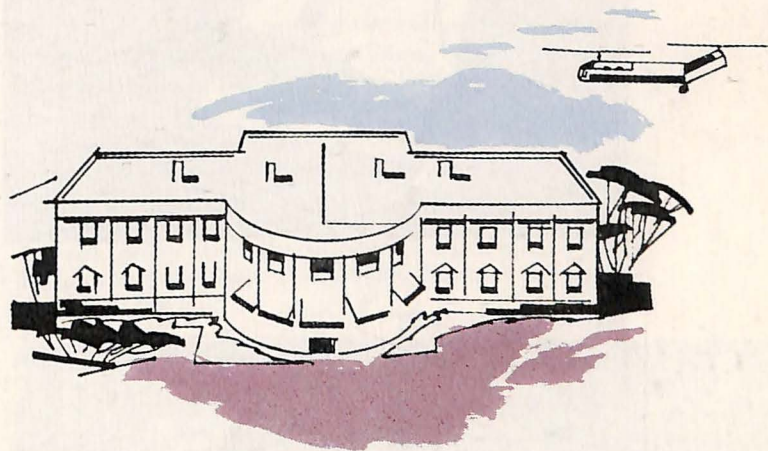
developed and carried out a program described by that organization as "Project Hummingbird." A detailed briefing of this campaign was given the Council prior to its introduction to public groups. During the year a graphic presentation showing the need for long-range planning for the provision of heliport facilities for helicopters and possibly other steep-gradient aircraft was given by FAA personnel before thousands of industry members, civic leaders and public officials in all areas of the country. Project Hummingbird is expected to be continued by FAA through 1961.

During the past year, the first certification of a helicopter for operation under instrument flight regulations was granted by the Federal Aviation Agency, which itself was conducting a major all-weather helicopter test program with the cooperation of the military and industry. The goal is to establish rules and control procedures giving the helicopter all-weather capability, bringing it closer to its full economic growth possibilities. In this unified project the military provided the equipment, pilots and flight engineers; industry, the maintenance, and the FAA, the electronics and certain expenses. Indicative of the success being achieved in this program will be addition of a turbine-powered helicopter to the test fleet next year.

Objectionable aircraft noise, which, with the rapid expansion of jet usage, has become an international problem, was brought effectively to the attention of helicopter manufacturers at a Council meeting featuring the presentation of a special paper on the subject. The head of the National Aircraft Noise Abatement Council emphasized the point that removal of jet airports to sites far from the cities they service brings the helicopter to the forefront as the most effective transportation to reduce to a minimum the time spent in

travel from airport to city. By the same token, however, the landing of the helicopter at urban heliports brings its own operating sounds right into the midst of business or residential areas. It was recommended that use of roof-tops, waterfronts and industrial areas as helistops and heliports would do much to keep the noise nuisance factor to a minimum. The Council is working closely with the NANAC in achievement of its objectives.

With Washington the home of the Nation's Number One 'heliport'—the back yard of the White House, the Council is endeavoring to secure congressional action authorizing the District of Columbia Commissioners to conduct a survey for recommendation of suitable heliport sites throughout the area. The Metropolitan Washington Board of Trade has adopted a resolution supporting this proposal and it is hoped that action will ensue prior to the opening of the 30-mile distant Dulles International Airport. Four heliports are included in the Dulles Airport plans. But, the question is—"Where will the helicopters land in Washington?" Immediate action is needed to provide helicopter land-



ing facilities in the Nation's Capital.

One of the surveys conducted by the Council during the year was concentrated in the field of executive and corporate use of helicopters. It was learned that industries currently operating their own rotorcraft included mining, textiles, electrical, radio, gas, oil, construction, food, banking, broadcasting, and lumber—as well as the aircraft industry itself.

Top individual executive use of the helicopter was by President Dwight D. Eisenhower. In accepting an award presented him at the annual banquet of the American Helicopter Society for his consistent use of helicopters the President said in part "I owe my grateful thanks to the helicopter industry, to its presidents, its engineers, the people that support and believe in it—and, indeed, to those other people who just use it."

UTILITY AIRPLANE COUNCIL



DWANE L. WALLACE

*Cessna Aircraft
Company
Chairman, Utility
Airplane Council*

Industry leaders predict the decade of the '60s will see business and private plane use enjoy its greatest acceptance. Already the largest user of the Nation's airports and air navigation facilities, general aviation (all civil flying excepting the airlines) will impose ever-increasing demands on our Nation's air facilities. The past decade, 1950-1959, laid the solid foundation for the industry which now exists. Unit sales more than doubled and their value increased six times. During the first year of the new decade (1960), it is anticipated that sales of business and utility aircraft will total approximately 7600 units, having a retail value of more than \$200,000,000. Despite the great progress of the past ten years, the decade ahead presents a potential which is almost unlimited.

To provide background for a better understanding of general aviation, and for activities of the Utility Airplane Council, some statistical accounts and comparisons are in order.

- The four active aircraft manufacturing members of the Utility Airplane Council produce in excess of 90 per cent of all general aircraft; the two engine makers in the Council produce almost all of the engines which power all currently built general aircraft.
- In the ten-year period, 1950-1959, general air-

craft manufacturers, who regularly report their sales to the Utility Airplane Council, delivered 46,998 general aircraft.

- FAA now places the active number of general aircraft at about 70,000, of which approximately 40 per cent make up the business fleet. Members of the Utility Airplane Council have manufactured almost all of these aircraft and their power plants.

- General aviation will fly an estimated 12,500,000 hours during 1960, three times more hours than the airlines, and about 1,750,000,000 miles, more than twice as many as the airlines.

- General aviation's contribution to the Nation's economy is now substantially in excess of a billion dollars, counting the sales of airplanes, fuel, oil, parts, supplies, and related services such as wages paid to mechanics, airport attendants, and professional, general aircraft pilots.

- The radio-navigation equipment industry has enjoyed a parallel growth to general aviation. The availability of fine navigation-communication instruments and electronic devices of a size, weight, dependability, accuracy, and cost to make them especially suitable for small aircraft, has played no small part in the tremendous growth of general aviation. In this regard, studies carried out by Government and the industry several years ago, in advance of the creation of the Federal Aviation Agency, suggested that though the numbers of annual hours flown might grow from about 10 million to 20-25 million by 1970-75 (which figures, incidentally, were considered to be most conservative by competent industry observers), general aviation IFR use would increase six to eight times. This prediction seems to be borne out by the circumstances of general aviation instrumentation and use which prevail today.

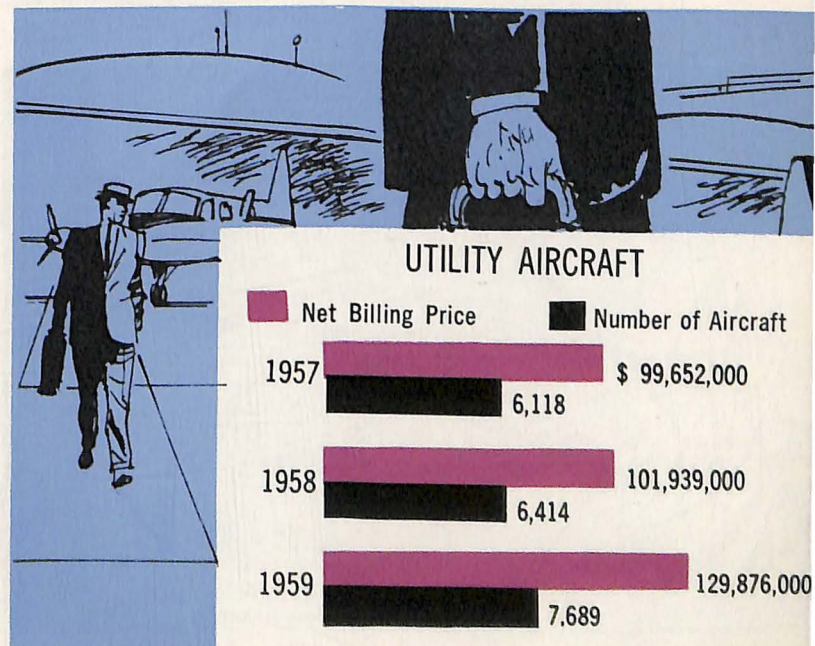
General aviation is adding to the Nation's productivity. More widespread markets are quickly reached and customer service is consequently improved. This aids the business plane user, the customer or client he serves, and boosts the sales and profit margins of both. Large corporation operators of fleets of airplanes aren't the sole beneficiaries of these benefits. The small company or individual business or professional man has also found that the time-saving convenience and mobility of a private airplane provides a real competitive edge. In the case of the big company, diversified activities and widespread plants and offices become wholly practical; and the individual business plane user finds whole new vistas of business and professional opportunity opened up.

The Utility Airplane Council members are fully aware of the conditions which now prevail for the continuing growth and expansion of their industry. Together, they have worked hard to lay the groundwork for this. Vigorous, individual, competitive effort

has built strong dealer and distributor organizations providing the widespread good service which the American consumer expects, and which is being constantly expanded and improved. Plant capacities have been greatly expanded. The past year, alone, has seen extensive plant expansion under way and more planned in the general aviation industry. Engineering organizations have been similarly expanded, and research and development efforts intensified, as industry growth and profit ratios have permitted larger expenditures. The industry's leaders recognize that, despite the successes of today, further foundation must be laid for the future growth of our industry and its contributions to the national economy and to the American way of life.

The Utility Airplane Council, through its staff, committees of its members, and through coordinated efforts, keeps itself continuously apprised of developments which can have a present or potential effect on the industry. Because civil aviation is a highly regulated industry in the development and manufacture of aircraft, as well as in every area of operation and use, a principal Council staff activity has been to maintain a close working relationship with the Federal Aviation Agency and its key staff. The past year, for

General aviation aircraft, which includes all civil aircraft with the exception of airliners, continue to show increasing gains, statistics in the 1960 edition of Aerospace Facts and Figures reveal. In 1957 manufacturers' net billing amounted to \$99,652,000, and in 1959 this amount increased to \$129,876,000. Number of aircraft produced increased from 6,118 in 1957, to 7,689 in 1959. Utility aircraft provide the businessman and the farmer with one of their most productive tools. Today there are more than 28,000 business planes operating in the U. S.



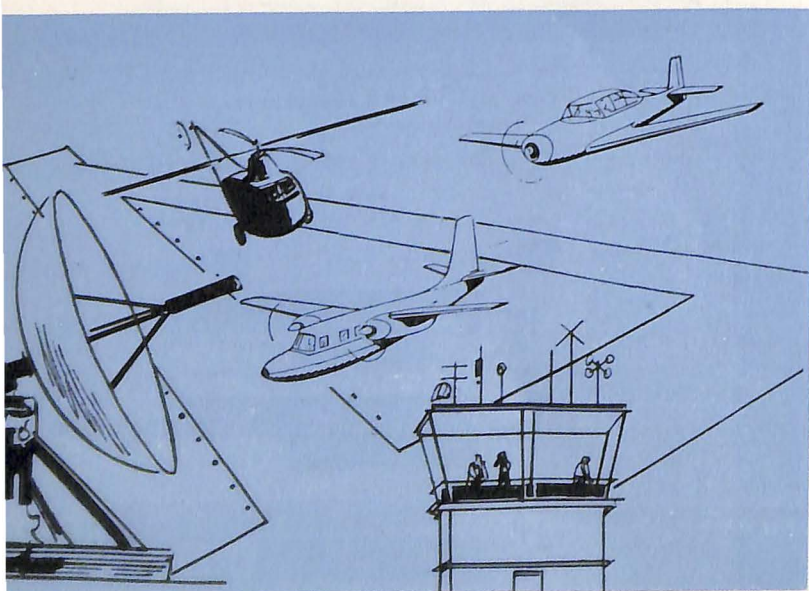
example, has seen some very important activities in fields of technical standards, radio frequency allocations and stability, maintenance standards proposals, and airmen physical standards, which have required detailed attention of the Council. These in turn, though approached by the UAC in a framework of Council interest as they affect the general aircraft industry, are also carefully coordinated by the UAC staff within the over-all Association activities and the routine work of the Association's different Service offices, as well as with other associations concerned with different general aviation fields.

Technical Standard Orders:

Technical Standard Orders (TSO's), which had been proposed in the aggregate by the Civil Aeronautics Board before the creation of the Federal Aviation Agency, have since been the subject of speculative and informal discussion between FAA and the Utility Airplane Council. FAA has made various proposals and has been increasingly active, particularly in suggestions involving electronic-navigation and communication equipments and electrical system requirements.

The FAA has advised the industry of its intention to require "approved" radio equipments for IFR operation. The general aircraft industry has pointed out to the FAA that IFR operations are now extensively conducted by general aviation with equipments

Federal Aviation Agency made major progress in 1959 in the certification of new aircraft and in improving the nation's air navigation and control facilities. FAA engineers and pilots last year certificated 3 new jet airliners, 17 general aviation aircraft and 5 helicopter models; the agency installed such aids as long-range radars, approach light systems and traffic control towers at the rate of one a day during the year.



which, though quite satisfactory, are not FAA-approved. Competent technical opinion within the industry, as well as very extensive and highly qualified pilot experience, indicates that the presently available fine equipments meet adequate requirements for IFR use within the FAA-ATC system. They are accurate and reliable and complement Air Traffic Control (ATC) system development.

The Council has represented to FAA that imposition of required standards (TSO's), even those of a minimal nature, will bring about no improvements in safety or operation that the industry would not itself achieve in its cultivation of the growing general aircraft market, but, on the contrary, would greatly complicate the industry's manufacturing processes and add unnecessary increments of cost.

Physical Standards of Pilots:

Last year the Utility Airplane Council conducted studies and submitted formal comments in two areas of FAA rulemaking activity concerned with the physical standards of private pilots. The first of these, more stringently and in a more detailed manner, established certain diseases and other physical impairments as diagnosis which would deny a pilot's license. The Council informed FAA they considered this rule change largely unnecessary. Though FAA did implement its proposal, subsequent changes have considerably modified their initial approach, and the most recent changes establish an appeal procedure within the Agency which did not previously exist.

The second FAA proposal was much more controversial. It demanded that an examination for a private license be given by an FAA-designated medical examiner. Previously, these examinations could be given by the family physician, utilizing an FAA form. The Utility Airplane Council opposed this vigorously in consonance with almost the entire general aviation community; however, the FAA has ordered this rule into effect.

FAA Radio Frequency Communication Channel Spacing:

FAA, in its efforts to improve the air traffic control service to all airspace users, has obtained five additional megacycles of spectrum space not previously available for air traffic control purposes. FAA now proposes to further divide this available communication channel spectrum by 50 Kc spacing in place of the 100 Kc spacing now generally prevalent, and to accomplish this change-over by 1 June 1963. This new communication spacing will require an airborne transceiver capable of 360 channel operation, an equipment considerably more costly than those presently used, and would also largely obsolete existing equipments.

Following these joint FAA-industry studies, the FAA revised their initially-proposed plan in a manner

which has largely answered the objections raised by our Council and the general aircraft industry.

The UAC feels it is essential that FAA continue to provide 100 Kc service, at least through 1968. Careful study by committees of the Council—in consultation with others, including highly qualified pilot experience, and consideration of the technical problems involved—satisfied the UAC that FAA can do this and, at the same time, adjust its ATC communications to provide service for those airspace users who, because of high altitude operation or some other reason, will be better served by 50 Kc channel separation at an earlier date.

The Utility Airplane Council was instrumental in bringing about joint study of this problem by a special committee, composed of the principal makers of general aircraft and of aircraft radio and electronic equipment.

Members of the UAC also participated in an FAA-industry conference called by FAA to discuss this problem. Although it is too soon to report an account of the outcome of these FAA-industry activities, the trend of evidence suggests a mutually satisfactory solution will be reached.

Radio Frequency Stability Requirements:

It is now proposed that the radio frequency stability of all airborne VHF radio transmitters shall be increased from .01% to .005%. If this were to be made a mandatory Federal Communications Commission requirement, it would obsolete many thousands of existing airborne transmitter equipments, and substantially increase the cost of new equipments. Council study reveals that the improvement, though technically measurable, is for all practical purposes negligible. The UAC finds this view to be in accord with those expressed by other segments of general aviation, as well as by the manufacturers of general aircraft radio equipments. The Council has called on the Radio Technical Commission for Aeronautics (RTCA) to make representations to the appropriate authorities that this stability increase is unnecessary and that, as such, it should be permissive and not mandatory.

FAA-Proposed Maintenance Standard Orders:

The FAA has proposed changes in the manner in which it conducts regulatory, supervisory, and inspection activities concerned with aircraft maintenance, and called a conference which was attended by the Customer Service and Parts Managers of the Utility Airplane Council member companies. The agenda supplied by FAA in advance of its meeting did not provide adequate background for advance consideration of the problems FAA felt existed and wished to discuss.

The FAA has made three proposals: (1) Maintenance Standard Orders would be established which would be mandatory in nature; (2) Maintenance Directives, to cover maintenance items now considered

to be temporary in nature, but which would be made mandatory and involve violation processes in event of non-compliance; and (3) Mandatory reporting of unsafe mechanical conditions by certificated repair stations (which is already in effect), all certificated mechanics and pilots.

The Utility Airplane Council is not in accord with these proposed actions for which FAA has so far been unable to provide a satisfactory explanation for their necessity.

The industry is proud of its service record. It operates through hundreds of dealers throughout the free world, thus giving the most widespread attention to good customer service practices. It is a factor which has made very substantial contribution to the growth of the industry.

Our industry feels that its thousands of customers—beneficiaries of the most excellent customer service system conducted by the industry, constantly being cultivated and improved—should not be saddled with unnecessary maintenance requirements imposed by the Federal Government.

General FAA-UAC Relations:

Though the Utility Airplane Council has opposed the FAA in certain of its proposals, there are many areas in which it has been in hearty accord. During the past year, FAA has made a number of changes to provide improvements to its Air Traffic System and in the rules related to air traffic operation. The Utility Airplane Council members in particular wish to compliment FAA on its efforts to free-up more and more airspace and recognize the needs of the general aviation pilot for higher ceilings for uncontrolled operations. The UAC also feels the FAA has made great strides in counseling and advising with the industry and the general aircraft user before instituting formal rule-making proposals.

Liaison Activities with the General Aviation Community:

The Utility Airplane Council and its staff work closely with the various segments of the general aviation community. The General Aviation Council (GAC), composed of ten different organizations active in some general aviation field, is a principal UAC activity. Its coordinated effort has been a frequent common spokesman for general aviation views and the UAC participates actively in the work leading to such joint decisions. Increasingly, the General Aviation Council is becoming the channel through which the FAA can most effectively communicate with general aviation and its diverse segments, and vice versa. The Manager of the Utility Airplane Council has served as the GAC's Secretary-Treasurer (a voluntary, uncompensated activity of the Utility Airplane Council) since the GAC was first organized several years ago. The UAC Chairman serves as a member of its Steering Committee.



AIA MEMBER COMPANIES



DIVISION A

Aero Commander, Inc.
Aerodex, Inc.
Aerojet-General Corp.
Aeronca Manufacturing Corporation
Aeronutronic, Division of Ford Motor Company
Aluminum Company of America
American Brake Shoe Company
Avco Corporation
The B. G. Corporation
Beech Aircraft Corporation
Bell Aerospace Corporation
The Bendix Corporation
Boeing Airplane Company
Cessna Aircraft Company
Chance Vought Aircraft, Inc.
Chandler-Evans Corporation
Cleveland Pneumatic Industries, Inc.
Continental Motors Corporation
Cook Electric Company
Convair, a division of General Dynamics Corporation
Dallas Airmotive, Inc.
Douglas Aircraft Company, Inc.
The Garrett Corporation, AiResearch Division
General Electric Company
 Flight Propulsion Division
 Defense Electronics Division
General Laboratory Associates, Inc.
General Motors Corporation, Allison Division
The B. F. Goodrich Company
Goodyear Aircraft Corporation
Grumman Aircraft Engineering Corporation
Gyrodyne Company of America, Inc.
Harvey Aluminum
Hiller Aircraft Corporation
Hoffman Laboratories, Inc.
Hughes Aircraft Company
Hydro-Aire Co., a division of Crane Co.
Jack & Heintz, Inc.
Kaiser Aircraft & Electronics,
 Division of Kaiser Industries Corporation
The Kaman Aircraft Corporation
Kollsman Instrument Corporation
Lear, Inc.
Lockheed Aircraft Corporation
MB Electronics, a division of Textron Electronics, Inc.
The Marquardt Corporation
The Martin Company
McDonnell Aircraft Corporation
Minneapolis-Honeywell Regulator Company
Motorola, Inc.
North American Aviation, Inc.
Northrop Corporation
Pacific Airmotive Corporation
Packard Bell Electronics
Pescio Products, Borg-Warner Corporation
Piper Aircraft Corporation
Radio Corporation of America
 Defense Electronic Products
Republic Aviation Corporation
Reynolds Metals Company
Rohr Aircraft Corporation
The Ryan Aeronautical Company
Solar Aircraft Company
Sperry Rand Corporation
 Sperry Gyroscope Company
 Vickers, Inc.
Sundstrand Aviation, Div. of Sundstrand Corporation
Temco Electronics and Missiles Company
Thiokol Chemical Corp.
Thompson Ramo Woolridge, Inc.
United Aircraft Corp.
Westinghouse Electric Corporation
 Air-Arm Division
 Aviation Gas Turbine Division

DIVISION B

AviQUIPO, Inc.
Bellanca, G. M.
Brinckerhoff, Wm. W.
Brukner, Clayton J.
Bush, Charles T.
Chambers, Reed M.
Condon, Cyril Hyde
DeSeversky, A. P.
Eggert, H. F.
Fales, Herbert G.
Hanks, Col. Stedman Shumway
Hotchkiss, Henry G.
Kahn, Roger Wolfe
Manufacturers Aircraft Assn., Inc.
McCarthy, J. F.
MacCracken, Wm. P., Jr.
Parker & Company
Scholle, Howard A.
Sikorsky, I. I.
Sullivan, John Dwight

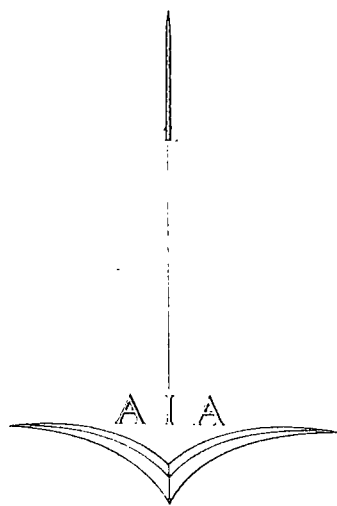
HONORARY LIFE MEMBERS

Loening, Albert P.
Loening, Grover

DIVISION OF AFFILIATE MEMBERS

Air Carrier Service Corporation
Aircraft & Missiles
Aviation Financial Services, Inc.
Aviation Week
The Babb Company, Inc.
Booz, Allen Applied Research, Inc.
Butler Overseas Corporation
Eastern Aircraft Corporation
Fulfillment Corporation of America
Grand Central Aircraft Company
Robert W. Johnson
Lund Aviation, Inc.
Lybrand, Ross Bros. & Montgomery
National Aviation Corporation
National Credit Office, Inc.
Robert Schasseur, Inc.
Shell Oil Company
Smith, Kirkpatrick & Co., Inc.
Space/Aeronautics
Texaco, Inc.
U. S. Aviation Underwriters, Inc.
Vickers-Armstrongs, Inc.
Robert L. Walsh
Edwin C. Walton
Western Aviation





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OF AMERICA, INCORPORATED
610 Shoreham Building, Washington, D. C.