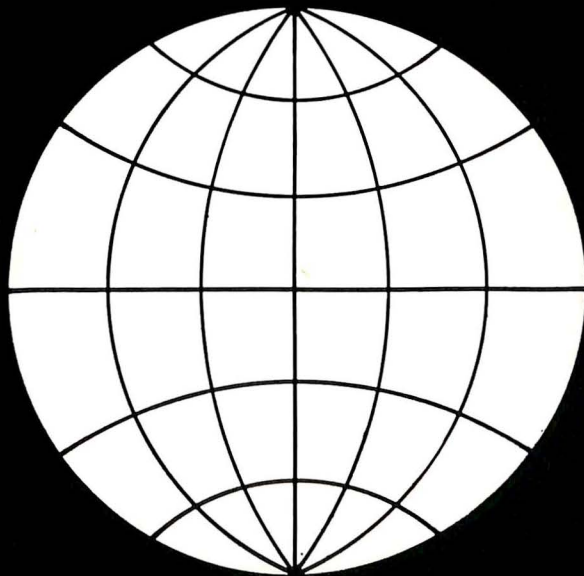


**1959 annual report**



**AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA INCORPORATED**



AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA INCORPORATED



## TO THE MEMBERSHIP



The fiscal year for this Association ended on October 31, 1959. This year has been both an important one in progress and a crucial one in its impacts on the aerospace industry.

In progress, the year was marked by impressive gains in air and space science and technology, and by fulfillment of the long-heralded jet age of air transportation. A number of important weapons moved from test to operational status. More successful explorations of space were accomplished, and the threshold of man-in-space projects was reached through research and through flight tests of a manned air and space vehicle. Significant gains also were made in aircraft and missile technology, including new tooling and manufacturing methods. Test status was reached in rocket engines far more powerful than any presently in use.

Great advances also were made in utility aircraft and helicopter improvements and sales, and in the development of new ideas in vertical and short-take-off-and-landing aircraft.

This year, as in the past several years, was marked by changes which deeply affect the constituted aerospace industry—changes born of the very progress which is being made in the development of weapons of almost cataclysmic potential. The rate at which changes are occurring in virtually every facet of endeavor is posing far-reaching problems for industry's management.

While solving many of the technological problems involved in the development and fabrication of new aircraft, missiles and space vehicles, equal success was not enjoyed in solving many of the other acute problems confronting the industry.

First are the problems confronting our major customer—the Defense Department—which industry must share directly or indirectly. Our military customer must continue to maintain an effective retaliatory

force made up, for the most part, of relatively conventional weapons. At the same time and as a result of rapid advances in technology, the defense establishment must support an unusually large research and development effort so that the greater performance capabilities inherent in new and advanced weapons can be realized at the earliest possible date.

To operate and maintain a tried and effective force-in-being is a costly undertaking. To compress into some five years the research and development efforts that normally would take perhaps twenty-five to fifty years is another extremely costly program. To endeavor to do both concurrently is a challenge of the greatest magnitude.

The military will be required to take greater calculated risks in making determinations as to the allocation of funds. They will be forced to earlier decisions that future programs will prove out. This means that projects of great future promise may have to be delayed to provide for an immediate capability. This, in turn, has varied and profound effects upon the industry members of the team.

Reduced weapons inventories of the missile era has brought a shift from mass production to precision fabrication of very limited quantities. One result of this is that more and more companies are competing for fewer and fewer contracts. Another result is that the need for an unprecedented degree of reliability in components has made precision fabrication more essential than ever before. This requires an extensive realignment of our labor force with a decline in the number of production workers and an increased requirement for engineering and technical skills. It necessitates high-cost machines which quickly could become useless as the result of an advance in our technology. It is pertinent to observe that the cost to develop one of our modern weapon systems could easily exceed the cost of producing the limited num-



ber of weapons that defense would require.

Thus, during this period, we are primarily devoted to research and development, rather than production effort. To meet and solve these problems, aircraft and missile manufacturers have made and are continuing to make radical changes in their organizations in order to cover the broad scope of aircraft, missiles, spacecraft, their propulsion systems, guidance and related equipments.

Reflecting the changing nature of the organization and activities of the companies who comprise this Association, the organization name was changed in May to Aerospace Industries Association. By definition, aerospace embraces research, development and production of manned and unmanned vehicles and their supporting equipment for movement above the Earth's surface, whether they move within the layer of atmosphere which surrounds our planet or above it.

Two other organizational changes were made to provide greater concentration of effort on specific activities. As a result of the rapidly increasing proportion of the defense dollar which is allocated for missiles—approximately 6.8 billion dollars in the current fiscal year, compared to 58 million dollars in 1947—the Guided Missile Committee of the Association, formerly a division of the Technical Service, was reorganized in June as a separate entity known as the Guided Missile Council. Previously, the Committee had concerned itself primarily with the engineering aspects of missile research and manufacture. The reorganization was made to afford the Council a scope of activity encompassing management interests in addition to engineering and manufacturing, and to give it increased stature in the Association. Thirty companies are represented on the Council, reflecting the wide participation of the membership in the guided missile field.

A Flight Operations Safety Committee also was established to develop and present industry's views on

policies and procedures governing the utilization of the airspace. The increasing use of modern, high-speed jets—both military and commercial—together with the increased usage of utility aircraft of all types, necessitated careful coordination of industry's need for adequate space in which to conduct its flight test operations without interfering with the activities of other airspace users. It is not generally realized that flight test operations also are essential for development of some missiles, guidance systems, and aeronautical equipment and components as well as for complete aircraft.

Therefore, industry participation in the solution of airspace problems is necessary in order that the Federal Aviation Agency may have available all the information it needs for proper evaluation of test requirements.

Typical of recent projects in which AIA members have made a major contribution are these:

1. The development of a new system for machining complex aircraft and missile parts which offers savings in skilled man-hours of 80 to 95 per cent. This system, called APT for Automatically Programmed Tool, employs a technique similar to the paper roll in a player piano. A high-speed digital computer calculates the data necessary to program the motions of a numerically controlled machine tool in cutting metal components. An example of the time and money savings made possible by this system is evident in the programming task for a wing rib shape, which requires 200 hours to program manually and only five hours by the APT method.

APT was developed as a joint effort by the USAF Air Materiel Command, Massachusetts Institute of Technology and technical representatives of 19 AIA member companies. It is now being refined for even greater productive efficiency under the management of the APT Project Coordinating Group of AIA's Nu-

merical Control Panel.

2. Preparation of an annual five- to ten-year forecast of engineering and manufacturing trends and requirements, a document which represents the combined thinking of industry's top specialists in design, production and materials. This important book serves as a guide to Government agencies in determining whether certain projects are feasible within a given time period, and it indicates to the Government, the aerospace industry and its allied industries, problem areas which will require increased attention and effort and future requirements for tools, equipment and materials. This forecast is a joint effort on the part of several AIA committees and subcommittees.

3. Preparation of a study entitled "The MILDDU Proposal" which, despite its unwieldy title, is an important contribution to the increasingly complex problem of logistic support. MILDDU is a program which would provide a universal standard for military-industry support data interchange, increase the accuracy of spare parts accounting, reduce over-purchase of spares and improve the speed and efficiency of providing needed spares at the right time.

The above are but a few examples of how AIA's work promotes more efficient defense programming and production. Daily, the 1900 members of the 42 committees are studying present and *anticipated* problems in *hundreds* of areas. The data assembled by

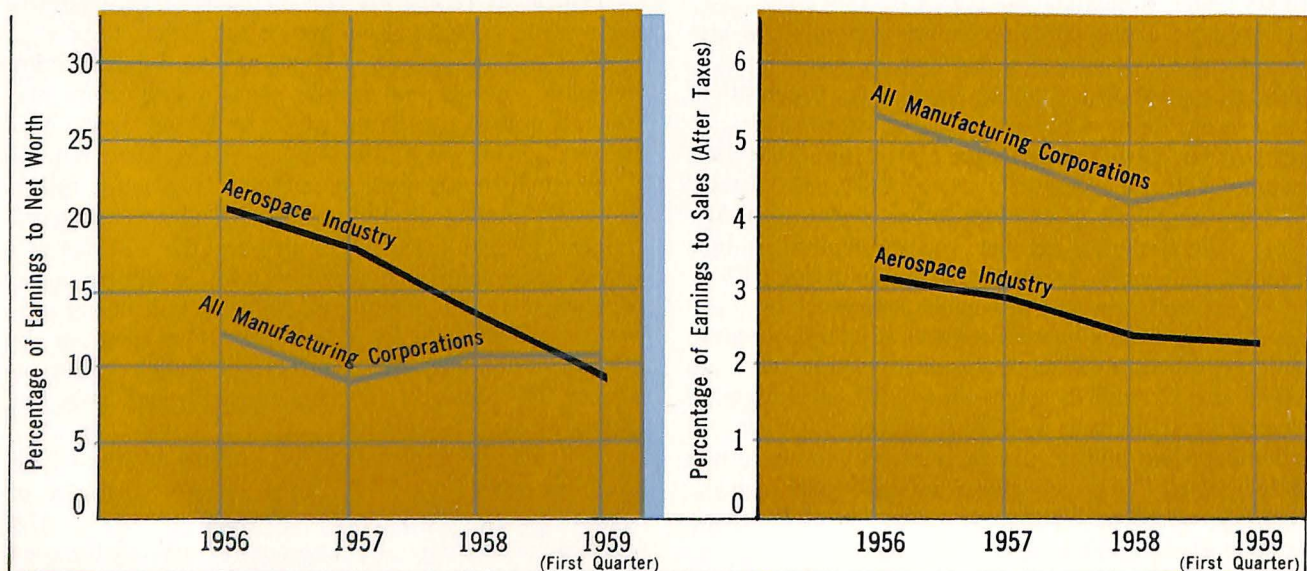
these committees are prepared for or made available to the Department of Defense, the Army, Navy, and Air Force, the National Aeronautics and Space Administration, the Federal Aviation Agency and other interested governmental agencies. Collectively, the results of this unheralded "pick-and-shovel" work produced a fount of knowledge of inestimable value to the Nation's aerospace programs.

### General Aviation:

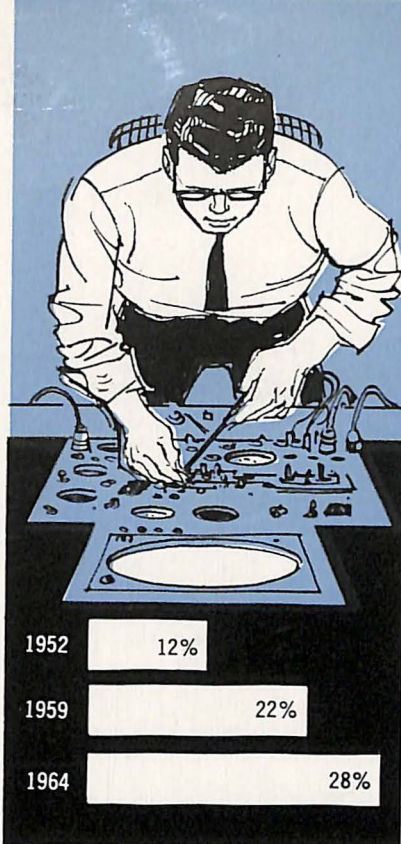
One of the brightest spots in the aerospace picture is the increased acceptance of small aircraft for business and utility purposes. The five-year period, 1954-1958, has seen the production and sale of such aircraft more than double, reaching 6,414 units valued at approximately \$135,000,000. This trend has continued during 1959. In the first nine months, the industry has delivered approximately 5,600 units having a retail value of \$128,000,000, compared to 4,725 units valued at \$102,000,000 delivered in the same period last year.

To offset this promising trend is the shortage of landing areas for the utility aircraft fleet. This creates two immediate problems: 1. the denial of the air age to those places which are not now air accessible; and 2. increasing congestion, both on the airport itself and, in the light of present thinking about the congested airspace, in the airspace itself.

*The earnings rate of aerospace companies comprising the aircraft and parts industry—measured against both net worth and sales—continued to decline in the first quarter of 1959, following the trend of the previous three years. The rate of earnings on net worth has dropped from 20.3 per cent in 1956 to 8.8 per cent in the first quarter of 1959, well below the average for all manufacturing corporations. These companies show only a slight change from 12.6 per cent in 1956 to 10.6 per cent in the first 3 months in 1959. The ratio of earnings to sales of aerospace companies has dropped steadily from 3.1 per cent in 1956 to 2.3 per cent in 1959. All other manufacturing changed from 5.2 per cent in 1956 to 4.5 per cent in the first quarter of this year.*



Source: Federal Trade Commission  
Securities and Exchange Commission



*The demands of a rapidly expanding technology have created increasing requirements for engineers in the aircraft and missile industry. In 1952, about 12 per cent of all employees in the major aircraft companies were engineers. Today, approximately 22 per cent are engineers, and it is estimated that this will increase to about 28 per cent in the next five years.*

### **The Helicopter Industry:**

The developers and producers and operators of helicopters are another rapidly growing element in our total aviation picture. In addition to the increased usage by military operators, widespread acceptance of the helicopter as a profitable commercial transportation vehicle is increasing. One of the major handicaps to the progress of Nation-wide helicopter acceptance is the restrictive local regulations which impede the full utility of the helicopter's potential. Every effort is being made by the Helicopter Council to assist and cooperate with cognizant branches of Federal, state and local government to advance heliport and helistop planning and to assist in the development of proper regulations which will increase helicopter usage. It is especially important that steps be taken now if the full potential to be derived from the application of jet propulsion to the helicopter is to materialize during the next few years.

### **Aviation Export:**

Despite a decline for the third consecutive year, exports of aircraft and other aeronautical products continue to represent about nine per cent of the total U. S. export of finished goods. Two elements largely responsible for the 1959 decline are: 1. the slowdown in this Nation's military assistance programs, and 2. the declining market for larger piston-engined aircraft. Military aid, in the aviation categories, has been declining rapidly, while shipments of piston-engined transports have slowed appreciably pending deliveries of turbine-powered units. On the brighter side, exports of turbine-powered transports during 1960 are estimated at \$550 million as compared with \$133 million for 1959.

In this area, one of the knottiest problems facing the industry and the Government is the disposal, largely through export, of several thousand used, multi-engined, transport aircraft during the next several years. The Association is continuing its efforts to make this possible without disruption of major world markets for new equipment.

During the last session of Congress, the Association testified on various proposals which would affect our capabilities and endorsed that legislation which we felt would better enable the industry to execute its responsibilities. The Association testified in connection with the extension of the Renegotiation Act of 1951. It submitted a statement presenting the industry's position on various bills to change the basic procurement law. The Administration-sponsored measure to provide indemnification against hazardous risks was endorsed, and amendments to the National Space and Aeronautics Act which would make the patent provisions of this Act parallel the policies and procedures of the Department of Defense were urged. A careful review of the Government's depreciation policies for tax and contract pricing purposes was recommended. In the regulatory field, recommendations were made with regard to the definition of the aircraft industry—currently subject to Labor Department review under the Walsh-Healey Act.

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, rockets and engines, 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 and missile 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.

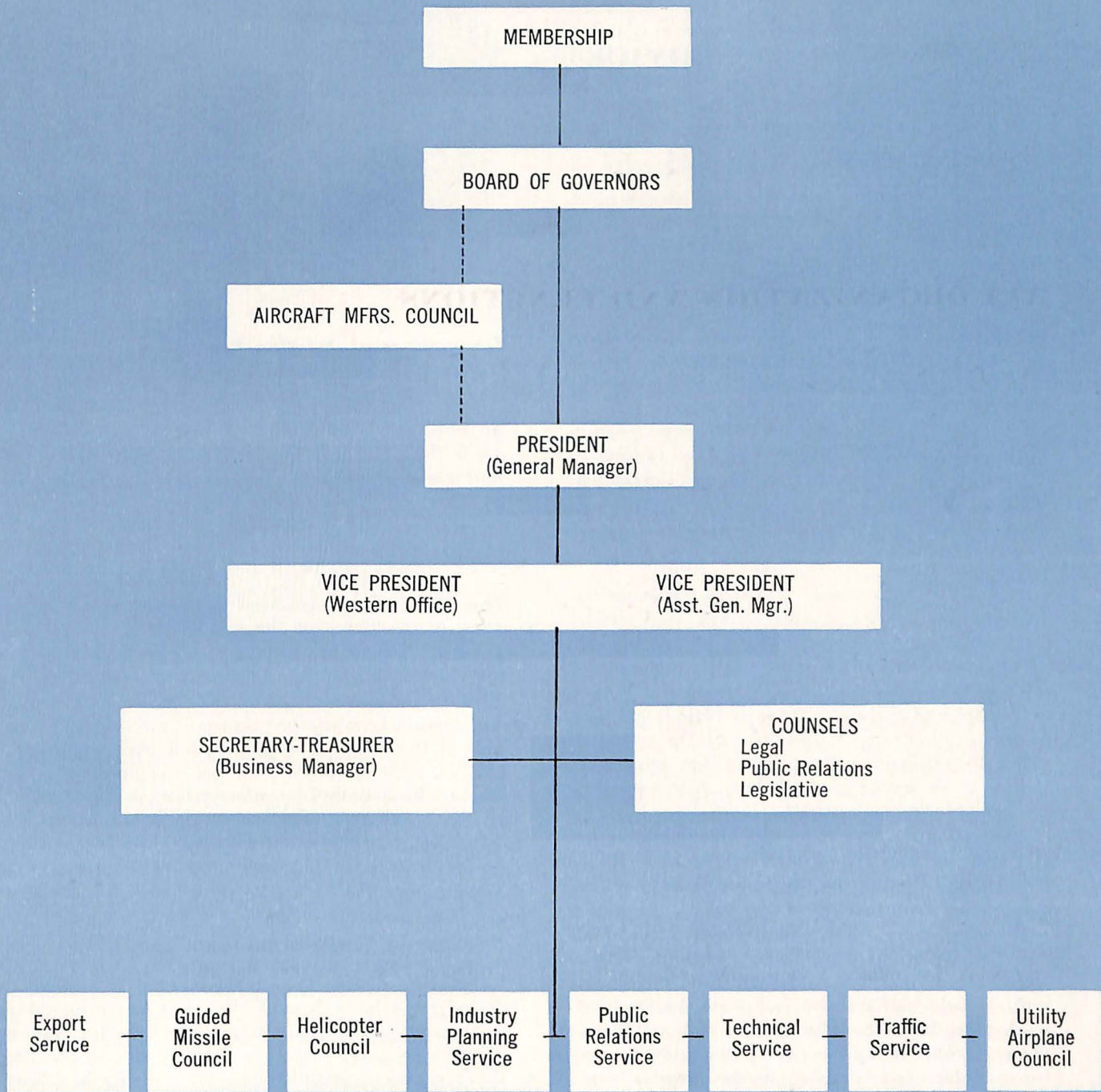
Policy direction of the Association's activities is vested in a Board of Governors which is composed of the chief executive officers of various member companies. Under this policy, AIA activities are carried on by committees and councils representing every

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 five Services, three Councils, 17 main Committees, and 20 Subcommittees, 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 interests of the Association are banded under councils, each of which has staff service.

AIA is made up of 117 members, including 72 voting members and 45 affiliates.

Chief executive officer is the President, who also is General Manager, while a Vice President performs the duties of general manager of the Western Region office at Los Angeles. The eight AIA 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 and financial matters.







## EXPORT SERVICE



**L. E. TOLLEFSON**  
*Douglas Aircraft Co.*  
*Chairman, Export*  
*Committee*

Export Committee  
Export Advisory Committee  
Finance Committee  
Military Aid Committee  
Military and Civil Liaison  
Surplus Disposal Committee

The AIA Export Service, with a world-wide sphere of interest, works through its Export Committee organization in coping with export problems—both governmental and private. Through various avenues of communication, Export Service receives information primarily concerning the political and economic activities in 76 countries which bear upon the interests of American aviation export.

Illustrating the broad scope of this operation is the fact that, during the first nine months of 1959, some 250 selected items from 73 political areas were circulated to AIA members.

During the past year, sharp scrutiny has been focused on foreign aviation markets, including the local and international influences affecting them. Areas under continuous study include: the background of market developments in respect to regional economic alliances; the increasing trend in product licensing, foreign plant and other equity investments abroad; Government export subsidies, extraordinary financing and other kindred situations. The international aviation information service, developed by the AIA Export Service over a period of forty years, has achieved the capability to service, virtually "off-the-shelf," any question of a non-security or non-competitive nature that may be raised regarding aviation markets in any part of the export world.



### ***Importance of Aviation Exports to National Economy:***

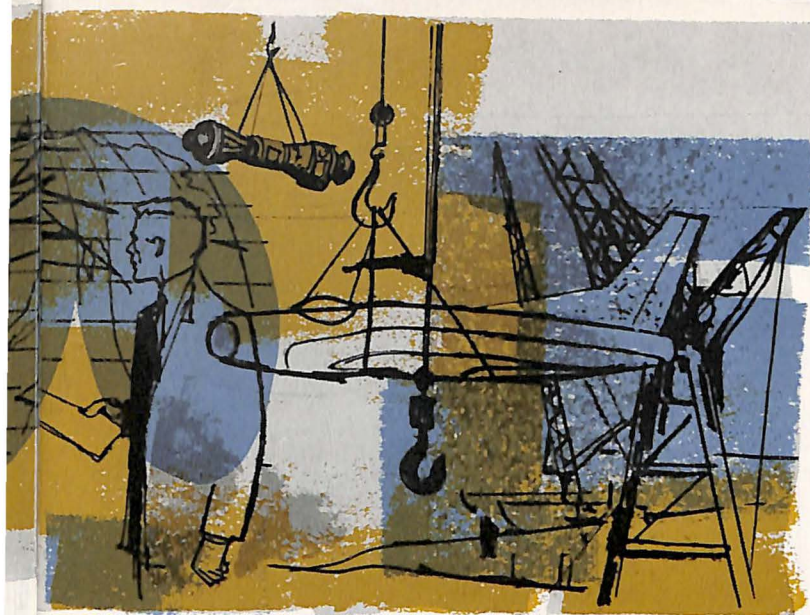
The export of aviation products continues to make an important contribution to the national economy. Since the close of World War II, exports of aircraft and other aeronautical products have aggregated over \$16 billion. During 1958, these exports represented about 9 per cent of the total U. S. exports of finished goods.

During 1959—for the third consecutive year—aviation exports have continued to decline, reflecting the effect of the transition through which our industry is passing. Two of the leading elements responsible for the decline in our exports are: the slowdown in our military assistance program, and the declining market for larger, piston-engined transport aircraft. Military aid, in the aviation categories, has been rapidly declining, while shipments of piston-engined transport aircraft have slowed up appreciably pending delivery of the turbine-powered units. It is estimated that 1959 export of the new transports (with spares) will be on the order of \$133 million, with about \$550 million scheduled for export in 1960.

### ***Serving the National Interest:***

Activities of the Export Service and its committee organization have through the years become increasingly important to the national interest. Not only do aviation exports contribute substantially to the Nation's economic stability, but they are equally beneficial in contributing to our national prestige and international relations generally. In this regard, a very comprehensive and effective program of mutual understanding and assistance in matters of international trade and relations has been developed between the aviation industry and the Government.

The Export Service works closely with the Departments of State, Commerce, Defense, and other Gov-



ernment agencies concerned with international trade, defense and political affairs. By no means the least of these mutually beneficial endeavors is the fact that, through the Aerospace Industries Association, export executives of the industry have addressed eight successive classes of U. S. Air Attache-designees during the past year. These lectures, dealing with non-competitive, basic developments in world aviation, are a regular feature on the curriculum of the Air Attache classes.

All facets of world conditions having a bearing on aviation export trade are continually studied, discussed and mutually considered with appropriate Government officials.

#### ***AIA Approach to International Trade Problems:***

In Export Service operations involving problems of international trade, proposed projects must meet the following criteria: 1. projects must be of a non-competitive nature (as between U. S. companies), and of sufficient and broad concern to the industry; 2. projects must be consistent with and in furtherance of the national interest; 3. industry members, with appropriate personnel—and with the Government, where needed—must join with AIA Export in diligently pursuing each mutually approved project to an ultimate conclusion; 4. the project must not duplicate action by any other trade association group which sufficiently meets the requirements of the aviation industry; and, 5. all important matters proposed for industry-wide handling must be considered by the Advisory Committee and, if approved, referred to one of the four working committees for study and recommendation to the Export Committee for appropriate action.

The Aerospace Industries Association's Export Service and its Export Committee, representing 38 manufacturing members active in foreign trade, give major

attention to projects essential to industry's export progress through its working committees:

#### ***1. Export Financing***

Efforts of this committee are directed toward aiding industry in securing better terms from the Export-Import Bank, as well as increasing the awareness and understanding on the part of commercial banks and insurance companies of the international financing requirements of the industry.

#### ***2. Export Licensing and Related Security Clearances***

At mid-year 1959, the export licensing of all civil aviation products and related technical data was transferred from the Department of State to the Department of Commerce. However, the Department of State retained the licensing authority with respect to military aviation materiel and data. As a result, many complications arose which, through industry-Government consultations, are being progressively straightened out. The intensive Military Aid Committee activity in this area also has accomplished much in facilitating our industry's overseas operations. The Committee works in areas where the agencies of other governments consider prompt export release and licensing of their native aviation product a *service* their manufacturers have a right to expect.

#### ***3. International Aviation Liaison***

The Military and Civil Liaison Committee concentrates its efforts on maintaining cooperation with the national aviation manufacturers' trade associations in Canada, Great Britain, France, Germany, Italy and Japan. Similar continuing liaison is fostered with the Military and Civil Air Attaches of other "Free World" countries. Numerous foreign air force missions on official tours of the U. S. are honored and assisted by the Export Committee.

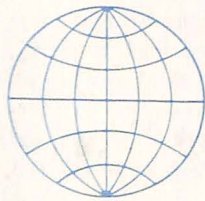
#### ***4. Orderly Marketing of Piston-Engined Transports***

Cooperation with Government agencies in devising a program for the timely and effective distribution of surplus civil and military air transports is a primary effort of the Surplus Disposal Committee. The disposal, largely through export, of several thousand used, multi-engined, transport aircraft during the next three or four years, without disruption of major world markets for new equipment, is of great concern to our industry, the airlines, and our Government. Through the efforts of the AIA Export Service, the Departments of Commerce and State and the FAA have launched a project whereby the first *Free World Census of Civil Aircraft* will be published by December 31, 1960.

These are typical examples of the teamwork of Government and industry in accomplishment of tasks that are in the interest of the Nation and of industry.



## GUIDED MISSILE COUNCIL



For the past fifteen years, the aircraft manufacturing industry has been undergoing a transition. From an industry devoted entirely to aircraft manufacture up to the time of World War II, it moved into the missile field in the years following the war, the new assignment increasing in proportion to the total workload with every passing year.

Due to the rapidly increasing demands placed upon this phase of Aerospace Industries Association activity, the Guided Missile Committee of the AIA, formerly a division of the Technical Service, was reorganized in June as the Guided Missile Council. The move was made to afford the Council a scope of activity in keeping with the greatly expanding progress in this area of industry endeavor.

Previously, this division—operating as a function of the AIA Technical Service—concerned itself primarily with the engineering aspects of missile research and manufacture. The reorganization permits the Council to encompass all management interests relating to guided missile manufacture, including engineering aspects of the industry.

Thirty manufacturing companies have membership on the Council thus reflecting the wide participation by our companies in the fields of guided missiles and space vehicles. The Council, having both large and small companies as members, represents a true cross-section of industry and thus is in a position to speak authoritatively on matters concerning guided missiles and space vehicles.

The average guided missile contains more than 300,000 intricate parts. Failure of a single part which might cost but a few cents could mean the failure of a multi-million dollar missile system. The missile, once it leaves its launching site, must work perfectly.

As a result, guided missiles have been developed in



**E. P. WHEATON**  
*Vice President,  
Douglas Aircraft Co.  
Chairman, Guided  
Missile Council*

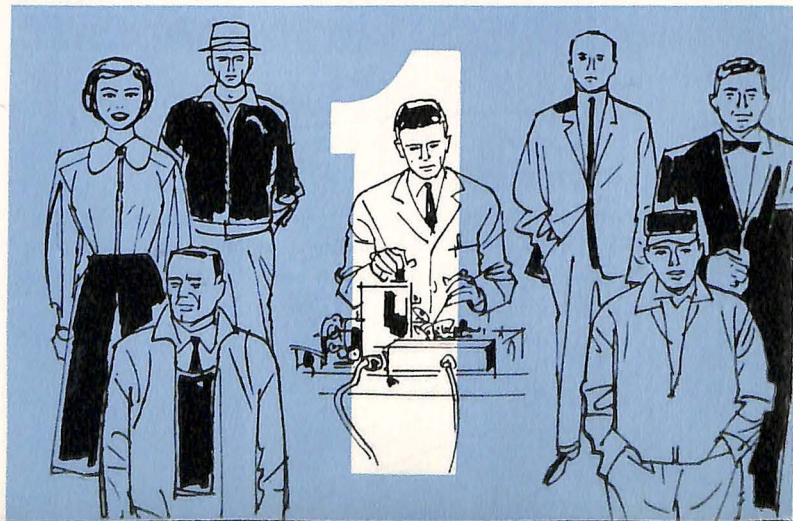
keeping with the "weapon system" concept. This includes early warning networks, search radars, effective communications, ground control, logistics support and facilities, and so on.

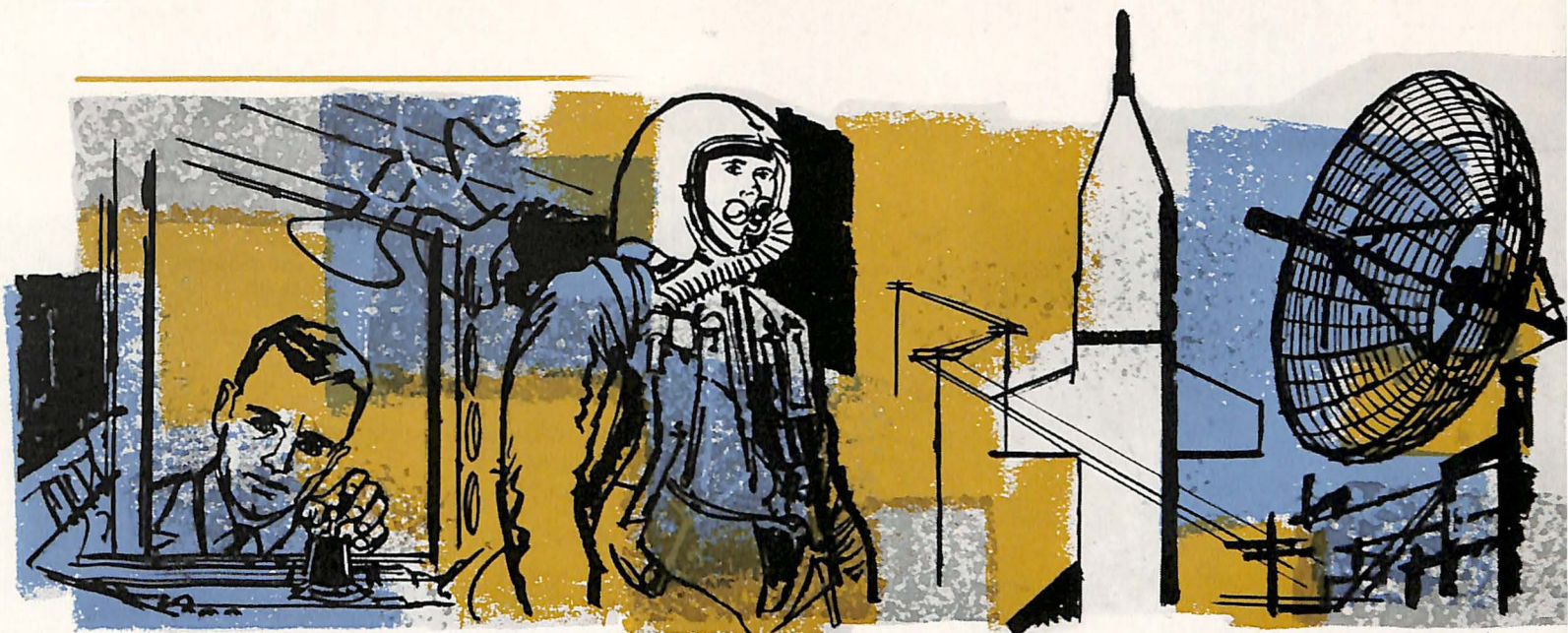
To encompass this great new field, the aerospace industry has had to revolutionize its manufacturing methods. Equipment of the type carried in guided missiles is subjected to fantastic environmental conditions. Accelerations, vibrations, heat stresses and strains are of an order never encountered by any other device created by man. These environmental conditions have led the aerospace industry to manufacturing methods, assembly, and testing techniques that are completely new.

### **Reliability:**

Continuing efforts were made by the Guided Missile Council to advise the Department of Defense concern-

*USAF's ballistic missile programs are supported by an aerospace industry team of more than 100,000 people of which one out of every seven is a scientist or a technical expert. Annual expenditures for these projects are about \$2 billion.*





ing the industry's views on the effectiveness of the Department of Defense Reliability Monitoring Program. These views are to the effect that, although the DOD document was welcomed as a policy guide, reliability prediction to a statistical, defensible accuracy cannot be made to the degree implied in the DOD document.

#### ***Exchange of Information on Testing Components:***

In order to effect a saving in time required for development of missiles and a saving in funds to the Government, the Guided Missile Committee requested that the Department of Defense concur in an industry plan for the voluntary exchange of information on testing of unclassified guided missile components which have proved satisfactory.

Although a congressional report pointed up the desirability of increased exchange of information on guided missile matters, the Department of Defense tabled our industry recommendation. It was stated that, pending the results of a DOD study of the problem as related to the ballistic missile programs, they were not in a position to approve of or concur in our proposal.

#### ***De-briefing of Contractors Following Loss of Contract Award:***

The Council has urged the Department of Defense to establish appropriate policies to insure de-briefing of contractors, on an individual company basis, following the loss by that company of any major contract award.

The Council bases this recommendation on the experience of companies who, on being given an occasional de-briefing (following the award of a contract to a company other than theirs), found it to be of

considerable benefit. Because of general interest in this connection, many companies with prime missile contracts are currently following the practice of holding de-briefing sessions with their potential subcontractors who have lost a subcontract award.

#### ***Bio-Astronautics:***

During 1959, at the request of the Armed Forces-National Research Council Committee on Bio-Astronautics, the Guided Missile Council participated in the effort to improve availability of information concerning organizations, key individuals, or groups of people who are engaged in work in the field of bio-astronautics.

#### ***Air Force Training of Ballistic Missile Personnel:***

At its request, assistance was given to the Air Force Training Command, which is studying the most effective methods of training Air Force personnel for operation of Intercontinental Ballistic Missiles.

#### ***The Space Age:***

Although the member companies represented on the Guided Missile Council are already very active in all fields of space activity, the "young" space age has not yet produced a significant impact on the overall aerospace industry manufacturing complex insofar as total product is concerned. It appears that space work will reach significant proportions in a relatively short time, although it is still too early to predict what proportion of the industry's total product space projects will eventually assume. Guided missile research, development and production will continue to occupy the major portion of industry's attention in this area for some time to come.



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



**WM. M. TODD**  
*Lockheed Aircraft  
 Corporation  
 National Chairman  
 Industrial Security  
 Committee*



**J. D. ESSARY, JR.**  
*Boeing Airplane Co.  
 National Chairman,  
 Industrial Relations  
 Advisory Committee*



**JOHN J. ROSCIA**  
*North American  
 Aviation, Inc.  
 Chairman, Procurement  
 and Finance Committee*



**SIDNEY G. FABER**  
*Kollsman Instrument  
 Corporation  
 Chairman, Patent  
 Committee*



**H. A. WADSWORTH**  
*Bendix Aviation Corp.  
 Chairman, Service  
 Publications Committee*



**R. F. MOORE**  
*Boeing Airplane Co.  
 Chairman, Spare Parts  
 Committee*

**Government Reports Committee**

- Data Processing
- Facilities Reporting, Policy, and Procedures
- Program Progress Reporting

**Industrial Security Committee**

**Industrial Relations Advisory Committee**

- Safety
- Wage and Unemployment Insurance Committee
- Training Directors
- Employment Managers and Selective Services

**Procurement and Finance Committee**

- Contract Cost Principles
- General Research Costs
- Procurement Legislation
- Patent Provisions of the Space Act
- Responsibility for Supplies
- Uniform Subcontract Clauses
- Depreciation
- Settlement of Terminated Contracts
- Indemnification Against Nuclear & Other  
 Unusually Hazardous Risks
- Technical Data and Proprietary Rights

**Patent Committee**

- Technical Data and Proprietary Rights
- Procurement Regulations of the Space Adminis-  
 tration

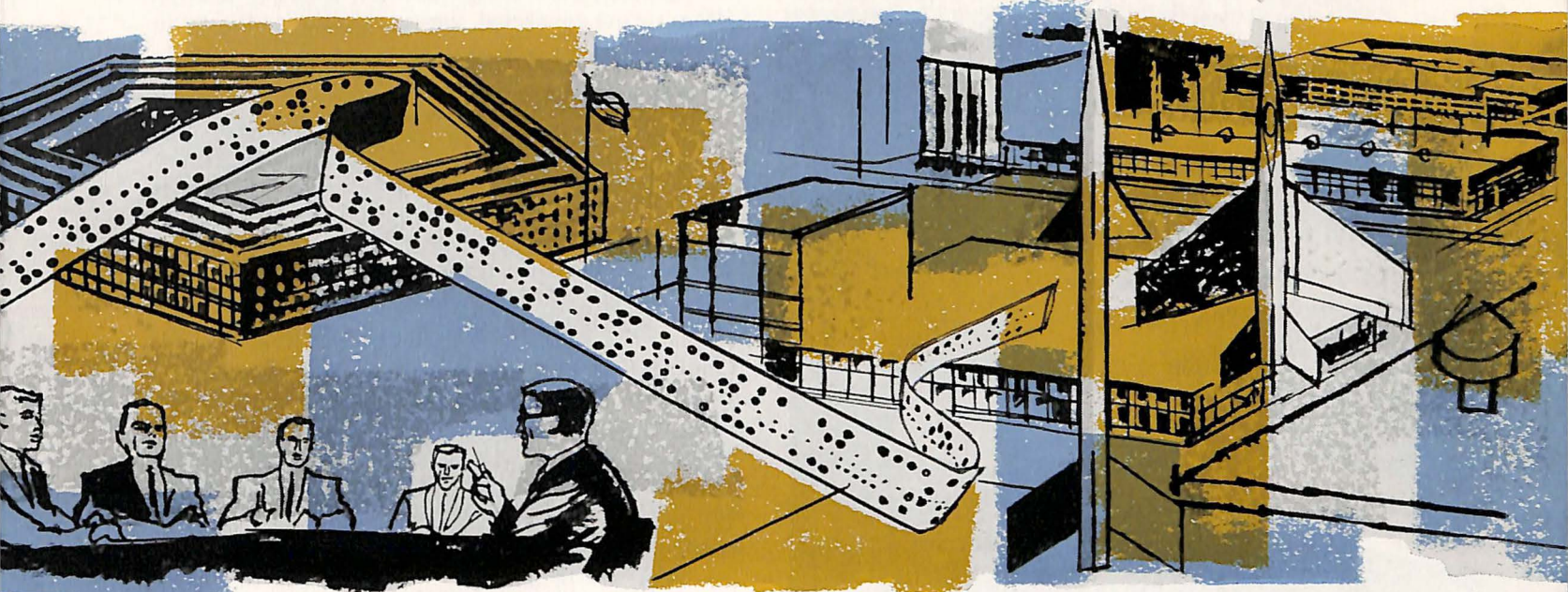
**Service Publications Committee**

- Maintenance of Missile Weapon Systems
- Illustrated Parts Breakdowns for Aeronautical  
 Articles
- Vendor Handbook Revisions and Changes for  
 Air Force
- Vendor Handbook Revisions and Changes for  
 Navy/BuAer
- Retroactive Changes Procedures of the Services
- Technical Manual Standardization
- Data Processing of Handbook Formats
- ATA Service Publications Specification ATA-100
- Simplification of Flight Handbooks
- Guide for Preparation of Air Force Technical  
 Orders

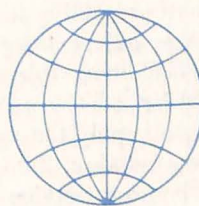
**Spare Parts Committee**

- Federal Cataloging
- Vendor/Prime Contractor Design Change Data  
 Coordination
- Logistics Study Group
- Spare Parts Provisioning Policies and Documents
- Ground Support Equipment Provisioning Docu-  
 ments
- Replacement Parts Sales Problems
- Parts Breakdowns for Aeronautical Articles





## INDUSTRY PLANNING SERVICE

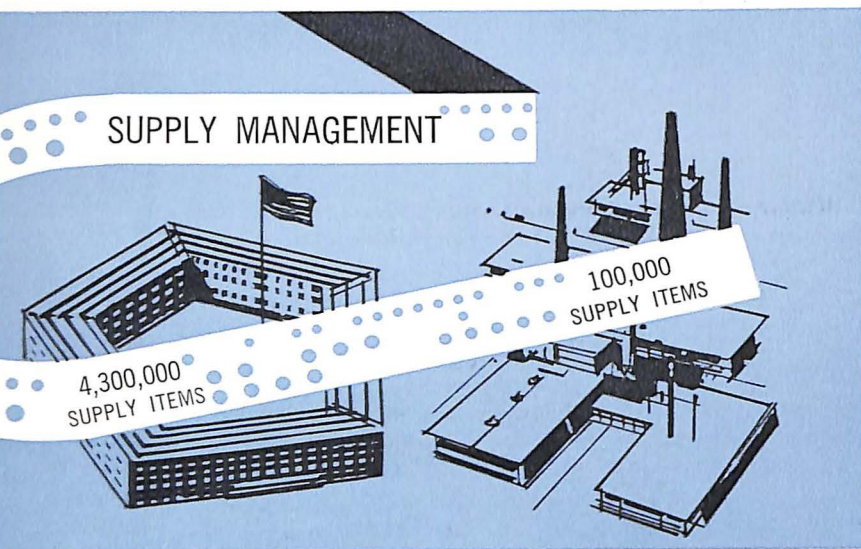


The committees of the Industry Planning Service serve as a liaison between the policy-making and regulation-drafting offices of the military services on the one hand, and the large and complex aircraft, missile and engine manufacturers on the other. The committees, by direction, are precluded from any individual company's negotiations with a military procuring service regarding a specific contract. During the contracting procedure, when dates, quantities, and prices are bargained out between a company and the military buyer, many of the general terms of the contract *are not subject* to negotiation. The military buyer automatically includes in the contract certain so-called

"boiler plate" provisions specified by military regulations or statutes.

These general contract terms and conditions, at the time they are drafted for inclusion in procurement regulations, *are* of primary concern to the committees of the Industry Planning Service. The effect of procurement regulations upon companies competing for military contracts is felt directly upon internal company operations, as are many Federal statutes and Federal Government Regulations. But, unlike those Federal Regulations which are required to be published in the Federal Register before they become effective and which are subject to the protections afforded to the public and industry by the Administrative Procedures Act, the procurement regulations may

The Department of Defense carries 4,300,000 different supply items in contrast with the 100,000 items carried by a large mail order house. The Aerospace Industries Association, in cooperation with the military services, has developed a plan of logistics information exchange, utilizing electronic data processing equipment, which will reduce costs and increase the efficiency of managing the huge Defense Department supply programs.



be issued without the “notice and hearings” processes specified in the Administrative Procedures Act.

A primary committee responsibility is to ascertain what new regulations, or revisions to existing regulations, are being considered or drafted. Next, a function of each Industry Planning Service committee is to find ways and means of presenting the industry view to the agency responsible before the new or revised regulation is issued. Following this, industry must then determine the nature of the advice, facts and projections with which to supply the agency involved.

In organizing industry opinion, the committees and staff of the Industry Planning Service clearly can do a job that no individual company representative can do. While each company has a voice in the opinion eventually furnished to the Government, the advice emanating from the Association—collectively and impartially devised—is more properly considered.

When a military office is interested in industry’s viewpoint, pinpointing the company experts among the three-quarters of a million aircraft and missile company employees is a unique function of Industry Planning Service committees. That the committees have brought specialized industry executives together with their opposite numbers in the military, with mutually beneficial results, has often been testified to by the Secretaries of the military departments.

The suggestions of the company experts, summarized and generalized as industry recommendations,

of course, are advisory only to the military services. In the descriptions of the work of the individual committees that follow, results of many hours of industry effort are not delineated, inescapably, due to the nature of the efforts.

#### **Maintenance Support:**

AIA groups together its services which contribute to maintenance and support of missiles and aircraft, their propulsion systems and their accessories. Activities of the committees in the areas of spare parts, service publications, field service, support equipment, contract maintenance, training aids and training equipment, because of their co-relationship, are organized under Maintenance Support in Industry Planning Service.

#### **Spare Parts Committee**

The Spare Parts Committee, with a membership of approximately 120 managers and assistant managers of spare parts departments, represents all segments of the industry. It operates under a system whereby small ad hoc panels, representative of interested segments of the industry, are established to undertake the solution of individual problems, make recommendations to the Committee and cease operation after action has been taken. Within the Committee, there are presently seven ad hoc panels actively engaged in twenty projects.

For more than fifteen years, this Committee has worked with the military services, assisting in the development of procedures for the selection and ordering of spare parts, special tools, test and ground handling equipment and training aids and training equipment. The Air Force, for example, has reported that although weapon system support has increased considerably, there has been, nevertheless, a reduction in spares from 43% of the aircraft program in the beginning of 1952 to 23.5% in 1959. Committee contributions toward this accomplishment have been of major significance.

During the semi-annual meetings of the Committee, arrangements are made for the military service representatives to explain their policies, plans and problems to the members. These meetings provide valuable opportunities for contractors and suppliers to receive firsthand policy information from the services. With this knowledge, industry is able to comply with military requirements expeditiously and accurately.

*Provisioning Procedures:* The Committee continually participates with the Air Force and Navy in revision of their individual procedures for selecting and ordering spare parts and ground support equipment. Emphasis in these activities, during the past year, has been directed toward increased simplification and adaptability to mechanization of data handling.

At present, the Committee is reviewing ballistic missile support procedures in an effort to resolve problems experienced by contractors. Participation by Committee members in the preparation of ballistic missile spare parts provisioning manuals will increase during the next year.

The Committee members have also worked with the Air Force in mechanizing paper-work handling of spare parts design changes. Adoption of this procedure enables a contractor to have a continuous, mechanized spare parts documentation from initial selection of spare parts to eventual shipment and invoicing.

*Identification of Parts:* The Committee has been working with the military services in a combined program of education and improvement in identifying assemblies, such as landing gear actuators, which may be used interchangeably even though some of their component parts may differ. The incomplete identification of such parts causes supply and maintenance problems when adequate inventories of the different

*The aerospace industry today is developing space probe vehicles which require thrust levels as high as 6 million pounds. An indication of the heat energy problems involved in launching this vehicle is shown by the fact that in bringing the vehicle to an altitude of 50 feet above the launching pad, enough heat is generated to boil away 10,000 gallons of water.*



component parts are not available. As a result of Committee recommendations, the Air Force has instituted an educational program looking toward proper identification of parts which maintenance people turn in for repair.

*Cataloging of Parts:* As new weapon systems with many new parts and technological improvements in existing items are brought into the Federal Cataloging System, there is need for greater utilization of this system in procurement procedures. The Air Force has invited participation by the Committee—and has acted on its recommendations—in developing procedures for prescreening contractor part numbers against existing catalog items to avoid unnecessary ordering of parts and data.

*Military/Industry Logistics Study Group:* One of the current contributions of the Committee is the work that it has spearheaded with the military services in development of a system for daily transmittal of spare parts logistics information. The system would use compatible electronic data processing machines between the military services and the contractors. This system is expected to eliminate much of the present paper-work burden as well as contribute materially to the in-service availability of industry's products; assure better control of spare parts; reduce the human error factor in posting records; and thus, assure substantial dollar savings.

#### **Service Publications Committee**

Service publications are written by this industry to cover the operation, test, launch, maintenance and overhaul of the Nation's aircraft, missiles, components and support equipment. The ever-increasing complexity of weapon systems demands continual improvement in the state of the handbook art in order to keep instructions simple and handbooks of usable size. The Committee, comprised of 85 service publications managers, has taken the lead in initiating various improvements, in addition to providing the military services with requested advice on the revision of existing specifications.

*Maintenance of Missile Weapon Systems:* Missile systems demand new types of technical manuals not previously required for aircraft. New ways are also needed of segregating the voluminous instructions into portions applicable to individual jobs. Requirements for publications governing operational and organizational maintenance of missile weapon systems are being studied by the Committee through 1) the review of proposed specifications, and 2) participation in the study of surveys conducted by the Air Force with the assistance of contractor representatives.

*Standardization of Technical Manuals:* With more standardization of requirements by the military service, technical manuals could be made for less money and could be used more interchangeably than at present. A study showed that in the area of handbook



format, style and material only, there are over twenty basic specifications plus many directives and interpretations which the industry must follow. Many other specifications govern technical content. The Committee recently developed an audio-visual presentation which was made to the Department of Defense, outlining an approach to standardization of requirements for manuals and stressing the need for holding the line against additional complications. Indications are, as a result of this presentation, that a DOD project to standardize manual specifications will be undertaken.

*Vendor/Prime Contractor Handbook Relationships:* Under the weapon system concept, some handbook data previously supplied direct to the military services is now channeled through the prime contractor and included in all weapon system manuals. The Committee has developed recommendations to the military services and industry, including: procedural shortcuts; time-phasing of negotiations steps; uniform interpretation of specifications; and, initial advice of requirements to vendors.

#### ***Industrial Relations Advisory Committee***

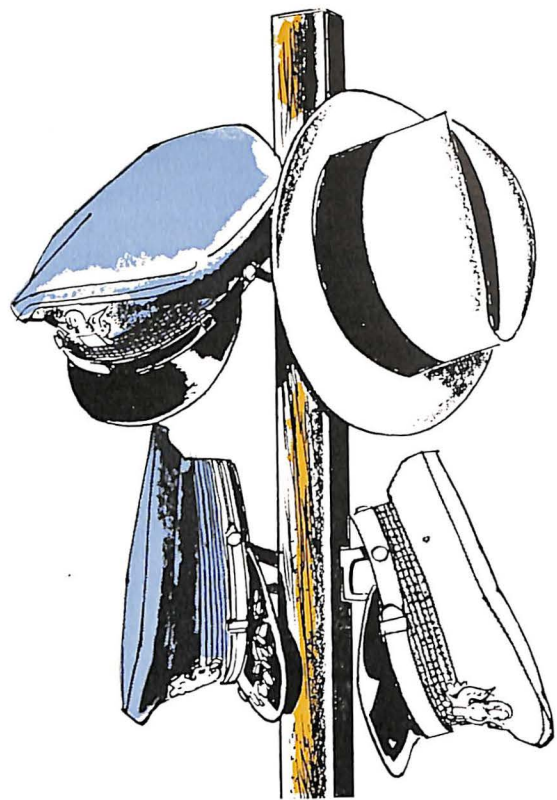
The Committee, during the past year, has been chiefly concerned with presenting to the Wage-Hour and Public Contracts Division of the Labor Department, information and views in connection with the new minimum wage re-determination for the aircraft industry. These briefs, with supporting statistical data, have been submitted in support of the "definition" of our industry, as agreed upon by this Committee. A recent, tentative decision by the Labor Department to exclude military electronics from the definition is now being protested. Efforts are being made to have this decision reversed.

#### ***Industrial Security Committee***

As it has done since its formation, the Security Committee and staff work closely with the Department of Defense and other Government agencies to improve security procedures and provide better protection for classified material.

Benefits are mutually derived by exchange of ideas between those who formulate the security regulations under which our plants must operate, and those who have the job of administering the program. For example, at the request of the Defense Department, the Committee is now reviewing a proposed new system for "identifying and classifying the various items being developed and produced (by contractors) which contain secrets." Upon completion of this review, industry's position will be conveyed to the DOD.

Staff continue to keep Committee members advised of probable or actual changes in regulations, changes in Government forms and judicial decisions which affect security. Additional work of this Committee includes activities in the fields of plant protection and civil defense.



#### ***Government Reports Committee***

The Government Reports Committee has the responsibility for negotiating with all Government agencies on the establishment, simplification and elimination of Government reporting requirements. National meetings are held twice yearly with representatives of the Bureau of the Budget, the military services, and other Federal agencies on mutual problems relating to Government Reports.

Working groups meet on an average of every two weeks to discuss current problems. Subcommittees, composed of industry experts in specific fields, are created as needed to follow through on individual reporting problems. The working group and its subcommittees make every effort to work with the military services in the early stages of formulation of new reports, or revisions to existing reports.

As a direct result of the Government Reports Committee's efforts during recent years, a Reports Management Division was established at USAF's Air Materiel Command. The Committee and its subcommittees have worked closely with this group during 1959. Their efforts have been effective in the outright elimination of many reporting requirements, the simplification of others, and in a substantial reduction of requests for unauthorized reports. Most of the recommendations of the several industry subcommittees of experts in connection with reports on 1) Air Force-owned, contractor-operated facilities; 2) perpetual inventory of aircraft engines; and 3) Government approvals of company pilots and crew members to fly Government-owned airplanes, were adopted by the USAF or are under consideration.

Recommendations by a joint Government Reports/Spare Parts Committee working group in connection with Vendors Materiel Inspection and Receiving Report (DD Form 250) were favorably received and are under consideration by the Air Force.

As a partial result of the Committee's work with the Air Research and Development Command, a more effective reports management function was established recently by that Command, and constructive meetings have been held regarding reporting requirements with personnel from ARDC, the Ballistic Missiles Division and the Ballistic Missiles Center.

The Committee is currently discussing with Navy Reports Management the establishment of a more effective control of reports and closer working relations with the Committee. A subcommittee recommendation resulted in a revised Navy regulation on recurring physical inventories of facilities with resulting reductions in reporting costs exceeding \$350,000 annually.

Information with respect to the volume of production of aircraft and aircraft engines and consolidated corporate financial summaries are available through the Government Reports Committee. The Committee and staff are looked to by Government agencies for authoritative statistics on developments in the industry. Investment houses and corporate analysts regularly seek statistical advice. Staff suggestions to Government agencies have helped in maintaining the accuracy of Government statistical series on the industry.

#### **Patent Committee**

*Proprietary Rights:* Member companies continue to experience considerable difficulty with respect to regulations regarding contract obligations pertaining to proprietary data. The theoretical rules established by the Department of Defense are not appropriate for actual contracting situations. At the present time, material based upon industry's experience is being collected for use in making additional presentations to the Department of Defense showing the necessity for further and more equitable revisions of the policies and procedures in this area.

*National Aeronautics and Space Administration:* In the enactment of Public Law 85-568 which established the NASA, the 85th Congress, at the last minute, agreed to extensive provisions therein covering "Property Rights in Inventions" and "Contributions Awards." Although it is apparent that it was the intent of the legislators to provide incentives to the industry for invention, and at the same time, to protect the Government's interest, the Patent Committee does not believe that this objective was achieved. It was unfortunate that these subjects were not covered in the hearings, thereby obtaining the benefit of expert knowledge on their complexities.

The Aerospace Industries Association urges that the 86th Congress amend P.L. 85-568 to make its patent provisions parallel the policies and procedures of

those of the Department of Defense. Such an amendment will enable contractors doing R&D work for the military services and the Space Administration to operate under a single set of rules governing patents.

#### **Procurement and Finance Committee**

*Procurement Legislation:* During the first session of the 86th Congress, many bills were introduced proposing certain changes in the basic procurement law of the Department of Defense and the military services. The proposal which received the most extensive consideration was the Saltonstall Bill (S.500). The purpose of this bill was to provide for more efficient procurement through the reduction of lead time and a greater delegation of authority. It was also written so as to place competitive negotiated procurement on the same basis as advertised procurement and to give statutory recognition to the weapon system method of procurement. At the hearings held by a subcommittee of the Senate Armed Services Committee on the Saltonstall Bill and others introduced by Senators Williams, Javits and Keating, a statement was submitted on behalf of this Association which endorsed the Saltonstall Bill, with certain modifications. It is expected that Senator Saltonstall will introduce a new bill in the second session of the 86th Congress which will incorporate a number of the suggestions made by this Association and others, as well as the various Government agencies concerned. In view of the studies which are required to be made by the legislation which extended the Renegotiation Act until June 30, 1962, it is not anticipated that any major changes in the basic procurement law will occur during 1960.

*Indemnification Against Nuclear and Other 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 magnitude of these projects, adequate insurance coverage generally is not available. As a result, contractors are continually 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.

The Aerospace Industries Association has cooperated with the Department of Defense in the preparation of suitable legislation for indemnifying contractors against loss or damage sustained in connection with operations of this nature.

During the first session of the 86th Congress, a bill in this connection, sponsored by the Department of Defense, was introduced; but its consideration was postponed. The Association is continuing to cooperate with the Department of Defense and other interested industry groups, including the insurance industry, and is hopeful that suitable legislation with respect to this subject will be enacted in 1960.

*Depreciation:* Another important subject of concern to the aerospace industry is the depreciation policies of the Government for tax purposes and for contract pricing purposes.

During each of the last two national emergencies, provision has been made in the tax laws for accelerated amortization of defense facilities certified as necessary for the furtherance of the defense program. The current legislation on the subject expires on December 31, 1959.

Although the Internal Revenue Code of 1954 liberalized to some extent the methods for computing depreciation deduction for tax purposes, the new methods it provided are only a step in the direction of a realistic depreciation policy. Accordingly, efforts will be made by the Aerospace Industries Association to establish, for tax and contract pricing purposes, a depreciation policy providing for the recovery of the cost of facilities much earlier than currently permitted. Such a policy will inevitably result in more modern facilities in defense and other industries, as well as reduce the need for the Government to supply such facilities.

*Contract Cost Principles:* For approximately nine years, the Department of Defense has been considering the adoption of a single set of contract cost principles which would be applicable not only to cost-reimbursement type contracts, but also to fixed-price type contracts and for use in making settlements of all terminated contracts. During this nine-year period, *except* for the last year, the DOD has coordinated the various drafts with respect to such a proposal with the AIA. On November 2, 1959, the Department of Defense issued such cost principles, with use thereof being required for all contracts negotiated on or after July 1, 1960. Until that time, their use is permissive. Because these principles will become a part of every defense contract negotiated, it is expected that these principles will be reviewed by the AIA Procurement and Finance Committee and that the Committee's views will be made known to the Department of Defense.

*Settlement of Terminated Contracts:* In view of the importance to this industry of firm, fast and fair settlements of contracts which are terminated for the convenience of the Government, this industry has continued its surveillance of the policies and procedures of the Department of Defense and the military services in this area. Although many problems still remain unsolved and certain practices and procedures need improvements, a close working military-industry relationship exists to resolve the issues involved and to improve the settlement procedures.

One of the knotty problems still plaguing industry is the method for disposing of excess or surplus property resulting from a termination, and the removal of such property from a contractor's plant. Many of the other problems are an outgrowth of the relationship of the prime contractor to its subcontractors.

*Renegotiation:* Efforts were made during the 85th Congress and again during the first session of the 86th Congress to amend the Renegotiation Act of 1951 so as to provide more equitable standards for determining whether or not the earnings of a defense contractor are excessive. During the first session of the 86th Congress, testimony was presented on behalf of this Association at hearings separately held by the House Committee on Ways and Means and the Senate Committee on Finance.

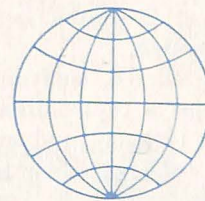
These efforts were not successful, and the application of the Act was extended until June 30, 1962, without substantial change.

However, most constructively, the extension legislation did direct the Senate and House Armed Services Committees to make full and complete studies of the procurement policies and practices of the Department of Defense and the military services. These studies are to include an examination of the experience to the military agencies in the use of various methods of procurement and types of contractual instruments, "with particular regard to the effectiveness thereof in achieving reasonable costs, prices, and profits." Also indicative of the very constructive attitude of the legislators involved is the fact that the Joint Committee on Internal Revenue Taxation was simultaneously directed to make a "full and complete study" of the Renegotiation Act and the "policies and practices of the Renegotiation Board." The reports of the Armed Services Committees are due on September 30, 1960. The report of the Joint Committee on Internal Revenue Taxation is required by March 31, 1961.

*Special Tooling and Government Facilities:* Because of the unique requirements of development and manufacture in the aircraft and missile field, it has generally been necessary that the Government furnish certain special test equipment and production facilities. Certain problems have resulted from this situation. Although most of the problems in the area of special tooling or test equipment are being handled satisfactorily on an individual company basis, major difficulties in the facilities area do exist. The Air Force has indicated, for example, that it should get out of the facilities business. In other words, contractors should furnish all equipment needed for the performance of Government contracts. Unfortunately, unless a realistic approach is taken to the problems involved, it will continue to be necessary for Government agencies to furnish needed facilities to defense contractors. Primary reasons are four in number: 1) the changing and uncertain nature of the aircraft and missile requirements; 2) the fact of low earnings rates—substantially below the over-all industry average on any basis; 3) the existing unrealistic depreciation policies; and 4) the uncertainties involved in the renegotiation process. Efforts will continue to be made by this Association to demonstrate the need for a realistic approach to the over-all facilities problem.



## PUBLIC RELATIONS SERVICE



Public Relations Advisory Committee  
Executive Committee  
Editorial Committee  
Aviation Education Committee  
Shows and Exhibits Committee

**A. M. ROCHLEN**  
*Vice President,  
Douglas Aircraft Co.  
Chairman, Public  
Relations Advisory  
Committee*

A greatly increased tempo in communications marked the activities of the Public Relations Service during 1959. Changes in the composite of the aerospace industry, its products and its relationships, have been extensive. The requirements for information on the industry from various quarters of Government, as well as from the press, have increased markedly as awareness of the industry's impact on the Nation's economy and the national security has become apparent.

The continually-expanding importance of the missile as a production weapon, and the orderly transition of the industry from its development and production of manned-aircraft and guided missiles to spacecraft

research, place a heavy burden on informational reporting functions of Public Relations Service.

Interpretation of the effect of these changes in the status of the industry to both Government and private interests has been difficult. The basic AIA program is to keep the public informed on all problems and activities of the aerospace industry; the focusing of attention of the industry's role in the missile and space age has been the staff's primary effort.

General information requests received by Public Relations Service continued to increase during the first ten months of 1959. An estimated total of 11,000 requests were answered during the period of January to October, 1959, compared to about 9,500 during the same period last year.

In addition to the ever-increasing demand for aviation educational materials, an upsurge of special requests—because of the restive economic situation—has been manifest. In meeting these requests, our office of Research Analysis—during the last two years and, in particular, this past year—has become increasingly an external information source, as well as performing an internal-use function.

This office has gathered, analysed and disseminated data on many aspects of aviation to member companies (especially planners and analysts), 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.

Similarly, this office has become a "check-point" for Defense Budget information for many of the financial and budget writers. A special mailing list for company planning personnel, i.e., economists and directors of market research, long-range planning, and development planning, has been established. Some sixty company representatives have asked to be placed on this list. Industry planners call and visit the office in search of sources of data and to discuss studies which they are conducting. Although most of these requests are of a fiscal nature (dollar and number data), requests are also received for sources of technical and strategy reports.

#### **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"—continue to be used by television stations throughout the Nation and are increasingly successful among the Nation's schools and colleges.

Out of the 298 television market areas, these films were used in 247. As of September 1, 1959, total reported showings by television stations reached 834. How many stations used the four films without report-

ing cannot be estimated.

In addition, since these films were offered to schools beginning last December, there had been 505 showings prior to September 1. This represents as many showings as the available supply of prints would allow. These films have been shown and roundly praised by a number of technical colleges and universities, military organizations, The American Legion (which has its own copies) and technical societies.

#### **Speeches:**

During 1959, the President and the Chairman of the Board of the Aerospace Industries Association have made eleven addresses of national interest; among them were such topics as: Government roles and responsibilities in the Space Age; technological advances in the realm of flight; status of the aircraft industry; the Space Age and industry; defense spending and the outlook for the industry; and the aerospace industry and the "new idea age."

#### **Background Memoranda:**

During the past year, staff has issued four background memoranda on subjects requiring detailed analysis. These have been: selected excerpts from congressional hearings; the Year-End Statement of the aircraft industry; aviation aspects of the Federal Budget; and digest of added budget data.

#### **Publicity:**

In the months subsequent to November 1958, Public Relations Service has issued 63 news releases and an additional 11 releases tailored for radio and TV media. These do not include *Letter to Aviation Writers*, which has a circulation of approximately 1,800, and which is increasingly accepted and used by the press. This letter features a monthly report on industry employment, wages, aircraft deliveries and Defense Department missile and aircraft programs. A special page of fillers was added to the letter during the past year.

#### **Press Conference:**

*The APT System Press Conference:* The AIA joined with the USAF Air Materiel Command and the Massachusetts Institute of Technology in a two-day press conference at Cambridge, Massachusetts, February 24-25, dealing with their tri-group participation in the development of the APT System (Automatically Programmed Tool). Some 75 of the Nation's press—including business papers, trade journals, radio, television and wire services—were in attendance. Coverage by all media elements has been most gratifying.

*The Calibration Survey Press Conference:* In August, the AIA, together with the USAF Air Materiel Command, the National Bureau of Standards, and under the sponsorship of the Sperry Gyroscope Company, conducted a press conference delineating our industry's problems in calibration and measurement.

Despite the fact that the subject covered was most complex, it was dealt with at length by major papers in New York, Washington and throughout the Nation, and enjoyed great success in both aviation and non-aviation trade publications.

#### **Planes-Aerospace:**

*Planes'* circulation since November 1958 has increased from 38,500 to 47,000 as of October 1, 1959. Included among the recipients are editors and senior editorial writers of some 600 newspapers throughout the Nation, labor and management groups, the Congress, about 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 *Planes-Aerospace*, were reestablished beginning in January 1959. These articles are effective in dealing with complicated subjects for our primary audience, as well as stimulating press response.

The articles appearing in *Planes-Aerospace* during the past year have been aimed at fostering public understanding of the aerospace industry's problems. A substantial number of articles were devoted to explaining that the aircraft industry is the missile and

#### **Booklets:**

*Missiles—From Concept to Countdown:* Distribution of 100,000 copies to Congress, schools, the press, opinion leaders, Government officials and other selected groups, though largely completed, is still under way. About 4,000 copies remain in inventory.

Approximately 30,000 copies of the booklet were ordered in reprint for member company promotion distribution. In most cases, the fourth covers were imprinted with individual company messages and signatures.

*Aircraft Year Book:* The 1959 edition was published March 15, in the same format as the 1957-58 edition. It once again reflected a substantial improvement over previous issues. The 1959 edition contained 486 pages—an increase of some 54 text pages over the 1958 edition.

The 1960 edition of the Year Book will bear the title *Aerospace Year Book*. It will be published approximately February 1, 1960.

*U. S. Aircraft, Missiles and Spacecraft—1959:* Under its new title, excerpted pages of the *Aircraft Year Book*, once again, were published by the AIA



spacecraft industry. Major insert articles were carried on Renegotiation, the evolution of the aerospace industry, problems of the civil jet age, the role of industry in the Space Age, salute to NATO, air traffic survey and an aerospace materials forecast.

The lead articles and editorials explained industry's position on the NASA patent provisions, small business, the necessity for a consistent space program, airport needs, and indemnification. Lead articles dealt with subjects ranging from weapon system management to the problem of surplus transports.

In May, following the recommendation of PRAC, the name of *Planes* was changed to *Planes-Aerospace*. The masthead was revised in the May issue giving equal display to both *Planes* and *Aerospace*. In the August issue, *Aerospace* was given greater prominence in the masthead. The January issue will see the completion of the transition, and the name will be simply *Aerospace*.

for the National Aviation Education Council. The booklet was comprised of 152 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 7,100. Expected sales by year-end 1959 will reach 10,500.

*Aviation Facts and Figures—1959:* Published in its same format, the booklet featured one additional chapter, entitled "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 1960 edition of Facts and Figures will bear the title *Aerospace Facts and Figures—1960*. As in prior years, it will be published on May 15.

*Annual Report:* 4,000 copies of the Annual Report were published and distributed to Congress, other Government officials, selected AIA committee executives and to the press.



**M. L. PENNELL**  
Boeing Airplane Co.  
Chairman, Aircraft  
Technical Committee



**DAVID COCHRAN**  
General Electric Co.  
Chairman, Propulsion  
Technical Committee



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



**K. F. MUNDT**  
Aerojet-General Corp.  
Chairman, Manufac-  
turing Committee



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



**JOHN T. BAILEY**  
Bell Aircraft Corp.  
National Chairman,  
Quality Control  
Committee



**K. W. GALLIGER**  
The New York Air  
Brake Company  
Chairman, Accessory  
and Equipment Tech-  
nical Committee

Aircraft Technical Committee

Aerospace Research & Testing Committee  
Flight Test Telemetry Dynamics & Aeroelas-  
ticity Panel

Airworthiness Requirements Committee

Transport Panel  
Helicopter Panel  
Utility Aircraft Panel  
Engineering Contract Requirements Committee  
Drafting Panel  
Microfilm Panel  
National Aircraft Standards Committee

Accessory & Equipment Technical Committee

Administrative Engineering Committee  
Drafting Practices Panel  
Microfilm Panel  
Auxiliary Power System Panel  
Proprietary Rights Panel

Electronic Equipment Technical Committee

Electronic Parts Committee  
Electron Tube Panel  
Semiconductor Devices Panel  
Connector Panel  
Electronic Specifications Committee  
Radio Noise Interference Panel

Flight Operations Safety Committee

Manufacturing Committee

Manufacturing Equipment Committee  
Numerical Control Panel  
Tooling Committee  
Numerical Tooling Panel  
Manufacturing Test Equipment Committee  
Manufacturing Conservation Committee  
Preservation & Packaging Committee

Materials Procurement Committee

Materials Management Panel  
Economics Panel  
Government Regulations Panel

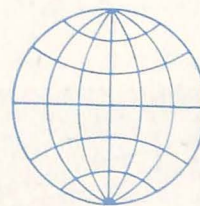
Propulsion Technical Committee

Engine Committee  
Powerplant Airworthiness Panel  
Turbine & Jet Engine Panel  
Propeller Committee  
Drafting Panel  
Rocket Committee  
Liquid Propellants Division  
Accessory Components Panel  
Propellant Panel  
Solid Propellants Division  
Explosive Class. Test Panel

Quality Control Committee



## TECHNICAL SERVICE



As technology advances, aerospace weapons systems of defense become more complicated—and, more expensive. Indeed, modern aerospace weapons have become so complicated that the military specialist in strategy and tactics can do little more than point out his needs in basic terms of required performance capability. It is then up to men of management, science, and engineering in industry to build the machine.

Because the aerospace weapons systems of today are so complex and costly, there is an inevitable trend away from mass produced aircraft and missiles. The AIA Technical Service has been increasingly conscious of this shift in emphasis since much of its committee organization has been patterned on the

traditional division of the industry as airframe, engine, and accessories. These neat distinctions are becoming more and more obscure to a point that we anticipate a reassessment of many of our programs.

In the light of the foregoing, activities of the Technical Service during the past year have been especially productive to the industry and to the Government. A chief concern of the Technical Service has been directed toward the building of better aerospace systems more efficiently and, therefore, more economically.

### *Aircraft Technical Committee:*

The Aircraft Technical Committee is composed of principal engineering executives from member compa-



nies engaged in the design and production of aircraft, engines, and their components and equipment. 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 Aircraft Standards Committee.

#### ***Aerospace Research and Testing Committee:***

In the field of research and development, the Aerospace Research and Testing Committee (ARTC) provides the voice and forum for the airframe and missile manufacturers. Active programs, like those of most AIA committees, fall into three major categories: The exchange of knowledge and cooperative solution of common technical problems; providing the military and Government agencies with a single point of contact for determination of industry opinion, requirements and recommendations; and a continuing source of advice to member company managements; and to subordinate industry, with respect to future technical requirements and planning.

In pursuing its assignment, the Committee recently completed a cooperative evaluation of a new alloy of interest to some sixteen member companies for military applications. Through this study, each was provided with the results of a comprehensive test program

*More than 1,900 executives from among the 117 member companies of the Aerospace Industries Association serve in 42 highly specialized areas. Their efforts are aimed at producing better aircraft, missiles and spacecraft at lower costs.*



at one-sixteenth of the otherwise necessary investment. Similarly, the ARTC frequently undertakes standardization of test procedures in those areas peculiar to the products of our industry. Use of the same procedures throughout the AIA membership enables the accumulation of technical data on common basis, and allows useful exchange of such data when the opportunity presents itself. Conducting these studies through the use of project specialist groups and technical panels, ARTC has, in the past year, completed seventeen engineering investigations. Two panels, on the subjects of "Dynamics and Aeroelasticity" and "Flight Test Telemetry," continue to provide an essential medium of exchange and standardization in these fields.

The ARTC, on many occasions, is called upon to provide comments and opinion in assistance to such agencies as the Department of Defense, the Air Research and Development Command, the Bureau of Aeronautics, the National Academy of Sciences, etc. During the past year, the Committee has been of service to these agencies in the accumulation of aerospace industry recommendations and requirements through twelve major surveys and investigations, the results of which are of direct use to contributing members, as well as to the governmental agencies requesting the advice.

In this period of technological advance, one of the most important and, perhaps, most difficult tasks is the timely prediction of future requirements. During the years of 1952 through 1958, the ARTC annually prepared, at the request of the Department of Defense, an analysis of the five- and ten-year industry requirements in the field of materials, processes and manufacturing methods.

The Report served as an important guide line for Department of Defense sponsored materials research activities. As the ARTC initiated its study for the 1959 Report, it was apparent that the pressure of technical advance and the urgencies of the defense products dictated a more comprehensive statement of future industry needs in materials, systems and methods. The 1959 Annual Forecast of Trends and Requirements was divided into two parts, engineering trends and requirements, and necessary developments in manufacturing technology. The final Report, published in June, provides a sound and capable analysis of future systems which will become the products of the industry, and interprets those plans in terms of specific technical developments required to make those systems available.

Response to this publication has been excellent. It is being utilized by member companies, hundreds of subcontractors, materials producers, and Government agencies as a guide for directing research and development programs toward ends which will best serve our defense effort, the community at large, and the aerospace industry.

### ***Airworthiness Requirements Committee:***

The Airworthiness Requirements Committee is composed of technical representatives from twenty-seven of AIA's member companies to continually review all U. S. airworthiness requirements for suitability and to coordinate industry airworthiness problems with the various Government agencies. It also assists our Government in formulating U. S. international policy with respect to airworthiness requirements.

Since the establishment of the Federal Aviation Agency in January 1959 and the accompanying period of readjustment, airworthiness actions were limited until the FAA announced that an airworthiness review (FAA/Industry) will take place this year. There is now a marked upswing in activity, and meetings are being scheduled to submit coordinated industry proposals for the agenda.

The helicopter members of ARC have been active during the year and recently concluded a series of meetings to discuss twin engine turbine ratings with the FAA. British industry and their Air Registration Board also participated. Similarly, the entire committee coordinated, at the request of the military services, a number of specifications pertaining to strength and rigidity requirements for military aircraft.

Liaison is maintained with the Federal Aviation Agency and the military services on a daily basis and in this way it has been possible to provide the Government with an industry opinion on technical questions.

### ***Engineering Contract Requirements Committee:***

The Engineering Contract Requirements Committee (ECRC) is concerned principally with the engineering data requirements of contracts for aircraft and missiles. Committee membership, currently thirty, is limited to those AIA companies and their divisions engaged in the design and manufacture of complete aircraft, helicopters or missiles.

The major effort of the Committee, during the past year, was to participate jointly with other AIA committees in reviewing and making recommendations on a group of weapon system specifications released by the Air Force.

For many years contractors have been obligated to produce data without knowledge of such requirements when a contract is made. Some procurement specifications have failed to mention the requirement; others overlap or conflict. A consolidation of all contractual data requirements into a single specification has been proposed to the services by ECRC.

### ***National Aircraft Standards Committee:***

The National Aircraft Standards Committee (NASC) is the committee representing the aircraft and missile manufacturers in the study of mutual standardization problems of aircraft and missile parts, components, materials and processes and related standards, specifi-

cations and other documents. Their findings result in: the issuance of appropriate industry standards, the promotion of their use, and advice to Government agencies of industry views.

Within its scope, the NASC is now regarded as a necessary adjunct to the governmental groups determining the aircraft standards of the military services. However, in view of recent technical requirements and prime contractor/subcontractor relationships of new weapon systems, expansion of the NASC to include all segments of industry represented by AIA is under consideration. This would make the NASC as the industry authority on all standardization matters. The Department of Defense has designated liaison representatives in each service activity sharing an interest with the NASC.

Much standardization work has been done during the year through projects where higher design requirements are obsoleting current products, making it essential for new ones to be standardized. More than 87 new standards and revisions were released last year in the National Aircraft Standards Series.

Of particular interest is the extensive participation by the NASC in the increasing effort by the Government and military services to achieve standardization. The Committee serves, on a voluntary basis, to evaluate Government proposals for standardization related to the aerospace industry. This "Industry Coordination" by NASC includes the review of proposed military aeronautical specifications, directives, regulations and policies regarding standardization and the furnishing of appropriate industry recommendations. During the past year, at the request of the military services, approximately one hundred such documents were processed by the NASC for industry comments prior to their release.

### ***Accessory and Equipment Technical Committee:***

The Committee is composed of a senior member from each of twenty-seven companies engaged in development and manufacture of accessories and equipments used in the operation or support of aircraft and missiles, except those predominantly electronic in nature.

During 1959 the major effort of the AETC was in the field of standards and specifications. Generally acting upon the requests from various governmental agencies for industry coordination on proposed specifications or standards, the action of the Committee was principally of two kinds. The first was in reviewing and submitting suggestions for improvement in the documents directly to the Government agency involved in those cases where no other AIA committee had a specific interest. The second case was to participate jointly with the other committees in reviewing and making recommendations on those Government documents which were of mutual concern to a number of AIA committees.

### **Electronic Equipment Technical Committee:**

The need to integrate the design and manufacture of electronics systems with other airborne systems has accelerated the trend of major weapons system manufacturers to: consolidate with electronics companies; develop a strong electronics division or to establish team agreements. More than three-fourths of our principal member companies now have strong electronic equipment activities.

The Electronic Equipment Technical Committee is composed of chief electronics engineers of member companies engaged in design and production of electronics equipment or systems for aircraft, missiles or spacecraft. Its principal objective is formulation of industry opinion on broad engineering policy questions and surveillance of its subordinate working groups. The scope of activity is restricted to airborne electronic equipment for military applications and excludes commercial, industrial and ground-based equipment.

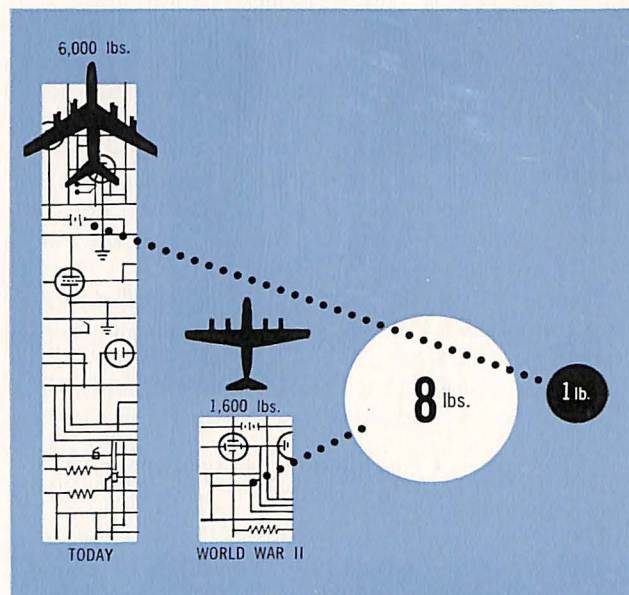
The complexity of electronics in a weapons system is typically illustrated by the ICBM's. This giant missile has over 40,000 identifiable parts in its airborne system, a million feet of wiring, and 30,000 connecting points at a single R & D test stand and launching pad. Industry is studying several approaches to reduce electronic equipment complexity, including micromodules, molecular electronics, and other new concepts of components and circuits.

EETC has placed great emphasis in working toward, and in, recommending uniform and practical reliability requirements for the three military services. In this regard, the Committee has assisted the Department of Defense in an ad hoc study of *Specification Management for Reliability* through surveys, reports, and meeting discussions. This report, to be published this year, is expected to point the way toward improved parts reliability.

### **Electronic Parts Committee:**

The importance of electronic parts in the equipment and systems produced, and the heavy investment in parts testing, specifications, and reliability led to development of an active parts program. A prime objective of this Committee is to make recommendations to both parts manufacturers and the military which will result in maximum part quality at a reasonable cost. Close working relationships have been developed with parts manufacturers and cognizant military services which have expedited solutions to many technical problems of systems designers.

The Committee provides continuing advice to military and parts manufacturers on current and future requirements for improved and new component parts needed to design advanced electronic systems for airborne and space vehicles. Typical of these efforts is the EPC relay activity. The inadequacy of present relay specifications requires unduly definitive proof testing by the user. For example, it cost one member company



*A modern jet bomber today carries 6,000 pounds of electronic equipment compared to the 1,600 pounds carried by its World War II counterpart. However, one pound of electronic equipment in the new aircraft can do more than eight pounds in the old model.*

\$85,000 in testing to prove that a certain relay met his requirements for a particular application. Considering the many relay applications in each system, and the numerous systems being developed, the costs of these tests can be staggering when duplicated in system designers' plants. The Committee is defining relay parameters and tests so that military specifications can be revised to require adequate qualification and acceptance testing. This test data should be made available by the military to eliminate the need for time consuming and expensive testing by system designers.

### **Electronic Design:**

Through annual meetings of the Electronic Specification Committee with Air Force and BuAer, General Design Requirements for Airborne Electronic Equipment have been kept up-to-date with the rapidly changing technological developments in materials, processes and electronic design. This working relationship provides military specification writers with industry "know how" and results in more practical general design requirements. This results in savings to the military and to industry in both time and money through a reduction in the number of divergent requirements by individual services. It also simplifies contract negotiations by reducing the number of deviation requests by designers. These meetings also clarify the military thinking back of the requirements and provide valuable interpretations to guide equipment designers.

### **Flight Operations Safety Committee:**

The Flight Operations Safety Committee (FOSC)

is an operations group representing the aircraft manufacturing industry in the resolution of national and area problems affecting the safety and effectiveness of flight operations, and in particular, those pertaining to flight testing. The Committee is composed of representatives from twenty-seven AIA member companies.

Committee work, for the most part, is related to Federal operational policies relating to airspace usage, air traffic control procedures, etc. The Federal Aviation Agency's plans for airspace utilization are fundamentally based on joint use wherever possible, rather than segregation of flight activities as has been the case in the past. This, in turn, requires radar and other equipment such as airborne IFF. It also requires a high degree of coordination between the FAA and airspace users, both in formulating operational policies and local area operating procedures.

The Committee is now drafting a proposal to the Federal Aviation Agency which would provide for consideration of air traffic density in addition to unpopulated ground areas when flight test areas are established by FAA. Conversely, the Committee will report flight test areas which should be considered when airways and jet routes are established.

West Coast companies have been experiencing the most difficulty in resolving these operational problems. Other manufacture areas concerned include those of Fort Worth-Dallas, Wichita, St. Louis, Columbus and Atlanta.

In the Southern California airspace complex, agreement has already been reached among the military and civil users with respect to procedures to be used in the new flight test areas proposed recently by FAA. The Aerospace Industries Association, together with the Air Force and Navy, also has certain proposals to make with respect to airway alignments and offshore flight test areas.

### ***Manufacturing Committee:***

Through AIA's Technical Service, the production executives of manufacturing member companies functioning as a policy body, direct seven working committees in efforts to foster, and promote solutions to common problems affecting manufacture of aerospace products.

Under the Manufacturing Committee, groups of technical experts function as working committees. Each committee provides a single authoritative source for obtaining, identifying, coordinating and solving non-competitive common problems relating to manufacturing research and development, manufacturing equipment, fabrication and assembly tooling, manufacturing methods and processes, and material conservation programs. Operating within the parameters of the AIA charter, the MC's working committees have pursued a wide variety of manufacturing problems over

the past year. The committees involved and their principal programs are:

***Manufacturing Equipment Committee:*** Comprised of 32 member companies and their divisions, the Manufacturing Equipment Committee concentrates on efforts to identify current and future needs for research, development, testing and standardization of machine tools and their controls; and other manufacturing equipment as mandated by an ever-increasing demand for higher level manufacturing capabilities.

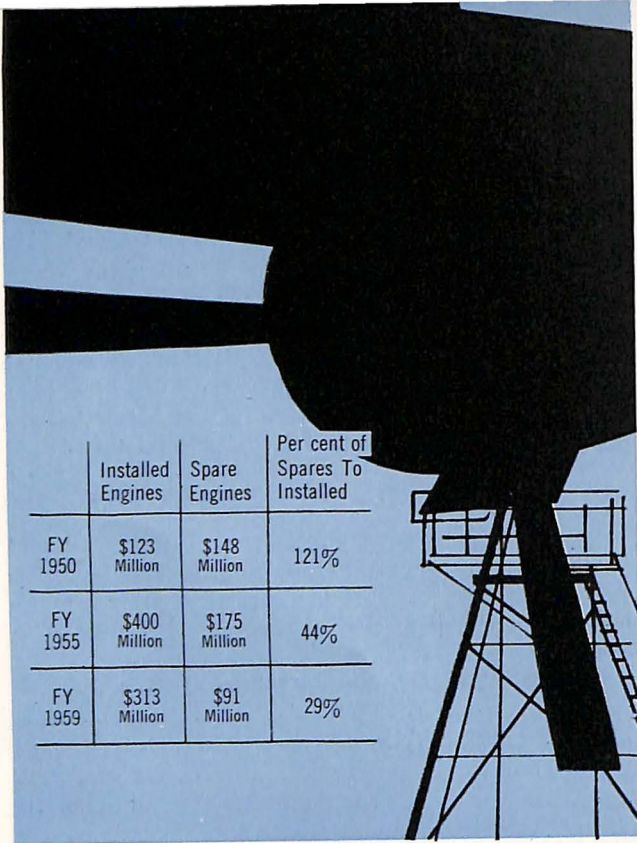
The Committee has 40 active projects in work which deal with a variety of technical problems in the broad area of manufacturing equipment. Typical are four projects intended to develop industry standards for heavy duty routers, portable trimming equipment for high strength materials, automatic wire processing equipment and automatic riveting equipment including riveting heads, frames and positioning devices.

1959 saw the culmination of Government procurement of 76 configurations or sizes of machine tools procured against the MEC's specifications. The Committee actively participated with the Government in the development of specifications used for procurement of 611 machines representing \$80,000,000 of machine tools. Of this total, 105 machine tools valued at \$30,000,000 were equipped with numerical control systems designed around performance requirements initially defined by this Committee.

During 1959, the committee published NAS 939 and 940, covering two types of hydraulic presses and NAS 936, a performance specification for precision bed-type milling machines suited to present and future needs for machining high strength materials.

A three-year effort was completed during the year wherein the MEC provided equipment specialists to assist the Air Force and Navy in conducting acceptance tests of Government-procured machines at the manufacturer's site. Thirty-seven acceptance tests were conducted between June 1956 and February 1959 at which 47 different machine types were completely tested prior to delivery to the user. Although a vast number of manhours were contributed by the AIA member companies in this effort, the benefits accruing to the Government, the machine manufacturer and machine users far outshadow the initial investment.

***MEC/Numerical Control Panel:*** The MEC's Numerical Control Panel is made up of representatives of 28 AIA member companies and their divisions. At the present time, the panel is working on 16 projects dealing with various aspects of machine control systems. Typical is the project on standardization of punched tape used for input to all numerical control systems. A standard punched tape media is being developed to permit use of a single standard on 5 major domestic systems currently on the market without major cost to the user. By close coordination among AIA, other trade associations, and Government agencies, it is virtually assured that all future numerically controlled



	Installed Engines	Spare Engines	Per cent of Spares To Installed
FY 1950	\$123 Million	\$148 Million	121%
FY 1955	\$400 Million	\$175 Million	44%
FY 1959	\$313 Million	\$91 Million	29%

*Close cooperation between the Air Force and aerospace industry has produced dramatic savings in the number of spare engines required in relation to engines installed in aircraft. In fiscal year 1950, for every four installed engines, the Air Force was buying five spare engines. Today USAF is buying approximately one spare engine for every four installed engines. The savings are due primarily to the increased service life of the engines, shortened supply pipelines and better methods of forecasting requirements.*

machines will utilize the AIA-developed standard.

Typical of MCC project activities which have produced various documents for cost reduction through elimination of waste are: Conservation of Electro-Mechanical Components, Conservation of Stainless Steel Honeycomb, Economical advantages of Company-owned Laundries, Means of Determining Optimum Sheet sizes in Titanium, Material Handling Aids, Potential Sale of Waste Chemical Solutions, Standard Packaging in Electronic Parts.

Individual companies have continued to provide the Air Force and Navy with data on proven cost reduction practices. Military services have, in turn, continued to publish this information on a monthly basis, distributing it widely through air material areas to all prime contractors and subcontractors.

**Materials Procurement Committee:** The Materials Procurement Committee, composed principally of Directors of Material and Procurement, is interested in materials management and subcontracting. The past year's program has been largely dominated by two subjects: make-or-buy policy and small business. The Committee has been active in expressing the industry's views on make-or-buy, and while not opposed to the

Government's policy in principle, is alarmed at the administrative interpretations at the plant level. In the area of small business, the Committee has emphasized the need for selection of suppliers at the subcontract level solely on the basis of competitive price, quality and delivery.

In the area of materials management, the Committee has made an extensive study of the application of automatic data processing to material control. Another study in the economics area is evaluating inventory control practices aimed at cost reduction. Since more than *half of the procurement dollar now goes into sub-contracts*, the importance of this area of activity is being emphasized in terms of management and cost controls by *both* Government and industry.

**Preservation and Packaging Committee:** A working committee of the Manufacturing Committee with the purpose of serving as a central and authoritative source of industry opinion on preservation and packaging of aerospace equipment and as a medium for the exchange of related noncompetitive information among members. The Committee has 52 members who represent 37 member companies.

In furtherance of its primary function, this Committee furnished the Government with industry's opinion on a series of specifications or standards: Quality of Wood Members for Containers, Helicopter Rotor Blade Containers, Reusable Aircraft Engine Shipping Containers, and Volatile Corrosion Inhibitor Film and Pressure Sensitive Adhesive Tape. Work is continuing on three important projects: standardization of electronic accounting machine reproduction of packaging data cards, standardization of packaging for liquid oxygen system components, and development of improved reusable containers and carrying cases.

#### **Propulsion Technical Committee**

The Propulsion Technical Committee is composed of top engineering management of companies engaged in research, development and production of propulsion systems in both air-breathing and non-air-breathing categories. Representatives of its three working groups—the Engine, Propeller, and Rocket Committees—participate with other AIA technical committees in the coordination of proposed new specifications for weapons systems, reliability, maintainability, etc.

**Engine Committee:** With membership generally at the chief engineer's level, the Engine Committee works cooperatively with the Government and with airframe manufacturers in several major areas. Of primary interest is the development of a more efficient tabular method of presenting turbine engine performance data, which will supersede the parametric method presently used. The tabular method, as proposed, will eliminate the time-consuming task of manually plotting numerous curves for engine performance at specified speeds and altitudes.

*Rocket Committee:* The Rocket Committee, Liquid and Solid Propellant Divisions, also with membership at the chief engineer's level, have published a proposed industry standard for symbols, definitions and performance criteria of liquid and solid propellant rockets. Recommendations for the adoption of these standards have been given wide circulation throughout Government and military agencies, professional societies and other organizations.

New detailed components specifications for use by the rocket industry in ordering components from vendors have also been developed by the Committee.

Currently under development is a standardized procedure for cleaning liquid oxygen propellant systems in missiles, and standards for determining that the systems are clean prior to use. This data, in the form of a proposed specification, will provide a uniform technique for prevention of explosions caused by contamination in a liquid oxygen propellant system.

The solid propellant division of the Rocket Committee, during the year, completed a proposed specification for determining the hazard classification of solid propellants for submission to the Air Force.

*Propeller Committee:* The activity of the Propeller Committee is confined largely to cooperative efforts in the field of standardization of general interest to the propulsion industry. Through common interests with the engine and rocket manufacturers in certain military documents, the Propeller Committee acts as coordinator for specialists of the engine and rocket industries concerned with the development of standard utility parts.

### **Quality Control Committee**

Concerned with the review of quality control policy directives and general inspection specifications of the Department of Defense and the military services, the Quality Control Committee collects, classifies and issues information to advance quality control and reliability techniques.

There are 42 member companies of the Association represented on the Quality Control Committee.

NAS 938, published by the panel in June 1959, established a uniform axis nomenclature for all different type machines. This standard is already receiving international recognition.

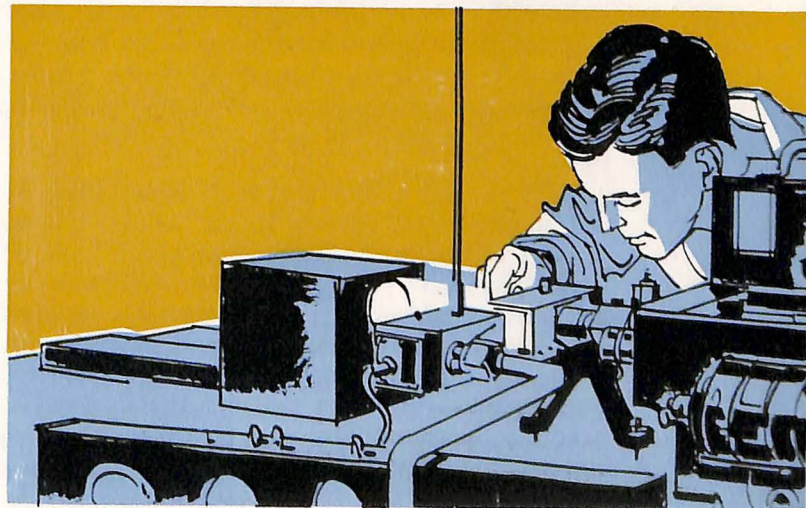
Probably the most significant activity of the NCP is its APT (Automatically Programmed Tool) Project. This project (supported by 20 AIA companies and two non-AIA organizations) is pursuing refinement of a computer programming system which allows a shop man to describe the geometry of a production part in a language which, in turn, can be understood and processed by a general purpose electronic computer. The computer output, in turn, provides a stored intelligence which is accepted by the machine tools servo-mechanisms and translated to machine motions.

During 1959, the APT Project occupied full time services of 25 qualified computer programmers in a concentrated effort to refine the APT computer programming system jointly developed over the previous two years by the Massachusetts Institute of Technology (under Air Force contract) and AIA's NCP. In September 1959, the APT Project released a Phase I computer deck consisting of 22,000 IBM cards extending the ability of the system to accept three-dimensional "advice" and to produce three-dimensional parts of complex geometry. It is anticipated that work in this area will increase greatly. The achievement of a fully comprehensive computer programming system will provide the aerospace industry, as well as industry generally, an economical means of translating engineering design into actual production parts at a minimum of cost.

In April 1957, the NCP prepared an AIA publication titled, "Numerical Control." This 114-page document provided a comprehensive state-of-the-art summary of American industry's progress in applying numerical control to machine tools. It highlights the aircraft industry's roll of leadership in researching and applying the new technology. This report has become virtually an international bible on the subject, having been printed in foreign language by NATO nations. Publication of NCP's latest edition will be made in December 1959.

*Tooling Committee:* The Tooling Committee is the voice and forum for representatives of 35 aircraft and missile manufacturers in the tooling research and development area. Currently, this Committee is engaged in activities covering twenty-three projects.

*The lead in the development of new manufacturing techniques and materials, necessary to build the next generation of high performance weapons, is taken by the Research and Testing Committee and the Manufacturing Equipment, Tooling and Test Committees of the Aerospace Industries Association. These committees chart the course for new methods of building the weapons of tomorrow.*



One project undertook to forecast the five- and ten-year future needs in all areas of tooling as affected by the trend toward brazed and welded steel airframes.

Tooling considerations for heat treating 200-300,000 lbs. per sq. inch tensile strength steel and titanium parts is being investigated. Another Committee project is developing a brazed steel honeycomb case history book which will make available a state-of-the-art text on this rapidly changing technology.

Another project group is investigating a BuAer request dealing with special tooling contract requirements and has developed a proposed "contract exhibit" form.

One of the most significant Committee projects is dealing with the urgent need to appraise educational organizations and company management with the need for a higher level of technical and managerial capability among tooling and manufacturing research personnel. This project is being closely coordinated with other organizations to insure the greatest interchange of information on defining the needs for higher level academic skills in the manufacturing research areas.

*Manufacturing Test Equipment Committee:* Forty-three 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 five state-of-the-art surveys.

One project titled, "Production Environmental Testing Survey," was conducted to determine the types and extent of environmental testing being carried out as a production requirement.

Six projects have produced working documents now available for use by member companies in the design, fabrication, maintenance and calibration of manufacturing test equipment. These include the MTEC reference "Specification for Power Supplies" and "Specification for Hydraulic Test Stands." These documents provide a reference for use in preparation of procurement specifications for this type hardware.

Another recently completed project established a series of "Preferred Drafting Symbols for Hydraulic Test Equipment" which were found to be lacking in the military specification but needed by the designers of production test equipment. The preferred drafting symbols will be published in the near future as an NAS standard.

There are twelve additional projects, investigations, and state-of-the-art surveys in the following areas: methods and techniques in pressure testing with gas, testing procedures and equipment for semi-conductors and transistorized circuits, the potentials of standardizing, high potential testing procedures, automatic programming of electrical and electronic test equipment, development of test equipment material standards handbook, pneumatic test equipment specifications, correlation of test equipment data, and hydraulic-pneumatic filtration.

*Manufacturing Conservation Committee:* Over the past year representatives from 41 member companies and divisions comprising the Manufacturing Conservation Committee have continued devising methods to reduce material costs through more effective interchange of proven conservation practices.

In the interest of improving uniformity, precision and accuracy of measurement throughout all U. S. industry, the Committee completed a three-year survey covering measurement and calibration practices and capabilities of member companies. The study, undertaken at Air Force request, was given wide distribution throughout Government and industry to arouse an awareness of the need for finer calibration and measurement capability required for missiles, spacecraft, etc. The National Bureau of Standards has referred to the survey report as being a "most significant primer" on calibration and measurement.

The Committee conducted an exhaustive survey of quality control systems of member companies with emphasis on allocation of quality control, reliability and inspection effort to the successive stages of production of equipment.

The Committee has also acted as industry liaison in the preparation of surveys dealing with exchange of information on antifriction bearings, vendor quality ratings, survey of obsolete and/or conflicting Government specifications, and Army-Navy specifications for hardware.

#### *AIA Drafting Practices Panels*

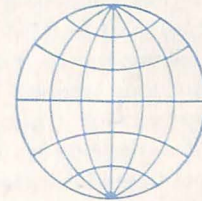
Panels of drafting specialists, usually chief draftsmen or those having direct responsibilities in the preparation of engineering data, representing the several segments of the aerospace industry, have participated in a joint effort for the past several years to achieve standardization in the preparation of drawings in connection with Air Force and Bureau of Aeronautics contracts. However, the awarding of missile contracts by military departments or agencies using other than Air Force-BuAer drafting specifications, made it clear that action to unify drafting practices of all military services and other Government agencies, was vital if duplications of drafting effort was to be avoided.

A Department of Defense project, initiated in 1957, continued with frequent meetings of military, the AIA Drafting Panel and other industry groups. As a result, a drafting specification is now available which is designed to unify all the various drafting practices.

Efforts of the Joint Drafting Panel, which acts as an eight-man steering committee to the panels-at-large, are presently being directed toward standardization of drafting procedures of the military and various other Government agencies. The Department of Defense estimates that it spends \$2.5 billion annually on the preparation of drawings. There is little doubt that a considerable saving can be achieved. The savings will increase as more experience is gained and differences in drawing requirements are reduced.



## TRAFFIC SERVICE



**R. H. ROSS**  
*Allison Division  
 General Motors Corp.  
 General Chairman,  
 Eastern Regional  
 Traffic Committee*



**R. R. KRUEGER**  
*Douglas Aircraft Co.  
 General Chairman,  
 Western Regional  
 Traffic Committee*

### Traffic Committee

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

The primary function of the Traffic Service is to assist the individual company traffic manager to operate an efficient traffic department through the cooperation accomplished by Association activities. In those fields where the burden is too great for the individual traffic manager to operate, the Traffic Service functions for the benefit of all.

The basic objective of these activities is a satisfactory transportation service secured at the lowest rates compatible with efficient operation. The beneficial results of low rates flow not only to the contractor but to the contractor's customers. As the Government generally is the largest customer, a large part of these activities is directed to its benefit.

Efforts in this respect have not always been successful, due primarily to Government agencies which, as explained in our Annual Report a year ago, have insisted upon operations which have not only imposed upon the Government added expense but have prevented the industry from securing the advantage of rate negotiations under competitive conditions. So far has this gone that, under cost reimbursable type contracts where material for contract performance has been purchased, the Government transportation agencies insist that they control the transportation service from the vendor to the prime contractor. Essentially, this arrangement constitutes an unnecessary and costly in-



interference with contract performance. Efforts to change this so far have failed. We are hopeful, however, that at some future time the Government will realize the savings available under such arrangements.

Within the past year, but little transportation legislation of importance to this industry has been introduced into Congress. Three bills were introduced at the behest of the railroads to remove existing inhibitions which prevent railroads from participating in other forms of transportation. Because such participation would eventually destroy existing competition between motor carriers, water carriers and railroads, the Traffic Service prepared and submitted to the Surface Subcommittee of the Senate Committee on Interstate and Foreign Commerce a statement in opposition to these bills. At the conclusion of the first day, the hearing, not completed at the time, was adjourned and it now appears it will not be resumed.

Among the things accomplished has been the active participation of the Traffic Service in proceeding before the Interstate Commerce Commission where the railroads and motor carriers were trying to limit their liability for loss and damage on all freight transported exceeding in value to \$3.00 per pound. This has been especially obnoxious to members of this industry because it not only imposes losses on shippers for carrier negligence, but it also invites carrier negligence. In May, in a decision by the whole Commission, the carriers' petition was denied.

The bill for transporting household goods of member employees transferred on company orders is substantial for this industry. Efforts are being made to reduce these costs by means of consolidations. Negotiations with the household goods carriers to this end are being conducted.

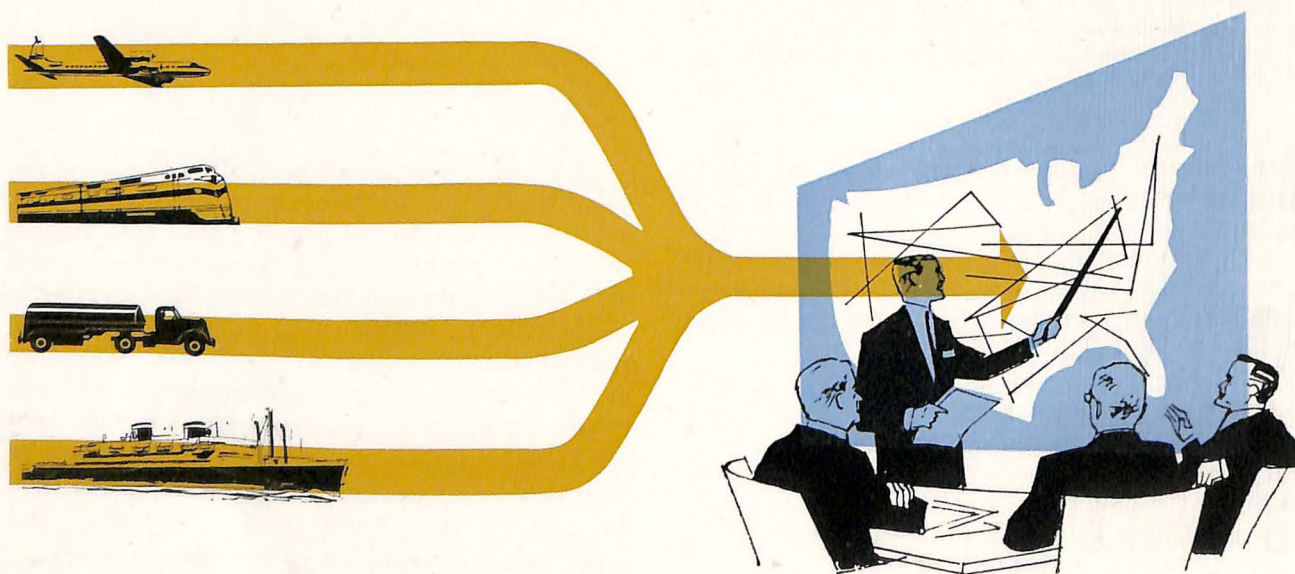
With the increased movement of atomic materials in which members are interested, carriers, both motor

and rail, sought rules for the settlement of claims under released rates, on a basis so low as, in substance, to remove all liability. As a result of the representations made by the Traffic Service, the Commission has directed the carriers to show why they should be permitted to publish the rule they have proposed. The proceedings have been set down for hearing December 8, 1959.

At present, two investigations into the Nation's transportation system are under way: one by the Department of Commerce, and the other by the Senate Interstate and Foreign Commerce Committee, the latter pursuant to a resolution introduced by Senator Magnuson, Chairman of that Committee. Of the 22 associations named to serve in an advisory capacity to the Senate Committee, only two are exclusively shipper organizations. All of the remainder are exclusively carrier associations or associations in which carriers hold a very large proportion of the memberships. The Traffic Service is watching this situation closely.

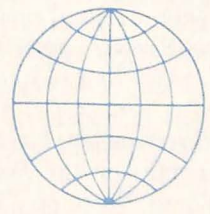
The Traffic Service functions through its two standing committees, namely the Eastern and Western Regional Traffic Committees. Two meetings each of these committees separately, and one joint meeting annually, are held. Members are informed through these meetings and through bulletins which are supplied to them, keeping them abreast of current developments.

Unlike industry generally, carriers are permitted to organize associations where they agree among themselves on the rates they believe they should charge the public. Because a substantial part of the Commission's work in dealing with changes in rates is devoted to the prevention of reductions, a constant stream of proposals for rate increases pours out of these carrier associations. A substantial part of the work of the Traffic Service is devoted to the defeat of these proposals.





**HELICOPTER COUNCIL**

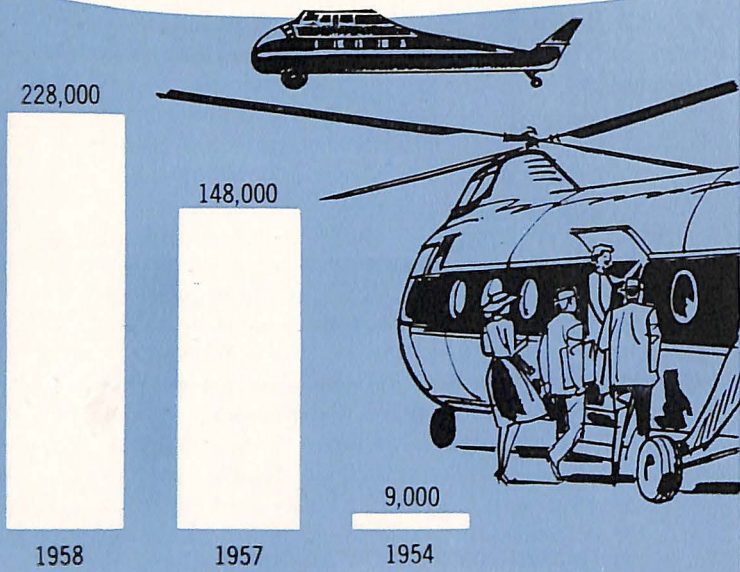


**HARVEY GAYLORD**  
*President,  
Bell Helicopter Corp.  
Chairman, Helicopter  
Council*

Emphasis on heliport and helistop development, vital to the progress of the industry, was dominant in the wide variety of the Helicopter Council activities during the past year. Growing recognition of this factor is typically illustrated by the recent Los Angeles Chamber of Commerce sponsorship of a conference on the *Planning and Designing of Urban Heliport Facilities*.

The Los Angeles Conference was presented with an

## HELICOPTER GAINS



*The scheduled helicopter airlines registered new gains during 1958, carrying 228,000 passengers, an increase of 54 per cent over the 148,000 passengers transported in the previous year. Number of helicopter passengers has mushroomed since 1954 when only 9,000 passengers were carried.*

exhaustive analysis of the legal aspects of planning for urban heliports. The legal counsel for the Council presented a detailed paper on *heliport location* and has made it available to local zoning officials of the Nation's cities and urban areas. The Council Chairman concentrated on Heliports in a major address to the Conference.

An official spokesman for the Council has served for several months on the Federal Aviation Agency-Industry Heliport Working Group in the final revision of an official Heliport Design Guide to be issued soon by the FAA. This document will qualify many of the points raised by the Council in modifying local regulations adopted in the days prior to the advent of rotary aircraft. Many of these outmoded regulations actually penalize the specific operational features of the helicopter and its ability to rise and descend vertically, fly at an extremely low speed, come to a complete hovering stop while airborne, etc.

The Heliport Engineering Committee, during the past year, has developed design guide materials helpful to structural engineers and architects. Additionally, the Committee has prepared instructional materials for municipal officials describing the desirability

of, and the technique for, the building of Helistops, roof platforms, etc. The Committee obtained the concurrence of FAA in this recommendation, and as a result both the FAA Heliport Design Guide and the Council's Heliport Design Guide contain the .75 Helicopter gross weight per sq. ft. figure as the recommended maximum for all kinds of impact loads.

The American Legion, at its 1959 National Convention, resolved to "re-affirm the principles and objectives" adopted at their 1958 Convention to "promote and encourage the development and use of helicopters and the passage of necessary ordinances and regulations as will permit their efficient operation."

On October 9, the National Security Division of the Legion requested the Council to provide information helpful to them in promoting the use of the helicopter. This request suggested that "perhaps some action by The American Legion, particularly in the field of passage of ordinances and regulations, would be helpful to you."

In liaison with The American Legion and other public-spirited organizations, the Council emphasizes the difficulty in overcoming the inertia of our legal processes. The Council urges that the utility of the helicopter and the regulatory problems preventing its use, if any, be brought to the attention of local and state governmental officials. It is the Council's belief that industry is responsible for proffering inspiration and guidance for providing helicopter services for the general welfare, as well as effectively aiding military operations.

The regulatory framework of any municipality—including its ordinances or regulations covering such matters as land-use zoning, heliport licensing and operation, intermittent operation of helicopters, building codes, fire codes, etc.—determines largely whether private or commercial helicopter operations are practicable within the city limits. Where the cumulative effect of this regulatory framework is burdensome, potential helicopter users are, in effect, forced to rely on other forms of transportation and thus are deprived of the many benefits which the helicopter could make available.

In view of the importance of this regulatory framework, the Council makes every effort to assist and cooperate with the cognizant branches of the Federal, state and local governments in pointing up the need for advance heliport planning. Toward this achievement, Council staff and representatives met with an official of the National Institute of Municipal Law Officers. After discussions of the regulatory problems from the viewpoint of the heliport operator as well as from that of the municipal official, the Council successfully recommended that NIMLO adopt and distribute to its members a model heliport ordinance similar to the ordinance the Council prepared for Phoenix, Arizona.

The Council and its Vice Chairman appeared before

a congressional committee early this spring to submit testimony in support of a proposed joint congressional resolution which would authorize the District of Columbia Commissioners to order a \$25,000 study of available District heliport sites. The resolution was passed unanimously by the Senate and reported out favorably by both the House District Subcommittee on D. C. Business and the full House District Committee; it is now pending in the House.

Through its legal advisors, the Council has submitted a detailed report on a proposed revision to the Chicago heliport ordinance, and, further, has suggested certain revisions in proposed changes of the aeronautical regulations of the Illinois Department of Aeronautics. At present, the proposed ordinance is under study by the Chicago Aviation Department.

The Council has also taken steps to provide assistance to officials in other municipalities—New Orleans and Philadelphia being two of the larger cities—where provisions for heliports, or revisions in heliport regula-

tions, are now being considered. In St. Louis, an ordinance providing for the licensing of heliports and the regulation of heliport operations has now been proposed. The Council's legal advisors have also conferred with the New Jersey Department of Aeronautics on behalf of a Philadelphia-based helicopter operator who wanted to establish a heliport on the steel pier at Atlantic City; and prepared material disclaiming any municipal need for regulating air safety aspects of helicopter operation. The latter was primarily prepared for consideration by officials of a Buffalo, New York, suburb who were contemplating the imposition of an unduly restrictive helicopter ordinance.

An important development concerned with the carriage of external loads by helicopters is now under study by members of the Helicopter Subcommittee of the AIA Airworthiness Requirements Committee. The study concerns the inclusion of external load regulations under Parts 6 and 7 of the Civil Aeronautical Regulations.

Special surveys and lists prepared by staff for national distribution included directories of: *Commercial Helicopter Operators in the United States and Canada*; *Executives and Companies Owning and Operating Helicopters*; *Government Agencies Owning Helicopters in the United States and Canada*; and a *Federal Aviation Organizational Chart and Directory*.

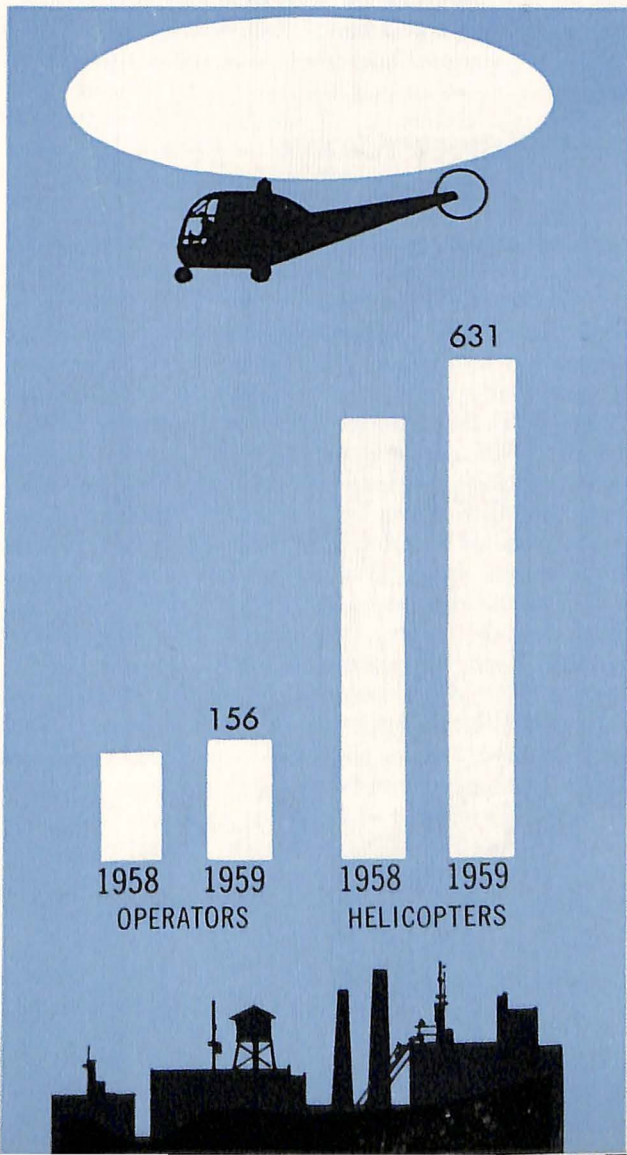
The deep interest of the military in helicopter progress was demonstrated late this fall by announcement of Army and Marine Corps participation in the world's first helicopter air traffic service to be established December 1. The two military organizations will aid in an intensive, all-weather operations test of helicopters. The two services, with Helicopter Council members, will join with the Federal Aviation Agency in this project, which operationally includes daily flights, regardless of weather conditions, between Philadelphia and New York, and between Bridgeport, Connecticut and the FAA National Aviation Facilities Experimental Center, Atlantic City, New Jersey.

The implications of this project to Helicopter Council members and to industry in general are incalculable in evaluating the growth of helicopter operations, both commercially and militarily.

A spectacular helicopter flight demonstration during the year was the commercially-sponsored "Project Medi-copter" at the 1959 meeting of the American Medical Association in New Jersey. Approximately 3,500 physicians received helicopter flights "designed to familiarize them with the advances now being made in medical transportation." Council staff participated in arranging this major demonstration.

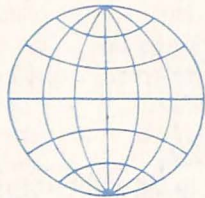
The latest available statistics for 1959 show an increase of 30% in the number of commercial operators and 26% in the number of helicopters used by them in the United States and Canada. The Council has also ascertained that the number of privately-operated heliports has been growing steadily.

*There are 156 commercial helicopter operators in the U. S. today using 631 'copters, an increase of 10 per cent in operators and 11 per cent in helicopters since 1958. The helicopter performs a wide variety of functions, giving industry one of its most valuable and versatile tools.*





## UTILITY AIRPLANE COUNCIL



**GEORGE T. PEW**  
*Aero-Design &  
Engineering Co.*  
*Chairman—Utility  
Airplane Council*

The use of a small planes for business and utility purposes continues to increase. This area of civil flying activity referred to as *general aviation* includes all civil flying excepting the airlines. It has become the largest user of the nation's airports, airways, and the largest user of the Nation's airports, airways, and 1958 has seen the production and sale of such aircraft more than double, reaching 6,414 units valued at approximately \$135,000,000. This trend has continued during 1959. In the first nine months, the industry has delivered approximately 5,600 units having a retail value of \$128,000,000, compared to 4,725 units valued at \$102,000,000 delivered in the same period last year.

Based on the trend since 1957, the last year the Federal Aviation Agency conducted a use survey, general aviation is now flying at an annual rate approximating 12,300,000 hours. For purposes of comparison, FAA sources report airline revenue hours were 3,546,000 in 1958. Based on this same trend, FAA sources also have estimated general aviation flew 1,544,000,000 miles in 1958, twice as many as the airlines.

The active fleet of general aviation now exceeds 70,000 units, greatly outnumbering the Nation's airline fleet which, according to FAA data, was about 1,900 units at the beginning of this year.

Despite the ever-increasing volume of their business, members of the Utility Airplane Council find many



people still think the airplane an expensive toy or a luxury they cannot afford. The thousands of active aircraft and the millions of hours and billions of miles they fly is the most substantial evidence to the contrary. Thousands of businessmen, having once experienced the increased efficiency and productivity which results from their use of private aircraft, find they cannot afford to be without them. Members of the Utility Airplane Council, individually and collectively, are greatly interested in making these facts more widely known.

### **Technical Standard Orders:**

Last year some new Technical Standard Orders (TSO's) were proposed by the Civil Aeronautics Board. Council members feel adoption of these can increase the cost and complexity of electronic airborne equipments for flight under FAA Instrument Flight Rules (IFR). In an effort to make constructive suggestions in this area, the Council has conducted a comprehensive study and has prepared a "Minimum Performance Standard for Airborne Electronics Equipment for IFR Use in General Type Aircraft." In this regard, Utility Airplane Council members feel that the availability of fine communication and navigation equipments, of a satisfactory size and weight, which are accurate, dependable, simple and easy to operate and economically priced, have contributed greatly to the present day utility of the small business and private aircraft. Council members are of the opinion that the existing Civil Air Regulations, coupled with the normal competitive processes of the industry, provide adequate safeguards from the standpoint of safety and the development of new and improved equipments. It is the Council's opinion that the opposite would be true if comprehensive TSO's and other supervisory and regulatory procedures were incorporated into the Civil Air Regulations.



### ***Physical Standards of Pilots:***

During the year, the Federal Aviation Agency has proposed two changes in the regulations governing the licensing of private pilots. One of these would more stringently, and in a more detailed manner, establish certain diseases and other physical impairments as diagnosis which would deny a license to the operator. Members of the Council conducted a careful review of the existing regulation and jointly were of the opinion that there was already ample coverage for these circumstances. The Council informed the appropriate Bureau that it considered the proposals largely unnecessary. Subsequent changes in the FAA rules reflect a more moderate approach.

The other proposed change concerned the conduct of the required physical examination. Under present FAA procedures, private pilot examinations can be conducted by the family physician, utilizing a Federal form. The FAA proposes to require these examinations be made only by FAA certificated flight examiners. The Council feels very strongly that there is no evidence which warrants such a move. The Council has recorded its views in opposition and finds itself to be in concert with the other associations representing various fields of general aviation. No action has yet been taken by the FAA on this particular matter.

### ***Pilot Training:***

Representatives of the Utility Airplane Council made an extensive review of the Civil Air Regulations as they relate to pilot training. This resulted from a 1958 proposal by the Civil Aeronautics Board that the requirements for obtaining a private pilot's license be substantially changed to include an additional ten hours (for a total of 50) of supervised instruction and experience as a prerequisite to the private license. Members of the Council agree with the announced objec-

tives of this proposed rule which aim at producing better private pilots. But the Council questions the practicability of the proposal. Following a careful study, they recommended the requirement for a private pilot's license be divided into two steps: 1. a primary license based on demonstration of suitability which could be obtained in 25 hours of supervised instruction and experience; 2. an advanced private pilot's license which would require 15 additional hours of training and experience, going into more advanced techniques.

More importantly, however, Council members expressed the view that there had been no substantial overhaul or review of training techniques for many years. They urged that the syllabus, curriculum, and various manuals utilized for these purposes be reviewed and updated in the light of present knowledge. The CAB functions which had initially proposed pilot license change have since been absorbed into the FAA, and this particular proposal has remained in status quo. Council members feel it warrants a most careful study by the new Federal Aviation Agency.

### ***Airport Shortage:***

An airplane is only so useful as there are places for it to go. A shortage of landing areas creates two immediate problems: 1. the denial of the air age to those places which are not now air accessible; and, 2. increasing congestion both on the airport itself, and, in the light of present thinking about the congested air space, in the air space itself.

In past years the federal Government's airport interests have been directed essentially to the building or improvement of the larger type terminal airports. Little attention has been paid to increasing the number of smaller airports and flight strips, thousands of which are needed.

The adequacy of the Nation's airports is a matter of constant review by the Council. It is of the opinion that the provision of airports and their maintenance should be essentially a function of the local community and the state, with the Federal Government providing coordination, planning advice, and some financial assistance, so that they would be properly fitted into the system of traffic management.

As the use of small aircraft becomes increasingly accepted, as a business tool and for private transportation, an ever-growing interdependence between general and airline aviation results. Though there are more than 6,000 airports, the Nation's scheduled airlines serve only about 600 of these. General aviation's rapid growth makes it a close partner of the airlines in bringing fast modern transportation to every section of the country, but many places are still relatively or completely inaccessible by air. Many thousands of new small airports and flight strips are needed.

Council members have pointed out that, while every airport need not be accessible to the airlines, every

airport must be readily accessible to general aviation.

Although it is possible to bring about some segregation by having airports especially suitable to receive the general aviation traffic, these airports must still be within the areas served by the large terminal centers. For example, businessmen and others in private aircraft or air taxis are increasingly coming to and from off-airline points to connect with airline schedules. FAA control tower statistics show there is already substantial general aircraft movement to these centers, and that these itinerant movements now exceed those of the airline. The need to go to these traffic centers will increase with the growth of the use of private aircraft. More importantly, the need will be based on well-founded economic reasons.

The Council, in addition to pointing up the need for more smaller airports to ease area congestion, also suggested that the large airports should provide separate runways and traffic patterns for small aircraft.

#### **Participation in General Aviation Council:**

The Council, through its staff, ad hoc committee activities and the coordinated activities of its members, keeps itself continually apprised of the developing general aviation industry. Several years ago, the Utility Airplane Council joined with a number of other organizations active in various fields of general aviation in the formation of the General Aviation Facilities Planning Group (GAFPG). This Group was formed primarily to advise and assist with the work of the President's Special Assistant for Aviation Facili-

*Business flying accounts for nearly half of the 11.5 million hours flown in 1958 by general aviation, which includes all civil flying except the scheduled airlines, Aviation Facts and Figures, official publication of the Aerospace Industries Association, reports. This segment of general aviation has grown rapidly since the end of World War II when it accounted for only 11 per cent of the total. Companies today consider business aircraft one of their most important—and profitable—business tools.*

NEARLY ONE HALF

**11.5 MILLION**  
**11.5 MILLION**

FLYING HOURS



ties Planning whose recommendations resulted in the creation of the new Federal Aviation Agency. Because its membership has recognized that coordinated efforts will be continuously desirable, the GAFPG recently re-organized as the General Aviation Council. Our Utility Airplanes Council Manager was elected secretary-treasurer of the new General Aviation Council, and our Council's Chairman serves as a member of the GAC Steering Committee.

#### **Activities of Technical Committee:**

For some years the Utility Airplane Council members have been accustomed to repairing, rebuilding, or modifying aircraft engines and products of their manufacture. These activities were conducted under regular procedures of factory supervision, quality control and inspection. Recently, however, the FAA has re-interpreted the regulations covering repair and overhaul of aircraft and components, and has stated that this could only be done under the provisions of a certificated repair station. For the manufacturer to do the work it has been accustomed to doing for many years under the new interpretation, would require a completely different method of processing the work through the factory. The Council feels that this interpretation is neither reasonable nor practical in its suggestion that the original manufacturer is not capable of reworking products of his own manufacture without special FAA certification. The Council has suggested modification of the regulations which would solve the FAA interpretation by redefining FAA rules to permit a manufacturer to rework his own products.

In addition to the Minimum Performance Standard described above, and the question of the repair station certificate, it has reviewed many minor problems resulting from dealings with the Federal Aviation Agency. All of its activities have been closely coordinated with those of the AIA Technical Service. Members of the UAC Technical Committee have also prepared an agenda of items which are being submitted through the AIA Technical Service to the FAA for inclusion in the Annual Review of the Civil Air Regulations.

#### **Study of Public Relations and Industry Statistics:**

The Council is currently studying areas of public relations in which it might coordinate some of its efforts. These would be directed primarily to the climate for the growth of general aviation. It is also reviewing the availability of statistical information about general aviation. FAA data is frequently out-of-date and there is much information available within the industry which could be effectively assembled. Both the matter of statistics and of coordinated public relations efforts are still in a study status. No action programs have been recommended to or considered by Council members.

## AIA MEMBERS

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Allison Division, General Motors Corp.  
Aluminum Company of America  
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Convair, a division of General Dynamics Corporation  
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The Garrett Corporation, AiResearch Div.  
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Division of Kaiser Industries Corp.  
The Kaman Aircraft Corp.  
Kollsman Instrument Corp.  
Lear, Inc.  
Lockheed Aircraft Corp.  
MB Electronics, a div. of Textron Electronics, Inc.  
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The Martin Company  
McDonnell Aircraft Corp.  
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The New York Air Brake Co.  
North American Aviation, Inc.  
Northrop Corporation  
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Pacific Airmotive Corp.  
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Pesco Products Division, Borg-Warner Corp.  
Piper Aircraft Corporation  
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Rohr Aircraft Corp.  
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Solar Aircraft Company  
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Temco Aircraft Corp.  
Thiokol Chemical Corp.  
Thompson Ramo Woolridge, Inc.  
United Aircraft Corp.  
Vertol Aircraft Corp.  
Westinghouse Electric Corp.  
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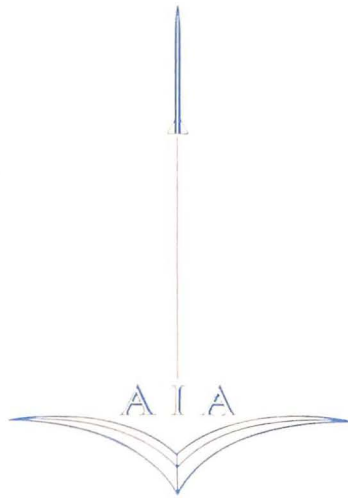


## DIVISION B

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Chambers, Reed M.  
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deSeversky, A. P.  
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Fales, Herbert G.  
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Hotchkiss, Henry G.  
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Loening, Albert P.  
Loening, Grover  
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