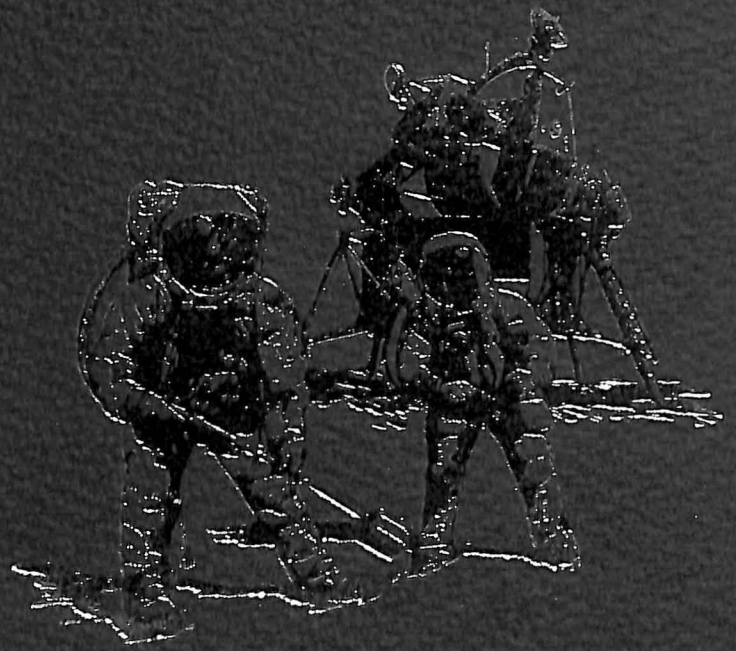


AEROSPACE INDUSTRIES ASSOCIATION/1969 ANNUAL REPORT



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TO THE
MEMBERSHIP



KARL G. HARR, JR.

In 1969 a decade of intensive effort, and centuries of curiosity, culminated dramatically in the landing of men on the moon and their safe return to earth.

For the aerospace industry this event represented the most visible evidence to date of its capability to achieve any national goal of high technology content.

Otherwise 1969 saw the industry in a period of overall transition. As technological capability continued its sharp advance declines occurred in several economic areas. Comparisons between 1969 and 1968 show the following:

- Sales declined from \$29.5 billion to \$27.1 billion.
- Employment dropped from 1,418,000 to 1,355,000 persons.
- Sales to the Department of Defense dropped to \$16.2 billion compared with \$16.6 billion, largely due to a decline in aircraft sales.
- Space sales dropped to \$3.2 billion from \$3.8 billion, principally due to the approaching completion of the hardware phase of the Apollo program.
- Commercial aerospace sales, principally jet transports, declined from \$6.4 billion to \$5.8 billion. This was a result of the phasing out of current transport models while production of the new generation of high-capacity, wide-bodied jets was just getting underway.
- Backlog at the end of the third quarter

was \$29.2 billion compared to \$31.5 billion.

In two important areas — exports and non-aerospace sales — increases were registered in the same period.

- Aerospace shipments abroad increased from \$3 billion to \$3.1 billion. Aerospace exports, a key element in maintaining the nation's favorable balance of trade, led all other manufactured products in shipments to foreign countries.
- Non-aerospace products and services increased from \$2.6 billion to \$2.7 billion. These sales represent work by aerospace firms in such areas as air and water pollution control, urban transportation, power generation, water desalination and marine sciences.

Two major organizational changes were made within the Association. At year's end, members of the Utility Airplane Council formed a separate association, and three members of AIA resigned. They were Beech Aircraft Corporation, Cessna Aircraft Company and Piper Aircraft Corporation.

The Procurement and Finance Committee was reorganized into the Procurement and Finance Council to meet current and anticipated requirements in this area of activity.

Major projects included:

- Completion of Phase III of the Weapon Systems Development Process.
- An analysis of the Requests for Proposals

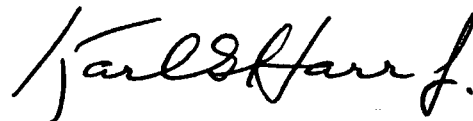
procedures and recommendations to improve them which were made at the request of the Air Force.

- Presentation of a detailed analysis of the Cost Principles of the Armed Services Procurement Regulation with recommendations to clarify and improve the government-industry relationship in this field.
- Preparation of a "White Paper" on Independent Research and Development which was issued as a report by the members of the Council of Defense and Space Industry Associations.

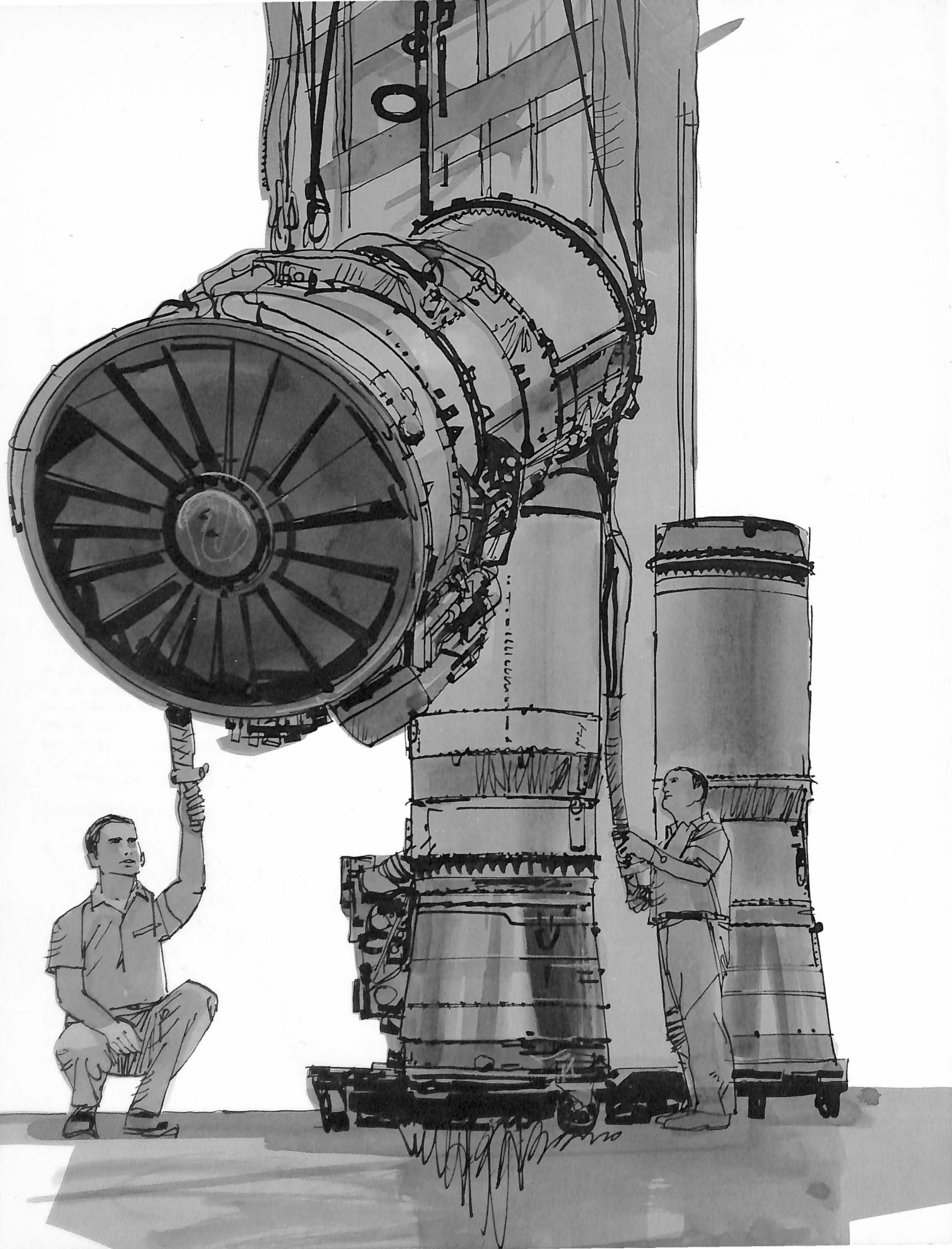
During the year, the industry viewed favorably two actions aimed at strengthening and improving the procurement processes of the government. Congressional action established a Commission on Government Procurement, and the Department of Defense appointed a Blue Ribbon Panel to make recommendations toward improving DoD acquisition policies and processes.

There were hundreds of separate actions performed by the Association during the year, and details of key actions are contained in this 1969 *Annual Report*.

Respectfully submitted,



KARL G. HARR, JR.
President



AEROSPACE OPERATIONS SERVICE

The Aerospace Operations Service during 1969 was engaged in more than 100 projects to further the states of the various arts involved in production, procurement, subcontracting and quality assurance of aerospace end articles, systems and parts and in the broad field of contractor support of these products after delivery to the customers.

Principal objectives are to develop cooperatively improved methods of managing and monitoring major functional operations, keep abreast of new technologies, materials and opportunities for advantageous use of computers, develop standards and specifications for aerospace procedures and production equipment and reduce costs.

The Aerospace Operations Service functions in widely diversified areas encompassing manufacturing, materiel management, product support, quality assurance, service publications and spare parts. Operating through six committees, supervising numerous task groups, the Service endeavors to anticipate and avoid, or solve industry and/or government problems.

AIA is participating in an effort to reduce the redundancy of research projects in metal-working industries and to upgrade manufacturing oriented education courses. Ways and means of attracting students to manufacturing careers are being studied.

Quality Assurance

The Quality Assurance Systems Study issued in 1969 presented composite information on the responsibility assignments and personnel requirements and distribution of AIA member companies to control the quality of their products.

The report provides a comparative reference guide by which managers in the field of quality assurance may evaluate their departmental functions and objectives against the composite report of similar departments of other companies.

It provides a statistical analysis, on a percentage basis, of the organizational locations within the various company managements of all quality assurance functions.

The results of this study demonstrate the great amount of attention given by the aerospace industry to functions which assure the quality and integrity of highly sophisticated equipment and systems.

NASA/AIA Quality Assurance

Quality managers from all National Aeronautics and Space Administration centers and headquarters and managers of major NASA programs discussed with AIA methods for continued improvement of the government/contractor interface with the objective of optimum quality management effectiveness.

A principal subject pertained to the respective roles of NASA, prime contractors, subcontractors and suppliers in achieving and monitoring quality control. Recurring problem areas requiring further study were identified and assigned for action or discussion in future review meetings.

Field Service Support

AIA maintained liaison with the DoD and the military departments in order to prevent or solve problems caused primarily by lack of understanding or misinterpretation of the documents which authorize the use of field service representatives.

AIA obtained a cancellation, by re-interpretation, of an order from the Office of the Joint Chiefs of Staff to the European and Pacific Theatres which had denied logistic support to the field service representatives not under contract and charged to overhead. Accordingly, the policies established in 1966 governing the relationship between the DoD and contractors on both direct and overhead type field service representatives remain unchanged.

NATO Symposium

AIA, at the invitation of the DoD, participated as a member of the U.S. delegation in the Fourth NATO Symposium on Codification of Equipment held in London, England. Each NATO member country reported on the status of its implementation of the NATO-adopted codification program and the problems encountered.

The multiple benefits and savings which can result from a cataloging program appeared to be questionable to some NATO members and the U.S. delegates were called upon to explain and endorse the program.

NATO barriers to understanding include the differing stages of progress in the work of cataloging and mechanization, the size of the country, the volume of military equipment involved in the program, and the financial support provided by each country to its manufacturers and political motivation.

The symposium created a better understanding by the NATO nations of the attitude toward the U.S. Federal Cataloging Program and a better understanding by AIA of the NATO problems which affect government/contractor relationships.

Computer Aided Manufacturing

An AIA study group in 1969 demonstrated that the new technology of computer graphics can be applied effectively within manufacturing operations. Process and tool planning, tool designing, and numerical control programming will be among the first functions to benefit. Computer graphics can provide manufacturing with the much-needed, real-time communication link with computers.

Although computer software will be costly and additional computer-type hardware will be required, these conditions will be more than offset by:



DR. RICHARD K. WILSON
North American Rockwell
Corporation
Chairman, Manufacturing
Committee



KENNETH B. GAY
North American Rockwell
Corporation
Chairman, Materiel
Management Committee



LEONARD T. BARD
Westinghouse Electric
Corporation
Chairman, Product Support
Committee



B. W. CLAWSON
McDonnell Douglas
Corporation
Chairman, Quality
Assurance Committee



ARTHUR C. GILL, JR.
Beech Aircraft Corporation
Chairman, Service
Publications Committee



RALPH W. EMERSON
General Dynamics
Corporation
Chairman, Spare Parts
Committee

- Substantial reduction in manufacturing flow time.
- Extended use of computers.
- More effective use of technical skills.
- General improvement in the quality of planning, tool designing, and numerical control programming.
- Cost savings through greater application and control of standardized methods and design features.

As a result of the findings of the initial study, a second phase study group has now been formed to coordinate design engineering and manufacturing engineering functions into a continuous computerized package through the use of graphics.

National Aerospace Standards

AIA in 1969 issued ten new or revised NAS specifications in the manufacturing area. The aerospace industry buys \$300 million worth of machine tools annually using these specifications. It is conservatively estimated that savings of about \$7.5 million annually are realized through utilization of these standards.

Small Business Liaison

For many years AIA has maintained liaison with the Small Business Administration, DoD, NASA and the Department of Commerce in anticipating and solving problems involving procurements from small business firms.

During 1969, AIA:

- Participated in several national and regional small business conferences on quality control, scheduling, truth in negotiations, value engineering and technology utilization to assist small business concerns in understanding government specifications, policies, and requirements.
- Recognized the shortcomings experienced in guidelines for small business subcontracting programs adopted in 1968 by DoD and SBA and drafted proposed new guidelines. Their adoption is believed to be highly probable. Redundancy has

been reduced by rewriting the existing 36 questions in the guidelines to 21.

- Participated in the government/industry review and recommendations on House Report No. 1975 issued by the House Select Committee on Small Business. The committee had studied the problems of small businesses in order to propose legislation to strengthen their position in government procurements. With AIA's participation, the government/industry committee endorsed four of the proposals and recommended against three.

High Speed Twist Drills

Reduced drilling costs will result from an AIA standardization project which was completed in 1969 after three years of study. A new drill standard was prepared which provides improved and consolidated point geometries, tightened tolerances and better selection for working the various exotic hard materials used in modern aircraft.

During tests of the new standard conducted at seven member companies under uniform testing procedures with nine different work materials, it was found that the split point geometry and tighter tolerances produced more uniform holes and resulted in extended drill life averaging 200 per cent. This is particularly important to aerospace companies which may drill as many as 33 million holes a month. Results in titanium tests were particularly good.

Cost and Leadtime

AIA since 1965 has made periodic surveys on cost and procurement leadtime of 41 basic components used in aerospace manufacturing. During 1969 three such surveys were conducted.

The average leadtime, which started at 9.8 weeks in 1965, rose to a high of 19.6 weeks in January 1967. Leadtime has improved continuously and in November 1969 was down to 13.4 weeks. The cost of the same 41 items rose slowly until January

1969 when the percentage increased abruptly. By November 1969 the cost was 12.8 per cent higher than the 1965 baseline.

Manufacturing Symposia

Three AIA manufacturing symposiums were held in 1969. They were:

- High Modulus Composites Manufacturing Methods.
- Advancements Pertinent to Manufacturing Equipment and Related Production Methods.
- Packaging Engineering.

More than 200 people attended these symposiums and the discussions identified topics requiring industry study and resulted in the initiation of five new projects.

Numerically Controlled Equipment

A list of 2,017 numerically controlled profile milling equipments operated in 80 aerospace plants was published by AIA in 1969. This list provides information relating to potential production capabilities and facilitates interchange of non-proprietary type maintenance and operating information to reduce redundant effort. This will assist in avoiding production bottlenecks and reduce costs.

Data Exchange

A dictionary of preferred definitions of data elements to be used in failure reporting between the world's airlines and their manufacturing suppliers will be issued during 1970 as the first product of AIA's work with the Air Transport Association, the Association International des Constructeurs de Material Aerospacial (AICMA) and the International Air Transport Association.

This dictionary is expected to become a significant tool for initiating design improvements to existing equipment as well as providing criteria for future design development and an improved base for administration of warranty requirements.

The first step in this activity, a data survey questionnaire outlining 36 basic data

parameters, was submitted to 76 of the member airlines comprising ATA and IATA. Responses received from 57 airlines produced nearly 57 different definitions for each of the basic data parameters. This mass of information is now in the process of being evaluated and consolidated by several task groups in which the airlines and the manufacturers are participating.

Spare Parts

A strong AIA position presented in 1969 in opposition to an Air Force proposal for obtaining firm prices for spare parts before the design of the parts was completed or identified by part number was a significant factor in the Bureau of the Budget deferring action on approval and further implementation of the procedure.

This proposed pricing approach, which is being service tested in conjunction with the Air Force implementation of total package procurement programs for certain aerospace systems, prompted an AIA study to determine its feasibility. Designated the Indentured Parts Price List (IPPL) concept, it is based on the principle that the sum of all parts prices shall not exceed the total price of the equipment of which they are a part without regard to any problems that may occur in fabricating, handling, storing and delivering these parts as spares.

A review of experiences resulting from programs or proposals for programs utilizing the IPPL, together with a comparison of current contractual spares pricing procedures with projected applications of the proposed IPPL concept, led to the AIA contention that this concept is contractually impractical. It ignores cost experience as it evolves in the performance of the contract.

Furthermore, its initial administrative cost is high due to the requirement for pricing every item on all contract end items which, in the case of airframe components, could require pricing on thousands of items which will never be sold or required as spare parts. For example, the spare parts history of an aircraft currently in the Defense inventory showed that 80,000 items were reviewed for provisioning, with 13,000 recommended and priced for spares procurement by the contractor. However, only 8,000 were purchased by the customer. Under the IPPL procedure all of the 80,000 items would have been priced and the pricing efforts for 67,000 would have caused a wasteful expenditure of manpower and time. The impact of design changes and redundant repricing on these items would also compound the problem.

Spare Parts Phased Provisioning

AIA participated in an *ad hoc* panel of representatives from the government and industry trade groups to provide a greatly expanded revision of the DoD spare parts phased provisioning procedures in 1970.

These procedures were initially developed during 1966 under AIA leadership to provide economies through the early procurement of specific long-lead time items in quantity lots as well as by deferring costly machining and processing until the anticipated requirements were confirmed through operational use.

Among the objectives to be achieved by the projected revision will be more procedural instructions to both the contractor and the provisioning activity on the processes required to accomplish phased provisioning. In addition, procedural requirements will be modified so as not to restrict buffer stock considerations to limited production periods covered by annual contracts. When developed, the system will provide a means of establishing, scheduling and managing buffer stock throughout the phased provisioning period.

Parts Provisioning

AIA participation in an Air Force effort to streamline its major spare parts selection and ordering procedures has resulted in the development of a single consolidated provisioning instruction which is expected to provide both the Air Force and industry with a more simplified method of managing supply support projects.

This single provisioning document will replace four separate and redundant provisioning instructions currently in use. It has been developed with the objective of providing flexibility to the government in selecting minimum essential data to fit each specific procurement while, at the same time, providing the contractor with clear, precise instructions on government requirements for documentation, data and spare/repair parts. In addition, it also provides the contractor with an action plan with time frames when each phase of the provisioning process must be accomplished.

Following a period of review and coordination, mutual agreement on this document was reached during 1969 in almost all areas with the exception of the incentive/penalty section. However, resolution efforts for that section have been handled as a separate project.

Technical Manuals

According to an AIA evaluation report issued in 1969, an Army specification amendment establishing contractual read-

ability standards will increase technical manual preparation costs significantly. It also will lengthen the period between information cut-off dates and delivery, thereby lengthening delivery schedules without achieving significant improvements in technical manual readability.

These findings were presented to various Army groups as part of a program that AIA has been conducting to refute claims concerning the lack of readability of technical manuals made by government representatives. They claimed that a significant number of technical manuals prepared by contractors are above the comprehension level of the users.

While opposing contractual imposition of this amendment, AIA has proposed an approach to this problem which was developed jointly with various Army elements during 1967.

This approach called for the establishment of guidelines which prescribed the use of short, direct sentences, minimizing the use of multi-syllable words and limiting technical terms to those which should be understandable to users who are high school graduates. This approach is not a contractual requirement, but many contractors are using it.

AIA is planning further efforts for 1970 to acquaint a wider range of government representatives with this guideline approach to readability while at the same time obtaining increased acceptance from contractors that they will make use of it.

Repair Contracts

A proposed outline for the structure of the statement of work section of repair contracts was presented by AIA to DoD during 1969 as the first step in implementing its 1968 report on corrective measures to improve contract repair performance related to repair turn-around times.

This effort reflects consideration of the wide proliferation of the types of repair contracts in existence and the fact that contractual requirements differ considerably within a given military service as well as among the services. Although it was recognized that some flexibility is necessary to permit adaption to unique circumstances, it is also essential to systemize the scope of work requirements to a greater extent than has been done previously.

The Air Force has responded to this action by utilizing portions of the proposed AIA work statement outline in service tests of commercial overhaul/repair contracts with a number of aerospace contractors. The results of these tests are expected to be available in 1970, and AIA is continuing its coordination efforts.

AEROSPACE PROCUREMENT SERVICE

The Aerospace Procurement Service supports the functions of finance, accounting, contract administration, legal activities pertaining to procurement, patents, industrial relations, industrial security, government reports and manpower utilization. One Council and three principal committees provide a medium for conducting evaluations and resolving problems of mutual concern to government and industry.





The Aerospace Procurement Service in 1969 largely was involved in areas concerned with the proposed changes and additions to government policies and procedures relating to the business activities of aerospace companies.

Product Liability

One of the most serious problems currently confronting the aircraft manufacturing industry is the lack of insurance capacity, at economically feasible rates, to cover product liability, particularly as to the potential liabilities to commercial passengers. This problem will increase in magnitude with the projected increased use of commercial air transportation.

AIA is advancing a program under which claims for the personal injury or death of domestic commercial air passengers will be promptly and equitably settled. In addition to the speedy settlement of such claims and the avoidance of protracted litigation and attendant expenses, effectuation of the program should stabilize insurance premiums and make available adequate insurance coverage.

Under the Warsaw Convention, air carriers have limited liability to passengers for death or bodily injury occurring in the course of international air transportation. This limitation of liability, however, does not extend to the aircraft manufacturing industry. A revision to the Warsaw Convention is contemplated and AIA is actively participating in such activity to seek the extension to manufacturers in the aircraft industry.

Manpower Utilization Analysis Group

The Manpower Utilization Analysis Group made an inventory of aerospace industry manpower by functional classifications. This provides the management of participating companies with information about the number of people in various functions related to comparative base data. This information is especially useful in planning and manpower monitoring.

Indemnification

Present statutes and regulations covering the indemnification of government contractors for extra hazardous risks involved in or catastrophic losses which might result from the performance of such contracts do not afford adequate protection for either the public or the contractor.

For many years, industry has sought an appropriate solution to the problem. Because of the direct impact of this problem on the government procurement process, AIA appeared before the Military Operations Subcommittee on HR 474 to establish a Commission on Government Procurement to present testimony providing the basis for the consideration and the proposal of legislation to solve the problem by such Commission, or the independent introduction of appropriate legislation to this end.

The report issued by the subcommittee on the hearings suggests, as a problem appropriate for study by the Commission, the financial risks of catastrophic accidents arising from the performance of government contracts.

Warranties

AIA during 1969 developed a comprehensive analysis of the variations that developed in Department of Defense contractual requirements dealing with express and implied warranties, consequential damages and related clauses.

Some DoD elements were departing from the long standing policy of recognizing the state-of-the-art factors and the costs of broad warranties involved in military products and in some cases specifying contract provisions more stringent than in traditional commercial practice.

The AIA analysis was provided to the DoD with a request that a standard policy be established. The Office of the Secretary of Defense has indicated that the urgency and importance of this matter are recognized.

Consideration is being given to adopting policies which would accomplish these objectives:

Provide for the use of warranties similar to those used in commercial business for the purchase of commercial items.

Exclude warranties from early stages of research and development, cases where the state-of-the-art is being advanced, and where, in these or similar situations, a cost reimbursement type contract is used.

Recognize the cost of the deferred liability assumed by contractors when warranties are used.

Specifically relieve contractors of liability for consequential damages where

it is commercial practice to disclaim such liability or where by the nature of the product it would be inequitable or costly to require contractors to assume the risk.

Cost/Schedule Control System Criteria

AIA continued to work through the Council of Defense and Space Industry Associations on the Cost/Schedule Control System Criteria (C/SCSC) toward the objective of standard requirements in terms of results rather than methods. A presentation was made to key officials of the Office of the Secretary of Defense in regard to the accounting of applied direct costs. However, that office decided not to make any substantial change to its Instruction.

CODSIA recommendations were also developed with regard to a Cost Performance Report designed to support C/SCSC, Systems Acquisition Reports for DoD, Congress and System Program Office activities. These recommendations were presented first to the DoD with the result that many issues were resolved. The remaining issues have since been presented at a hearing before the Bureau of the Budget and a generally practical reporting system has been adopted.

DoD/NASA Incentive Contracting Guide

The DoD/NASA Incentive Contracting Guide was published in 1969. Publication followed eighteen months of intensive efforts by AIA through CODSIA in reviewing of chapters as drafted by DoD and NASA representatives.

This effort permitted submission of industry suggestions and recommendations "before the fact" and provided for thorough discussions of each recommendation with government representatives. A large percentage of industry suggestions were accepted. Others were rejected because the suggestions required changes or additions to the ASPR.

AIA now plans through CODSIA to formulate proposed recommendations for changes in the ASPR coverage concerning incentive contracting which will be of benefit to DoD as well as industry.

Contract Risk Analysis

A study of the increased risk assumed by contractors in recent years, apart from the technical risks dealt with in the Weapon Systems Development Study, was initiated in 1969. It had become apparent that there have been myriad changes in government procurement policies, procedures and contract provisions which, coupled with the increased complexity and technical uncertainty in military hardware,

have in the composite brought about a substantial increase in contractors' liability.

The study will set forth each of these developments, wherever possible quantify the risk and compare it to commercial practice and provide an overview of the effect. The completed study will provide a better perspective of these matters for both the government and industry and a base for future development of policy.

Contract Cost Principles

Fifteen proposed revisions to the Cost Principles of the ASPR were received from DoD for review and comment in 1969. Because of the continued "piecemeal" conversion of the cost principles to rigid rules for cost disallowance, a position paper on the Cost Principles of the Armed Services Procurement Regulation was published by AIA.

This paper, which has received wide attention, presents a comprehensive history of the cost principles and relates how the cost principles have become incompatible with sound business practices; contribute to the deterioration in the buyer-seller relationship, and are unnecessarily increasing costs for the government as well as industry. The problems considered in the paper are: arbitrary quantified limitations; superimposed or "shifted" cost principles; vague terminology; disallowing unmentioned costs; reduced role of the contracting officer; constraint of the Contract Appeals Board; and cost control through disallowance. The paper recommends that the cost principles be restored to their original intent of cost determination.

Uniform Cost Accounting Standards

An amendment to the Defense Production Act directed the Comptroller General to study the feasibility of uniform cost accounting standards to be applied to all negotiated prime contract and subcontract defense procurements of \$100,000 or more.

AIA participated with CODSIA in meetings with General Accounting Office representatives concerned with this subject and in providing the GAO with industry views. AIA also reviewed and responded to a GAO request for comments on a draft of its report to the Congress.

AIA stated that the need for uniform cost accounting standards has not been demonstrated; that such standards would be impractical even if possible; that no savings would be realized but rather there would be increased costs to the government, and concluded by urging greater objectivity in review and report to the Congress.

Military Standard Contract Administration Procedures (MILSCAP)

The Department of Defense program known as MILSCAP is designed to attain a greater degree of simplification, standardization, and automation in the processing of procurement, contract administration, and related logistics and financial data. The system is scheduled to become fully operational in 1970.

AIA has closely monitored the military service actions to implement the system. A presentation made to the Assets Management Systems Advisory Committee summarized experiences with the Defense Contract Administration Services, Air Force, Army and Navy implementing directives, and also outlined the contractor interface problems. Highlighted were non-consistent applications and lack of funding to cover costs incurred by contractors in accommodating some of the military service implementation plans.

AIA has also met with Navy representatives and obtained a number of clarifications which should help to lessen the impact on contractors.

Government Property

AIA has continued to monitor DoD and military service department policy matters regarding the use, control, and accounting for government property in the hands of contractors.

Through exchanges of views with DoD officials, AIA has continued to express industry's arguments against proposed ASPR language which would make the contractor responsible for loss or damage to government property, should the contractor fail to maintain an approved property control system.

Another subject upon which AIA has continued activities is the Air Force five year phase-out program which DoD indicates may be adopted.

Patents and Data

A concept issued by DoD would have required contractors to grant licenses of their proprietary technology (patents and technical data), at reasonable royalties determined by the government, for the performance of follow-on production contracts by another contractor. AIA participated in the development of a CODSIA position paper on the concept which provided reasons for rejecting the concept as unsound. It is understood that the DoD will not implement the concept.

Acting through CODSIA, AIA objected to the clauses, pointing out their adverse impact on the development of new or improved products, as well as their in-

equities. Continued use of the clauses as well as their implementation in ASPR is presently before the DoD.

Under newly issued regulations, the Atomic Energy Commission acquires certain rights in inventions made in the course of a contractor's independent research and development. AIA has requested AEC to review this practice, pointing out its inequities and adverse impact upon contractors' independent research and development programs.

AIA through CODSIA presented extensive comments on a proposed revision of ASPR data clauses dealing with technical data furnished by contractors with "limited rights" to the government, and more specifically, the legend which appears on such data and sets forth the limited rights acquired by the government. In general, the revision as issued contains a new legend that is an improvement, but which is susceptible of misinterpretation. AIA has requested the DoD to issue instructions assuring the proper interpretation of the legend so that a contractor's limited rights data will not be used by the government for certain procurement purposes. In connection with "limited rights" data, AIA has also requested DoD to issue a directive under which such data would be disclosed within the government only to those having a "need-to-know."

Distinguished Service Citation

AIA received the Distinguished Service Citation, the highest award given by the Department of Defense, for its support and assistance to national civil defense preparedness. In making the presentation, Virgil L. Couch, Assistant Director of Civil Defense (Industrial Preparedness), stated:

"The Aerospace Industries Association of America has provided outstanding support and assistance in achieving many of the goals of national civil defense preparedness. The Association was one of the first national organizations to provide such leadership and cooperation.

"Through their national officers and through especially appointed committees, the Association has maintained constant liaison with national defense planners and has provided information and necessary guidance to members and others throughout the industry on how to prepare for civil defense emergencies."

OFCC Guidelines

The Office of Federal Contract Compliance in 1969 proposed interpretations and guidelines for preventing sex discrimination to be followed by government contractors. While supporting the intended purpose of



WILLIAM L. CLARK
North American Rockwell
Corporation

Chairman, Procurement and
Finance Committee



GEORGE H. SCOTT
Ling-Temco-Vought
Incorporated

Chairman, Industrial
Relations Committee



CHARLES A. MAHAN
United Aircraft Corporation
Chairman, Industrial
Security Committee



ANDREW L. BAIN
Singer-General Precision,
Inc.
Chairman, Patent Committee

the guidelines, AIA objected to those regulations which increase the cost of doing business and the difficulty of administrative compliance where the benefit to be gained is not proportionate to these increased expenses.

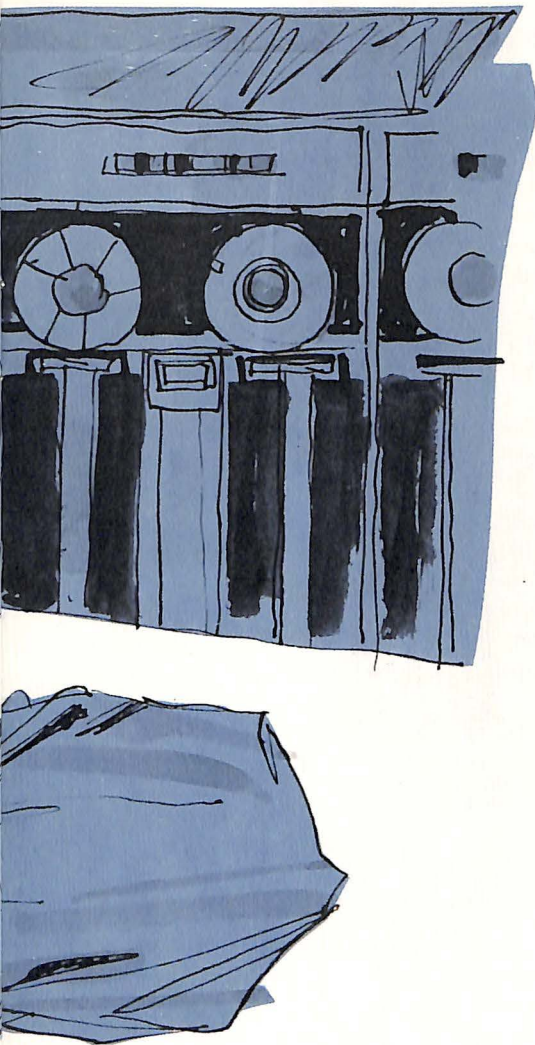
AIA commented specifically on inclusion of women's colleges in recruiting itineraries, advertising for help in women's publications, making jobs available to women on a part-time basis, equal physical facilities including restroom lounges for all employees, federal and state limitations on overtime for women, proportionate mix of women and men in training programs, and prohibition of the compliance officer from discussing possible violations with employers.

Security Manual Changes

Both the Office of Industrial Security and the Office of the Directorate for Security Policy in 1969 submitted proposed changes to the Industrial Security Manual. AIA through CODSIA reviewed and commented on the proposed changes covering clarification of residence requirements pertaining to immigrant aliens, repaired and drilled security cabinets, reproductions of Top Secret and Secret material originated by AEC, shredders, overwriting discs and drums, strongroom and closed area criteria, temporary help supplier personnel, visitor control procedure and administrative termination of personnel security clearances. Comments on the proposed changes were directed toward better security with fewer and simpler controls.



AEROSPACE TECHNICAL COUNCIL



The Aerospace Technical Council in 1969 continued its efforts to resolve mutual government/industry problems. The Council's three divisions and 12 working committees have been engaged in numerous activities related to government policies, procedures, and actions which broadly affect the technical side of the industry.

Effective channels of communication have been maintained between AIA and senior government technical management officials. The objectives have been to exchange views on problem areas which have significant impact on the aerospace industry. Productive dialogue covered such subjects as the structuring of major weapon system programs when engineering development is approached and entered, increased efficiency with management systems, the purpose of and approach to new management techniques such as milestone programming, and the application of requirements rather than detailed procedures in contracts.

Management Systems Control

A high level of effort was continued during 1969 in support of the DoD-CODSIA Management Systems Control Program, now three years underway. This includes issuance of DPC-70 which sets forth requirements for use of management systems in contracts, issuance of DoD Manual 7000.6 which lists all management systems, and initiation of a review and analysis of all financial management systems.

Considerable slippage of critical tasks to be performed was experienced. Further, a "moratorium" on the control feature of DoD Instruction 7000.6, the new DoD policy for controlling the development of new and revised documents, was issued during the year. As a result, new management systems documents in 1969 continued to display characteristics the program was initiated to prevent — elimination of detailed procedures and duplication of management systems requirements.

At year's end, plans were also underway to initiate all remaining Review/Analysis Task Groups which are to eliminate duplicate and unnecessary management systems from the current inventory of more than 600 and identify those to be authorized for use on future contracts.

Weapon Systems Development Studies

Continuing to the next phase of a study initiated in 1968, AIA assessed and made additional recommendations to improve the process and reduce mutual government/industry problems associated with the "Essential Technical Steps and Related Uncertainties in DoD Weapon Systems Development."

Focusing on policies and development implementation procedures, the problem addressed in Phase III of the study was the long-term commitments both government and industry make without either the requisite technical information or without regard to the varying degree of uncertainty in the technical information that is available at the time of these commitments. With this problem statement, the objective was to determine what information is necessary and reliably available in order to make meaningful decisions in the weapon systems development process.

During the study, actual as compared to planned availability of valid data, use of prototypes, the effect of encountering "unknown unknowns," the competitive process, policy directives, the effectiveness of risk assessments, the timing of fixed price procurement and the elements of the development process were assessed for their effects on commitments, requisite technical information, and the varying degree of uncertainty of technical information.

Based on this assessment, the following conclusions were made: the DoD Policy Directive (3200.9), that initiates Engineering Development, is a limited option development strategy; contractors could make significant contributions to the preliminary program RFP's including the work statement; qualified industry sources could make a significant contribution to a more conservative statement of uncertainties, given the proper competitive environment.

Five recommendations were made and presented to DoD to reduce the problem areas. Key points are:

- Guidelines should be issued for the DoD Directive that initiates engineering development which expands on the concept of program tailoring so that greater program flexibility can be fully exploited.
- A supplement should be issued to the

The Aerospace Technical Council is the industry's top level technical advisory body through which broad technical and management problems affecting both government and industry are reviewed and solutions sought.



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 Chairman, Air-Breathing Propulsion Committee



RUDE STEINBERGER
Hercules Incorporated
 Chairman, Rocket Propulsion Committee

DoD Directive for Proposal Evaluation and Source Selection to encourage, in appropriate cases, the evaluation by qualified industry sources of the RFP.

- More use of prototypes should be considered early in development, as appropriate.
- A policy should be developed requiring DoD/industry application of searching, thorough and objective risk assessment.
- Changes should be made in procurement practices beneficial to the competitive environment encouraging early identification of technical uncertainties.

In support of these recommendations, several approaches were developed. These include:

- A sample set of program alternatives for DoD Directive 3200.9 and guidelines for their further expansion and use.
- A proposed supplement to DoD Directive 4105.62 and a procedure for handling a review of the RFP.
- A discussion on prototypes and how uncertainty can be reduced by their appropriate use in the phases of development.
- A general consideration of when and where risk assessments are applicable and the inhibiting factors that tend to reduce the effectiveness of risk assessment.
- A set of detailed recommendations concerning improvement of the competitive environment.

Systems Engineering/Technical Performance Measurement

AIA recognized the potential impact of the systems engineering standard proposed by the Air Force in 1968 and at that time initiated a major effort to provide appropriate comments to be used in the preparation of a standard which would have tri-service applicability.

The thrust of the recommendations was that the document should specify "what" the contractor's systems engineering management system should accomplish but not "how" the contractor should do the job.

After review by CODSIA, an Air Force trial standard on systems engineering management was published in 1969. Though it is much more acceptable than its preceding draft, this standard still contains requirements which are too broad in scope and depth of application.

This Air Force standard has DoD approval for trial application only and is being tailored to three major Air Force programs to gain test experience applicable to the further development of a tri-service standard.

Development by the Navy of systems effectiveness techniques, and by the Army of a systems engineering manual for internal DoD use are additional portions of

the DoD effort aimed at tri-service systems engineering requirements.

AIA is continuing to work for more acceptable government requirements for the contractor's systems engineering management process through direct discussions with DoD and the services. The objective of this continuing effort is to assure that tri-service requirements will contain realistic criteria for cost effective contractual application, permit maximum contractor initiative and prerogative in the engineering of the system design, and provide appropriate visibility of technical performance to permit adequate government management of the program without undue contractual costs.

Configuration Management

AIA worked with the services in implementing a major project to assist DoD in the development of the family of tri-service requirements documents which define the DoD configuration management system. A follow-on project conducted in 1969 had the objective of assisting DoD in the standardization of configuration management data elements.

The development by NASA of a configuration management policy directive and guidelines manual also was monitored, and NASA was urged to make its configuration management requirements consistent with those of the DoD system in order to achieve uniformity of application.

Data Management

In a continuing effort to work with DoD in the formulation of improved government policies and requirements for the management of technical data, several discussions were held at OSD staff level and with the individual military services concerning the implementation of policies contained in the new DoD Instruction 5010.12.

The objective has been to reduce the proliferation and volume of contractual requirements for technical data. The development of a tri-service Authorized Data List has been followed closely and constructive suggestions have been made to help convert existing Authorized Data Lists of the three services to a consolidated list which will permit DoD to acquire minimum necessary technical data.

Several submissions were made to DoD concerning the requirements for reproducible data packages, the deferred ordering or delivery of data, minimizing RFP data requirements and the quality of technical data. Strong opposition was taken to a proposed requirement for a quality assurance system for technical data similar to that required for hardware. This position

was based upon the lack of a demonstrated need for such a system and the attendant increased costs.

Computer Aided Design

As a part of the DoD program to accelerate the application of computer techniques to the design, production, and testing of defense systems, DoD prepared a proposed program plan for coordinating the development and implementation of computer aided design and numerical control manufacturing processes.

AIA led a review of the program plan which acknowledged acute awareness of the importance of this emerging technology, and agreement with the need for the development of such a plan. However, the necessity for a careful and orderly approach to the development of the plan to exploit properly the potential in this field was emphasized.

AIA recommended that the DoD study its entire defense procurement policy as it will be affected by computer aided design and numerical control technology. The recommendation also emphasized that new and improved techniques which affect every phase of the cycle of conceptual, design, manufacture, test-operate and support are in a preliminary state of evolution.

The DoD plan implies standardization of the complete system procurement cycle with the attendant danger of penalizing both the government and industry by increasing costs and leadtime and by stifling innovative drive. The position also recommended that DoD should study developments in this field to determine the most advantageous role for the government to play. The program plan also should clearly provide for industry to maintain its own prerogatives and competitive position in the methods and procedures used in the cycle of design, manufacture and test.

Standardization Management

AIA has worked extensively with the DoD Office of Technical Data, Standardization Policy and Quality Assurance to develop an appropriate charter for a Joint Military/Industry Standardization Management Advisory Committee.

This Office has requested top-level DoD approval of the charter to establish this advisory committee to the Department of Defense Technical Data and Standardization Policy Council. The Advisory Committee will advise DoD on overall visibility and management of part, material, process standardization efforts within DoD and use the full standardization capabilities of industry in the development and maintenance of these standards.

In the interest of a more efficient industry effort, AIA has also engaged in discussions with the Society of Automotive Engineers and Electronic Industries Association on ways to improve standardization efforts without fostering wasteful duplication of effort. In addition, organization and operating procedures for AIA's participation in international standardization activities have been drafted.

Electronic Design Uniformity

Implementation of tri-service use of the 63 design practice standards developed in Phase I of this program, in lieu of over 500 separate service requirements which they superseded, accrued an estimated \$33 million cost avoidance during 1969.

A two-year Phase II program initiated in 1969, has revised 30 of the original 63 standards to keep them viable and up to date with the rapidly changing electronic technology. In addition, 11 new standards are scheduled to be released in 1970. These include microelectronics, environmental requirements, corrosion control, dissimilar metals, readout devices and grounding. These new standards will improve the cost effectiveness of design by replacing over 100 conflicting and duplicating design practices by 11 tri-service standard practices.

Environmental Test Procedures

AIA worked with the military services to revise and expand the test methods for aerospace equipment to meet environmental demands. Extensive revisions were made covering acceleration, vibration, acoustical noise, shock and space simulation.

A parallel effort is the standardization of testing requirements in equipment specifications, and the elimination of the many varying requirements now contained in many individual specifications. A policy statement has been approved that MIL-STD-810 shall be maintained and used as the primary documentation for environmental test procedures. This policy will bring about a reduction in the variety of test methods now specified in equipment specifications, and should ultimately result in a single set of test procedures acceptable to both industry and the military services.

Microelectronics

A major AIA objective was accomplished when DoD accepted a policy change to permit the issuance of a general specification for microelectronics and individual detail military specifications for microelectronic devices. AIA also assisted DoD in preparing a general microelectronic device specification for release in 1970 to

implement this policy change. Detailed device specifications are being drafted and are expected to be issued in 1970.

These hardware specifications will provide the needed and timely uniform design criteria and visibility of those microelectronic devices experiencing broad acceptance for use in the new generation of major weapon systems now evolving. Thus, devices having the benefit of large commercial volume and continuity of production can be exploited by military usage with proper specifications to ensure that by design and verification tests they can meet the performance, environmental stress and reliability requirements.

National Aerospace Standards

The National Aerospace Standards are voluntary industry-developed documents covering such aerospace hardware as fasteners, fittings, electrical items, aerospace materials, packaging materials and machine tools.

Typical of the 41 new standards issued in 1969 include:

- Completion of the series of bolt standards and specifications utilizing the new "tri-wing" recess. These standards will be used on all the new wide-bodied jet transports, and will effect substantial savings on stocking, tools and replacement. One airline has estimated a reduction of 60 percent in its bolt inventory from this standardization action.
- A specification and standard for wire termination interconnecting devices to meet critical environmental requirements of space. These devices have functioned successfully in flights to the moon and back.
- A specification for a numerically controlled milling machine covering manufacturing, performance, inspection and procurement requirements.

Structural Design Criteria

A four-year effort by AIA and the Air Force to revise aircraft structural design criteria to current requirements will be completed with the publication by the Air Force of revisions to 15 criteria specifications during 1970.

The documents cover requirements for aircraft flight loads, flying qualities, landing and ground handling loads, and fatigue testing. The revisions contain requirements and design criteria that reflect performance and techniques required in the design and testing of the newer generations of military airplanes.

Other major efforts involve the development of specifications and revisions in areas not previously or adequately documented, such as classification of structural castings, reinforced plastic structural

materials, finishes for space vehicles, and internal sound levels of military aircraft.

Metric System Study

Responsibility for the three-year national study, authorized by Congress, of the advantages and disadvantages of the increased use of the metric system in the United States is assigned to the National Bureau of Standards, Department of Commerce. The first year has been devoted principally to planning for a series of national hearings, to be held during 1970.

A corollary one-year, in-house study by the Department of Defense, in support of the national study, will have broader implications for the aerospace industry. The DoD study will measure the impact of the metric system use on its capability to perform assigned missions.

A Council project group has been established to provide an industry focal point for review of the progress and thrust of the national study, contact with the Department of Commerce and other government departments engaged in the study, and assistance to members of the industry in the conduct of their own analyses.

Noise Abatement

Intensive efforts by AIA's special *ad hoc* group has resulted in improvements to the proposed new rule establishing noise standards for transport aircraft type certification. While the current generation of wide-bodied jets can be certificated, growth versions of these aircraft may encounter difficulty. Efforts are being made to effect change that will allow the development of economical aircraft while minimizing noise disturbances in the vicinity of airports.

AIA is participating in a new FAA/industry task force to develop noise criteria for the certification of short take-off and landing (STOL) aircraft. It is most important that these criteria be carefully developed in order not to restrict this segment of the air transportation industry.

New activity by FAA and industry in 1970 is anticipated in the development of noise certification criteria for the supersonic transport, already type-certificated transport category aircraft and VTOL aircraft.

Consideration is being given to continue an Operations Research Program on noise abatement tradeoffs as a joint industry/FAA effort. These discussions are in a preliminary phase though it appears that government interest in the continuation of this program is high. This operation research effort provides a computerized program mathematical model which will be capable of evaluating, on an economic

basis, the various tradeoffs involved in reducing the disturbance due to aircraft noise. The model would simulate the U.S. air transport system through 1985.

Turbojet and Turbofan Engine Requirements

AIA has presented to the three military services a single document which contains the engine requirements specification for turbojet and turbofan engines for the three services. This document clarifies, simplifies and updates the contents of the present three documents, based on today's and near-future needs.

The preliminary work for this document has resulted in modification of Air Force and Navy policy in testing of engines, resulting in shorter, less expensive development programs without loss of product quality. Review of this industry document by the services is expected to be completed in 1970. A similar effort to develop a single requirements specification for turboshaft and turboprop engines is planned for 1970.

Aircraft Exhaust Emissions

The Department of Health, Education & Welfare in 1969 presented to Congress its report on the contribution of aircraft exhaust emissions to air pollution. This report was required by the Air Quality Act of 1969. The HEW report used considerable information that was developed by AIA and the Air Transport Association.

HEW accepted industry's position that a federally funded and administered program on aircraft exhaust emissions control was unnecessary. This conclusion was reached after determining that aircraft engines add little to the total air pollution problem.

Further, the new generation of turbojet and turbofan engines will have relatively smoke-free operating characteristics and there are means available for direct reduction in the smoke produced by some engines now in operation.

Bailed Aircraft

Efforts with the Air Force to develop practical regulations and requirements related to the qualification of flight crews and to the conduct of flight operations with bailed aircraft are continuing. In response to Air Force concern regarding the safety of contractor operations, AIA has established a program to develop operating safety statistics for all contractor operations, including both bailed aircraft and contractor-owned aircraft.

This program will provide recommendations for improvement of contractor operations where problem areas are located.

In conjunction with the statistical program, an effort will be made to develop more appropriate means of reporting accident rates in test programs where the exposure to risk is high and the total hours of flying are low.

If this program is successful, it should be possible to obtain relaxation of government controls and management system requirements which are now imposed on the contractor.

Crashworthiness Program

An effort to find ways of increasing passenger survivability resulting from accidents involving large air carrier aircraft was initiated by AIA in 1967. This effort was essentially completed in mid-1969, with a FAA publication of major proposed changes for the certification requirements for transport category aircraft.

The FAA proposal incorporated almost all of the AIA's recommendations in the three areas highlighted for improvements. These included more stringent flammability requirements for materials used in aircraft interiors, upgraded standards for cabin emergency lighting and adoption of a systems approach with regard to cabin evacuation.

In response to part of the FAA notice, not covered by the original AIA recommendations, it was pointed out that some FAA proposals regarding increased crash load requirements were unnecessary and would impose severe economic penalties on aircraft. The adoption by FAA of the substance of the AIA recommendations is expected to improve substantially the inherent safety of the transport category airplane.

Unitized Cargo Equipment

An AIA project group was established during 1968 to develop procedures for FAA approval of pallets, nets and containers by the equipment manufacturers, relieve the burden on the aircraft manufacturers to certify this equipment, and facilitate airline interchange of unitized cargo.

Former procedures required that the varied nets, pallets and containers provided by each airline for each type of aircraft be individually certificated as part of that airline configured aircraft. The new procedures were prepared in the form of a National Aerospace Standard (NAS) and adopted by the FAA as a basis for certification.

It is estimated that savings to aircraft manufacturers through the use of NAS 3610 will approximate \$1,500,000 per model, assuming a production life of ten years. Long-range benefits include accel-

eration of interchangeability of standardized cargo units among the various airlines which will lead to reduced shipping costs.

SST Airworthiness Standards

AIA has been actively working with the FAA and other organizations since 1960 with the objective of developing economically practical and technologically achievable airworthiness standards for supersonic transport category aircraft.

With the expressed need of the FAA to complete such standards in 1970, for application to the British/French Concorde (and recognition that standards applied to this aircraft will also be applied to the American SST), a sense of urgency has been injected in working out the details of specific requirements.

Informal working sessions with the FAA were held during 1969 with the remaining unresolved tentative standards forming the basis for a government industry SST airworthiness standards conference to be held in mid-1970.

International Airworthiness Requirements

Attempts by AIA to obtain more uniformity between U.S. and airworthiness standards of other countries led to an attempt to reduce the differences between the United States and United Kingdom airworthiness codes for small airplanes.

With the exception of the airworthiness codes in the Communist world, all codes are derivatives of either the U.S. or U.K. airworthiness regulations. Following a comprehensive comparison of U.S. and U.K. regulations for small airplanes, representatives of the AIA, FAA, the British Air Registration Board and the Society of British Aerospace Companies met in England in 1969 with the objective of arriving at common airworthiness standards.

Many differences in the respective codes were resolved. While differences still exist, excellent progress has been made and the project will continue.

When this project is completed, participating companies expect that the costs for obtaining future U.K. certification approvals will be reduced.

Airworthiness Standards

AIA representatives continue to work with FAA on matters concerning airworthiness standards. Specific suggestions were made on the need to streamline the rule-making process and the need for delegation of additional certification tasks to industry in order to shorten the certification process and reduce the "unknowns" in the process. Recommended actions to resolve the problem areas were provided.

INTERNATIONAL SERVICE



JOHN W. SHAVER
McDonnell Douglas
Corporation
Chairman, International
Committee



The introduction of the Nixon Trade Bill and the passage of liberalized export control legislation late in 1969 were progressive measures establishing an improved trade environment.

The Administration has assumed a positive attitude on commercial export growth for the nation by establishing a goal of \$50 billion in U.S. total exports by 1973. Achieving this objective is critical since the U.S. balance of trade reduced from a surplus of \$7.1 billion in 1964 to a low last year of \$845 million.

The Chairman of the Cabinet Committee on Export Expansion, Commerce Secretary Maurice H. Stans, is involving his Department in the export credit problems, import tax problems around the world and all other forms of non-tariff barriers that tend to restrict U.S. access to foreign markets.

Trade Policy

AIA completed a comprehensive analysis of aerospace non-tariff barriers in 1969 to support national economic policy and further the development of an unrestricted international sales environment.

Congressional recognition of the importance of international trade and U.S. exports to the nation's basic economic health continues to be a key factor in

the establishment and the implementation of U.S. trade policy. Dynamic progress in the development of free world commerce may be deterred if Congressional analysis of international trade matters is not emphasized and increased. It is important for the U.S. to maintain liberal international trade policies in order for the aerospace industry to continue to expand its role as the nation's leading manufacturing exporter. AIA formed a group to report to government agencies on the industry's export objectives, showing the impact of these sales on the nation's security and economy.

DoD Shift in Policy

Broad changes in DoD policy concerning military exports were evident in 1969. Military aerospace sales to allies were still permissible on a selective basis. However, DoD directed that sales should be negotiated in most instances between U.S. industry and foreign governments directly, based on valid requirements of the customer. AIA held several meetings with DoD during 1969 to determine the extent of future DoD cooperation with industry in military export sales.

Space Equipment Exports

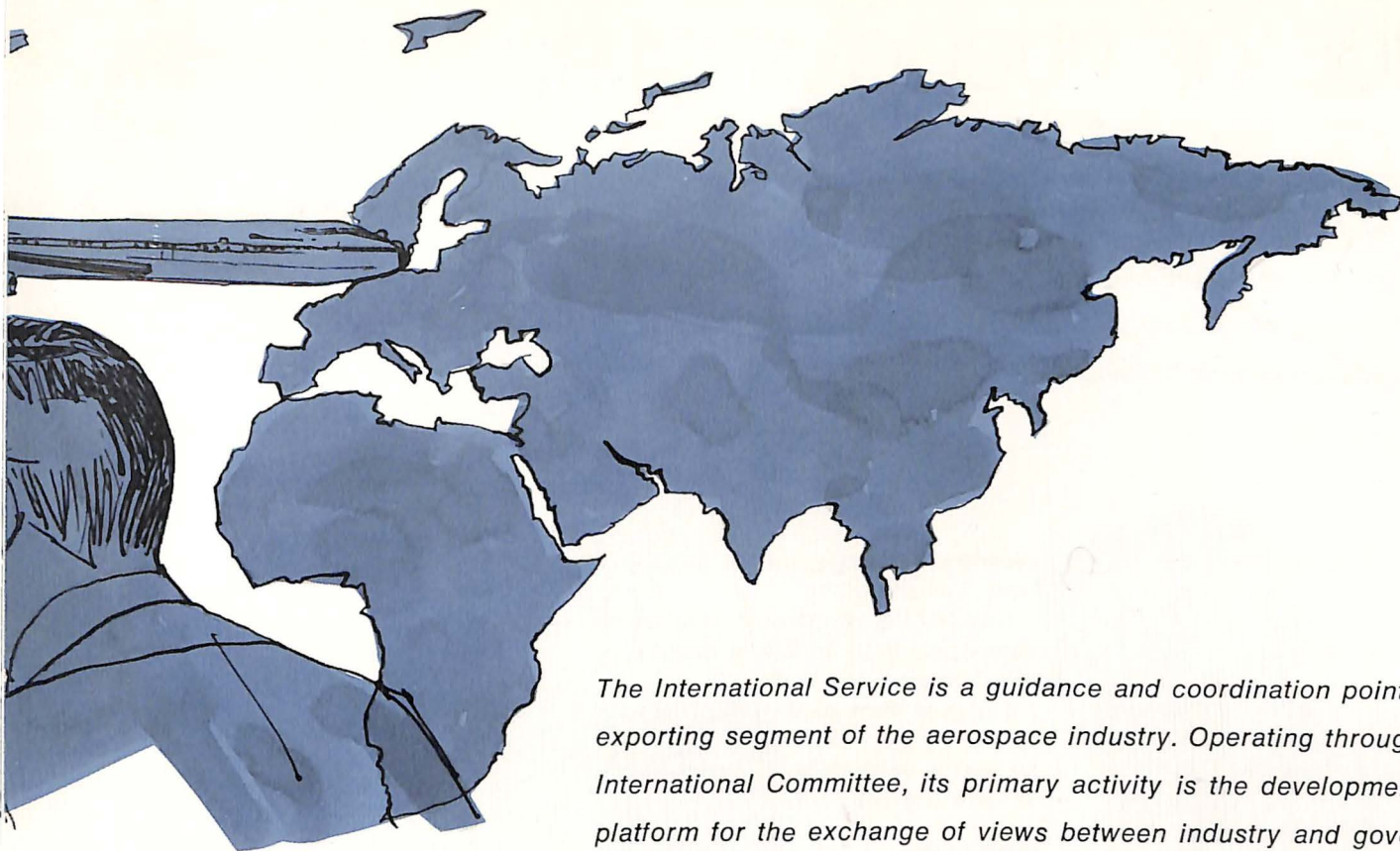
The State Department announced two important agreements in 1969 concerning

international cooperation in space projects. One is between the United States and India which permits use of the ATS "F" satellite by India for one year for educational television. A second is a recent government-to-government agreement which allows the export to Japan of U.S. launch vehicle technology up to the level of a Thor Delta.

Another effort pointing to further international cooperation in space was provided by the 1969 report of the President's Space Task Group. It states that international interests will be best served by projects which afford maximum opportunities for direct foreign participation. It discusses the creation of attractive international institutional arrangements and the involvement of foreign experts in the detailed definition of United States space programs and in the conceptual and design studies.

Export Licensing

The State Department's Office of Munitions Control in 1969 replied constructively concerning the results of a comprehensive AIA survey designed to focus on specific problems and to recommend corrective courses of action related to export licensing. Progress is resulting from the continuing dialogue between the State



The International Service is a guidance and coordination point for the exporting segment of the aerospace industry. Operating through the International Committee, its primary activity is the development of a platform for the exchange of views between industry and government agencies, to assist in creating, within the national interest, the optimum environment for increasing aerospace exports.

Department and AIA concerning changes in the International Traffic in Arms Regulations. AIA also made specific recommendations to the State Department in the matter of wording required in technical assistance agreements. This project will be continued in 1970.

AIA also cooperated with the Department of Commerce Office of Export Control in the development of new licensing procedures. The elimination of validated export license procedures for the shipment of civil aircraft engines to Latin America during 1969 was a major accomplishment. Cooperating with the Office of Export Control and submitting industry recommendations concerning regulations and procedures on new and improved methods proved an effective method of operation for the new AIA Export Control Task Force. The Export Administration Act of 1969 replaces the Export Control Act of 1949 and provides for liberalized yet controlled trade with all countries with which the U.S. has diplomatic or trading relations.

International Finance

The most important continuing factor affecting commercial aerospace export programs during 1969 was the capability to extend export credits to foreign buyers.

Commercial bankers have expressed keen interest in the export credit financing of civil aerospace products and during the past decade have become increasingly involved in aerospace international trade.

Comprehensive international finance programs concerning aerospace products begun by AIA at the beginning of the decade have provided factual and detailed information on an industry basis to international financial experts in various sectors of the international business community. Financial organizations and government officials have now become aware and concerned with the significance and overall economic impact of U.S. aerospace exports.

The nation's tight money situation in 1969 created a very critical shortage of funds for export financing. Bank interest rates rose considerably. The Export-Import Bank of the United States, recognizing this serious economic crisis at a time when chronic balance of trade as well as balance of payments problems faced the United States, responded positively to industry's requirements for export financing.

During Fiscal Year 1969 the Export-Import Bank financed 55 commercial transport aircraft to 10 foreign market areas amounting to a contract value of \$451 million. This ended a decade of historical

growth, and impressive assistance by Eximbank to the aerospace industry. During the past decade (FY 1960-1969), Eximbank has financed a total of 320 commercial transport aircraft to foreign market areas with a total contract value of \$2.9 billion.

At the end of 1969 the Export-Import Bank announced that ten-year term financing, if necessary, would be made available for the new generation of wide-bodied jet transport aircraft. This progressive action satisfactorily meets industry requirements.

NATO Industrial Group (NIAG)

At the request of DoD, AIA cooperated with three other trade associations in appointing from industry principal representatives to serve on the NATO Industrial Advisory Group which serves in an advisory capacity to the Conference of NATO Armament Directors.

NIAG is designed to improve NATO research, development and production policies and practices insofar as they affect industry; to foster a deeper feeling of international involvement in these areas; to seek closer cooperation among the industries of NATO countries; and to encourage the timely and efficient exchange of information between NATO governments and defense industries.

OFFICE OF PUBLIC AFFAIRS

The Office of Public Affairs serves to further the aerospace industry's objective to inform the educational community, news media, the government and the general public as to activities conducted by the industry in the areas of national security, space exploration, international trade and commerce and civil aviation.



L. BERKLEY DAVIS
General Electric Company
Chairman, Public Affairs
Council

In its second year of operation, the Office of Public Affairs further aligned its activities to serve increasing needs for communications concerning the industry to various publics.

The office continued to serve as a focal point to mobilize the informational resources of member companies, assisted by a Public Affairs Council made up of company public relations and public affairs executives. A major activity involved the development and presentation of industry-wide positions on issues of direct interest to the industry.

A greatly strengthened relationship between Public Affairs and other AIA councils and committees developed during 1969. This close relationship adds immeasurably to the effectiveness of the Association's public affairs effort.

The office also established a Public Relations Panel made up of Washington-based public relations specialists of member companies to enhance relations with the media and exchange information on industry-wide problems. By the end of the year, this new panel had proven increasingly effective.

Press briefings were provided during the year on such diverse topics as the supersonic transport, air commerce restraints, aircraft noise regulations, the nation's space program, and proposed smoke hoods for airline passengers.

Karl G. Harr, Jr., president of AIA, made a number of presentations during 1969, providing positions and ideas on a variety of subjects of direct interest to the Association. These included:

- Testimony before the Senate Commerce Subcommittee on Aviation on proposed airport/airways legislation.
- Testimony before the House Military Operations Subcommittee on the proposed Holifield Commission to study the government procurement process.
- Testimony before the President's Inter-

departmental Task Force on the Supersonic Transport (SST).

- Aviation / Space Writers Association, Washington, D. C., 1969 Year End Review and Forecast.

Copies of these presentations were produced and distributed to the news media for use as background in the preparation of news and feature articles.

Publications

AIA's publications program continued to be a primary method of presenting the industry's accomplishments. Principal publications during 1969 included:

- *Aerospace Magazine*. This publication was issued quarterly as a major vehicle for public communications. Of special interest was an issue published in September entitled "Goals for America" in which articles were contributed by seven members of President Nixon's cabinet concerning the social and economic issues and policies of their government departments. An introduction to this special issue was provided by Vice President Spiro T. Agnew.
- *Aerospace Year Book*. The 47th annual edition of the *Year Book* was issued and distributed commercially. A publication for the National Aerospace Education Council, "U.S. Aircraft, Missiles and Spacecraft", was made up from selected sections of the *Year Book* and sold by NAEC.
- *Aerospace Facts and Figures*. Published since 1945, *Facts and Figures* is recognized by media, government, financial institutions and industry in general as the authoritative source for aerospace economic statistics. A listing of public relations officials of member companies was provided in the 1969 edition.
- *Annual Report*. In addition to its primary function of informing the membership of AIA, the report was distributed to government agencies, private organizations and the press.
- *AIA Organization and Functions*. This

booklet, which describes the structure and operations of AIA, was revised and reissued during 1969.

Editorial Service

A monthly pictorial editorial service was initiated at year's end as a service for member company publications. By means of appropriate material illustrating facts, figures and general information about the aerospace industry, member company publications are better equipped to communicate to industry employees the various issues and events of particular interest.

Economic Data

AIA continued to work on the improvement of the collection of aerospace statistics with the Federal Aviation Administration's Statistical Advisory Committee established in 1966. Cooperation was also provided the Bureau of Labor Statistics of the U.S. Department of Labor in developing and publishing in 1969 an information index for general aviation and helicopter manufacturers.

BLS was provided information through its Advisory Council in such areas as economic growth, employment and international statistics in order to expand that agency's aerospace industry statistics. Public Affairs also continued its work with the Bureau of the Census of the Department of Commerce on improving aerospace statistics published by that agency.

Two statistical surveys of the industry's employment were published and the monthly Economic Indicators of the industry's activities were distributed widely. Two surveys of aircraft on order from the industry were also conducted.

AIA continued its support of the National Aerospace Education Council in order to improve the curricula on aerospace subjects offered the nation's students and to assist the teaching profession.



TRAFFIC SERVICE



GLENN R. RODIN
The Boeing Company
Chairman, Traffic
Committee

The Traffic Service is responsible for obtaining adequate, economical and efficient transportation facilities for the aerospace industry.

AIA's Traffic Service during 1969 concentrated its efforts to reducing costs and improving the effectiveness of aerospace logistics programs. To attain these objectives it was primarily active in four areas: common carrier rates and services; litigation before federal regulatory agencies with respect to rates and services; U.S. Customs matters and several coordinated government-industry projects to facilitate the movement of aerospace material with safety, expedition and maximum economy.

Common Carrier Rates and Services

Truck and rail rates generally rose nine percent in 1969. Constant and careful screening of carrier rates revealed numerous cases where proposals affecting aerospace articles were found to be unjustified or otherwise unreasonable, requiring action by Traffic Service to prevent publication of such rates. When protests

to carriers and their rate associations were ineffective to accomplish desired results it was necessary to seek adjudication of the issues before the Interstate Commerce Commission.

During the past year Traffic Service has participated in nine such ICC proceedings, four of which were decided favorably to AIA. Decisions are still pending with respect to the remaining five. The following completed ICC proceedings resulted in total annual savings of \$651,000 to AIA member companies, broken down as follows:

- Prevented imposition of increased rates on passenger aircraft seats ranging from 50 to 82 percent for motor carrier shipments from California to Washington. Annual savings: \$108,000.
- Obtained an ICC ruling declaring unlawful a 2 percent charge by household

goods movers on bills not paid within 14 days. Annual savings: \$300,000.

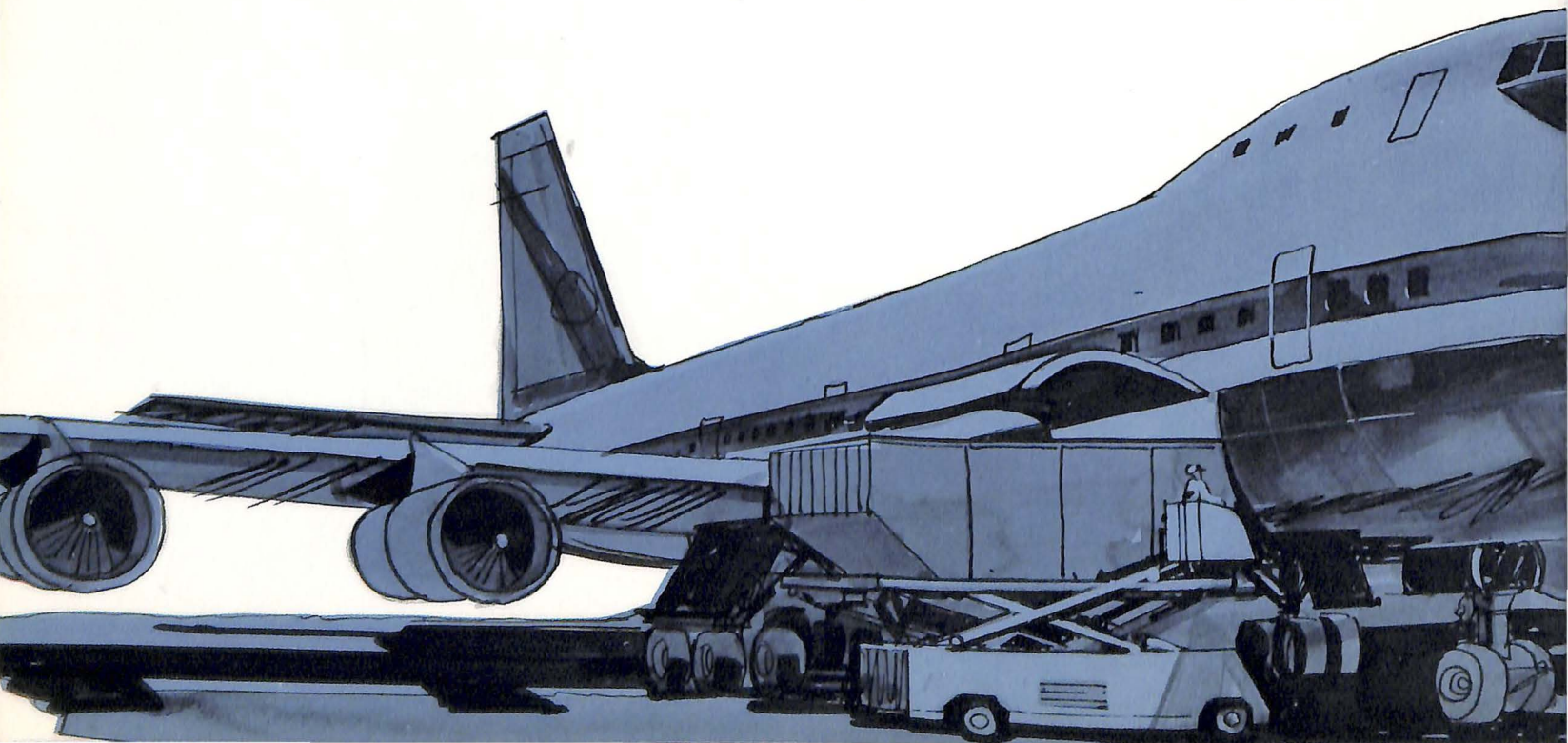
- Successfully petitioned for suspension and investigation of motor carrier penalty charges on shipments weighing under 500 pounds. Tariffs were subsequently cancelled. Annual savings: \$100,000.
- Opposed and obtained cancellation of a special 2 percent service charge imposed by motor van carriers. Annual savings: \$143,000.

Traffic Service is also a party to the following ICC cases which at year's end were still active in various stages of litigation:

- A rule-making proceeding to require motor carriers to upgrade service covering aerospace shipments of small lots of explosives and hi-value articles.
- A rule-making proceeding designed to improve the quality of service provided by household goods carriers.
- A petition for declaratory order to establish the lawfulness of motor and rail carrier claim settlement rules affecting losses and damages to aerospace shipments.
- A complaint against tariff rules limiting the liability of railroads to maximum of \$300,000 for loss and damage to hi-value aerospace articles.

The following actions have been taken during the year before carrier associations. Some of the actions, as indicated, have been successfully concluded. Others are still pending.

- Obtained reductions of \$137.17 per shipment on increased rates for helicopter blades.



- Obtained reductions on rates applicable to galley units, primarily those used in large jet aircraft. Annual savings: \$51,000.
- Protested a general 6 percent increase in trans-continental motor carriers rates.
- Protested increased rates applicable nationwide on motor carrier shipments of passenger aircraft seats.
- Protested proposed increased rates applicable to motor carriers shipments of air hose or ducts.
- Proposed new handling procedures to reduce the high incidence of damage to mobile homes.
- Protested proposed surface freight forwarders limitation of liability to \$5 per pound.

U.S. Customs Matters

The effect of U.S. Customs regulations on the continuing ability of the aerospace industry to compete effectively and profitably in world markets has received close attention during 1969. Customs regulations have evolved over the years into a patchwork of archaic restrictions, difficult if not impossible to interpret, and serving as impediments rather than aids to the industry. The following actions have been taken to promote relief in this area:

- Appeared before the U.S. Tariff Commission and presented a plan of action to revise and up-date customs regulations governing temporary import procedures, i.e., duty-free entry of foreign aerospace components which are subsequently exported as part of a U.S.-manufactured article. Final action is pending.
- Worked in close coordination with the

Department of Commerce to obtain revisions to customs regulations calling for payment of duty on the full value of U.S.-manufactured aircraft returned from abroad rather than on the value of foreign manufactured components contained in such aircraft. The Department has advised that legislation will be proposed in 1970 to resolve this problem.

- Undertook publication of an import/export manual setting forth and interpreting the requirements and procedures of U.S. Customs. The manual will aid industry employees working in this area.

Government Interface

Quite often the actions of various agencies of government at all levels, federal, state and local, impose restrictions or establish requirements which affect the ability of the aerospace industry to maintain a viable transportation network for the safe, expeditious and economical movement of its commodities. When problems arise in this area, Traffic Service coordinates the interest of AIA members through the Traffic Committee so as to assure adequate representation of industry positions necessary to accomplish corrective actions. The following are resumés of several projects which have been undertaken in this area throughout the past year:

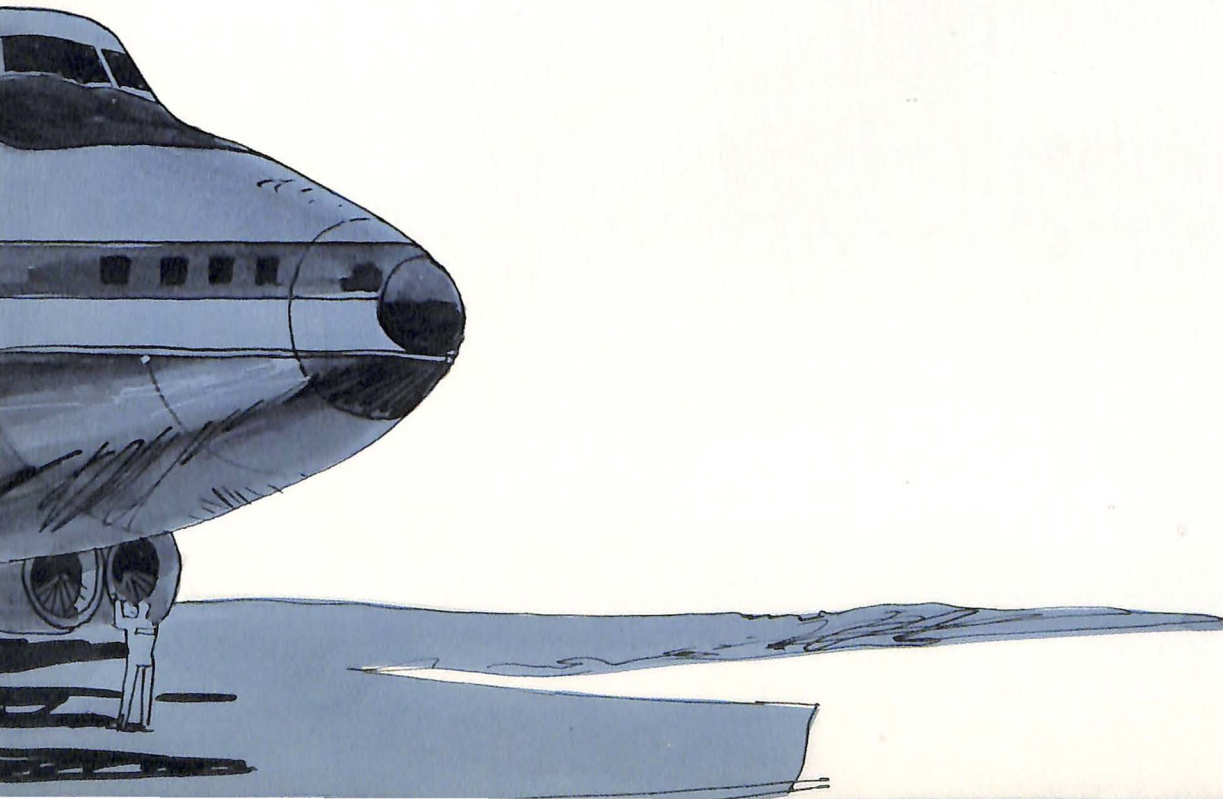
- A task force of the Traffic Committee, in a joint industry-government project undertaken in cooperation with California highway planners, developed a program which will insure continued open access to aerospace plant facilities which are

now threatened with encapsulation by encroaching freeway systems.

- In a cooperative project with the Defense Supply Agency and the Office of the Secretary of Defense reviewed and revised security regulations governing the transportation of classified material so as to provide improved in-transit protection for classified material at greater economy.
- As a member of an advisory committee, consisting also of representatives of the National Academy of Sciences, the National Bureau of Standards and NASA, assisted the Department of Defense in a project to identify and measure the shock and vibration environment of material in-transit by common carriers.
- At the request of the U.S. Army Missile Command established a task force to review and comment on a proposed military standard governing transportability requirements for missile weapon systems.
- Participated in a program instituted by the Civil Aeronautics Board to review and revise agreements governing air carrier liability, claims rules and practices.

Cost Savings

Traffic Service during 1969 continued its program of gathering and exchanging ideas and information relating to improved techniques used by member companies to support government cost savings efforts. Successful actions by individual aerospace traffic managers resulted in savings of approximately \$16.4 million. The results of coordinated actions taken by the AIA Traffic Committee are reflected in this amount.



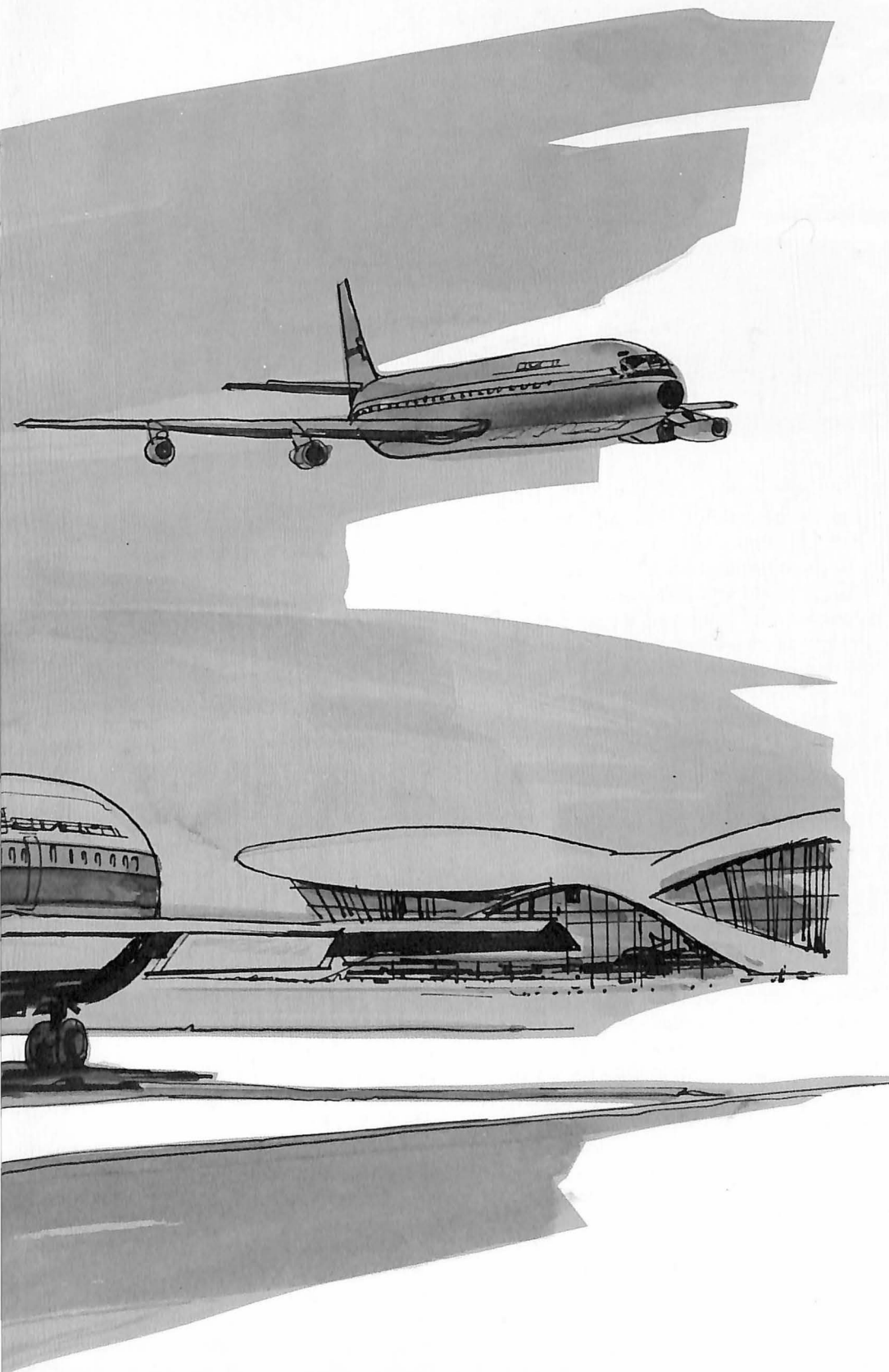
TRANSPORT AIRCRAFT COUNCIL

The Transport Aircraft Council coordinates and presents transport aircraft and engine manufacturers' views with respect to commercial air transport matters; it plans and gives direction to AIA actions designed to promote the most effective and efficient potential of civil air transport aircraft.



JACKSON R. MCGOWEN
McDonnell Douglas
Corporation
Chairman, Transport
Aircraft Council

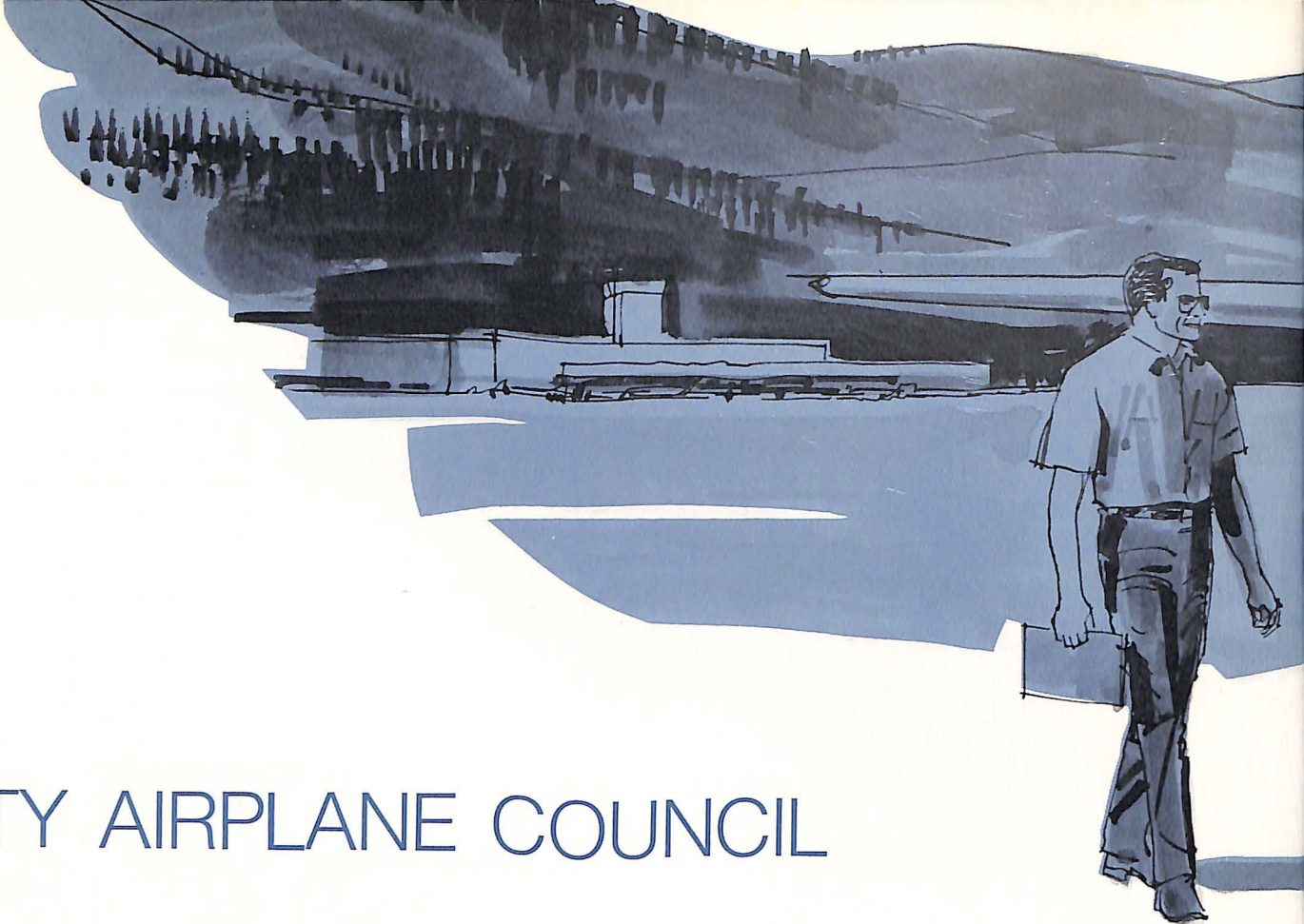




The Transport Aircraft Council in 1969 through close association with other segments of the civil air transport industry and appropriate government agencies continued to promote the exchange of technical information designed to contribute to the solution of air commerce constraints. Programs designed to solve these growing problems were expanded and participation among the air carrier manufacturing, airline operating and airport management interests in treating with these programs was broadened.

Actions completed or undertaken in 1969 included:

- Publication of "Transport Aircraft Characteristics, Trends, and Growth Projections." This document identifies growth parameters of possible future aircraft. It is designed to inform airport planners of those trends in conventional takeoff and landing aircraft design characteristics that are expected to influence significantly the design and operation of airports of the future. The document has been distributed world-wide and action has been initiated to up-date its contents.
- Development of a future trends document for short take-off and landing (STOL) aircraft that will synthesize future potential parameters of such aircraft, again to provide advance planning data for communities, airport designers and operators.
- Formulation of a standard data format for the collection and assembly of airport physical, operating and economic data. This data is intended to provide both current and long-range planning information to aircraft manufacturers and airport operators.
- Participation with Department of Transportation Air Traffic Control Advisory Committee established in 1968 for the purpose of defining the air traffic control and airport system needs of the 1980s. The report will identify both the system goals as well as the time-phased actions required to achieve these objectives.
- Initiation of a joint industry effort to review federal advisory standards for airport construction and design in light of future aircraft design trends and to make recommendations for changes to the FAA.



* UTILITY AIRPLANE COUNCIL



WILLIAM L. PIPER, JR.
Piper Aircraft Corporation
Chairman, Utility
Airplane Council

The primary efforts of the Utility Airplane Council in 1969 were directed toward better public understanding of the essential role of general aviation as an integral element of the nation's air transportation system and economy.

General Aviation Growth

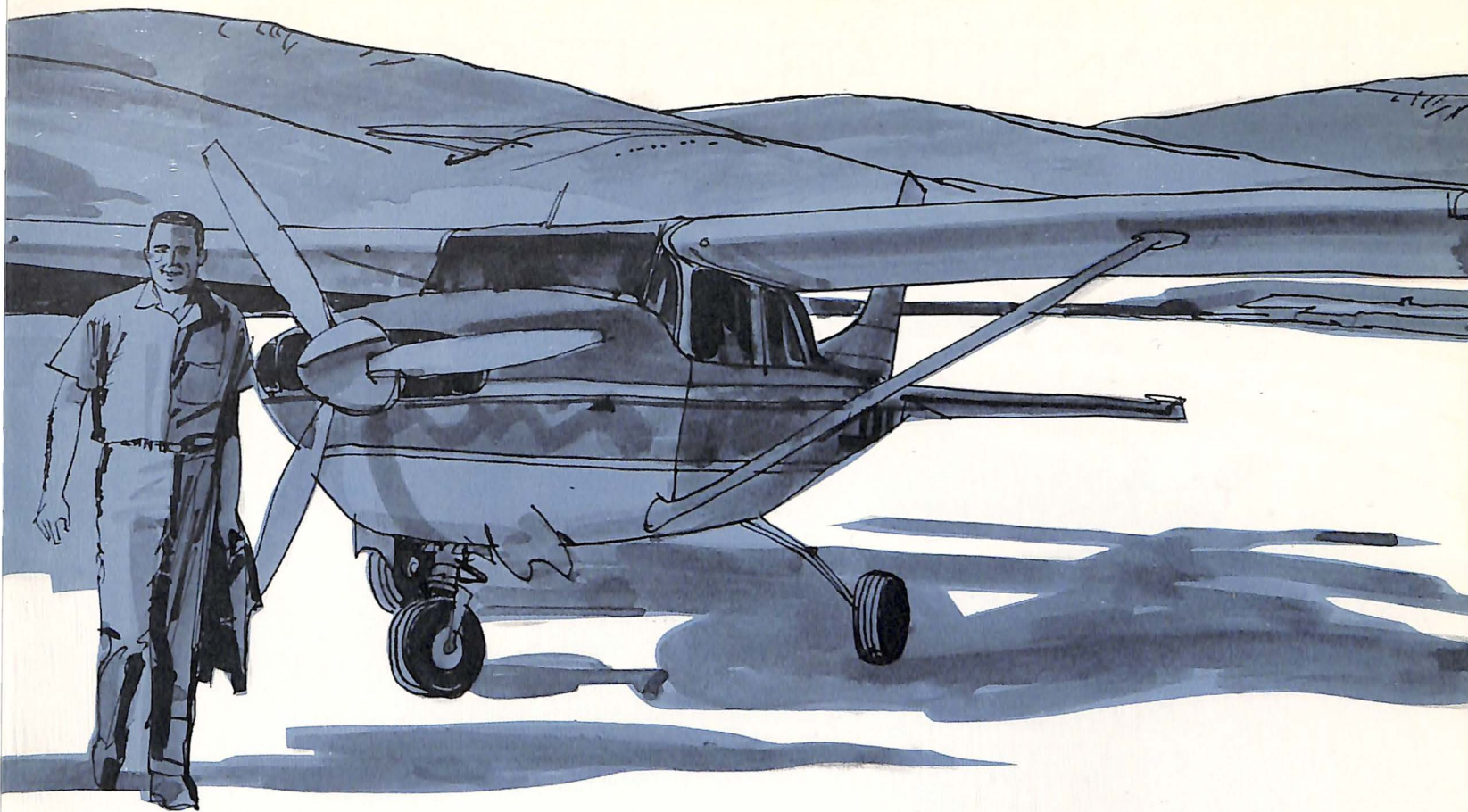
During the decade of the 60s the active fleet of general aviation has increased from approximately 75,000 in 1960 to an estimated 130,000, and flying hours have increased from 13,000,000 in 1960 to more than 25,000,000.

The industry's trendline has shown strong and continuing growth which has steadily accelerated during the past decade. Despite such tangible evidence there has been a lack of adequate factual information concerning general aviation in relation to the sizeable economic contribution made to the nation's Gross National Product.

Speas Study

To provide such needed factual information, during the latter part of 1968 and completed in early 1969, the members of the Utility Airplane Council jointly funded a comprehensive research project. The firm of R. Dixon Speas Associates was commissioned for this purpose. With the cooperation of the UAC members, but with independent responsibility, they prepared a basic research paper, "The Magnitude and

**The Utility Airplane Council was disbanded, effective December 31, 1969, as noted in the President's Message to the Membership.*



Economic Impact of General Aviation."

The study provides factual evidence that general aviation is making a significant contribution to the national economy which will more than double in the decade of the 70s. It also disclosed a positive relationship between Gross National Product and changing levels of general aviation activity.

Aviation Education

Adequate programs of aviation education in the nation's schools continued to be a matter of interest and concern to the members of the Utility Airplane Council. In past years this annual report has reported work of the UAC directed primarily to high schools. Several years ago filmstrips with coordinated sound, which could be utilized in classrooms, describing career opportunities and the importance of the community airport, were distributed to base operators in almost 500 places which they in turn could utilize for local efforts. They have been continuously used since then.

During the 1966-67 and 1967-68 school years several teams traveled extensively throughout the nation presenting a lecture program with coordinated background sound and color slides called "In The Pilot's Seat" to hundreds of high school assemblies.

As a further part of a continuing education effort, UAC members made a grant to the American Association of Junior Colleges to conduct a special study to pre-

pare a recommended syllabus for air age education suitable for junior colleges. This work is programmed for completion by mid-1970 and will be available for 1970-71 junior college program planning. This research study is being conducted independently by a professional team of junior college educators, and several representatives of the UAC have been invited to serve on the advisory committee monitoring the study.

FAA Liaison

Rule-making activities of the Federal Aviation Administration as they relate to the manufacture of general aircraft and their pilotage and operation in the nation's airspace are continually monitored. These activities included:

- A UAC team that monitored all aspects of the FAA's first National Aviation System Planning Review Conference and participation in the various seminars which were a part of the conference.
- Participation in meetings concerned with the growing congestion at major airports and assistance in the planning of modification of proposed rules considered to be unnecessarily stringent.
- Meeting with FAA officials in relation to a UAC/FAA cooperative effort which has continued for more than 36 months to improve the availability, currency and variety of general aviation statistical data of great public value which only FAA can properly compile.

UAC commented favorably on the following FAA proposals:

- To remove restrictions on the operation of aircraft with one-pilot station under Instrument Flight Regulation conditions.
- To give greater credence to recent pilot experience as a credit toward pilot proficiency checks.
- To change unnecessary restrictive requirements for conducting demonstration and market survey flights in aircraft not yet formally certified and which imposed more stringent requirements on American aircraft than those of foreign manufacture brought to this country.

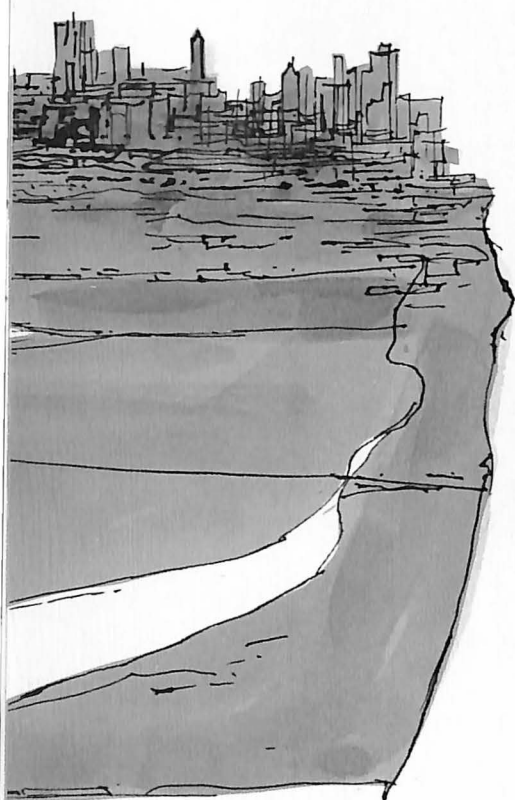
In other actions, UAC:

- Opposed a FAA Notice which would establish special and quite restrictive rules in order to operate to and from a number of what are termed "high density terminal areas" on the grounds that entirely suitable alternate measures were available. While opposing the rule making as issued, the UAC recognized the need for additional restrictions, presented alternate suggestions, and offered to work constructively in cooperation with the FAA and others in arriving at mutually satisfactory compromise measures.
- Cooperated with FAA in publicizing the further extension of the near-collision voluntary reporting procedure study and in disseminating the research findings as so far compiled by FAA.

VERTICAL LIFT AIRCRAFT COUNCIL



The Vertical Lift Aircraft Council coordinates and presents the vertical lift aircraft industry views on matters affecting these aircraft and in promoting the development and use of V/STOL aircraft.



The Vertical Lift Aircraft Council during 1969 carried forward its programs designed to achieve wider knowledge and acceptance of vertical lift systems.

Northeast Corridor Hearings

In the Civil Aeronautics Board's Northeast Corridor VTOL investigation hearings, completed in 1969, the Council's formula for determining Direct Operating Costs proved of significant value to those submitting proposals based on turbine powered helicopters.

Specific effort was applied to the problem of designing and siting metropolitan facilities.

V/STOL Airworthiness

Support for the Aerospace Technical Council project to revise and refine the tentative Federal Aviation Regulations on V/STOL Airworthiness continued. Input of basic data will be completed early in 1970 at which time suggested revisions will be recommended to the Federal Aviation Administration.

Highway Safety

Support of National Highway Safety Bureau and Public Health Service planning for emergency highway medical services continued. Studies on helicopter-supported highway safety programs, funded by the National Highway Safety Bureau, were completed and implemented through demonstration projects funded by both federal and local government agencies.

Four of these demonstrations were funded by the National Highway Safety Bureau. In addition, nine states operating 21 helicopters for highway medical service are being assisted by the federal government under the matching funds concept.

During the Labor Day holiday period, VLAC assisted in planning and directing a helicopter-supported medical and evacuation demonstration for the National Capital Beltway system.

VLAC-prepared articles describing the role of the helicopter as an ambulance and law enforcement tool were reprinted and distributed by the Public Health Service and state and local government agencies.

Facilities Planning

Major effort was devoted to assisting the Federal Aviation Administration in its revision of the Heliport Design Guide.

Working through VLAC, a group consisting of representatives from the Air Transport Association, the Airport Operators Council and the Federal Aviation Administration reviewed and refined the various drafts of the Design Guide to assure consideration of views from all segments of the vertical lift industry. Publication is scheduled in 1970.

In addition, VLAC has initiated investigation of the need and feasibility of a National Advisory Group for Heliport Standards. Discussions with the ATA, AOC, FAA, the American Institute of Architects, the Society of Automotive Engineers and others will begin in 1970.

VLAC Publications

The following publications were distributed in 1969.

Vertical Lift Designation Chart. This comprehensive listing of both production models and research/development projects was revised and distributed. Ninety-six production models ranging in size from 1 to 50 places are listed and twenty-one research and development projects.

1969 Directory of Helicopter Operators-Commercial-Civil Government and Helicopter Flight Schools in the United States and Canada. This listing includes 1,379 operators for an increase of more than 34 percent over the 1967 total of 1,023 and a five year increase of almost double the 1964 total of 710. Similarly, the number of helicopters operated increased to 3,433. This is almost 40 percent greater than the 1967 total of 2,438 and almost double the 1,764 aircraft operated in 1964.

The Federation Aeronautique Internationale Directory of Helicopter Records and the 1969 edition of *Recipients of Helicopter Awards, 1944-1969* were also issued.

DoT/NASA Transportation Study

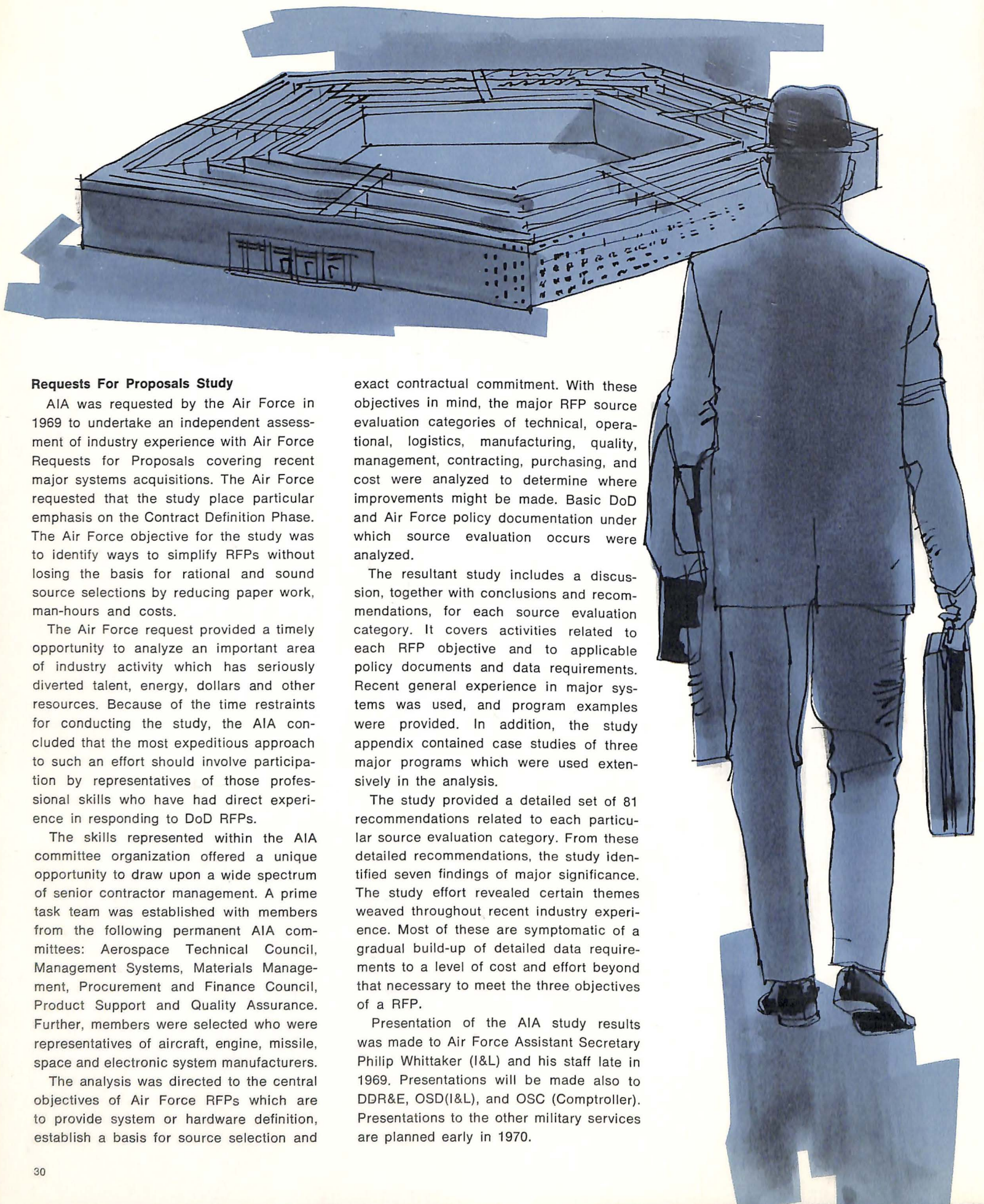
In conjunction with the Aerospace Technical Council, the Utility Aircraft Council and the Transport Aircraft Council, VLAC assisted in providing the initial industry input to planning the Department of Transportation/National Aeronautics and Space Administration study on national transportation research and development requirements.

Scheduled for completion in 1970, this project is designed to define research and development objectives for the total air transportation system of the next decade.



WARREN T. ROCKWELL
Bell Helicopter Company
Chairman, Vertical Lift
Aircraft Council

REQUESTS FOR PROPOSALS



Requests For Proposals Study

AIA was requested by the Air Force in 1969 to undertake an independent assessment of industry experience with Air Force Requests for Proposals covering recent major systems acquisitions. The Air Force requested that the study place particular emphasis on the Contract Definition Phase. The Air Force objective for the study was to identify ways to simplify RFPs without losing the basis for rational and sound source selections by reducing paper work, man-hours and costs.

The Air Force request provided a timely opportunity to analyze an important area of industry activity which has seriously diverted talent, energy, dollars and other resources. Because of the time restraints for conducting the study, the AIA concluded that the most expeditious approach to such an effort should involve participation by representatives of those professional skills who have had direct experience in responding to DoD RFPs.

The skills represented within the AIA committee organization offered a unique opportunity to draw upon a wide spectrum of senior contractor management. A prime task team was established with members from the following permanent AIA committees: Aerospace Technical Council, Management Systems, Materials Management, Procurement and Finance Council, Product Support and Quality Assurance. Further, members were selected who were representatives of aircraft, engine, missile, space and electronic system manufacturers.

The analysis was directed to the central objectives of Air Force RFPs which are to provide system or hardware definition, establish a basis for source selection and

exact contractual commitment. With these objectives in mind, the major RFP source evaluation categories of technical, operational, logistics, manufacturing, quality, management, contracting, purchasing, and cost were analyzed to determine where improvements might be made. Basic DoD and Air Force policy documentation under which source evaluation occurs were analyzed.

The resultant study includes a discussion, together with conclusions and recommendations, for each source evaluation category. It covers activities related to each RFP objective and to applicable policy documents and data requirements. Recent general experience in major systems was used, and program examples were provided. In addition, the study appendix contained case studies of three major programs which were used extensively in the analysis.

The study provided a detailed set of 81 recommendations related to each particular source evaluation category. From these detailed recommendations, the study identified seven findings of major significance. The study effort revealed certain themes weaved throughout recent industry experience. Most of these are symptomatic of a gradual build-up of detailed data requirements to a level of cost and effort beyond that necessary to meet the three objectives of a RFP.

Presentation of the AIA study results was made to Air Force Assistant Secretary Philip Whittaker (I&L) and his staff late in 1969. Presentations will be made also to DDR&E, OSD(I&L), and OSC (Comptroller). Presentations to the other military services are planned early in 1970.

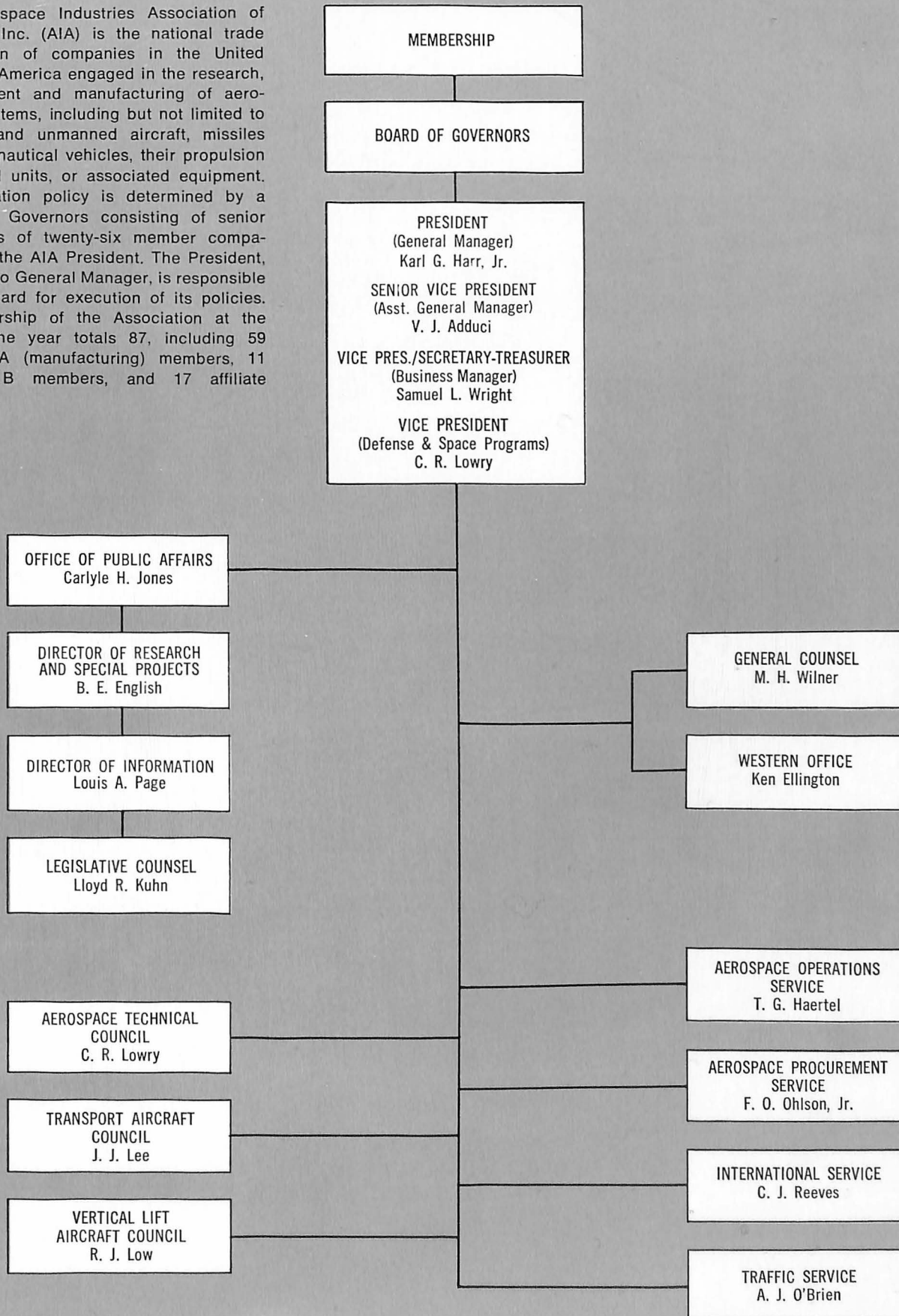
ORGANIZATION CHART

(January 1, 1970)

The Aerospace Industries Association of America, Inc. (AIA) is the national trade association of companies in the United States of America engaged in the research, development and manufacturing of aerospace systems, including but not limited to manned and unmanned aircraft, missiles and astronautical vehicles, their propulsion or control units, or associated equipment.

Association policy is determined by a Board of Governors consisting of senior executives of twenty-six member companies and the AIA President. The President, who is also General Manager, is responsible to the Board for execution of its policies.

Membership of the Association at the end of the year totals 87, including 59 Division A (manufacturing) members, 11 Division B members, and 17 affiliate members.



AIA MEMBERSHIP

MANUFACTURING MEMBERS

ABEX CORPORATION
AERODEX, INC.
AEROJET-GENERAL CORPORATION
AERONCA, INC.
AERONUTRONIC DIVISION, PHILCO-FORD CORPORATION
AMPHENOL CONNECTOR DIVISION
The Bunker-Ramo Corp.
AVCO CORPORATION
BEECH AIRCRAFT CORPORATION
THE BENDIX CORPORATION
THE BOEING COMPANY
CESSNA AIRCRAFT COMPANY
CHANDLER EVANS, INC.
Control Systems Division of
Colt Industries, Inc.
CONTINENTAL MOTORS CORPORATION
CURTISS-WRIGHT CORPORATION
FAIRCHILD HILLER CORPORATION
THE GARRETT CORPORATION
GATES LEARJET CORPORATION
GENERAL DYNAMICS CORPORATION
GENERAL ELECTRIC COMPANY
Aerospace Group
Aircraft Engine Group
GENERAL MOTORS CORPORATION
Allison Division
THE B. F. GOODRICH COMPANY
Aerospace & Defense Products
GOODYEAR AEROSPACE CORPORATION
GRUMMAN AEROSPACE CORPORATION
A Subsidiary of Grumman Corporation
GYRODYNE COMPANY OF AMERICA, INC.
HARVEY ALUMINUM, INC.
HERCULES INCORPORATED
HONEYWELL INC.
HUGHES AIRCRAFT COMPANY
IBM CORPORATION
Federal Systems Division
INTERNATIONAL TELEPHONE & TELEGRAPH CORPORATION
Defense-Space Group
ITT Aerospace/Optical Division
ITT Avionics Division
ITT Defense Communications Division
KAISER AEROSPACE & ELECTRONICS CORPORATION
KAMAN AEROSPACE CORPORATION
KOLLSMAN INSTRUMENT CORPORATION
LEAR SIEGLER, INC.
LOCKHEED AIRCRAFT CORPORATION
LTV AEROSPACE CORPORATION
THE MARQUARDT CORPORATION
MARTIN MARIETTA CORPORATION
MC DONNELL DOUGLAS CORPORATION
MENASCO MANUFACTURING COMPANY
NORTH AMERICAN ROCKWELL CORPORATION
NORTHROP CORPORATION
PACIFIC AIRMOTIVE CORPORATION
PIPER AIRCRAFT CORPORATION
PNEUMO DYNAMICS CORPORATION

RCA

Defense Electronic Products
ROHR CORPORATION
SINGER-GENERAL PRECISION, INC.
A Subsidiary of the Singer Co.
SOLAR, DIVISION OF INTERNATIONAL HARVESTER CO.
SPERRY RAND CORPORATION
Sperry Gyroscope Division
Sperry Systems Management Division
Sperry Flight Systems Division
Vickers Division
SUNDSTRAND AVIATION, DIVISION OF SUNDSTRAND CORPORATION
TELEDYNE RYAN AERONAUTICAL
TEXTRON INC.
Bell Aerospace Company
Bell Helicopter Company
THIOKOL CHEMICAL CORPORATION
TRW INC.
TWIN INDUSTRIES CORPORATION, DIVISION OF THE WHEELABRATOR CORP.
UNITED AIRCRAFT CORPORATION
UNIVERSAL OIL PRODUCTS COMPANY
WESTINGHOUSE ELECTRIC CORPORATION
Aerospace Electrical Division
Aerospace Division
Astronuclear Laboratory

DIVISION B MEMBERS

AVIQUIPO, INC.
PARKER & COMPANY INTERNATIONAL, INC.
MANUFACTURERS AIRCRAFT ASSOCIATION, INC.
BRUKNER, CLAYTON J.
CONDON, CYRIL HYDE
DE SEVERSKY, A. P.
FALES, HERBERT G.
HANKS, COL. STEDMAN SHUMWAY
SIKORSKY, I. I.

HONORARY LIFE MEMBERS

LOENING, ALBERT P.
LOENING, GROVER

DIVISION OF AFFILIATE MEMBERS

AIR CARRIER SERVICE CORP.
ASSOCIATED AEROSPACE ACTIVITIES, INC.
AVIATION WEEK & SPACE TECHNOLOGY
BOOZ, ALLEN APPLIED RESEARCH, INC.
BRITISH AIRCRAFT CORP. (U.S.A.), INC.
COMMERCE OVERSEAS CORPORATION
DOYLE, O'CONNOR & CO., INC.
EASTERN AIRCRAFT CORP.
INFORMATION HANDLING SERVICES, INC.
LYBRAND, ROSS BROS. & MONTGOMERY
NATIONAL AVIATION CORP.
NATIONAL CREDIT OFFICE, INC.
SPACE/AERONAUTICS
TEXACO, INC.
TRANSAERO, INC.
U. S. AVIATION UNDERWRITERS, INC.
EDWIN C. WALTON



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1725 DE SALES STREET, N.W., WASHINGTON, D. C. 20036