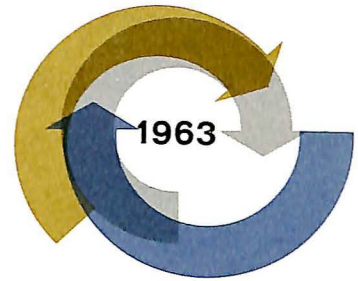




AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.



ANNUAL REPORT



AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.

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Westinghouse Electric Corporation

KARL G. HARR, JR., *President, Aerospace Industries Association*

TO THE MEMBERSHIP



Karl G. Harr, Jr. assumed the presidency of the Aerospace Industries Association on April 1, 1963. A 1943 graduate of Princeton University (Phi Beta Kappa), Mr. Harr served three years as a special intelligence officer in the U.S. Army. Following his military service, he attended Yale Law School, from which he graduated in 1948. A Rhodes Scholar, he received his Doctorate from Oxford University in 1950. After four years in legal practice, Mr. Harr saw extensive Government service with the Departments of State and Defense and, from 1958 to 1961, as a Special Assistant to the President. He came to AIA from the New York law firm of Rogers, Hoge and Hills.

The year 1963 was one of heightened activity for the aerospace industry as the producers of aircraft, missiles, spacecraft and associated equipment continued to fulfill their manifold responsibilities to provide modern, reliable weapons systems to the nation's defense forces, fabricate the complex and varied flyable and ground-based components for the national space exploration program, and deliver civil aircraft to the world's users.

The industry continues to be one of the predominant factors in the nation's economy. At year-end, the aerospace industry's sales volume of more than \$20.6 billion was second only to that of the automotive industry and comprised approximately 29 per cent of all the funds expended for national defense and space research and technology. Overall sales accounted for 3.5 per cent of the Gross National Product and about 10 per cent of the sales of all "durable goods" industries.

Aerospace exports of \$1.2 billion (exclusive of materiel furnished to foreign nations under the Mutual Defense Assistance and Mutual Aid Programs) represented more than 5.4 per cent of the value of all products shipped abroad.

In 1963, the aerospace industry was also the nation's prime employer, its 1,253,000 workers exceeding those of the second-ranked automotive industry by a considerable margin.

The ever-increasing emphasis on research and development served to broaden the aerospace industry's capability and hence to strengthen its position as the primary industrial wellspring of technological advancement. The ability of the nation to defend itself against aggression and to meet any new technological challenge rests, in great measure, on the competence of aerospace scientists and engineers.

As in previous years, the industry's 1963 sales volume was achieved largely through sales to the various Government agencies, these sales amounting to about 85 per cent of the total. Aware of their responsibility to reduce the cost of Government aerospace equipment despite mounting

product complexity, the companies which comprise the Aerospace Industries Association renewed their efforts to produce high-performance/high-quality systems in the most effective manner possible.

The principal objective of this program was and is increased productive efficiency on the part of industry, the inevitable result of which is provision to the Government of better aerospace systems at reduced costs. It is felt that these objectives can be attained by a process of enlightenment, by constant interchange of industry/Government views in specific problem areas, by thoughtful consideration by each party of the opposing view, and by mutual cooperation in resolving the differences.

A departure point for this program was an Association-sponsored study, "The Industry-Government Aerospace Relationship," prepared by the Stanford Research Institute and released in the spring. The report was not intended to provide a panacea for the myriad complex problems of the unique teamship between the Government and the aerospace industry, a relationship which has no parallel in our national history. Instead, it was to serve as a focal point for cooperative attention, by analyzing the factors in the relationship and delineating the problem areas.

To follow up the interest generated by the SRI report, the Association sponsored a series of "workshops," the purpose of which was to delve into specific problem areas in an effort to resolve differences. The workshops were organized by category, with both Government and industry task forces participating in discussions about procedural differences in such operations as electronics, exports, facilities, financial management, flight test, industrial security, product support and logistics, propulsion, spare parts, technical manuals, quality control and reliability and traffic management.

The Association considers the first series of workshop discussions to have been highly successful. They served not only to identify the problem areas in more detail, but they also produced the initial steps toward solutions.

A further move toward improving the relationship, in the sense that it will bring an improvement in the flow of information which forms the basis for many years of industry/Government discussions, was the formation by the Association of an *Economic Data Service*. This service will compile and publish more complete statistical data on aerospace industry operations for use by Government and industry, and will work with Government agencies in an effort to improve the accuracy of the available data on the industry.

Following approval by the Board of Governors, the Association moved to mobilize the top-level technical talent in the industry to serve as an advisory board on technical matters, to provide advanced thinking and policy planning in technical areas, and to supervise and set policy guidance for the *AIA Technical Service* and the technical committees. To meet these objectives, the Association formed the *Aerospace Technical Council*, composed of 50 top-level technical officials of AIA member companies. By placing greater emphasis on technological considerations in industry-wide policy planning, providing a sound base for industry comment on technical matters, and insuring top-level attention to them, it is felt that the Council can make an important contribution to the direction the industry will take in the coming years. Through application of its collective experience and intellect to technical management policies, the Council can also assist in bettering the industry/Government relationship.

In addition to its activities concerned with military and space systems, the Association broadened its work in other directions, notably general aviation. The *Utility Airplane Council*, through a subcommittee structure, initiated a new program to develop corrective action in three areas affecting the growth of general aviation. The inadequacy of general aviation ground facilities prompted formation of a *UAC Airport Development Committee*, the assignment of which is to bring home to community leaders the importance of air accessibility. The committee has undertaken extensive research on the economic impact of general

aviation, which will serve as the documentary basis for a community education program. Greater airspace mobility, possibly involving revision of existing regulations, is the goal of another UAC group, the *Airspace Usage Subcommittee*. Recognizing a need for more realistic pilot training and licensing rules, the *Pilot Rating Requirements Committee* is seeking to develop a qualification structure for operating privileges tied to modern usage of the utility airplane.

In an attempt to focus the attention of the Federal Aviation Agency and other Government agencies on the special problems of helicopters and other vertical lift aircraft, the *Vertical Lift Aircraft Council* sponsored a presentation to officials of FAA and 11 other agencies in September. One result of the meeting was FAA's agreement to conduct a review of regulations pertaining to VTOL aircraft in the spring of 1964.

A similarly beneficial series of meetings was conducted by the Association's *Industry Planning Service* in October. In conjunction with the Bureau of Naval Weapons, three two-day seminars on "Integrated Maintenance Management," designed to improve defense readiness through employment of new procurement practices, were sponsored.

The *Public Relations Service* adopted a new mode of reaching the public with the industry's story: production of *short television films* made available to TV news bureaus. These films, dealing with various aspects of industry problems and activities, achieved a remarkable response, reaching an estimated audience of 90,000,000.

Public Relations Service also produced for television audiences a feature film covering the contributions of the industry to the nation's space program. "All Systems Go" reached some 7,000,000 people through almost 200 telecasts.

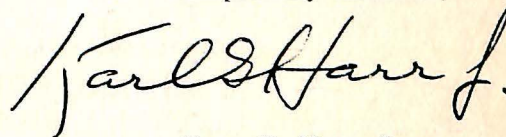
The Service conducted, in cooperation with the *Wharton School of Finance* of the University of Pennsylvania, a seminar designed for two purposes: to acquaint leading economists from eastern universities with the economics

and technological responsibilities of the industry, and to enlist the interest of the academic world in seeking solutions to mutual Government/industry problems.

The multitude of beneficial, detailed accomplishments of the other Association Services are contained in the body of this report.

In general, the year 1963 was marked by a high degree of effort on the part of all segments of AIA in a reorganized and reoriented program designed to revitalize the activities of the Association. While we feel that measurable progress has been made toward achieving the specific goals of the aerospace industry, we consider the most important accomplishment of the past year to have the laying of a foundation, both within the industry and Government, for a broader and more effective relationship.

Respectfully submitted,



KARL G. HARR, JR.
President



AIA ORGANIZATION AND FUNCTIONS

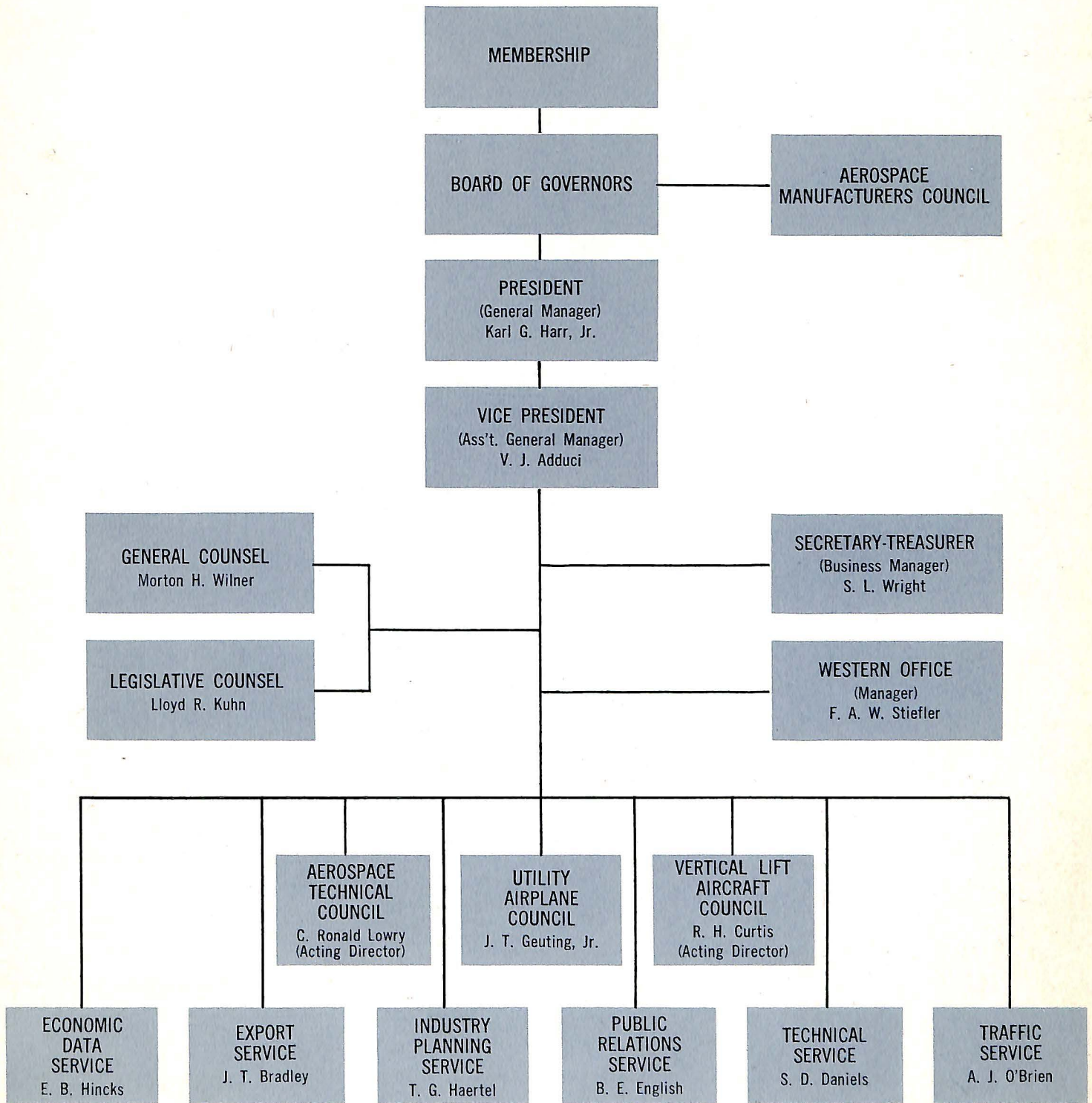
The Aerospace Industries Association of America, Inc., is the national trade association of the manufacturers of aircraft, missiles, spacecraft, propulsion, navigation and guidance systems, support equipment, accessories, parts, materials and components used in the construction, operation and maintenance of these aerospace products.

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

The Aerospace Industries Association was created over forty years ago to serve as a vehicle for the lawful interchange of information between its member companies, and to represent those companies in their relations with their customers, Government or commercial, on matters of industry-wide interest.

Through its committees of industry experts and its staff, the Association provides a medium for collaboration on non-competitive problems common to the industries and major segments of the industries which comprise its membership.

Membership of the Association totals 105, including 60 Division A (manufacturing) members, 19 Division B members, and 26 affiliate members.



EXPORT SERVICE





T. NORMAN LaBASH

*General Electric
Technical Services
Company, Inc.
Chairman, Export
Committee*

Export Committee

Export Advisory Committee
International Finance Committee
Military and Space Committee
Trade Development Committee

During 1963, U. S. aerospace exports amounted to more than \$1.2 billion, but a realistic review indicates that an even greater effort in the overseas selling of U. S. aerospace products is necessary to strengthen the U. S. economy.

Sound export selling provides continued stability for the dollar as a medium of international exchange, in addition to improving our balance of payments. International business opportunities which were not available ten years ago are becoming routine, and the aerospace industry is seeking to exploit more fully its foreign market potential.

U. S. aerospace exports have progressed to the point of being a very significant portion of the U. S. manufacturing export total. Aerospace exporters were at a turning point at the end of 1963. The industry can recall the sporadic lows and mediums of the 1950's when a total annual dollar volume of aerospace exports looked good at \$800 million. Prospects for annual exports of \$1.5 to \$1.8 billion during the late sixties are excellent, and \$2 billion in annual U. S. aerospace exports is not unrealistic for 1970 and beyond.

The magnitude of the Military Assistance Program makes its inclusion essential in any discussion involving aerospace exports. For the ten-year period 1952 through 1961, for example, about \$17 billion was funded and spent on force improvement equipment for allied nations. For the ten-year period extending through 1971, approximately \$8 billion has been projected for this program.

While the \$17 billion was being provided through Grant Aid, an additional \$5 billion, or about 25 per cent of the total, was being sold directly. It is encouraging to note that during 1963 both sales and deliveries for the first time were exceeding materials and supplies furnished through grants under the Military Assistance Program.

The aerospace industry is moving toward an export achievement which will significantly reduce balance of payments restraints upon our ability to meet overseas military deployment needs. In this connection, total aerospace sales for 1963, excluding those sales made through military channels, exceeded \$1 billion for the fourth straight year. The rate of foreign sales of utility aircraft, which accounted for 1500 units last year, is holding steady, as are engines, radar and electronics and spare parts. Heavy transport sales which have declined since the peak of 1960 appear to be gaining.

With this relatively successful program under way, the objectives for the short and long term future involve sustaining this program. High level Department of Defense spokesmen have stated that "industry and Government must seek ways to increase our participation in the \$55 to \$65 billion new equipment programs which our Allies are forecast to spend during the next decade."

Specific actions which should be pursued to accomplish these objectives are:

1. Industry and Government should find a way to provide some \$3 billion or more in credit assistance over the next decade.
2. Continued Government/Industry forums to spread appreciation of each other's problems, procedures, and objectives.
3. A more precise approach to the export of advanced technology.
4. An increase in the effectiveness with which industry participates in Government's international research and development programs.
5. Improvements in the capability between Government and industry in export pricing of military equipment.

6. More ingenuity in exporting to soft currency areas.
7. Need for transition policies when going from Grant Aid to cash sales.

National leaders have clearly stated the importance of international trade, and much time and effort during the past several years have been devoted to the Export Expansion Program. Proclamations and policy statements from U. S. Government leaders on trade expansion, gold flow, more assistance and cooperation with industry have indicated that the task of the aerospace exporters is to translate these policy statements into actions. This is being accomplished with specific objectives carried out through specific and positive actions. Such thinking has struck a responsive chord with industry representatives, international bankers, and Government officials.

A prominent Air Force official chose as his subject, "A New Look at the Air Force Role in International Sales." He stated that the Air Force had taken on a chore, made it a challenge, and is taking a new look at aerospace exports. "What we see is opportunity," he said.

The AIA Export program is divided into three functional activities for implementation: 1. International Finance; 2. Military and Space Programs Support; 3. Export Trade Development.

Each activity is backed by a subcommittee of the main Export Committee for the purpose of effective joint industry-Association projects.

The programs of the working committees are:

International Finance — recognized as the key to greater U. S. aerospace export sales. It has become obvious that the Export-Import Bank is reluctant to finance military aerospace exports even though the charter of the Eximbank does not prohibit this type of export financing. No other U. S. Government organization or commercial finance organization is presently geared to finance military aerospace exports on a conventional export financing basis. Government spokesmen state that no bona-fide military export sale will be lost to American industry due to a void of capital for this purpose. This does not, however, provide a complete and clear-cut method of established finance facilities for aerospace exporters to use for this largest and greatest potential area of aerospace export sales. This is a responsibility of the International Finance Group of the Export Committee. A leading commercial banker analyzed the problem by stating that ". . . there must be a willingness and readiness to struggle. To win the 'Battle of Washington' requires unceasing energy, a very thick skin, and above all, continuous follow-up. One cannot become discouraged by inconsistencies, initial lack of response, and many unexpected obstacles."

In summarizing export finance requirements, an Administration leader stated that Government and commercial financial mechanisms must find a way to provide some \$3 billion or more in credit assistance over the next decade. If the Government has to utilize foreign aid appropriations or the Export-Import Bank to support every credit extension, the credit program will not be adequate to support the import requirements of our Allies.

Military and Space Programs Support — presents the greatest potential for export sales at the present. The

export sales of space equipment and allied products poses an extremely interesting potential, but international programs which establish space equipment requirements are not fully developed. The industry is observing these developments with interest. Aerospace exporters have special problems including financing, security clearance, proprietary rights, and pricing.

The AIA Export Committee, working with the Air Force International Liaison Office, has held meetings this year with the Air Force Chiefs of Staff of fifteen countries — The Netherlands, France, Greece, New Zealand, Turkey, Germany, Belgium, Italy, Australia, Japan, Spain, Denmark, Norway, Iceland and Sweden.

The new Defense Intelligence Agency meets with the AIA Export Committee three times a year and with each graduating class of U. S. Military Attaches. During 1963, AIA briefed more than seventy of these officers from the three services.

The State Department's Munitions Control officers are cooperating within established security policy.

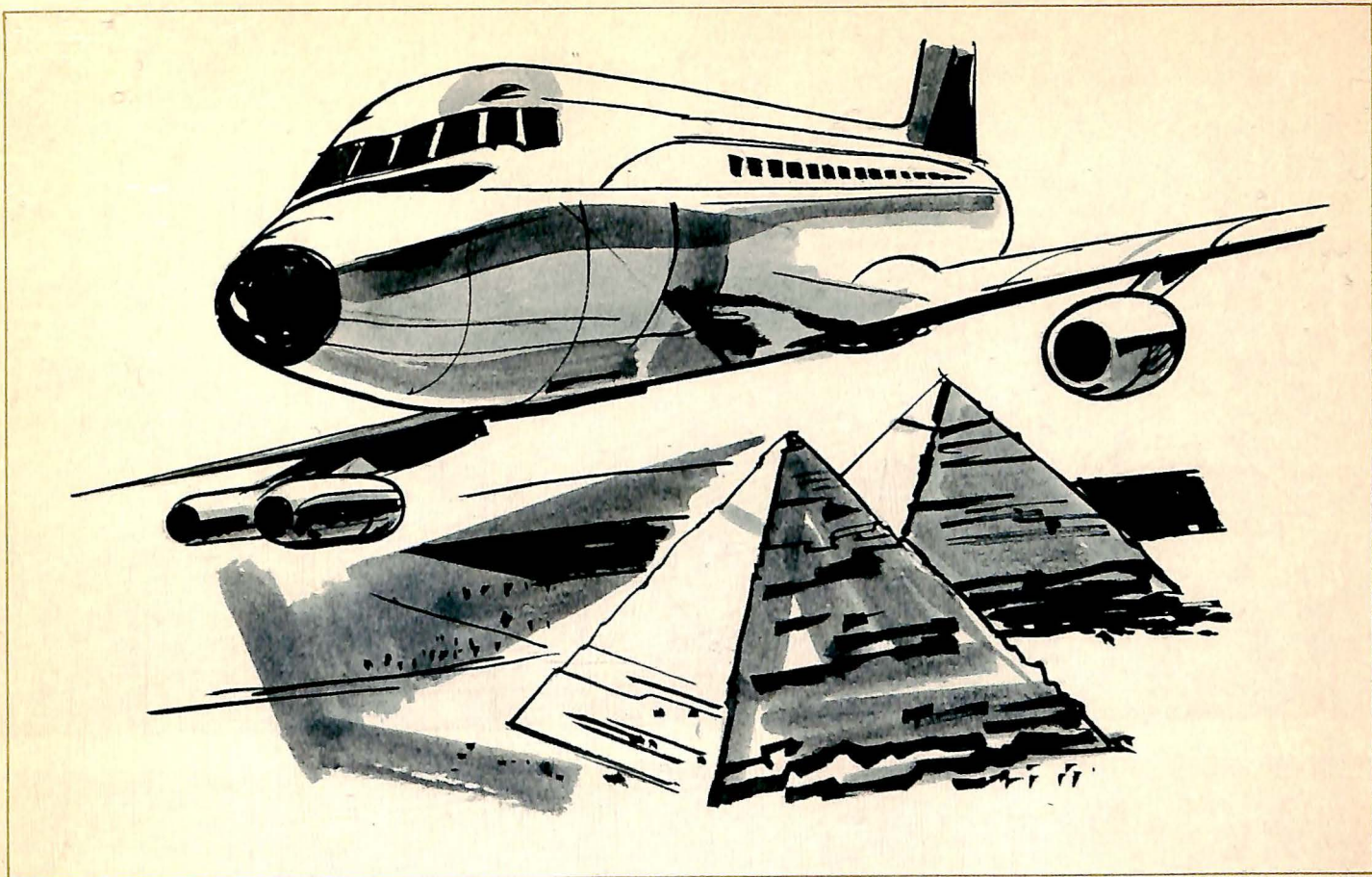
NASA international programs hold little promise for any significant achievement and, in fact, predict 1/10 of 1 per cent for sales of space equipment to the total sales program. NASA has predicted that some concessions would probably be considered as our communication satellite program progresses and other programs move to a more advanced stage.

The workshop projects which were conducted in conjunction with other AIA Committees in connection with the Stanford Research Institute report did not devote much attention to the international area. It was decided, however, to use this program for focusing attention to the chronic problems of getting aerospace sales representatives to the market place with appropriate materials and obtaining authority to ship. AIA met with appropriate State and Defense representatives and pointed out that some of the restrictions on security clearance and export licenses could be resolved through simple changes in regulations. The Government representatives accepted this approach and cooperated fully in drawing up a list of recommended actions. Two of these actions were:

1. An Air Force regulation was modified to reflect changes that will expedite personnel clearances for sales and service in foreign areas.
2. A DoD letter to the services directed that they conduct a study on why export licenses could not be acted upon within forty-eight hours.

The international pricing procedures including the cost of sales and service to foreign clients must be clarified. There are recommended changes to the Armed Service Procurement Regulations being considered. A more realistic concept of cooperative international R & D programs is being implemented by DoD. There are many questions, however, involving patents and proprietary rights that must be resolved.

The Export Committee met with representatives of the Department of Commerce and with representatives from companies producing heavy transport, engines, vertical lift craft, utility aircraft, and electronics. During the course



of these discussions it was pointed out that this industry has observed and in some instances supported a reduction from 30 per cent ad valorem to a 10 per cent ad valorem. While in the process of effecting this reduction, U. S. aerospace exporters have competed with nations which have held to a 14 per cent rate in some instances. It was acknowledged that these inequities have not always been exercised because of national interest. To insure a competitive position, AIA requested that any negotiated reduction be regulated on a *quid pro quo* basis. If agreement is reached on this formula, then U. S. aerospace manufacturers may look toward a zero-in and zero-out rate, with the possible exception of heavy transports.

In cooperation with FAA, the AIA Export Committee met with the Directors of Civil Aviation from four countries this year, and established communications with most of the FAA foreign offices.

The State Department's Foreign Service sends each Civil Aviation Attache to AIA for briefing prior to departure for his overseas post. AIA exchanges correspondence with these officials relating to problems as well as to market opportunities.

The Export Trade Development — program in process covers these goals:

1. Work with the State Department to issue new

- instructions for all Free World embassies with respect to cooperation and assistance in the promotion of U. S. aerospace export sales by U. S. Government officials. This instruction was sent to all of the U. S. Free World embassies in 1959 and 1961.
2. Develop, in cooperation with AIA staff, an aerospace export trade educational presentation which will demonstrate the significant aerospace contribution to our overall international trade.
3. Recognize U. S. aerospace participation in the more significant international air shows and determine the feasibility of AIA cooperative assistance in some of these events.
4. Outline specifications for U. S. embassy assistance to American aerospace exporters in cooperation with the Departments of State and Commerce and develop specific guidelines in this respect.
5. Work with the Bureau of the Census in an effort to obtain a more thorough release of aerospace export statistics. This project will result in a greater release of data on aerospace exports which is a vital requirement for industrial market researchers.
6. Follow-up on the useful and specific proposals of the White House Conference on Exports as these matters directly affect the export trade of aerospace products.

INDUSTRY PLANNING SERVICE



The function of the Industry Planning Service is to maintain a broad and continuous pattern of coordination and cooperation between the aerospace industry and its principal customer, the Government.

The Department of Defense, the National Aeronautics and Space Administration and other Government agencies directly concerned with the nation's defense and space efforts, are vitally linked with the aerospace industry. It is essential in the wide and complex area of policy in regulations governing procurement, operations and maintenance that continuous contact be maintained to facilitate planning, to avoid costly and time-consuming misunderstandings and generally to mesh the efforts of all concerned.

The Industry Planning Service, through its committees, is responsible within the AIA structure for the assembly and presentation of the aerospace industry's knowledge in specialized fields. These include finance, accounting, law, contracts, product support, industrial relations, industrial security, patents, spare parts, Government reporting and service publications.

In addition to the specific recommendations which are submitted to Government agencies, the committees arrange one or more Government-industry meetings during the year to exchange information. Mailing lists of Government representatives are maintained to provide a continuous flow of information. Committee officers and members and AIA staff maintain contact with the cognizant Government representatives in further efforts to exchange views and ideas.

The benefits of these efforts are superior aerospace products at the lowest possible cost.

PROCUREMENT AND FINANCE COMMITTEE

The year 1963 was one of activity and innovation by the Department of Defense, assisted by the Committee, in the area of Government procurement management. Among these innovations are: the greatly increased use of fixed price and incentive contracts in place of cost-plus-fixed-fee; the negotiating of profits and fees based upon weighted guidelines; a definitive program for the evaluation of contractors' performance; the issuance of many revisions of the Armed Services Procurement Regulation and, late in 1963, efforts to eliminate duplication of ASPR and military service regulations as well as conflicts and inconsistencies; increased use of competitive procurement; the establishment of a DoD Directorate of Contract Administration Services to develop common policies and procedures pertaining to field contract administration services. In addition, the various military services and the Defense Supply Agency implemented various new concepts in procurement management. Through its working groups and with the cooperation of other AIA committees, the Committee has continued to supply information and expert industry representatives for consultation to Government procurement agencies.

The Procurement and Finance Committee is responsible for areas of financial, tax, contractual, accounting and general procurement activities and problems of the industry. Task groups are constituted by the Committee for the purpose of handling specific problems within its area of activities. The Committee, at its annual meeting, receives reports from these task groups and makes plans for the next year.



J. F. POWER
Lockheed Aircraft Corporation
 Chairman,
 Government Reports
 Committee



C. L. SHELTON
United Aircraft Corporation
 Chairman, Patent
 Committee



W. J. MURPHY
Aerojet General Corporation
 Chairman, Industrial
 Relations Advisory
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A. R. BECKHARDT
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 Chairman, Product
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R. J. GODDARD
Hughes Tool Company Aircraft Division
 Chairman, Industrial
 Security Committee



A. J. DAVIDSON
Boeing Company Aero-Space Division
 Chairman, Service
 Publications Committee



C. L. MEADOR
General Dynamics Corporation
 Chairman, Procurement
 and Finance Committee



W. A. MARCO
Lockheed California Company
 Chairman, Spare
 Parts Committee

GOVERNMENT REPORTS COMMITTEE

Electronic Data Processing
 Program Progress Reporting
 Aeronautical Manufacturers Planning Reports
 Records Management

INDUSTRIAL RELATIONS ADVISORY COMMITTEE

Safety
 Unemployment Insurance
 Wage and Salary

INDUSTRIAL SECURITY COMMITTEE

PROCUREMENT AND FINANCE COMMITTEE

Contract Cost Principles
 Accounting Procedures and Principles
 Equal Employment Opportunity
 Termination Settlements
 Reserves Pending Execution of Release
 Facilities Policy
 Depreciation Policies
 Procurement Legislation
 Federal Tax Legislation
 State Taxation of Government Owned Property
 Indemnification Against Unusually Hazardous Risks
 Record Retention
 Proprietary Rights
 Make or Buy Policies
 Duty and Customs
 Renegotiation
 Federal Patent Policy

PATENT COMMITTEE

Proprietary Rights in Technical Data
 Federal Patent Policy
 Patent Office Fee Bill
 ASPR Section IX, Part I
 Infringement of Copyrights

PRODUCT SUPPORT COMMITTEE

Integrated Single Support Concept
 Contract Technical Service Personnel
 Data Problems in Product Support
 Military Personnel Training Requirements
 Failure Reporting
 Support of Military Exports
 Weapon System Effectiveness
 Aerospace Ground Equipment, Requirements Policy
 Configuration-Management

SERVICE PUBLICATIONS COMMITTEE

Exchange of Cost Saving Techniques
 General Requirements for Military Manuals
 Manuals for Missiles and Space Systems
 Army 5-Part Manuals
 ATA-100 Service Publications Specification
 Technical Manual Printing and Distribution
 Information Panel
 Standardization of Manual Specifications
 (MITM Program)
 Developments in the Acquisition, Storage, and
 Retrieval of Operating and Maintenance Data
 Detailed Technical Manual Cost Estimating,
 Recording and Reporting Requirements
 Develop "Standards for Determining Capability
 to Produce Adequate Technical Manuals."
 Develop "Industry Standards for Adequate Technical
 Manuals."
 Identify "Elements of Manual Cost Which are
 Applicable and Appropriate."

SPARE PARTS COMMITTEE

Federal Cataloging and Prescreening Data Requirements
 Uniform Technical Documentation Provisioning
 Format Requirements
 Spare Parts Provisioning Policies and Procedures
 Aerospace Ground Equipment Provisioning
 Documentation
 Contractor Support Procedures for Army, Navy and
 Air Force and NASA
 Design Change Procedures Documentation
 Spare Parts Replenishment Procurement Policy
 & Practices

Contract Cost Principles

A task group of the Committee continues surveillance over the administration of the ASPR concerned with allowability of contract cost.

Probably the most active area of concern currently is the administration of provisions of cost principles pertaining to contractor-generated and other independent research and development. The problems include methods of determining the amounts to be reimbursed by the Government to the contractor, methods of appraising the contractor's efforts, and the degree of control that is exercised by the customer. Members of the task group have reviewed the proposals which have been presented by the DoD and are studying the implementation and complexities of the problems more fully to promote the joint development of the best attainable solution for both the Government and industry.

Other areas of current interest pertain to bidding and proposal expense; employee relocation costs; cost of leasing or renting equipment, such as computers; and the Committee recently provided its recommendations to the DoD concerning air travel costs, deferred compensation, and allowability of certain indirect costs.

The AIA continues its cooperation with the Department of Defense and other Government agencies in the development of equitable cost principles by supplying pertinent information and the views of this industry as various problems arise and conditions change.

Incentives for Contract Performance

During 1963, the Department of Defense included in the ASPR an introductory statement of policy to utilize profit to stimulate efficient contract performance. The Department of Defense has stressed the importance of incentive contracting to provide motivation for superior performance. Similarly, a program is under way to use weighted guidelines in determining profit based upon such factors as risks accepted by the contractor, difficulty of contractors' tasks, record of contract performance. Related to this is a DoD program of contractor performance evaluation.

AIA submitted specific recommendations on each of these subjects, using a task group of industry experts. AIA continues to keep the industry advised of the developments as they occur.

Settlement of Terminated Contracts

Recommendations with respect to amending the ASPR to provide for the removal of the formula method for the determination of profit from the termination article and to consider the revision of the ASPR in connection with the treatment of profit and fee on terminated subcontractor work were transmitted early in 1963 to the Department of Defense.

The ASPR Committee is considering these industry recommendations, and a proposed revision to the procurement regulations regarding contract termination is expected to be issued in 1964 for industry review.

Proprietary Rights in Technical Data

Continuing difficulties were encountered by the aerospace industry in the administration of the provisions of the ASPR pertaining to the proprietary rights of contractors in technical data on products developed at contractor's expense. Over the years, the Committee has continued its efforts to cooperate with the Department of Defense on various revisions and, in 1963, AIA again submitted recommendations. It is anticipated that a proposed revision to the ASPR will be developed in 1964.

The question of protecting the private property rights of design manufacturers of aeronautical and space equipment continues to be a most serious problem, not only for the prime contractors, but particularly for the thousands of small companies designing and developing many of the essential items needed in modern weapons systems.

Patent Policies

The most important development in this area in 1963 was the issuance of a memorandum by the President of the United States on Government Patent Policy. The October 1963 memorandum requires interpretation and implementation by the military departments and other Government agencies. The Procurement and Finance Committee, in cooperation with the Patent Committee, is monitoring these developments and the AIA position will be presented when appropriate.

Also during 1963, the Committee continued to seek adoption of certain amendments to the patent provisions of the Space Act which would remove the requirements that title to all inventions made under a contract with NASA be vested in the Government unless a waiver is granted by the Administrator.

Indemnification Against Unusually Hazardous Risks

The continuing problem of the aerospace industry involving the uninsurable risks incurred in the performance of many defense and space contracts received increasing attention from the Committee. Industry is greatly concerned wherever risks are so great that neither the public nor the contractors can be protected adequately. As a result of industry representation, various studies were made of the problem raised by the lack of indemnification authority to cover unusually hazardous risks for which adequate insurance coverage is generally not available. It is anticipated that the DoD will submit recommendations urging that indemnification legislation be sought to provide the needed authority in this area. Additionally, efforts were continued to attain similar indemnification authority in behalf of NASA research and development contracts.

Depreciation

One of the sections of the Investment Credit Act of 1962 provided that the basis of assets subject to investment credit would be reduced by the amount of investment credit for depreciation purposes. During 1963, the House Ways and Means Committee considered legislation which would repeal the earlier provision. In response to a Congressional request for information, AIA urged the

Congress to take this action in connection with its consideration of the 1963 tax bill.

The task group also continued efforts to urge the Treasury Department to repeal the reserve ratio test where the taxpayer uses depreciation lives equal to or longer than the depreciation guideline lives, so long as the same lives are used by the taxpayer for financial accounting purposes.

Government-Owned Facilities

The Committee assisted in development of policies covering the use by contractors of Government-owned facilities, particularly special test equipment and special tooling. The problem of Government-owned facilities continues to be closely linked with the depreciation problem for both tax and contract cost purposes. However, the present depreciation policies, when coupled with the overall uncertainty involved in defense programming, and the high cost of facilities are not an adequate incentive for contractors who must provide specialized research and space facilities for the performance of specific contracts. Therefore, the Government necessarily has had to support partially the cost of those facilities required in highly speculative utilization risks. It must be remembered that the industry continues to invest a major portion of its earnings in order to provide necessary facilities for the performance of defense contracts, exceeding the amount provided by the Government.

In an effort to clarify varying interpretations and provide for more comprehensive treatment of methods of eliminating competitive advantage, late in 1963 the Department of Defense proposed a revision to the ASPR with respect to the regulations covering Government property. The Committee, working with the Government Reports and Manufacturing Committees, submitted the views of the Association pertaining to the proposed revisions.



The group will continue discussion of this problem with members of the ASPR Committee in an attempt to arrive at an equitable solution.

Government-Industry Aerospace Relationship

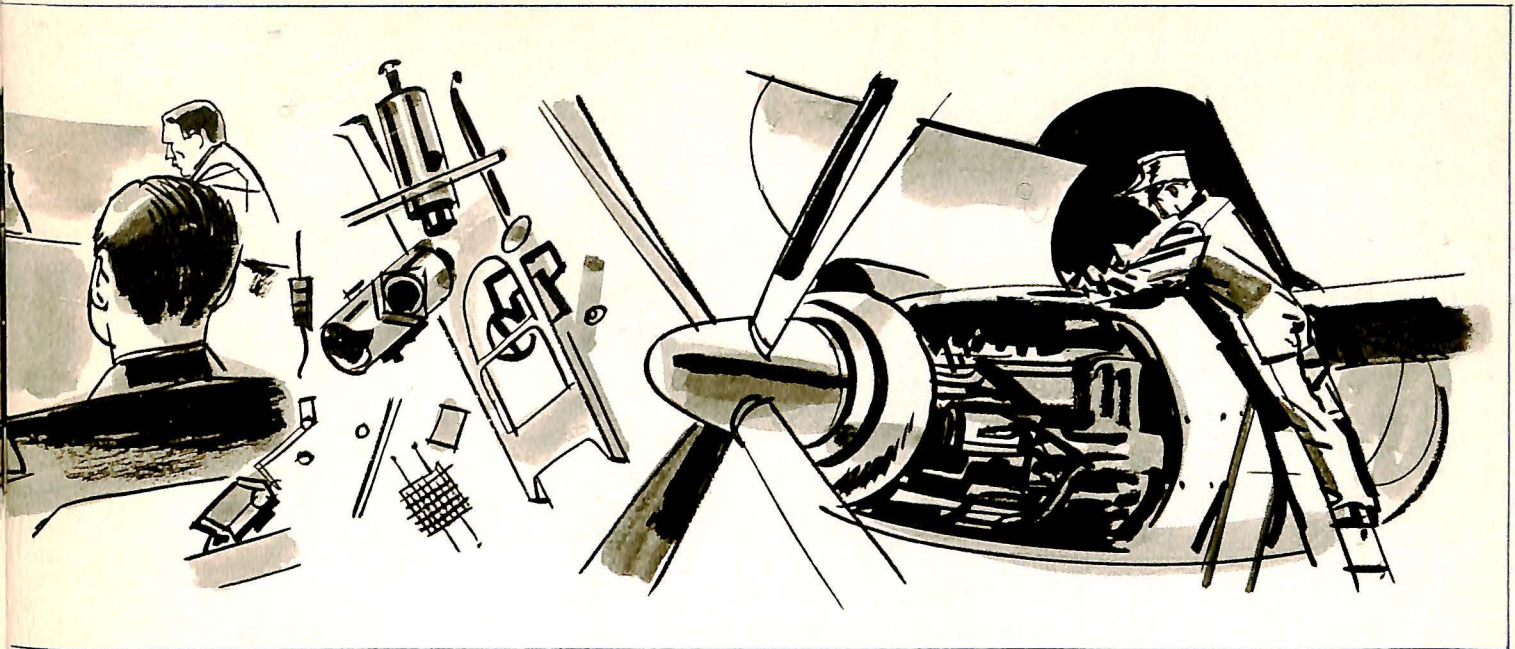
In the implementation of the report made concerning the Government-Industry Aerospace Relationship, workshops composed of representatives of the Committee and the Department of Defense were conducted. Among the workshops held was one pertaining to financial management, which considered the problems in connection with DoD auditing of multi-divisional companies and the need for more uniform policies with respect to audit procedures. Another workshop considered primarily the need for more uniform policies and implementations by the military services and other Government agencies of facilities provided to contractors which must comply with the requirements of more than one department or agency.

General

The Committee also considered numerous contract clauses issued by the military services, some of which were not specifically authorized by the ASPR, and provided recommendations thereon. Individual ASPR clauses relating to facilities contracts, contractor debts owed to the Government, taxation, inspection and audit, and make-or-buy policies have been studied by the Committee and appropriate recommendations made to the Department of Defense and NASA.

PATENT COMMITTEE

The major developments during the year in the field of Government Patent Policy were the issuance of a White House Memorandum on Patent Policy and the introduction of various legislative proposals. The Patent Committee assembled the industry views, and these activities



will continue as the Department of Defense, National Aeronautics and Space Administration and other Government agencies interpret and implement the memorandum. The various legislative proposals were also reviewed by the Committee.

In addition, the Patent Committee is studying the developments pertaining to the use of contractor furnished data and drawings, as well as developments in Patent Office regulations and procedures.

NAASA Patent Licensing Regulations

The Patent Committee is assisting in the NASA efforts to improve the patent licensing regulations which are based upon the Space Act.

Proprietary Rights in Technical Data

The Patent Committee is continuing in the effort to obtain equitable revision of the ASPR provisions pertaining to the treatment of proprietary rights in technical data, particularly in the implementation of the individual military services procurement regulations. In addition, attention has been devoted to the treatment of proprietary rights in technical data by Government agencies.

The Patent Committee continued its study of United Nations' activities in the patent area, proposals made by Common Market countries for area patent agreements, and contractual arrangements affecting patents in NATO procurement.

PRODUCT SUPPORT COMMITTEE

The costs incurred by the Government for the lifetime operation and maintenance of aerospace systems or equipment are approximately four to five times the original purchase cost. Thoughtful consideration and planning for maintenance at the time of design conception have a decided effect on the 4-to-1 ratio. The Product Support

organizations in the industry are performing services which will provide the maximum use of the equipment. Similarly, the Product Support Committee with membership by the industry's support and logistics managers serves the military departments, NASA and other customers as well as the membership on operational and maintenance developments.

Policies affecting the furnishing by contractors of materiel, personnel, data and services for the use and upkeep of such equipment are handled by the Product Support Committee. More specifically, Product Support is concerned with maintenance support planning; the training of military operation and maintenance personnel; the furnishing of contractor technical personnel in the field; the furnishing of materiel such as repair parts; special tools, test and aerospace ground equipment; training aids and technical publications for operations and maintenance; failure reporting analysis and other logistics elements. As a main AIA committee, it has administrative control over the Spare Parts and Service Publications committees.

Recognition of the close relationship of these tasks and the desirability for their close coordination under one management entity is increasing, both within the industry and Government organizations. A significant advance in the promotion of this principle was made by the Navy in cooperation with AIA in the development of "Integrated Maintenance Management." The co-sponsored introduction of this program to Navy-Industry seminars was one of the highlights of the year. More than 1,300 industry and service personnel attended the presentations that were held on the East and West Coasts and in Chicago. Results from the Navy-Industry trials have proved the soundness of the policy and assure the continued growth of the program.

Workshops resulting from the Stanford Research Institute Study (SRI) have produced the identification of

major areas requiring industry and DoD effort. One of these subjects pertains to the need for a clear understanding of the military services and industry organization structures covering the responsibility for product support tasks. The failure reporting procedures within the DoD and the individual armed service organizations is another subject that is under review.

Contractor technical representation (Field Service Representation) continues to be an industry problem with the DoD and the individual services. The trend in the Government is toward stricter accounting controls and economy. The contractor needs a quick reacting channel of information from the field service representatives to expedite statistical analysis leading to design development. Maintaining a balance between the needs of the Government and the contractors is difficult.

The identification, establishment, scheduling and measurement of product support tasks or deliverable items that contribute to weapon system effectiveness requires greater attention. The basic objectives to identify the subjects to be measured have been endorsed; however, much study is required in order to obtain workable measurement procedures and specifications. The degree of ultimate standardization may be greatly limited, due to the differences between the services, weapon systems, and products to be measured.

SPARE PARTS COMMITTEE

Initiation of economies through submission of recommendations for reduction and simplification of contract requirements involving spares support is one of the prime objectives of the Spare Parts Committee. For example, contributions by the Committee toward this accomplishment have been attributed as a significant factor in the Air Force's efforts in reducing their spares inventory representing 75 per cent of the value of their aircraft in 1956 to 25 per cent of the present value of their aircraft inventory.

This Committee, which has been in operation for the past twenty years, is comprised of 125 managers of spare parts and supply support departments representing all segments of the aerospace industry. It operates under a system permitting policy and broad procedural matters to be handled by Committee action. Since only two Committee meetings generally are held each year, most of the operations are conducted by panel activities. Members are given the opportunity to review and furnish recommendations on drafts of new and revised policies and specifications prior to official release. Small *ad hoc* panels or the AIA staff coordinate the responses and develop the formal AIA position papers.

Since its inception, the Committee has worked with the military services, assisting in the development and revision of policies, procedures and practices for the selection, ordering and inventory control of spare parts, special tools, test and aerospace ground equipment, and training aids and training equipment. Through its review actions and joint Government-industry meetings, the Committee seeks to disseminate greater understanding of support operations



and to eliminate many of the causes for project delays and procedural deviations. This, in turn, results in more workable procedures and cost reduction.

Spare Workshop

Plans in the area of spare parts provisioning and management for improving the Government-industry aerospace relationship were initiated by Committee members and representatives from the military services during a September workshop meeting. A number of specific problem areas were identified at that meeting and courses of remedial action established for them.

Among the actions that the Government representatives will accomplish are:

1. Initiation by the Defense Supply Agency with industry assistance of a test program to facilitate increased selection of standard items by the contractor during the design phase as a cost reduction aid.
2. Establishment of common definitions for the various provisioning terms used by the military services to facilitate contractor implementation of provisioning techniques.

In turn, the Committee members agreed to the following:

1. Initiation of actions toward establishing guidelines for individual prime contractor-vendor orientation and guidance meetings to promote increased documentation requirement applications in prime contractor-vendor hardware contracts.
2. Development of questionnaires for surveying member companies concerning criteria for determining provisioning documentation to be included under separate line item contractual coverage, and to determine criteria for applying incentive contracting techniques in the initial support area as a cost reduction aid.

One recent accomplishment resulting from the workshop discussions is the agreement by the Air Force that requests to contractors for additional technical data and drawings previously supplied will be negotiated contractually rather than requested without compensation. Because of the continuing nature of these workshop activities, further meetings on these topics are planned in 1964.

Replenishment Spare Parts Activities

Adoption of procedures for competitive procurement of

spare parts continues to pose major problems to both industry and the Government. The latest version of the Department of Defense Hi-Dollar Breakout Program procedure and the Navy's implementation of it were issued in April, followed shortly thereafter by an Army version. Although based on recommendations submitted to the Department of Defense by AIA last year, the revised procedure is complex and time consuming. Upon request, AIA supplied a comparison study of the concepts of the AIA recommendations and the Government breakout requirements. These Committee members have been participating in other service tests of a simplified procedure designed by the Air Force to achieve economies in spares selections. Defense Department action on this problem has been deferred to allow time for study of the breakout implementation plans of the various military services, and further discussion with Defense officials is planned.

Support Procedures

During the past year the Committee has been engaged in various efforts involving the selection and ordering support procedures of the military services. For example, preliminary investigation by an *ad hoc* panel has indicated some misunderstanding by both the military and industry as to the actual methods of implementation of sophisticated support procurement techniques such as Delayed Procurement, Deferred Procurement, Responsive Production Inventory, Incremental Release and In-Production Support. Proposed clarification changes to affected portions of the Air Force spare parts provisioning procedure, formulated by the Panel, were distributed to the Committee for review. Similar action with the other military services is planned.

Evaluation has been undertaken on two proposed Air Force documents pertaining to materiel support for aerospace and associated equipment contracts during the build-up period of a program. This documentation was developed from an original AIA proposal initiated by the Committee to provide contractor support. A proposal to consolidate the requirements of both documents into one has been submitted to the Committee for review prior to its subsequent presentation to the Air Force.

Industry-Initiated Actions

In connection with a Committee-initiated program last year to provide assistance in developing standardized support procedures for NASA space systems, an *ad hoc* panel has initiated further studies to modify the original AIA proposal in order to develop a more complete support document. This latest proposal, which includes the areas of training equipment, ground support equipment, hardware and item support equipment, as well as spares support, will be presented to NASA representatives in the near future. It is believed that many economies can be realized by the adoption of such a uniform provisioning procedure by the NASA field activities.

In furtherance of recommendations provided to the Air Force last year concerning improvements for their Technical Information File, additional studies were undertaken by the Committee this year to substantiate the value of

this handbook to industry. Information covering improvements necessary in this handbook, how extensively it was being used and what was considered to be its most desirable form of application, were provided to the Air Force in October. It is believed that the results of these studies justify the continuation of the Technical Information File and point the way in its utilization toward significant cost savings through the elimination of duplicate and unnecessary items of equipment.

Logistics Data Interchange

The Committee spearheaded the industry efforts in evaluating the Defense Department's proposed Military Industry Logistics Data Interchange Procedure which had been developed from an earlier "Improved Data Interchange" concept prepared by a joint AIA/Military task group and submitted to the Defense Department in July 1959. This latest proposed procedure provides a means for rapid exchange of logistics information between the contractor and the military services by various types of automatic data handling devices. More than 2000 suggestions were included in the industry views submitted to the Defense Department in 1963. Utilization of this procedure is expected to increase the accuracy of spare parts accounting and procurement.

SERVICE PUBLICATIONS COMMITTEE

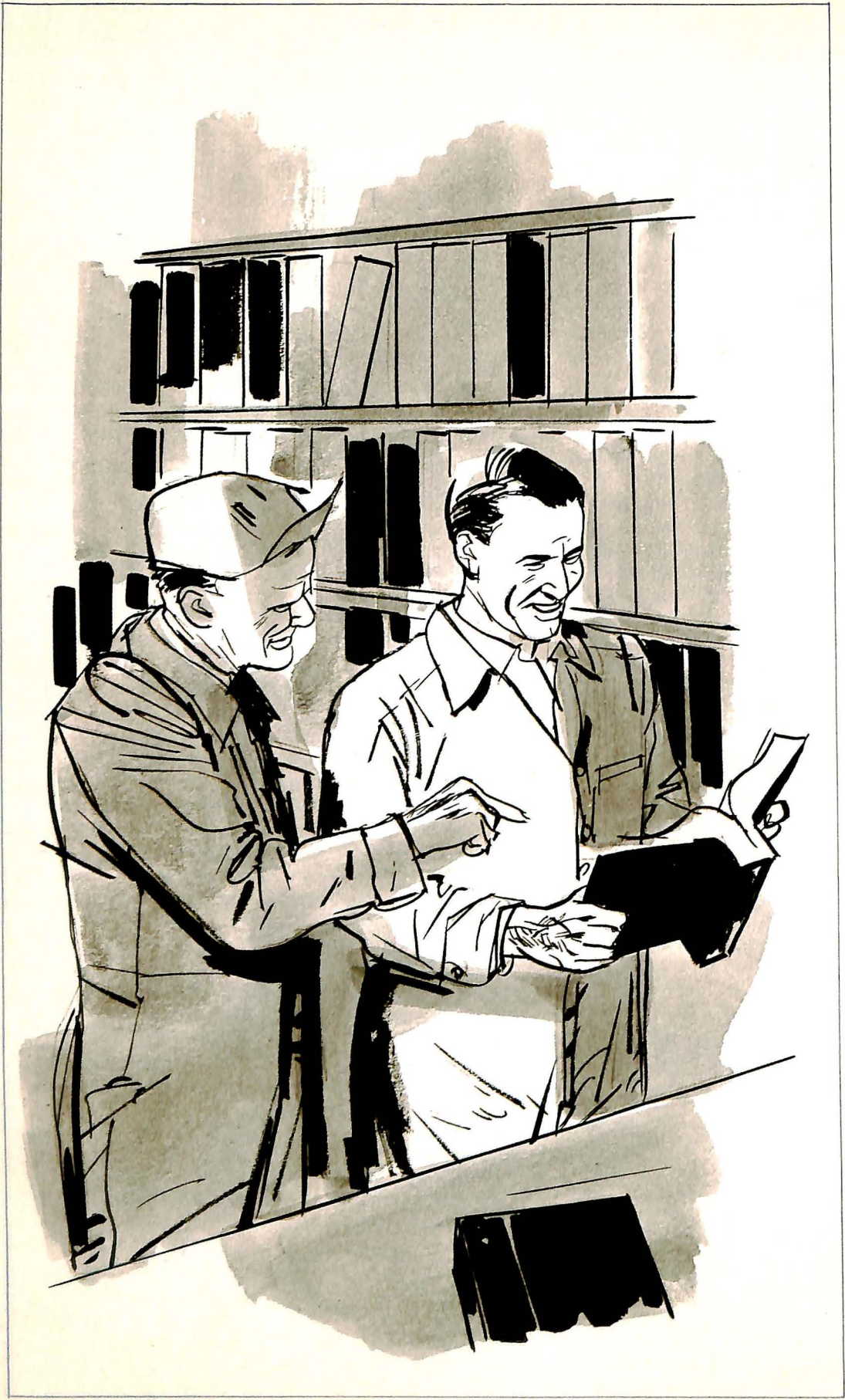
Cost consciousness is the keynote of the Service Publications Committee and its projects are subjected to a cost evaluation scrutiny in addition to their normal technical and administrative study and evaluation. Perhaps the most significant recent accomplishment of the Committee has been its prompt response to a DoD request for industry examples of cost reduction techniques in producing technical manuals. Within a 90-day period, the Committee was able to receive the request, obtain the industry replies, evaluate, compile and deliver to the DoD a completed report. The best evidence of respect for its content is the fact that it is now in its third printing and demands for it continue to be received.

Handbook Procurement

The subject of handbook costs, when treated with limited knowledge, is full of potential hazards. A Panel has therefore been assigned by the Committee to the task of clarifying the subject of handbook procurement and preparation. A presentation with slides has been produced to describe the diverse, complex efforts which the contractor must intermesh in order to produce technical manuals which are correct, in agreement with the equipment configuration, and on time. This presentation has been shown to many interested personnel in Government and industry and is available for future showings.

DoD Study of Printing Costs

Another cost project to which AIA was invited to contribute is a DoD project entitled "Management of Publications and Printing in the DoD." This is planned as a comprehensive review of printing and publications activities within the DoD.



New Techniques

The search for new techniques is not confined to the operations pertaining to the preparation of handbooks. A Panel is continually searching for new ways of accumulating, storing and retrieving operational, check-out and maintenance data. Electronic data processing equipment, microimage, filing and retrieval equipment and similar types of equipment and related systems are continually under Panel review. The systems with likely potential are then presented and demonstrated to the whole Committee.

Specification Reviews

Committee members and panels are continually reviewing new specifications or revisions for the military services and the Air Transport Association. Committee members are also providing their services to the DoD and its study groups working on technical manual specification standardization.

Information and Education

Our Information Panel has produced and distributed eleven releases of articles that are of interest to publications and printing personnel. These releases are not only for the benefit of our members but they are also distributed to more than 100 Government key personnel to help clarify various aspects of the preparation and production of operation and maintenance instruction.

INDUSTRIAL RELATIONS ADVISORY COMMITTEE

Many new and sometimes unique problems in several areas within the jurisdiction of the Industrial Relations Advisory Committee occurred in 1963. The rapidly changing technology within the aerospace industry and the increasing use of automation were among the problems faced during the past year.

The changing technology with its demands for new and changing work skills has placed a great deal of emphasis on the hiring, training and re-training of employees, as has the trend toward automation. Many new skills are not available in the labor market and most member companies have been forced to expand their training staff to meet the demand.

INDUSTRIAL SECURITY COMMITTEE

The scope of the activities of this Committee includes not only security as applied to the protection of classified material within the facility but the physical security of the plant as well as civil defense and the responsibility for establishing and maintaining proper standard operating procedures for administration of the security program.

For a number of years this Committee has acted in an advisory capacity to the Department of Defense. The provisions of the Industrial Security Manual, which by reference is a part of procurement contracts, are being constantly reviewed by the Committee members as individuals and by the Committee in session. As new or changed regulations are issued, their practicality from the contractor's point of view is evaluated by Committee members and

reports are made to the Department of Defense.

During 1963, thirty-five Committee members met with twelve top security officers and civilians from the contracting agencies to discuss mutual problems in the administration of the security program. A Government-industry "workshop" was held later to discuss actions necessary to eliminate needless and costly requirements.

GOVERNMENT REPORTS COMMITTEE

The Government Reports Committee works with the Bureau of the Budget, cognizant Government agencies and with other AIA committees in handling Government Reports requirements under the provisions of the Federal Reports Act of 1942. Government agencies have a need for meaningful and essential data. Committee work directed toward these goals requires a very considerable effort in evaluating existing and proposed reporting requirements. Members of the Committee work toward elimination of requirements that are unwarranted or not justifiable, and recommend ways in which cost reductions to Government and industry may be achieved by simplification and elimination of reports.

The Committee continued emphasis in 1963 on the streamlining of industry reporting requirements to the contracting agencies of DoD and NASA.

Data Management

In this connection, progress was realized when the Air Force issued a Data Management regulation. The principles involved in this regulation are a milestone in the techniques of controlling the flow of reports, blueprints, punchcards, and other data on company operation. The Government Reports Committee has been collaborating with the Air Force for five years in the work leading up to this regulation.

Much of the Committee's work in 1964 will be directed toward specific reporting systems that are made visible for the first time in the manuals that implement the Air Force data management regulation. The Committee also worked closely with the newly established Defense Supply Agency. In particular, a section of the DoD-wide requisition and issue procedure was reworked into a Contractor Handbook for Requisitioning DoD Materials. This work led the Committee into further collaboration with DSA in other service and industry standardization programs such as MILSTAMP (for documenting shipments into military transportation agencies) and MILSAAD (a directory of military and contractor shipping points and receiving locations). A subcommittee concerned itself with the implementation of reporting in connection with MILSTAMP and MILSTRIP.

Defense Industrial Plant Equipment Center

The Committee also provided work programs to the newly established Defense Industrial Plant Equipment Center on the documentation of Government facilities, to the National Aeronautics and Space Administration for their set of finance reports, and to the Department of Defense and the military services on the family of reports known as the Defense Contractors Planning Reports.

PUBLIC RELATIONS SERVICE





TED BURKE

*The Garrett Corporation
Chairman, Public
Relations Advisory
Committee*

Public Relations Advisory Committee

Executive Committee
Editorial Subcommittee
Aviation Education Subcommittee
Shows & Exhibits Subcommittee
Aircraft Sound Subcommittee

To align its functions and activities more closely with the overall objectives of the Association, the Public Relations Service in 1963 effected a major reorientation of its programs. The focal point of the reorientation was the conviction that improved communications could be an important factor in the Association aim of bettering the relationship between industry and Government.

The primary objective of the reoriented program was the development of increased awareness of the problem areas of the aerospace industry and the importance to the nation of an operationally efficient industry. Accordingly, the Public Relations Service and the Public Relations Advisory Committee established a twofold goal: a) to contribute to an improved industry/Government relationship through more effective communications, and b) to stress to the public and the Government the importance of the aerospace industry by detailing its position in the national economy, its role as supplier of defense and space equipment, the intricacies of modern aerospace research, development and production, and the problems of meeting the manifold responsibilities assigned the industry.

A major portion of the Service's 1963 effort was aimed toward directing public attention to an economic study conducted by the Stanford Research Institute. The study report outlined the areas of inconsonance in the industry/Government relationship, and its wide dissemination through the various media generated considerable interest on the part of Government officials. It served as the springboard for a series of productive industry/Government "workshop" conferences.

Public Relations Service also sponsored a seminar on the economics of the aerospace industry, designed to acquaint economists and other opinion leaders with the unique problems of the industry.

To serve both elements of the twofold goal, the Service revised the format of the Association publication, *Aerospace*, introducing a quarterly magazine designed to treat in depth the many complicated facets of aerospace manufacture and to translate technical complexities into intelligible language as a method of improving understanding of the industry.

To reach a broader audience, the Service also initiated a series of television films which pointed up industry's contributions to national defense and space exploration.

In addition to these new measures, the Service continued its routine function of disseminating information to the public and meeting requests of Government agencies and private organizations for specialized information compiled by the AIA Services and Councils.

The following is a resume of the 1963 activities of the Public Relations Service:

The Stanford Research Institute Report

The Stanford Research Institute's study of "The Industry/Government Aerospace Relationship" received widespread coverage through a press conference and later follow-up actions. More than 2,100 copies of the report's findings and recommendations were distributed, on a complimentary basis or through sale, to Government officials, research organizations, financial analysts, educators, news media, the AIA membership and other interested com-

panies. Public Relations Service also participated in arrangements for the follow-on two-day industry/Government workshop conferences covering 12 specific areas of operation.

Aerospace Economic Seminar

The SRI report was further utilized at a two-day seminar held in cooperation with the Wharton School of Finance, University of Pennsylvania. Designed to apprise leading economists from major eastern universities with the economics and technological task of the aerospace industry, the seminar was attended by 38 professors and representatives of 12 aerospace firms. Two additional seminars were planned.

Aerospace Quarterly

A marked increase in the number of requests for placement on the distribution list, unsolicited comments of a laudatory nature, and a number of reprints in general media testified to a high degree of acceptance of the magazine *Aerospace* in its new quarterly format. Two articles in particular, written especially for *Aerospace* by then Vice President Lyndon B. Johnson and NASA Administrator James E. Webb, were extensively quoted. At year-end, circulation to the press, educators, economists,

financial analysts, members of Congress, committee staffs and other Government officials totaled 26,500.

Aerospace Facts and Figures

The annual publication *Aerospace Facts and Figures*, a textual/statistical record of aerospace activities, was considerably expanded, particularly in the Space and Finance chapters. The publication met with the largest sale in its history, estimated at more than 3,500 copies. Distribution was handled by Aero Publishers of Los Angeles, Calif., which planned a more extensive promotional campaign for the 1964 edition.

U. S. Aircraft, Missiles and Spacecraft

The annual pictorial and textual compilation of the industry's products and achievements, *U. S. Aircraft, Missiles and Spacecraft*, served as a replacement for the defunct *Aerospace Year Book*. Published by the National Aerospace Education Council with the cooperation of Public Relations Service, "AM&S" recorded a distribution of 15,000 copies in 1963.

Annual Report

A basic document for informing the public on the breadth and scope of AIA activities, the *Annual Report* gained greater readership in 1963. The print order was



increased to 7,500 because of additional requests from Government agencies, private agencies and news media.

Films

Comments from using stations indicated surprising acceptance of the newly-initiated series of short newsclips designed for television use. Keyed to a current or near-future news event, the film shorts emphasized industry's efforts to provide high-quality, high-performance aerospace equipment. An example was a one-minute film timed for showing after the MA-9 Project Mercury mission; the short described the life support system which protected Astronaut Gordon Cooper in space. It was used by 142 stations with an estimated audience of 15,000,000. Nine such TV clips were released during 1963; they were used 960 times and reached a viewing audience of 90,000,000, with more than 100 stations showing each release.

Public Relations Service also released a 26½-minute feature film designed primarily for TV showings. Titled "All Systems Go," the film depicts the contributions of the aerospace industry to the national space program. It met with remarkable success, reaching an audience estimated at 7,400,000 in 198 showings. A second feature film, covering the industry's role in national de-

fense, was in final stages of preparation at year-end.

Aerospace Education

The Association continued its support of the National Aerospace Education Council, which reported that 24,000 requests for information were received during 1963, an increase of 7,500 over the previous year. NAEC noted particular success in promoting aerospace workshops during the summer months.

Publicity

Public Relations Service prepared and issued seventy-six news releases during the year, and fifty-two memos dealing with inquiries and programs were prepared for the Public Relations Advisory Committee. The Service also handled numerous inquiries from local and out-of-town press.

Noise Abatement

AIA continued its sponsorship of the National Aircraft Noise Abatement Council in cooperation with the Air Transport Association and the Air Line Pilots Association. NANAC continued to develop community relations programs to explain the overall efforts of the industry and the operators to minimize noise in airport operations.



TECHNICAL SERVICE



The committee activities of the Technical Service reflect the shift in emphasis from production to research and development. The engineering committees review more Government specifications aimed at systems management and less at hardware procurement. The manufacturing committees are heavy in numerical control with its great potential for cost saving, particularly on limited production work. The Procurement Committee finds the sub-contract and purchase functions faced with influences which change traditional criteria of price, delivery and schedule. The Flight Operations Committee finds the customer competing with the contractor for the shrinking man-hours in flight test programs.

All are indicative of change, and a growing recognition of the need to adapt the organization to the times. Action in this area is anticipated in 1964.

AIRCRAFT TECHNICAL COMMITTEE

This Committee's membership represents engineering management of those companies engaged in design and production of aircraft.

There were no formal meetings of the Committee during the past year. However, a number of subjects of engineering policy nature were reviewed by correspondence surveys. Members have recognized the growing need for industry technical opinion which is not limited to or reflected solely in the views of a main technical committee. This is expected to be the subject of significant attention during 1964.

Aerospace Research and Testing Committee

Concern with common industry engineering problems involving research, development and testing is the tie that

links together the forty-seven members of the Aerospace Research and Testing Committee who carry the responsibility for the structures, aerodynamics, materials and testing activities in their companies or divisions.

Problems in highly specialized fields are worked out by panels of specialists who meet, as necessary, to carry out their assignments and to exchange information. A highly successful Symposium on Aeroelastic and Dynamic Modeling Technology was co-sponsored by the Dynamics and Aeroelasticity Research Panel of ARTC and the Air Force Flight Dynamics Laboratory. Attended by more than 400 engineers and scientists, the three-day meeting covered theory, design and applications of model testing techniques. The Panel on Flight Test Telemetry is working to develop specifications and standards for use on the new UHF bands. An industry workshop, attended by equipment manufacturers and users, produced a specification for performance and testing for telemetry transmitters in the UHF bands. A test program has also been initiated to evaluate revised FM standards through a contract with a firm specializing in the development of T/M equipment. Development and exchange of experimental techniques and data form the basis of the activities of the Panel on Thermophysical Properties. This group is working closely with a similar committee of the Department of Defense, providing them with the views and requirements of industry in this relatively new field.

ARTC's project activities encompass five principal areas:

1. Problems in advanced design
2. Standardization of testing procedures
3. Development of new specifications and standards
4. Cooperative test programs
5. Development of design data.



R. J. LUTZ
General Dynamics Corporation
 Chairman, Aircraft Technical Committee



C. E. REID
Republic Aviation Corporation
 Chairman, Manufacturing Committee



F. E. McCREERY
Rohr Corporation
 Chairman, Accessory and Equipment Technical Committee



W. G. DORAN
Douglas Aircraft Company, Inc.
 Chairman, Materials Procurement Committee



W. A. HANE
The Boeing Company Aero-Space Division
 Chairman, Electronic Equipment Technical Committee



C. J. McDOWALL
General Motors Corporation, Allison Division
 Chairman, Propulsion Technical Committee



M. R. STANLEY
Northrop Corporation Norair Division
 Chairman, Flight Operations Committee



I. DAGAN
Rohr Corporation
 Chairman, Quality Control Committee

AIRCRAFT TECHNICAL COMMITTEE

- Aerospace Research & Testing Committee
- Dynamics & Aeroelasticity Research Panel
- Flight Test Telemetry Panel
- Thermophysical Properties Panel
- Airworthiness Requirements Committee
- Personal Aircraft Transport
- Vertical Lift Aircraft
- Engineering Contract Requirements Committee
- Drafting Panel
- National Aerospace Standards Committee
- Powerplant Installation Committee

ACCESSORY & EQUIPMENT TECHNICAL COMMITTEE

- Administrative Engineering Committee
- Drafting for Numerical Control Machines
- Drafting Practices

ELECTRONIC EQUIPMENT TECHNICAL COMMITTEE

- Electronic Parts Committee
- Connector Panel
- Electron Tubes Panel
- Gyros & Accelerometers Panel
- Microelectronics Panel
- Semiconductor Devices Panel
- Radiation Effects Panel
- Relay Reliability Panel
- Electronic Equipment Specification Committee
- Design Requirements & Test Uniformity Program
- High Potential & Insulation Test Panel
- Radio Frequency Interference Panel
- Drafting Panel
- Electronic Systems Reliability Committee

FLIGHT OPERATIONS COMMITTEE

- Safety Panel

MANUFACTURING COMMITTEE

- APT Management Council
- APT Technical Advisory Project
- Aerospace Manufacturing Engineering Committee
- Numerical Panel
- Electronics Manufacturing Engineering Committee
- Manufacturing Conservation Panel
- Manufacturing Equipment Committee
- Welding Equipment Panel
- Manufacturing Test Engineering Committee
- Preservation & Packaging Engineering Committee

MATERIALS PROCUREMENT COMMITTEE

- CCMR Rating Systems
- Configuration Management
- Economic Assistance Program
- Government Source Inspection
- Make-or-Buy Policy
- Small Business
- Surveillance of Aerospace Contracts

PROPULSION TECHNICAL COMMITTEE

- Propulsion Working Committee
- Powerplant Airworthiness Requirements Panel
- Turbine and Jet Engine Panel
- Propeller Requirements Panel
- Engineering Data Panel
- Reliability Panel
- Liquid Rocket Engine Control Components Panel
- Liquid Rocket Propellants Panel
- Solid Propellant Safety Panel

QUALITY CONTROL COMMITTEE

- Government Special Liaison Panels
- Measurement Standards & Calibration
- Reliability Panel

Thirty projects were completed in the past year covering these areas. Typical projects completed include: the definition of industry needs in re-entry physics, space environment and ablation; test procedures for fasteners; test for compatibility of various materials with liquid oxygen; target specification for high temperature sealing compounds; calibration procedures for high temperature strain gauges; engineering standards for fusion welds; and, area cleanliness requirements.

Concurrent with its project activity, ARTC maintains liaison activity with Government agencies and technical groups of professional societies, to avoid overlap of activity and advise these groups of its results. Through joint Industry-Services specialists' meetings, problem areas in military and Federal specifications are worked out.

Although specific dollar savings are often difficult to ascertain in this type of activity, many savings are effected through the development of common standards and specifications. Exchange of non-proprietary technical data and cooperative test programs provide many member companies, as well as Government agencies, with necessary information and data at a fraction of the cost entailed by individual investigations.

Airworthiness Requirements Committee

The Airworthiness Requirements Committee is composed of engineering representatives from airframe manufacturers concerned with the certification of aircraft, rotorcraft and VTOL vehicles. The Committee represents the industry with the Federal Aviation Agency in certification and airworthiness matters. It initiates proposals for revision of the Civil Air Regulations and related policies and procedures where they concern airworthiness requirements. It similarly establishes the manufacturers' position when such proposed revisions are prepared by the FAA.

Since there is a wide divergence of interest among the various manufacturers, the Airworthiness Requirements Committee is divided into four groups—Transports, Personal Aircraft, Rotorcraft and VTOL Aircraft. In effect, there are four Airworthiness Requirements Committees. Each of these committees, through its Secretary, maintains daily liaison with FAA's Flight Standards Service, in addition to the FAA/ARC relationship which is carried on through a series of meetings between the FAA and Airworthiness Requirements Committees.

Some of the more significant technical projects accomplished by the committees have been the establishment of a 2½-minute rating for helicopters; AIA proposals concerning tentative airworthiness objectives for the supersonic transport; requirements for three-engine turbine-powered transports; and requirements for turbine-powered general aviation aircraft. In addition, the VTOL Committee has assisted the FAA in its program to establish realistic requirements for VTOL aircraft. This is a continuing project which is being accomplished through joint meetings of AIA's VTOL Committee and its counterpart group in the FAA.

Engineering Contract Requirements Committee

ECRC, now in its tenth year, is responsible for representing prime manufacturers of aircraft, missile and

spacecraft systems in matters concerning contract requirements which affect policies, procedures and general documentation practices of the engineering organizations of its 27 member companies. ECRC also serves as a focal point for coordination with other AIA functions toward assuring consideration of overall system effects and system-concept integration of all contract requirements for which our engineering organizations have an implementing or compliance responsibility. Operating under direct cognizance of the Aircraft Technical Committee assures that ECRC activities are directed toward execution of committee responsibilities consistent with the interests and policies of top engineering management levels of its member companies.

Complexities of the modern aerospace system have required the development and organization of many specialized interest functions, both technical and non-technical. Not surprisingly, as each becomes established, it develops policies and requirements which result in contractual conditions intended to assure consideration of that specialty at all phases of a system's life. Often, a specialist's well-intended zeal for his specialty results in requirements specifications which are either inconsistent with or otherwise penalize overall system objectives. Almost invariably, due to the multiplicity of system interfaces, requirements of one specialty can be found to be redundant and at times in conflict with certain requirements of other specialties. Thus, the same system complexity which caused creation of these specialties, as well as the definitive requirements to implement their criteria, also requires perhaps even greater emphasis on balancing the integration and system-effects. Within its interest areas, ECRC has constantly directed its efforts at assuring such system-concept integration and at maintaining appropriate balance between the various contract requirements involved.

During 1963, as in the past, ECRC has been an active committee with more than 35 projects on its agenda. Illustrating ECRC efforts toward system effects integration of engineering requirements, is the fact that approximately 75 per cent of these projects were carried on in consonance with other AIA committees having mutual interest or interface with the project being considered. In nearly all cases, ECRC inputs on a given project also reflect recommendations and comments developed via coordination with the appropriate specialist functions within its member companies.

A majority of projects involving multiple AIA committee participation are carried on following the "key sponsor" technique which has proven its effectiveness in the past. Significant projects for which ECRC has served in the key sponsor's role during 1963 include:

1. Reliability Programs. Following nearly 18 months of coordination, the "A" revision was issued in May 1963. ECRC liaison is continuing with cognizant DoD and military reliability agencies toward coordination on a pending new tri-service reliability specification anticipated for early 1964 release.

2. Revised regulations concerning Engineering Change Proposals preparation, format and extent of information required plus modification in Class I/II change definitions. This document has also undergone lengthy coordination.



Prior to its release in July 1963, coordination efforts extended to include several AIA committees, other industry associations, plus representatives of the Bureau of the Budget, the Advisory Council on Federal Reports, and the document's parent DoD agency, the Aeronautical Standards Group.

Other projects in which ECRC has participated during 1963 include Maintainability Requirements; Maintainability Definitions; Detailed Specifications for Fixed and Rotary Wing Aircraft; USAF's safety specification plus a proposed similar BuWeps document; and, in conjunction with SAWE, coordination with NASA, DoD and ASG toward development of a common Weights Engineering standard.

Nearly all requirements affecting engineering need various types of documentation. In this regard, an important adjunct to ECRC operations is the activity carried on by its Drafting Panel. Experts in the field of documentation, this group maintains surveillance over contract requirements affecting that specialty area. Drafting Panel activities are monitored by ECRC and their efforts coordinated through the AIA's Joint Drafting Panel.

As the aerospace system continues to grow in complexity and its demands for more and more technological advancement, engineering elements of industry can expect to see continued increase in specialization and in definitization of requirements for contractual enforcement of specialist interest consideration. For all aerospace companies, and especially for those of ECRC who are assigned total system development responsibility, this pattern requires parallel increase in the efforts devoted to the assurance of over-all system effects consideration and balanced implementation of all system requirements. The ECRC is dedicated to continuing and improving its activities as part of the industry-wide effort at achieving and maintaining this balance toward assurance of continued advancement in aerospace systems capabilities and performance.

National Aerospace Standards Committee

The National Aerospace Standards Committee is composed of leading standards engineering personnel appointed from the Association's major airframe, missile, and space systems manufacturers. Their function is the study of mutual standardization problems of aerospace system parts, components, materials, processes, and related standards, specifications, and policy matters. This leads to the adoption and promulgation of appropriate industry standards, promotion of their use consistent with improved design and economic considerations. Also, at the request of the Government agencies, the Committee annually reviews and submits technical comments on a large number of their proposed documents.

Activities of the Committee, spanning a period of 22 years, have authoritative Government and commercial recognition. Industry standards and the specifications issued as National Aerospace Standards (NAS's) now total more than 2,000 documents. Indexing and publishing is accomplished for AIA by the National Standards Association, Inc. Automatic distribution of current standards is made to over 1,100 companies, Federal Government

agencies, colleges, technical schools, libraries, and individuals. In addition over 500 inquiries related to NAS standards were processed in the past year.

The work of the Committee is conducted on a continuing basis through a highly developed correspondence procedure and at national meetings held quarterly. Near perfect attendance records of the active member companies and appointed Government liaison representatives from the Air Force, Army, Navy, National Aeronautics and Space Administration, and the Defense Supply Agency, affords a timely exchange of information and attests to the value received. Committee proceedings are given wide distribution thus affording extensive review and encouraging contributions beyond the Committee structure. Participating member companies are provided the opportunity and avenue to bring to their customers' attention specific needs and objections in the proposal stage of documentation. This minimizes the extent to which individual contractors would be obligated to seek deviations under the terms of their contract.

Among the projects active in the NASC is the Forecast of Standard Product Requirements which had its inception in 1962. Currently, the program is being contributed to by a majority of the member companies and is of increasing interest to the Government agencies with which the NASC has liaison. This program will result in standards being available when needed. To further extend the recognition of such industry standardization efforts, the Committee is actively contributing to a recently formed *ad hoc* study group under the auspices of the Department of Commerce. This panel's objective is to make recommendations regarding national standardization needs. It is composed of representatives from all interested Government agencies and the major trade and professional societies engaged in standardization activities.

A number of cost savings evaluations were made during the year which were most encouraging. These included:

1. The total cost including the issuance of reports for a NASC qualification test program was \$4,767. It is estimated that of the 42 NASC members 23 are potential users. Therefore, at a conservative cost of \$2,300 for each member to conduct such tests a total savings of \$48,000 to our industry can be realized.

2. A member company's detailed cost analysis of entering a nonstandard 69¢ part into an existing program was in excess of \$1,000.

3. Development of a NAS standard was undertaken by a member company after determining that the percentage of savings ranged from 39 per cent to 66 per cent on each of the individual parts covered by the standard.

4. A one-year record on a single system development contract indicated that participating in the NASC program had eliminated the creation of 650 new drawings. The resultant saving was established as \$260,000 based on a unit cost of \$400 per drawing. Other in-house programs were believed to be equally affected.

While recognizing a standards program must be kept within optimum bounds, the aforementioned examples do point out the need for a continuing and progressive standardization effort.

Powerplant Installation Committee

The Powerplant Installation Committee is composed of representatives having technical and administrative responsibility for propulsion system installations and related matters in airframes, missiles and space vehicles. The Committee provides technical advice in matters relating to propulsion system installation requirements to military and civil agencies of the Government, and also assists other committees of AIA in matters involving such engineering efforts.

During the past year, the Committee has held two regular full scale meetings, and has participated in several other joint activities on an *ad hoc* project group basis. One of the primary accomplishments of the Committee was the completion of a revision to the Design Manual on Aircraft Fire Protection for Reciprocating and Gas Turbine Engine Installations, which was released in January 1963. This publication first released in 1949, has been brought up to date in the section on fire protection for reciprocating engine installations, and the second part having to do with fire protection for gas turbine engines has been completely rewritten. No further revisions to part 1 are contemplated. However, the part of the manual having to do with gas turbine engine installations will be revised as advancements are made in the state-of-the-art. As with previous issues, it is anticipated that this latest revision will serve as the authentic document on this subject for use by aircraft designers throughout this country and the Free World.

In response to a request by the operators of air transports, an *ad hoc* group from this Committee met with representatives of the airlines propulsion system specialists and the manufacturers of jet engines for a review of possible needs for establishing propulsion system reliability criteria in jet transports. Although it was felt that much good might accrue in open discussions with airlines' representatives on the subject of propulsion system reliability, PIC representatives were not in favor of attempting to promulgate any standards for issuance by the Society of Automotive Engineers.

Prior to the advent of the FAA request for proposals on the supersonic transport, FAA propulsion branch chiefs were invited to discuss with PIC the FAA philosophies which might be reflected in proposed rule making and ultimate regulations applicable to the SST propulsion system. These discussions resulted in transmittal of a letter from FAA to the PIC in August, noting that mutual benefits would be derived by active participation by the Powerplant Installation Committee in the drafting of suggested standards and participation in discussions of specific problem areas, so that proposals which would attain the necessary safety objectives would be the product of the Government-industry effort.

During this year the PIC, for the first time, met jointly with the engine manufacturers for discussions of common problems outside the immediate area of Government specifications. The joint meeting was most productive in revealing problem areas wherein there appeared to be probable solutions and where the two groups can work to a mutual advantage, thus departing from the user-supplier relation-

ship which has been the source of friction between the two groups for many years. Both PIC and the engine manufacturers feel that, at such time as they may meet jointly with the military services for discussions of revisions to the general engine specifications in the future, many of the conflicting recommendations previously submitted will be eliminated.

Aside from the actions reported, the PIC has reviewed and made recommendations pertaining to cabin air contaminants, installation of fuel and oil lines, flutter, deformation and vibration requirements applicable to transport category airplanes, crash fire protection, SST tentative airworthiness objectives and standards, a standard means for presenting engine performance data, and FAA technical standard orders.

The Committee will continue to be interested in all aspects of a propulsion system and will expect that the need will soon be apparent for a similar activity in the field of boosters for missiles and space systems.

ACCESSORY & EQUIPMENT TECHNICAL COMMITTEE

Providing an authoritative source for presenting the views of aerospace accessory and equipment manufacturers on noncompetitive matters involving engineering, performance and regulatory matters is the objective of the twenty-five members of the Accessory & Equipment Technical Committee.

AETC and its working committee, the Administrative Engineering Committee (AEGC), have joined with various other AIA committees in providing comments and recommendations on such documents as "Quality Control Systems Requirements," a bulletin on Engineering Changes, Environmental Test Methods, Missile/Space System Safety Engineering, Coordination of Maintainability specifications, and various other "hardware" specifications.

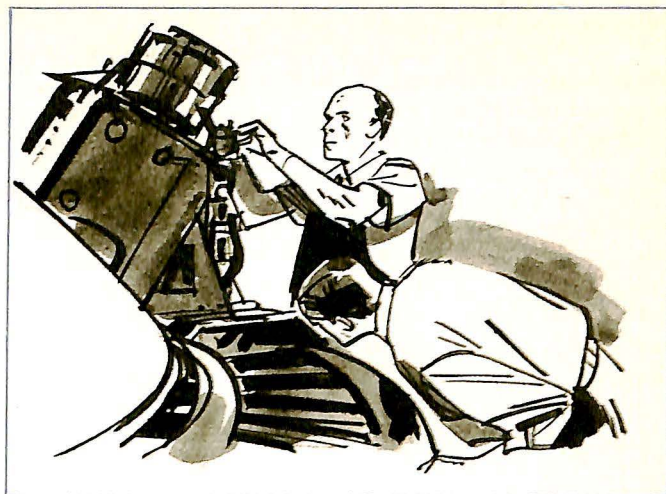
AETC provides representation, along with the Propulsion Working Committee and the Powerplant Installation Committee, on a special panel investigating the service life of accessory drives and splines.

The Administrative Engineering Committee provides representation on the Joint Drafting Practices Panel, composed of members from several AIA technical committees. The panel has reviewed and commented on specification requirements for drawings and microfilming of drawings and data.

ELECTRONIC EQUIPMENT TECHNICAL COMMITTEE

Electronic engineering executives of thirty-one AIA member companies constitute the Electronic Equipment Technical Committee, which provides electronic technical support to overall AIA goals and objectives, and coordinates industry-wide problems confronting electronic systems engineering management.

AIA electronic efforts were initiated about 12 years ago and remain unique in reflecting defense electronic systems manufacturers' views and integrating those with views of weapon or space system prime contractors. In technical matters related to electronic components, AIA committees speak solely from the position of a using industry. Thus they are distinctive rather than duplicative of other associations' efforts.



Aerospace electronics engineers continued in 1963 to demonstrate their ability to meet the numerous technical and management challenges of the ever-expanding interfaces of electronic engineering with manufacturing, new environments, new applications, and increased complexity coupled with need for higher reliability and longevity.

Aerospace electronic functions now involve 14 major systems. These include communication, flight-control, fire control, guidance, navigation, ECM-CCM, command control, checkout, reconnaissance, tracking, surveillance, scientific instrumentation, range instrumentation, and computation and data processing. Recent estimates indicate that aerospace electronic research and production plants have expanded to 26 per cent of the total aerospace facilities, and that DoD and NASA's 1963 spending on electronics was 16 per cent and 25 per cent respectively of their budgets. Such large expenditures places increased responsibility in both Government and industry.

The EETC recognizes the significance to the aerospace industry and national defense of the above evolutionary changes, and continues to seek improved coordination with DoD, NASA and other industry groups to establish practices and procedures which will reduce cost, improve effectiveness and minimize lead time of electronic equipment.

Meeting presentations, tours and discussions have included:

1. Timely presentations by authoritative military, NASA or industry personnel, to provide full understanding of problem and planning areas, assess technical trends, and develop joint Government-industry efforts to solve mutual problems. These have included Soviet Space Technology Achievements, Infra-red Technology, Coherent Optical Technology, and Expanding Interface of Formal Engineering and Manufacturing.

2. Visits to military, NASA and industry installations for briefings and tours have provided valuable field operational background in direct area of members' responsibilities. These have included Navy Electronics Laboratory, Scripps Institute of Oceanography, Electronics Wing of Canadian Armament Research and Development Establishment, and McDonnell Electronics, Space and Aircraft

Research and Production facilities.

3. Meeting discussions in 1963 have provided policy direction of EETC working committees to accelerate action and improve electronic equipment and systems in aircraft, missiles, spacecraft and their associated ground checkout, control and detection systems.

EETC has participated along with other main technical committees in coordination of specifications having major impact on engineering cost and management. These have included Safety, Human Engineering, Absolute Quality Control, Maintainability, NASA Reliability and Quality Assurance, and Clean Room Requirements.

EETC accomplishes its detailed work through three working committees, eleven panels, and such *ad hoc* projects and surveys as are required. These subordinate activities provide coordinated recommendations on needed changes in procurement specifications, test procedures, and environmental and reliability requirements. They serve as a valuable link in the coordination channel between military, weapon system primes, NASA, electronic systems contractors and component manufacturers.

Two Government-industry electronic workshops have made encouraging progress in defining problems and initiating actions to improve Government-industry teamwork to relieve the burden and cost of operation under conflicting military and NASA philosophies and requirements in the electronics area. Finalization of these joint efforts is scheduled for May 1964.

Electronic Parts Committee

The Electronic Parts Committee is composed of representatives of twenty-five major electronic systems manufacturers. The Committee has a continuing program to coordinate information on improved and new parts requirements for advance systems. Close working relationships with parts manufacturers and cognizant military services has expedited solutions to many component problems of system designers.

The Committee provides direction of its seven subordinate panels, which accomplish the Committee's detailed work.

EPC is continuing to assist in planning and implementation of a DoD-NASA-industry specification management system capable of providing up-to-date engineering and procurement data for reliable electronic parts. This program has great potential for eliminating multi-million-dollar cost of duplicate development, testing, documentation and stocking of the same or similar parts. For instance, one diode is now sold and stocked under 291 different part numbers; one connector manufacturer produces one million items and estimates one thousand would meet all needs if proper management and discipline had been provided initially.

EPC has encouraged and supported the various military sponsored test data exchange programs which are now saving many millions of dollars by eliminating much duplicate testing of components by various contractors.

EPC has encouraged component reliability improvement through study of physics of failure modes and mechanisms and devising controls to remove these, rather than costly testing of large number of parts to determine reliability

by present statistical philosophy. Knowledge gained through this new approach will result in reliability improvement by several orders of magnitude and at a reduced testing cost.

EPC has recommended that DoD and NASA recognize early the need for joint DoD-NASA-industry management of the numerous programs evolving on microelectronics definitions, reliability, and standardization of test methods, packaging and functions. Microelectronics has great potential for improving reliability, performance and cost of systems. Consideration is being given to entirely new harnessing and connection concepts which are needed for a practical application of microelectronics technical breakthrough.

Technical accomplishments of note include updating of terminology and test methods for six types of gyros which had been issued by EPC in 1962 and accepted as industry-wide standards. A comparable accomplishment is 75 per cent completed to issue terminology and test standards for accelerometers.

EPC Panels are assisting the military services in adding appropriate reliability requirements to specifications for relays and connectors.

The increasing need for electronic parts resistant to radiation effects resulted in formation of a panel to assist DoD and NASA in developing standard definitions for radiation effects, and to establish damage criteria, test methods and procedures.

Electronic Equipment Specification Committee

The Electronic Equipment Specification Committee continues to coordinate general environmental, design, reliability, and data specification requirements for electronic equipment. The EESC-Government-EIA Uniformity Program is obtaining coordinated tri-service design requirements. These are added, when approved, as identifiable sections of a military standard. The scattered verbiage on the same requirements is then deleted from the thirteen single service general electronic design specifications and replaced by reference to applicable sections of the military standard.

Twelve requirements have been approved and issued and eight more are completed by industry and in final coordination with the services. Ten additional requirements were completed in 1963 and ten new assignments are planned for completion in 1964.

Unifying the design requirements of the services will simplify keeping current with the changing state-of-the-art. This will result in design and deviation negotiation cost reductions estimated at \$15,000,000 per year for aerospace companies.

EESC provided coordinated electronic system comments on weapon system specifications for maintainability, tri-service environmental test specification, engineering change procedures, and electro-magnetic compatibility requirements and tests.

The EESC has, for ten years, participated in an annual EESC-Aeronautical Standards Group-Air Force-BuWeapons meeting to revise general design requirements for airborne electronic systems, related test and checkout equipment, and environmental requirements. This continues to

be an outstanding example of military-AIA teamwork by keeping these specifications dynamic and usable with a minimum of effort and cost.

Electronic Systems Reliability Committee

The Electronic Systems Reliability Committee consists of a reliability specialist from each of twenty-five AIA companies engaged in weapon or space system programs. The Committee's scope of activities includes all reliability problems related to achievement of reliability goals in weapon and space system programs. Through the Committee representative, individual companies sponsor projects directed toward advancing the reliability state-of-the-art. All tentative projects are carefully screened and defined as to description, scope, specific outputs and completion schedules by the project planning group before seeking approval and sponsorship. Seven projects have been completed and issued in the AIA technical report series during 1963 in addition to eight projects which are in progress.

During the past year ESRC has urged DoD to unify military services and NASA specifications for reliability management, prediction techniques, design, evaluation and test.

ESRC is encouraged with reports that an informal DoD-Military Services Reliability Group has released tri-service reliability specifications on definitions, test levels and accept/reject criteria for reliability of electronic equipment, has a tri-service reliability management specification in coordination, and reports progress in unifying other tri-service reliability specifications.

ESRC has participated with other technical committees in supplying coordinated AIA recommendations to the Air Force on revisions to Air Force specification on reliability program for systems, subsystems and equipment.

FLIGHT OPERATIONS COMMITTEE

The Flight Operations Committee was established to provide a concerted effort on the part of the manufacturers to diminish the collision potential between flight test aircraft and other airspace users, and to act as a group for industry on other matters pertaining to flight operations, including flight test.

During the past several years, the FAA and AIA have been coordinating on a daily basis to insure that flight test operations can be continued, without undue restrictions, in the safest possible manner. The implementation of "positive control" throughout the country has presented some rather complex scheduling, flight planning and communications problems. However, they have been worked out by the establishment of special arrangements throughout the country which best suit the particular flight test activity and local traffic control environment.

In a series of meetings between AIA and the Air Force, the latter generally agreed, and steps are being taken, to revise Air Force directives to indicate more clearly Air Force and industry responsibilities in the flight testing of Air Force aircraft and missiles. Further, the Committee Secretary, in coordination with the USAF, is participating in lecture and discussion programs with future Systems Program Officers at Wright-Patterson Air Force Base. All of these efforts will continue to contribute to improved

Air Force-industry relations.

The Committee has participated in a number of other areas where its technical capabilities are required, such as the Flight Safety Foundation's Aviation Crash Injury Research Committee, the Radio Technical Commission for Aeronautics, the National Aircraft Noise Abatement Council, etc.

In addition, by establishment of a Safety Panel composed of safety experts from its member companies, it has assisted the Air Force and Navy in formulating aerospace safety specifications and has initiated a program which would provide for the exchange of systems safety information between member companies.

MANUFACTURING COMMITTEE

This main Committee, comprised of top level manufacturing executives, continues to administer broad policy problems relating to manufacturing research and development, manufacturing equipment, conservation, production testing, tooling, methods and processes and other factory type operations. During 1963, the MC completed an analysis of its working organization in an endeavor to assure a manufacturing capability in pace with the rapidly advancing design engineering state-of-the-art in the aerospace industry. This appraisal led to the establishment of a new working committee to deal with the industry's technical problems in the manufacture of electronic products, which was approved by the Board of Governors in May and has since been organized as the Electronics Manufacturing Engineering Committee. Additionally, heavy emphasis has been placed on working toward achievement of reductions in manufacturing costs.

Through its APT Management Council the MC has continued to guide the IIT Research Institute in the management and technical direction of the APT Long Range Program. APT, the acronym for Automatically Programmed Tools, is rapidly becoming a standard throughout American industry as the computer language and system for numerical control applications. During the past year, there has been an effective transition of this aerospace program to a broader industry base, as its participation has increased to include membership from the automobile, farm implement, machine tool, computer and numerical control systems industries, as well as several Government agencies, including NASA, AEC, Army and Navy. In furtherance of this objective, the MC has also recently authorized a foreign market survey and reduced some of the past restrictions on distribution of the APT language.

The Committee through the next year will continue to direct the efforts of its working groups toward increasing the industry's manufacturing capability as new requirements develop. The Committee will also increase support of AIA efforts to accomplish improved communications with DoD, the military services and NASA in areas of scientific advancement which necessitate improved or unique new manufacturing and production concepts.

Aerospace Manufacturing Engineering Committee

The rapid advance of aerospace design engineering requirements created a demand for a group within AIA

charged with the responsibility of insuring, through effective research and development and other programs, a capability pacing the manufacturing state-of-the-art. This group, the Aerospace Manufacturing Engineering Committee, is comprised of manufacturing engineering divisional heads representing all segments of the industry, including spacecraft, aircraft, missile, propulsion, and accessory and equipment manufacturers.

To achieve this aforementioned manufacturing capability, the AMEC, assisted by the specialists on their staffs, is working in support of twenty-one active projects. These each represent major manufacturing requirements and have been initiated to solve problems affecting manufacturing methods, tools, techniques, and operating systems in use or anticipated. Several such projects were completed during 1963, giving valuable direction to all member companies represented. An example of one product of the Committee was a document distributed during the past year entitled, "Assembly Drilling Methods for Aerospace Materials" which was written from data compiled following an extensive cooperative drilling research program.

Projects conducted by the Committee during the past year include studies to assess the current state-of-the-art to determine the base on which to project manufacturing R&D requirements in the fields of material joining, material removal and material forming. Typical examples of specific projects include elevated temperature forming, high energy and pressure forming applications, fusion and resistance welding, diffusion bonding, ultrasonic metallic plating, sub-zero forming and advanced fastening techniques. Other projects involve the Committee in coordination within AIA and with other associations and, where necessary, in reviewing Government specifications to screen out requirements leading to unwarranted or excessive manufacturing costs.

An increasingly valuable benefit has been accruing to the membership through an informal exchange of non-proprietary information on improvement of existing or advanced manufacturing and tooling methods and procedures. Workshop sessions during business meetings provide for discussion of specific manufacturing problems of mutual interest. The benefits deriving from this method of information interchange include intangible but significant savings realized through the elimination of duplicated effort on similar industry-wide manufacturing problems. Additionally, the Committee maintains liaison or initiates contact with military agencies, NASA, the Military Advisory Board of the National Academy of Sciences and other organizations influencing scientific or technological progress, which will ultimately be reflected in aerospace manufacturing requirements. Such liaison has enhanced the industry's position in determining how best to allocate corporate manufacturing research and development funds through the collection of intelligence of other industry and Government sponsored projects. This has materially reduced the possibility of costly duplicated effort predicated on less knowledgeable direction.

One of the more significant activities of the AMEC continues to be the direction of the work of their Numerical Panel which is concerned with the application of numerical control. An important related function is representation on the APT Management Council which directs the IIT

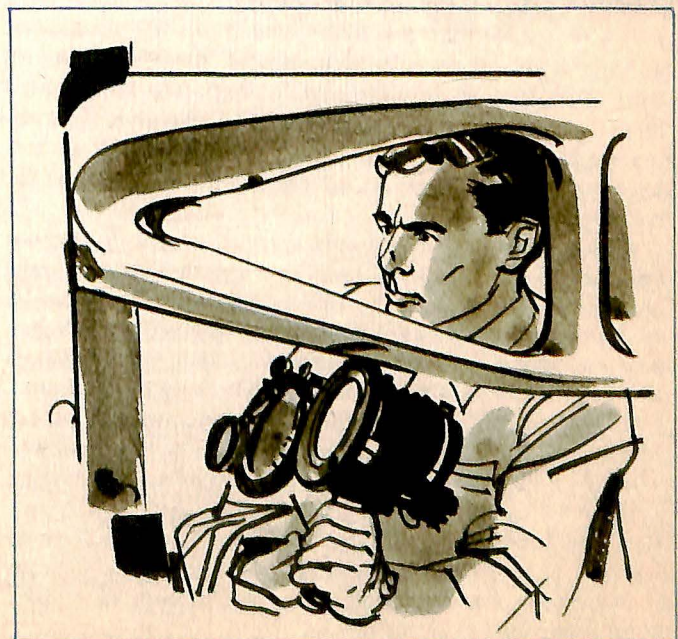
Research Institute's conduct of the APT Long Range Program. The past year has seen a decided increase in this latter activity as the APT Program continues to grow throughout American industry and increase in technical capability.

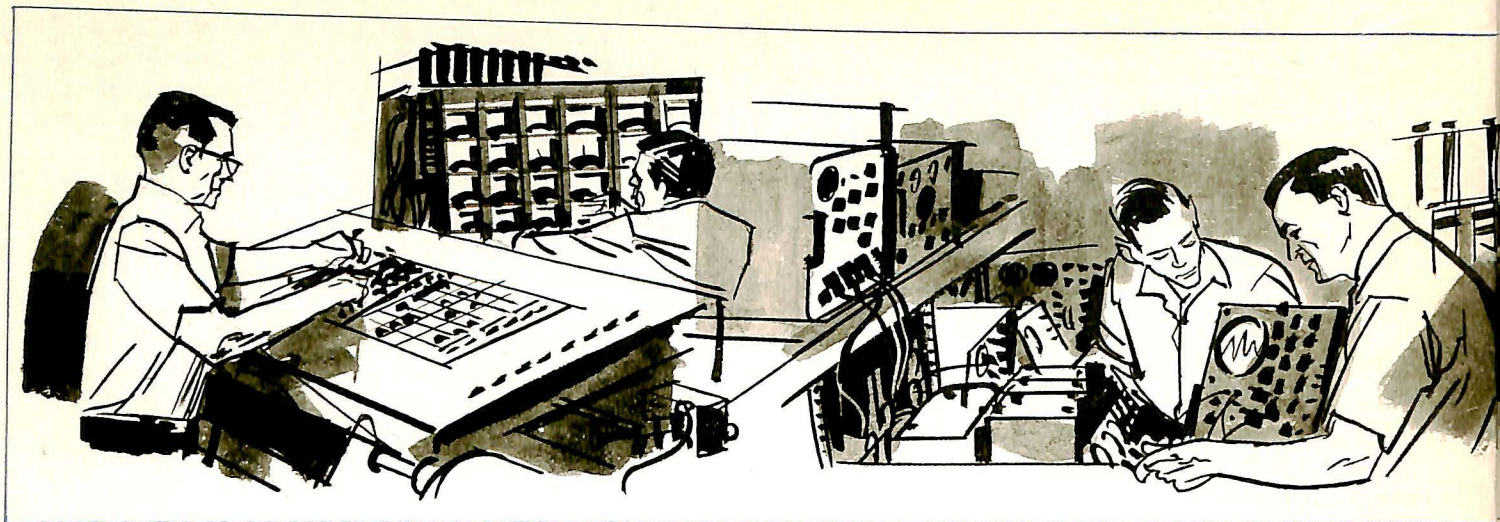
The goals of the AMEC in the forthcoming year — in continuing cooperative work on their several projects, searching out specifications and attempting to guide action on those offering opportunity to reduce costs or avoid duplication, aiding the accomplishment of the ultimate goals of the APT Long Range Program, continuing to encourage interchange of information between members — all will be aimed at accomplishing the Committee responsibility of satisfying the anticipated technical manufacturing requirements of the aerospace industry.

AMEC/Numerical Panel

Under the guidance of the Aerospace Manufacturing Engineering Committee, the Numerical Panel has concentrated over the past year in the broad areas of numerical control, with specific emphasis on: 1. New areas of numerical control application. 2. Promoting efficiency and reduced costs. 3. Developing improved standards and operating capability through coordination with machinery and control manufacturers and other trade associations and professional societies. 4. Continuing support of the technical composition and schedule of the APT Long Range Program now under cognizance of the IIT Research Institute.

Continuing into the eighth year of AIA's program in numerical control technology for manufacturing, the Panel's efforts are directed toward the application of numerical control to advance types of manufacturing equipment and processes. An example of such effort is a study project to explore the feasibility of automatic production through the use of computer programs. The first stage of the study pertains to the feasibility of integrating





software systems to execute basic functions of processes, tools and fabrication of the product, after release of design data. A substantial effort also continues in the development and promulgation of standards related to the use and performance of numerical control systems and equipment. Cooperative development and use of these standards by machine tool and control manufacturers and a large segment of using industry has substantially improved the overall understanding of machine configurations, characteristics and performance capabilities by user and manufacturer alike. An outstanding example of these is the current development of tool holder specifications for numerical control machine tools. The conclusion of this project will result in NAS specifications that will help to substantially reduce each company's inventory requirements for NC machine tool holders. Such standardization is possible only through a continued coordination with other associations to provide the vehicle for exchange of technical viewpoints and the resulting development of compatible standards.

The Numerical Panel has continued to function as a point of authority and communication with cognizant military agencies in all facets of the numerical control field. Forecasts of requirements for research and development in numerical manufacturing have resulted in continued funding by the Air Force of numerical control hardware and research in advance software systems for NC data processing.

Perhaps the most important activity of the Numerical Panel over the past year has been the technical support of IIT Research Institute's APT Long Range Program, by definition of further development work required to advance the system capability consistent with state-of-the-art changes in machining technology. Through its Technical Advisory Project (TAP) and the APT Management Council, an effective communication link is maintained between the more than sixty AIA and non-AIA companies participating in the APT Long Range Program and the APT contractor. The panel's objectives for the forthcoming year will be to continue to apply a concentrated effort toward the solution of problems necessary to increase the efficiency of numerically controlled manufacturing.

Electronics Manufacturing Engineering Committee

Because of a continuing expansion of electronics in the aerospace industry it became apparent that a new committee, specifically organized and staffed to handle electronics as a separate area from other manufacturing interests, should be included on the working level under the Manufacturing Committee. In May of this year, the MC proposed to the Board of Governors that an Electronics Manufacturing Engineering Committee be formed which should concern itself "with operations relative to manufacturing research, development, methods and processes, tools and techniques, reliability and documentation to satisfy requirements of the aerospace industry pertaining to electronics."

Following Board approval, the EMEC held an organizational meeting attended by over forty production management, manufacturing engineering management, and manufacturing research and development management personnel, representing thirty-six basic electronics manufacturing plants. Activities of this first meeting included a panel discussion with top level guests from DoD, the Air Force, and one company expressing their viewpoint of "Problems in Electronics Manufacturing"; a review of AIA; election of officers and appointment of a Steering Committee; and a round table discussion of individual company problems relating to electronics manufacturing.

Subsequently, the Steering Committee developed an operating procedure and formed a recommendation for an internal organization to assure that the Committee's assigned responsibilities will be met through proper project activity. With these administrative tasks behind them, the Committee conducted their second meeting in October 1963, and initiated a definition of major problems and necessary action leading toward their resolution.

It is expected that 1964 will be a productive period for the newly-formed Electronics Manufacturing Engineering Committee as it undertakes the difficult task to develop itself as a voice of influence in the changing trends of electronics.

Manufacturing Equipment Committee

The development of National Aerospace Standard equip-



ment performance specifications predicated on the determination of manufacturing equipment requirements necessary to translate engineering designs into finished aerospace products is the primary function of this Committee. Its membership, representing major manufacturers of aircraft, missiles, spacecraft, accessories and equipment, and powerplants, during the past year has cooperatively engaged in a diverse area of projects related to advanced fabricating, processing, and allied machinery and systems.

This has been a period, for the second straight year, of intense activity for the MEC in attempting to fulfill this responsibility. Support of the Air Force's Industrial Modernization Program, in addition to their charter responsibility to keep abreast of manufacturing equipment needs dictated by the rapid evolution of aerospace requirements, has resulted in an extremely heavy workload. The first five of the ten specifications initiated to support the USAF program were completed during the year, coordinated with USAF representatives and published. The remaining specifications are nearing publication. This major program was initiated, and deemed justifiable in light of significant savings attributable to numerically controlled equipment, the urgent need for modernization of aging USAF-owned production facilities and the increasing complexity and tolerance limitations required of today's products.

The MEC's Welding Equipment Panel, established last year because welding equipment capabilities were not advancing as fast as the industry's welding requirements dictated, has performed admirably in attempting to rectify this situation. They have completed and published Manual Gas Metal Arc, Manual Gas Tungsten Arc, Mechanized Gas Tungsten Arc, and Mechanized Gas Metal Arc welding equipment performance specifications. It is estimated that the panel will have completed all twelve of its assigned projects early in 1964. On completion of their work it is expected they will have made significant contributions toward providing performance requirements, standardization and interchangeability of welding equipment used by our industry.

Among the eighteen projects completed during 1963 were five NAS specifications, Tube Bender — Numerical Control, Precision Aircraft Type for Thin Wall, Ferrous

and Non-Ferrous Alloys, Numerically Controlled Drafting Line Plotter, Shear Forming Equipment — Horizontal and Vertical, Drilling Machines, Numerically Controlled, and Numerically Controlled Horizontal and Vertical Jig Boring Machines. Additionally, other projects currently under development include specifications for printed circuit manufacturing and assembly equipment, hot forming presses, standard cutting, alignment and tolerance tests to reduce specification preparation and acceptance test costs and revision of several published specifications to maintain their compatibility with the state-of-the-art.

To ensure that the MEC's specifications reflect a competent coalescence of aerospace industry requirements with equipment-producer capabilities, they are coordinated prior to publication with affected equipment builders, military agencies, and interested trade associations. Close coordination is also maintained with several other AIA committees and outside agencies, including the military and NASA to ensure a composite reflection of scientific and technological advances of importance to the industry in the resultant equipment specifications.

This is a continuing effort to define realistic equipment requirements for the industry.

Manufacturing Test Engineering Committee

The change in the name of this Committee from Manufacturing Test Equipment Committee to Manufacturing Test Engineering Committee is indicative of the growth in complexity of product testing and final check-out prior to delivery to the customer. This area is the responsibility of the forty-six members of the Committee who represent the aerospace manufacturers of AIA.

Automation and the utilization of computer techniques are rapidly replacing the older hand techniques, with resultant improvement in speed, precision and repeatability of testing. Unfortunately, the increased complexity often results in increased cost, forming the basis for the major effort of the MTEC in its MATES program (Manufacturing Acceptance Test Economics Study). This program, started last year, seeks the proper combination of equipment complexity, documentation and personnel skill to effect the most economical approach to product testing. Toward this end, MTEC is reorienting all of its projects.

Typical of MTEC's eighteen projects are the following: Development (with EESC) of a test code for high potential and megger testing of electrical components and systems; standards for automatic test programming; effect of nuclear instrumentation and miniaturized electronics on product testing; vibration test requirements for electronic equipment; industry standards for test, calibration and maintenance procedures; and, drawing requirements for in-plant test equipment.

MTEC maintains liaison activity with other AIA committees and various Government agencies. In cooperation with the Quality Control Committee, calibration and measurement problems representing advancement in standards capabilities are coordinated with the National Bureau of Standards. Activities in the area of contamination control and testing of electronic parts receive support of MTEC as well as a number of other AIA committees.

Preservation & Packaging Engineering Committee

The principal area of effort of the Committee is with respect to Government contractual requirements for preservation and packaging of components and parts and for descriptive data covering the specific methods used. It seeks to uncover possible problem areas such as unnecessary costs and procedural delays which were not foreseen, and by collective action to determine the best solutions as bases for recommendations by AIA to Government agencies. Close ties with personnel of the Government agencies are maintained to obtain the necessary background information to make sure the problem solutions developed are in consonance with the basic objectives of the requirements stipulated by the Government.

Other areas of major effort are:

1. Development of standards that member companies may use to obtain economical and effective packaging of components and parts purchased from subcontractors and vendors.

2. Exchange of information and experience to keep its members abreast of advances in the state-of-the-art of preservation and packaging technology.

In order to mobilize better the talent of its sixty members from thirty-seven different companies, the Committee superimposed a project group organization over its normal project activity. Project groups formed early in the year are: A. Steering Group; B. Data Development and Distribution; C. Marking of Packaging; D. Packaging Design; E. Packaging Testing; and, F. Research and Development.

The Committee meets twice a year. At one meeting a joint Government-industry session provides an opportunity for the industry and Government representatives to meet, exchange experience, discuss common problems, and work toward solutions. The joint sessions serve to maintain a satisfactory Government-industry aerospace relationship in the packaging area.

The Committee completed six projects and continued action on eight others. Nearly all of the continuing projects have objectives directly related to value engineering savings and overall cost reduction. For example, analysis by a project group of a proposed Federal Standard covering vibration testing of packages disclosed that contractors would have to purchase additional vibration testing equipment to carry out the procedure. After several joint coordination meetings, the Government representatives agreed to make changes that would permit use of existing testing equipment. In another project, the requirements of the various Government agencies for descriptive data on packaging methods used for specific packages are kept under continuing review to promote standard requirements conducive to minimizing contractors' costs of collection, coding, and dissemination of the descriptive data.

In addition to the completion of its specific project goals, the Committee in 1964 will point its effort toward:

1. Closer and even more productive ties with Government agencies concerned with packaging matters.

2. A closer watch on changes to and for new specifications affecting preservation and packaging.

3. Keeping its members abreast of the state-of-the-art advances in packaging technology.

4. The application of value engineering concepts to selected projects to establish the worth of accomplishments.

MATERIALS PROCUREMENT COMMITTEE

Listed below are some highlights from the year's activity of the AIA Materials Procurement Committee, representing the materiel function at top management level, including responsibility for subcontracting, purchasing and materiel management.

Economic Assistance Program. Following preliminary discussions and planning in 1962, the DoD-Aerospace Industry Economic Assistance Program began operation in January 1963. The AIA Materials Procurement Committee had volunteered to DoD to participate in a program which would render economic assistance to labor surplus areas at the subcontract level. Under the program, DoD solicits information specified by member companies from the Small Business Administration and the Area Redevelopment Administration. DoD furnishes source information which is distributed to participating companies, where it is utilized to expand their supplier base if at all possible. The program has been helpful in placing purchases and subcontracts in these areas, thereby assisting in the economic utilization of the labor surplus areas for the defense program.

Termination Regulations. Changes in procedure of terminations at the subcontract level have been accepted by the Government to be incorporated in ASPR revisions. These recommendations will expedite terminations by providing greater flexibility of action in disposition of material at the field administrative level and by eliminating uneconomic procedures at the subcontract level.

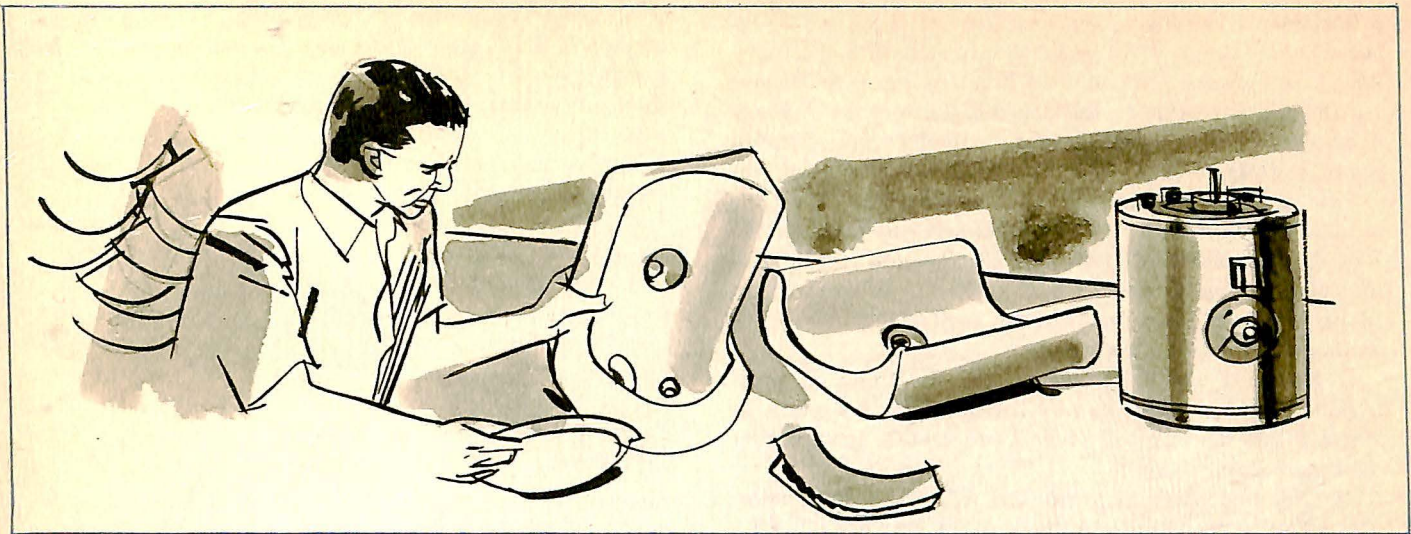
Configuration Control. Service test configuration control programs were analyzed and will be studied further. Initial efforts indicate a potential impact on the ability of prime contractors to maintain historical cost reduction curves on purchased items as well as shift procurements to small business in some cases.

Small Business. The Committee activity in this area covered several items:

1. *Size Standards.* Proposed new size standard classifications for small business, introduced in 1962, were unsatisfactory. Through industry action before the Bureau of the Budget and Small Business Administration, new size standards were finally introduced in midyear, which eased the reporting burden to the extent that an annual savings of \$5,000,000 is estimated.

2. *Monthly Reviews.* The Small Business Administration had proposed that SBA personnel conduct monthly reviews of small business activity in each aerospace prime contractor's facility. Through the Committee's effort working with SBA and DoD, the objectives of the proposal were achieved without the added administrative burden which could have been inspired.

3. *Reporting Statistics.* As a result of the Materials Procurement Committee's work, two major changes were effected. The Report Form DD-1140 was eliminated and the basis of reporting was changed from a payment basis to commitment basis. Since most companies' records of such transactions are on a commitment



basis for other purposes, a savings will be effected by eliminating the special reporting measures.

Make-or-Buy. An Air Force review program in cooperation with the interested AIA committees verified that policy intentions at headquarters were not implemented at field level practice in both Government and contractor organizations. Clarifying recommended changes in ASPR have been approved and should soon be released.

ComSat Corporation. The Committee presented the industry's position on Federal Communications Commission proposed procurement regulations for the Communications Satellite Corporation. Industry recommended uniformity with procurement regulations of other Government agencies doing business with the aerospace industry.

Defense Sharing Program. The Committee held one of its meetings this year in Montreal, Canada, for the purpose of reviewing with representatives of the Canadian government their experience with the U.S.-Canada Defense Production Sharing Program.

PROPULSION TECHNICAL COMMITTEE

The Propulsion Technical Committee is a main committee composed of executives generally at the vice-president or director of engineering level of companies engaged in research, development and production of engines or rockets of their own design for the propulsion of aircraft, spacecraft and missiles.

During the past year, the PTC has met once, and has otherwise confined its activities to matters of a broad policy nature in which the degree of PTC interest is at a level similar to that of other top technical committees.

Aside from the management aspects of PTC interests, the Committee has continued to give broad, overall direction to the Propulsion Working Committee, delegating to this group and its specialized panels all matters of a detailed nature.

Propulsion Working Committee

By action of the Propulsion Technical Committee, a request to the AIA Board of Governors that the former

Engine, Propeller and Rocket Committees be combined into one Propulsion Working Committee, was approved by the Board, and has been in operation during the past year. Membership on the PWC is generally at the chief engineer level from companies whose activities qualify them for membership on the Propulsion Technical Committee. By combining the former Engine, Propeller and Rocket Committees into one new group, problems common to all propulsion manufacturers can be much more easily handled and the need for meetings of separate groups eliminated. For the handling of detailed, specific problems, appropriate panels or project groups are established as needed.

During the past year the PWC has collaborated with other technical working committees in such matters as maintainability requirements, reliability requirements, systems safety requirements, engineering change procedures and data management programs. In specialized areas of activity, the following accomplishments are reported:

1. Approval by the Federal Aviation Agency of a 2½-minute special rating recommended for helicopter turbine engines. (This rating is urgently needed by the helicopter manufacturers and operators to permit helicopter operations from rooftop heliports.)
2. Submittal of comments to FAA on supersonic transport tentative airworthiness objectives and standards.
3. Met with airlines propulsion specialists and representatives of the Powerplant Installation Committee for discussions of propulsion system functional reliability requirements.
4. Initiated a survey to engine and airframe companies for establishing a standardized means for presenting engine performance data.
5. Initiated action with the Powerplant Installation Committee for resolving conflicts in recommendations previously sent to the Government on turbojet and turboprop engine specification requirements.
6. Broadened the scope of the former drafting practices panel to include all aspects of engineering data.
7. Completed draft revisions to a series of liquid

propellant rocket engine specifications, as requested by the Air Force. This is to be fully coordinated with the Navy, Army, Air Force, NASA and industry prior to release. Discussions pertinent to the coordination of these specifications are expected to generate a better understanding between DoD, NASA and industry, thus prompting the review of other documents wherein requirements of a conflicting nature exist for the same types of hardware.

8. Issued one new industry specification for rocket control components and drafted a second, preliminary to discussions with manufacturers of bi-propellant electrical command repetitive type valves.

9. Prepared and submitted to the Air Force a draft propellant specification on mixed oxides of nitrogen; also reviewed and commented upon a propellants specification for mixed amine fuels.

10. Initiated steps through the Chemical Propulsion Information Agency for dealing with all agencies involved in the procurement and use of liquid propellant rocket engines.

11. In conjunction with the Air Force, prepared a draft revision to Chapter 10 of Air Force Manual No. 32-6. Revisions as agreed upon between Air Force representatives and the Solid Propellant Safety Panel will permit the continued safe handling and storage of solid propellants.

12. In conjunction with the Bureau of Naval Weapons, established a schedule for the preparation of realistic reliability-maintainability requirements for engines, omitting such requirements as may be applicable only to complete systems or to other specialized types of equipment.

13. Established a special project group to review accessory drive and flange standards for turbine engines, for alleviation of wear problems and reported failures of splined drives.

14. Named four representatives from turbine and rocket engine manufacturers, to represent PWC on an informal Air Force-Navy-Industry management group which will provide direction on propulsion system standardization activities and resolve or arbitrate policy problems between the Government and the propulsion industry on other matters.

15. Appointed a four-man steering group to review and direct the activities of the several SAE technical committees assigned to develop standards for the propulsion industry.

16. Provided a qualified group, in conjunction with other AIA technical committees, to assist the Air Force in the preparation of a Data Management Manual.

17. Met with the Powerplant Installation Committee for discussions and a better understanding of common problems upon which viewpoints have been widely divergent between the two groups.

In all of these activities, the objective is to simplify and standardize; to eliminate duplicating, conflicting or costly requirements which contribute nothing to the reliability or dependability of the end product; to deliver more pounds of thrust for each dollar spent, in a consistently reliable and dependable manner.

QUALITY CONTROL COMMITTEE

The trend toward establishment of comprehensive con-



tractual requirements by Government buying agencies for quality assurance and reliability programs came into sharp focus during the year. As a result, the Quality Control Committee concentrated its activity on review of such actual or prospective program requirements, preparation of constructive recommendations, and participation in joint Government-industry follow-on coordination meetings. The recommendations and coordination approach were in support of the basic objectives of the program, but at the same time urged elimination of those requirements that might disrupt established management organizational structures, restrict operational flexibility, create unnecessary costs, and fail to contribute to achievement of the required quality and reliability. Because of the impact of the program requirements on other departments within a company, the Committee effected appropriate coordination with other AIA technical committees.

Important milestones marking the year's activity were:

1. Recommendations to DoD concerning first draft of revision to "Quality Control System Requirements."
2. Recommendations to the USAF Aeronautical Systems Division, concerning proposed revision to "Reliability Program for Systems, Subsystems, and Equipment."
3. Participation in joint coordination meeting on NASA's "Reliability Program Provisions for Space System Contractors."
4. Recommendations to NASA on "Quality Program Provisions for Space System Contractors."
5. Participation in joint conference with Air Force Logistics Command on quality level of replenishment spare parts.
6. Participation in joint Industry-Government Workshop on Quality and Reliability, a part of the AIA-DoD Forum on "The Industry-Government Aerospace Relationship."
7. Joint Industry-Government session of the 13th annual meeting of the QCC.

In order to balance the comprehensive quality and reliability program requirements with the overall DoD cost reduction program, individual Committee members necessarily assessed departmental operations to "cut out the fat" to offset the costs of essential added controls. The QCC Quality Control Systems Study summary was found useful in such regard inasmuch as it provides criteria to facilitate such assessments. It contains a cross-section of the allocation in specific areas of the quality and reliability effort of some eighty-eight companies/divisions — an accumulation of data that is unique to the aerospace industry.

The organization of the Committee continued without change except for the creation of a Policy Steering Group. Of the forty-three members, more than 90 per cent regularly attend meetings. Decision was made early in the year, however, to concentrate Committee effort on problems associated with management of quality programs rather than on day-to-day technical operations. Project activity received attention accordingly. Liaison panels maintained informal communication with quality control

administrative personnel of DoD, NASA, the military services, and FAA in furtherance of the Government-industry aerospace relationship.

With the advent of "Quality Program Requirements," industry must expect adjustments to quality control operations. The major program of the Committee for 1964, therefore, will be to identify and work out solutions to common problem areas related to implementation and application, and by effective communication and coordination to obtain acceptance by the Government of recommended solutions.

JOINT DRAFTING PRACTICES PANELS

The initial organization of the AIA Drafting Practices Panels in 1955, foresaw the need for standardizing on ways and means for the preparation and submittal of drawings to the Government, but did not foresee the implications of the vast "data package" with all its ramifications, which is so important a factor in contract negotiations as they are carried on today. To cope with these expanded interpretations of what constitutes "Engineering Data" as an integral part of the complete "Data Package," the company responsibilities of representatives appointed to the various drafting panels have been expanded to the point where, in many instances, they become an integral part of the contract negotiation team and cannot be classified as "chief draftsmen" responsible only for the preparation of acceptable sets of drawings. In recognition of the above, the propulsion segment has expanded the stated scope of its former Drafting Panel and has changed its name to "Engineering Data." It is probable that similar, appropriate action may be taken by the other segments, also that the Joint Drafting Panel, composed of the chairman and vice-chairman of each of the four segment panels, may also have its name changed to more properly delineate its activities in the field of engineering data. The Joint Drafting Panel acts as advisor, arbiter, and director of the overall AIA activities in the area of engineering data.

During the past year, the panels have prepared and submitted to cognizant Government agencies, consolidated comments on the following proposals:

1. Lists Associated with Engineering Drawings
2. Engineering Drawings, Sizes and Formats
3. Types of Engineering Drawings
4. Dimensioning and Tolerancing
5. Standard Guide for the Entry of Reference Numbers in Punched Card Accounting Machine or Electronic Data Processing Equipment Systems.

In each of the above items, proposed new or revised documents were fully coordinated within the AIA structure, consolidated recommendations forwarded to the cognizant military agency, and then a joint military-industry meeting held for resolution of controversial items.

As a matter of further interest, seven members of a group of twelve people selected to advise the Technical Logistics Data and Information Committee of DoD, are active, participating members of one or another of the AIA panels. Since more than a billion dollars a year is spent on drawings alone, action to be taken by the industry groups and the TLDIC is expected to produce a saving of several millions of dollars annually.

TRAFFIC SERVICE





J. A. McSWIGAN
*General Electric
 Company
 Flight Propulsion
 Division
 Chairman, Eastern
 Traffic Committee*



L. H. COONS
*The Boeing Company
 Aero-Space Division
 Chairman, Western
 Traffic Committee*

Traffic Committee

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

Throughout the past year, one of the principal efforts of Traffic Service has been to improve the effectiveness of the Government-AIA traffic management relationship. A significant step forward in furtherance of this program was taken in September when the chairmen and vice chairmen of the AIA Eastern and Western Traffic Committees, together with the Director of Traffic Service, met in a one-day workshop session with representatives of the principal traffic management organizations of the Department of Defense. This workshop was one of several which were jointly convened by AIA and DoD on that day to improve the industry-Government relationship.

The Traffic Management workshop highlighted one of the primary activities of AIA Traffic Service: to serve as a focal point for the presentation of views of aerospace traffic managers to their principal customer — the Government. It also illustrated how traffic managers of AIA-member companies, by their participation in the Association's Traffic Committees, can cooperatively take action and obtain results which individually and independently they cannot accomplish. The action taken in the workshop and the methodology there followed also point up the value to the Government of having available to it the services of an industrial traffic committee composed of the traffic managers of the principal aerospace contractors with whom it does business. Industry and Government are thus able to converse at one time and place on common problems. Conclusions can be reached and solutions formulated which improve the effectiveness and reduce the costs of the separate and mutual endeavors of each.

Within their separate areas of responsibility, the traffic management organizations of the individual companies of AIA and those of the Government perform a similar function: to assure the movement of materiel and personnel

expeditiously and at lowest cost. There is a marked dissimilarity, however, in the structure of the organizations which have been set up to perform this function for industry and Government respectively.

For example, there is a line of policy and operational control from the Office of the Secretary of Defense, through the Headquarters traffic offices of the Army, Navy and Air Force, through the headquarters traffic offices of the subordinate commands of those services, through the numerous field procurement traffic offices, down to the individual military traffic personnel who are in immediate contact with traffic managers of aerospace companies. Understandably, this line of control often becomes diffused.

In contrast, the individual company traffic manager deals with multiple and conflicting military management controls and procedures. In many cases he is subjected to the management or surveillance of two or more services. Very often he is faced with management control and surveillance of traffic offices of two or more subordinate commands within a single service. Most often there is no practical requirement for a qualified industrial traffic department with in-house expertise and capability to be linked to a ponderous chain of command which was established in the first instance to provide centralized guidance and necessary assistance to post, camp and station military transportation officers.

Recognizing the potential defects of such a situation, workshop participants, both industry and Government, agreed to undertake a survey for the purpose of taking action to determine the extent to which overlapping and duplicating military controls of industrial traffic managers can be eliminated. A series of field visits by a Government-industry team was set up to make this determination. This team will carry through on its program throughout

the coming year.

How Traffic Service Functions

AIA Traffic Service functions through two general committees, each composed of the principal traffic officers of member companies located in the Eastern and Western halves of the United States. The Director of Traffic Service serves as the Secretary of the two Committees. Two Rate and Classification subcommittees perform and meet concurrently under the aegis of each of the general Committees. Matters of joint interest to the members of the Traffic Committees are continually coordinated throughout the year by means of Traffic Bulletins which come from AIA. These bulletins cover developments in the transportation industry and the various decisions of courts and regulatory agencies of interest and concern to aerospace traffic organizations. In a similar manner, military and other governmental directives and regulations and Government requests for coordinated action with the aerospace industry in the traffic and transportation area are also distributed by means of AIA Traffic Bulletins. Members of the AIA Traffic Committees are also kept apprised of Congressional developments concerning traffic and transportation. One hundred thirty Traffic Bulletins were issued in 1963.

Co-ordination of Industry and Government Traffic Programs

In support of a continuing program for maintaining open channels of communication between AIA traffic managers and the traffic managers of their principal customer, the Federal Government, attendance of Government representatives at meetings of the AIA Traffic Committees is encouraged and solicited. During the past year, the Traffic

Committees have met on five occasions. Government representatives participated in each of these meetings. It was thus possible to jointly consider matters of mutual interest bearing on the various traffic and transportation factors concerning production and delivery of aerospace products. Illustrative of such joint actions are the following committee activities:

1. Coordinated members' interest on action taken by the Department of Defense to obtain a simplification of rail and motor carrier tariff rates governing the transportation of various aircraft parts and components.
2. Reconciled conflicting attitudes of industry and the military services governing the use of the U. S. Postal Service in a manner adverse to the interests of contractors and contrary to the stated policies of the military postal service.
3. Coordinated the activities of industry and the military services to assure the lawful application of reduced rates under the provisions of Section 22 of the Interstate Commerce Act.
4. Coordinated the interests of AIA members with respect to military regulations prescribing practices and procedures controlling Government procurement traffic management.

Additional Activities of Traffic Service

Although a large percentage of the work of the Traffic Service is concerned with coordinating the activity of members' traffic departments and those of the Federal Government, much of its enterprise is devoted to serving as an adjunct to the traffic departments of members in areas where an industry-wide approach can accomplish



results not otherwise obtainable by the individual efforts of company traffic managers. Additionally, the AIA Traffic Committees provide the means whereby company traffic managers may interchange their knowledge and experience on problems related to non-competitive traffic matters. In several instances, these discussions and interchanges at meetings of the Traffic Committees have resulted in actions being taken by Traffic Service to represent AIA interest before Federal transportation regulatory agencies and common carrier rate and tariff bureaus. Representative of the foregoing actions are:

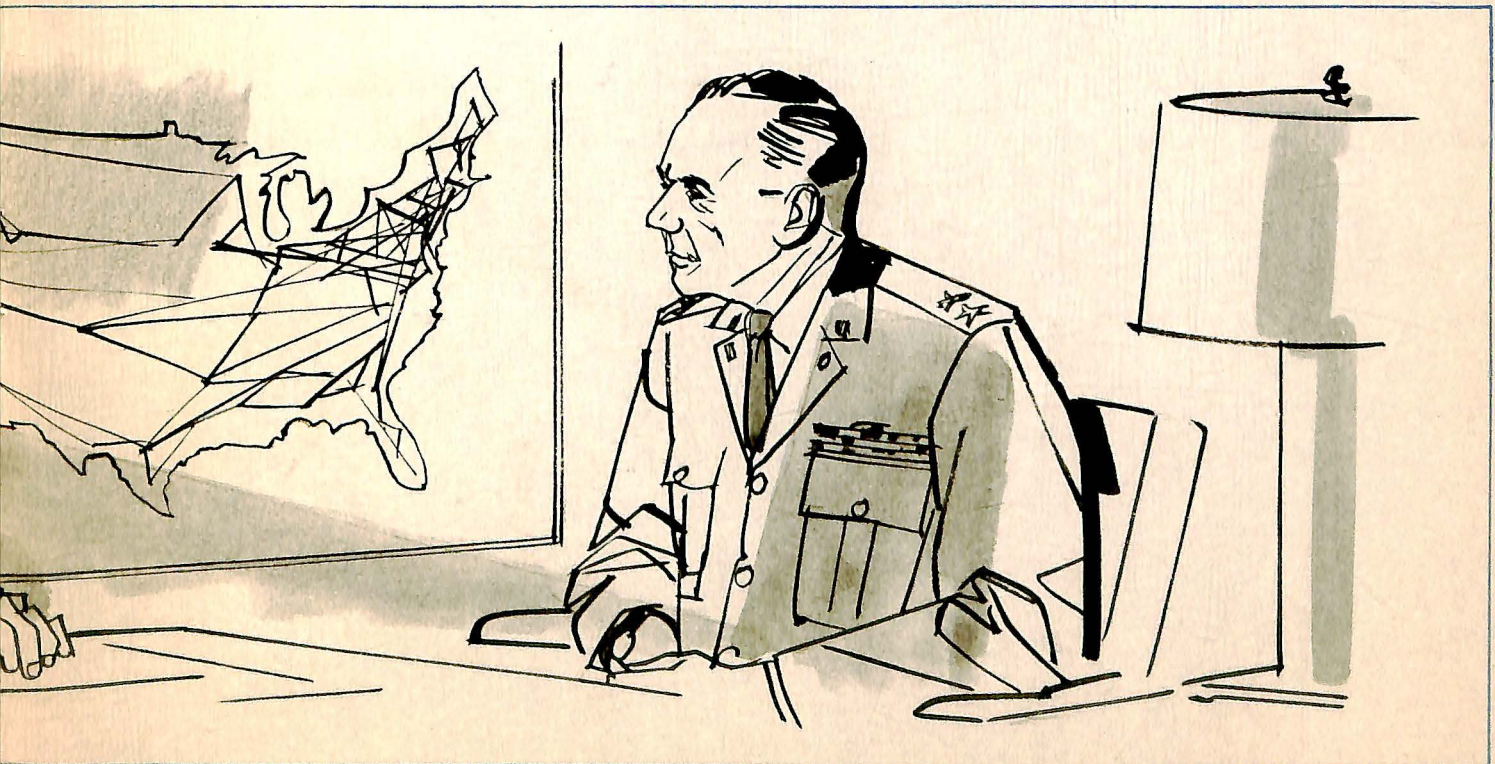
1. Intervened in a proceeding before the Interstate Commerce Commission for the purpose of demonstrating the lawfulness of the application of special reduced rates to contractor materiel moving in support of production contracts with agencies of the United States Government.
2. In another Interstate Commerce Commission proceeding, action was taken to successfully oppose motor carrier attempts to limit their liability for all shipments having a prior or subsequent movement by air.
3. Action taken before the Civil Aeronautics Board to support a relaxation of rules so as to permit a more expeditious movement of combined lots of small shipments at reduced rates.
4. In coordination with the AIA Government Reports Committee, prevailed upon the Department of Defense to adopt an orderly and practical implementation of cargo documentation procedures under the MILSTAMP program.
5. Successfully opposed attempts by air freight forwarders to increase charges applicable to movements of aerospace materiel.

6. Coordinated the interests of Traffic Committee members in securing a relaxation of Bureau of Customs regulations which inhibit the expeditious and economical movement of import and export materiel.
7. Represented the interests of AIA members before the National Classification Board of the American Trucking Association in opposition to motor carrier attempts to increase the rates on radioactive materials. Proposed increased rates were cancelled.
8. Action taken to successfully oppose efforts by motor carriers to establish unreasonable provisions governing the exclusive use of motor carrier equipment by members.

Cost Reduction Program

Again this year, continuing emphasis was placed by the AIA Traffic Committees on efforts to improve the effectiveness of the Department of Defense Cost Reduction Program. Activity in this area centered on the accomplishment of new or modified management actions which result in savings associated with the movement of persons and materiel. Inasmuch as DoD procurement absorbs a sizeable portion of aerospace production, the efforts of the Traffic Committees in this area constitute a direct reduction in military procurement costs as well as a savings in all Government funds expended in aerospace programs. Under this program, successful efforts by individual aerospace traffic managers resulted in savings of more than \$15,000,000. Reflected in this sum are the results of coordinated actions taken under the aegis of the AIA traffic committees.

This program will receive continued emphasis throughout the coming year.



UTILITY AIRPLANE COUNCIL





C. J. REESE
*Continental Motors
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The number of active aircraft in the general aviation fleet passed the 85,000 mark in 1963, but even more significant is the high rate of utilization. Over the past decade, the number of hours flown by utility aircraft has increased by 50 per cent and the number of miles traveled has doubled.

Production during the year reached the 7,569 level, compared with 6,700 in 1962. Value of the general aviation aircraft sold was \$153 million (manufacturers' net billing prices), compared with \$137 million a year earlier. Included in the totals were 1,579 aircraft valued at \$35 million sold abroad which compares with 1,458 planes worth \$31 million exported in 1962.

Member companies of the Utility Airplane Council introduced an expanded number of models in 1963 to form a complete line of piston equipment, and also included pure jets and turboprops for corporate use.

The Utility Airplane Council staff in 1963 concentrated its efforts on programs designed to improve the outlook for general aviation. Among the areas of effort were programs to stimulate more airports and airparks in smaller cities; getting easier access to airports in metropolitan centers; recommending specific modern licensing and regulatory procedures compatible with today's aircraft and operating conditions; and providing more information about general aviation's benefits both to the frequent user and the general public.

Proof that the utility aircraft is the only rapid, flexible air link for most of the nation's communities is evident in the fact that general aviation aircraft serve more than 8,000 airport communities across the country. By contrast, scheduled air service is available at fewer than 600 airports and only about 250 of these get scheduled service with a major degree of frequency.

Serving Airline Passengers

The airline feeder operation is another area where general aviation planes perform a vital service. In one month during 1963, for example, a single air taxi service made connections for 2,700 airline passengers in one metropolitan area. Thousands of airline travelers now begin or end their trips in general aviation aircraft.

Flying more than 1.7 billion miles per year, general aviation is the largest single user of airspace, airports and navigation and communication aids. Federal Aviation Agency statistics show that utility aircraft account for more than half of the total flying hours of all aviation — military, commercial and general.

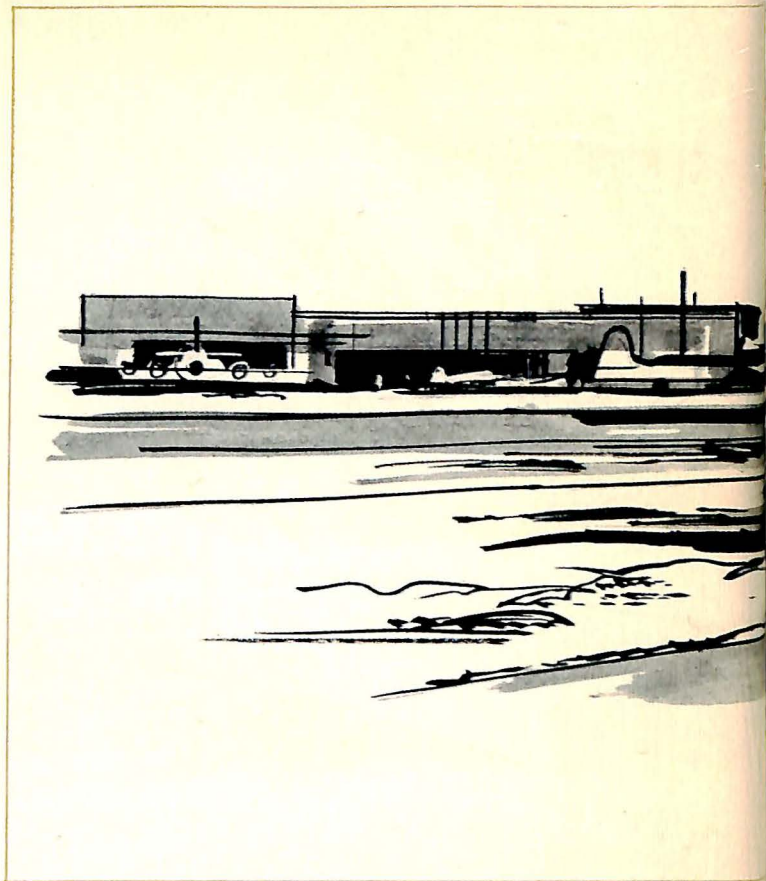
FAA's Office of Policy Development predicts that both the number of planes and the number of hours flown will keep on climbing. FAA estimates that by 1968 there will be 99,000 active aircraft flying more than 17 million hours.

Business Flying Leads Growth

Much of the growth will be attributable to business flying. Business transportation now accounts for 42 per cent of all general aviation flying, but does not include the hours recorded for agricultural, charter, patrol and similar commercial uses.

To achieve and sustain the FAA-predicted growth of general aviation, Utility Airplane Council members are aware that more members of the general public must understand general aviation's advantages. At the same time, member firms are investing much of their earnings for research and development, marketing techniques, plant expansion and equipment modernization.

One important Government step in the recognition of general aviation's benefits was the creation of an Office



of General Aviation Affairs within FAA with an Assistant Administrator in charge.

Early in the year, UAC arranged for the Assistant Administrator to visit various general aviation plants so that he might become better informed of the capabilities of planes currently in production. Subsequently, the FAA office was expanded with the appointment of a Deputy Assistant Administrator for General Aviation Affairs. UAC anticipates continuing favorable associations with both men.

UAC's Education Committee made substantial progress and set up subcommittees in three major areas during the year: airport development, pilot rating requirements and public education.

Economic Importance of Airports Studied

The Airport Development Subcommittee is working on projects to determine the economic importance of airports to communities and ways to make this importance known to civic leaders and the public. This group is seeking to stimulate the development of new airports and airparks and is also attempting to improve accessibility for general aviation aircraft at major terminals.

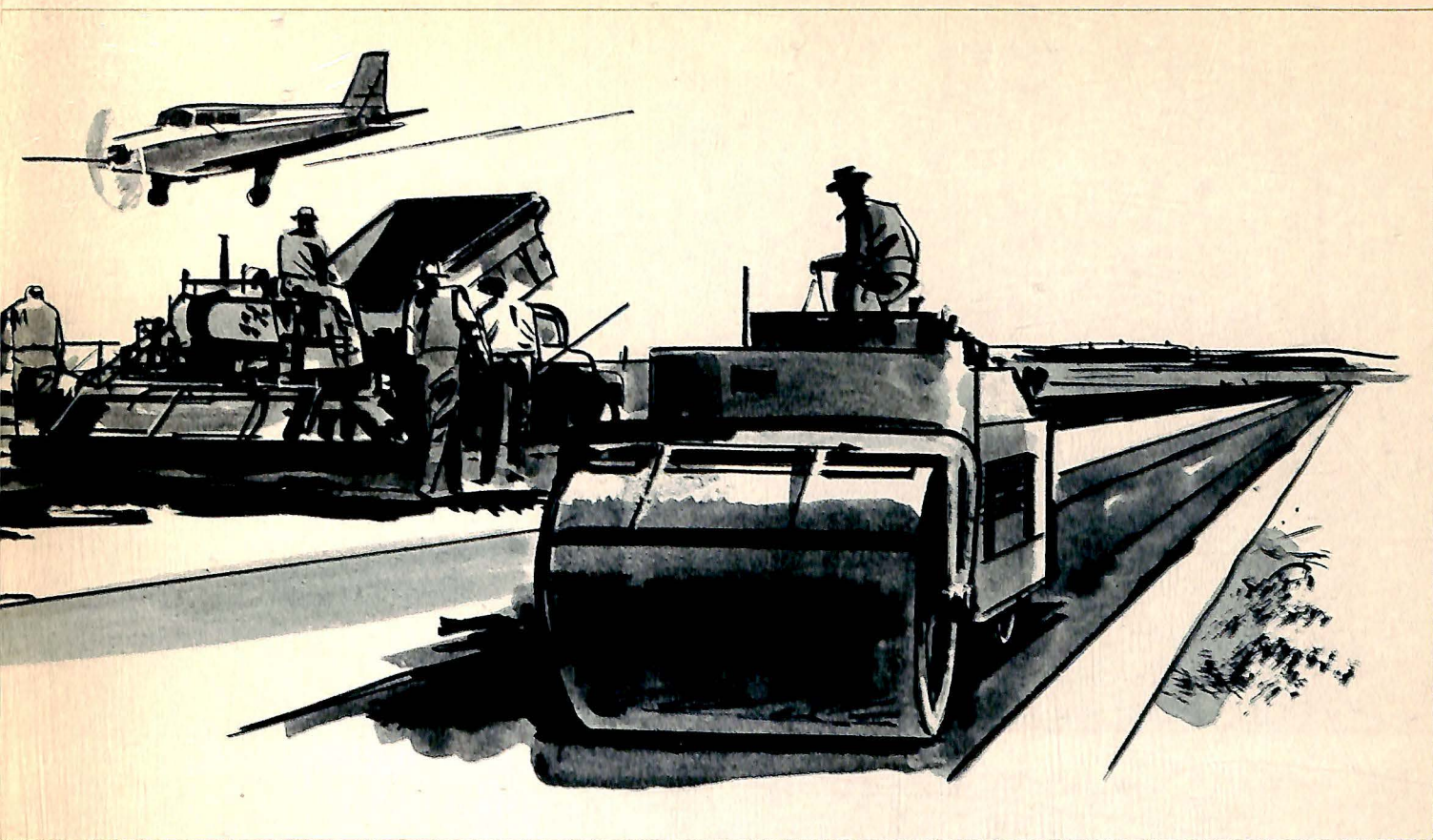
The Pilot Rating Requirements group is working closely with FAA to pinpoint the training and compatibility testing needed before an airman can be licensed to fly in a particular environment. The group is striving to make the physical act of getting a license easier and more direct without sacrificing the present safety standards. The

problem is being approached by trying to discover what makes a theoretically perfect pilot and then working back to the student. The work is scheduled over many months to determine the needs, arrive at standards and evaluate ways of achieving those standards.

UAC also took action in 1963 on another proposed hurdle to licensing. Although concurring with FAA that a fundamental knowledge of instrument flying is beneficial for certain types of flying, UAC opposed a proposed rule which sought to make instrument instruction a pre-solo requisite. UAC contended that programming instrument instruction in the early hours of learning as a mandatory act would achieve little since student pilots are closely supervised on flying, the weather at the time of flight and the distance they may fly from the airport.

The Public Education Subcommittee began work on short and long-range projects to "sell" general aviation. For the near future, data is being accumulated and materials are being prepared to provide an accurate picture of general aviation today. These materials will show why general aviation is important to individuals, communities and the nation far beyond those directly involved.

For the longer range, UAC member companies are preparing youth-education programs designed to stimulate acceptance of personal air travel. Included will be specialized curricula, possible textbooks and teaching aids and teacher-incentive programs.



Regulatory Changes Sought

Another UAC effort involved attempts to obtain re-establishment of the Annual Review of the Airworthiness Requirement of the Federal Air Regulations, much as they were conducted by FAA's predecessor agency. Reasons why UAC considers reinstatement of the Annual Review so important were given formally and informally to the FAA Administrator, to the Horizon and Tigtrope task forces and to the Agency Regulatory Council. These efforts will be continued in 1964.

UAC also expressed its views to FAA on why it considers the rule calling for 12-inch identification numbers and letters unnecessary. FAA was informed that if the 12-inch identification symbols are vital for security, i.e., easy identification by military interceptors, the two-year time to put them on is dangerous.

The Council has long been concerned about the fact that statistical information about general aviation has lagged by two years or more. As a result, UAC has begun work with FAA's Statistics Branch to develop new methods of gathering and distributing meaningful data about the general aviation field.

In keeping with the growing desire for fewer Government controls, UAC has advocated that a Federal Air Regulation be reinstated to permit manufacturers to certificate their own aircraft. UAC feels the FAA Administrator has the authority to delegate this responsibility

under the 1958 act which created FAA. If the Designated Manufacturer's Certification Representative (DMCR) approach were reinstated, speedier decisions, less reporting, lower production costs and fewer conflicting interpretations would result. UAC will continue to work on constructive proposals to achieve this goal.

Similarly, UAC is concerned about the trend toward positive control of aircraft and restricted airspace and the effect on the cost of navigation and communication equipment and restraints on use of general aviation planes. UAC informed FAA that there was an apparent tendency to try to over-restrict and over-regulate, e.g., rules governing operations on or near airports without control towers. Other examples of over-restriction involve establishment of uniform traffic pattern entry points, traffic pattern altitudes and departure procedures.

Another UAC activity during the year involved the Federal Communications Commission proposal to levy a fee on aircraft transmitters and operators' licenses. UAC's feeling was that one agency should not be permitted to place a tax on equipment which must be installed under the regulations of another agency.

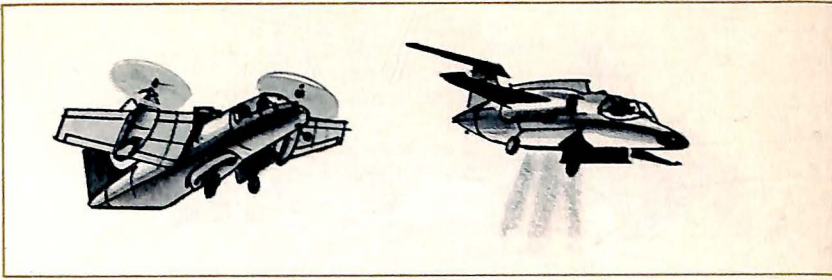
Overall, UAC's staff maintained constant liaison with Government agencies and other groups concerned with general aviation. The Council's manager was a frequent spokesman on the subject, addressing formal gatherings, participating in industry forums and distributing documents.

VERTICAL LIFT AIRCRAFT COUNCIL





JACK E. LEONARD
Hughes Tool Company
Aircraft Division
Chairman, Vertical
Lift Aircraft Council



The Vertical Lift Aircraft Council provides a single, authoritative source for obtaining, coordinating and presenting the vertical lift industry's views on non-competitive problems, and simultaneously promoting the utilization of vertical lift aircraft in the U. S. and abroad.

The Council's major effort during the year involved a presentation of the vertical lift industry's problems and prospects to the Administrator of the Federal Aviation Agency and other ranking Government officials.

Preparation of the presentation was a major cooperative effort of the 15 member companies, the VLAC staff and the Council's legal advisor. In addition to monthly meetings of a special *ad hoc* committee created to prepare the presentation, VLAC members provided specific company data and comments for inclusion in the presentation.

Although the FAA Administrator's January 1963 invitation called for a presentation primarily to FAA officials, the original audience was subsequently expanded to include representatives of the Department of Defense, the U. S. Coast Guard, the Civil Aeronautics Board, the Bureau of the Budget, National Aeronautics and Space Administration, the White House and the Departments of Commerce, Agriculture, State, Interior and Post Office. The final format of the presentation was expanded to cover vertical lift activities of interest to these other agencies.

The presentation was made by VLAC's legal advisor on September 20 at the Departmental Auditorium in Washington, D. C. Its title was "Government - Industry Relations in the Field of Vertical Lift Aircraft."

Government officials attending the meeting were told the extent of military and civilian uses of vertical lift transportation. They were informed that verticraft are a national asset and therefore qualify for a high priority in national planning.

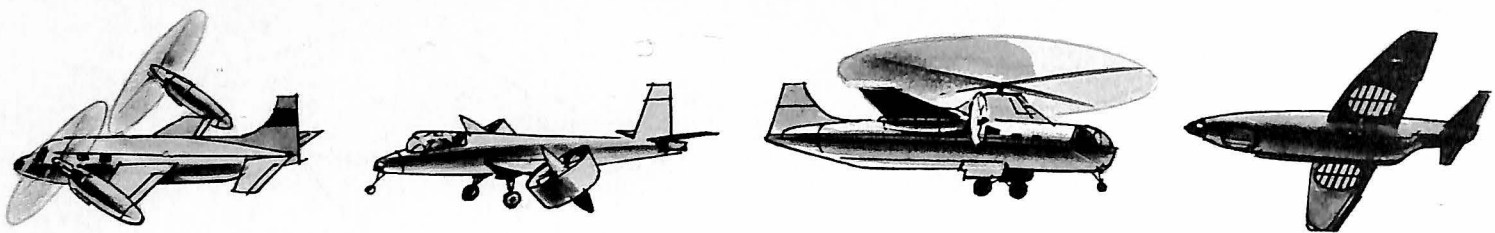
The presentation also covered the volume of helicopter-type VTOL operations (civil and military, in the U. S. and abroad), the growth of the vertical lift manufacturing industry and the prospects for future markets.

It was pointed out that the vertical lift industry has produced all 5,000 helicopter-type VTOLs currently being used by the military, as well as more than 1,300 commercial helicopters. VTOL helicopters are now being exported at the rate of \$9 million a year.

Various comments about helicopter shortcomings were noted and answered. Examples were given to show that today's helicopters have improved comfort, safety and reliability. Speeds and payloads have increased. Existing rotorcraft now carry useful payloads of 45-50 per cent of their gross weight. And for the near future, forthcoming helicopters will fly in the 200-215 knot range, compound helicopters will fly at 250 knots plus, propeller and fan VTOLs will fly at speeds of 300-400 knots and jet VTOLs will exceed 400 knots.

In describing VLAC's hopes for Government action, the Council's legal advisor urged FAA and the other agencies in attendance to:

1. Adopt generally and extend the practice of using Government-industry know-how in *ad hoc* working groups to recommend the solution of specifically identified problems.
2. Establish machinery to review periodically regulations of Government, using know-how and suggestions from industry.
3. Establish new FAA-local community relationships so leadership could be given in supplying advice and counsel to communities about VTOL private and public heliports and off-heliport landings.
4. Adopt and announce a new top-level Government



policy and plan giving the development and use of VTOL aircraft a high priority and reflecting an attitude of Government encouragement, backing and support.

Immediately after the VLAC presentation, FAA Administrator N. E. Halaby commented, "We in FAA expect to give the VLAC presentation careful and extensive study because it contains much new information about the vertical lift industry. It will certainly prove helpful in focusing FAA thinking on the special problems of helicopters and other VTOL aircraft."

VLAC understands that FAA has concurred with its recommendation that the practice of *ad hoc* Government-industry working groups be adopted and extended.

In addition, FAA has officially notified VLAC that it will conduct a review of regulations pertaining to VTOL aircraft in the spring of 1964. VLAC feels such a review, with industry and FAA regions participating, will enable all parties to capitalize on available experience and knowledge. This review can also serve the military by eliminating duplication of testing and help in the evolution of criteria common to military and civil designs. In addition, the periodic review can help reduce the FAA regional work loads and permit reprogramming of testing and certification requests. One other potential way of reducing the work of the FAA regions is the expansion and greater utilization of the Designated Engineer Representative (DER) system.

FAA representatives and VLAC staff are conducting informal discussions related to the two other recommendations made during the September 20 presentation.

Both FAA and VLAC are certain that additional economic studies are needed to compare VTOLs with surface and fixed-wing operations in the short-haul passenger-cargo field. Nevertheless, both groups agree there is a sizeable potential and need for VTOLs to meeting growing U. S. requirements.

In this connection, FAA is asking manufacturers to evolve a new short-haul passenger-cargo airliner. The design parameters and certification standards issued by FAA involve a fixed-wing aircraft but FAA has agreed that the comments of the vertical lift industry about such an aircraft would be helpful. VLAC has therefore circulated the FAA draft request to its member companies.

VLAC is currently working with the FAA on two major projects of mutual interest—a new Helicopter Design Guide and an education film on helicopter usage.

FAA's Helicopter Design Guide was first issued in 1959 and requires modification to cover the performance and operating practices of helicopters evolved since that time. A special VLAC Heliport Committee has commented to FAA on the material in the proposed Design Guide, and the final version may serve to implement the VLAC recom-

mendation that FAA and local communities work together on vertical lift landing rights and facilities.

The film under consideration by FAA, for which VLAC member firms have offered assistance, aimed at demonstrating the versatility and convenience of the helicopter and attempting to counter the same types of criticisms faced by the automobile industry 60 years ago.

VLAC Publications

Among the publications prepared by the VLAC staff during the year were:

A revised version of the Vertical Lift Aircraft Designation Chart, covering 27 production models and 18 research and development programs.

A Directory of Helicopter Operators and Helicopter Flight Schools in the U. S. and Canada, which showed that the number of commercial operators had climbed from 332 (with 994 helicopters) in 1962 to 405 operators (with 1157 rotorcraft) in 1963. Including executive and Government listings, there were 600 operators flying 1497 helicopters in 1963.

A Directory of Heliports/Helistops in the U. S., Canada and Puerto Rico, which listed 797 heliports and 69 more under consideration.

Updatings of three standard VLAC publications, including "The Versatile Helicopter," "Federation Aeronautique Internationale—Directory of Helicopter Records" and "Recipients of Helicopter Awards 1944-1963."

An illustrated booklet based on "The Versatile Helicopter." About 10,000 copies were published by the National Aerospace Education Council for distribution to educators and teachers.

Substantial evidence turned up during the year as to the extent the Department of Defense benefits from the operations of the nation's scheduled helicopter airlines. One estimate made during the hearing on the Fiscal 1964 helicopter subsidy request placed the saving at \$70 million, more than the total paid the three subsidized helicopter airlines by the Civil Aeronautics Board since service began in 1948.

Another significant statement made during the floor debate on the helicopter subsidy bill came from the chairman of the Aviation Subcommittee of the Senate Commerce Committee. He declared, "The biggest thing ahead of us in aviation is not supersonic transportation. The big advance of the future will be in traveling short distances in vertical landing and take-off aircraft. . . . Headway is being made. Considerably more headway has been made in the past year or two in vertical take-off and landing development. If that program is successful, we will shortly see greater progress than we have seen to date."

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