

Development of Aircraft Engines

ROBERT SCHLAIFER

*Assistant Professor of Business Administration
Harvard University*

Development of Aviation Fuels

S. D. HERON

Consulting Engineer

Two Studies of Relations Between Government and Business



Division of Research

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DONALD K. DAVID, *Dean*

MELVIN T. COPELAND, *Director of Research*

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To

C. L. S.

F. H. F.

W. S. F.

Foreword

Since 1942 the Harvard Business School has sponsored a program of research in the field of aviation. This study is a part of that program. It has been preceded by publications based on research done by members of the School's Faculty and Staff on operating and financial problems of aircraft manufacturers, on problems of the Federal Government in accelerating wartime plane production and in the disposal of surplus aircraft, on terminal airport financing and management, on personal aircraft business at airports, on human factors in aircraft design, and most recently a study of the effects of airline competition on rates, service, and the self-sufficiency of the domestic certificated airlines.

Over the past thirty years there has been much discussion of the proper function of government in the development of aircraft and aircraft components. It was the suggestion of the Harvard Business School's Advisory Committee on Aviation Research that an impartial inquiry into the relationship of government and industry in the development of aircraft and aircraft components in this country would prove worth while as a basis for future policy. Dr. Schlaifer was assigned the project and soon found that practical considerations would make it necessary to limit the field of inquiry unless publication of results were to be delayed for a very long time. It was decided that he should focus his attention upon a major component, namely, engines, and it was subsequently determined that his research should also include British and European experience.

Because the United States had been highly successful in the development of air-cooled engines between the two World Wars, whereas the British and Germans appeared to be in the fore in developing liquid-cooled engines, and because the latter were both ahead of this country in developing gas turbines, the interesting question was raised whether these facts might in part be explained by the differing relationships between the engine manufacturers and the governments in those countries.

Foreword

Dr. Schlaifer, whose previous experience combined that of a physicist with that of a historian, discovered early in his research that it would be extremely valuable to have accompanying his own research a history of the development of aviation fuels, and he was fortunate in interesting Mr. S. D. Heron, Consulting Engineer, in such a project. Mr. Heron's earlier participation in the development of many aircraft engines and components, and his numerous contributions to aircraft fuel improvements made him exceptionally well qualified to write upon this subject. Of especial importance is the fact that about fifteen of Mr. Heron's thirty-six years' active experience were devoted to aircraft-engine development for the British (Royal Aircraft Establishment) and United States (McCook and Wright Fields) governments, and yet he has had the private company point of view through work for Armstrong Siddeley, Wright Aeronautical, Ethyl, and other corporations. Problems of government and industry relationships have thus been an integral part of Mr. Heron's long experience.

This study was financed by the Aviation Research funds of the Harvard Business School, contributed by aircraft manufacturing companies. Mr. Heron generously contributed his time and efforts. Consistent with its general policy, the Business School provides the facilities and opportunities for research and for publication of the results but does not assume any institutional responsibility for the findings. The views expressed by the authors of the study are entirely their own.

In a period of history when the maintenance of this country's independence and its ability to protect the independence of others may well depend upon its staying well out in front in the development of new weapons and means of conveying them to the enemy, this study of government and industry relations in the development of aircraft engines is considered to be of timely importance.

MELVIN T. COPELAND
Director of Research

Soldiers Field
Boston, Massachusetts
October, 1949

GEORGE P. BAKER
James J. Hill Professor of Transportation

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