

ASTRONAUTICS AND GUIDED FLIGHT SECTION REPRINTS

The following is a list of the Section lectures which have been printed in the *Journal* since 1960.
Most of them are available as reprints.

| Author | Title | Published |
|-------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------------------|
| Nonweiler, T. R. F. | Problems of Interplanetary Navigation and Atmospheric Re-Entry | March 1960 |
| Best, D. | Some Problems of Polar Missile Control | August 1960 |
| Maxwell, W. R. and Young, G. H. | Solid Propellant Rocket Motors | April 1961 |
| Symposium (summarised) | The Training of Guided Missiles Engineers | July 1961 |
| Smelt, R. | The Agena Satellite and Discoverer Programme | November 1962 |
| Smith, K. | A Comparison of the Control Problems of Missiles and Manned Aircraft | March 1962 |
| Neat, W. N. and Page, K. G. | Packaged Liquid Rocket Motors | March 1962 |
| Lane, R. J. | Recoverable Air-Breathing Boosters for Space Vehicles | June 1962 |
| Symposium | The Economics of Astronautics | June 1962 |
| Biggs, A. G. and Cawthorne, A. R. | Bloodhound Missiles Evaluation | September 1962 |
| Davies, H. | The Design and Development of the Thiokol XLR 99 Rocket Engine for the X-15 Aircraft | February 1963 |
| Jefferson, G. R. | The Development of Thunderbird | June 1963 |
| Stauff, E. | Development of Guided, Tactical Missiles in France | August 1963 |
| Francis, R. H. | The Development of Blue Steel | May 1964 |
| Williams, W. C. | Technical History of the Mercury Programme—A Discussion | December 1964 |
| Smith, T. L. | RAE Guided Weapon Test Vehicles in the 1950s | February 1965 |
| Lines, A. W. | Design of Spacecraft for Experiments in the ESRO Scientific Programme | November 1965 |
| Shepherd, Capt. C. W. H. and Harrison, J. E. A. | The UK Polaris Project | September 1966 |
| Dorling, E. B. and Hickman, P. L. V. | Symposium—Trials Data and their Handling | November 1966 |
| Symposium | Symposium on Management | March 1967 |
| Tokaty, G. A. | Aerospace Research and Its Relation to Universities, Industry and the Establishments | October 1967 |
| Pardoe, G. K. C. | Some Technical and Management Considerations in European Space Programmes | December 1967 |
| Hume, C. R. and Ducamus, P. M. | Symposium—A Progress Report of the ESRO II Programme | January 1968 |
| Flemming, N. C. | Functional Requirements for Research/Work Submersibles | February 1968 |
| Symposium | Simulation and Control of Guided Weapons | April 1968 |
| Symposium | ELDO | July 1968 |
| Symposium | Commercial Applications of Satellites for Europe | April 1969 |
| Cadoux, J. E. | The Air-to-Air Missile Matra 530 | May 1969 |
| Jacob, J. E. B. | Vigilant: A Portable Anti-Tank Weapon for Infantry Use | May 1969 |
| Pout, H. W. | The Evolution of Guided Weapons | June 1969 |
| Symposium | Management Techniques of Guided Weapon Development | January 1970 |
| Augustine, N. and Yates, R. M. | The Evolution of the US Tactical Missile Programme | December 1970 |
| Symposium | Space Satellite and Launch Vehicle Technology | November & December 1970 |
| Symposium | Operational Research in the Guided Weapons Field | January & February 1971 |
| Kerr, T. H. | Techniques of Measuring Cost-Effectiveness of Weapon Systems | September 1971 |
| Childs, D. J. | Cost Control of Guided Weapons Development Programmes | September 1971 |
| King, G. E. | Guided Weapon Design to Meet Cost Requirements | October 1971 |
| Evans, L. G. | Joint Venture and International Collaboration | October 1971 |
| Cleaver, A. V. | Astronautics After Apollo | November 1971 |
| Mathews, Charles W. | The Space Shuttle and Its Uses | January 1972 |
| Elliot, H. | Scientific Deep Space Problems | January 1972 |
| Mathews, Charles W. | American Space Station Activities | February 1972 |
| Tavassoli, A. A. | Metallic Materials for the Space Shuttle | March 1972 |

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WILKINSON, K. G.

**Air transport development between the UK and Europe—
the next twenty years**

Two developments stand out as likely to determine, more than any other, the future development of air transport in the geographical area of Europe. These are, entry of Great Britain into the Common Market and the development of quiet, shorter take-off civil transport. A suggestion is made of an outline of how European air transport might develop over the next 20 years with these main determinants in mind and also of the way in which government policy on airport development is already creating a frame for the future which may itself become a main determinant.

BREWER, G. F.

The future of general aviation in Europe

The recent growth of general aviation is discussed. As we try to look into the future of general aviation in the world as a whole, the important single factor affecting growth rates is not the potential but the capabilities of the general aviation community to penetrate the total latent potential. Statistically we could build an impressive history of the growth of general aviation in Europe over the past decade.

BEAMONT, R. P.

Experiences in military flying during the Second World War

The author describes how during the battle for France in 1940, he observed that the RAF's set piece, fighter formation, manoeuvres were inadequate and that flexibility and initiative were essential to success. This was confirmed during the Battle of Britain during which attack in "finger fours" was perfected. In 1942 the author was posted to Hawker Aircraft as test pilot to help develop the Typhoon and later the Tempest. He pioneered the ground attack operational techniques which played an important part in the Allies build-up to D-Day, and commanded the first Tempest wing, which played a major part in the defeat of the V1. The author's post-war experiences as a test pilot have enabled him to keep in close touch with the evolution of air fighting, and he concludes that the basic principles established in two world wars remain appropriate to modern conditions.

BRENNAN, M. J.

V/STOL developments in Hawker Siddeley Aviation Ltd.

The future requirement for civil air transport is reviewed as follows. A brief historical statement on the growth of civil air transport is given. The present extreme difficulties facing the airline operator are discussed—congestion on the ground and in the air—and the continuing growth of air traffic. One solution is to build more conventional airports near the city centres. This is proving an extremely expensive and almost impossible task. An alternative is to design and develop an intercity STOL or V/STOL air transport system, the value of which is outlined. A brief description of the development of the Harrier is given, and a review of the work done by Hawker Siddeley in its search for a solution to the civil air transport problem is outlined. The characteristics of the HS.141 are described.

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