Fig. 17.2. French space port at Hammaguir, Algeria, in 1967. Four Diamant-A rockets had been launched from this site before it was closed in 1967. The continuing launches would now be conducted from the French *Centre Spatial Guyanais*, or the *Guiana Space Center*. Photo courtesy of Centre National d'Études Spatiales, France.

launches ascending over the Atlantic Ocean into retrograde orbits. (Israel was later to experience the same disadvantage because of its geographical location.)

Kourou Space Center

Consequently a decision was made on 14 April 1964 to build a new space port, the *Guiana Space Center* (*Centre Spatial Guyanais — CSG*) near Kourou in French Guiana. Subsequently, the Kourou center has been developed into a major space port. CSG is strategically located close to the equator (latitude 5.5°N) and thus takes the full advantage of Earth rotation and allows especially efficient satellite launch into near equatorial orbits, including the geostationary orbit favored by communications satellites.

La Force de Frappe

In the 1950s, the French military undertook vigorous development of long-range ballistic missiles. Together with the nuclear weapons, they would form the future French ballistic missile "strike force" (*la force de frappe*). A comprehensive missile program included both liquid-propellant engines and solid-propellant motors. Special government and industrial organizations were formed to contribute to and support the development.

Centre National d'Études Spatiales (CNES)

The increasingly ambitious French civilian space effort was also reorganized. On 19 December 1961, President Charles de Gaulle signed a bill forming the *National Center of Space Studies* (*Centre National d'Études Spatiales — CNES*), replacing the *Committee of Space Research* (*Comité des Researches Spatiales — CRS*) that had coordinated space activities in France since 1959. An Air Force general, Robert Aubinière, became the first Director General of CNES, and he served in this position for 10 years. In addition to guiding the French national space effort, CNES was directed to develop plans for French participation in the rapidly growing European space programs.

Winner of the *Luigi Napolitano Book Award* (2006) from the International Academy of Astronautics

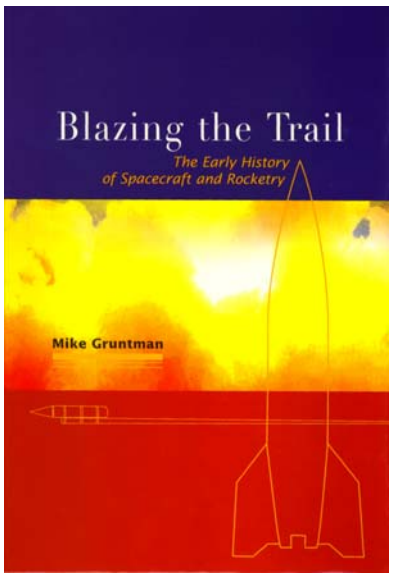
Blazing the Trail

The Early History of Spacecraft and Rocketry

Mike Gruntman

AIAA, Reston, Va., 2004
ISBN 156347705X; 978-1563477058

505 pages with 340 figures
Index: 2750+ entries, including 650 individuals



This book presents the fascinating story of the events that paved the way to space. It introduces the reader to the history of early rocketry and the subsequent developments which led into the space age. People of various nations and from various lands contributed to the breakthrough to space, and the book takes the reader to far away places on five continents.

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This book bridges the gap. It is a one-stop source of numerous technical details usually unavailable in popular publications. The details are not overbearing and anyone interested in rocketry and space exploration will navigate through the book without difficulty. The book also includes many quotes to give readers a flavor of how the participants viewed the developments. There are 340 figures and photographs, many appearing for the first time.

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