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DEFA PARCA: EARLY SURFACE-TO-AIR MISSILE FOR THE FRENCH ARMY

Abstract

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Abstract
DEFA's PARCA: Early Surface-to-Air Missile for the the French Army
by Ph. Jung, J. Robert, C. Rothmund, J-J. Serra, C. Vanpouille
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Soon after the end of World War II, DEFA (Direction des Etudes et Fabrications d'Armement) undertook the development of an anti-aircraft missile called PARCA (Projectile Autopropulsé Radioguidé Contre Avions). The tasks were split between APX (Atelier de Constructions de Puteaux) for manufacturing and telemetry, LRBA (Laboratoire de Recherches Balistiques et Aérodynamiques) for liquid propulsion and guidance, ETVS (Etablissement d'Expériences Techniques de Versailles) for solid propulsion and ETBS (Etablissement d'Expériences Techniques de Bourges) for testing.

According to initial specifications, PARCA was to be a supersonic missile with a range of 20 km. In 1954, the manufacture of a reduced performance version (13 km), PARCA de transition, was decided for training purposes, these pre-series missiles being launched by artillery units. Three years later, a third and a fourth version were born: PARCA Programme with a range of 33 to 43 km and the autoguided PARCA Puissant with a range of 100 km. Some prototypes of PARCA Programme were launched under the name ELEONORE, and experimental vehicles were also launched to test ramjet engines planned for PARCA Puissant.

This paper deals with the history of the PARCA development, including progress on: - solid propulsion: four wrap-around boosters and a sustainer, of which several types of different natures and impulse were used during the tests; - liquid propulsion: 2 tons thrust sustainer using the same principle as the Veronique one, but with improved tanks allowing maneuvering. Several pressurizing architectures were tested before cancellation of the liquid solution. - guidance system: based on a COTAL radar during the development phase and pre-series tests, and a new AQUITAINE radar planned for the operational vehicle.

The program ended in 1958, PARCA being replaced in Armée de Terre by the American Hawk missile. The last missiles were used for the training of artillery units until 1961, after which the project was definitively canceled.