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SEREB VE 121 EMERAUDE, A DIAMANT SPACE LAUNCHER PRECURSOR

Abstract

On 9 January 1959, de Gaulle lost no time into shifting France from a fourth Republic without vision and unable to take major decisions to a profoundly modernized fifth one, including creating a company dedicated to develop nuclear ballistic missiles. Both philosophy and goals were very clear: the H bomb to be tested by 1968, before its use with missiles. Created on 17 September 1959, SEREB (Société pour l'Etude et la Réalisation d'Engins Balistiques) was built from the vast experience highly secretly and quickly developed as soon as WWII had ended: Sud Aviation, Nord Aviation, MATRA (Mécanique Aviation TRAction), Dassault, SEPR (Société d'Etude de la Propulsion par Réaction), Poudrerie Nationale, ONERA (Office National d'Etudes et de Recherches Aéronautiques), CEA (Commissariat à l'Energie Atomique). Many problems had to be solved, beginning with long duration solid propulsion necessary for quick reaction launch, when only 550 mm diameter grains had been tested. Inertial guidance, flight control in vacuum and hypersonic reentry also were major steps to be achieved. In a stroke of genius, SEREB launched on 3 October 1960 a technological, modular, program, EBB (Etudes Balistiques de Base), the synthesis of which would result into a Mach 15 two-stage test vehicle, the Véhicule d'Essais VE 231. The most powerful rocket motors in France at the time were: *(LRBA liquid propellant) the 4 t motor of Véronique, and a series of bench tested motors (8, 12 and 16 t thrust); *(solid propellant) the 550 mm diameter SEPR 734 of 26 t thrust for only a few seconds, used by the MATRA R 422, although longer durations were being achieved for the Casseur program. Conservatively it thus was decided to use a liquid propelled first stage, topped by a smaller solid propelled one. Thus were born the VE 121 and VE 111. While the decision to use solid propellant for the missiles only was taken in April 1961, the development of Emeraude, although LRBA (Laboratoire de Recherches Balistiques et Aérodynamiques) was not a member of solid propulsion-focussed SEREB, was to have far reaching consequences for France and Europe... This paper retraces the story of the VE 121 Emeraude liquid propelled rocket of 28 t thrust, beset by initial failures, a worrying first for SEREB. It continues our series on the French Precious Stones, which among others culminated with the resounding success of Diamant, in orbit in 1965.