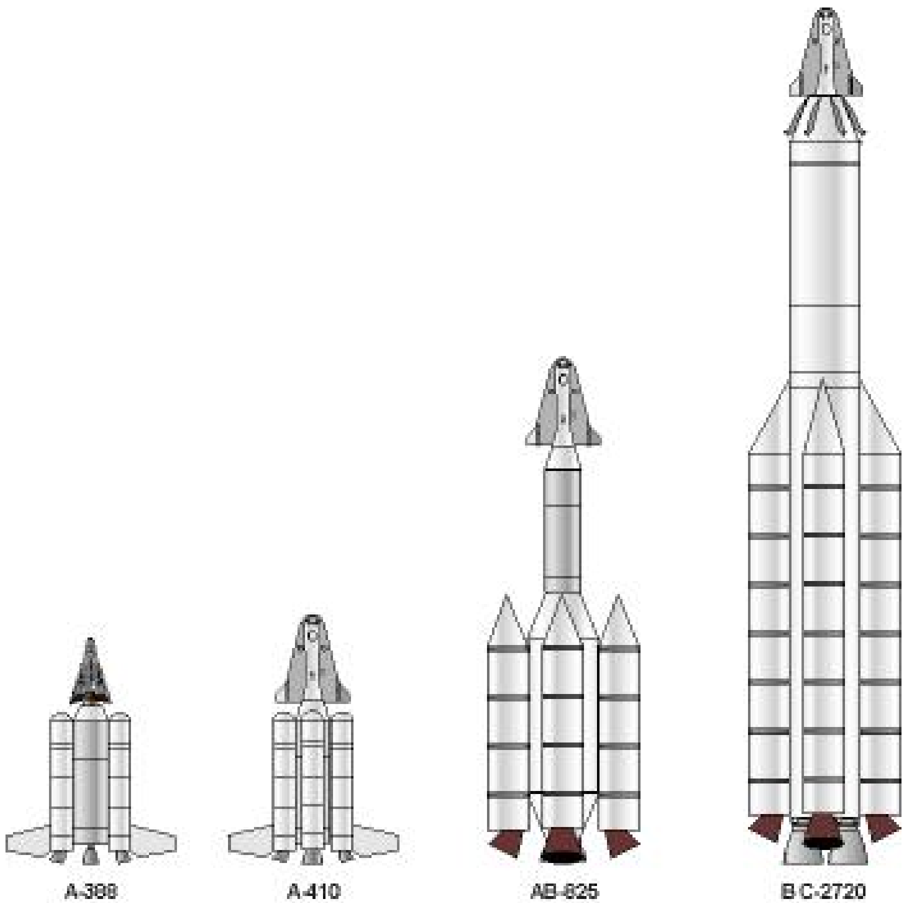
SLS Family

In the mid-1950's, US Air Force-funded studies identified the optimum long-term solution for space launch. The studies indicated the desirability of segmented solids for a first stage to achieve low cost, high reliability and flexibility of basic booster size by adding or subtracting segments. Studies further showed that oxygen-hydrogen propellants, with their very high specific impulse, were a preferred choice for upper stages, where mass was more important. This choice also resulted in minimum systems cost. By stressing the concept of a single liquid stage with a single engine, it was felt that a high reliability for the over-all system could be achieved. Furthermore, by starting out from the very beginning with the concept that this was to be a standardized vehicle for a wide variety of space missions, it was felt that a basically good design could be achieved which would be useful for '…at least five, and perhaps ten years…' as a work-horse booster.



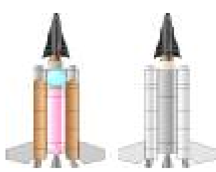
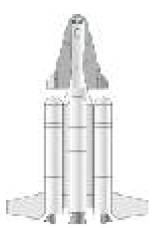
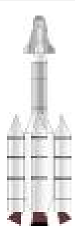
In fact the design philosophy of this 'Space Launching System' was decades ahead of its time. Due to short-term funding restrictions, the Air Force selected adding solid rocket boosters to the Titan 2 ICBM for its SLV-4 space launch requirement. If they had gone forward with the Space Launching System, they would have fielded the equivalent of the Ariane 5, Delta 4, or Atlas 5 forty years earlier. Such a system would probably still be in use today, and in no need for replacement.

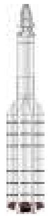
The Air Force had sponsored key technology development in the late 1950's to prepare for the SLS. This included the successful testing of a Titan LR-87 engine to burn liquid oxygen and hydrogen in 1958-1960, and initial contracts for test of 100 inch segmented solid rocket boosters in 1959-1960.

The smallest member of SLS was sized to boost the Air Force's Dynasoar manned spaceplane into low earth orbit. The 'A' liquid core stage was limited to 14 feet diameter to allow rail transport. The 100 inch diameter of the solids were set by the limitation of Aerojet's heat-treat facility. This had the capability to put 9 tones of payload into low earth orbit.

To support the Air Force's project Lunex moon landing project, 'B' and 'C' Lox/LH2 stages were conceived. These were 25 feet in diameter, and their lateral solid boosters 180 inches/15 feet in diameter. Both would have to be transported by ship.

A decision to proceed with the Space Launching System in July 1961 would have resulted in first flight of the A vehicle in mid-1964, first manned launch in mid-1965, first launch of the BC super-booster in mid-1966, and the first manned landing on the moon in late 1967. Instead NASA was given the Apollo program, the Titan 3 was developed for the Air Force's launch needs, and an opportunity to build a flexible launch system that would still be in use today was lost.

	SLS A-388	The A-388 was the version of the Space Launching System family proposed to fill the SLV-4 requirement - boost to orbit of the Dynasoar manned spaceplane. The booster...more.
	SLS A-410	The smallest identified member of the SLS family, selected to place the Air Force Lunex lunar lander re-entry vehicle in a low earth orbit for initial tests, was...more.
	SLS AB-825	The AB-825 represented a medium launch vehicle of the USAF 1961 Space Launching System family. The AB-825 would have conducted earth orbit tests of partially-fuelled...more.

	SLS BC-2720	The BC-2720 was the member of the SLS family selected to boost the Air Force Lunex lunar lander on a direct lunar trajectory. This would have used four 180 inch...more.