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Abstract

The National Aeronautics and Space Administration is defining an unmanned, expendable derivative of the Space Shuttle that can provide a near-term heavy lift launch capability. Called Shuttle-C, this launch vehicle is a low-cost performance enhancement of the National Space Transportation System (NSTS) capable of placing 50- to 75-ton payloads into low Earth orbit by 1994.

While heavy lift launch capabilities have been studied for some time, the particular combination of Shuttle-C program guidelines is somewhat unique; i.e., near term, highly reliable, low cost, payload interchangeability with the Shuttle, and maximum use of existing NSTS hardware and experience.

The only new element of Shuttle-C, the Cargo Element, will provide a cylindrical payload bay 15 ft in diameter by 82 ft long. This unmanned capability will complement the manned Shuttle vehicle and provide growth to support new space initiatives. It will serve as a test bed for new and modified systems, provide robust launch capability for the Space Station Freedom, and supply a progression of launch ability.

Program definition is essentially complete, preliminary design is progressing, and a NASA/Contractor Team stands ready to restore to the United States a launch capability absent since the early 1970's.

Introduction

Shuttle-C (the "C" stands for Cargo) is a Space Shuttle-derived, expendable launch vehicle. The Shuttle-C uses all of the elements of the Space Shuttle, except that the Orbiter is replaced with a wingless, tailless cargo element. This cargo element has a payload bay that is 15 ft in diameter by 82 ft long and can accommodate payloads up to 150,000 lb (Figure 1).

Shuttle-C will be used along with the Space Shuttle to provide the nation not only with a heavy lift capability but also with a NSTS that consists of both manned and unmanned launch vehicles. Payload possibilities with Shuttle-C are significant - a sampling includes space station assembly and resupply, planetary, geosynchronous, DOD, and any heavy lift to low Earth orbit.

At present, the Shuttle-C program is in a definition/design phase which is being conducted by Martin Marietta Aerospace, Rockwell International, and United Technologies Corporation under the direction of the Marshall Space Flight Center (MSFC). The Johnson Space Center, Kennedy Space Center, Lewis Research Center, and Jet Propulsion Laboratory are serving in supporting roles. Program authority to proceed is expected in 1991 and the first launch of Shuttle-C is scheduled for 1994.

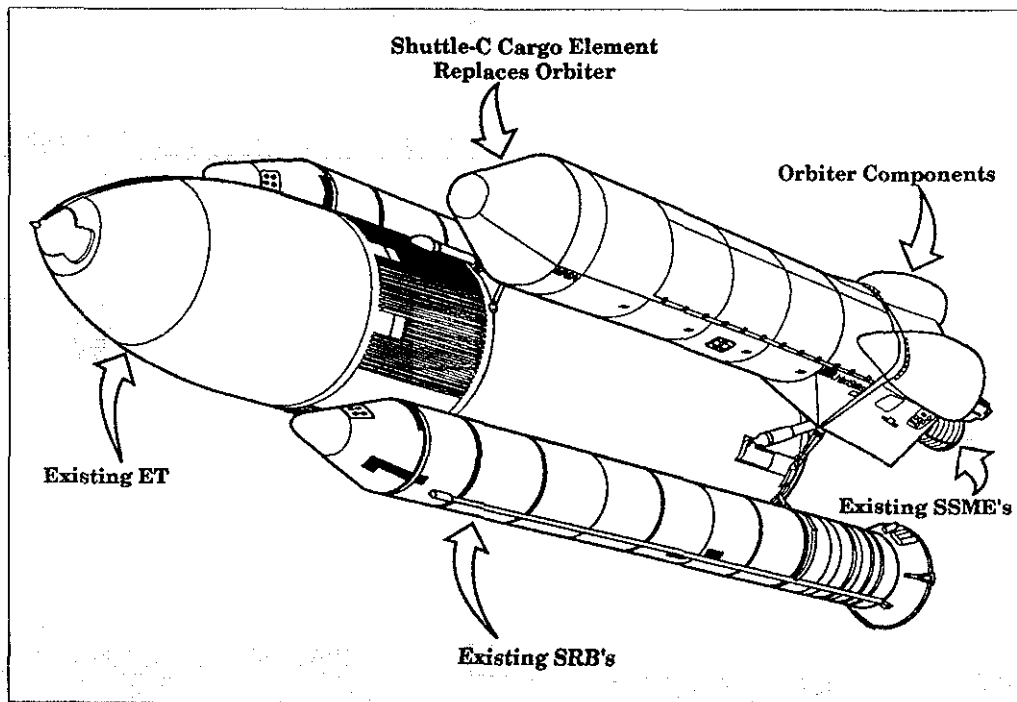


Figure 1. Basic elements of Shuttle-C.