LOCKHEED MARTIN

Space Systems Company

Information

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Titan II Space Launch Vehicle Profile

PROGRAM	Titan II Space Launch Vehicle (SLV).	
CUSTOMER	U.S. Air Force, Space & Missile Systems Center (SMC), Los Angeles, California.	
CONTRACT VALUE	$659.3 million	
CONTRACT STATUS	Lockheed Martin Space Systems Company's Astronautics Operations, under contract to SMC, converted 14 government-owned Titan II intercontinental ballistic missiles (ICBMs) for use as space launch vehicles. The contract was awarded in January 1986 and continues through March 2002.	
LOCKHEED MARTIN ROLE	Lockheed Martin has modified the Titan IIs so they can be used as space launch vehicles. This includes modifying the forward structure of the second stage to accommodate a 10-foot diameter payload fairing with variable lengths; manufacturing the new fairings plus payload adapters; refurbishing the Titans' liquid rocket engines; upgrading the inertial guidance systems; developing command, destruct and telemetry systems; performing payload integration; and modifying Space Launch Complex 4 at Vandenberg Air Force Base, Calif., to conduct the launches.	
DESCRIPTION	The Titan II space launch vehicle is a modified Titan II ICBM. It consists of two liquid-propellant stages, a payload adapter and payload fairing.	
PURPOSE	To provide low- to medium-weight launch capability into low Earth orbit.	
FIRST STAGE	Length:	70 feet
	Diameter:	10 feet
	Engine Thrust:	474,000 pounds (vacuum)
	ISP:	296 sec (vacuum)
SECOND STAGE	Length:	40 feet
	Diameter:	10 feet
	Engine Thrust:	100,000 pounds (vacuum)
	ISP:	316 sec (vacuum)
GUIDANCE and NAVIGATION	Inertial Guidance System Consisting of Inertial Measurement Unit and Missile Guidance Computer	

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	Subcontractor:	Litton
PAYLOAD FAIRING	Diameter:	10 feet
	Lengths:	20 to 30 feet
	Aluminum skin-stringer tri-sector design	
	Subcontractor:	Boeing
LIQUID ROCKET ENGINES	Refurbished Titan II ICBM engines	
	Propellant:	Nitrogen Tetroxide & Aerozine 50
	Subcontractor:	Aerojet

CAPABILITY

The Titan II can lift approximately 4,200 pounds into polar low-Earth orbit.

BACKGROUND

Lockheed Martin built more than 140 Titan ICBMs, once the vanguard of America's nuclear deterrent force, for the Air Force. Ten manned and two unmanned Titan IIs also were flown as space launch vehicles in NASA's Gemini program in the mid-1960s.

Deactivation of the Titan II ICBM system began in July 1982. The last missile was taken from its silo at Little Rock Air Force Base, Arkansas, on June 23, 1987. Deactivated missiles are in storage at Davis-Monthan Air Force Base in Tucson, AZ. Lockheed Martin was responsible for transporting the Titan IIs to its facilities in Denver and then to Vandenberg Air Force Base.

PERFORMANCE

The Air Force and Lockheed Martin have successfully launched 10 Titan II Space Launch Vehicles from Vandenberg Air Force Base, Calif. The first four were Sept. 5, 1988; Sept. 5, 1989; April 25, 1992; and Oct. 5, 1993. On Jan. 25, 1994, a Titan II launched the first U.S. moon mission in more than two decades: the Deep Space Program Science Experiment 1 (DSPSE 1) spacecraft, also known as Clementine, for the Department of Defense's Ballistic Missile Defense Organization (BMDO). The sixth Titan II was launched April 4, 1997, carrying a Defense Meteorological Satellite Program (DMSP) satellite. The seventh Titan II was launched May 13, 1998, carrying the NOAA-K satellite for the National Aeronautics and Space Administration (NASA) and the National Oceanic and Atmospheric Administration (NOAA). The eighth launch was June 19, 1999, carrying the QuikScat satellite for the Jet Propulsion Lab (JPL) and NASA. The ninth launch was Dec. 12, 1999, carrying a DMSP satellite. The most recent launch was Sept. 21, 2000, carrying the NOAA-L satellite.

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For more information about Lockheed Martin Space Systems-Astronautics Operations, see our website at http://www.ast.lmco.com

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