EXERCISE 1.4: TITAN II: FINAL MISSION

Directions: Read the following article concerning the Titan II and its role in the Space Program. Answer the questions that follow in complete sentences.

Adapted from *Last of the Titans: Passage of a Cold Warrior*, by Maj. Dan Wetmore, USAF, Association of Air Force Missileers Newsletter, Vol. 11, No. 4, December 2003.

Within the realm of American rocketry is a class of booster engines known as the "Heritage Vehicles." Thor, Atlas, and Titan started out life as launch vehicles for nuclear munitions, and later transitioned to second careers transporting satellites into earth orbit. The Thor and Atlas programs ended long ago. And on 18 October 2003, the Titan program closed as well, when the last Titan II, designated "Space Launch Vehicle 23G-9," rocketed into space from a launch pad on Vandenberg Air Force Base. The Heritage Vehicles were members of a select fraternity. Yet within it, the Atlas and Titan II enjoyed the further distinction of having held a third job. Of the many boosters fielded in the history of U.S. rocketry, only those two performed in all three arenas of space activity: missile defense, satellite lift, and manned space flight.

Missile Defense: As instruments of strategic deterrence, Intercontinental Ballistic Missiles (ICBMs) served on the front lines of the cold war. Among the quartet of U.S. ICBMs (Atlas, Titan, Minuteman, and Peacekeeper), the Titan II cast the longest shadow, tipped as it was with the 9-megaton Mark 6, the largest warhead ever fielded by the United States. With an explosive equivalence 600 times that released at Hiroshima, 54 Titan IIs stood watch for nearly a quarter of a century from 1963-1987. The ultimate weapon of war, the Titan II was also an implement of peace.

The Manned Space Program: In 1961, President John F. Kennedy challenged America to send a man to the moon by decade's end. This brought an additional role for the Titan II. The 250,000-mile path to the moon was laid with three stepping-stones, Mercury, Gemini and Apollo. For the Mercury missions, Redstone and Atlas D rockets carried one-man capsules into space in order to baseline the mechanics of space travel and study its effects on humans.

Building on Mercury's foundation, the Gemini Program followed. In ten of the twelve flights of the Gemini program during 1965-66, modified Titan IIs carried astronauts aloft aboard two-man craft. These flights focused on the logistics of "twinning" spacecraft in orbit, rendezvous and docking procedures. The subsequent Apollo missions were heir to these efforts, and the Saturn V launches brought the first moon landing on 20 July 1969.

Commercial and Government Satellite Lift: In 1986, following decommissioning of the Titan II as a weapon system, fourteen of the fifty-four remaining vehicles were reacquired by Lockheed Martin in a "swords to plough shares" venture. Returned to the factory in Colorado, they were retrofitted for spacelift duty, then shipped to Vandenberg. In 1988, the Titans began to fly again, successfully placing weather and experimental payloads in polar, low-earth orbit. Titan II continued its contributions to lunar exploration in its third occupation, when the payload of 1994's Clementine mission provided evidence of water on the moon.

Of all the Titan IIs minted by the Martin Company between 1962-67, 108 have now passed into history. Two were destroyed in various accidents, while 106 performed their intended function. Eighty-one were used in ICBM tests and evaluations: twenty-three were launched above ground at Cape Kennedy, fifty-eight were launched in-silo from north Vandenberg. Twelve flew from the Cape in the Gemini program, and thirteen have now lofted satellites from south Vandenberg.

Of the forty-five left, forty retired to the "Boneyard" at Davis Monthan Air Force Base in Arizona. Four others are displayed at museums.

Ultimately, the second-to last forged was the last to fly. The missile originally known as B-107 was "commissioned" on 18 April 1967 at the Martin plant. In 1968 it entered active duty with the 381st Strategic Missile Wing at McConnell AFB in Kansas. From 1968 to 1986, it stood alert at Launch Complex 8 near Kingman, 50 miles west of Wichita, under the watchful eyes of the 532nd Strategic Missile Squadron.

In 1988 it returned to Colorado for two years of retrofitting for space flight, finally making its way to Vandenberg in 1996. There, on 18 October 2003, G-9 provided the 430,000 pounds of thrust necessary to take a weather satellite for its six-minute ride 100 nautical miles into space.

But as the last Titan II to launch after four decades on active duty, G-9's progress can be plotted on a larger scale. Having counted both warheads and

scientific wares among its payloads, the forty-year flight of this single (and nearly singular) craft traversed the whole of the history of space utilization.

Questions (Use a separate paper):

1. In your own opinion, why was the Titan II important to America's Space Program? Use complete sentences, and use between 5 and 10 sentences.

2. In your own opinion, what was the most important contribution that the Titan II made during its lifetime? Use complete sentences, and use between five and 10 sentences.