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ОТЧЕТ

По Лабораторной работе

Направление: 01.03.02 Прикладная математика и информатика
(код направления / название направления)

Профиль: Математические методы механики полета ракет-носителей и
космических аппаратов
(название профиля)

Тема: Уравнение Кеплера
(название лабораторной / курсовой)

Выполнено Эльбатлуни Рашад
студентом: _____
(ФИО)

Группа: ИПМ-бд 02-22
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Contents

Theory 3

 Input data: 3

 Calculations: 3

Introduction..... 3

Interesting Facts 3

Designations..... 4

Conclusion 4

Application..... 5

Theory

Mission = moon-10

Input data:

$$r_a = 2738 \text{ km.}$$

$$r_p = 2088 \text{ km.}$$

Calculations:

$$a = \frac{r_a + r_p}{2} = \frac{2739 + 2088}{2} = 2413.5$$

– semimajor axis of the orbit

$$e = \frac{r_a - r_p}{2a} = \frac{2739 - 2088}{2 \times 2413.5} = 0.1348663766$$

-orbital eccentricity

Introduction

Luna 10, a Soviet robot space mission, was created and launched on March 31, 1966. In addition to becoming the first lunar satellite to land on the moon safely, its primary aim was to achieve several learning goals, such as gaining a thorough understanding of the valuable lunar atmosphere and carrying out some familiar testing linked to sustainable lunar operations, paving the way for possible human moon orbital missions in the near future.

Interesting Facts

- During its exploration of the moon's orbit, Luna 10 collected crucial data on a variety of subjects, including the density of nearby small space rocks, the radiation belts and amount of cosmic radiation, the magnetism of the moon, and the makeup of its rocks (which are similar to Earth's rocks).
- The most significant development in tracking the moon's orbit was locating the crowded regions known as "mascons". These places affect the moon's orbital path because they are situated within basins on the lunar surface.
- The notes in "The Internationale" were replicated by solid-state oscillators in the spacecraft for the 23rd Congress of the Communist Party of the Soviet Union. These oscillators were preprogrammed in order to ensure a successful live performance of the song.

Designations

Luna 10, or Ye-6S, was a Soviet Union-built spacecraft that was launched in 1966. It was made up of a pressurized lunar orbiter module and a Ye-6 bus that was used to transport instruments for lunar observations and a science payload. Propulsion systems were housed in the bus, while the orbiter module took detailed pictures of the moon's surface. The main goal of the mission was to investigate the moon's surface and atmosphere, gathering important information about its temperature, density, and composition. Future space exploration has been greatly influenced by the Ye-6S mission and is still being informed by it.

Conclusion

Luna 10's 56-day mission ended on May 30, 1962, due to battery depletion. Before this, the spacecraft made 219 active data transmissions over 460 lunar laps at a 72.2 degree inclination. It orbited for another 378 x 985 km until, at some point,

the pull of Earth's gravity made it uneasy. After that, it most likely traveled toward the Moon, where it crashed at the end of 1966 in an undisclosed location.

Application

