

Design maturity achieved for Europe's Earth Return Orbiter

Description

ESA's Earth Return Orbiter has reached a significant **milestone** on its mission to bring the first Mars samples back to Earth. The spacecraft recently completed its Platform Critical Design Review, confirming the performance, quality, and reliability of the systems for this **groundbreaking** mission.

The Earth Return Orbiter is a key part of the Mars Sample Return campaign, which aims to return martian rock, soil, and atmospheric samples to Earth. European industry is now gearing up for the next phase, with the **validation** of the design paving the way for the **integration** phase.

NASA has updated its Mars Sample Return program to reduce complexity, risk, and cost, and ESA has been working closely with NASA to prepare for these changes. The Earth Return Orbiter is now ready to begin manufacturing and testing its components for the upcoming mission.

The spacecraft's innovative design allows it to capture a basketball-sized capsule filled with samples collected by NASA's Perseverance rover. This mission showcases European technological prowess, with teams utilizing advanced technologies in **autonomous** navigation and **rendezvous**.

The Earth Return Orbiter's five-year mission to Mars and back will also involve acting as a communication relay with rovers and landers on the martian surface. With contributions from 11 European countries, including France, Italy, Germany, and the UK, the spacecraft is set to be the largest ever built for interplanetary flight.

Airbus Defence and Space has overall responsibility for the mission, with Thales Alenia Space playing a crucial role in assembling the spacecraft and developing the communication system. This mission marks a new chapter in space exploration, with European excellence at its core.

Vocabulary List:

1. **Milestone** /'maɪlstoʊn/ (noun): An important event or point in progress.
2. **Groundbreaking** /'raʊndbrɪkɪŋ/ (adjective): Introducing new ideas or methods.
3. **Validation** /vælɪdeɪʃn/ (noun): The action of checking or proving the accuracy or quality of something.
4. **Integration** /ɪntɪɡreɪʃn/ (noun): The process of combining parts into a whole.
5. **Autonomous** /ətəʊnəməs/ (adjective): Having the freedom to act independently.
6. **Rendezvous** /rəndəvʊs/ (noun): A meeting at an agreed time and place.

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Comprehension Questions

Multiple Choice

1. What is the goal of the Earth Return Orbiter in the Mars Sample Return campaign?

- Option: A. Bring moon samples back to Earth
- Option: B. Return martian rock soil and atmospheric samples to Earth
- Option: C. Explore Jupiter's moons
- Option: D. Study asteroids in space

2. Which organization has overall responsibility for the Earth Return Orbiter mission?

- Option: A. NASA
- Option: B. SpaceX
- Option: C. Airbus Defence and Space
- Option: D. ESA

3. What is a key aspect of the Earth Return Orbiter's design for capturing samples?

- Option: A. Football-sized capsule
- Option: B. Tennis ball-sized capsule
- Option: C. Basketball-sized capsule
- Option: D. Soccer ball-sized capsule

4. Which countries have contributed to the Earth Return Orbiter mission?

- Option: A. China and India
- Option: B. USA and Canada
- Option: C. France Italy Germany and the UK
- Option: D. Australia and New Zealand

5. What role does Thales Alenia Space play in the Earth Return Orbiter mission?

- Option: A. Developing the rover technology
- Option: B. Assembling the spacecraft and developing the communication system

Option: C. Launching the spacecraft into orbit
Option: D. Analyzing the samples collected by the spacecraft

6. What is a significant feature of the Earth Return Orbiter for its mission to Mars and back?

Option: A. No communication relay with the martian surface
Option: B. Solely powered by solar energy
Option: C. Utilizes autonomous navigation and rendezvous
Option: D. Carries a crew of astronauts to Mars

Answer

Multiple Choice: 1. B. Return martian rock soil and atmospheric samples to Earth 2. C. Airbus Defence and Space 3. C. Basketball-sized capsule 4. C. France Italy Germany and the UK 5. B. Assembling the spacecraft and developing the communication system 6. C. Utilizes autonomous navigation and rendezvous

Vocabulary quizzes

Multiple Choice (Select the Correct answer for each question.)

1. Which branch of physics deals with the behavior of physical bodies when subjected to forces or displacements?

Option: A. Chemistry
Option: B. Mechanics
Option: C. Biology
Option: D. Astronomy

2. What term is used to describe something that attracts and holds attention or interest?

Option: A. Boring
Option: B. Captivating
Option: C. Dull
Option: D. Mundane

3. In biology what refers to the process of genetic change in response to environmental conditions?

Option: A. Evolution
Option: B. Adaptation
Option: C. Mutation
Option: D. Reproduction

4. What term is used to describe the impact between two or more objects in motion?

Option: A. Fusion

- Option: B. Collision
- Option: C. Explosion
- Option: D. Separation

5. How does someone feel when they are looking forward to something with excitement?

- Option: A. Weary
- Option: B. Apathetic
- Option: C. Eagerly
- Option: D. Indifferent

6. What term is used to describe something given or received as an equivalent for services debt loss injury or suffering?

- Option: A. Punishment
- Option: B. Compensation
- Option: C. Reward
- Option: D. Gift

7. What do you call periods when something is not working or available especially electricity or water supply?

- Option: A. Surplus
- Option: B. Outages
- Option: C. Efficiency
- Option: D. Abundance

8. Which type of knowledge is essential basic and foundational to a particular field or subject?

- Option: A. Advanced
- Option: B. Superficial
- Option: C. Fundamental
- Option: D. Optional

9. What term describes the action of working together to produce or create something?

- Option: A. Sabotage
- Option: B. Collaboration
- Option: C. Competition
- Option: D. Isolation

10. What is a significant point or event in the development or progress of something?

- Option: A. Starting point
- Option: B. Milestone
- Option: C. End point
- Option: D. Regression point

**Gap-Fill (Fill in the blanks with the correct word from the vocabulary list.)**

11. Companies plan _____ to gain a competitive advantage in the market.

12. Virtual reality offers a(n) _____ experience that feels real.

13. Surgical procedures require a high level of _____ to ensure accuracy.

14. Workers are often provided with fair _____ for their hard work.

15. His contributions to the project were duly _____ by the team.

16. The detective will _____ the crime scene to gather evidence.

17. The new invention was hailed as a _____ achievement in the field.

18. Self-driving cars operate with _____ decision-making capabilities.

19. The spies arranged to meet at a secret _____ point.

20. Facing constant technical issues can be a _____ experience.

Matching Sentences (Match each definition to the correct word from the vocabulary list.)

21. The falcon is known for its incredible speed and agility.
22. Her sense of humor was described as fun and .
23. The director decided to produce a modern of the classic film.
24. theory unifies electromagnetism and the weak nuclear force.
25. The actor delivered an outstanding in the leading role.
26. Team is essential to achieve success in complex projects.
27. Economic markets can experience periods of uncertainty and .
28. Graduating from college was a significant in her life.



29. Peer reviews provide essential of scientific research findings.

30. The company aimed for seamless of its various departments.

Answer

Multiple Choice: 1. B. Mechanics 2. B. Captivating 3. B. Adaptation 4. B. Collision 5. C. Eagerly 6. B. Compensation 7. B. Outages 8. C. Fundamental 9. B. Collaboration 10. B. Milestone

Gap-Fill: 11. strategically 12. immersive 13. precision 14. compensation 15. acknowledged 16. investigate 17. groundbreaking 18. autonomous 19. rendezvous 20. frustrating

Matching sentence: 1. Peregrine 2. quirky 3. remake 4. Electroweak 5. performance 6. collaboration 7. instability 8. milestone 9. validation 10. integration

CATEGORY

1. Sci/Tech - LEVEL5

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