

The Blott Matthews Challenge



Mission to Mars

Briefing Meeting Saturday 3rd October 2015
Bear Hotel, Havant

Topics

Introduction – Charles Matthews

Competition Key Requirements – Richard Blott

Experts and Support – Richard Blott

Judging Criteria and Submission Format – Charles Matthews

Prizes and Prize Giving – Charles Matthews

Questions.

Organising Team



Charles Matthews is a graduate professional engineer and a barrister. His career has been spent initially in the Royal Navy and then in hi-tech industry in the UK and overseas. Charles has had a lifelong interest in cosmology.



Richard Blott is a Chartered Electrical Engineer. After a full career in the Royal Navy he has been responsible for research satellite and space propulsion programmes and studies and chairman of a multinational space propulsion committee.

Key Requirements

What is the science or exploration objective and what benefit does the mission offer?

What is your overall mission strategy taking account of:

- ❖ The time that it takes to get to Mars and back, depending, for example, on when the Earth is close to Mars and the propulsion system performance.
- ❖ The time needed at Mars to complete the science/exploration objective allowing for selection of a suitable landing site and disruption from dust storms and other environmental challenges.
- ❖ How the astronauts will be protected from the harsh Space and Martian environments.
- ❖ The design of a spacecraft capable of travelling to and orbiting Mars, landing on and ascending from the Martian surface and returning to the Earth 'space station'.
- ❖ Why your mission, spacecraft, human protection, launch and assembly and propulsion system designs are realistic in terms of technologies available today or currently in development.
- ❖ Optimisation of cost and schedule.

How did you assess the cost and schedule for such a mission?

A Few Tips

Good Planning:

- ❖ Agree the tasks to be done and who will do them,
- ❖ Build your project schedule working back from the submission date,
- ❖ Build in enough (but not too many) milestones to review and maintain progress,
- ❖ Leave margins to allow for the unforeseen,
- ❖ Agree the structure of your design submission early so you can contribute to it as you go along.

Task Management:

- ❖ Identify what you need to complete the task (inputs and outputs),
- ❖ Identify what ‘you know’ and what ‘you know you don’t know’,
- ❖ Identify the dependencies between tasks.

Meetings:

- ❖ Agree the purpose of any meeting and what needs to be achieved,
- ❖ Record any decisions.

A Few More Tips

Use the assumption that you can start and finish the mission at a space station orbiting the Earth to focus on getting to Mars and back.

There is a lot of information available on missions to Mars. Thorough research may be time consuming but pays off.

But do not just copy out what you find out. We want your ideas!

Like every other engineering project teamwork is essential.

Don't Panic! If you think you are in trouble let us know the problem and we will see what we can do to help.

We will not tell you how to design your mission but we can suggest ways to overcome difficulties.

Experts and Support

The Experts who all wish you good luck are:

- ❖ Prof. Andrew Coates, Deputy Director and Head of Planetary Science at UCL's Mullard Space Science Laboratory (MSSL). Science missions include Exo-Mars Rover, Cassini (Saturn) and Mars Express.
- ❖ Dr David A Green, Programme Director Space Physiology & Health MSc King's College London; Co-ordinator Aerospace & Extreme Environment Adaptation Group
- ❖ Doug Liddle, Director In-Space Missions Ltd who has lead the design of Surrey Satellite Technology Ltd Satellites up to 3 tons.
- ❖ Dr Susan Jason, Lead Engineer for Surrey Satellite Technology current science missions.
- ❖ Camilla Blott, young aerospace engineer at QinetiQ working on Tornado, Typhoon and Watchkeeper projects.
- ❖ Nick Williams, young aerospace engineer at Cobham plc working on in-flight refuelling.

Support:

- ❖ Rod Edwards, Chief Executive Young Engineers.

Judging and Submission Format

Judging Team:

- ❖ Charles, Richard and the Experts will judge your mission designs,
- ❖ We will explain how we reached our decisions at the Prize Giving.

Judging Criteria:

TOPIC	MARK
Science or Exploration objective unique benefit	15
Overall Mission Strategy	25
Spacecraft, human protection, propulsion, launch and assembly design	40 (10 each)
Optimising Cost and Schedule	10
Presentation	10
Total	100

You must upload your Mission Design to the BMC website by 15th February 2016, It is an opportunity to show that you can present a complex topic clearly and imaginatively.

To give a 'level playing field' for comparison please follow these rules:

- ❖ In PDF format not exceeding a file size of 20MB,
- ❖ Not exceeding 30 minutes presentational time including any videos,
- ❖ Video up to 5 minutes in length may be included by link to YouTube,
- ❖ Animation and/or computer assisted designs(CAD) must be embedded in the file so that they can be viewed with standard Microsoft Office programmes.

Prizes and Prize Giving

The Prize Giving will be on Saturday 5th March 2016.

The Prizes:

- ❖ First Prize £2,000
- ❖ Second Prize £1,000
- ❖ Third Prize £500.

The Prize Money has been lodged with Young Engineers.

As we have an entry of 5 schools and we wish to encourage you all to send us a really good mission design we will award three Third prizes.

In addition to your Design Submission we will ask each team to let us have a 5 minute presentation to introduce themselves at the prize giving.

Thank You
Questions?