



Briefing Sheet: **Satellite Team**

Sept 4, 1996: Team Information

The Mission

The mission begins when the Low Earth Orbiting satellite constellation becomes available. This group of satellites circle the Earth in a polar orbit every 101.3 minutes, at an altitude of 822 km. Because the Earth is rotating beneath them, the satellites it will pass over a different place on the surface of the planet each orbit and so a constellation of satellites is needed to provide round the clock coverage.

Each satellite can deliver information in both visible and infrared light. This can provide high resolution (10 m) images of volcanic activity in a strip 100 miles (about 160 km) wide. A different instrument can gather lower resolution images suitable for reporting weather conditions in a strip over 1000 miles (1600 km) wide. Data from ground based sensors, on the island, will also be transmitted to the satellite.

The satellite control team would normally monitor the health of each satellite and rely on automated systems to arrange for the collection and transmission of data from the satellite. Recent software problems however mean that the team will have to instruct each satellite when to collect data so that it is positioned over Montserrat. If the satellite is instructed to collect data at the wrong time the hurricane and volcano teams will have to use less accurate data, from other satellite systems that were not designed for this task.

Your Task

Before the mission begins, your team should practice working out how to instruct the satellite to collect data at the right time. You should be able to:

- Receive hourly updates of the positions of available satellites in both latitude and longitude.
- Plot the reported position of the satellite on the tracking map.
- Using the speed of the satellite, calculate when to make an observation.
- Using the wavelength that the satellite receives on, calculate the corresponding frequency.

- Prepare and send a set of instructions via the Communications Officer each five minutes to be relayed to the satellite.
- Plot the location of the image returned by the satellite and report the success (or otherwise) of the observation to the Communications Officer.

Team Tasks

Your team needs to have people in charge of the following tasks (A team member can take more than one role):

1. Satellite Status Officer. Select one person to record the real time data (location and receiving wavelength) about the next available satellite.
2. Observation Selection Officer. Select one person to calculate the time that observations need to be made.
3. Communications Control Officer. Select one person to calculate the frequency on which the next satellite will receive its instructions.
4. Recorder. Select one person to fill out the Satellite Instruction and Report Forms every five minutes. They should also write down all questions from Mission Control and respond back with written notes to be given to the Communications or Data Officers.
5. Observation Recording Officer. Select one person to plot the location on the map that the satellite observations were made of.
6. Runner to Comm. Team. Select a spokesperson to interact with the Communication Team (may be combined with Recorder).
7. Reporter. Select one person to update a “graphic organiser” every few minutes so that each team can tell what is going on at a glance. *The organiser should be a white board located near the team for all the teams to see.*