

## Communications System

The Communications system consists of a satellite in orbit around Mars, over the Mars One settlement, one in orbit around the sun, and existing ground stations on Earth.

The satellite over the Mars settlement is an areostationary satellite, the Mars equivalent of a geostationary satellite. It is always in the same place in the sky on Mars, receiving data from the settlement and transmitting it to Earth. On Earth the data is received by ground stations using large satellite dishes. The areostationary satellite enables almost 24/7 communication, which is interrupted only when Mars is in between the satellite and the Earth.

This is solved by placing a second satellite in an orbit around the sun, trailing 60 degrees behind the Earth. With this second satellite in place, when Mars is in between the areostationary satellite and the Earth, the signal can be relayed by the second satellite.

Once every 26 months, the Sun is exactly in between Mars and the Earth. This occultation lasts about six weeks. The second communications satellite will also be used to relay signals during this period.

However, when the Sun is in between Mars and the Earth and at the same time Mars is in between the areosynchronous satellite and the second satellite, we will have no contact with Mars for about two hours. Fortunately this is a rare situation and occurs when it is after midnight on Mars.

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