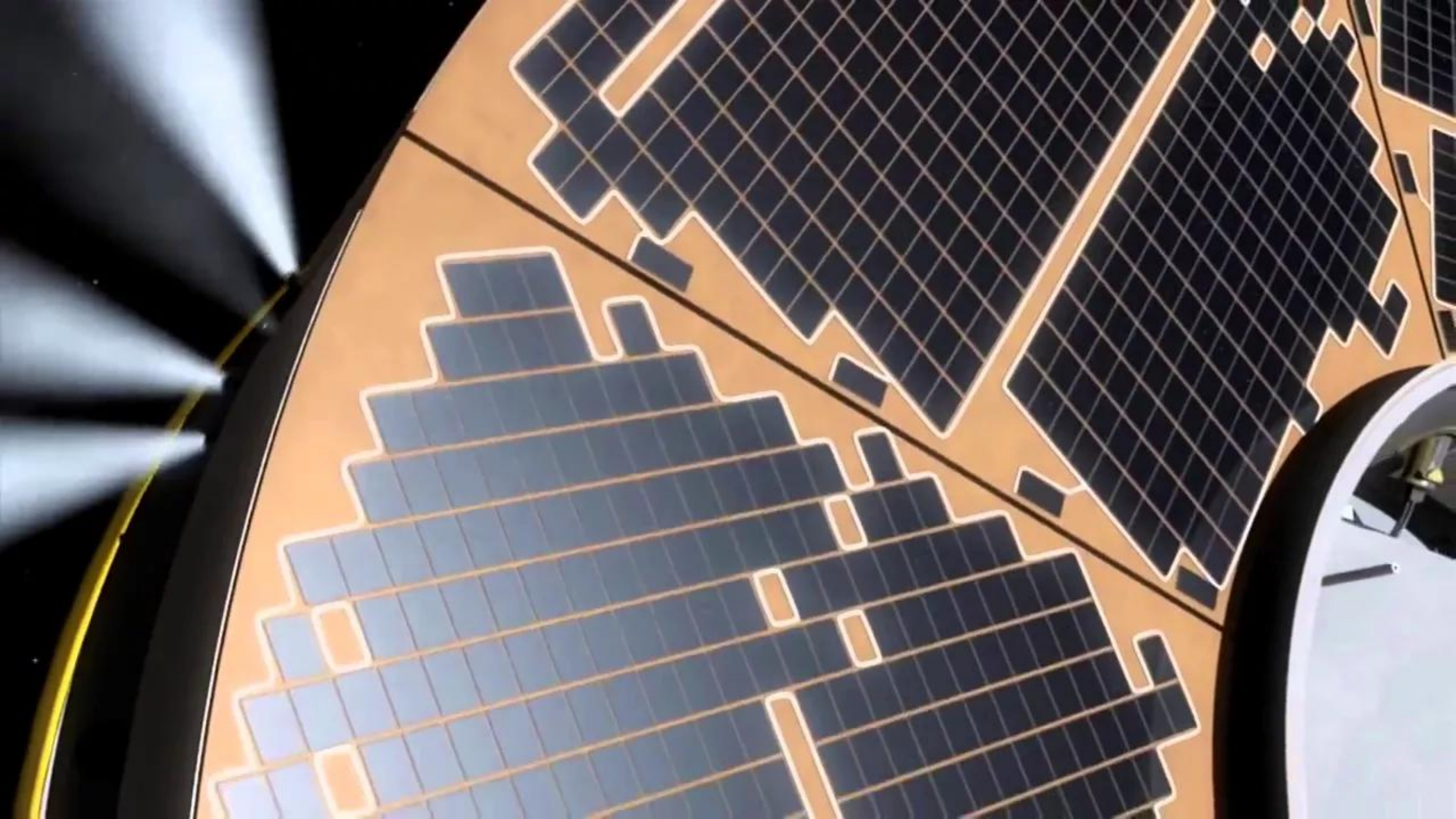

1
00:00:00,000 --> 00:00:22,000
MUSIC

2
00:00:22,000 --> 00:00:24,000
We have spacecraft separation.

3
00:00:24,000 --> 00:00:27,000
APPLAUSE

4
00:00:27,000 --> 00:00:36,000
And confirmation from our video system.

5
00:00:36,000 --> 00:00:41,000
Approximately 50 minutes after launch, the spacecraft separates from the upper stage of the launch vehicle.

6
00:00:41,000 --> 00:00:46,000
Six minutes after that the spacecraft transmitter sends a signal back to earth

7
00:00:46,000 --> 00:00:49,000
which is received by the tracking stations.

8
00:00:49,000 --> 00:00:54,000
Once we receive that signal, we are ready to send our first command up to the spacecraft.

9
00:00:54,000 --> 00:00:58,000
And that actually marks the beginning of the cruise phase.

10
00:00:58,000 --> 00:01:02,000
MUSIC

11
00:01:02,000 --> 00:01:04,000
There are some incredible challenges on the way to Mars.

12
00:01:04,000 --> 00:01:07,000
One of the things is there are always anomalies; there are always things that are

13
00:01:07,000 --> 00:01:09,000

going to go wrong that you never expected.

14
00:01:09,000 --> 00:01:13,000
You have a baby spacecraft that is on its way to Mars and its seeing the space environment for the first time.

15
00:01:13,000 --> 00:01:20,000
So it's going to see temperature ranges from minus 250 degrees Fahrenheit to plus 250 degrees Fahrenheit.

16
00:01:20,000 --> 00:01:24,000
And you've got instruments all over the spacecraft, you've got propellant lines that you can't let freeze.

17
00:01:24,000 --> 00:01:29,000
And so there's always this challenge of keeping the entire spacecraft tuned thermally.

18
00:01:29,000 --> 00:01:33,000
Some of the things we're going to be doing during the cruise phase are some trajectory correction maneuvers,

19
00:01:33,000 --> 00:01:38,000
which are basically pushing us along the path of where we want to end up when we arrive on Mars.

20
00:01:38,000 --> 00:01:44,000
The launch vehicle puts us on a specific path on a trajectory and along the way from here to Mars over the

21
00:01:44,000 --> 00:01:48,000
9 months that we'll be flying there, we need to make small corrections to that.

22
00:01:48,000 --> 00:01:51,000
SOUND OF SMALL THRUSTERS

23
00:01:51,000 --> 00:01:58,000
If you were trying to shoot a bow and arrow at a bulls-eye, at a target, and you had drawn back the bow and

24
00:01:58,000 --> 00:02:02,000
you had shot off the arrow, and you realized all of a sudden that it wasn't actually going to hit the target

25
00:02:02,000 --> 00:02:07,000
How great would it be if you could pause in the middle, make a slight adjustment to the arrow and

26
00:02:07,000 --> 00:02:09,000
watch it hit the target.

27
00:02:09,000 --> 00:02:15,000
We have given ourselves 6 opportunities to make a trajectory correction maneuver.

28
00:02:15,000 --> 00:02:21,000
And each of those correction maneuvers uses the thrusters on the spacecraft

29
00:02:21,000 --> 00:02:25,000
to give a little push to the spacecraft to correct its trajectory.

30
00:02:25,000 --> 00:02:28,000
One of the things that makes landing on another planet so difficult,

31
00:02:28,000 --> 00:02:30,000
is that we're essentially trying to hit a moving target.

32
00:02:30,000 --> 00:02:33,000
The spacecraft left a planet that was spinning around the sun at it's own speed

33
00:02:33,000 --> 00:02:38,000
and we're now aiming for another planet. And we can't just aim for where the planet is at the time that we

34
00:02:38,000 --> 00:02:43,000
launch, but we have to aim for where we think the planet's going to be by the time that we get there.

35
00:02:43,000 --> 00:02:48,000
All of those motions; the navigation team has to carefully track and predict where things

36
00:02:48,000 --> 00:02:54,000
are going to be in the solar system, in order for us to successfully navigate to Mars.

37
00:02:54,000 --> 00:02:58,000
The trip from here to Mars is over 8 and-a-half months and we need to make sure that we

38
00:02:58,000 --> 00:03:02,000

monitor all of the sensitive instruments, science and engineering to make sure

39
00:03:02,000 --> 00:03:07,000
that over that 8 and-a-half month journey, everything is working properly.

40
00:03:07,000 --> 00:03:11,000
The better we do our job during the cruise phase of the mission, the better