1
00:00:03,750 --> 00:00:01,429
[Music]

2
00:00:05,749 --> 00:00:03,760
sometimes you have to do something just

3
00:00:07,749 --> 00:00:05,759
to show that you can do it

4
00:00:08,870 --> 00:00:07,759
when the wright brothers flew for the

5
00:00:11,669 --> 00:00:08,880
first time they do

6
00:00:12,150 --> 00:00:11,679
an experimental aircraft and in the same

7
00:00:13,830 --> 00:00:12,160
way

8
00:00:15,190 --> 00:00:13,840
the mars helicopter is designed to show

9
00:00:17,189 --> 00:00:15,200
that we can fly

10
00:00:24,870 --> 00:00:17,199
and helicopter flight in the martian

11
00:00:28,630 --> 00:00:27,349
from day one this was the unwavering

12
00:00:31,830 --> 00:00:28,640
dream of our team

13
00:00:33,830 --> 00:00:31,840

to get our helicopter launched to mars

14
00:00:36,709 --> 00:00:33,840
so that we can get that opportunity to

15
00:00:39,430 --> 00:00:36,719
do the very first rotograph flight test

16
00:00:40,869 --> 00:00:39,440
in the actual environment of mars it's

17
00:00:44,150 --> 00:00:40,879
extremely difficult to

18
00:00:45,110 --> 00:00:44,160
fly at mars because is so thin compared

19
00:00:47,190 --> 00:00:45,120
to earth

20
00:00:49,270 --> 00:00:47,200
at mars it's less than one percent so

21
00:00:51,670 --> 00:00:49,280
the first and foremost challenge is

22
00:00:52,470 --> 00:00:51,680
to make a vehicle that's light enough to

23
00:00:54,869 --> 00:00:52,480
be lifted

24
00:00:57,270 --> 00:00:54,879
and then the second is to generate lift

25
00:00:58,389 --> 00:00:57,280
the rotor system is to spin very fast

26
00:01:00,790 --> 00:00:58,399
two thousand

27
00:01:02,630 --> 00:01:00,800
twenty two hundred twenty four hundred

28
00:01:04,549 --> 00:01:02,640
twenty six hundred we're spinning

29
00:01:06,310 --> 00:01:04,559
between two thousand and three thousand

30
00:01:07,270 --> 00:01:06,320
revolutions per minute and it takes a

31
00:01:09,750 --> 00:01:07,280
lot of energy

32
00:01:10,789 --> 00:01:09,760
so it's that balance of a very light

33
00:01:13,750 --> 00:01:10,799
system

34
00:01:14,230 --> 00:01:13,760
yet having enough energy that's needed

35
00:01:24,710 --> 00:01:14,240
to

36
00:01:26,469 --> 00:01:24,720
time it takes off the time it lands

37
00:01:28,469 --> 00:01:26,479
what we do do on the ground is we plan

38
00:01:29,109 --> 00:01:28,479

the flights and so we determine from

39
00:01:37,030 --> 00:01:29,119
here

40
00:01:40,469 --> 00:01:37,040
our experiment window is 30 martian days

41
00:01:43,749 --> 00:01:40,479
so we have planned up to five flights

42
00:01:44,550 --> 00:01:43,759
of incremental difficulty very first

43
00:01:46,149 --> 00:01:44,560
flight the

44
00:01:48,310 --> 00:01:46,159
main thing is we want to get the legs

45
00:01:51,429 --> 00:01:48,320
off the ground and so we will

46
00:01:52,870 --> 00:01:51,439
basically go up about three meters and

47
00:01:54,789 --> 00:01:52,880
we'll hover there

48
00:01:56,389 --> 00:01:54,799
and then we'll come down again and that

49
00:01:59,190 --> 00:01:56,399
will be the first you know really

50
00:02:00,870 --> 00:01:59,200
major milestone most of our flights will

51
00:02:02,950 --> 00:02:00,880
be at the three to five meter height

52
00:02:04,310 --> 00:02:02,960
we will be going horizontally again at a

53
00:02:06,630 --> 00:02:04,320
few meters per second

54
00:02:07,590 --> 00:02:06,640
probably go out you know 50 70 meters

55
00:02:09,270 --> 00:02:07,600
and come back in

56
00:02:10,949 --> 00:02:09,280
successive flights we'll probably push

57
00:02:13,030 --> 00:02:10,959
that further try to go further

58
00:02:14,949 --> 00:02:13,040
so our priority will be to get back

59
00:02:15,589 --> 00:02:14,959
engineering telemetry and not so much

60
00:02:17,350 --> 00:02:15,599
images

61
00:02:20,309 --> 00:02:17,360
but i'm sure we'll return a few you know

62
00:02:23,030 --> 00:02:20,319
because they'll always look cool

63
00:02:23,670 --> 00:02:23,040

at this point we've tested all we can on

64
00:02:25,830 --> 00:02:23,680
earth

65
00:02:27,830 --> 00:02:25,840
we have mathematical models that shows

66
00:02:28,229 --> 00:02:27,840
how it will fly at mars and we've tested

67
00:02:30,470 --> 00:02:28,239
it

68
00:02:31,910 --> 00:02:30,480
in the simulated environment that we can

69
00:02:34,790 --> 00:02:31,920
create on earth

70
00:02:36,470 --> 00:02:34,800
it really is time now to do the real

71
00:02:38,630 --> 00:02:36,480
flood types at mars

72
00:02:40,630 --> 00:02:38,640
nothing is a given but we have done

73
00:02:42,390 --> 00:02:40,640
everything we can in terms of a test

74
00:02:44,229 --> 00:02:42,400
program here on earth the vehicle is

75
00:02:45,830 --> 00:02:44,239
performing extremely well so far it's

76
00:02:47,509 --> 00:02:45,840
been doing exactly the right thing

77
00:02:49,190 --> 00:02:47,519
even right now and is bolted onto the

78
00:02:50,390 --> 00:02:49,200
perseverance rover so

79
00:02:53,589 --> 00:02:50,400
there's a very good chance that we'll

80
00:02:56,229 --> 00:02:53,599
pull it off yes but it's still high risk

81
00:02:57,350 --> 00:02:56,239
and none of us forget that you could

82
00:02:59,990 --> 00:02:57,360
have a glitch that

83
00:03:00,949 --> 00:03:00,000
you know could mean end of mission yes

84
00:03:03,990 --> 00:03:00,959
it's going to be

85
00:03:07,430 --> 00:03:04,000
exciting reacting to any surprises

86
00:03:10,630 --> 00:03:09,190
what's really most important is

87
00:03:13,750 --> 00:03:10,640
everything we're learning here

88
00:03:16,830 --> 00:03:13,760

is for the future roto craft systems