1
00:00:01,201 --> 00:00:04,303
Mars 2020 Supersonic Parachute
Test: Flight Test #1

2
00:00:04,336 --> 00:00:08,041
At 6:45 a.m. on October 4
NASA performed its first

3
00:00:08,074 --> 00:00:10,109
supersonic parachute test
in support of

4
00:00:10,142 --> 00:00:13,813
its upcoming Mars 2020 mission.

5
00:00:14,714 --> 00:00:17,016
The 58-foot-tall
sounding rocket launches

6
00:00:17,049 --> 00:00:18,785
off the eastern shore
of Virginia,

7
00:00:18,818 --> 00:00:21,254
out of NASA's Wallops
Flight Facility.

8
00:00:21,287 --> 00:00:23,256
This two-stage rocket
accelerates to

9
00:00:23,289 --> 00:00:25,091
over three times
the speed of sound

10
00:00:25,124 --> 00:00:27,360
and an altitude of
over 50 kilometers

11

00:00:27,393 --> 00:00:29,662
■or nearly halfway to
the edge of space.

12
00:00:31,831 --> 00:00:33,933
Once the second stage has
burned out,

13
00:00:33,966 --> 00:00:35,234
it separates from the payload

14
00:00:35,267 --> 00:00:38,237
and the payload continues to
the desired test condition.

15
00:00:39,705 --> 00:00:42,475
Onboard is a new payload
designed to test parachutes

16
00:00:42,508 --> 00:00:45,344
in a low-density environment
and at supersonic conditions

17
00:00:45,377 --> 00:00:48,247
analogous to what NASA's
Mars 2020 mission,

18
00:00:48,280 --> 00:00:50,783
America's next Mars rover,
would encounter

19
00:00:50,816 --> 00:00:52,618
as it comes through the
Martian atmosphere.

20
00:00:54,587 --> 00:00:56,889
As the payload dives
back into the atmosphere,

21
00:00:56,922 --> 00:01:00,126

the roar of the oncoming wind
becomes more audible.

22
00:01:00,159 --> 00:01:02,128
[wind sounds]

23
00:01:04,029 --> 00:01:06,532
Onboard computers detect that
it has achieved the proper

24
00:01:06,565 --> 00:01:09,102
test conditions and subsequently
deploy the parachute.

25
00:01:09,135 --> 00:01:10,870
[click]

26
00:01:10,903 --> 00:01:13,406
A hundred pounds of nylon,
Technora and Kevlar

27
00:01:13,439 --> 00:01:15,174
are shot out the
back of the vehicle

28
00:01:15,207 --> 00:01:17,143
at nearly 100 miles an hour.

29
00:01:20,012 --> 00:01:21,214
In slow motion■

30
00:01:21,247 --> 00:01:24,417
in video originally shot at a
thousand frames per second

31
00:01:24,450 --> 00:01:26,686
but played back here at
30 frames per second■

32

00:01:26,719 --> 00:01:29,455
we see the initial suspension
lines deploying out of the pack

33
00:01:29,488 --> 00:01:31,357
and taking the
parachute backwards

34
00:01:31,390 --> 00:01:33,993
where it will ultimately inflate
in nearly half a second.

35
00:01:38,030 --> 00:01:39,632
Researchers watching this video

36
00:01:39,665 --> 00:01:41,834
are observing the initial
motions of the fabric,

37
00:01:41,867 --> 00:01:43,336
the uniformity of
the inflation,

38
00:01:43,369 --> 00:01:44,704
and how symmetric it is.

39
00:01:44,737 --> 00:01:46,639
And they begin inferring
which areas may be

40
00:01:46,672 --> 00:01:48,341
more structurally
loaded or stressed

41
00:01:48,374 --> 00:01:50,243
than other areas
of the parachute.

42
00:01:50,276 --> 00:01:52,378
Every frame will be

examined closely

43
00:01:52,411 --> 00:01:54,780
to look for signs of damage
in any of the stitching

44
00:01:54,813 --> 00:01:56,516
used to hold the
canopy together.

45
00:01:59,785 --> 00:02:01,220
At the moment of full inflation

46
00:02:01,253 --> 00:02:03,823
the parachute is going 1.8 times
the speed of sound

47
00:02:03,856 --> 00:02:06,259
or nearly 1300
miles an hour

48
00:02:06,292 --> 00:02:09,962
and generating nearly 35,000
pounds of drag force■

49
00:02:09,995 --> 00:02:12,465
drag that would be necessary
to help slow a payload down

50
00:02:12,498 --> 00:02:14,333
as it was entering the
Martian atmosphere.

51
00:02:16,502 --> 00:02:18,704
This was the first of several
tests in support of

52
00:02:18,737 --> 00:02:21,007
NASA's Mars 2020 mission.

53
00:02:21,040 --> 00:02:23,209
The data obtained during
these tests are critical

54
00:02:23,242 --> 00:02:25,778
for better understanding the
environment and dynamics

55
00:02:25,811 --> 00:02:27,847
of a supersonic parachute
inflation at Mars.

56
00:02:29,048 --> 00:02:31,017
Additional imagery courtesy:
Tod Crady and Thomas Reed

57
00:02:31,751 --> 00:02:33,719
NASA Jet Propulsion Laboratory