1
00:00:01,760 --> 00:00:04,000
The payload consists of three
instruments

2
00:00:04,000 --> 00:00:10,719
an IMU, a camera and the
PNDL. The PNDL is Psionic

3
00:00:10,719 --> 00:00:14,799
navigation doppler lidar. There's a
technology developed at NASA

4
00:00:14,799 --> 00:00:18,480
a few years back and we have licensed
that technology from NASA and

5
00:00:18,480 --> 00:00:23,119
commercialized it
and by commercializing it we've changed

6
00:00:23,119 --> 00:00:27,279
the design
somewhat to make it smaller and

7
00:00:27,279 --> 00:00:32,239
more efficient and with more capability.
The optical head is what you see on the

8
00:00:32,239 --> 00:00:36,160
on the front of the vehicle when you're
looking at the payload

9
00:00:36,160 --> 00:00:39,920
and consists of the four telescopes that
look in different

10
00:00:39,920 --> 00:00:46,719
directions. A laser beam is sent out
and fine resolution

11
00:00:46,719 --> 00:00:51,840
velocity and range are measurements and
by having those measurements

12
00:00:51,840 --> 00:00:54,960
from different directions we can obtain
full

13
00:00:54,960 --> 00:00:59,680
three-dimensional vector velocity of the
trajectory of the vehicle relative to

14
00:00:59,680 --> 00:01:03,359
the ground.
And we can also obtain uh line of sight

15
00:01:03,359 --> 00:01:05,920
distance
measurements and from the distance

16
00:01:05,920 --> 00:01:10,799
measurements we can of course get
uh altitude. All right here we go Masten

17
00:01:10,799 --> 00:01:13,040
ops to all 6 second count to engine start...

18
00:01:13,760 --> 00:01:16,880
Now we can use that as part of the
navigation

19
00:01:16,880 --> 00:01:20,799
sensor suite

20
00:01:20,799 --> 00:01:28,720
to make very accurate
navigation or position and velocity

21
00:01:28,720 --> 00:01:35,040

estimates of the vehicle as it's landing.
So what that helps is to land in

22
00:01:35,040 --> 00:01:39,439
very precise predetermined locations for
example

23
00:01:39,439 --> 00:01:46,000
landing on the moon next to a crater
where water may be present or repeat

24
00:01:46,000 --> 00:01:52,479
landings in the same position
for different missions to the moon or

25
00:01:52,479 --> 00:01:58,000
other planetary bodies maybe mars in the
near future.

26
00:01:59,680 --> 00:02:03,119
Working with Masten allows us to
advance TRL,

27
00:02:03,119 --> 00:02:07,600
the readiness of the sensor because it's
all autonomous we can improve

28
00:02:07,600 --> 00:02:13,040
the algorithms that are used to
navigate autonomous vehicles synchronize

29
00:02:13,040 --> 00:02:16,480
and coordinate all the interfaces with
the mass and vehicles such that we have

30
00:02:16,480 --> 00:02:20,319
a
complete data simulation of landing

31
00:02:20,319 --> 00:02:24,160

trajectory.
This is only like a first step a next

32
00:02:24,160 --> 00:02:30,319
step for example would be to
actually start looking at how this data

33
00:02:30,319 --> 00:02:35,360
would directly be controlled with
the Masten navigation computer for

34
00:02:35,360 --> 00:02:40,000
example.
And with the end goal to use this

35
00:02:40,000 --> 00:02:44,319
data in a closed loop
and what i mean by that is use the

36
00:02:44,319 --> 00:02:48,640
velocity
data with their navigation computer

37
00:02:48,640 --> 00:02:54,080
to control their vehicle.
So we may have photography of the area

38
00:02:54,080 --> 00:02:58,560
we want to land
but once an autonomous vehicle is trying