1
00:00:06,470 --> 00:00:04,390
so understanding how vehicles behave

2
00:00:08,230 --> 00:00:06,480
during atmospheric re-entry will help

3
00:00:10,230 --> 00:00:08,240
give future spacecraft developers some

4
00:00:12,789 --> 00:00:10,240
unique information that can enhance

5
00:00:14,709 --> 00:00:12,799
their design efficiencies and safety

6
00:00:16,550 --> 00:00:14,719
one experiment that has had three

7
00:00:18,870 --> 00:00:16,560
successful flights to gather this never

8
00:00:20,950 --> 00:00:18,880
before collected information uh why

9
00:00:22,790 --> 00:00:20,960
don't we join lori meigs now out at the

10
00:00:24,310 --> 00:00:22,800
payload operations integration center at

11
00:00:26,550 --> 00:00:24,320
the marshall space flight center in

12
00:00:30,790 --> 00:00:26,560
huntsville alabama to learn more about

13
00:00:32,470 --> 00:00:30,800

the re-entry breakup recorder lori

14
00:00:34,549 --> 00:00:32,480
it's a wild ride for the re-entry

15
00:00:36,549 --> 00:00:34,559
breakup recorder but an important one it

16
00:00:38,630 --> 00:00:36,559
tests a system that rides a space

17
00:00:40,229 --> 00:00:38,640
vehicle then records data as it

18
00:00:41,510 --> 00:00:40,239
re-enters the atmosphere and breaks up

19
00:00:43,910 --> 00:00:41,520
and then it returns that data for

20
00:00:45,590 --> 00:00:43,920
analysis we spoke with andrew feistel

21
00:00:47,590 --> 00:00:45,600
from the aerospace corporation to find

22
00:00:51,430 --> 00:00:47,600
out more about this first of its kind

23
00:00:56,069 --> 00:00:53,270
we care about

24
00:00:58,229 --> 00:00:56,079
attaining reentry breakup data because

25
00:01:01,110 --> 00:00:58,239
there have been observational campaigns

26
00:01:05,109 --> 00:01:01,120
in the past that are watching re-entries

27
00:01:07,190 --> 00:01:05,119
from cameras kind of high-level

28
00:01:09,750 --> 00:01:07,200
things we could pull from that data but

29
00:01:12,950 --> 00:01:09,760
there's a real lack of real

30
00:01:15,590 --> 00:01:12,960
precise detailed real-time data that

31
00:01:18,310 --> 00:01:15,600
comes from the re-entering vehicle

32
00:01:20,870 --> 00:01:18,320
during that re-entry time frame

33
00:01:22,789 --> 00:01:20,880
that data is the data that

34
00:01:24,870 --> 00:01:22,799
reaver is recording and transmitting

35
00:01:26,870 --> 00:01:24,880
back to us how is it transmitted back to

36
00:01:28,230 --> 00:01:26,880
you if this is breaking up it is

37
00:01:29,190 --> 00:01:28,240
essentially

38
00:01:35,749 --> 00:01:29,200

a

39
00:01:38,230 --> 00:01:35,759
system

40
00:01:39,910 --> 00:01:38,240
and it does this all while still falling

41
00:01:43,270 --> 00:01:39,920
to the ground there's only a few minutes

42
00:01:45,350 --> 00:01:43,280
we have of data communication time but

43
00:01:47,990 --> 00:01:45,360
we get all of the data that we need that

44
00:01:49,830 --> 00:01:48,000
is essential about that initial reentry

45
00:01:50,630 --> 00:01:49,840
breakup process

46
00:01:53,190 --> 00:01:50,640
and

47
00:01:55,190 --> 00:01:53,200
comes to us on a website

48
00:01:57,350 --> 00:01:55,200
how many times have you flown this

49
00:01:59,830 --> 00:01:57,360
re-entry recorder there have been four

50
00:02:01,590 --> 00:01:59,840
flights all courtesy of iss resupply

51
00:02:03,109 --> 00:02:01,600
craft

52
00:02:04,630 --> 00:02:03,119
three of the four flights were

53
00:02:07,590 --> 00:02:04,640
successful

54
00:02:09,510 --> 00:02:07,600
don't know why

55
00:02:11,430 --> 00:02:09,520
never made the phone call but the three

56
00:02:13,110 --> 00:02:11,440
that were successful

57
00:02:15,910 --> 00:02:13,120
gave

58
00:02:17,910 --> 00:02:15,920
data such as temperature pressures

59
00:02:20,150 --> 00:02:17,920
rotation rates

60
00:02:23,190 --> 00:02:20,160
accelerations about the host vehicle

61
00:02:26,229 --> 00:02:23,200
that are helping us better define the

62
00:02:27,589 --> 00:02:26,239
survivability of future re-entering

63
00:02:30,150 --> 00:02:27,599

space vehicles

64
00:02:33,190 --> 00:02:30,160
so that is the goal to to find out

65
00:02:36,550 --> 00:02:33,200
how to to better our current models

66
00:02:38,390 --> 00:02:36,560
that are predicting survivability of

67
00:02:40,309 --> 00:02:38,400
space vehicles re-entering space

68
00:02:41,830 --> 00:02:40,319
vehicles what are you learning from the

69
00:02:43,030 --> 00:02:41,840
data

70
00:02:45,110 --> 00:02:43,040
well one of the main things we're

71
00:02:47,270 --> 00:02:45,120
learning from the data is is kind of

72
00:02:50,309 --> 00:02:47,280
these high-level altitude

73
00:02:52,309 --> 00:02:50,319
regions of which significant events are

74
00:02:53,190 --> 00:02:52,319
happening and we're seeing at least with

75
00:02:57,670 --> 00:02:53,200
these

76
00:03:00,949 --> 00:02:57,680
returned data

77
00:03:03,830 --> 00:03:00,959
the major significant breakup events

78
00:03:06,390 --> 00:03:03,840
tend to be happening about 74 to 70

79
00:03:08,229 --> 00:03:06,400
kilometers i call that out specifically

80
00:03:10,710 --> 00:03:08,239
because there's a historical 78

81
00:03:14,070 --> 00:03:10,720
kilometers that is used somewhat as an

82
00:03:16,390 --> 00:03:14,080
input to a lot of current modeling

83
00:03:18,710 --> 00:03:16,400
simulations and the

84
00:03:20,390 --> 00:03:18,720
the specific altitude that the breakup

85
00:03:22,790 --> 00:03:20,400
event occurs

86
00:03:25,110 --> 00:03:22,800
has a huge impact on the footprint the

87
00:03:26,789 --> 00:03:25,120
debris field when it goes down all the

88
00:03:29,830 --> 00:03:26,799

way to the ground

89
00:03:31,589 --> 00:03:29,840
i'm kind of like a shotgun the closer or

90
00:03:33,270 --> 00:03:31,599
further away from you the faster it will

91
00:03:35,030 --> 00:03:33,280
disperse

92
00:03:38,309 --> 00:03:35,040
the first data ever recorded during the

93
00:03:40,149 --> 00:03:38,319
breakup re-entry occurred on jax's htv-2

94
00:03:41,910 --> 00:03:40,159
vehicle after it departed the station

95
00:03:44,070 --> 00:03:41,920
now the data returned by river has

96
00:03:46,070 --> 00:03:44,080
helped calibrate re-entry breakup and

97
00:03:48,550 --> 00:03:46,080
re-entry hazard prediction models