1
00:00:13,070 --> 00:00:09,860
Columbia Houston we have a tally ho on l

2
00:00:16,820 --> 00:00:13,080
def called the long-duration exposure

3
00:00:19,130 --> 00:00:16,830
facility this 11-ton satellite had been

4
00:00:21,470 --> 00:00:19,140
in space for almost six years when a

5
00:00:24,740 --> 00:00:21,480
shovel frugal tree dipped and profits

6
00:00:27,890 --> 00:00:24,750
safely back to her prey touchdown or go

7
00:00:29,900 --> 00:00:27,900
home after delivery to the Kennedy Space

8
00:00:33,110 --> 00:00:29,910
Center in several months of close

9
00:00:36,200 --> 00:00:33,120
inspection l dev became an empty shell

10
00:00:38,090 --> 00:00:36,210
it's 57 external experiments were

11
00:00:40,280 --> 00:00:38,100
shipped to scientists around the globe

12
00:00:43,610 --> 00:00:40,290
including a group at NASA's Langley

13
00:00:46,100 --> 00:00:43,620

Research Center in Virginia the effects

14
00:00:48,260 --> 00:00:46,110
of long-term exposure to space can be

15
00:00:51,200 --> 00:00:48,270
seen in this materials and coatings

16
00:00:53,630 --> 00:00:51,210
experiment according to Wayne schlampe a

17
00:00:56,150 --> 00:00:53,640
senior engineer at Langley the various

18
00:00:58,670 --> 00:00:56,160
colorations and striping is evident on

19
00:01:01,459 --> 00:00:58,680
the surfaces here we're not present when

20
00:01:03,470 --> 00:01:01,469
L death was put in the world in fact the

21
00:01:06,350 --> 00:01:03,480
top of this panel looked exactly like

22
00:01:09,140 --> 00:01:06,360
its unexposed underside prior to the

23
00:01:10,940 --> 00:01:09,150
journey the goal is to determine the

24
00:01:13,310 --> 00:01:10,950
significance of these changes so that

25
00:01:17,350 --> 00:01:13,320
future spacecraft and structures can be

26
00:01:20,149 --> 00:01:17,360
built with the best possible materials

27
00:01:22,760 --> 00:01:20,159
Don Humes a Langley aerospace

28
00:01:24,430 --> 00:01:22,770
technologist had 22 aluminum panels

29
00:01:27,220 --> 00:01:24,440
positioned around

30
00:01:30,570 --> 00:01:27,230
their mission was simple be struck by

31
00:01:32,890 --> 00:01:30,580
micro meteoroids another man-made debris

32
00:01:34,600 --> 00:01:32,900
determining how many particles are out

33
00:01:37,060 --> 00:01:34,610
there where they are and what they're

34
00:01:41,880 --> 00:01:37,070
made of is critical in designing future

35
00:01:46,930 --> 00:01:44,590
research scientist Gale Harvey is

36
00:01:49,630 --> 00:01:46,940
discovering the de thermal control paint

37
00:01:53,050 --> 00:01:49,640
used almost universally on spacecraft

38
00:01:55,180 --> 00:01:53,060

can contaminate optical materials this

39
00:01:57,130 --> 00:01:55,190
unexpected brown staining will almost

40
00:01:59,710 --> 00:01:57,140
certainly result in an across-the-board

41
00:02:03,970 --> 00:01:59,720
change in surface coatings for space

42
00:02:06,580 --> 00:02:03,980
applications learning more about cosmic

43
00:02:08,560 --> 00:02:06,590
rays as the goal of an l def experiment

44
00:02:11,830 --> 00:02:08,570
at the naval research lab in Washington

45
00:02:14,470 --> 00:02:11,840
DC according to physicist Jim Adams

46
00:02:17,020 --> 00:02:14,480
cosmic rays are fast-moving particles

47
00:02:20,290 --> 00:02:17,030
that can penetrate human skin and

48
00:02:22,120 --> 00:02:20,300
disrupt onboard computers another factor

49
00:02:25,210 --> 00:02:22,130
to be considered in developing future

50
00:02:26,830 --> 00:02:25,220
space hardware technologically what will

51
00:02:29,500 --> 00:02:26,840
come out of L death is a set of

52
00:02:32,590 --> 00:02:29,510
handbooks which will be the Bible for

53
00:02:34,660 --> 00:02:32,600
how spacecraft are built for the next 20

54
00:02:36,250 --> 00:02:34,670
or 30 years I think would be a very long

55
00:02:37,720 --> 00:02:36,260
time before there's an opportunity to

56
00:02:39,940 --> 00:02:37,730
fly such a large spacecraft for such a

57
00:02:42,310 --> 00:02:39,950
long time and learn so much about the

58
00:02:45,100 --> 00:02:42,320
effects of the space environment more

59
00:02:47,290 --> 00:02:45,110
than 12 million tomato seeds carried on

60
00:02:49,930 --> 00:02:47,300
Al def have been distributed to students

61
00:02:52,000 --> 00:02:49,940
of all ages around the country

62
00:02:54,340 --> 00:02:52,010
the majority of the plants eventually

63
00:02:56,860 --> 00:02:54,350

produced my way through and the second

64
00:02:59,200 --> 00:02:56,870
generation mistake in addition to

65
00:03:01,630 --> 00:02:59,210
providing valuable information about the

66
00:03:03,670 --> 00:03:01,640
effects of space on living matter the

67
00:03:08,440 --> 00:03:03,680
scenes project is designed to excite

68
00:03:11,530 --> 00:03:08,450
young people about science the

69
00:03:13,900 --> 00:03:11,540
long-duration exposure facility six

70
00:03:16,510 --> 00:03:13,910
years of unparalleled information