1
00:00:05,349 --> 00:00:03,590
we are here in uh building 32 which is

2
00:00:07,269 --> 00:00:05,359
where our chamber bee

3
00:00:08,870 --> 00:00:07,279
is one of the vacuum chambers we have

4
00:00:11,669 --> 00:00:08,880
here at johnson space center that's

5
00:00:13,190 --> 00:00:11,679
rated to be used by humans uh one of the

6
00:00:14,950 --> 00:00:13,200
ways that we simulate space here on

7
00:00:17,670 --> 00:00:14,960
earth and with us we've got christina

8
00:00:19,590 --> 00:00:17,680
enchando who is the test director for um

9
00:00:21,510 --> 00:00:19,600
some tests we've been doing with the z1

10
00:00:23,109 --> 00:00:21,520
space suit that we have here behind us

11
00:00:24,230 --> 00:00:23,119
and the suitport thanks so much for

12
00:00:25,589 --> 00:00:24,240
joining us christina thank you for

13
00:00:28,470 --> 00:00:25,599

having me how are you doing today i'm

14
00:00:30,390 --> 00:00:28,480
doing well good good um so

15
00:00:31,750 --> 00:00:30,400
obviously we're not at vacuum but we are

16
00:00:33,430 --> 00:00:31,760
in a vacuum chamber why don't we start

17
00:00:35,510 --> 00:00:33,440
there tell us what a vacuum chamber kind

18
00:00:37,510 --> 00:00:35,520
of does and and why we would do a test

19
00:00:39,670 --> 00:00:37,520
in it okay well we use the vacuum

20
00:00:42,229 --> 00:00:39,680
chambers to simulate space

21
00:00:44,709 --> 00:00:42,239
we will during a test we would remove

22
00:00:47,590 --> 00:00:44,719
all the air inside the chamber reducing

23
00:00:50,709 --> 00:00:47,600
the pressure inside just to get give us

24
00:00:52,869 --> 00:00:50,719
a feel for that the environment of space

25
00:00:54,470 --> 00:00:52,879
and there are multiple reasons why we

26
00:00:56,310 --> 00:00:54,480
would want to test in space one we want

27
00:00:58,630 --> 00:00:56,320
to make sure that our hardware

28
00:01:01,430 --> 00:00:58,640
will survive the environment of space

29
00:01:03,990 --> 00:01:01,440
and uh also for uh being able to get a

30
00:01:06,630 --> 00:01:04,000
fit uh a feel for the for the for the

31
00:01:09,350 --> 00:01:06,640
suit and how um how it would operate

32
00:01:10,870 --> 00:01:09,360
okay in a space-like environment so this

33
00:01:13,270 --> 00:01:10,880
okay let's kind of go one piece at a

34
00:01:15,429 --> 00:01:13,280
time here z1 suit this is the c1 suit

35
00:01:17,749 --> 00:01:15,439
new suit we're designing for exploration

36
00:01:20,149 --> 00:01:17,759
yes so we want to do different things

37
00:01:21,670 --> 00:01:20,159
when we go into future exploration

38
00:01:23,990 --> 00:01:21,680

on the space station you use your hands

39
00:01:25,830 --> 00:01:24,000
a lot for exploration if you're going to

40
00:01:27,590 --> 00:01:25,840
say an asteroid or mars you would be

41
00:01:29,030 --> 00:01:27,600
walking around a lot

42
00:01:30,950 --> 00:01:29,040
and that requires different space suits

43
00:01:32,950 --> 00:01:30,960
so we're working on a new design and

44
00:01:34,550 --> 00:01:32,960
then we also uh part of the design is

45
00:01:37,030 --> 00:01:34,560
that it would be incorporated with a

46
00:01:38,390 --> 00:01:37,040
space a suit port and tell us a little

47
00:01:39,670 --> 00:01:38,400
bit about a suit port what does that do

48
00:01:41,429 --> 00:01:39,680
well the suit port is the interface

49
00:01:43,910 --> 00:01:41,439
between your space vehicle and the

50
00:01:46,230 --> 00:01:43,920
exploration suit uh so this would the

51
00:01:49,350 --> 00:01:46,240
support allows you to quickly

52
00:01:51,109 --> 00:01:49,360
get into the suit and be ready for

53
00:01:52,550 --> 00:01:51,119
exploring

54
00:01:54,710 --> 00:01:52,560
so right here it looks kind of it's kind

55
00:01:56,709 --> 00:01:54,720
of against a wall but in real life in

56
00:01:59,270 --> 00:01:56,719
the future it would be on the end or on

57
00:02:01,030 --> 00:01:59,280
the outside of a vehicle a rover or a

58
00:02:03,350 --> 00:02:01,040
spaceship of some sort that's right this

59
00:02:05,749 --> 00:02:03,360
will be hanging off the back um outside

60
00:02:07,749 --> 00:02:05,759
while the crew the astronauts are inside

61
00:02:09,510 --> 00:02:07,759
and then they can open this part up

62
00:02:11,990 --> 00:02:09,520
right and then climb in from the back

63
00:02:14,710 --> 00:02:12,000

yes there's a hatch on the other side so

64
00:02:16,710 --> 00:02:14,720
you would open the hatch get inside

65
00:02:19,350 --> 00:02:16,720
close the hatch and then the

66
00:02:21,110 --> 00:02:19,360
the volume inside is equalized with the

67
00:02:23,750 --> 00:02:21,120
outside with the outside environment and

68
00:02:27,190 --> 00:02:23,760
that allows you to detach from the suit

69
00:02:29,190 --> 00:02:27,200
port and begin exploring okay and um

70
00:02:31,589 --> 00:02:29,200
let's see we were talking earlier about

71
00:02:33,589 --> 00:02:31,599
vacuum um obviously on the outside in

72
00:02:35,430 --> 00:02:33,599
space this part where we are now would

73
00:02:37,190 --> 00:02:35,440
be at a vacuum but inside it would be a

74
00:02:38,710 --> 00:02:37,200
little bit lower air pressure than we

75
00:02:40,309 --> 00:02:38,720
have on the space station that's about

76
00:02:41,910 --> 00:02:40,319
sea level it'd be lower because it's

77
00:02:43,910 --> 00:02:41,920
smaller volume we can keep it lower and

78
00:02:46,150 --> 00:02:43,920
then this is the same at the same air

79
00:02:47,750 --> 00:02:46,160
pressure which makes it quicker we don't

80
00:02:49,110 --> 00:02:47,760
have to do a pre-re-protocol like you've

81
00:02:52,630 --> 00:02:49,120
probably seen for spacewalks if you

82
00:02:54,229 --> 00:02:52,640
watch nasa tv right right okay um so

83
00:02:55,990 --> 00:02:54,239
tell us how the tests work what what

84
00:02:57,509 --> 00:02:56,000
what have you all been having

85
00:03:00,390 --> 00:02:57,519
done here what have we been doing this

86
00:03:02,630 --> 00:03:00,400
week uh so this is a different design of

87
00:03:06,470 --> 00:03:02,640
support so a couple of months ago we

88
00:03:08,550 --> 00:03:06,480

were testing a a support design that had

89
00:03:11,509 --> 00:03:08,560
clamps on it and they were actuated by a

90
00:03:14,229 --> 00:03:11,519
motor this support design does not use a

91
00:03:15,990 --> 00:03:14,239
motor it uses airbags and

92
00:03:19,350 --> 00:03:16,000
flippers

93
00:03:21,750 --> 00:03:19,360
and so it's it's seeming to its work

94
00:03:25,030 --> 00:03:21,760
it's been working very well um in order

95
00:03:27,190 --> 00:03:25,040
to undock from the support we'll put air

96
00:03:29,110 --> 00:03:27,200
into these airbags and the flippers

97
00:03:31,430 --> 00:03:29,120
would rotate into the undock position

98
00:03:34,229 --> 00:03:31,440
releasing the the subject so we've been

99
00:03:36,869 --> 00:03:34,239
kind of practicing that evaluating the

100
00:03:37,670 --> 00:03:36,879
suitport and at the same time evaluating

101
00:03:43,110 --> 00:03:37,680
the

102
00:03:45,030 --> 00:03:43,120
come out

103
00:03:46,470 --> 00:03:45,040
bend over see if they could

104
00:03:48,630 --> 00:03:46,480
adjust their boots

105
00:03:50,869 --> 00:03:48,640
and turn around inspect their support

106
00:03:53,030 --> 00:03:50,879
make sure everything's okay and practice

107
00:03:53,910 --> 00:03:53,040
re-docking to the suit port okay so

108
00:03:55,830 --> 00:03:53,920
you've had

109
00:03:57,670 --> 00:03:55,840
engineers and astronauts yes on the

110
00:03:59,509 --> 00:03:57,680
other side of this wall yes yes inside

111
00:04:02,070 --> 00:03:59,519
the suit we've had engineering test

112
00:04:05,830 --> 00:04:02,080
subjects as well as crew okay and they

113
00:04:07,110 --> 00:04:05,840

climb in and like you said just kind of

114
00:04:09,429 --> 00:04:07,120
do the

115
00:04:11,350 --> 00:04:09,439
lever to release themselves and walk

116
00:04:13,830 --> 00:04:11,360
away and then basically

117
00:04:16,150 --> 00:04:13,840
redo it and get back out yes so and that

118
00:04:18,310 --> 00:04:16,160
helps you just make sure that this this

119
00:04:20,789 --> 00:04:18,320
idea of the suit port works and yes it's

120
00:04:22,950 --> 00:04:20,799
it's to dem it's to demonstrate um

121
00:04:25,189 --> 00:04:22,960
pressurized donning of the suit for one

122
00:04:27,030 --> 00:04:25,199
so during the test the chamber is at

123
00:04:28,950 --> 00:04:27,040
reduced pressure creating a pressure

124
00:04:30,950 --> 00:04:28,960
differential across the suit

125
00:04:33,030 --> 00:04:30,960
so the the test subject would don a

126
00:04:34,790 --> 00:04:33,040
pressurized suit so we're evaluating how

127
00:04:36,310 --> 00:04:34,800
well that works because it's uh it's

128
00:04:37,189 --> 00:04:36,320
different it's different than what we do

129
00:04:39,670 --> 00:04:37,199
now

130
00:04:42,870 --> 00:04:39,680
and the other part of the evaluation is

131
00:04:45,590 --> 00:04:42,880
to just evaluate the donning the docking

132
00:04:47,189 --> 00:04:45,600
and undocking of the support

133
00:04:48,629 --> 00:04:47,199
in the pressurized suit so right now the

134
00:04:49,990 --> 00:04:48,639
suit is not pressurized the suit is not

135
00:04:52,950 --> 00:04:50,000
pressurized how is it different when it

136
00:04:54,950 --> 00:04:52,960
is it gets uh stiffer

137
00:04:58,070 --> 00:04:54,960
it'll start inflating like a like a

138
00:04:59,270 --> 00:04:58,080

balloon as we reduce the pressure

139
00:05:00,870 --> 00:04:59,280
and so that's something you really can't

140
00:05:02,070 --> 00:05:00,880
test outside of a vacuum chamber that's

141
00:05:03,350 --> 00:05:02,080
right and you want to know how that's

142
00:05:05,110 --> 00:05:03,360
going to work before you go into space

143
00:05:06,310 --> 00:05:05,120
definitely for the first time but

144
00:05:07,909 --> 00:05:06,320
everything's going well so far it is

145
00:05:10,469 --> 00:05:07,919
it's been it's been going very well

146
00:05:12,469 --> 00:05:10,479
we're very excited we've had uh two uh

147
00:05:14,230 --> 00:05:12,479
test subjects come through this week and

148
00:05:15,590 --> 00:05:14,240
we expect three more next

149
00:05:17,430 --> 00:05:15,600
and i think this is kind of the the

150
00:05:19,029 --> 00:05:17,440
final milestone of the year for y'all

151
00:05:20,870 --> 00:05:19,039
right yes and

152
00:05:22,950 --> 00:05:20,880
kind of all of your work's been leading

153
00:05:24,710 --> 00:05:22,960
up to proving that the support works and

154
00:05:25,909 --> 00:05:24,720
and we think that it does right yes so

155
00:05:28,629 --> 00:05:25,919
hopefully we'll be seeing that in the