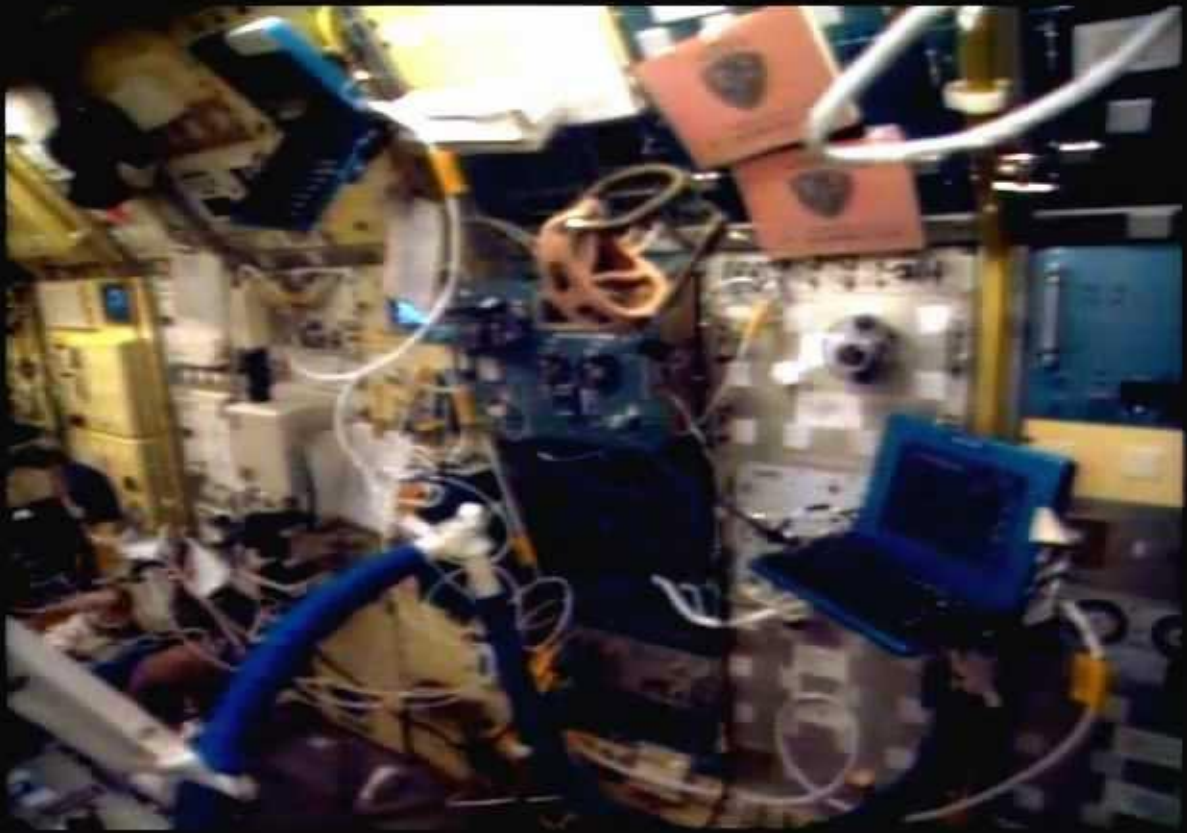

1
00:01:27,329 --> 00:01:34,030
that

2
00:01:47,490 --> 00:01:36,620
and once again we have live downlink

3
00:01:47,500 --> 00:03:53,000
or support team

4
00:07:02,090 --> 00:04:21,319
you

5
00:07:05,939 --> 00:07:04,500
this is Spacelab mission operations

6
00:07:08,340 --> 00:07:05,949
control we are now receiving live

7
00:07:20,990 --> 00:07:08,350
downlink from orbiter Columbia this view

8
00:07:31,280 --> 00:07:29,300
go ahead for the daily status check once

9
00:07:32,810 --> 00:07:31,290
again we're continuing to receive live

10
00:07:35,450 --> 00:07:32,820
downlink from the space lab module

11
00:07:36,940 --> 00:07:35,460
inside Columbia's cargo bay and the view

12
00:07:39,800 --> 00:07:36,950
we're seeing here is coming from a

13
00:07:42,470 --> 00:07:39,810

camera that is mounted in the aft end of

14
00:07:45,260 --> 00:07:42,480
the space lab module this camera is

15
00:07:47,780 --> 00:07:45,270
looking forward in the module and so we

16
00:07:50,870 --> 00:07:47,790
are seeing the right-hand side or the

17
00:07:54,080 --> 00:07:50,880
starboard side of the space lab module

18
00:07:56,030 --> 00:07:54,090
and just if you point out a few of the

19
00:07:58,220 --> 00:07:56,040
things we're seeing in this view if we

20
00:08:02,420 --> 00:07:58,230
look at the left-hand most part of the

21
00:08:05,840 --> 00:08:02,430
of the view here we see the like yellow

22
00:08:09,550 --> 00:08:05,850
to yellow boxes and what those are is

23
00:08:12,440 --> 00:08:09,560
that is where the Space Lab VCRs are

24
00:08:14,300 --> 00:08:12,450
located those VCRs used to record all

25
00:08:17,500 --> 00:08:14,310
the video that comes from these cameras

26
00:08:20,390 --> 00:08:17,510
that we are seeing we only get portions

27
00:08:22,430 --> 00:08:20,400
small opportunity to opportunities to

28
00:08:24,350 --> 00:08:22,440
get this video downlink and so those

29
00:08:27,010 --> 00:08:24,360
video recorders are used to record all

30
00:08:30,469 --> 00:08:27,020
the video that those cameras take and

31
00:08:32,360 --> 00:08:30,479
then moving more to the just to the

32
00:08:35,779 --> 00:08:32,370
right we see the bubble drop in particle

33
00:08:39,469 --> 00:08:35,789
unit unit experiment that again is one

34
00:08:42,130 --> 00:08:39,479
of the facilities that is uses the crew

35
00:08:45,579 --> 00:08:42,140
to load the different test chambers and

36
00:08:47,870 --> 00:08:45,589
initiate the test runs and then the

37
00:08:50,270 --> 00:08:47,880
experiments are the test runs are then

38
00:08:52,070 --> 00:08:50,280

remotely commanded to and operated from

39
00:08:54,980 --> 00:08:52,080
here on the ground at Space Lab mission

40
00:08:56,510 --> 00:08:54,990
operations control and further to the

41
00:08:59,360 --> 00:08:56,520
right almost directly in the center of

42
00:09:02,510 --> 00:08:59,370
your screen in the green-colored rack is

43
00:09:05,270 --> 00:09:02,520
what is that is where the astronaut lung

44
00:09:07,190 --> 00:09:05,280
function experiment is located again

45
00:09:10,329 --> 00:09:07,200
that experiment is studying the effects

46
00:09:16,460 --> 00:09:10,339
of weightlessness on the human pulmonary

47
00:09:18,530 --> 00:09:16,470
system and just on the bottom left-hand

48
00:09:21,260 --> 00:09:18,540
side of your screen you can see one of

49
00:09:23,090 --> 00:09:21,270
the crew members this particular one

50
00:09:25,490 --> 00:09:23,100
being payload specialist Bob Thirsk who

51
00:09:27,829 --> 00:09:25,500
is performing activities in the torque

52
00:10:08,639 --> 00:09:27,839
velocity dynamometer which is located in

53
00:10:13,920 --> 00:10:11,790
dr. Douglas what of mcgill university in

54
00:10:16,619 --> 00:10:13,930
montreal is the chief scientist behind

55
00:10:18,179 --> 00:10:16,629
the tree experiments his devoted as

56
00:10:20,460 --> 00:10:18,189
careers trying to understand how the

57
00:10:23,069 --> 00:10:20,470
vestibular system or our inner ears

58
00:10:25,859 --> 00:10:23,079
balance and orientation Center how its

59
00:10:28,980 --> 00:10:25,869
functions and how specifically it adapts

60
00:10:31,169 --> 00:10:28,990
to a weightless environment the idea for

61
00:10:33,900 --> 00:10:31,179
the torso rotation experiment first came

62
00:10:35,489 --> 00:10:33,910
to dr. watts several years ago when one

63
00:10:37,530 --> 00:10:35,499

of his colleagues suffered an injury

64
00:10:40,859 --> 00:10:37,540
that required the wearing of a rigid

65
00:10:42,449 --> 00:10:40,869
next place the colleague mission to dr.

66
00:10:43,980 --> 00:10:42,459
Watson after a few minutes of walking

67
00:10:47,819 --> 00:10:43,990
around on the laboratory began to

68
00:10:50,730 --> 00:10:47,829
develop symptoms of nausea muscle

69
00:10:53,549 --> 00:10:50,740
location is a term that we use to

70
00:10:56,040 --> 00:10:53,559
describe a person who rigidly fixes

71
00:10:57,449 --> 00:10:56,050
their head to their torso and such that

72
00:10:58,889 --> 00:10:57,459
when they have to turn their head to the

73
00:11:02,340 --> 00:10:58,899
right or to the left they have to turn

74
00:11:05,489 --> 00:11:02,350
their whole torso as well what's the

75
00:11:07,019 --> 00:11:05,499
rotation is example of an abnormal motor

76
00:11:08,699 --> 00:11:07,029
strategy in which the subject

77
00:11:10,739 --> 00:11:08,709
concentrates on a body frame of

78
00:11:13,590 --> 00:11:10,749
reference rather than the external world

79
00:11:15,119 --> 00:11:13,600
and this causes us to suppress the

80
00:11:18,900 --> 00:11:15,129
normal way that our vestibular apparatus

81
00:11:21,329 --> 00:11:18,910
in our brain likes to operate another

82
00:11:22,919 --> 00:11:21,339
good example of suppressing the normal

83
00:11:25,110 --> 00:11:22,929
way that our brain and vestibular system

84
00:11:27,030 --> 00:11:25,120
likes to operate is someone who's trying

85
00:11:30,059 --> 00:11:27,040
to read a book inside a car that is

86
00:11:31,439 --> 00:11:30,069
moving down a twisty country road ball

87
00:11:34,139 --> 00:11:31,449
would be bumped around all over the

88
00:11:36,239 --> 00:11:34,149

place of product focus on the books when

89
00:11:37,919 --> 00:11:36,249
really our brains and our vestibular

90
00:11:39,600 --> 00:11:37,929
apparatus would like to make reference

91
00:11:41,669 --> 00:11:39,610
to the X the world at that we see

92
00:11:43,230 --> 00:11:41,679
outside the window and as you know

93
00:11:45,600 --> 00:11:43,240
several people who try to read books

94
00:11:49,439 --> 00:11:45,610
inside moving cars become motion sick as

95
00:11:52,289 --> 00:11:49,449
well what is interesting to dr. wat is

96
00:11:55,199 --> 00:11:52,299
that astronauts tend to inadvertently

97
00:11:56,610 --> 00:11:55,209
develop a torso rotation motor strategy

98
00:11:59,549 --> 00:11:56,620
as well during the first couple of days

99
00:12:01,379 --> 00:11:59,559
of spaceflight and we probably do this

100
00:12:03,710 --> 00:12:01,389
to try to minimize our symptoms of

101
00:12:07,439 --> 00:12:03,720
motion sickness but in fact we might be

102
00:12:10,019 --> 00:12:07,449
exacerbating the symptoms the doctor

103
00:12:11,850 --> 00:12:10,029
Watts torso rotation experiment study on

104
00:12:14,549 --> 00:12:11,860
the life and microgravity Space Lab

105
00:12:17,039 --> 00:12:14,559
mission we are going to be measuring our

106
00:12:20,199 --> 00:12:17,049
eye movements with special electrodes

107
00:12:24,249 --> 00:12:20,209
that we apply to our faith

108
00:12:29,679 --> 00:12:24,259
the special velocity rate center that we

109
00:12:32,280 --> 00:12:29,689
rigidly fixed to the top of our head it

110
00:12:34,809 --> 00:12:32,290
also will be measuring our torso

111
00:12:36,999 --> 00:12:34,819
movements as well with the special

112
00:12:42,369 --> 00:12:37,009
backpack accelerometer which is fixed to

113
00:12:44,290 --> 00:12:42,379

our back after the flight is over dr.

114
00:12:46,269 --> 00:12:44,300
what is going to compare our eye

115
00:12:48,129 --> 00:12:46,279
movements to our head movements and our

116
00:12:49,840 --> 00:12:48,139
head movements to our chest movements

117
00:12:52,329 --> 00:12:49,850
and he'll be looking for any evidence

118
00:12:54,160 --> 00:12:52,339
that we might have adopted some torso

119
00:12:56,859 --> 00:12:54,170
rotation motor strategy during this

120
00:12:58,449 --> 00:12:56,869
flight will be doing this experiment was

121
00:13:00,489 --> 00:12:58,459
early in the mission we've already done

122
00:13:02,559 --> 00:13:00,499
it exactly towards the middle of the

123
00:13:05,109 --> 00:13:02,569
flights a couple of days and again

124
00:13:08,379 --> 00:13:05,119
towards the last day or two of the space

125
00:13:10,509 --> 00:13:08,389
mission if it turns out in fact that

126
00:13:12,850 --> 00:13:10,519
we'd have a dot to torso rotation motor

127
00:13:14,439 --> 00:13:12,860
strategy during the flight which might

128
00:13:16,449 --> 00:13:14,449
cause symptoms of motion sickness

129
00:13:18,730 --> 00:13:16,459
that'll be relatively easy to train

130
00:13:22,290 --> 00:13:18,740
future astronauts to avoid this type of

131
00:13:25,150 --> 00:13:22,300
motor strategy or to pre adapt them to

132
00:13:26,980 --> 00:13:25,160
the atypical movement environment or in

133
00:13:29,980 --> 00:13:26,990
a ground-based laboratory prior to

134
00:13:32,619 --> 00:13:29,990
flight well that's what the torso

135
00:13:35,049 --> 00:13:32,629
rotation experiments is all about if you

136
00:13:37,720 --> 00:13:35,059
see us in downly video over the next few

137
00:13:40,989 --> 00:13:37,730
days wearing strange-looking apparatus

138
00:13:42,579 --> 00:13:40,999

on our head or on our chest you know

139
00:13:44,379 --> 00:13:42,589
that will be just checking out to see

140
00:13:46,989 --> 00:13:44,389
that whether or not we are trying to

141
00:13:48,819 --> 00:13:46,999
unconsciously suppress the normal way

142
00:13:51,730 --> 00:13:48,829
that our vestibular apparatus likes to

143
00:13:54,100 --> 00:13:51,740
operate well that's it today from the

144
00:13:56,259 --> 00:13:54,110
space shuttle columbia tune in tomorrow

145
00:14:46,470 --> 00:13:56,269
to learn what are the other exciting

146
00:14:53,590 --> 00:14:49,390
now in view of from Columbia the outer