1
00:00:12,150 --> 00:00:09,270
good morning and welcome to space lab j

2
00:00:13,910 --> 00:00:12,160
crew post flight press conference i'd

3
00:00:15,030 --> 00:00:13,920
like to turn the program over to the

4
00:00:17,430 --> 00:00:15,040
commander

5
00:00:19,830 --> 00:00:17,440
hoot gibson go ahead

6
00:00:21,429 --> 00:00:19,840
thank you barbara good morning and uh

7
00:00:23,509 --> 00:00:21,439
thank you for the opportunity to speak

8
00:00:25,910 --> 00:00:23,519
to you after the conclusion of a very

9
00:00:28,230 --> 00:00:25,920
successful mission uh we of course are

10
00:00:30,630 --> 00:00:28,240
the crew of space lab j

11
00:00:32,229 --> 00:00:30,640
uh sts-47

12
00:00:34,150 --> 00:00:32,239
which of course was the 50th flight of

13
00:00:36,389 --> 00:00:34,160

the space shuttle and i'd like to

14
00:00:40,069 --> 00:00:36,399
reintrodu introduce the crew

15
00:00:42,470 --> 00:00:40,079
uh right to my right our mission pilot

16
00:00:44,389 --> 00:00:42,480
major kurt brown

17
00:00:46,069 --> 00:00:44,399
who was making his first flight aboard

18
00:00:48,470 --> 00:00:46,079
space lab j

19
00:00:49,990 --> 00:00:48,480
our payload commander mission specialist

20
00:00:52,229 --> 00:00:50,000
number one

21
00:00:54,069 --> 00:00:52,239
mark lee making a second flight aboard

22
00:00:55,430 --> 00:00:54,079
space lab j

23
00:00:57,189 --> 00:00:55,440
our flight engineer or mission

24
00:00:59,270 --> 00:00:57,199
specialist number two

25
00:01:00,790 --> 00:00:59,280
jf making his second fight on this

26
00:01:04,310 --> 00:01:00,800
mission

27
00:01:07,910 --> 00:01:04,320
jan davis

28
00:01:10,469 --> 00:01:07,920
making her first flight aboard sts-47

29
00:01:13,910 --> 00:01:10,479
our mission specialist number four dr

30
00:01:16,630 --> 00:01:13,920
may jemison making her first flight

31
00:01:18,630 --> 00:01:16,640
and our payload specialist number one

32
00:01:21,109 --> 00:01:18,640
dr mamuru mori

33
00:01:24,710 --> 00:01:21,119
uh the first japanese astronaut making

34
00:01:26,230 --> 00:01:24,720
his first fight aboard sts-47

35
00:01:27,990 --> 00:01:26,240
we're here today to tell you our story

36
00:01:29,429 --> 00:01:28,000
to tell you the story of space lab j and

37
00:01:31,749 --> 00:01:29,439
i think we can best do that with some of

38
00:01:34,230 --> 00:01:31,759

the images from the mission so

39
00:01:36,870 --> 00:01:34,240
with that if we can uh start the video

40
00:01:38,710 --> 00:01:36,880
uh the crew will describe the mission as

41
00:01:40,390 --> 00:01:38,720
we saw it

42
00:01:44,710 --> 00:01:40,400
using our video images and our still

43
00:01:49,429 --> 00:01:46,789
well at t-minus six seconds main engine

44
00:01:52,230 --> 00:01:49,439
was starting and uh shortly

45
00:02:01,510 --> 00:01:52,240
at t zero we started the 50th mission of

46
00:02:05,350 --> 00:02:03,190
once we clear the tower we begin our

47
00:02:07,510 --> 00:02:05,360
roll maneuver which puts us in the

48
00:02:09,669 --> 00:02:07,520
orbital plane that our mission would be

49
00:02:18,229 --> 00:02:09,679
in and that was 57 degrees of

50
00:02:22,229 --> 00:02:20,390
and shortly after liftoff

51
00:02:24,309 --> 00:02:22,239
we reached 20 000 feet and already by

52
00:02:25,670 --> 00:02:24,319
then we're at mach 1 and you'll be able

53
00:02:35,670 --> 00:02:25,680
to see some of the shock waves off the

54
00:02:39,910 --> 00:02:38,070
and not much longer after that about two

55
00:02:41,110 --> 00:02:39,920
minutes into the flight uh we've used

56
00:02:42,869 --> 00:02:41,120
all the energy we can get out of our

57
00:02:43,990 --> 00:02:42,879
solid rocket boosters and we separate

58
00:02:45,990 --> 00:02:44,000
from those

59
00:02:56,150 --> 00:02:46,000
and now we're only on the uh the main

60
00:03:00,790 --> 00:02:58,309
once we got up we turned our

61
00:03:02,470 --> 00:03:00,800
uh rocket ship into a spacecraft by

62
00:03:05,589 --> 00:03:02,480
opening the payload bay doors there and

63
00:03:09,830 --> 00:03:05,599

got ready uh to activate that laboratory

64
00:03:12,949 --> 00:03:11,430
and heading down the tunnel the more i

65
00:03:15,750 --> 00:03:12,959
look at this picture is kind of like

66
00:03:18,550 --> 00:03:15,760
taking the subway to work here

67
00:03:20,470 --> 00:03:18,560
it's about 20 feet long and

68
00:03:22,390 --> 00:03:20,480
it's fun to go down you just give a push

69
00:03:24,550 --> 00:03:22,400
off at one end you have to make a little

70
00:03:25,589 --> 00:03:24,560
jog as you go into

71
00:03:27,030 --> 00:03:25,599
the

72
00:03:29,509 --> 00:03:27,040
lab here and you can see you got to

73
00:03:31,670 --> 00:03:29,519
stick your hand out to stop

74
00:03:33,509 --> 00:03:31,680
a little bit but once you're in the lab

75
00:03:34,949 --> 00:03:33,519
we started activation we got back there

76
00:03:36,949 --> 00:03:34,959
about three and a half hours into the

77
00:03:38,070 --> 00:03:36,959
mission and the activation went very

78
00:03:40,309 --> 00:03:38,080
smoothly

79
00:03:41,750 --> 00:03:40,319
a relative started working on a material

80
00:03:43,990 --> 00:03:41,760
science experiment uh this is

81
00:03:45,350 --> 00:03:44,000
accessorization experiments using image

82
00:03:47,270 --> 00:03:45,360
mirror furnace

83
00:03:49,509 --> 00:03:47,280
and i became also a subject of four

84
00:03:51,110 --> 00:03:49,519
different japanese experiments

85
00:03:52,949 --> 00:03:51,120
this is a

86
00:03:55,110 --> 00:03:52,959
perceptual motor function experiment

87
00:03:57,350 --> 00:03:55,120
using a joystick and in those

88
00:03:58,789 --> 00:03:57,360

experiments scientists on the ground

89
00:04:03,670 --> 00:03:58,799
checked my eye movement while i

90
00:04:06,869 --> 00:04:05,429
twice a day of course we would hand over

91
00:04:08,470 --> 00:04:06,879
the vehicle we were working the dual

92
00:04:10,550 --> 00:04:08,480
shift mission we had the redshift in the

93
00:04:12,149 --> 00:04:10,560
blue ship so in the morning we'd hand

94
00:04:13,589 --> 00:04:12,159
over from blue to red

95
00:04:15,030 --> 00:04:13,599
in the evening we would hand over from

96
00:04:16,789 --> 00:04:15,040
red to blue

97
00:04:18,310 --> 00:04:16,799
handing over both the orbiter functions

98
00:04:20,509 --> 00:04:18,320
and the space lamp

99
00:04:22,550 --> 00:04:20,519
on the blue shift we did the free flow

100
00:04:24,310 --> 00:04:22,560
electrophoresis experiment which is a

101
00:04:26,230 --> 00:04:24,320
japanese experiment we're passing

102
00:04:28,550 --> 00:04:26,240
electrical current through

103
00:04:30,150 --> 00:04:28,560
some biological materials to separate

104
00:04:31,270 --> 00:04:30,160
them out according to their electric

105
00:04:33,110 --> 00:04:31,280
potential

106
00:04:34,870 --> 00:04:33,120
we had three of these experiments

107
00:04:37,350 --> 00:04:34,880
scheduled and we were able to do two

108
00:04:39,909 --> 00:04:37,360
extra ones during the flight so we feel

109
00:04:41,670 --> 00:04:39,919
like we had a really good experiment

110
00:04:44,150 --> 00:04:41,680
there very successful even though we did

111
00:04:45,590 --> 00:04:44,160
lose some of the downlink data

112
00:04:47,350 --> 00:04:45,600
one of the experiments that you've heard

113
00:04:49,189 --> 00:04:47,360

a lot about was lower body negative

114
00:04:50,870 --> 00:04:49,199
pressure and these are just images from

115
00:04:52,550 --> 00:04:50,880
the lower body negative pressure the

116
00:04:55,270 --> 00:04:52,560
objectives of that experiment was to

117
00:04:57,430 --> 00:04:55,280
really see how the heart adjusts to

118
00:04:58,950 --> 00:04:57,440
microgravity and to figure out can you

119
00:05:00,550 --> 00:04:58,960
use lower body negative pressure as a

120
00:05:02,950 --> 00:05:00,560
counter measure to help people to

121
00:05:04,790 --> 00:05:02,960
readjust when they come back some of the

122
00:05:07,430 --> 00:05:04,800
other experiments that we did that dealt

123
00:05:08,870 --> 00:05:07,440
with medical issues were fluid therapy

124
00:05:12,870 --> 00:05:08,880
system

125
00:05:15,350 --> 00:05:12,880
talked about

126
00:05:16,950 --> 00:05:15,360
can you produce iv fluids in space and

127
00:05:19,189 --> 00:05:16,960
whether or not you're able to

128
00:05:20,710 --> 00:05:19,199
successfully administer them but we did

129
00:05:22,390 --> 00:05:20,720
spend a lot of time working with lower

130
00:05:27,350 --> 00:05:22,400
body negative pressure and we got lots

131
00:05:30,629 --> 00:05:29,110
well the space lab crew was busy working

132
00:05:32,950 --> 00:05:30,639
back in the lab the orbiter crew was

133
00:05:35,270 --> 00:05:32,960
also busy on the mid deck we had several

134
00:05:36,950 --> 00:05:35,280
experiments that we ran

135
00:05:39,430 --> 00:05:36,960
one of these is the protein crystal

136
00:05:43,909 --> 00:05:39,440
growth which we see here being activated

137
00:05:47,830 --> 00:05:45,990
the another experiment we had going was

138
00:05:51,110 --> 00:05:47,840

a medical uh

139
00:05:52,710 --> 00:05:51,120
data take of energy utilization and we

140
00:05:54,870 --> 00:05:52,720
collected

141
00:05:57,749 --> 00:05:54,880
some blood samples tests for glucose and

142
00:05:59,909 --> 00:05:57,759
we logged all the food and water and

143
00:06:02,390 --> 00:05:59,919
some urine samples we took to better

144
00:06:03,830 --> 00:06:02,400
understand how the body actually uses

145
00:06:06,309 --> 00:06:03,840
the food that we intake while we're in

146
00:06:08,309 --> 00:06:06,319
zero-g environment

147
00:06:10,070 --> 00:06:08,319
the first thing i had to do in the body

148
00:06:12,230 --> 00:06:10,080
right after i woke up

149
00:06:13,510 --> 00:06:12,240
was to attack three different directors

150
00:06:16,150 --> 00:06:13,520
on my body

151
00:06:19,189 --> 00:06:16,160
except the fourth and fifth days i wore

152
00:06:22,710 --> 00:06:19,199
all the time a backpack called pms

153
00:06:24,790 --> 00:06:22,720
and to monitor my exocardiogram and

154
00:06:26,070 --> 00:06:24,800
retrograde wave and skin conductance

155
00:06:27,350 --> 00:06:26,080
level

156
00:06:28,790 --> 00:06:27,360
every day

157
00:06:30,070 --> 00:06:28,800
in the afternoon

158
00:06:32,790 --> 00:06:30,080
i wear this

159
00:06:35,189 --> 00:06:32,800
and i spent a couple of hours to

160
00:06:37,830 --> 00:06:35,199
conduct cell culture experiments using a

161
00:06:40,150 --> 00:06:37,840
specially designed culture kit

162
00:06:43,029 --> 00:06:40,160
and optical microscope

163
00:06:45,909 --> 00:06:43,039

we mainly observed how cells are

164
00:06:48,469 --> 00:06:45,919
developed under micro g and took many

165
00:06:50,469 --> 00:06:48,479
microscopic pictures

166
00:06:51,909 --> 00:06:50,479
i'm not sure if we had a record number

167
00:06:53,909 --> 00:06:51,919
of in-flight maintenance procedures but

168
00:06:56,629 --> 00:06:53,919
we did have some fairly critical ones

169
00:06:58,870 --> 00:06:56,639
early in the mission we had a water leak

170
00:07:00,710 --> 00:06:58,880
in the materials science rack and we

171
00:07:03,110 --> 00:07:00,720
went in there and it was a fairly simple

172
00:07:04,790 --> 00:07:03,120
thing to fix once we took the insulation

173
00:07:06,230 --> 00:07:04,800
away it was similar to just fixing a

174
00:07:07,909 --> 00:07:06,240
leaky faucet

175
00:07:10,070 --> 00:07:07,919
at home but it

176
00:07:11,990 --> 00:07:10,080
kept the loop intact and were able to

177
00:07:13,990 --> 00:07:12,000
continue with furnaces such as this

178
00:07:16,070 --> 00:07:14,000
which is the image mirror ferns

179
00:07:18,150 --> 00:07:16,080
it was one of the funded projects to

180
00:07:19,909 --> 00:07:18,160
work on on orbit because it was rather

181
00:07:21,270 --> 00:07:19,919
interactive you had to establish a melt

182
00:07:22,950 --> 00:07:21,280
zone in this particular scene we're

183
00:07:25,029 --> 00:07:22,960
putting a quartz tube

184
00:07:27,670 --> 00:07:25,039
around the sample and then once we got

185
00:07:30,469 --> 00:07:27,680
the image mirror closed we went ahead

186
00:07:32,230 --> 00:07:30,479
and brought the samples together and

187
00:07:33,990 --> 00:07:32,240
we bring them together so that the focus

188
00:07:36,870 --> 00:07:34,000

of the there's a light bulb in the back

189
00:07:39,110 --> 00:07:36,880
and also one in in the in the cover

190
00:07:41,189 --> 00:07:39,120
the focus of the energy is on the gap

191
00:07:43,909 --> 00:07:41,199
between the two samples

192
00:07:45,189 --> 00:07:43,919
this was one of them that we did we did

193
00:07:47,029 --> 00:07:45,199
two other

194
00:07:49,990 --> 00:07:47,039
experiments in the in the image mirror

195
00:07:51,110 --> 00:07:50,000
furnace one of them was a glass cube

196
00:07:53,589 --> 00:07:51,120
experiment

197
00:07:56,309 --> 00:07:53,599
this glass cube where the objective was

198
00:07:58,230 --> 00:07:56,319
to turn it into a glass sphere and do

199
00:07:59,029 --> 00:07:58,240
some measurements in this particular

200
00:08:00,790 --> 00:07:59,039
case

201
00:08:03,270 --> 00:08:00,800
the temperature got a little bit higher

202
00:08:04,710 --> 00:08:03,280
than we expected

203
00:08:06,390 --> 00:08:04,720
and i guess it's one of the reasons that

204
00:08:08,230 --> 00:08:06,400
you do experiments to try to understand

205
00:08:11,110 --> 00:08:08,240
the reaction to certain materials in

206
00:08:12,790 --> 00:08:11,120
zero gravity and the other one that was

207
00:08:14,230 --> 00:08:12,800
looks like it's very successful with our

208
00:08:16,150 --> 00:08:14,240
summer skype

209
00:08:18,629 --> 00:08:16,160
sample we have a sample here that's

210
00:08:20,950 --> 00:08:18,639
about oh it gets

211
00:08:23,029 --> 00:08:20,960
six to eight millimeters long

212
00:08:25,909 --> 00:08:23,039
in addition to the image furnace we also

213
00:08:28,070 --> 00:08:25,919

had some other major furnaces in the two

214
00:08:29,990 --> 00:08:28,080
material science racks we had four other

215
00:08:32,230 --> 00:08:30,000
major furnaces including this one which

216
00:08:34,469 --> 00:08:32,240
was a continuous heating furnace which

217
00:08:35,430 --> 00:08:34,479
had two heating chambers and two cooling

218
00:08:36,790 --> 00:08:35,440
chambers

219
00:08:38,310 --> 00:08:36,800
of course we also had the large

220
00:08:40,310 --> 00:08:38,320
isothermal furnace and the gradient

221
00:08:42,790 --> 00:08:40,320
heating furnace as well as our acoustic

222
00:08:44,710 --> 00:08:42,800
levitation furnace which were able to

223
00:08:45,670 --> 00:08:44,720
conduct our experiments because we had

224
00:08:49,910 --> 00:08:45,680
the

225
00:08:55,829 --> 00:08:49,920
racks for a total of 22 material science

226
00:08:59,829 --> 00:08:58,150
we had a couple of audio dosimeters that

227
00:09:01,590 --> 00:08:59,839
we kept in place in different parts of

228
00:09:03,910 --> 00:09:01,600
the orbiter every time i came back to do

229
00:09:05,990 --> 00:09:03,920
one uh the payload commander accused me

230
00:09:07,509 --> 00:09:06,000
of coming back to perform pilot science

231
00:09:09,350 --> 00:09:07,519
this is a little bit of pilot science

232
00:09:12,630 --> 00:09:09,360
that we're seeing right here

233
00:09:14,310 --> 00:09:12,640
and this is a study in angular momentum

234
00:09:16,230 --> 00:09:14,320
and of course we're all familiar with

235
00:09:17,509 --> 00:09:16,240
the way an ice skater

236
00:09:20,630 --> 00:09:17,519
starts out with their arms out and

237
00:09:22,790 --> 00:09:20,640
retracts their arms to increase the

238
00:09:24,389 --> 00:09:22,800

rotational speed and uh our pilot is

239
00:09:27,829 --> 00:09:24,399
here uh checking it out to see that it

240
00:09:29,910 --> 00:09:27,839
does in fact work in in weightlessness

241
00:09:38,470 --> 00:09:29,920
this spooled him up pretty good watch

242
00:09:43,910 --> 00:09:40,949
we had a relatively new piece of gear on

243
00:09:46,550 --> 00:09:43,920
board the bicycle odometer and this is

244
00:09:49,110 --> 00:09:46,560
really a wonderful contraption and we

245
00:09:51,670 --> 00:09:49,120
were able to use this up on the flight

246
00:09:55,030 --> 00:09:51,680
deck and it's quiet enough that we're

247
00:09:56,949 --> 00:09:55,040
able to to exercise during sleep periods

248
00:09:59,350 --> 00:09:56,959
well after a busy day doing experiments

249
00:10:00,870 --> 00:09:59,360
and uh working out we headed for the

250
00:10:03,990 --> 00:10:00,880
galley and the child up there is really

251
00:10:05,110 --> 00:10:04,000
pretty good here's mark making a meal

252
00:10:07,910 --> 00:10:05,120
and

253
00:10:10,310 --> 00:10:07,920
we were very fortunate to eat

254
00:10:13,110 --> 00:10:10,320
early and often during this mission

255
00:10:14,870 --> 00:10:13,120
and uh we all liked it and we found

256
00:10:17,430 --> 00:10:14,880
chopsticks up there pretty practical in

257
00:10:19,350 --> 00:10:17,440
zero g although you'll notice our

258
00:10:20,550 --> 00:10:19,360
japanese payload specialist is having

259
00:10:21,990 --> 00:10:20,560
cross-cultural experience he's the one

260
00:10:24,470 --> 00:10:22,000
using the spoon

261
00:10:26,630 --> 00:10:24,480
uh but we found uh curry rice up there

262
00:10:29,269 --> 00:10:26,640
with superb and uh i'm gonna recommend

263
00:10:31,430 --> 00:10:29,279

taking it uh as a standard item

264
00:10:33,030 --> 00:10:31,440
chopsticks were real good for most the

265
00:10:35,990 --> 00:10:33,040
foods we ate up there but not for all of

266
00:10:36,710 --> 00:10:36,000
them so we used other techniques

267
00:10:38,870 --> 00:10:36,720
for

268
00:10:40,870 --> 00:10:38,880
certain foods that we ate there and

269
00:10:42,550 --> 00:10:40,880
here you'll see it

270
00:10:45,190 --> 00:10:42,560
getting ready to get dark up there which

271
00:10:47,030 --> 00:10:45,200
of course it did 16 times a day and it

272
00:10:48,710 --> 00:10:47,040
uh it gets dark in a big hurry as you're

273
00:10:53,110 --> 00:10:48,720
just about to see

274
00:10:56,550 --> 00:10:54,630
just like on earth you have certain

275
00:10:58,150 --> 00:10:56,560
personal hygiene things you must take

276
00:10:59,430 --> 00:10:58,160
care of this is the red shift getting up

277
00:11:02,150 --> 00:10:59,440
and getting ready to go to work for a

278
00:11:03,670 --> 00:11:02,160
day and uh doing a little uh teeth

279
00:11:05,430 --> 00:11:03,680
brushing there and

280
00:11:07,430 --> 00:11:05,440
washing our hair and

281
00:11:09,030 --> 00:11:07,440
our commander you know he you can only

282
00:11:10,949 --> 00:11:09,040
do so much for what you got to work with

283
00:11:12,470 --> 00:11:10,959
but

284
00:11:13,829 --> 00:11:12,480
he's doing his best here and it's

285
00:11:15,190 --> 00:11:13,839
actually pretty easy in space you don't

286
00:11:17,110 --> 00:11:15,200
have to find a wall to hang a mirror on

287
00:11:18,870 --> 00:11:17,120
you can kind of just let it hang around

288
00:11:24,550 --> 00:11:18,880

but uh he's

289
00:11:28,870 --> 00:11:26,949
it takes a little while to get ready

290
00:11:30,870 --> 00:11:28,880
i understand that four members of our

291
00:11:33,750 --> 00:11:30,880
flight had a lot of interesting

292
00:11:36,389 --> 00:11:33,760
publicity down here the fog embryology

293
00:11:37,590 --> 00:11:36,399
experiment was one that i think was very

294
00:11:38,550 --> 00:11:37,600
successful

295
00:11:43,670 --> 00:11:38,560
we

296
00:11:46,069 --> 00:11:43,680
gave them humor chorionic gonadotropin

297
00:11:47,509 --> 00:11:46,079
causing the ovulate were able to

298
00:11:49,509 --> 00:11:47,519
actually

299
00:11:51,430 --> 00:11:49,519
have over a hundred live tadpoles that

300
00:11:53,590 --> 00:11:51,440
were brought back that were actually

301
00:11:56,710 --> 00:11:53,600
conceived and born in space

302
00:11:59,430 --> 00:11:56,720
the experiment went very well

303
00:12:01,829 --> 00:11:59,440
the results now the investigators out at

304
00:12:04,310 --> 00:12:01,839
ames research center working busily on

305
00:12:06,069 --> 00:12:04,320
things but very

306
00:12:08,230 --> 00:12:06,079
generally the gross appearance of the

307
00:12:09,110 --> 00:12:08,240
tadpoles that were conceived in zero g

308
00:12:11,590 --> 00:12:09,120
are

309
00:12:13,590 --> 00:12:11,600
looked very normal they seem very normal

310
00:12:16,069 --> 00:12:13,600
so it was a good experiment one of the

311
00:12:17,990 --> 00:12:16,079
things we also wanted to look at was how

312
00:12:19,590 --> 00:12:18,000
what was the behavior was there a

313
00:12:20,389 --> 00:12:19,600

problem with

314
00:12:22,550 --> 00:12:20,399
their

315
00:12:25,190 --> 00:12:22,560
tadpoles interpretation of what goes on

316
00:12:27,350 --> 00:12:25,200
on zero g can they swim normally so we

317
00:12:29,750 --> 00:12:27,360
actually took up tadpoles that were

318
00:12:31,670 --> 00:12:29,760
hatched here on the on the ground and

319
00:12:33,269 --> 00:12:31,680
watched their swimming behavior some of

320
00:12:36,550 --> 00:12:33,279
the things it seemed like is that they

321
00:12:38,790 --> 00:12:36,560
had a difficult time figuring out

322
00:12:41,590 --> 00:12:38,800
which way to swim as you can see so they

323
00:12:43,590 --> 00:12:41,600
swim in circles but we're able to bring

324
00:12:46,870 --> 00:12:43,600
tadpoles back down and also observe

325
00:12:51,110 --> 00:12:49,350
we also did our studies on a blue shift

326
00:12:53,670 --> 00:12:51,120
of angular momentum and since i am an

327
00:12:55,750 --> 00:12:53,680
ice skater it was kind of fun to play

328
00:12:57,750 --> 00:12:55,760
with pulling my arms in going faster and

329
00:13:01,110 --> 00:12:57,760
then putting them back out and

330
00:13:04,550 --> 00:13:03,269
we also had fun with

331
00:13:06,150 --> 00:13:04,560
other things

332
00:13:07,190 --> 00:13:06,160
and watching the physics of how they

333
00:13:08,949 --> 00:13:07,200
behave

334
00:13:12,550 --> 00:13:08,959
when we spin them around there's a pair

335
00:13:17,269 --> 00:13:14,790
she is using thorax which is amazing

336
00:13:19,590 --> 00:13:17,279
radio equipment to communicate directly

337
00:13:23,430 --> 00:13:19,600
to the people on the ground we contacted

338
00:13:26,310 --> 00:13:23,440

many schools around the world

339
00:13:29,990 --> 00:13:26,320
here we flew over japan it was very

340
00:13:31,670 --> 00:13:30,000
impressive for me to see my hometown

341
00:13:33,910 --> 00:13:31,680
from space

342
00:13:35,750 --> 00:13:33,920
this is hokkaido i just resold the

343
00:13:37,910 --> 00:13:35,760
northern ireland of japan

344
00:13:40,389 --> 00:13:37,920
sapporo is the capital of the uh

345
00:13:43,269 --> 00:13:40,399
hokkaido where i used to work

346
00:13:46,069 --> 00:13:43,279
most of the time when we flew over japan

347
00:13:48,710 --> 00:13:46,079
was cloudy but i had a long time

348
00:13:51,030 --> 00:13:48,720
to see a tokyo metropolitan area

349
00:13:52,710 --> 00:13:51,040
i was very much impressed that the tokyo

350
00:13:55,030 --> 00:13:52,720
bay was very clean

351
00:13:56,629 --> 00:13:55,040
as you see there

352
00:13:59,430 --> 00:13:56,639
this is hurricane

353
00:14:00,550 --> 00:13:59,440
bonnie which was about 500 miles north

354
00:14:02,790 --> 00:14:00,560
northeast

355
00:14:04,230 --> 00:14:02,800
of bermuda when we took this photo and

356
00:14:05,750 --> 00:14:04,240
you can see the spiral bands around the

357
00:14:07,110 --> 00:14:05,760
well-developed eye it's a classic

358
00:14:08,949 --> 00:14:07,120
hurricane

359
00:14:11,269 --> 00:14:08,959
just after that we got ready to check

360
00:14:13,430 --> 00:14:11,279
out the vehicle uh for landing and here

361
00:14:14,790 --> 00:14:13,440
we are checking out the elevons during

362
00:14:16,389 --> 00:14:14,800
what we call the flight control system

363
00:14:17,509 --> 00:14:16,399

checkout you can see them moving back

364
00:14:20,550 --> 00:14:17,519
there

365
00:14:22,230 --> 00:14:20,560
on the wing in this wide-angle view and

366
00:14:25,430 --> 00:14:22,240
we were well satisfied the vehicle was

367
00:14:26,949 --> 00:14:25,440
ready for entry and so was the ground

368
00:14:28,550 --> 00:14:26,959
well after a very successful mission

369
00:14:30,710 --> 00:14:28,560
it's time to come home even though we

370
00:14:32,310 --> 00:14:30,720
got an extra day so we had to prepare

371
00:14:34,069 --> 00:14:32,320
the vehicle for entry got in our suits

372
00:14:36,230 --> 00:14:34,079
got all strapped back in

373
00:14:38,150 --> 00:14:36,240
uh made our deorbit burn that was very

374
00:14:40,150 --> 00:14:38,160
successful and we're on our way home

375
00:14:41,829 --> 00:14:40,160
this is a view out my window we're in

376
00:14:43,590 --> 00:14:41,839
the the red is a globe from the entering

377
00:14:45,110 --> 00:14:43,600
the atmosphere the

378
00:14:46,550 --> 00:14:45,120
excitation that orbit does and you can

379
00:14:48,470 --> 00:14:46,560
see the sunrise we're in a big right

380
00:14:49,430 --> 00:14:48,480
bank at that point

381
00:14:51,990 --> 00:14:49,440
back

382
00:14:52,710 --> 00:14:52,000
in our atmosphere with the hoop flying

383
00:14:54,790 --> 00:14:52,720
here

384
00:14:56,710 --> 00:14:54,800
we are starting to get some

385
00:14:58,629 --> 00:14:56,720
tips off the wings

386
00:14:59,990 --> 00:14:58,639
and uh then doing some more checking

387
00:15:01,509 --> 00:15:00,000
we'll be in our right turn here on our

388
00:15:03,110 --> 00:15:01,519

heading alignment circle preparing to

389
00:15:03,990 --> 00:15:03,120
roll out on final

390
00:15:08,230 --> 00:15:04,000
uh

391
00:15:13,030 --> 00:15:10,470
the orbiter as you see looks like it's a

392
00:15:13,829 --> 00:15:13,040
very nice flying aircraft it looks very

393
00:15:16,470 --> 00:15:13,839
uh

394
00:15:18,069 --> 00:15:16,480
very happy in that environment there

395
00:15:24,470 --> 00:15:18,079
on the ground it looks like it's falling

396
00:15:27,829 --> 00:15:26,230
we had had a lot of concern about the

397
00:15:29,350 --> 00:15:27,839
weather at the cape and being able to

398
00:15:31,030 --> 00:15:29,360
get back in there but as you can see we

399
00:15:33,990 --> 00:15:31,040
had just an absolutely beautiful day to

400
00:15:35,990 --> 00:15:34,000
come back to the kennedy space center

401
00:15:37,350 --> 00:15:36,000
air suit rolling out on final and

402
00:15:38,710 --> 00:15:37,360
shortly you'll see him put the nose down

403
00:15:40,629 --> 00:15:38,720
a little bit we'll pick up some more air

404
00:15:42,470 --> 00:15:40,639
speed and prepare for the final landing

405
00:15:43,910 --> 00:15:42,480
phase

406
00:15:46,470 --> 00:15:43,920
i got to fly the orbiter for a few

407
00:15:47,430 --> 00:15:46,480
seconds on entry and uh thanks to hoot

408
00:15:49,670 --> 00:15:47,440
and

409
00:15:51,189 --> 00:15:49,680
the older flies very nicely it felt like

410
00:15:51,990 --> 00:15:51,199
a much smaller aircraft than it really

411
00:15:56,389 --> 00:15:52,000
is

412
00:15:59,590 --> 00:15:57,990
a view from the vertical assembly

413
00:16:02,470 --> 00:15:59,600

building as we come in you can still see

414
00:16:04,150 --> 00:16:02,480
the the moisture off our wings getting

415
00:16:06,470 --> 00:16:04,160
ready my primary job in life now is to

416
00:16:07,829 --> 00:16:06,480
put the gear down there comes the gear

417
00:16:13,829 --> 00:16:07,839
and

418
00:16:15,829 --> 00:16:13,839
hit all the parameters that we're

419
00:16:20,870 --> 00:16:15,839
looking for as we come into land very

420
00:16:25,430 --> 00:16:23,749
we touched down at 205 knots and shortly

421
00:16:28,150 --> 00:16:25,440
after that we were calling out airspeed

422
00:16:30,389 --> 00:16:28,160
we're looking for 175 knots and at a

423
00:16:32,150 --> 00:16:30,399
point we uh i got to deploy the drag

424
00:16:33,829 --> 00:16:32,160
chute

425
00:16:35,670 --> 00:16:33,839
we were the first deploy with the nose

426
00:16:38,069 --> 00:16:35,680
still in the air a test that we're doing

427
00:16:40,870 --> 00:16:38,079
to hopefully expand the envelope

428
00:16:49,030 --> 00:16:40,880
and then the nose touched down about 130

429
00:16:52,230 --> 00:16:50,710
approaching about 60 knots we've gotten

430
00:16:53,590 --> 00:16:52,240
about all we could out of drag chute so

431
00:16:55,590 --> 00:16:53,600
we go ahead and jettison and then we let

432
00:16:58,310 --> 00:16:55,600
the orbiter roll to a stop

433
00:17:00,069 --> 00:16:58,320
like in the previous emissions

434
00:17:02,150 --> 00:17:00,079
as i mentioned this was the conclusion

435
00:17:03,430 --> 00:17:02,160
of a very successful mission we had just

436
00:17:06,230 --> 00:17:03,440
uh one

437
00:17:07,590 --> 00:17:06,240
one redshift handover one redshift tag

438
00:17:09,669 --> 00:17:07,600

up left to make

439
00:17:11,990 --> 00:17:09,679
and this is uh kurt and i having our