
MCDONNELL
DOUGLAS

1
00:00:24,349 --> 00:00:22,550
well good morning and welcome to the

2
00:00:26,470 --> 00:00:24,359
post flight press conference for the

3
00:00:27,750 --> 00:00:26,480
sts-60 mission

4
00:00:41,190 --> 00:00:27,760
the

5
00:00:42,470 --> 00:00:41,200
flight for discovery and with that i'll

6
00:00:44,630 --> 00:00:42,480
turn it over to crew commander charlie

7
00:00:47,270 --> 00:00:44,640
bolden thanks very much kyle and uh

8
00:00:49,670 --> 00:00:47,280
welcome to everybody wherever you are uh

9
00:00:50,869 --> 00:00:49,680
very s uh quickly let me reintroduce the

10
00:00:51,910 --> 00:00:50,879
crew since we've been through this

11
00:00:54,389 --> 00:00:51,920
before

12
00:00:56,150 --> 00:00:54,399
all the way down on my far right uh

13
00:00:57,270 --> 00:00:56,160

ron sega who was our mission specialist

14
00:00:59,830 --> 00:00:57,280
number two

15
00:01:01,590 --> 00:00:59,840
uh to his left jan davis who was mission

16
00:01:03,830 --> 00:01:01,600
specialist number one

17
00:01:05,109 --> 00:01:03,840
uh to my immediate right

18
00:01:06,710 --> 00:01:05,119
my pilot

19
00:01:08,789 --> 00:01:06,720
ken rightler

20
00:01:10,310 --> 00:01:08,799
to my immediate left

21
00:01:12,950 --> 00:01:10,320
sergey krikalov who was mission

22
00:01:14,550 --> 00:01:12,960
specialist number four and to sergey's

23
00:01:16,550 --> 00:01:14,560
left our payload commander and mission

24
00:01:18,310 --> 00:01:16,560
specialist number three uh franklin

25
00:01:19,429 --> 00:01:18,320
chang diaz

26
00:01:20,789 --> 00:01:19,439
so what we're going to do from here on

27
00:01:22,630 --> 00:01:20,799
out we're going to show you about a 16

28
00:01:24,710 --> 00:01:22,640
minute video that will give us an

29
00:01:27,190 --> 00:01:24,720
opportunity to explain what we thought

30
00:01:28,870 --> 00:01:27,200
we did and then you can ask us questions

31
00:01:31,030 --> 00:01:28,880
in case we did something that you didn't

32
00:01:32,310 --> 00:01:31,040
think we did or uh

33
00:01:34,550 --> 00:01:32,320
we didn't do something that you thought

34
00:01:36,390 --> 00:01:34,560
we did then we'll show you some slides

35
00:01:38,710 --> 00:01:36,400
that are primarily geared toward earth

36
00:01:40,310 --> 00:01:38,720
observations and after that we'll take

37
00:01:41,510 --> 00:01:40,320
questions and answers so with that why

38
00:01:42,950 --> 00:01:41,520

don't we go ahead and roll the video and

39
00:01:45,990 --> 00:01:42,960
we'll make an attempt to describe it to

40
00:01:49,190 --> 00:01:47,270
the first thing you're going to see is

41
00:01:51,590 --> 00:01:49,200
an advertisement from the sponsor this

42
00:01:53,510 --> 00:01:51,600
is uh the nasa logo the meatball that

43
00:01:55,350 --> 00:01:53,520
we've all come to know and love

44
00:01:57,190 --> 00:01:55,360
and these are the two patches that we

45
00:01:57,910 --> 00:01:57,200
have come to know and love they're both

46
00:01:59,429 --> 00:01:57,920
the

47
00:02:00,789 --> 00:01:59,439
english and cyrillic versions of our

48
00:02:02,789 --> 00:02:00,799
crew patch

49
00:02:04,469 --> 00:02:02,799
as is normal we wake up get breakfast

50
00:02:06,230 --> 00:02:04,479
and then we go in and get suited up and

51
00:02:07,749 --> 00:02:06,240
you'll see each of us in succession here

52
00:02:10,229 --> 00:02:07,759
as we go through the suit up and check

53
00:02:11,670 --> 00:02:10,239
out in the launch and entry suits uh

54
00:02:13,350 --> 00:02:11,680
everybody trying to act like we're very

55
00:02:14,550 --> 00:02:13,360
relaxed and it's just another day at the

56
00:02:16,790 --> 00:02:14,560
office but i think all of you know

57
00:02:18,150 --> 00:02:16,800
better by now but we were very excited

58
00:02:19,990 --> 00:02:18,160
about this flight everything had gone

59
00:02:21,830 --> 00:02:20,000
very very well in the flow so far in the

60
00:02:23,510 --> 00:02:21,840
countdown and

61
00:02:24,949 --> 00:02:23,520
everybody but me was very confident that

62
00:02:26,710 --> 00:02:24,959
we were going to get off on day one i

63
00:02:28,309 --> 00:02:26,720

still had it to be proved to me since i

64
00:02:31,670 --> 00:02:28,319
had never done it before so it was a new

65
00:02:35,190 --> 00:02:32,790
everything was just about like the

66
00:02:36,710 --> 00:02:35,200
simulator until somebody said 3-2-1 and

67
00:02:38,470 --> 00:02:36,720
everything started rumbling around and

68
00:02:40,390 --> 00:02:38,480
the engines lit off

69
00:02:42,309 --> 00:02:40,400
and we knew that it wasn't a simulator

70
00:02:47,030 --> 00:02:42,319
anymore this is the real thing

71
00:02:48,869 --> 00:02:47,040
on-time launch beautiful morning at ksc

72
00:02:50,790 --> 00:02:48,879
feeling of those main engines and the

73
00:02:52,869 --> 00:02:50,800
solid rocket boosters is just

74
00:02:55,190 --> 00:02:52,879
incredible feeling of being pressed back

75
00:02:57,030 --> 00:02:55,200
in your seat and accelerating upwards

76
00:02:59,110 --> 00:02:57,040
followed immediately by that big role to

77
00:03:00,630 --> 00:02:59,120
get us aligned with our

78
00:03:02,710 --> 00:03:00,640
our high inclination right up the east

79
00:03:04,309 --> 00:03:02,720
coast of the u.s

80
00:03:06,149 --> 00:03:04,319
not a whole lot to see out the windows

81
00:03:08,790 --> 00:03:06,159
because of the the attitude of the

82
00:03:10,149 --> 00:03:08,800
vehicle but uh

83
00:03:12,869 --> 00:03:10,159
really trying to pay attention to what

84
00:03:13,589 --> 00:03:12,879
you're doing inside at this point

85
00:03:18,630 --> 00:03:13,599
the

86
00:03:20,630 --> 00:03:18,640
like riding down a country road

87
00:03:22,630 --> 00:03:20,640
but once the solid rocket boosters are

88
00:03:25,110 --> 00:03:22,640

finished up about two minutes

89
00:03:27,190 --> 00:03:25,120
they come off in a nice clean

90
00:03:29,350 --> 00:03:27,200
burst of energy and then the main

91
00:03:30,869 --> 00:03:29,360
engines take you the rest of the way

92
00:03:32,789 --> 00:03:30,879
one of the first things we do once we

93
00:03:35,030 --> 00:03:32,799
get on orbit is open up the payload bay

94
00:03:36,949 --> 00:03:35,040
doors and this view of the payload bay

95
00:03:39,030 --> 00:03:36,959
you can see the space have module in the

96
00:03:42,070 --> 00:03:39,040
foreground and the wake shield

97
00:03:44,630 --> 00:03:42,080
there and also aft of the wake shield we

98
00:03:46,710 --> 00:03:44,640
had a gas bridge which included a

99
00:03:49,190 --> 00:03:46,720
capital bridge and the brimsat

100
00:03:51,350 --> 00:03:49,200
deployable and the otarax deployable

101
00:03:53,350 --> 00:03:51,360
and then we get right away to spacehab

102
00:03:55,509 --> 00:03:53,360
activation

103
00:03:57,350 --> 00:03:55,519
basically uh this is the first order of

104
00:04:00,550 --> 00:03:57,360
business for us on orbit and jan and i

105
00:04:02,309 --> 00:04:00,560
got to do that and we found a few traces

106
00:04:05,110 --> 00:04:02,319
of debris

107
00:04:07,429 --> 00:04:05,120
common in a new type of spacecraft but

108
00:04:09,509 --> 00:04:07,439
we took care of that and got down to the

109
00:04:11,830 --> 00:04:09,519
business of getting all the systems

110
00:04:14,869 --> 00:04:11,840
activated in the lab something fairly

111
00:04:16,949 --> 00:04:14,879
fairly simple to get down to work

112
00:04:18,789 --> 00:04:16,959
the space have module worked very well

113
00:04:20,789 --> 00:04:18,799

all of the systems worked very well and

114
00:04:23,350 --> 00:04:20,799
it turned out to be a really nice

115
00:04:25,350 --> 00:04:23,360
environment to work in and here we are

116
00:04:27,909 --> 00:04:25,360
checking out the initial systems and

117
00:04:30,150 --> 00:04:27,919
doing the setup of the module before we

118
00:04:31,909 --> 00:04:30,160
start doing the experiments in the space

119
00:04:33,830 --> 00:04:31,919
head

120
00:04:36,390 --> 00:04:33,840
even on the end of flight day one we

121
00:04:38,629 --> 00:04:36,400
were busy doing ds0201 which is sensory

122
00:04:40,150 --> 00:04:38,639
motor investigations you see jan in the

123
00:04:42,230 --> 00:04:40,160
foreground as the subject here with

124
00:04:44,150 --> 00:04:42,240
electrodes placed on her head and

125
00:04:45,590 --> 00:04:44,160
there's sergey as well with a small

126
00:04:47,909 --> 00:04:45,600
laser which is the white thing and the

127
00:04:50,790 --> 00:04:47,919
accelerometer on top he's undergoing

128
00:04:54,230 --> 00:04:50,800
sinusoidal head oscillations we perform

129
00:04:57,430 --> 00:04:54,240
these exercises on day one two five six

130
00:04:59,110 --> 00:04:57,440
seven and eight with jan sergey myself

131
00:05:01,189 --> 00:04:59,120
and ken this was another one of the

132
00:05:03,350 --> 00:05:01,199
joint science uh detailed supplemental

133
00:05:05,110 --> 00:05:03,360
objectives dso202 which was metabolic

134
00:05:07,270 --> 00:05:05,120
studies and believe it or not i've just

135
00:05:08,950 --> 00:05:07,280
inserted a catheter in franklin's arm

136
00:05:10,710 --> 00:05:08,960
and if you look very closely right down

137
00:05:13,029 --> 00:05:10,720
there by my left hand you saw the blood

138
00:05:14,870 --> 00:05:13,039

just start flowing into the tube uh i

139
00:05:16,310 --> 00:05:14,880
was pretty excited about that once

140
00:05:17,830 --> 00:05:16,320
charlie and franklin were finished

141
00:05:19,430 --> 00:05:17,840
drawing blood from each other then they

142
00:05:21,350 --> 00:05:19,440
handed it to me and

143
00:05:23,270 --> 00:05:21,360
i was going to to work up the blood in

144
00:05:25,189 --> 00:05:23,280
this centrifuge

145
00:05:27,029 --> 00:05:25,199
you can see that we ran that centrifuge

146
00:05:29,909 --> 00:05:27,039
pretty much free floating worked just

147
00:05:32,230 --> 00:05:29,919
like a gyroscope

148
00:05:34,629 --> 00:05:32,240
once the samples were taken both urine

149
00:05:36,070 --> 00:05:34,639
and blood samples we had to freeze them

150
00:05:37,909 --> 00:05:36,080
to to make sure that they would stay

151
00:05:41,189 --> 00:05:37,919
preserved until we could get back and

152
00:05:43,510 --> 00:05:41,199
harvest the science we use two freezers

153
00:05:48,629 --> 00:05:43,520
gn2 freezers like this to to put the

154
00:05:51,110 --> 00:05:49,909
this was always a pretty interesting

155
00:05:52,870 --> 00:05:51,120
time when you go down to the mid deck

156
00:05:53,990 --> 00:05:52,880
and you see this fog and haze down there

157
00:05:56,710 --> 00:05:54,000
and you wondered what these guys were

158
00:05:57,990 --> 00:05:56,720
doing with uh with a gn2 sample did you

159
00:06:00,310 --> 00:05:58,000
into uh

160
00:06:02,150 --> 00:06:00,320
freezer there

161
00:06:03,990 --> 00:06:02,160
another part of the metabolic experiment

162
00:06:05,270 --> 00:06:04,000
i'm not drawing blood here as it may

163
00:06:07,510 --> 00:06:05,280

look like i am but i'm actually

164
00:06:10,309 --> 00:06:07,520
measuring the venous pressure

165
00:06:12,469 --> 00:06:10,319
of the blood that we have already

166
00:06:14,390 --> 00:06:12,479
obtained a catheter for it's called

167
00:06:16,469 --> 00:06:14,400
peripheral venous pressure a

168
00:06:19,029 --> 00:06:16,479
non-invasive way to get pressure of the

169
00:06:20,790 --> 00:06:19,039
veins we also did hermetic

170
00:06:22,150 --> 00:06:20,800
tests on the blood as well with another

171
00:06:24,469 --> 00:06:22,160
little centrifuge and that's what i'm

172
00:06:25,990 --> 00:06:24,479
doing here filling up capillary tubes

173
00:06:28,070 --> 00:06:26,000
from the blood and then inserting them

174
00:06:29,830 --> 00:06:28,080
into a small hermetic

175
00:06:31,189 --> 00:06:29,840
centrifuge and i'd run those for a

176
00:06:32,830 --> 00:06:31,199
couple minutes and

177
00:06:35,670 --> 00:06:32,840
then record the

178
00:06:38,309 --> 00:06:35,680
readings this is the the rack there in

179
00:06:40,469 --> 00:06:38,319
the back is called eclipse it's one of

180
00:06:42,950 --> 00:06:40,479
our material processing experiments in

181
00:06:44,870 --> 00:06:42,960
the space app having to do with liquid

182
00:06:47,990 --> 00:06:44,880
phase centering it's from the university

183
00:06:50,710 --> 00:06:48,000
of alabama at huntsville

184
00:06:53,110 --> 00:06:50,720
we had an another rack uh kind of like

185
00:06:54,950 --> 00:06:53,120
this one that you see here and it was on

186
00:06:57,270 --> 00:06:54,960
the other side of the space hub and it

187
00:06:58,870 --> 00:06:57,280
was called the sef space experiment

188
00:07:01,589 --> 00:06:58,880

facility

189
00:07:03,830 --> 00:07:01,599
and it was probably the most interactive

190
00:07:05,589 --> 00:07:03,840
experiment we flew on on the space out

191
00:07:06,790 --> 00:07:05,599
you see a crystal there the bottom of

192
00:07:09,029 --> 00:07:06,800
the picture

193
00:07:11,749 --> 00:07:09,039
the beginnings of a crystal that we grew

194
00:07:13,990 --> 00:07:11,759
for several a couple days actually

195
00:07:17,350 --> 00:07:14,000
highly interactive with keyboard entries

196
00:07:19,430 --> 00:07:17,360
through a small computer and

197
00:07:21,270 --> 00:07:19,440
the picture that you see there is the

198
00:07:22,950 --> 00:07:21,280
end when the crystal was completely

199
00:07:24,230 --> 00:07:22,960
formed and we get the feeling that it's

200
00:07:25,909 --> 00:07:24,240
a pretty good one

201
00:07:27,749 --> 00:07:25,919
this was another experiment in space hab

202
00:07:29,670 --> 00:07:27,759
called orcep or the organic separation

203
00:07:31,430 --> 00:07:29,680
experiment was actually two parts one

204
00:07:33,430 --> 00:07:31,440
was a phase partitioning experiment and

205
00:07:35,909 --> 00:07:33,440
the other actually a

206
00:07:37,430 --> 00:07:35,919
live cell growth it both canisters

207
00:07:38,870 --> 00:07:37,440
inside and what i was doing here was

208
00:07:41,830 --> 00:07:38,880
actually conducting one of the many

209
00:07:44,710 --> 00:07:41,840
status checks that we did this is in

210
00:07:47,189 --> 00:07:44,720
what we call a crim it's a commercial

211
00:07:49,189 --> 00:07:47,199
refrigeration incubation module and it

212
00:07:51,830 --> 00:07:49,199
actually was able to keep the samples at

213
00:07:53,749 --> 00:07:51,840

desired temperature

214
00:07:54,550 --> 00:07:53,759
this is an experiment

215
00:07:57,110 --> 00:07:54,560
we

216
00:07:59,830 --> 00:07:57,120
expose several materials

217
00:08:01,430 --> 00:07:59,840
in space and grow some

218
00:08:03,589 --> 00:08:01,440
bio crystals

219
00:08:05,510 --> 00:08:03,599
and this kind of experiment could be

220
00:08:07,670 --> 00:08:05,520
very important in future to to

221
00:08:09,110 --> 00:08:07,680
understand how we could use

222
00:08:10,390 --> 00:08:09,120
weightlessness

223
00:08:23,510 --> 00:08:10,400
and

224
00:08:25,430 --> 00:08:23,520
this experiment named sams

225
00:08:28,230 --> 00:08:25,440
record data from

226
00:08:35,110 --> 00:08:31,430
all vibration acceleration and we return

227
00:08:42,709 --> 00:08:35,120
this data back to us for

228
00:08:47,110 --> 00:08:45,190
another experiment we had was uh protein

229
00:08:48,630 --> 00:08:47,120
crystal growth and this is a graph on a

230
00:08:50,389 --> 00:08:48,640
power book that we had that shows when

231
00:08:52,949 --> 00:08:50,399
nucleation occurred you can see the peak

232
00:08:55,190 --> 00:08:52,959
at the end we had a laser scattering

233
00:08:57,590 --> 00:08:55,200
detector which detected when a crystal

234
00:08:59,350 --> 00:08:57,600
was actually growing and we were real

235
00:09:01,030 --> 00:08:59,360
excited when we saw these two peaks and

236
00:09:02,470 --> 00:09:01,040
the two different sea rims that we had

237
00:09:04,550 --> 00:09:02,480
indicating that we had a really good

238
00:09:06,470 --> 00:09:04,560

crystal and hopefully we have some good

239
00:09:08,070 --> 00:09:06,480
results from this protein crystal growth

240
00:09:11,030 --> 00:09:08,080
experiment from university alabama

241
00:09:15,750 --> 00:09:14,070
this is another biological

242
00:09:17,190 --> 00:09:15,760
experiment life science experiment

243
00:09:18,389 --> 00:09:17,200
actually

244
00:09:19,590 --> 00:09:18,399
we flew

245
00:09:21,509 --> 00:09:19,600
to

246
00:09:24,070 --> 00:09:21,519
cage of

247
00:09:26,310 --> 00:09:24,080
with rats and

248
00:09:28,870 --> 00:09:26,320
we took care of them this

249
00:09:30,310 --> 00:09:28,880
part of the experiment we show

250
00:09:31,670 --> 00:09:30,320
as we fit

251
00:09:34,070 --> 00:09:31,680
water

252
00:09:34,949 --> 00:09:34,080
in these gauges

253
00:09:37,590 --> 00:09:34,959
we had

254
00:09:39,910 --> 00:09:37,600
over 50 of these uh canisters that had

255
00:09:41,829 --> 00:09:39,920
uh different tubes in them filled with

256
00:09:44,230 --> 00:09:41,839
different biological

257
00:09:47,269 --> 00:09:44,240
experiments we had crystal growth we had

258
00:09:50,630 --> 00:09:47,279
seeds actually seeds that were flown on

259
00:09:52,389 --> 00:09:50,640
from eldef we had actually miniature

260
00:09:54,389 --> 00:09:52,399
wasps and all kinds of different

261
00:09:56,790 --> 00:09:54,399
biological experiments and we activated

262
00:09:59,350 --> 00:09:56,800
them by mixing two fluids together and

263
00:10:00,949 --> 00:09:59,360

in some cases we used these incubators

264
00:10:02,710 --> 00:10:00,959
where we would take out the individual

265
00:10:04,470 --> 00:10:02,720
tubes and place them in the front of the

266
00:10:05,430 --> 00:10:04,480
incubator and

267
00:10:07,910 --> 00:10:05,440
monitor

268
00:10:13,350 --> 00:10:07,920
the temperatures and other data from

269
00:10:18,150 --> 00:10:16,150
a very late addition to our experiment

270
00:10:20,470 --> 00:10:18,160
list was this sterling orbiter

271
00:10:21,829 --> 00:10:20,480
refrigerator freezer which we

272
00:10:24,069 --> 00:10:21,839
filled up with

273
00:10:26,230 --> 00:10:24,079
drink containers to check out how it

274
00:10:28,230 --> 00:10:26,240
worked we also had some ice cream on

275
00:10:30,230 --> 00:10:28,240
board the first time the history of

276
00:10:31,190 --> 00:10:30,240
space program that astronauts enjoy

277
00:10:32,870 --> 00:10:31,200
truly

278
00:10:34,870 --> 00:10:32,880
real ice cream

279
00:10:37,110 --> 00:10:34,880
and we really we really had a good time

280
00:10:39,590 --> 00:10:37,120
with that

281
00:10:42,150 --> 00:10:39,600
we get an opportunity to see um

282
00:10:44,310 --> 00:10:42,160
see us in our in action here on the mid

283
00:10:46,550 --> 00:10:44,320
deck as we all the ice cream is packed

284
00:10:48,310 --> 00:10:46,560
in small containers like the the old uh

285
00:10:49,829 --> 00:10:48,320
food containers that i think most of you

286
00:10:51,990 --> 00:10:49,839
became accustomed to before we started

287
00:10:54,790 --> 00:10:52,000
using uh the much more flexible ones it

288
00:10:56,630 --> 00:10:54,800

was quite quite delicious

289
00:10:58,470 --> 00:10:56,640
we had an opportunity to perform a

290
00:11:00,069 --> 00:10:58,480
couple of uh in-flight maintenance

291
00:11:01,430 --> 00:11:00,079
activities this one got i think a little

292
00:11:03,750 --> 00:11:01,440
bit more visibility in it than the

293
00:11:05,430 --> 00:11:03,760
others it was this collapsed rubber duck

294
00:11:06,870 --> 00:11:05,440
that provided a means of transporting

295
00:11:07,910 --> 00:11:06,880
air from the orbiter into the spacehab

296
00:11:09,110 --> 00:11:07,920
module

297
00:11:11,670 --> 00:11:09,120
eventually what we ended up doing was

298
00:11:13,430 --> 00:11:11,680
just taking the cover from our atlas uh

299
00:11:16,230 --> 00:11:13,440
plastic cover and inserting it kind of

300
00:11:17,829 --> 00:11:16,240
as a stiffener on the inside of this

301
00:11:20,389 --> 00:11:17,839
rubber duct here and then reinstalling

302
00:11:22,389 --> 00:11:20,399
it it worked very well

303
00:11:24,230 --> 00:11:22,399
and this is another experiment to

304
00:11:26,870 --> 00:11:24,240
understand what kind of environment we

305
00:11:28,710 --> 00:11:26,880
have on board it's very simple but it's

306
00:11:30,870 --> 00:11:28,720
allowed to

307
00:11:38,710 --> 00:11:30,880
visually see what kind of acceleration

308
00:11:42,630 --> 00:11:40,310
these are some of the scenes of

309
00:11:44,389 --> 00:11:42,640
preparing food in the in the mid deck

310
00:11:46,790 --> 00:11:44,399
which you probably have seen in the past

311
00:11:48,550 --> 00:11:46,800
but it's a matter of just simply

312
00:11:50,949 --> 00:11:48,560
rehydrating uh

313
00:11:52,630 --> 00:11:50,959

containers plastic containers with dried

314
00:11:54,310 --> 00:11:52,640
out food

315
00:11:56,150 --> 00:11:54,320
flight day hey this is a special night

316
00:11:58,630 --> 00:11:56,160
we call it international night we uh not

317
00:12:00,470 --> 00:11:58,640
only had uh chopsticks and uh japanese

318
00:12:03,430 --> 00:12:00,480
food curried chicken and so forth we had

319
00:12:05,110 --> 00:12:03,440
the small russian uh bread loaves as

320
00:12:07,590 --> 00:12:05,120
well as cheese uh dip that sergey

321
00:12:10,470 --> 00:12:07,600
arranged to have on the flight so we uh

322
00:12:11,509 --> 00:12:10,480
we ate everything from american uh jerky

323
00:12:13,670 --> 00:12:11,519
to uh

324
00:12:15,110 --> 00:12:13,680
to japanese and and russian food on

325
00:12:16,790 --> 00:12:15,120
flight day eight

326
00:12:18,230 --> 00:12:16,800
it's a more challenging way to have

327
00:12:19,430 --> 00:12:18,240
dessert here as

328
00:12:21,269 --> 00:12:19,440
sergey

329
00:12:26,150 --> 00:12:21,279
i think has a cashew bounced off the

330
00:12:30,310 --> 00:12:28,389
so each each one was uh was more

331
00:12:32,310 --> 00:12:30,320
challenging you'd expect and here's

332
00:12:33,910 --> 00:12:32,320
charlie on the on the ergometer each of

333
00:12:35,030 --> 00:12:33,920
us had an opportunity to exercise and

334
00:12:38,389 --> 00:12:35,040
this

335
00:12:40,150 --> 00:12:38,399
is basically a a fixed bicycle and we uh

336
00:12:41,910 --> 00:12:40,160
we thought that was really important we

337
00:12:43,350 --> 00:12:41,920
were so busy in flight we probably would

338
00:12:46,230 --> 00:12:43,360

have liked to exercise a bit more than

339
00:12:54,470 --> 00:12:46,240
we got a chance to

340
00:12:57,829 --> 00:12:55,990
and here's a scene of just brushing

341
00:12:59,829 --> 00:12:57,839
teeth and basically uh how to maintain

342
00:13:01,829 --> 00:12:59,839
yourself in the uh in the environment of

343
00:13:04,230 --> 00:13:01,839
the uh of the space shuttle

344
00:13:06,150 --> 00:13:04,240
in my case i uh i slept in the space hab

345
00:13:08,230 --> 00:13:06,160
so not only did i transport myself down

346
00:13:10,470 --> 00:13:08,240
back and forth during the normal days

347
00:13:12,389 --> 00:13:10,480
but also in the evening

348
00:13:13,910 --> 00:13:12,399
we had the opportunity to send a couple

349
00:13:15,590 --> 00:13:13,920
of messages to the russian people in

350
00:13:17,030 --> 00:13:15,600
this case we were singing a lullaby

351
00:13:19,430 --> 00:13:17,040
spiatustali

352
00:13:21,430 --> 00:13:19,440
guruski which means tired toys are

353
00:13:23,030 --> 00:13:21,440
sleeping it's a traditional lullaby

354
00:13:24,230 --> 00:13:23,040
right before the evening news to put all

355
00:13:25,670 --> 00:13:24,240
the children in the right frame of mind

356
00:13:27,269 --> 00:13:25,680
to go to sleep

357
00:13:28,470 --> 00:13:27,279
this is during some of our rms

358
00:13:29,990 --> 00:13:28,480
activities

359
00:13:31,829 --> 00:13:30,000
i think actually ron was operating the

360
00:13:34,470 --> 00:13:31,839
arm in that case and i was backing him

361
00:13:36,310 --> 00:13:34,480
up this is during one of the unbirthing

362
00:13:38,389 --> 00:13:36,320
of the wake shield

363
00:13:40,150 --> 00:13:38,399

we had really good luck with the arm it

364
00:13:42,389 --> 00:13:40,160
was very smooth and

365
00:13:43,829 --> 00:13:42,399
our training prepared us well for these

366
00:13:45,910 --> 00:13:43,839
activities

367
00:13:48,389 --> 00:13:45,920
we had four

368
00:13:50,710 --> 00:13:48,399
unbirths

369
00:13:52,629 --> 00:13:50,720
actually three members i guess and this

370
00:13:53,750 --> 00:13:52,639
is one of the times when we rotated the

371
00:13:56,389 --> 00:13:53,760
arm

372
00:13:57,430 --> 00:13:56,399
so that the wake shield hardware could

373
00:13:58,550 --> 00:13:57,440
look at

374
00:14:00,230 --> 00:13:58,560
different

375
00:14:01,750 --> 00:14:00,240
atmospheres the horizon sensor was

376
00:14:05,189 --> 00:14:01,760
looking at different things and checking

377
00:14:07,269 --> 00:14:05,199
out the hardware on the wake shield

378
00:14:08,710 --> 00:14:07,279
we noticed that uh on flight day four

379
00:14:10,069 --> 00:14:08,720
that the attitude control system had a

380
00:14:12,069 --> 00:14:10,079
problem and one of the attempts to

381
00:14:14,230 --> 00:14:12,079
diagnosis was to bring the wake shield

382
00:14:15,750 --> 00:14:14,240
over the overhead windows of the

383
00:14:18,550 --> 00:14:15,760
of the orbiter and look at it with a

384
00:14:19,509 --> 00:14:18,560
camcorder and looked at the mechanical

385
00:14:20,470 --> 00:14:19,519
motion

386
00:14:22,790 --> 00:14:20,480
we did

387
00:14:24,230 --> 00:14:22,800
a growth on the port side arm and very

388
00:14:26,389 --> 00:14:24,240

successful with respect to vacuum and

389
00:14:28,310 --> 00:14:26,399
films and we also could control it from

390
00:14:29,509 --> 00:14:28,320
laptop computers there as you see on

391
00:14:31,110 --> 00:14:29,519
board

392
00:14:33,750 --> 00:14:31,120
very interesting experiment plasma

393
00:14:35,269 --> 00:14:33,760
physics uh used the wake shield as a

394
00:14:37,269 --> 00:14:35,279
source of voltage

395
00:14:39,829 --> 00:14:37,279
and that we would observe the actual

396
00:14:42,550 --> 00:14:39,839
changes in the luminescence of the wake

397
00:14:45,910 --> 00:14:42,560
shield at night with image intensifier

398
00:14:50,150 --> 00:14:48,629
this was uh the deploy of odor x and as

399
00:14:52,470 --> 00:14:50,160
you can see the balls start coming out

400
00:14:54,230 --> 00:14:52,480
there were a grand total of six spheres

401
00:14:56,230 --> 00:14:54,240
metallic spheres and they were used for

402
00:14:57,189 --> 00:14:56,240
subsequent tracking by radar sites on

403
00:14:59,189 --> 00:14:57,199
the ground

404
00:15:01,350 --> 00:14:59,199
our primary site was eglin the air force

405
00:15:03,509 --> 00:15:01,360
base and uh there's also a backup site

406
00:15:05,590 --> 00:15:03,519
in kwajalein but this was

407
00:15:07,590 --> 00:15:05,600
pretty interesting to watch and

408
00:15:08,470 --> 00:15:07,600
you see these balls go trailing out and

409
00:15:10,069 --> 00:15:08,480
then

410
00:15:11,590 --> 00:15:10,079
kind of coming together again out there

411
00:15:13,269 --> 00:15:11,600
and there they'll probably be there for

412
00:15:17,189 --> 00:15:13,279
a couple of years orbiting until they

413
00:15:21,350 --> 00:15:18,949

the next deploy that we had and both of

414
00:15:22,949 --> 00:15:21,360
these occurred on flight day seven uh

415
00:15:24,790 --> 00:15:22,959
was the deploy of the

416
00:15:27,590 --> 00:15:24,800
brimsat satellite from the university of

417
00:15:29,430 --> 00:15:27,600
bremen in germany a very small

418
00:15:30,949 --> 00:15:29,440
lightweight satellite and its primary

419
00:15:33,030 --> 00:15:30,959
objective is to

420
00:15:34,870 --> 00:15:33,040
do some of observations of earth's

421
00:15:36,870 --> 00:15:34,880
atmosphere while on orbit and then

422
00:15:38,389 --> 00:15:36,880
during its uh subsequent re-entry which

423
00:15:40,470 --> 00:15:38,399
will come in a few months

424
00:15:41,910 --> 00:15:40,480
to actually collect data about the

425
00:15:43,430 --> 00:15:41,920
makeup of the atmosphere as it comes

426
00:15:45,750 --> 00:15:43,440
back through

427
00:15:47,509 --> 00:15:45,760
we had a very busy flight on

428
00:15:48,710 --> 00:15:47,519
flight day eight we actually closed up

429
00:15:50,870 --> 00:15:48,720
the hab

430
00:15:53,350 --> 00:15:50,880
closed the hatch out as you can see here

431
00:15:54,389 --> 00:15:53,360
and deactivated the space hab we were

432
00:15:56,470 --> 00:15:54,399
really busy

433
00:15:58,949 --> 00:15:56,480
the night before trying to stow things

434
00:16:00,470 --> 00:15:58,959
and the morning of entry we also

435
00:16:01,910 --> 00:16:00,480
were very busy

436
00:16:04,870 --> 00:16:01,920
trying to clean up everything on the mid

437
00:16:07,910 --> 00:16:04,880
deck and stow away all of our equipment

438
00:16:10,310 --> 00:16:07,920

and get ready to to come back home after

439
00:16:11,269 --> 00:16:10,320
uh busy and we felt a very successful

440
00:16:13,269 --> 00:16:11,279
flight

441
00:16:15,350 --> 00:16:13,279
this was hilarious because remember the

442
00:16:17,509 --> 00:16:15,360
bicycle ergometer that we were on this

443
00:16:18,870 --> 00:16:17,519
is it or pieces of it and i remember

444
00:16:20,470 --> 00:16:18,880
hearing ron and the guys down on the

445
00:16:21,910 --> 00:16:20,480
midday going

446
00:16:23,590 --> 00:16:21,920
pieces were just going everywhere

447
00:16:25,829 --> 00:16:23,600
they're trying to gather them all in and

448
00:16:27,509 --> 00:16:25,839
put them back in their place

449
00:16:29,670 --> 00:16:27,519
time to get back into the launch and

450
00:16:31,910 --> 00:16:29,680
entry suits and get ready to come back

451
00:16:34,150 --> 00:16:31,920
this re-entry came in right across

452
00:16:36,470 --> 00:16:34,160
alaska and canada down across the

453
00:16:38,870 --> 00:16:36,480
heartland of america and right in across

454
00:16:41,509 --> 00:16:38,880
atlanta it was mostly daytime and so we

455
00:16:43,670 --> 00:16:41,519
didn't see a lot of the real spectacular

456
00:16:46,150 --> 00:16:43,680
fire that you see sometimes but it was a

457
00:16:47,990 --> 00:16:46,160
very very clean entry we did have to go

458
00:16:49,749 --> 00:16:48,000
around one time because of the some

459
00:16:51,110 --> 00:16:49,759
concern with weather that was not a

460
00:16:52,389 --> 00:16:51,120
problem at all very comfortable just

461
00:16:54,389 --> 00:16:52,399
sitting there in your suits all the work

462
00:16:55,829 --> 00:16:54,399
was done it's just a matter of letting

463
00:16:56,949 --> 00:16:55,839

time pass and letting the weather work

464
00:16:58,870 --> 00:16:56,959
itself out

465
00:17:01,110 --> 00:16:58,880
weather was great charlie made a real

466
00:17:04,069 --> 00:17:01,120
nice approach over the cape

467
00:17:06,630 --> 00:17:04,079
and brought discovery in for a for just

468
00:17:09,350 --> 00:17:06,640
an absolutely perfect landing it was a

469
00:17:11,829 --> 00:17:09,360
great uh great ending to uh to a really

470
00:17:14,309 --> 00:17:11,839
fantastic flight as far as i'm concerned

471
00:17:16,710 --> 00:17:14,319
the everybody had a lot of concerns

472
00:17:18,549 --> 00:17:16,720
about the weather i think on board

473
00:17:20,470 --> 00:17:18,559
we just kind of roll with the punches

474
00:17:21,829 --> 00:17:20,480
and roll with the flow we were very

475
00:17:24,230 --> 00:17:21,839
confident when they finally told us that

476
00:17:25,750 --> 00:17:24,240
we had to go for de-orbit and we had had

477
00:17:28,470 --> 00:17:25,760
an opportunity to see the weather on our

478
00:17:30,230 --> 00:17:28,480
previous pass and knowing the folk that

479
00:17:31,830 --> 00:17:30,240
worked the weather and knowing that hoot

480
00:17:33,590 --> 00:17:31,840
was in the shuttle training aircraft

481
00:17:35,110 --> 00:17:33,600
making the evaluations i was very

482
00:17:37,190 --> 00:17:35,120
comfortable and like ken said it was a

483
00:17:38,630 --> 00:17:37,200
gorgeous low level it's what it seemed

484
00:17:40,230 --> 00:17:38,640
like coming down across alaska and

485
00:17:41,110 --> 00:17:40,240
canada right through the heart of the

486
00:17:42,870 --> 00:17:41,120
u.s

487
00:17:44,470 --> 00:17:42,880
we did deploy the drag shoot we did a

488
00:17:46,630 --> 00:17:44,480

little bit different procedure than has

489
00:17:48,390 --> 00:17:46,640
been done before this was the first time

490
00:17:51,990 --> 00:17:48,400
that we actually deployed the drag chute

491
00:17:54,710 --> 00:17:52,000
prior to initiating the derotation

492
00:17:57,510 --> 00:17:54,720
it was unbelievably smooth

493
00:17:59,350 --> 00:17:57,520
very very stable when the nose came down

494
00:18:01,110 --> 00:17:59,360
all of your speeds end up being a lot

495
00:18:03,430 --> 00:18:01,120
slower than you're generally accustomed

496
00:18:05,750 --> 00:18:03,440
to but it makes the orbiter very very

497
00:18:06,710 --> 00:18:05,760
nice to handle and i was i was very

498
00:18:10,150 --> 00:18:06,720
pleased with the handling

499
00:18:14,310 --> 00:18:12,070
this is again a one last word from the