



1
00:00:48,790 --> 00:00:41,270
he

2
00:00:48,800 --> 00:01:38,149
is

3
00:01:42,310 --> 00:01:40,069
good morning canine crew i understand

4
00:01:45,190 --> 00:01:42,320
there's at least a couple of you all who

5
00:02:04,069 --> 00:01:45,200
may remember that show

6
00:02:07,429 --> 00:02:05,910
the robot arm officer here in the

7
00:02:09,270 --> 00:02:07,439
mission control center called the

8
00:02:11,910 --> 00:02:09,280
payload deployment and retrieval systems

9
00:02:14,070 --> 00:02:11,920
officer or pdrs reports that the wake

10
00:02:15,990 --> 00:02:14,080
shield has now broken its seal

11
00:02:18,390 --> 00:02:16,000
with its carrier platform and is in the

12
00:02:20,949 --> 00:02:18,400
process of slowly being raised above the

13
00:02:23,510 --> 00:02:20,959

payload bay into the low hover position

14

00:02:25,350 --> 00:02:23,520

this is the first major step on the road

15

00:02:28,390 --> 00:02:25,360

to the deployment of the wake shield

16

00:02:30,229 --> 00:02:28,400

which is scheduled at around 4 38 a.m

17

00:02:35,430 --> 00:02:30,239

central time this morning if all goes

18

00:02:39,190 --> 00:02:37,190

astronauts jim newman and jim voss

19

00:02:41,750 --> 00:02:39,200

raising the wake shield facility out of

20

00:02:43,750 --> 00:02:41,760

its carrier platform in this view uh

21

00:02:47,030 --> 00:02:43,760

from payload bay cameras uh in the

22

00:02:51,110 --> 00:02:48,949

the wake shield is being carefully

23

00:02:52,150 --> 00:02:51,120

lifted directly

24

00:02:55,110 --> 00:02:52,160

vertical

25

00:02:56,869 --> 00:02:55,120

behind the spartan science satellite

26
00:02:58,309 --> 00:02:56,879
now this view from a camera at the rear

27
00:02:59,910 --> 00:02:58,319
of the payload bay clearly showing the

28
00:03:01,430 --> 00:02:59,920
wake shield facility being lifted out of

29
00:03:03,750 --> 00:03:01,440
its cargo bay

30
00:03:05,190 --> 00:03:03,760
the orbiter is currently tracking over

31
00:03:06,790 --> 00:03:05,200
the pacific ocean

32
00:03:08,470 --> 00:03:06,800
on uh

33
00:03:12,470 --> 00:03:08,480
the wake shield is clear and we've set

34
00:03:12,480 --> 00:03:30,390
copy endeavor

35
00:03:35,190 --> 00:03:32,710
again the two-ton wake shield facility

36
00:03:36,869 --> 00:03:35,200
now being lifted to a low hover position

37
00:03:43,030 --> 00:03:36,879
over the payload bay by astronauts jim

38
00:03:47,190 --> 00:03:45,670

this is a clear view of the wake side of

39

00:03:49,750 --> 00:03:47,200

the satellite the

40

00:03:52,390 --> 00:03:49,760

the carousel side where the thin films

41

00:03:55,110 --> 00:03:52,400

will be grown in that canister at the

42

00:03:56,789 --> 00:03:55,120

bottom of the satellite that

43

00:04:02,390 --> 00:03:56,799

looks like the bottom

44

00:04:05,509 --> 00:04:04,470

chemical compounds of predominantly

45

00:04:07,670 --> 00:04:05,519

gallium

46

00:04:09,910 --> 00:04:07,680

arsenide compounds will be

47

00:04:11,350 --> 00:04:09,920

shot into that carousel atom by atom

48

00:04:13,990 --> 00:04:11,360

layer by layer

49

00:04:15,589 --> 00:04:14,000

as thin films are grown over the course

50

00:04:17,830 --> 00:04:15,599

of two days of free flight by the wake

51
00:04:21,110 --> 00:04:17,840
shield once it is deployed by jim newman

52
00:04:25,189 --> 00:04:23,510
this close-up view now showing the wake

53
00:04:28,629 --> 00:04:25,199
side of the satellite

54
00:04:31,110 --> 00:04:28,639
where

55
00:04:32,710 --> 00:04:31,120
shutters will open back and forth or

56
00:04:35,749 --> 00:04:32,720
during the course of the thin film

57
00:04:37,270 --> 00:04:35,759
growth to allow chemicals to stream

58
00:04:41,030 --> 00:04:37,280
through those tubes at the bottom of the

59
00:04:43,189 --> 00:04:41,040
picture into a carousel those tubes

60
00:04:45,590 --> 00:04:43,199
are the carrier panels if you will for

61
00:04:48,629 --> 00:04:45,600
all of the chemical compounds that will

62
00:04:51,590 --> 00:04:48,639
be used to build the thin films the thin

63
00:04:55,110 --> 00:04:51,600

wafer like endeavor with some updates on

64

00:04:57,909 --> 00:04:55,120

wakeshield we're in step three page 2-4

65

00:04:59,990 --> 00:04:57,919

we have sent the bus selection prefire

66

00:05:02,550 --> 00:05:00,000

com channel 2

67

00:05:06,150 --> 00:05:02,560

and we are not getting ages

68

00:05:10,790 --> 00:05:06,160

resetting and incrementing on flyer sciu

69

00:05:12,469 --> 00:05:10,800

pdu sensors and a to d converters

70

00:05:15,029 --> 00:05:12,479

copy underdog we'll look into it

71

00:05:29,909 --> 00:05:15,039

somewhere down list that you apparently

72

00:05:34,390 --> 00:05:32,230

astronaut jim newman now slowly

73

00:05:37,430 --> 00:05:34,400

maneuvering the wake shield facility

74

00:05:40,790 --> 00:05:37,440

from directly over the cargo bay to a

75

00:05:43,430 --> 00:05:40,800

position over the port side of the sill

76
00:06:12,309 --> 00:05:43,440
of the payload bay for the so-called ram

77
00:06:17,270 --> 00:06:14,230
this view from payload bay cameras on

78
00:06:19,830 --> 00:06:17,280
endeavor shows the orbiter approaching

79
00:06:21,909 --> 00:06:19,840
sunrise on the west coast of africa

80
00:06:23,830 --> 00:06:21,919
with the wake shield facility hanging at

81
00:06:26,309 --> 00:06:23,840
the end of the robot arm over the port

82
00:06:29,430 --> 00:06:26,319
side of the payload bay in the so-called

83
00:06:31,110 --> 00:06:29,440
ram cleaning position that has now begun

84
00:06:33,510 --> 00:06:31,120
about a two to two and a half hour

85
00:06:36,070 --> 00:06:33,520
procedure where atomic oxygen will

86
00:06:38,230 --> 00:06:36,080
stream over the wake shield and give it

87
00:06:39,990 --> 00:06:38,240
a bath if you will to remove any excess

88
00:06:41,830 --> 00:06:40,000

contamination which may have built up on

89

00:06:48,070 --> 00:06:41,840

the wake shield during its time in the

90

00:06:53,029 --> 00:06:51,430

all of the free fly or activation uh

91

00:06:54,870 --> 00:06:53,039

operations will continue at this point

92

00:06:57,510 --> 00:06:54,880

the wake shield itself is called the

93

00:07:00,150 --> 00:06:57,520

free flyer the other component of the

94

00:07:05,990 --> 00:07:00,160

wake shield facility is its carrier uh

95

00:07:10,150 --> 00:07:07,589

this is mission control houston at a

96

00:07:12,150 --> 00:07:10,160

mission elapsed time of three days 15

97

00:07:13,350 --> 00:07:12,160

hours 54 minutes into the flight of

98

00:07:15,270 --> 00:07:13,360

endeavour

99

00:07:18,390 --> 00:07:15,280

this live picture from

100

00:07:20,309 --> 00:07:18,400

the elbow camera on the robot arm of the

101
00:07:22,870 --> 00:07:20,319
shuttle endeavour showing the wake

102
00:07:24,550 --> 00:07:22,880
shield facility as it hangs

103
00:07:26,390 --> 00:07:24,560
outside the uh

104
00:07:28,950 --> 00:07:26,400
the port side of the payload bay of the

105
00:07:33,029 --> 00:07:28,960
shuttle in the ram cleaning position as

106
00:07:36,710 --> 00:07:34,950
but payload

107
00:07:38,390 --> 00:07:36,720
officials and the flight control team

108
00:07:40,230 --> 00:07:38,400
want to make sure that there is no

109
00:07:42,629 --> 00:07:40,240
further interruption of that stream of

110
00:07:44,629 --> 00:07:42,639
telemetry before giving the go to deploy

111
00:07:46,629 --> 00:07:44,639
the wake shield facility this live

112
00:07:47,670 --> 00:07:46,639
television picture now from the shuttle

113
00:07:49,430 --> 00:07:47,680

endeavour

114

00:07:51,430 --> 00:07:49,440

shows the wake shield hanging at the end

115

00:07:53,270 --> 00:07:51,440

of the robot arm over the starboard side

116

00:07:55,990 --> 00:07:53,280

of the orbiter as it passes over the

117

00:07:59,189 --> 00:07:56,000

northwest portion of africa this is uh

118

00:08:01,110 --> 00:07:59,199

in the attitude and the position uh for

119

00:08:02,950 --> 00:08:01,120

the continuing checkout of the attitude

120

00:08:05,830 --> 00:08:02,960

determination and control system on the

121

00:08:07,270 --> 00:08:05,840

wake shield uh before uh it is scheduled

122

00:08:15,909 --> 00:08:07,280

to be deployed an hour and a half from

123

00:08:20,790 --> 00:08:17,830

okay thanks

124

00:08:23,430 --> 00:08:20,800

the mmd uh referred to uh by astronaut

125

00:08:26,469 --> 00:08:23,440

jim newman aboard endeavour is a

126
00:08:28,550 --> 00:08:26,479
microgravity measurement device which

127
00:08:31,189 --> 00:08:28,560
will be used on the wake shield facility

128
00:08:33,029 --> 00:08:31,199
as part of the data collection

129
00:08:35,269 --> 00:08:33,039
effort that the wake shield will

130
00:08:37,990 --> 00:08:35,279
undertake over the next 50 hours

131
00:08:39,350 --> 00:08:38,000
clear we see charles in busa right now

132
00:08:40,550 --> 00:08:39,360
and

133
00:08:42,630 --> 00:08:40,560
does that mean you want us to run the

134
00:08:58,070 --> 00:08:42,640
start block if it doesn't have a one

135
00:08:58,080 --> 00:09:02,630
jim voss is coming down to the mid deck

136
00:09:09,269 --> 00:09:03,910
and

137
00:09:11,350 --> 00:09:09,279
we've found a use for all of them

138
00:09:13,670 --> 00:09:11,360

at this time uh during the wake field a

139

00:09:14,870 --> 00:09:13,680

few days will actually be and did today

140

00:09:18,150 --> 00:09:14,880

use all of them

141

00:09:18,949 --> 00:09:18,160

we uh had several set up on the mid deck

142

00:09:21,030 --> 00:09:18,959

uh

143

00:09:23,110 --> 00:09:21,040

those two pgscs the one on the left is

144

00:09:23,990 --> 00:09:23,120

the goddard payload stuff and the one on

145

00:09:26,710 --> 00:09:24,000

the right

146

00:09:27,829 --> 00:09:26,720

is the gps the orbiter now has gps

147

00:09:30,310 --> 00:09:27,839

installed

148

00:09:32,310 --> 00:09:30,320

and we're helping those

149

00:09:34,829 --> 00:09:32,320

guys learn more about gps so that we can

150

00:09:37,590 --> 00:09:34,839

when we install gps into the flight

151
00:09:39,509 --> 00:09:37,600
software our flight controllers will

152
00:09:41,190 --> 00:09:39,519
be able to use it the same way they do

153
00:09:45,990 --> 00:09:41,200
the ku band now and the tracking

154
00:09:50,389 --> 00:09:48,470
this is just one of the displays that

155
00:09:51,509 --> 00:09:50,399
they have it shows the satellites being

156
00:09:53,750 --> 00:09:51,519
tracked

157
00:09:55,829 --> 00:09:53,760
and where we are on the earth we also

158
00:09:58,389 --> 00:09:55,839
have a little world map on there

159
00:10:01,030 --> 00:09:58,399
it shows us where gps thinks we are and

160
00:10:03,350 --> 00:10:01,040
it agrees quite well with the orbiter

161
00:10:07,350 --> 00:10:03,360
uh state vector that uh the

162
00:10:18,790 --> 00:10:09,190
on this flight we do have a gps on the

163
00:10:22,550 --> 00:10:20,230

well we're going to show you a little

164

00:10:24,230 --> 00:10:22,560

bit about the rendezvous now here's

165

00:10:27,190 --> 00:10:24,240

part of the team it really took all five

166

00:10:28,949 --> 00:10:27,200

of us uh to do this one

167

00:10:30,710 --> 00:10:28,959

in the terminal phase

168

00:10:31,670 --> 00:10:30,720

two joe's up in the front

169

00:10:33,590 --> 00:10:31,680

uh

170

00:10:36,389 --> 00:10:33,600

rooting procedures keeping everybody

171

00:10:38,389 --> 00:10:36,399

focused and backing me up

172

00:10:40,710 --> 00:10:38,399

well we have

173

00:10:42,790 --> 00:10:40,720

pluto and underdog in the back

174

00:10:44,550 --> 00:10:42,800

underdog getting ready of course to uh

175

00:10:46,870 --> 00:10:44,560

to do the grapple

176

00:10:48,790 --> 00:10:46,880

pluto running the rendezvous tools

177

00:10:51,509 --> 00:10:48,800

a handheld laser

178

00:10:53,030 --> 00:10:51,519

and uh generally helping me out

179

00:10:55,110 --> 00:10:53,040

and then jim

180

00:10:57,590 --> 00:10:55,120

played a vital role trying to document

181

00:10:59,829 --> 00:10:57,600

this and in helping me build sun shades

182

00:11:01,590 --> 00:10:59,839

in real time to try and keep the son of

183

00:11:03,269 --> 00:11:01,600

a son out of our eyes this turned out to

184

00:11:04,389 --> 00:11:03,279

be real challenging with the beta angle

185

00:11:06,230 --> 00:11:04,399

we've got

186

00:11:08,389 --> 00:11:06,240

uh particularly with the fly around that

187

00:11:10,550 --> 00:11:08,399

we had which caused us to

188

00:11:12,310 --> 00:11:10,560

spend a little extra time so

189

00:11:14,150 --> 00:11:12,320

we didn't get as good a video as we

190

00:11:16,870 --> 00:11:14,160

would have liked out of these cameras we

191

00:11:18,310 --> 00:11:16,880

were too busy in the windows

192

00:11:20,310 --> 00:11:18,320

however

193

00:11:21,509 --> 00:11:20,320

we did manage to get the thing aboard as

194

00:11:22,310 --> 00:11:21,519

you saw

195

00:11:24,310 --> 00:11:22,320

and

196

00:11:25,990 --> 00:11:24,320

underdog did just a super job of

197

00:11:27,590 --> 00:11:26,000

grappling the thing because we had rates

198

00:11:30,230 --> 00:11:27,600

and two axes and we weren't able to

199

00:11:32,550 --> 00:11:30,240

adapt them to uh damp them all out we

200

00:11:34,710 --> 00:11:32,560

did get them fairly low for him

201
00:11:37,670 --> 00:11:34,720
and he did a terrific job on the

202
00:11:39,030 --> 00:11:37,680
the capture and here we now see

203
00:11:41,190 --> 00:11:39,040
the final

204
00:11:43,030 --> 00:11:41,200
desired end result

205
00:11:46,069 --> 00:11:43,040
the spartan

206
00:11:47,829 --> 00:11:46,079
settling into its cradle

207
00:11:56,550 --> 00:11:47,839
to be brought home hopefully after a

208
00:11:56,560 --> 00:12:06,949
thanks that was a nice tour

209
00:12:06,959 --> 00:12:11,030
go ahead

210
00:12:13,990 --> 00:12:13,030
yeah i kind of delayed my exercise a bit

211
00:12:16,150 --> 00:12:14,000
uh to

212
00:12:18,310 --> 00:12:16,160
be with you for wakefield um it shows an

213
00:12:19,430 --> 00:12:18,320

exercise period here on the flight plan

214

00:12:21,509 --> 00:12:19,440

followed by some more wakefield

215

00:12:23,350 --> 00:12:21,519

monitoring which i'd be happy to do

216

00:12:28,629 --> 00:12:23,360

um how would you like me to

217

00:12:36,949 --> 00:12:30,230

thanks for asking we'll get back with

218

00:12:36,959 --> 00:12:45,750

that's a great picture

219

00:12:45,760 --> 00:12:48,550

okay well

220

00:12:52,949 --> 00:12:51,269

as you can see we're

221

00:12:53,910 --> 00:12:52,959

you're gonna get a really nice release

222

00:12:56,310 --> 00:12:53,920

here

223

00:12:59,110 --> 00:12:56,320

pluto did a super job of letting it go

224

00:13:02,230 --> 00:12:59,120

without any tip off or anything

225

00:13:06,470 --> 00:13:04,150

you can see he just muscled the

226

00:13:13,990 --> 00:13:06,480

dog face out of the

227

00:13:19,030 --> 00:13:15,670

with his absolutely perfect smooth

228

00:13:22,470 --> 00:13:19,040

release really good job by him

229

00:13:26,710 --> 00:13:23,750

yeah it is it's real pretty

230

00:13:29,190 --> 00:13:26,720

interestingly enough we had trouble

231

00:13:32,069 --> 00:13:29,200

getting laser marks on it at close range

232

00:13:37,590 --> 00:13:35,670

off the uh ram side

233

00:13:47,189 --> 00:13:37,600

i'm sorry the wake side yeah the ram

234

00:13:51,430 --> 00:13:49,350

it tends to diffuse the laser instead of

235

00:14:04,230 --> 00:13:51,440

reflecting it back on that really smooth

236

00:14:07,910 --> 00:14:06,230

this is one area where the real thing

237

00:14:09,829 --> 00:14:07,920

sure beats the simulator all the heck

238

00:14:11,430 --> 00:14:09,839

although the behavior was exactly as the