



1
00:00:36,229 --> 00:00:02,790
hi i'm sts-130 flight engineer steve

2
00:00:36,239 --> 00:00:57,350
a broken promise i kept too long

3
00:01:03,750 --> 00:01:01,270
we get up in a foreign land

4
00:01:05,429 --> 00:01:03,760
trying to act like i got something

5
00:01:17,910 --> 00:01:05,439
planned

6
00:01:17,920 --> 00:01:30,310
don't let mama

7
00:01:37,270 --> 00:01:32,710
endeavor good morning and a special good

8
00:01:42,069 --> 00:01:39,670
good morning houston and thanks for that

9
00:01:44,710 --> 00:01:42,079
music that song is very appropriate

10
00:01:46,469 --> 00:01:44,720
today performed by fellow mobile alabama

11
00:01:49,590 --> 00:01:46,479
native jimmy buffett

12
00:01:51,830 --> 00:01:49,600
and on a day that we'll be working on

13
00:01:54,630 --> 00:01:51,840

opening our new window in the world

14

00:01:56,469 --> 00:01:54,640

performing eva number three here on the

15

00:01:59,670 --> 00:01:56,479

international space station in the space

16

00:02:08,949 --> 00:02:02,230

and we certainly agree with you kay

17

00:02:12,949 --> 00:02:11,110

today's wake up music for the astronauts

18

00:02:15,589 --> 00:02:12,959

on board shuttle endeavour

19

00:02:16,710 --> 00:02:15,599

song window on the world by jimmy

20

00:02:22,070 --> 00:02:16,720

buffett

21

00:02:26,150 --> 00:02:24,309

the crew members move into preparations

22

00:02:30,630 --> 00:02:26,160

for the third of three planned

23

00:02:32,710 --> 00:02:30,640

spacewalks on shuttle mission sts-130

24

00:02:34,790 --> 00:02:32,720

planning to finish up the connections of

25

00:02:36,550 --> 00:02:34,800

the new tranquility module and the

26

00:02:39,990 --> 00:02:36,560

cupola module

27

00:02:42,309 --> 00:02:40,000

and as higher noted open up the windows

28

00:02:46,790 --> 00:02:42,319

on the station's new observation deck

29

00:02:51,430 --> 00:02:48,630

this is inside the station's quest

30

00:02:53,430 --> 00:02:51,440

airlock where the spacewalkers are

31

00:02:55,830 --> 00:02:53,440

getting prepared for the mission's third

32

00:02:57,350 --> 00:02:55,840

and final spacewalk astronauts bob

33

00:02:59,589 --> 00:02:57,360

bankin and nicholas patrick are

34

00:03:02,790 --> 00:02:59,599

conducting this spacewalk as they have

35

00:03:06,630 --> 00:03:04,630

shuttle commander george zamka is also

36

00:03:08,550 --> 00:03:06,640

in view here inside the quest airlock

37

00:03:10,390 --> 00:03:08,560

along with station flight engineer tj

38

00:03:13,110 --> 00:03:10,400

creamer to assist the crew members in

39

00:03:14,470 --> 00:03:13,120

preparation for the spacewalk

40

00:03:16,470 --> 00:03:14,480

creamer and

41

00:03:19,430 --> 00:03:16,480

zamko will assist the crew members with

42

00:03:21,270 --> 00:03:19,440

getting into their spacesuits

43

00:03:23,509 --> 00:03:21,280

the crew members have now worn the

44

00:03:24,710 --> 00:03:23,519

oxygen masks for long enough in this

45

00:03:26,390 --> 00:03:24,720

pre-breathe

46

00:03:28,550 --> 00:03:26,400

procedure

47

00:03:30,470 --> 00:03:28,560

so astronauts bob benkin and nicholas

48

00:03:32,470 --> 00:03:30,480

patrick are removing those inside the

49

00:03:35,030 --> 00:03:32,480

station's quest airlock which is at a

50

00:03:36,149 --> 00:03:35,040

reduced pressure of 10.2 pounds per

51

00:03:39,190 --> 00:03:36,159

square inch

52

00:03:41,750 --> 00:03:39,200

compared to the 14.7 psi of the rest of

53

00:03:43,589 --> 00:03:41,760

the station

54

00:03:46,149 --> 00:03:43,599

banken and patrick will continue the

55

00:03:47,910 --> 00:03:46,159

external outfitting of the new elements

56

00:03:50,550 --> 00:03:47,920

delivered to the station by endeavors

57

00:03:54,550 --> 00:03:50,560

crew the node 3 cupola

58

00:03:56,229 --> 00:03:54,560

the note 3 tranquility and its cupola

59

00:03:57,990 --> 00:03:56,239

including additional fluid and cable

60

00:03:59,830 --> 00:03:58,000

routing on the outside side of

61

00:04:01,429 --> 00:03:59,840

tranquility to

62

00:04:03,030 --> 00:04:01,439

lead to the new

63

00:04:05,830 --> 00:04:03,040

location of the pressurized mating

64

00:04:07,750 --> 00:04:05,840

adapter number three that was positioned

65

00:04:10,229 --> 00:04:07,760

onto tranquility

66

00:04:13,750 --> 00:04:10,239

and removing the thermal covers on the

67

00:04:17,270 --> 00:04:15,589

spacewalkers nicholas patrick and bob

68

00:04:18,789 --> 00:04:17,280

bankin are in their suits we can see

69

00:04:21,270 --> 00:04:18,799

patrick here being

70

00:04:22,469 --> 00:04:21,280

maneuvered by shuttle commander george

71

00:04:23,270 --> 00:04:22,479

zamka

72

00:04:25,430 --> 00:04:23,280

and

73

00:04:27,590 --> 00:04:25,440

station flight engineer tj creamer will

74

00:04:30,390 --> 00:04:27,600

help with putting on the safer the

75

00:04:31,749 --> 00:04:30,400

simplified aid for eva or extravehicular

76

00:04:32,870 --> 00:04:31,759

activity

77

00:04:35,189 --> 00:04:32,880

rescue

78

00:04:37,270 --> 00:04:35,199

spacewalker bob benkin is in his suit

79

00:04:57,830 --> 00:04:37,280

and just out of view below where this

80

00:05:02,870 --> 00:05:01,430

and george the eevee hatch is open and

81

00:05:05,590 --> 00:05:02,880

latched

82

00:05:07,590 --> 00:05:05,600

okay copy evie hatch open and stowed i'm

83

00:05:11,749 --> 00:05:07,600

going to take the emergency mpev to

84

00:05:15,350 --> 00:05:13,430

bob i heard you said restaurant nicholas

85

00:05:18,550 --> 00:05:15,360

patrick now ready to come out the hatch

86

00:05:22,310 --> 00:05:20,390

that's affirmative steve i can close the

87

00:05:31,510 --> 00:05:22,320

mark onto the forward

88

00:05:35,590 --> 00:05:33,430

this is a view from the helmet camera on

89

00:05:38,070 --> 00:05:35,600

astronaut nicholas patrick's spacesuit

90

00:05:39,670 --> 00:05:38,080

the number 18 in the lower right corner

91

00:05:44,150 --> 00:05:39,680

will identify that view throughout the

92

00:05:45,909 --> 00:05:44,160

space walk as the camera on his suit

93

00:05:47,990 --> 00:05:45,919

happy next time and this is a view from

94

00:05:50,469 --> 00:05:48,000

astronaut bob benkin's camera on his

95

00:05:52,629 --> 00:05:50,479

helmet as he is getting ready to come

96

00:05:54,550 --> 00:05:52,639

out the airlock after passing some bags

97

00:05:56,550 --> 00:05:54,560

of equipment out to astronaut necklace

98

00:06:05,990 --> 00:05:56,560

patrick to pre-position on the outside

99

00:06:12,710 --> 00:06:09,270

the thermal cover is closed

100

00:06:17,430 --> 00:06:12,720

bob you are headed by the forward group

101
00:06:21,909 --> 00:06:18,830

copy

102
00:06:23,749 --> 00:06:21,919

that you can go uh donator when you hit

103
00:06:25,270 --> 00:06:23,759

number three go zetas up to the nick

104
00:06:26,950 --> 00:06:25,280

patrick highway there and it's a short

105
00:06:29,749 --> 00:06:26,960

one and that's where you'll throw the

106
00:06:31,110 --> 00:06:29,759

oih bag

107
00:06:36,550 --> 00:06:31,120

nick you're heading out to the end of

108
00:06:41,110 --> 00:06:38,550

and steve i copy that

109
00:06:43,510 --> 00:06:41,120

we'll take the af route for a change

110
00:06:44,870 --> 00:06:43,520

and uh we'll stop by the node 3

111
00:06:47,270 --> 00:06:44,880

starboard end cone and i've got a

112
00:06:57,909 --> 00:06:47,280

handrail for you when you get out there

113
00:07:01,909 --> 00:06:59,589

astronauts nicholas patrick and bob

114

00:07:03,430 --> 00:07:01,919

bankin are moving on to their work sites

115

00:07:06,710 --> 00:07:03,440

for the beginning of the spacewalk

116

00:07:09,430 --> 00:07:06,720

having set up the initial tool

117

00:07:10,469 --> 00:07:09,440

configurations outside of the quest air

118

00:07:13,589 --> 00:07:10,479

lock

119

00:07:15,589 --> 00:07:13,599

bankin is moving to the area to open the

120

00:07:17,270 --> 00:07:15,599

quick disconnects on the

121

00:07:18,870 --> 00:07:17,280

umbilicals that are connecting the

122

00:07:21,270 --> 00:07:18,880

redundant

123

00:07:22,550 --> 00:07:21,280

loops of the ammonia thermal control

124

00:07:24,390 --> 00:07:22,560

system to

125

00:07:26,710 --> 00:07:24,400

allow the ammonia to flow through those

126
00:07:29,270 --> 00:07:26,720
loops the primary system was activated

127
00:07:31,909 --> 00:07:29,280
during the mission's second spacewalk

128
00:07:33,510 --> 00:07:31,919
and patrick is moving also around

129
00:07:35,350 --> 00:07:33,520
tranquility to

130
00:07:37,110 --> 00:07:35,360
make cable connections for the

131
00:07:48,950 --> 00:07:37,120
pressurized mating adapter number three

132
00:07:55,189 --> 00:07:51,189
okay steve uh foodies three and four are

133
00:08:01,189 --> 00:07:56,790
excellent with that you can close the

134
00:08:05,830 --> 00:08:03,029
astronaut bob benkin has completed

135
00:08:07,749 --> 00:08:05,840
opening the quick disconnects on the lab

136
00:08:10,469 --> 00:08:07,759
side the destiny lab side of these

137
00:08:13,270 --> 00:08:10,479
ammonia lines for tranquility and he

138
00:08:15,510 --> 00:08:13,280

will move to the other side of the lines

139

00:08:18,550 --> 00:08:15,520

on tranquility to open those as well to

140

00:08:20,390 --> 00:08:18,560

activate this redundant system for the

141

00:08:24,309 --> 00:08:20,400

external thermal control system for

142

00:08:29,029 --> 00:08:26,469

this video is from the helmet camera on

143

00:08:31,430 --> 00:08:29,039

astronaut bob benkin spacesuit and while

144

00:08:34,709 --> 00:08:31,440

in the area he is securing some of the

145

00:08:36,870 --> 00:08:34,719

thermal covers around the ammonia lines

146

00:08:39,350 --> 00:08:36,880

astronaut nicholas patrick is working on

147

00:08:41,350 --> 00:08:39,360

cabling for the pressurized mating

148

00:08:42,550 --> 00:08:41,360

adapter number three let me see his

149

00:08:43,750 --> 00:08:42,560

helmet cam

150

00:08:46,790 --> 00:08:43,760

view here

151

00:08:49,990 --> 00:08:46,800

he is disconnecting some brackets

152

00:08:58,230 --> 00:08:50,000

and releasing cables from the adapter so

153

00:09:03,190 --> 00:09:00,310

i'm leaving f1

154

00:09:05,990 --> 00:09:04,310

that's affirmative that's the right

155

00:09:07,509 --> 00:09:06,000

thing to do great

156

00:09:09,750 --> 00:09:07,519

f two three

157

00:09:12,550 --> 00:09:09,760

four five and six

158

00:09:16,230 --> 00:09:13,590

nice job

159

00:09:17,430 --> 00:09:16,240

now there's uh four cable connectors at

160

00:09:18,949 --> 00:09:17,440

the dummy panel and they all have

161

00:09:20,150 --> 00:09:18,959

booties

162

00:09:21,910 --> 00:09:20,160

those are that

163

00:09:24,949 --> 00:09:21,920

and remember when you put the dust caps

164

00:09:26,630 --> 00:09:24,959

on on those two 603 and 608 they'll need

165

00:09:46,070 --> 00:09:26,640

the booties back on

166

00:09:50,070 --> 00:09:48,070

over there

167

00:09:51,670 --> 00:09:50,080

and all ta plants are released and

168

00:09:57,829 --> 00:09:51,680

re-closed

169

00:10:01,990 --> 00:09:59,910

astronaut bob bankin has completed

170

00:10:04,310 --> 00:10:02,000

securing those thermal covers in place

171

00:10:06,150 --> 00:10:04,320

for the ammonia lines and is going over

172

00:10:08,310 --> 00:10:06,160

to the other end of the lines to open

173

00:10:18,870 --> 00:10:08,320

the quick disconnects on the

174

00:10:24,389 --> 00:10:20,310

i don't know if you can look at camera

175

00:10:28,949 --> 00:10:26,870

at all and see anything on uh

176

00:10:37,509 --> 00:10:28,959

kind of the status of uh

177

00:10:37,519 --> 00:10:40,710

work on that

178

00:10:44,870 --> 00:10:42,790

steve i'm

179

00:10:46,389 --> 00:10:44,880

ended up with

180

00:10:51,269 --> 00:10:46,399

the cable

181

00:10:55,829 --> 00:10:53,750

that's great dick you got that uh

182

00:10:59,509 --> 00:10:55,839

got that 603 off okay

183

00:11:01,190 --> 00:10:59,519

yeah but the 602 and 603 the connectives

184

00:11:02,870 --> 00:11:01,200

were very hard to do mate if they're

185

00:11:05,110 --> 00:11:02,880

done

186

00:11:07,829 --> 00:11:05,120

very good and is the death cab uh is on

187

00:11:10,230 --> 00:11:07,839

603 plus booty i will uh the booty's

188

00:11:14,550 --> 00:11:10,240

alone i'll do the dust caps up here at

189

00:11:19,590 --> 00:11:16,310

these spacewalkers have completed their

190

00:11:22,870 --> 00:11:19,600

tests with the setup of the systems for

191

00:11:27,190 --> 00:11:24,790

later they will install some handrails

192

00:11:36,630 --> 00:11:27,200

and worksite interfaces for future

193

00:11:40,389 --> 00:11:38,069

these spacewalkers have joined each

194

00:11:42,790 --> 00:11:40,399

other near the cupola to begin removing

195

00:11:45,110 --> 00:11:42,800

the insulation from the outside of that

196

00:11:47,509 --> 00:11:45,120

element

197

00:11:50,150 --> 00:11:47,519

the cupola is three meters in diameter

198

00:11:55,590 --> 00:11:50,160

or about 9.8 feet and one and a half

199

00:11:59,590 --> 00:11:57,910

once the insulation is removed and bolts

200

00:12:00,470 --> 00:11:59,600

securing the window shutters in place

201
00:12:01,670 --> 00:12:00,480
are

202
00:12:04,470 --> 00:12:01,680
taken out

203
00:12:11,590 --> 00:12:04,480
the crew inside cupola can

204
00:12:15,110 --> 00:12:13,350
once the crew members removed the

205
00:12:17,509 --> 00:12:15,120
insulation covers

206
00:12:19,190 --> 00:12:17,519
patrick will be the one to release the

207
00:12:21,509 --> 00:12:19,200
three bolts on each of the window

208
00:12:24,870 --> 00:12:21,519
shutters for these seven windows while

209
00:12:26,550 --> 00:12:24,880
banking moves on to install some

210
00:12:29,030 --> 00:12:26,560
equipment on the outside of tranquility

211
00:12:31,990 --> 00:12:29,040
to help future space walkers such as

212
00:12:34,230 --> 00:12:32,000
handrails and worksite to interface

213
00:12:35,509 --> 00:12:34,240

connectors

214

00:12:37,269 --> 00:12:35,519

you can

215

00:12:40,790 --> 00:12:37,279

get to work on your side of the ground

216

00:12:45,509 --> 00:12:40,800

faster expect 12 turns each

217

00:12:48,470 --> 00:12:47,110

and my adverse pct starting with the

218

00:12:50,870 --> 00:12:48,480

second time

219

00:12:53,509 --> 00:12:50,880

you bet alpha 5 counter two proper five

220

00:12:56,069 --> 00:12:53,519

counted two thank you

221

00:12:58,790 --> 00:12:56,079

okay see the bag is secure

222

00:13:00,710 --> 00:12:58,800

on the top of the cupola i'm gonna do a

223

00:13:03,030 --> 00:13:00,720

glove inspection first before i get

224

00:13:07,829 --> 00:13:03,040

excited okay get the uh

225

00:13:12,310 --> 00:13:09,509

okay cover one

226

00:13:15,269 --> 00:13:12,320

bolt one is release

227

00:13:18,710 --> 00:13:15,279

right cover one bolt two

228

00:13:30,470 --> 00:13:20,949

okay cover one bowl two got it thanks

229

00:13:30,480 --> 00:13:34,790

cover four four movies

230

00:13:39,430 --> 00:13:36,710

nick you cut out a little bit i i copied

231

00:13:40,710 --> 00:13:39,440

uh cover four cover full full

232

00:13:44,069 --> 00:13:40,720

release

233

00:13:45,990 --> 00:13:44,079

happy cover four bolt one excellent

234

00:13:48,069 --> 00:13:46,000

got some really neat views of you uh

235

00:13:52,790 --> 00:13:48,079

both working around the cupola oh thank

236

00:13:57,670 --> 00:13:54,629

these spacewalkers are now working on

237

00:13:58,790 --> 00:13:57,680

removing the insulation covers inside

238

00:14:07,430 --> 00:13:58,800

the bag

239

00:14:13,110 --> 00:14:09,910

these spacewalkers will work together to

240

00:14:15,750 --> 00:14:13,120

roll up and fold up each of the covers

241

00:14:19,829 --> 00:14:15,760

into two separate assemblies that will

242

00:14:23,910 --> 00:14:22,069

into a bag that the crew members brought

243

00:14:34,790 --> 00:14:23,920

out of the hatch

244

00:14:38,710 --> 00:14:36,629

this is a view from the helmet camera on

245

00:14:40,949 --> 00:14:38,720

astronaut bob benkin's spacesuit as he's

246

00:14:42,949 --> 00:14:40,959

working to roll up one of the panels

247

00:14:54,629 --> 00:14:42,959

for the insulation covers on the outside

248

00:14:58,710 --> 00:14:56,790

the crew members have completed removing

249

00:15:01,030 --> 00:14:58,720

the insulation covers from the outside

250

00:15:02,629 --> 00:15:01,040

of the cupola

251
00:15:04,790 --> 00:15:02,639
this view on the outside of the station

252
00:15:06,949 --> 00:15:04,800
of the spacewalkers as the vehicle

253
00:15:23,590 --> 00:15:06,959
passes over the earth into an orbital

254
00:15:27,829 --> 00:15:24,829
thank

255
00:15:30,230 --> 00:15:27,839
you we get about to have cupola have its

256
00:15:35,670 --> 00:15:30,240
first full orbital sunrise and its

257
00:15:39,990 --> 00:15:38,069
spacewalkers bob banking on the left and

258
00:15:42,069 --> 00:15:40,000
nicholas patrick on the right working on

259
00:15:45,030 --> 00:15:42,079
the outside of the new tranquility node

260
00:15:47,590 --> 00:15:45,040
and cupola patrick is removing bolts

261
00:15:49,509 --> 00:15:47,600
that held the shutters on the kubila's

262
00:15:51,189 --> 00:15:49,519
windows in place

263
00:15:53,350 --> 00:15:51,199

and banking is working on installing

264

00:16:01,110 --> 00:15:53,360

worksite interfaces and handrails for

265

00:16:04,949 --> 00:16:03,030

this is a view from the helmet camera on

266

00:16:08,230 --> 00:16:04,959

astronaut nicholas patrick's spacesuit

267

00:16:14,150 --> 00:16:08,240

watching him remove the final bolt

268

00:16:14,160 --> 00:16:19,910

steve window 6.02 is released

269

00:16:26,230 --> 00:16:23,189

at all of them windows 6.2 that checks

270

00:16:29,910 --> 00:16:26,240

off my uh matrix of uh launch lock bolts

271

00:16:34,870 --> 00:16:32,470

the defaults did not work exactly as

272

00:16:37,509 --> 00:16:34,880

they did in the mbl

273

00:16:38,310 --> 00:16:37,519

i'm just going to do a quick they didn't

274

00:16:40,550 --> 00:16:38,320

pop

275

00:16:42,790 --> 00:16:40,560

completely free

276

00:16:44,230 --> 00:16:42,800

um until you get to third one so i'm

277

00:16:44,949 --> 00:16:44,240

just going to do a quick survey around

278

00:16:47,910 --> 00:16:44,959

the

279

00:16:52,150 --> 00:16:47,920

cooper here and make sure that

280

00:16:56,790 --> 00:16:54,150

the required number of friends

281

00:16:58,069 --> 00:16:56,800

okay that sounds good and uh i think

282

00:16:59,430 --> 00:16:58,079

you're doing a great job keeping your

283

00:17:01,990 --> 00:16:59,440

safety tether

284

00:17:07,429 --> 00:17:02,000

in your in your field of regard

285

00:17:07,439 --> 00:17:14,150

and houston likes that plan

286

00:17:18,710 --> 00:17:16,949

now 10 feet from all windows

287

00:17:21,350 --> 00:17:18,720

copy that if you need to come closer

288

00:17:22,789 --> 00:17:21,360

than that uh do let me know but i think

289

00:17:24,630 --> 00:17:22,799

for your further movements you do not

290

00:17:25,750 --> 00:17:24,640

need to do concur

291

00:17:28,470 --> 00:17:25,760

um

292

00:17:30,390 --> 00:17:28,480

i can carry it yes

293

00:17:31,909 --> 00:17:30,400

okay and bob the windows number two and

294

00:17:34,070 --> 00:17:31,919

three the station forward windows are

295

00:17:36,470 --> 00:17:34,080

the ones closest to your side

296

00:17:37,830 --> 00:17:36,480

we'll make sure we keep those closed

297

00:17:39,110 --> 00:17:37,840

okay

298

00:17:40,710 --> 00:17:39,120

the crew members on board the

299

00:17:42,789 --> 00:17:40,720

international space station and space

300

00:17:45,830 --> 00:17:42,799

shuttle endeavour have coordinated the

301
00:17:48,710 --> 00:17:45,840
space walkers locations and opening the

302
00:17:51,350 --> 00:17:48,720
first shutter on the cupola

303
00:17:52,470 --> 00:17:51,360
window number seven the circular window

304
00:18:13,350 --> 00:17:52,480
on the top

305
00:18:18,549 --> 00:18:15,750
well as expected the view through

306
00:18:21,029 --> 00:18:18,559
windows 7 is absolutely spectacular this

307
00:18:21,990 --> 00:18:21,039
has to be the largest window on board

308
00:18:23,029 --> 00:18:22,000
and

309
00:18:25,029 --> 00:18:23,039
when we

310
00:18:27,750 --> 00:18:25,039
have the others around it open it will

311
00:18:34,230 --> 00:18:27,760
give us a view of the entire globe

312
00:18:55,669 --> 00:18:37,029
window shutter number seven being closed

313
00:18:59,190 --> 00:18:57,510

you can see the two crew members working

314

00:19:00,549 --> 00:18:59,200

together astronaut bob bankin in the

315

00:19:02,390 --> 00:19:00,559

suit with the red stripes around the

316

00:19:03,190 --> 00:19:02,400

legs and astronaut nicholas patrick with

317

00:19:05,750 --> 00:19:03,200

him

318

00:19:07,510 --> 00:19:05,760

their task together is to route some

319

00:19:08,830 --> 00:19:07,520

cabling on the outside of the station

320

00:19:12,390 --> 00:19:08,840

for the

321

00:19:13,590 --> 00:19:12,400

video signal converter that

322

00:19:15,510 --> 00:19:13,600

helps with the

323

00:19:30,950 --> 00:19:15,520

video cameras on the

324

00:19:34,789 --> 00:19:32,789

the crew inside the international space

325

00:19:36,710 --> 00:19:34,799

station shutting the

326

00:19:39,110 --> 00:19:36,720

cover on window number three in the

327

00:19:46,390 --> 00:19:39,120

cupola now only a one shutter remaining

328

00:19:50,710 --> 00:19:48,870

and there uh shutter number two the last

329

00:19:52,630 --> 00:19:50,720

window covering to be tested on the

330

00:19:55,190 --> 00:19:52,640

cupola is opening

331

00:20:00,549 --> 00:19:55,200

the crew members inside cupola open the

332

00:20:05,830 --> 00:20:02,470

crew members visible in the window

333

00:20:08,310 --> 00:20:05,840

looking out to the cupola

334

00:20:10,390 --> 00:20:08,320

side of the cupola with the window open

335

00:20:17,669 --> 00:20:10,400

faces forward on the international space

336

00:20:25,110 --> 00:20:19,510

commission specialist bob banking making

337

00:20:29,270 --> 00:20:27,270

the addition of the tranquility

338

00:20:33,029 --> 00:20:29,280

node and the cupola

339

00:20:34,870 --> 00:20:33,039

addition to tranquility mark the 98

340

00:20:36,149 --> 00:20:34,880

complete point for the international

341

00:20:37,990 --> 00:20:36,159

space station

342

00:20:40,789 --> 00:20:38,000

and with the work done to

343

00:20:43,190 --> 00:20:40,799

during today's spacewalk i'm

344

00:20:44,390 --> 00:20:43,200

setting up the final ammonia cooling

345

00:20:45,909 --> 00:20:44,400

line for

346

00:20:47,830 --> 00:20:45,919

tranquility and the heater cables for

347

00:20:49,750 --> 00:20:47,840

the pressurized mating adapter that

348

00:20:51,590 --> 00:20:49,760

marks actually the completion of the

349

00:21:25,110 --> 00:20:51,600

external thermal control system for the

350

00:21:30,470 --> 00:21:27,830

see the crew getting some video pilot

351
00:21:33,590 --> 00:21:30,480
terry burt's there the cameraman birds

352
00:21:35,350 --> 00:21:33,600
has been working to install panels

353
00:21:37,029 --> 00:21:35,360
to cover up the

354
00:21:38,470 --> 00:21:37,039
wires and cables that the crew has been

355
00:21:46,270 --> 00:21:38,480
connecting and

356
00:21:50,149 --> 00:21:49,350
360 degrees it's amazing you can see

357
00:21:51,990 --> 00:21:50,159
this

358
00:21:53,750 --> 00:21:52,000
thickness of the atmosphere you can see

359
00:22:30,710 --> 00:21:53,760
the clouds coming and going

360
00:22:34,549 --> 00:22:32,310
so bob and nick were getting ready to go

361
00:22:37,350 --> 00:22:34,559
out the hatch here for their third

362
00:22:38,870 --> 00:22:37,360
spacewalk and the final spacewalk

363
00:22:41,590 --> 00:22:38,880

today was a little different nick was

364

00:22:44,390 --> 00:22:41,600

the first one out the hatch

365

00:22:45,909 --> 00:22:44,400

here bob and i being put into the

366

00:22:48,310 --> 00:22:45,919

station airlock in preparation for the

367

00:22:50,470 --> 00:22:48,320

eva i'm already in head first

368

00:22:52,149 --> 00:22:50,480

and there's bob waving he's going to be

369

00:22:54,390 --> 00:22:52,159

put in second i'm going to open the

370

00:22:59,110 --> 00:22:54,400

house today and bob's going to operate

371

00:23:06,070 --> 00:23:02,549

our two suit up experts were tj creamer

372

00:23:08,710 --> 00:23:06,080

seen here and our commander george zamka

373

00:23:10,870 --> 00:23:08,720

and they got us out the door in record

374

00:23:13,990 --> 00:23:10,880

time for this mission and in really

375

00:23:16,390 --> 00:23:14,000

great shape to do our last cva

376

00:23:18,070 --> 00:23:16,400

here you can see tj and george just off

377

00:23:20,230 --> 00:23:18,080

the left of the screen putting the safer

378

00:23:21,190 --> 00:23:20,240

that's the simplified aid preview eva

379

00:23:24,149 --> 00:23:21,200

rescue

380

00:23:26,470 --> 00:23:24,159

on bob's uh backpack as close

381

00:23:28,630 --> 00:23:26,480

and this is the little rocket pack that

382

00:23:30,470 --> 00:23:28,640

if you ever to drift free of station and

383

00:23:32,310 --> 00:23:30,480

you take each other would be broken

384

00:23:34,789 --> 00:23:32,320

would fly you back

385

00:23:36,549 --> 00:23:34,799

uh to so you grab onto the station and

386

00:23:38,950 --> 00:23:36,559

come home because if you were to drift

387

00:23:40,630 --> 00:23:38,960

away there'd be nothing to uh

388

00:23:44,310 --> 00:23:40,640

nothing to come get you station can't

389

00:23:47,909 --> 00:23:45,909

there's george on the left

390

00:23:54,310 --> 00:23:47,919

on goes safer and the next thing will be

391

00:23:57,830 --> 00:23:56,149

this is really uh

392

00:23:59,430 --> 00:23:57,840

in terms of ebay preparation one of the

393

00:24:00,870 --> 00:23:59,440

easier times for the ev crew member

394

00:24:02,470 --> 00:24:00,880

because you don't have to do anything

395

00:24:04,070 --> 00:24:02,480

you just hang on to handrail and

396

00:24:09,750 --> 00:24:04,080

somebody else does all the hard work as

397

00:24:12,710 --> 00:24:11,190

terry's reminding me that ends really

398

00:24:14,789 --> 00:24:12,720

soon once you're out of the airlock

399

00:24:16,950 --> 00:24:14,799

hatch it's all hard work

400

00:24:18,630 --> 00:24:16,960

and in goes bob and you can see bob

401
00:24:20,230 --> 00:24:18,640
still on an umbilical so that we don't

402
00:24:22,230 --> 00:24:20,240
deplete our

403
00:24:24,310 --> 00:24:22,240
oxygen tanks while we're waiting to go

404
00:24:26,230 --> 00:24:24,320
out the airlock we wear an umbilical

405
00:24:30,070 --> 00:24:26,240
till the last moment to bring us oxygen

406
00:24:33,909 --> 00:24:32,310
tj on the right there is an uh army

407
00:24:37,590 --> 00:24:33,919
helicopter pilot

408
00:24:38,470 --> 00:24:37,600
george back in the distance in the blue

409
00:24:41,029 --> 00:24:38,480
shirt

410
00:24:42,390 --> 00:24:41,039
is a navy fighter pilot i'm sorry marine

411
00:24:58,870 --> 00:24:42,400
fighter pilot

412
00:25:03,269 --> 00:25:00,950
closing the inside hatch

413
00:25:05,350 --> 00:25:03,279

and this is uh not too long before we'll

414

00:25:10,950 --> 00:25:05,360

depress the air lock and open the

415

00:25:15,669 --> 00:25:12,710

oleg on the right and the russian in the

416

00:25:19,590 --> 00:25:15,679

red shirt is a russian cosmonaut here on

417

00:25:19,600 --> 00:25:37,430

uh

418

00:25:37,440 --> 00:25:41,990

um

419

00:25:46,390 --> 00:25:44,470

connections and uh

420

00:25:47,990 --> 00:25:46,400

fittings and and basically it's called

421

00:25:50,149 --> 00:25:48,000

module outfit and getting the couple

422

00:25:55,510 --> 00:25:50,159

ready for a permanent life here on the

423

00:25:59,830 --> 00:25:57,830

this station task was hooking up some

424

00:26:02,070 --> 00:25:59,840

water lines and there's really really

425

00:26:03,350 --> 00:26:02,080

tight connections and a very heart very

426

00:26:05,029 --> 00:26:03,360

high torque that you have to do so

427

00:26:06,630 --> 00:26:05,039

there's special tools that we have

428

00:26:08,230 --> 00:26:06,640

they're pretty tough to get fit on there

429

00:26:08,950 --> 00:26:08,240

so we spent a couple hours getting these

430

00:26:13,029 --> 00:26:08,960

uh

431

00:26:15,430 --> 00:26:13,909

and

432

00:26:18,710 --> 00:26:15,440

the person in the green shirt there is

433

00:26:23,510 --> 00:26:20,630

just to be clear

434

00:26:25,990 --> 00:26:23,520

and here is the view from the cupola

435

00:26:27,430 --> 00:26:26,000

pre-window

436

00:26:28,950 --> 00:26:27,440

opening and

437

00:26:31,190 --> 00:26:28,960

during the spacewalk bob and nick one of

438

00:26:31,990 --> 00:26:31,200

their tasks was to go out and remove

439

00:26:33,750 --> 00:26:32,000

some

440

00:26:35,269 --> 00:26:33,760

launch bolts that held the windows in

441

00:26:38,470 --> 00:26:35,279

place so until they did that we could

442

00:26:41,269 --> 00:26:38,480

not open up the windows

443

00:26:45,029 --> 00:26:41,279

and here's a view of stevie ray robinson

444

00:26:46,549 --> 00:26:45,039

um a civilian pilot and he he was busy

445

00:26:48,789 --> 00:26:46,559

he spent most of his day in the coop

446

00:26:52,710 --> 00:26:48,799

look in those three turning ranches and

447

00:26:55,190 --> 00:26:52,720

doing various tasks that we had

448

00:26:56,149 --> 00:26:55,200

along with us was jeff williams and he

449

00:26:57,669 --> 00:26:56,159

was really

450

00:26:59,430 --> 00:26:57,679

kind of the bedrock for everything that

451
00:27:01,510 --> 00:26:59,440
we did he's an expert on the station

452
00:27:03,430 --> 00:27:01,520
he's very efficient he's been really

453
00:27:05,190 --> 00:27:03,440
helping us get everything done

454
00:27:06,789 --> 00:27:05,200
kay is putting together

455
00:27:08,870 --> 00:27:06,799
a uh

456
00:27:12,470 --> 00:27:08,880
one of our boxes is called an atu it's

457
00:27:15,990 --> 00:27:14,470
and that those two hoses were water

458
00:27:17,909 --> 00:27:16,000
lines that are used to cool it so that

459
00:27:19,510 --> 00:27:17,919
was a one of our tests today here's a

460
00:27:21,269 --> 00:27:19,520
view from the docking compartment you

461
00:27:23,029 --> 00:27:21,279
can see that several robotic arms a

462
00:27:25,350 --> 00:27:23,039
shuttle arm in the station arm

463
00:27:27,510 --> 00:27:25,360

and there on the cupola you can see nick

464

00:27:29,510 --> 00:27:27,520

patrick doing its work this is just a

465

00:27:31,029 --> 00:27:29,520

wonderful view that they have from the

466

00:27:32,389 --> 00:27:31,039

russian module what's called the docking

467

00:27:34,389 --> 00:27:32,399

compartment

468

00:27:35,590 --> 00:27:34,399

and you can see him doing work there mix

469

00:27:41,190 --> 00:27:35,600

floating up to take a look at this you

470

00:27:45,510 --> 00:27:43,029

these launch locks were a lot of fun

471

00:27:47,110 --> 00:27:45,520

there were 21 bolts um

472

00:27:49,350 --> 00:27:47,120

some of them were stiffer than expected

473

00:27:51,669 --> 00:27:49,360

but i think it took the best part of an

474

00:27:53,350 --> 00:27:51,679

hour to unback them all out and as soon

475

00:27:55,669 --> 00:27:53,360

as i did the window shutters were

476

00:27:57,430 --> 00:27:55,679

visibly loose and

477

00:28:02,149 --> 00:27:57,440

the windows could open a few minutes

478

00:28:05,590 --> 00:28:03,750

and this was the funnest part of the day

479

00:28:06,630 --> 00:28:05,600

um one of our tasks was to do a window

480

00:28:08,549 --> 00:28:06,640

check

481

00:28:10,070 --> 00:28:08,559

and uh you can see kay and i in there

482

00:28:11,909 --> 00:28:10,080

and that's windows 7. that's the window

483

00:28:14,149 --> 00:28:11,919

that looks straight down see we open it

484

00:28:16,230 --> 00:28:14,159

up and we just closed it

485

00:28:17,029 --> 00:28:16,240

and uh it was a real honor to get to be

486

00:28:18,630 --> 00:28:17,039

uh

487

00:28:27,590 --> 00:28:18,640

one of the first the first people in

488

00:28:31,029 --> 00:28:29,269

we had to coordinate with bob and nick

489

00:28:32,950 --> 00:28:31,039

to be sure that they were complete with

490

00:28:34,149 --> 00:28:32,960

their tasks and that they were not in

491

00:28:35,750 --> 00:28:34,159

the way and so there's a little bit of

492

00:28:37,510 --> 00:28:35,760

coordination between us

493

00:28:40,070 --> 00:28:37,520

and the shuttle

494

00:28:42,630 --> 00:28:40,080

which is where stevie ray and zembo were

495

00:28:44,310 --> 00:28:42,640

conducting the spacewalk in the ground

496

00:28:45,909 --> 00:28:44,320

where they were tracking things also so

497

00:28:47,590 --> 00:28:45,919

that was uh that was fun it was a good

498

00:28:48,950 --> 00:28:47,600

example of how we coordinate between

499

00:28:51,190 --> 00:28:48,960

station shuttle

500

00:28:53,110 --> 00:28:51,200

and the station control room on the

501
00:28:54,470 --> 00:28:53,120
ground in houston and also the shuttle

502
00:28:56,230 --> 00:28:54,480
control room on the ground energy center

503
00:28:58,389 --> 00:28:56,240
a lot of people doing a lot of work for

504
00:28:59,750 --> 00:28:58,399
this mission and their cage is the first

505
00:29:28,950 --> 00:28:59,760
person to open that window and she's

506
00:29:55,909 --> 00:29:31,029
and here comes jeff williamstown he's

507
00:30:01,190 --> 00:29:58,310
now this uh camera was as you can tell

508
00:30:04,630 --> 00:30:01,200
it was pointed nader and a lot of us uh

509
00:30:05,830 --> 00:30:04,640
uh either bumped into it or uh

510
00:30:06,549 --> 00:30:05,840
didn't even know it was there just

511
00:30:08,310 --> 00:30:06,559
because

512
00:30:10,710 --> 00:30:08,320
uh one of the things with the cooper in

513
00:30:12,870 --> 00:30:10,720

its orientation is it's uh

514

00:30:14,870 --> 00:30:12,880

it's just you you've got to flip over in

515

00:30:17,350 --> 00:30:14,880

order to be heads up in the cupola which

516

00:30:19,029 --> 00:30:17,360

can confuse you for a little bit

517

00:30:33,510 --> 00:30:19,039

so here are

518

00:30:38,149 --> 00:30:35,190

okay

519

00:30:40,950 --> 00:30:38,159

we've got several of these but

520

00:30:43,430 --> 00:30:40,960

just witnessed a spectacular

521

00:30:44,870 --> 00:30:43,440

sunset from cooper and one thing that

522

00:30:47,830 --> 00:30:44,880

that

523

00:30:48,830 --> 00:30:47,840

unlike a flat window or a pained window

524

00:30:51,190 --> 00:30:48,840

when you have

525

00:30:52,789 --> 00:30:51,200

a hemispheric window you don't have to

526

00:30:55,029 --> 00:30:52,799

have your face right up there you can

527

00:30:56,950 --> 00:30:55,039

actually back up and just take in the

528

00:30:58,630 --> 00:30:56,960

whole view but

529

00:31:03,669 --> 00:30:58,640

you can pretty much see the whole earth

530

00:31:08,710 --> 00:31:07,190

this is uh the conclusion of the eva and

531

00:31:11,430 --> 00:31:08,720

we'll let this go for a while but this

532

00:31:14,389 --> 00:31:11,440

this is uh bob banking coming on in and

533

00:31:16,950 --> 00:31:14,399

uh you can tell that there is a massive

534

00:31:19,750 --> 00:31:16,960

bags uh that front bag i believe was the

535

00:31:22,310 --> 00:31:19,760

the mri from the cupola that was uh

536

00:31:27,350 --> 00:31:25,350

and bob of course comes in head first

537

00:31:29,990 --> 00:31:27,360

and uh nick was outside and nick was

538

00:31:33,110 --> 00:31:30,000

handing him more bags

539

00:31:34,950 --> 00:31:33,120

so this is kind of like packing for uh

540

00:31:37,909 --> 00:31:34,960

for a vacation uh you know in a

541

00:31:39,669 --> 00:31:37,919

volkswagen beetle you know it's just

542

00:31:41,909 --> 00:31:39,679

very limited volume

543

00:31:43,269 --> 00:31:41,919

uh to put your stuff in and of course uh

544

00:31:45,029 --> 00:31:43,279

the space while you still have one

545

00:31:49,509 --> 00:31:45,039

spacewalker to go

546

00:31:49,519 --> 00:31:52,789

and so uh

547

00:31:58,470 --> 00:31:55,990

this was i was filming this uh

548

00:32:00,070 --> 00:31:58,480

and so it took a little while to to get

549

00:32:02,389 --> 00:32:00,080

nick up there but you'll see his feet

550

00:32:03,190 --> 00:32:02,399

coming up there shortly and then the two

551
00:32:05,350 --> 00:32:03,200
are

552
00:32:07,350 --> 00:32:05,360
there well now it's another bag

553
00:32:09,750 --> 00:32:07,360
the two are in there kind of reverse

554
00:32:17,350 --> 00:32:09,760
attitude and the next job today was to

555
00:32:20,630 --> 00:32:19,110
closing the hatch is crucial without

556
00:32:22,549 --> 00:32:20,640
that you can't re-pressurize the air

557
00:32:24,070 --> 00:32:22,559
lock and then come in in fact without

558
00:32:25,430 --> 00:32:24,080
that they won't let you in because this

559
00:32:26,389 --> 00:32:25,440
will be a hole in the air lock really

560
00:32:28,070 --> 00:32:26,399
big hole

561
00:32:29,669 --> 00:32:28,080
the hatch is hard because it swings into

562
00:32:31,430 --> 00:32:29,679
the airlock

563
00:32:32,789 --> 00:32:31,440

before you can lower it into what

564

00:32:35,029 --> 00:32:32,799

effectively is the airlock floor and i

565

00:32:36,630 --> 00:32:35,039

think there you can just see

566

00:32:45,990 --> 00:32:36,640

me coming in

567

00:32:49,509 --> 00:32:47,590

and right before you close the hatch you

568

00:32:53,110 --> 00:32:49,519

have to close the the thermal cover it's

569

00:32:54,470 --> 00:32:53,120

like a piece of mli that keeps the uh

570

00:32:57,029 --> 00:32:54,480

keeps the temperature of the hatch

571

00:32:58,149 --> 00:32:57,039

itself under control all these things

572

00:32:59,430 --> 00:32:58,159

are actually quite difficult and this

573

00:33:01,430 --> 00:32:59,440

was the first facebook in which i

574

00:33:03,430 --> 00:33:01,440

operated the hatch on the spacebox one

575

00:33:05,350 --> 00:33:03,440

and two that have been done by uh easy

576
00:33:16,870 --> 00:33:05,360
one bob benkin whom you see right there

577
00:33:20,389 --> 00:33:18,870
this is the end of the eva and we were i

578
00:33:42,789 --> 00:33:20,399
think we were fairly tired end of the

579
00:33:46,630 --> 00:33:44,870
and mike here's a view of uh just fun

580
00:33:51,430 --> 00:33:46,640
rash from cupola i think we

581
00:34:16,550 --> 00:33:52,870
the last one was the first time that we

582
00:34:19,990 --> 00:34:18,470
i have a feeling mike if

583
00:34:21,510 --> 00:34:20,000
when you're cap coming here and there's

584
00:34:23,589 --> 00:34:21,520
there's folks up here if you can't find

585
00:34:25,190 --> 00:34:23,599
them i would i would look in the cupola

586
00:34:26,710 --> 00:34:25,200
because there's gonna be a lot of folks

587
00:34:28,230 --> 00:34:26,720
enjoying time in there

588
00:34:30,230 --> 00:34:28,240

that makes sense we wish we were there

589

00:34:31,750 --> 00:34:30,240

too

590

00:34:33,669 --> 00:34:31,760

that view right there i had a chance to

591

00:34:35,750 --> 00:34:33,679

see bob and nick go in right at the end

592

00:34:37,030 --> 00:34:35,760

of their eva when they were clear we

593

00:34:38,629 --> 00:34:37,040

opened up the window and had a chance to

594

00:34:39,990 --> 00:34:38,639

see them do their last ingress into the

595

00:34:54,069 --> 00:34:40,000

airlock the airlock's just on the other

596

00:34:58,069 --> 00:34:55,829

and we're getting good video down here

597

00:35:01,109 --> 00:34:58,079

looks great

598

00:35:03,109 --> 00:35:01,119

excellent okay i don't think this uh

599

00:35:06,310 --> 00:35:03,119

there's too much narration other than

600

00:35:08,230 --> 00:35:06,320

it's really neat to stick your head out

601
00:35:11,109 --> 00:35:08,240
and look at the station

602
00:35:12,950 --> 00:35:11,119
uh you can see uh the progress the soyuz

603
00:35:14,310 --> 00:35:12,960
you can see right in the payload bay of

604
00:35:17,030 --> 00:35:14,320
endeavor

605
00:35:19,030 --> 00:35:17,040
you can see both robotic arms the truss

606
00:35:20,150 --> 00:35:19,040
you you really get a sense that there's

607
00:35:41,990 --> 00:35:20,160
a

608
00:35:44,790 --> 00:35:42,000
some video of

609
00:35:46,390 --> 00:35:44,800
somebody waving in there but the sun

610
00:35:48,069 --> 00:35:46,400
just provided too much of a reflection

611
00:36:04,470 --> 00:35:48,079
here terry's getting a good good shot of

612
00:36:09,349 --> 00:36:05,990
one thing about uh looking after the

613
00:36:10,950 --> 00:36:09,359

cupola that struck me right away is that

614

00:36:12,790 --> 00:36:10,960

you don't get a view like that anywhere

615

00:36:14,630 --> 00:36:12,800

else other than eva

616

00:36:17,109 --> 00:36:14,640

and in some ways

617

00:36:19,190 --> 00:36:17,119

it can be even better better less

618

00:36:21,190 --> 00:36:19,200

restriction uh less restricting than

619

00:36:23,510 --> 00:36:21,200

being inside that helmet for instance in

620

00:36:25,030 --> 00:36:23,520

the emu you can't really look up at all

621

00:36:26,550 --> 00:36:25,040

and you're quite restricted left and

622

00:36:31,030 --> 00:36:26,560

right also

623

00:36:32,470 --> 00:36:31,040

and here's a 360 degrees around and up

624

00:36:34,310 --> 00:36:32,480

and all squashed in with the rest of

625

00:36:36,150 --> 00:36:34,320

your crew so there's uh

626

00:36:38,790 --> 00:36:36,160

there's some

627

00:36:44,390 --> 00:36:38,800

elements that are like the eva and some

628

00:36:48,630 --> 00:36:46,630

see that sounds awesome unfortunately we

629

00:36:50,310 --> 00:36:48,640

lost the signal for the last little bit

630

00:36:54,550 --> 00:36:50,320

of it if you can uh

631

00:36:55,990 --> 00:36:54,560

hit pause and rewind a little bit

632

00:36:58,150 --> 00:36:56,000

like that was the end of our flight day

633

00:36:59,990 --> 00:36:58,160

highlights and here is a um

634

00:37:01,670 --> 00:37:00,000

gave me a tape and i just did a 360

635

00:37:03,829 --> 00:37:01,680

degree tour so

636

00:37:05,670 --> 00:37:03,839

i think narration will just detract from

637

00:37:07,430 --> 00:37:05,680

creation there i'll let you guys watch

638

00:37:27,430 --> 00:37:07,440

okay we're getting a good downlink again

639

00:37:37,750 --> 00:37:29,109

there's a striking resemblance to the

640

00:37:40,710 --> 00:37:39,430

i'm just missing your uh

641

00:37:48,550 --> 00:37:40,720

your little faces and there would be

642

00:37:48,560 --> 00:37:51,829

they're not so

643

00:37:56,230 --> 00:37:53,109

hopefully you might see a picture like

644

00:37:56,240 --> 00:38:02,069

sounds good

645

00:38:05,349 --> 00:38:03,910

so zambo was in there that's the bucking

646

00:38:15,589 --> 00:38:05,359

compartment but it was hard to see

647

00:38:20,150 --> 00:38:17,430

so then i flipped it around and tried to

648

00:38:22,069 --> 00:38:20,160

give a

649

00:38:24,950 --> 00:38:22,079

this is the

650

00:38:26,710 --> 00:38:24,960

attitude that we would have um

651
00:38:28,790 --> 00:38:26,720
thinking that the earth was down below

652
00:38:30,069 --> 00:38:28,800
us so i just put the camera over to give

653
00:38:31,430 --> 00:38:30,079
you a different perspective it really is

654
00:38:33,190 --> 00:38:31,440
a different perspective

655
00:38:34,710 --> 00:38:33,200
everywhere in station it's easy to

656
00:38:36,069 --> 00:38:34,720
rotate yourself give yourself a few

657
00:38:37,030 --> 00:38:36,079
seconds and then you can convince

658
00:38:39,510 --> 00:38:37,040
yourself

659
00:38:40,950 --> 00:38:39,520
of your new up and down orientation but

660
00:38:42,230 --> 00:38:40,960
in

661
00:38:44,230 --> 00:38:42,240
cupola it's really hard to do that

662
00:38:46,550 --> 00:38:44,240
because the earth is below you and you

663
00:38:47,910 --> 00:38:46,560

always have a sense that that's down so

664

00:38:49,829 --> 00:38:47,920

that's the only place i found it

665

00:38:51,349 --> 00:38:49,839

impossible to get a sense of that

666

00:38:52,710 --> 00:38:51,359

whenever you open your pocket in there

667

00:38:53,910 --> 00:38:52,720

you feel like something's gonna fall out

668

00:38:55,670 --> 00:38:53,920

of it

669

00:40:33,430 --> 00:38:55,680

um but of course it doesn't it just

670

00:40:37,349 --> 00:40:34,950

and the crew members moving in there to

671

00:40:40,790 --> 00:40:37,359

see the window opening that's commander

672

00:40:49,430 --> 00:40:40,800

george zamka and uh just motioning in

673

00:40:52,950 --> 00:40:51,030

cupola here will eventually be the home

674

00:40:54,630 --> 00:40:52,960

of a robotic workstation that will allow

675

00:40:55,910 --> 00:40:54,640

the teams

676

00:40:58,309 --> 00:40:55,920

controlling the

677

00:41:00,069 --> 00:40:58,319

space station robotic arm a real-time

678

00:41:01,829 --> 00:41:00,079

view of what's going on outside the