



1
00:00:06,789 --> 00:00:03,669
hi my name is ken ham i'm commander of

2
00:00:09,800 --> 00:00:06,799
the sts-132 space shuttle atlantis crew

3
00:00:25,429 --> 00:00:09,810
you're watching nasa tv

4
00:00:30,230 --> 00:00:28,070
from launch complex 39 at the kennedy

5
00:00:32,870 --> 00:00:30,240
space center in florida this is shuttle

6
00:00:34,470 --> 00:00:32,880
launch control at t-minus three hours

7
00:00:37,670 --> 00:00:34,480
and holding

8
00:00:39,110 --> 00:00:37,680
this is the 132nd launch of the space

9
00:00:41,270 --> 00:00:39,120
shuttle program

10
00:00:42,869 --> 00:00:41,280
the 32nd launch of space shuttle

11
00:00:44,790 --> 00:00:42,879
atlantis

12
00:00:48,790 --> 00:00:44,800
and the 34th shuttle flight to the

13
00:00:55,029 --> 00:00:52,310

here's our commander ken ham who has

14

00:00:56,869 --> 00:00:55,039
spent 13 days in space aboard discovery

15

00:00:58,389 --> 00:00:56,879
on 124.

16

00:01:00,630 --> 00:00:58,399
here's our pilot

17

00:01:03,430 --> 00:01:00,640
tony antonelli this is his second trip

18

00:01:05,189 --> 00:01:03,440
into space having flown as a pilot on

19

00:01:07,030 --> 00:01:05,199
119 aboard

20

00:01:09,670 --> 00:01:07,040
discovery which delivered a

21

00:01:12,789 --> 00:01:09,680
space station integrated truss segment

22

00:01:15,429 --> 00:01:12,799
and a pair of solar generating wings

23

00:01:18,789 --> 00:01:15,439
going over now to garrett riesman ms-1

24

00:01:21,510 --> 00:01:18,799
aboard atlantis on sts-132 he'll be

25

00:01:23,749 --> 00:01:21,520
performing spacewalks one and three he

26

00:01:25,749 --> 00:01:23,759

holds a phd in mechanical engineering

27

00:01:31,109 --> 00:01:25,759

and spent three months in space aboard

28

00:01:36,310 --> 00:01:34,069

and here is steve bowen he's the first

29

00:01:38,069 --> 00:01:36,320

ever submarine officer selected by nasa

30

00:01:39,590 --> 00:01:38,079

to be an astronaut he's mission

31

00:01:40,390 --> 00:01:39,600

specialist number three and we'll be

32

00:01:43,429 --> 00:01:40,400

doing

33

00:01:45,350 --> 00:01:43,439

two space walks eva's one and two

34

00:01:47,350 --> 00:01:45,360

this is his second

35

00:01:50,389 --> 00:01:47,360

spay flight having flown previously on

36

00:01:50,399 --> 00:01:53,429

pure sellers

37

00:02:00,230 --> 00:01:56,870

this is his third space flight

38

00:02:04,069 --> 00:02:00,240

having flown on sts-112 on atlantis and

39

00:02:08,550 --> 00:02:04,079

121 aboard discovery he's logged 41 eva

40

00:02:13,110 --> 00:02:11,350

and michael good making his second trip

41

00:02:14,630 --> 00:02:13,120

into space having served as distance

42

00:02:16,229 --> 00:02:14,640

specialist uh

43

00:02:17,910 --> 00:02:16,239

number two on this mission he'll be

44

00:02:20,949 --> 00:02:17,920

doing space walks

45

00:02:23,070 --> 00:02:20,959

on evas two and three he was previously

46

00:02:26,229 --> 00:02:23,080

on atlantis on

47

00:02:27,510 --> 00:02:26,239

sts-125 the most recent mission to

48

00:02:31,350 --> 00:02:27,520

do maintenance on the hubble space

49

00:02:37,790 --> 00:02:34,900

and here they come

50

00:02:46,200 --> 00:02:37,800

[Music]

51

00:02:46,210 --> 00:02:51,230

[Applause]

52

00:02:51,240 --> 00:03:10,710

[Music]

53

00:03:15,990 --> 00:03:12,790

and here we see our

54

00:03:17,670 --> 00:03:16,000

commander being seated in the cockpit

55

00:03:20,390 --> 00:03:17,680

he'll be followed by mission specialist

56

00:03:23,670 --> 00:03:20,400

number three steve bowen

57

00:03:23,680 --> 00:03:27,350

houston ms4

58

00:03:30,550 --> 00:03:28,710

hey good morning piers we're just

59

00:03:34,440 --> 00:03:30,560

enjoying your accent down here how do

60

00:03:49,110 --> 00:03:36,869

[Music]

61

00:03:53,030 --> 00:03:51,350

atlantis launch director

62

00:03:54,789 --> 00:03:53,040

go there

63

00:03:57,030 --> 00:03:54,799

okay hawk on behalf of all the

64

00:03:58,550 --> 00:03:57,040

manufacturing processing flight and

65

00:04:01,589 --> 00:03:58,560

launch teams that have worked on atlanta

66

00:04:03,030 --> 00:04:01,599

since march of 1980 i wish you all good

67

00:04:05,110 --> 00:04:03,040

luck god speed and have a little fun up

68

00:04:07,110 --> 00:04:05,120

there

69

00:04:08,309 --> 00:04:07,120

thanks mike those are great words and uh

70

00:04:10,229 --> 00:04:08,319

like you said there's a thousand of

71

00:04:12,149 --> 00:04:10,239

folks out there that have taken care of

72

00:04:13,910 --> 00:04:12,159

this bird for a long time

73

00:04:16,069 --> 00:04:13,920

right now special thanks to orbiter for

74

00:04:17,509 --> 00:04:16,079

getting us off the bed today

75

00:04:19,270 --> 00:04:17,519

and uh we're going to take her on our

76

00:04:21,110 --> 00:04:19,280

30-second flight

77

00:04:22,790 --> 00:04:21,120

and if you don't mind we'll take her out

78

00:04:26,070 --> 00:04:22,800

of the barn and make a few more laps

79

00:04:26,080 --> 00:04:30,310

freehold

80

00:04:34,310 --> 00:04:32,550

thanks i understood all that

81

00:04:38,870 --> 00:04:34,320

and ntd launch director you are clear to

82

00:04:43,670 --> 00:04:41,830

lana's crew our team has worked hard and

83

00:04:45,590 --> 00:04:43,680

it's with great pride that we send the

84

00:04:47,350 --> 00:04:45,600

first last crew of atlantis to the

85

00:04:52,150 --> 00:04:47,360

international space station with the

86

00:04:52,160 --> 00:04:54,790

well

87

00:04:54,800 --> 00:05:07,350

apc

88

00:05:11,590 --> 00:05:10,790

go for maintenance and start six five

89

00:05:12,629 --> 00:05:11,600

four

90

00:05:13,670 --> 00:05:12,639

three

91

00:05:15,350 --> 00:05:13,680

two

92

00:05:16,230 --> 00:05:15,360

one

93

00:05:21,430 --> 00:05:16,240

and

94

00:05:24,930 --> 00:05:21,440

atlantis reaching the crest of its

95

00:05:31,430 --> 00:05:24,940

historic achievements in

96

00:05:34,390 --> 00:05:31,440

[Music]

97

00:05:36,310 --> 00:05:34,400

houston is now controlling

98

00:05:38,150 --> 00:05:36,320

the role maneuver is complete atlantis

99

00:05:42,870 --> 00:05:38,160

is in a heads-down position on course

100

00:05:52,710 --> 00:05:42,880

for a 51.6 degree 136 by 36 statute mile

101
00:05:56,469 --> 00:05:54,629
and the three main engines on atlantis

102
00:05:58,950 --> 00:05:56,479
have now been throttled down to 72

103
00:06:00,950 --> 00:05:58,960
percent of rated thrust as the orbiter

104
00:06:03,029 --> 00:06:00,960
prepares to pass through the area of

105
00:06:08,850 --> 00:06:03,039
maximum dynamic pressure on the vehicle

106
00:06:13,510 --> 00:06:11,749
[Music]

107
00:06:15,189 --> 00:06:13,520
the engine's now beginning to throttle

108
00:06:20,250 --> 00:06:15,199
back up

109
00:06:33,990 --> 00:06:31,990
[Music]

110
00:06:36,629 --> 00:06:34,000
all three engines looking uh really good

111
00:06:38,309 --> 00:06:36,639
back at full throttle now at liftoff the

112
00:06:40,550 --> 00:06:38,319
fully fueled shuttle boosters and

113
00:06:43,590 --> 00:06:40,560

external tank weighed four and a half

114

00:06:47,270 --> 00:06:43,600

million pounds it now has burned half of

115

00:06:49,189 --> 00:06:47,280

that liftoff weight and propellant

116

00:06:51,029 --> 00:06:49,199

one minute 30 seconds into the flight

117

00:06:53,350 --> 00:06:51,039

all three auxiliary power units that

118

00:06:55,350 --> 00:06:53,360

provide hydraulic power to the orbiter's

119

00:06:56,230 --> 00:06:55,360

systems in good shape as are the fuel

120

00:06:58,390 --> 00:06:56,240

cells

121

00:07:00,870 --> 00:06:58,400

providing electricity to all of the

122

00:07:02,390 --> 00:07:00,880

systems on board atlantis is already 19

123

00:07:04,550 --> 00:07:02,400

miles in altitude

124

00:07:11,110 --> 00:07:04,560

downrange from the kennedy space center

125

00:07:15,510 --> 00:07:13,350

coming up on staging the point at which

126

00:07:29,110 --> 00:07:15,520

the twin solid rocket boosters burn out

127

00:07:33,749 --> 00:07:30,950

your egg timer right up there on your

128

00:07:35,430 --> 00:07:33,759

hood says 13 minutes which i think that

129

00:07:37,510 --> 00:07:35,440

means we're going to have a homes burn

130

00:07:39,430 --> 00:07:37,520

here shortly that's my get to work time

131

00:07:41,350 --> 00:07:39,440

it looks like it's 38 minutes to the

132

00:07:42,710 --> 00:07:41,360

burn yep

133

00:07:44,150 --> 00:07:42,720

and so

134

00:07:46,710 --> 00:07:44,160

i didn't think there was a lot i could

135

00:07:49,909 --> 00:07:46,720

do i got the flight deck

136

00:07:56,950 --> 00:07:49,919

camera mounted as far forward as i could

137

00:08:00,950 --> 00:07:59,350

atlantis thanks for the uh live view

138

00:08:04,950 --> 00:08:00,960

from the flight deck we are on board

139

00:08:12,869 --> 00:08:06,629

yeah copy that we're gonna

140

00:08:18,390 --> 00:08:14,070

the

141

00:08:19,510 --> 00:08:18,400

maneuvering system engine

142

00:08:22,150 --> 00:08:19,520

clearly

143

00:08:24,830 --> 00:08:22,160

in view the camera set up by the crew

144

00:08:27,510 --> 00:08:24,840

looking out the aft flight deck

145

00:08:29,270 --> 00:08:27,520

window here we are a little later in

146

00:08:32,310 --> 00:08:29,280

flight day two

147

00:08:34,310 --> 00:08:32,320

and effie and tony

148

00:08:36,870 --> 00:08:34,320

are flying the arm

149

00:08:38,709 --> 00:08:36,880

over to pick up the boom

150

00:08:41,029 --> 00:08:38,719

epe is very

151
00:08:42,389 --> 00:08:41,039
adeptly

152
00:08:45,590 --> 00:08:42,399
he's very

153
00:08:47,910 --> 00:08:45,600
happily free flying

154
00:08:53,190 --> 00:08:47,920
out the window

155
00:08:58,870 --> 00:08:55,509
help the window

156
00:09:08,470 --> 00:08:58,880
there is the arm that he is flying

157
00:09:10,310 --> 00:09:09,430
one

158
00:09:12,550 --> 00:09:10,320
two

159
00:09:13,590 --> 00:09:12,560
and the mode switch end effector mode

160
00:09:15,590 --> 00:09:13,600
switch

161
00:09:16,870 --> 00:09:15,600
to off place beautiful

162
00:09:19,030 --> 00:09:16,880
brakes

163
00:09:25,980 --> 00:09:19,040

um on please

164

00:09:29,190 --> 00:09:27,269

[Music]

165

00:09:31,110 --> 00:09:29,200

numbers are kind of all over the place

166

00:09:33,509 --> 00:09:31,120

if you like this we're going to continue

167

00:09:36,870 --> 00:09:33,519

left and get you the next picture on the

168

00:09:39,350 --> 00:09:36,880

top of 7-12 bravo

169

00:09:40,949 --> 00:09:39,360

this is mission control houston the

170

00:09:43,110 --> 00:09:40,959

discussion that's been ongoing is

171

00:09:44,630 --> 00:09:43,120

relative to the pan and tilt system on

172

00:09:47,670 --> 00:09:44,640

the

173

00:09:49,910 --> 00:09:47,680

orbiter boom sensor systems

174

00:09:51,910 --> 00:09:49,920

sensitive package on the tip of that

175

00:09:57,030 --> 00:09:51,920

boom

176

00:10:01,430 --> 00:09:58,790

and there it's jammed

177

00:10:10,470 --> 00:10:01,440

nope maybe not

178

00:10:14,630 --> 00:10:13,269

let's try to pan tilt reset again that's

179

00:10:16,829 --> 00:10:14,640

pretty scary

180

00:10:18,790 --> 00:10:16,839

that's what you got to do to

181

00:10:21,509 --> 00:10:18,800

see everything

182

00:10:23,590 --> 00:10:21,519

okay houston we're going to uh try the

183

00:10:25,350 --> 00:10:23,600

pin tilt reset one more time so we go

184

00:10:28,310 --> 00:10:25,360

left to the hard stop then up to the

185

00:10:30,790 --> 00:10:28,320

hard stop and then reset

186

00:10:33,990 --> 00:10:30,800

meanwhile down on the mid deck

187

00:10:38,310 --> 00:10:34,000

i am wrestling with a bag of oxygen

188

00:10:42,550 --> 00:10:40,150

oh

189

00:10:44,710 --> 00:10:42,560

got that they got that fresh mesh smell

190

00:10:46,069 --> 00:10:44,720

yep it said to put six of these things

191

00:10:48,470 --> 00:10:46,079

with all their foam in this chest and

192

00:10:52,310 --> 00:10:48,480

search bag that's the best i can do wow

193

00:10:55,509 --> 00:10:53,430

aboard

194

00:10:56,310 --> 00:10:55,519

space shuttle atlantis up on the flight

195

00:10:59,110 --> 00:10:56,320

deck

196

00:11:01,350 --> 00:10:59,120

mission specialist piers sellers they're

197

00:11:03,110 --> 00:11:01,360

on the left

198

00:11:06,230 --> 00:11:03,120

mission specialist steve bowen one of

199

00:11:08,470 --> 00:11:06,240

the space walkers you see his back to

200

00:11:13,269 --> 00:11:08,480

the camera on the right in this view

201
00:11:18,630 --> 00:11:15,990
the space shuttle and the space station

202
00:11:21,509 --> 00:11:18,640
should be moving into an orbital sunrise

203
00:11:30,069 --> 00:11:21,519
as they approach the central upper

204
00:11:34,949 --> 00:11:32,949
the international space station a still

205
00:11:37,590 --> 00:11:34,959
image taken

206
00:11:40,470 --> 00:11:37,600
from space shuttle atlantis

207
00:11:40,480 --> 00:11:44,949
2600 feet

208
00:11:49,910 --> 00:11:47,110
and stationed in houston atlantis is

209
00:11:50,870 --> 00:11:49,920
initiating the rpm in two

210
00:11:52,230 --> 00:11:50,880
one

211
00:11:54,230 --> 00:11:52,240
mark

212
00:11:55,030 --> 00:11:54,240
5pm

213
00:11:57,190 --> 00:11:55,040

the

214

00:12:00,150 --> 00:11:57,200

r bar pitch maneuver underway under

215

00:12:08,550 --> 00:12:00,160

control and command of shuttle commander

216

00:12:15,910 --> 00:12:10,970

and station

217

00:12:20,870 --> 00:12:18,710

station crew given the go to start the

218

00:12:23,430 --> 00:12:20,880

photos there's conducting the

219

00:12:24,470 --> 00:12:23,440

photography across the entire

220

00:12:25,990 --> 00:12:24,480

underside

221

00:12:33,269 --> 00:12:26,000

of atlantis's

222

00:12:37,110 --> 00:12:35,350

atlantis and station on the big loop on

223

00:12:40,710 --> 00:12:37,120

behalf of both the shuttle and station

224

00:12:43,190 --> 00:12:40,720

flight control rooms your go for docking

225

00:12:53,430 --> 00:12:43,200

atlanta's copies go for docking thank

226
00:12:53,440 --> 00:12:59,430
houston and station capture confirmed

227
00:13:03,110 --> 00:13:02,069
atlantis uh station nice ages readers

228
00:13:07,350 --> 00:13:03,120
double up

229
00:13:12,310 --> 00:13:07,360
yokoso and welcome to stage

230
00:13:16,150 --> 00:13:12,320
gabi station free drift thanks luigi

231
00:13:16,160 --> 00:13:24,710
space shuttle title enters arriving

232
00:13:28,710 --> 00:13:26,310
this is mission control houston the

233
00:13:31,670 --> 00:13:28,720
hatches between the two spacecraft now

234
00:13:33,670 --> 00:13:31,680
open commander ken ham

235
00:13:35,430 --> 00:13:33,680
second visit to the international space

236
00:13:40,389 --> 00:13:35,440
station and he's the commander of

237
00:13:43,670 --> 00:13:41,590
next is

238
00:13:46,230 --> 00:13:43,680

michael good his first visit to the

239

00:13:49,350 --> 00:13:46,240

international space station his second

240

00:13:51,670 --> 00:13:49,360

mission in space he flew aboard atlantis

241

00:13:54,150 --> 00:13:51,680

a year ago this month

242

00:13:58,230 --> 00:13:54,160

as part of the hubble space telescope

243

00:14:01,350 --> 00:13:58,240

servicing mission crew on sts-125

244

00:14:05,750 --> 00:14:04,230

an expedition 1617 crew member very

245

00:14:06,870 --> 00:14:05,760

familiar with the international space

246

00:14:10,150 --> 00:14:06,880

station

247

00:14:13,430 --> 00:14:10,160

his uh second visit to the complex

248

00:14:16,389 --> 00:14:13,440

behind him pilot tony antonelli

249

00:14:19,910 --> 00:14:16,399

he flew as part of the sts-119

250

00:14:22,949 --> 00:14:21,670

the robotics officer inside the space

251

00:14:24,790 --> 00:14:22,959

station flight control room is

252

00:14:26,389 --> 00:14:24,800

confirming that

253

00:14:28,389 --> 00:14:26,399

the integrated cargo carrier is now

254

00:14:30,069 --> 00:14:28,399

being lifted out of atlantis payload bay

255

00:14:33,509 --> 00:14:30,079

the retention latches that held the down

256

00:14:36,629 --> 00:14:35,110

so the station's arm is now in control

257

00:14:37,829 --> 00:14:36,639

of lifting that out and flying it over

258

00:14:39,430 --> 00:14:37,839

to uh

259

00:14:43,200 --> 00:14:39,440

where it will shortly be installed on

260

00:14:46,310 --> 00:14:43,210

the mobile base structure

261

00:14:51,750 --> 00:14:46,320

[Music]

262

00:14:56,949 --> 00:14:54,310

we copy tracy thanks for all the great

263

00:14:59,189 --> 00:14:56,959

work we'll take it from here and as you

264

00:15:01,189 --> 00:14:59,199

know if you do see the things moving

265

00:15:05,910 --> 00:15:01,199

outside we will be continuing with the

266

00:15:09,750 --> 00:15:07,430

thanks rob thanks for the great support

267

00:15:11,750 --> 00:15:09,760

you guys

268

00:15:13,670 --> 00:15:11,760

meanwhile garrett riesman steve bowen

269

00:15:15,430 --> 00:15:13,680

are currently inside the quest airlock

270

00:15:17,430 --> 00:15:15,440

they're wearing some oxygen masks at

271

00:15:19,269 --> 00:15:17,440

this point in time this is all standard

272

00:15:21,750 --> 00:15:19,279

procedure for them to breathe

273

00:15:23,670 --> 00:15:21,760

some enriched oxygen for about 45

274

00:15:26,230 --> 00:15:23,680

minutes they will be able to close the

275

00:15:28,310 --> 00:15:26,240

hatch between quest and the rest of the

276

00:15:30,550 --> 00:15:28,320

station coming up in about 15 minutes or

277

00:15:32,829 --> 00:15:30,560

so and then once that is done they will

278

00:15:35,269 --> 00:15:32,839

reduce the pressure inside quest from

279

00:15:38,310 --> 00:15:35,279

14.4 where it's had right now down to

280

00:15:47,509 --> 00:15:38,320

10.2 psi and that is where it will stay

281

00:15:47,519 --> 00:15:54,970

hello houston go ahead

282

00:15:54,980 --> 00:16:06,470

[Music]

283

00:16:06,480 --> 00:16:15,430

oh

284

00:16:15,440 --> 00:16:18,710

that's cool

285

00:16:23,110 --> 00:16:21,030

okay the house is open

286

00:16:24,790 --> 00:16:23,120

okay and you got her stowed

287

00:16:26,870 --> 00:16:24,800

uh it's a second

288

00:16:31,030 --> 00:16:26,880

yeah

289

00:16:38,710 --> 00:16:31,040

america

290

00:16:38,720 --> 00:16:43,030

nice sunny day out here

291

00:16:46,790 --> 00:16:45,350

looking good about another actually

292

00:16:52,150 --> 00:16:46,800

about another 20.

293

00:16:57,990 --> 00:16:54,310

garrett riesman you see there he's

294

00:17:00,629 --> 00:16:58,000

guiding the station's robotic arm with a

295

00:17:02,310 --> 00:17:00,639

what's you'll hear periodically at gca

296

00:17:05,270 --> 00:17:02,320

that's basically a

297

00:17:07,750 --> 00:17:05,280

ground controlled approach he's guiding

298

00:17:10,309 --> 00:17:07,760

uh verbally as he can see the arm much

299

00:17:12,949 --> 00:17:10,319

better than

300

00:17:14,870 --> 00:17:12,959

pure sellers can so he is going to be

301
00:17:17,110 --> 00:17:14,880
guiding it over closer to him so that he

302
00:17:21,750 --> 00:17:17,120
can climb into that foot restraint that

303
00:17:21,760 --> 00:17:26,390
all right i got clearance from the dish

304
00:17:29,750 --> 00:17:28,309
i think i'm headed to uh

305
00:17:31,510 --> 00:17:29,760
ingress right

306
00:17:34,470 --> 00:17:31,520
yeah the uh

307
00:17:36,870 --> 00:17:34,480
yep all the way into ingress

308
00:17:40,230 --> 00:17:39,029
steve bowen now

309
00:17:42,310 --> 00:17:40,240
holding the

310
00:17:44,310 --> 00:17:42,320
new space to ground antenna boom he'll

311
00:17:46,150 --> 00:17:44,320
hold on to that while

312
00:17:47,750 --> 00:17:46,160
garrett riesman climbs into the foot

313
00:17:50,549 --> 00:17:47,760

restraint on the end of the station's

314

00:17:55,190 --> 00:17:50,559

robotic arm after that uh bowen will

315

00:17:57,350 --> 00:17:55,200

hand off the boom to garrett riesman

316

00:18:00,150 --> 00:17:57,360

okay appears you're ready

317

00:18:03,029 --> 00:18:00,160

ready and we're going to take you uh

318

00:18:06,310 --> 00:18:05,590

please see the uhf we're well clear of

319

00:18:07,590 --> 00:18:06,320

it

320

00:18:09,110 --> 00:18:07,600

okay in the dish

321

00:18:11,110 --> 00:18:09,120

the victory uh

322

00:18:12,470 --> 00:18:11,120

uh

323

00:18:26,789 --> 00:18:12,480

well clear no

324

00:18:26,799 --> 00:18:30,630

zero

325

00:18:35,110 --> 00:18:32,470

garrett riesman is in position on the

326

00:18:38,230 --> 00:18:35,120

end of the station's robotic arm holding

327

00:18:40,549 --> 00:18:38,240

the spare boom for the space to ground

328

00:18:42,230 --> 00:18:40,559

antenna to be installed on the z1 truss

329

00:18:44,549 --> 00:18:42,240

you see there in the upper center of the

330

00:18:45,750 --> 00:18:44,559

picture for a translation to the airlock

331

00:18:51,020 --> 00:18:45,760

toolbox

332

00:18:54,710 --> 00:18:53,190

[Music]

333

00:18:58,870 --> 00:18:54,720

stop motion

334

00:19:01,669 --> 00:18:58,880

garrett reese man with the

335

00:19:04,230 --> 00:19:01,679

space-to-ground antenna dish firmly in

336

00:19:07,270 --> 00:19:04,240

hand being maneuvered now back over to

337

00:19:10,710 --> 00:19:07,280

the installation point this is a view

338

00:19:13,990 --> 00:19:10,720

from the perspective of steve bowen

339

00:19:16,710 --> 00:19:14,000

the nose of uh space shuttle atlantis

340

00:19:18,549 --> 00:19:16,720

cwc eyes taking photos of his colleague

341

00:19:20,310 --> 00:19:18,559

garrett reisman off in the distance on

342

00:19:22,070 --> 00:19:20,320

the end of the station's robotic arm

343

00:19:24,470 --> 00:19:22,080

with the spare

344

00:19:27,029 --> 00:19:24,480

space-to-ground antenna dish

345

00:19:29,270 --> 00:19:27,039

being relocated to the z1 truss element

346

00:19:32,470 --> 00:19:29,280

of the station where it will be uh

347

00:19:38,710 --> 00:19:32,480

permanently housed as a redundant

348

00:19:42,950 --> 00:19:40,390

hey antoni just let you know we just got

349

00:19:44,390 --> 00:19:42,960

ku back hey if they're working here when

350

00:19:45,750 --> 00:19:44,400

they get done and they get a moment if

351
00:19:47,990 --> 00:19:45,760
they can get somebody just kind of show

352
00:19:49,909 --> 00:19:48,000
us the interface why they kind of give

353
00:19:54,070 --> 00:19:49,919
it that little uh push and touch so to

354
00:19:59,190 --> 00:19:56,630
okay you can see uh in garrett's view

355
00:20:01,270 --> 00:19:59,200
there he was seeing the largest gap and

356
00:20:02,870 --> 00:20:01,280
you can see that interface

357
00:20:05,590 --> 00:20:02,880
right there you can tell there's there's

358
00:20:07,110 --> 00:20:05,600
not much of anything there you ready for

359
00:20:08,470 --> 00:20:07,120
the you guys if you're watching i'll

360
00:20:10,390 --> 00:20:08,480
wiggle it

361
00:20:13,430 --> 00:20:10,400
we're watching it

362
00:20:18,390 --> 00:20:15,750
whoa oh you got a huge chat

363
00:20:20,630 --> 00:20:18,400

yeah we did see that thanks that helps i

364

00:20:22,870 --> 00:20:20,640

think we need to re-torque them

365

00:20:24,230 --> 00:20:22,880

wow no problem so hold off on the heat

366

00:20:26,390 --> 00:20:24,240

shield they should let us go to a higher

367

00:20:28,630 --> 00:20:26,400

torque after seeing that yeah i didn't

368

00:20:29,669 --> 00:20:28,640

think it was good

369

00:20:32,070 --> 00:20:29,679

we still got a problem with this

370

00:20:34,789 --> 00:20:32,080

connector though

371

00:20:36,870 --> 00:20:34,799

all right guys uh i'll ask you this

372

00:20:38,549 --> 00:20:36,880

first and then uh give you a chance to

373

00:20:40,549 --> 00:20:38,559

speak up before we talk to houston but

374

00:20:42,149 --> 00:20:40,559

at some point we're just uh we're just

375

00:20:44,310 --> 00:20:42,159

staring at this connector and not making

376

00:20:48,149 --> 00:20:44,320

much progress how about you big g

377

00:20:50,390 --> 00:20:48,159

getting words before we

378

00:20:53,669 --> 00:20:50,400

it is a big advantage to uh having the

379

00:20:55,830 --> 00:20:53,679

two of us here to try to work together

380

00:20:57,990 --> 00:20:55,840

uh i'd say we give one more

381

00:20:59,110 --> 00:20:58,000

big effort to get it on

382

00:21:02,710 --> 00:20:59,120

and uh

383

00:21:04,549 --> 00:21:02,720

oh sunrise

384

00:21:10,390 --> 00:21:04,559

uh just another minute so if you want to

385

00:21:15,510 --> 00:21:13,270

yeah we gotta cover it up yeah

386

00:21:18,870 --> 00:21:15,520

that's gonna keep that cold and keep it

387

00:21:22,630 --> 00:21:20,230

okay

388

00:21:24,149 --> 00:21:22,640

i think i got it i think it's on my side

389

00:21:26,149 --> 00:21:24,159

that's your favorite

390

00:21:29,920 --> 00:21:26,159

bit off of it

391

00:21:29,930 --> 00:21:41,750

[Music]

392

00:21:45,590 --> 00:21:43,510

such a good job waiting for the uh

393

00:21:46,950 --> 00:21:45,600

fine-tuned good plan

394

00:21:48,230 --> 00:21:46,960

thanks movie

395

00:21:51,990 --> 00:21:48,240

thank you ready for the interface

396

00:21:55,510 --> 00:21:53,909

garrett riesman and steve bowen have now

397

00:21:57,990 --> 00:21:55,520

split their attention to two different

398

00:22:00,070 --> 00:21:58,000

tasks gareth riesman will go work on the

399

00:22:01,750 --> 00:22:00,080

installation of this work site for the

400

00:22:03,669 --> 00:22:01,760

dexter robot

401
00:22:05,430 --> 00:22:03,679
steve bowen is still working on this

402
00:22:06,789 --> 00:22:05,440
spare space to ground antenna assembly

403
00:22:08,149 --> 00:22:06,799
he's going to be

404
00:22:09,510 --> 00:22:08,159
removing what are called gimbal locks

405
00:22:11,350 --> 00:22:09,520
these are basically just locks that are

406
00:22:12,870 --> 00:22:11,360
put into place to hold

407
00:22:14,630 --> 00:22:12,880
everything securely

408
00:22:18,789 --> 00:22:14,640
during atlantis launch which of course

409
00:22:23,029 --> 00:22:21,110
while reisman and bowen are

410
00:22:24,710 --> 00:22:23,039
working on this spacewalk the robotics

411
00:22:27,669 --> 00:22:24,720
officer here inside mission control has

412
00:22:30,950 --> 00:22:27,679
confirmed that the shuttle's robotic arm

413
00:22:32,390 --> 00:22:30,960

has successfully grappled to mrm1

414

00:22:34,710 --> 00:22:32,400

this is some advanced activity in

415

00:22:36,789 --> 00:22:34,720

preparation for lifting that module

416

00:22:38,789 --> 00:22:36,799

out of atlantis payload bay and

417

00:22:42,870 --> 00:22:38,799

installing it on the russian segment of

418

00:22:53,110 --> 00:22:46,149

for 40 seconds i'll take it off ready on

419

00:22:57,590 --> 00:22:55,510

this is just releasing the locks to it

420

00:23:00,310 --> 00:22:57,600

i've got barbara pull over

421

00:23:02,549 --> 00:23:00,320

it looks like it released

422

00:23:04,870 --> 00:23:02,559

it actually moved

423

00:23:07,190 --> 00:23:04,880

and bar pull over release take the

424

00:23:09,669 --> 00:23:07,200

switch to off

425

00:23:11,510 --> 00:23:09,679

d mate

426
00:23:12,710 --> 00:23:11,520
that's with this one and i should get

427
00:23:14,470 --> 00:23:12,720
released

428
00:23:16,789 --> 00:23:14,480
to verify

429
00:23:18,549 --> 00:23:16,799
which um

430
00:23:20,070 --> 00:23:18,559
cable of this

431
00:23:28,400 --> 00:23:20,080
upper so go position on there you've

432
00:23:28,410 --> 00:23:31,669
[Music]

433
00:23:31,679 --> 00:23:43,669
okay

434
00:23:47,590 --> 00:23:45,190
all right tony so what did you do this

435
00:23:48,830 --> 00:23:47,600
morning yeah i got up this morning and i

436
00:23:51,029 --> 00:23:48,840
got all cleaned

437
00:23:53,830 --> 00:23:51,039
up good shave

438
00:23:54,630 --> 00:23:53,840

and we pulled mrm1 out of the payload

439

00:23:56,149 --> 00:23:54,640

bay

440

00:23:57,430 --> 00:23:56,159

and you probably can see that better in

441

00:23:58,789 --> 00:23:57,440

the monitor

442

00:24:01,269 --> 00:23:58,799

and

443

00:24:03,269 --> 00:24:01,279

in the bottom view is our camera

444

00:24:05,669 --> 00:24:03,279

looking in our payload bay at mrm1 and

445

00:24:07,110 --> 00:24:05,679

then our top view is the

446

00:24:09,029 --> 00:24:07,120

station's

447

00:24:11,510 --> 00:24:09,039

big arm end effector and you can see we

448

00:24:13,590 --> 00:24:11,520

lined it up so they can just go in and

449

00:24:16,710 --> 00:24:13,600

grapple and uh

450

00:24:18,230 --> 00:24:16,720

big cheese over in the cupola

451
00:24:19,909 --> 00:24:18,240
flying the big arm he's gonna grapple

452
00:24:23,590 --> 00:24:19,919
the module and plug it into the bottom

453
00:24:29,269 --> 00:24:26,549
and uh big g on the big loop uh the

454
00:24:33,240 --> 00:24:29,279
srms has mrm1 at the handoff position

455
00:24:37,430 --> 00:24:33,250
with the brakes on you go for grapple

456
00:24:38,950 --> 00:24:37,440
[Music]

457
00:24:41,750 --> 00:24:38,960
looks good

458
00:24:44,310 --> 00:24:41,760
this is a live action shot

459
00:24:46,870 --> 00:24:44,320
live action you can't see the angle is

460
00:24:47,990 --> 00:24:46,880
not too good but this is guarant

461
00:24:50,870 --> 00:24:48,000
gravity

462
00:24:52,870 --> 00:24:50,880
grappling mrm1

463
00:24:54,710 --> 00:24:52,880

you're at the mrm1 clearance position

464

00:24:58,470 --> 00:24:54,720

with the brakes on your go to maneuver

465

00:25:01,830 --> 00:25:00,149

okay copy all we're going to put that in

466

00:25:04,230 --> 00:25:01,840

the work

467

00:25:05,830 --> 00:25:04,240

and this is roughly a uh 20 minute

468

00:25:07,269 --> 00:25:05,840

maneuver that will

469

00:25:10,789 --> 00:25:07,279

reposition

470

00:25:12,149 --> 00:25:10,799

the russviet module at its pre-installed

471

00:25:14,390 --> 00:25:12,159

position

472

00:25:17,750 --> 00:25:14,400

the module has a number of components on

473

00:25:19,909 --> 00:25:17,760

the outside destined for future use at

474

00:25:25,669 --> 00:25:19,919

other locations on the international

475

00:25:29,750 --> 00:25:28,789

and houston uh iss robo that's the first

476

00:25:32,070 --> 00:25:29,760

bad thing

477

00:25:33,750 --> 00:25:32,080

we uh looked like a pretty good docking

478

00:25:36,710 --> 00:25:33,760

we never got contact one straight down

479

00:25:39,510 --> 00:25:36,720

the middle and got capture and contact

480

00:25:43,269 --> 00:25:39,520

the station's robotic arm

481

00:25:45,990 --> 00:25:43,279

is operated from inside the cupola the

482

00:25:49,269 --> 00:25:46,000

view you see here is of garrett riesman

483

00:25:50,950 --> 00:25:49,279

and piers sellers as they have been

484

00:25:53,350 --> 00:25:50,960

pretty much in charge of the station

485

00:25:54,310 --> 00:25:53,360

robotic arm operations throughout the

486

00:25:57,190 --> 00:25:54,320

day

487

00:25:59,510 --> 00:25:57,200

the robotic workstation was relocated

488

00:26:00,870 --> 00:25:59,520

from the u.s lab

489

00:26:03,590 --> 00:26:00,880

destiny

490

00:26:06,470 --> 00:26:03,600

to the robotic workstation a couple of

491

00:26:10,630 --> 00:26:07,909

all right i can't believe we haven't put

492

00:26:14,390 --> 00:26:10,640

this in flight day highlights this is uh

493

00:26:16,950 --> 00:26:14,400

definitely one of the highlights this is

494

00:26:19,669 --> 00:26:16,960

of course the cupola

495

00:26:22,110 --> 00:26:19,679

and

496

00:26:28,630 --> 00:26:22,120

we are of course the camera's gonna get

497

00:26:33,350 --> 00:26:29,830

flying over

498

00:26:40,630 --> 00:26:35,909

let's look back here so i can show you

499

00:26:40,640 --> 00:26:45,830

indeed back on

500

00:26:58,950 --> 00:26:47,610

and

501
00:27:03,909 --> 00:27:01,590
michael good will be performing his uh

502
00:27:06,310 --> 00:27:03,919
first spacewalk of this mission this

503
00:27:07,830 --> 00:27:06,320
will be his third

504
00:27:10,549 --> 00:27:07,840
eva and

505
00:27:12,310 --> 00:27:10,559
his colleague steve bowen who joined

506
00:27:13,750 --> 00:27:12,320
garrett riesman on the first spacewalk

507
00:27:15,830 --> 00:27:13,760
two days ago

508
00:27:22,470 --> 00:27:15,840
he'll be wearing a suit with a red

509
00:27:22,480 --> 00:27:28,389
good motion

510
00:27:28,399 --> 00:27:32,230
a little bit further

511
00:27:41,350 --> 00:27:34,630
he's coming

512
00:27:46,870 --> 00:27:44,870
you came a little bit perfect stop

513
00:27:49,990 --> 00:27:46,880

you can see the impingement point where

514

00:27:53,350 --> 00:27:50,000

my finger is you guys got that the wvs

515

00:27:55,350 --> 00:27:53,360

and then the impingement the

516

00:27:56,389 --> 00:27:55,360

the indentation went away for the most

517

00:27:59,110 --> 00:27:56,399

part

518

00:28:02,710 --> 00:27:59,120

once it was released and then there's no

519

00:28:04,870 --> 00:28:02,720

pairing to the fabric covering

520

00:28:07,669 --> 00:28:04,880

steve bowen has already unsnagged the

521

00:28:09,110 --> 00:28:07,679

cable he's just going to tie wrap it to

522

00:28:11,590 --> 00:28:09,120

the other

523

00:28:13,750 --> 00:28:11,600

cable that you see there this is a view

524

00:28:20,389 --> 00:28:13,760

from his helmet cam 30 minutes into the

525

00:28:24,789 --> 00:28:22,630

and it's turning

526

00:28:28,389 --> 00:28:24,799

michael good now releasing one of the

527

00:28:30,549 --> 00:28:28,399

two bolts securing the battery

528

00:28:31,830 --> 00:28:30,559

to its uh

529

00:28:34,149 --> 00:28:31,840

carrier

530

00:28:35,990 --> 00:28:34,159

on the p6 truss

531

00:28:39,669 --> 00:28:36,000

completely released

532

00:28:41,909 --> 00:28:39,679

okay and a few gang words for uh stevo

533

00:28:44,230 --> 00:28:41,919

or garrett about running torque and

534

00:28:46,950 --> 00:28:44,240

indicators as you do these uh just shout

535

00:28:49,350 --> 00:28:46,960

them out next will be release h2 yeah

536

00:28:51,750 --> 00:28:49,360

running torque was nothing on each one

537

00:28:53,909 --> 00:28:51,760

and you see the indicator there uh stevo

538

00:28:56,230 --> 00:28:53,919

fit so it went here from lock just that

539

00:28:58,230 --> 00:28:56,240

far on each one or something very far i

540

00:28:59,909 --> 00:28:58,240

can feel it uh you know right you know

541

00:29:03,029 --> 00:28:59,919

jumping on the thread at the end when i

542

00:29:07,510 --> 00:29:04,630

mike if you could pull it to your right

543

00:29:09,110 --> 00:29:07,520

a little bit so i can get down the

544

00:29:10,789 --> 00:29:09,120

thank you

545

00:29:12,870 --> 00:29:10,799

tony i really didn't feel any soft

546

00:29:15,029 --> 00:29:12,880

talking it was just uh

547

00:29:16,950 --> 00:29:15,039

it was just floating

548

00:29:18,870 --> 00:29:16,960

okay i can't be won't be interested to

549

00:29:22,549 --> 00:29:18,880

see if the pallet's the same or if it's

550

00:29:29,350 --> 00:29:25,830

bowen is now handing the new the first

551
00:29:31,909 --> 00:29:29,360
new battery and he'll hand that off to

552
00:29:34,389 --> 00:29:31,919
michael good who will uh head back to

553
00:29:36,149 --> 00:29:34,399
the work site for installation

554
00:29:39,750 --> 00:29:36,159
my revive is clear

555
00:29:42,710 --> 00:29:39,760
at the battery i am going to egress the

556
00:29:45,269 --> 00:29:43,909
okay you're gonna have to pitch it away

557
00:29:48,149 --> 00:29:45,279
a little bit

558
00:29:56,549 --> 00:29:48,159
if you push it yeah

559
00:30:00,389 --> 00:29:58,789
all right

560
00:30:03,029 --> 00:30:00,399
i'm gonna give you that and then you can

561
00:30:08,070 --> 00:30:03,039
take both and uh okay i've got the back

562
00:30:13,750 --> 00:30:09,510
there we go

563
00:30:18,470 --> 00:30:16,549

battery is moving in

564

00:30:20,230 --> 00:30:18,480

five

565

00:30:22,149 --> 00:30:20,240

six

566

00:30:24,070 --> 00:30:22,159

seven

567

00:30:26,070 --> 00:30:24,080

eight

568

00:30:28,950 --> 00:30:26,080

nine

569

00:30:30,870 --> 00:30:29,380

11

570

00:30:32,630 --> 00:30:30,880

[Music]

571

00:30:34,830 --> 00:30:32,640

12

572

00:30:36,389 --> 00:30:34,840

13

573

00:30:38,230 --> 00:30:36,399

14.

574

00:30:40,870 --> 00:30:38,240

15.

575

00:30:48,470 --> 00:30:40,880

getting ready for the twerk here

576

00:30:51,750 --> 00:30:50,630

try to getting my race

577

00:30:52,870 --> 00:30:51,760

okay i've got the battery you have the

578

00:30:54,149 --> 00:30:52,880

battery

579

00:30:56,070 --> 00:30:54,159

he's going to move over so you can get

580

00:30:59,029 --> 00:30:56,080

over that handrail for let me try and

581

00:31:04,710 --> 00:31:02,310

michael good now uh translating up to

582

00:31:07,509 --> 00:31:04,720

join steve bowen for the

583

00:31:12,470 --> 00:31:07,519

installation of the old battery number

584

00:31:14,149 --> 00:31:12,480

three into uh the empty slot b

585

00:31:16,389 --> 00:31:14,159

that is going in the hole

586

00:31:19,190 --> 00:31:16,399

how do i get the mli clear this time

587

00:31:21,909 --> 00:31:19,200

i'm a little bit left

588

00:31:32,310 --> 00:31:23,750

i'm showing it that's about as deep as i

589

00:31:36,870 --> 00:31:34,630

three brand new batteries now have been

590

00:31:40,070 --> 00:31:36,880

installed on the uh

591

00:31:43,110 --> 00:31:40,080

the p6 truss the crew has been given a

592

00:31:46,630 --> 00:31:43,120

go for the fourth battery today

593

00:31:49,509 --> 00:31:46,640

so they are jumping ahead

594

00:31:51,909 --> 00:31:49,519

now that the new battery is installed

595

00:31:54,549 --> 00:31:51,919

they are in the process now of removing

596

00:31:55,509 --> 00:31:54,559

the fourth old battery battery number

597

00:31:58,549 --> 00:31:55,519

four

598

00:32:00,950 --> 00:31:58,559

from the p6 truss

599

00:32:03,350 --> 00:32:00,960

once they have that removed they will

600

00:32:05,269 --> 00:32:03,360

install it on the pallet to be returned

601
00:32:07,430 --> 00:32:05,279
home aboard atlantis

602
00:32:09,750 --> 00:32:07,440
and then they will remove

603
00:32:15,269 --> 00:32:09,760
the fourth new battery from that pallet

604
00:32:18,950 --> 00:32:17,509
the crew is still ahead of the timeline

605
00:32:20,389 --> 00:32:18,960
therefore the ground team has offered up

606
00:32:22,870 --> 00:32:20,399
the option of taking care of this get

607
00:32:24,950 --> 00:32:22,880
ahead task on this spare space to ground

608
00:32:26,230 --> 00:32:24,960
antenna

609
00:32:27,830 --> 00:32:26,240
the entire objective of what they're

610
00:32:29,590 --> 00:32:27,840
trying to do is re-tighten these bolts

611
00:32:31,350 --> 00:32:29,600
and they will do a wiggle or a shake

612
00:32:32,789 --> 00:32:31,360
test on the entire assembly to make sure

613
00:32:34,070 --> 00:32:32,799

it's not moving more than what is

614

00:32:35,750 --> 00:32:34,080

expected

615

00:32:37,110 --> 00:32:35,760

if it does they will simply try to

616

00:32:38,789 --> 00:32:37,120

re-tighten the bolts once more at a

617

00:32:40,149 --> 00:32:38,799

higher setting

618

00:32:42,950 --> 00:32:40,159

but if it doesn't move more than what

619

00:32:44,389 --> 00:32:42,960

they expect they will release the

620

00:32:45,909 --> 00:32:44,399

temporary tether that was put on there

621

00:32:48,070 --> 00:32:45,919

during the first spacewalk of the

622

00:32:51,350 --> 00:32:48,080

mission and also released the launch

623

00:32:53,110 --> 00:32:51,360

locks that held the antenna down

624

00:32:55,350 --> 00:32:53,120

and mike you can do the wiggle test i'll

625

00:32:59,509 --> 00:32:55,360

put my ptp where okay i'm getting down

626

00:32:59,519 --> 00:33:02,310

and

627

00:33:05,750 --> 00:33:03,830

tony i'm doing a weight loss test i'm

628

00:33:07,830 --> 00:33:05,760

not getting any motion i'm seeing

629

00:33:09,590 --> 00:33:07,840

absolutely nothing nothing like we had

630

00:33:11,269 --> 00:33:09,600

the other day that's for sure

631

00:33:13,830 --> 00:33:11,279

okay great

632

00:33:16,470 --> 00:33:13,840

and i don't see any gaps

633

00:33:18,870 --> 00:33:16,480

let me give houston a chance to

634

00:33:21,509 --> 00:33:18,880

weigh in here houston we saw no motion

635

00:33:24,470 --> 00:33:21,519

at the wiggle test and we see no gaps

636

00:33:27,430 --> 00:33:24,480

we're ready to pick up in step 19.

637

00:33:29,909 --> 00:33:27,440

great job that does it uh skin is on

638

00:33:34,470 --> 00:33:29,919

firmly we are ready for step 19 and

639

00:33:40,389 --> 00:33:36,630

what you doing man hey where you been

640

00:33:43,350 --> 00:33:40,399

all day you just had a victorious eva

641

00:33:45,990 --> 00:33:43,360

have you been out goofing off somewhere

642

00:33:47,909 --> 00:33:46,000

come on i was uh holding piers coffee

643

00:33:49,509 --> 00:33:47,919

while he was working the car i see

644

00:33:51,830 --> 00:33:49,519

holding the coffee very nice there's

645

00:33:53,350 --> 00:33:51,840

nobody's gotta do that man yeah no look

646

00:33:54,710 --> 00:33:53,360

out the window this is bueno coming into

647

00:33:56,870 --> 00:33:54,720

hatching all right let's check it out

648

00:33:59,909 --> 00:33:56,880

after being the champion of champions

649

00:34:02,950 --> 00:33:59,919

you guys kicked some serious butt today

650

00:34:04,710 --> 00:34:02,960

look at that look he's in space just

651
00:34:09,349 --> 00:34:04,720
inside this is gonna look up all right

652
00:34:13,589 --> 00:34:11,669
hey he's come on come on yeah there he

653
00:34:14,710 --> 00:34:13,599
is

654
00:34:16,790 --> 00:34:14,720
the

655
00:34:19,109 --> 00:34:16,800
serious heroes today both those guys

656
00:34:21,589 --> 00:34:19,119
unbelievable

657
00:34:22,790 --> 00:34:21,599
they did like four batteries save the

658
00:34:25,109 --> 00:34:22,800
s-can

659
00:34:26,790 --> 00:34:25,119
got everybody ahead so that our next eva

660
00:34:28,470 --> 00:34:26,800
is going to be

661
00:34:30,869 --> 00:34:28,480
awesome we're going to get everything

662
00:34:33,220 --> 00:34:30,879
done i know it's unbelievable i am so

663
00:34:44,470 --> 00:34:33,230

stinking happy

664

00:34:48,550 --> 00:34:46,950

the awesome smell of space

665

00:34:50,149 --> 00:34:48,560

yeah for those of you watching at home

666

00:34:51,270 --> 00:34:50,159

you might not realize this but space has

667

00:34:52,550 --> 00:34:51,280

a smell

668

00:34:54,310 --> 00:34:52,560

it's actually the smell of the stuff

669

00:34:56,389 --> 00:34:54,320

outside the station

670

00:35:00,069 --> 00:34:56,399

kind of smells like

671

00:35:05,030 --> 00:35:02,710

oh there's a there it is there's a smell

672

00:35:08,710 --> 00:35:05,040

smell like chicken cat smells like uh

673

00:35:13,109 --> 00:35:08,720

ozone or uh kind of electrical smell

674

00:35:17,430 --> 00:35:14,230

guys

675

00:35:21,349 --> 00:35:17,440

unbelievable eva what do you have to say

676

00:35:22,950 --> 00:35:21,359

epic that was fun it was it was great

677

00:35:24,470 --> 00:35:22,960

unbelievable hanging out there at the

678

00:35:25,550 --> 00:35:24,480

end of the trust watching the world go

679

00:35:28,390 --> 00:35:25,560

by

680

00:35:31,109 --> 00:35:28,400

unbelievable really yeah gorgeous was it

681

00:35:32,230 --> 00:35:31,119

scary no i'm a little scared no don't be

682

00:35:33,990 --> 00:35:32,240

scared sure

683

00:35:35,589 --> 00:35:34,000

dude beautiful cause i was looking from

684

00:35:37,829 --> 00:35:35,599

inside the window and it looked really

685

00:35:40,310 --> 00:35:37,839

far out there you who was on top of the

686

00:35:42,630 --> 00:35:40,320

arm wow at one time i know but i kept my

687

00:35:44,550 --> 00:35:42,640

eyes closed the whole time

688

00:35:46,470 --> 00:35:44,560

one time we flew over south america i

689

00:35:48,550 --> 00:35:46,480

could see the amazon for as long as i

690

00:35:51,109 --> 00:35:48,560

could see a thousand miles how long does

691

00:35:54,230 --> 00:35:51,119

that thing a long way i can see it

692

00:35:59,990 --> 00:35:54,240

forever wow yeah some beautiful sunrises

693

00:36:02,230 --> 00:36:01,030

international food here in the

694

00:36:06,390 --> 00:36:02,240

international space station we got

695

00:36:08,069 --> 00:36:06,400

yakitori we got russian maybe uh chicken

696

00:36:16,440 --> 00:36:08,079

with rice there buena what are you

697

00:36:20,090 --> 00:36:19,109

[Music]

698

00:36:21,510 --> 00:36:20,100

i think it's the same thing

699

00:36:24,390 --> 00:36:21,520

[Music]

700

00:36:27,109 --> 00:36:24,400

with some serious good songs

701
00:36:28,550 --> 00:36:27,119
nice good job

702
00:36:32,710 --> 00:36:28,560
all right who else wants to play with

703
00:36:36,310 --> 00:36:34,870
i like that's good that's good that's

704
00:36:37,910 --> 00:36:36,320
good yeah

705
00:36:42,550 --> 00:36:37,920
it's the russian military but i have not

706
00:36:42,560 --> 00:36:48,790
this is the way to eat it

707
00:36:52,550 --> 00:36:50,710
it's a revolving restaurant

708
00:36:53,750 --> 00:36:52,560
having a pork chop

709
00:36:55,430 --> 00:36:53,760
pork chop

710
00:36:59,510 --> 00:36:55,440
wait wait wait we got like we got like

711
00:37:01,990 --> 00:36:59,520
sea urchin sashimi we have uh sudak we

712
00:37:03,589 --> 00:37:02,000
have yakitori we've got all kinds of and

713
00:37:06,550 --> 00:37:03,599

you're reading what

714

00:37:07,670 --> 00:37:06,560

pork chop pork chop

715

00:37:10,630 --> 00:37:07,680

this is a

716

00:37:12,790 --> 00:37:10,640

russian pasta with uh so just flying out

717

00:37:17,510 --> 00:37:12,800

pasta

718

00:37:26,630 --> 00:37:20,150

you got me

719

00:37:32,470 --> 00:37:29,670

station's robotic arm is now being uh

720

00:37:34,470 --> 00:37:32,480

repositioned with the integrated cargo

721

00:37:38,230 --> 00:37:34,480

carrier the uh

722

00:37:40,630 --> 00:37:38,240

basically the uh giant toolbox that

723

00:37:44,230 --> 00:37:40,640

michael good and garrett reisman will be

724

00:37:45,910 --> 00:37:44,240

uh working off of today they'll be uh

725

00:37:48,710 --> 00:37:45,920

installing two new batteries that are

726

00:37:51,510 --> 00:37:48,720

still remaining on this carrier

727

00:37:54,310 --> 00:37:51,520

onto the station and returning three

728

00:37:56,069 --> 00:37:54,320

batteries back to this carrier it is

729

00:37:57,349 --> 00:37:56,079

planned to be put back in atlantis's

730

00:37:59,589 --> 00:37:57,359

payload bay

731

00:38:07,270 --> 00:37:59,599

on saturday

732

00:38:10,550 --> 00:38:08,870

between the back of the battery and the

733

00:38:11,670 --> 00:38:10,560

power that comes in

734

00:38:16,310 --> 00:38:11,680

okay

735

00:38:16,320 --> 00:38:21,510

halfway 50 to go probably

736

00:38:21,520 --> 00:38:24,790

that's the interesting

737

00:38:31,670 --> 00:38:26,710

you're looking uh basically through the

738

00:38:35,349 --> 00:38:31,680

eyes of mission specialist michael good

739

00:38:37,109 --> 00:38:35,359

as he heads back to the p6 truss to

740

00:38:39,270 --> 00:38:37,119

assist with the installation of the new

741

00:38:41,589 --> 00:38:39,280

battery this is the fifth of six

742

00:38:45,030 --> 00:38:41,599

batteries the first of two to be can to

743

00:38:48,950 --> 00:38:45,040

be swapped out today and installed on

744

00:38:51,880 --> 00:38:50,710

i can get that once you get the battery

745

00:39:01,030 --> 00:38:51,890

okay

746

00:39:01,040 --> 00:39:09,829

local here

747

00:39:14,950 --> 00:39:11,990

three hours one minute into the space

748

00:39:17,589 --> 00:39:14,960

walk the task of removing and replacing

749

00:39:21,510 --> 00:39:17,599

six batteries on the p6 truss

750

00:39:24,950 --> 00:39:21,520

has been completed that was at 8 28 am

751
00:39:27,829 --> 00:39:24,960
central daylight time 9 28 eastern time

752
00:39:29,270 --> 00:39:27,839
the p6 truss now has a full complement

753
00:39:31,670 --> 00:39:29,280
of six

754
00:39:36,230 --> 00:39:31,680
new batteries those will be

755
00:39:40,950 --> 00:39:37,910
okay tony i have the

756
00:39:43,829 --> 00:39:40,960
acr with 21

757
00:39:46,069 --> 00:39:43,839
on my vrt with the rest

758
00:39:48,790 --> 00:39:46,079
okay uh i'm gonna have you go up to

759
00:39:49,990 --> 00:39:48,800
53-28 to get your fairly but while

760
00:39:51,750 --> 00:39:50,000
you're down there if you could just take

761
00:39:54,150 --> 00:39:51,760
a look around the only thing that should

762
00:39:56,150 --> 00:39:54,160
be left down there that you should see

763
00:39:57,750 --> 00:39:56,160

is garrett's fair lead which should be

764

00:39:59,510 --> 00:39:57,760

just inboard of you everything else

765

00:40:32,850 --> 00:39:59,520

should be cleaned up

766

00:40:40,230 --> 00:40:38,790

[Applause]

767

00:41:01,750 --> 00:40:40,240

okay

768

00:41:04,390 --> 00:41:02,950

this is a

769

00:41:05,589 --> 00:41:04,400

garrett reisman's camera here as you can

770

00:41:08,550 --> 00:41:05,599

see the thermal cover is open to the

771

00:41:10,630 --> 00:41:08,560

quest airlock he is inside

772

00:41:12,470 --> 00:41:10,640

my good just uh just outside that hatch

773

00:41:13,349 --> 00:41:12,480

there they are getting close to wrapping

774

00:41:15,030 --> 00:41:13,359

up

775

00:41:16,990 --> 00:41:15,040

today's spacewalk once again this is the

776

00:41:18,829 --> 00:41:17,000

third and final one for atlantis's

777

00:41:20,069 --> 00:41:18,839

mission right

778

00:41:22,710 --> 00:41:20,079

there yeah

779

00:41:23,260 --> 00:41:22,720

get into this thermal cover yeah

780

00:41:30,150 --> 00:41:23,270

okay

781

00:41:34,069 --> 00:41:31,990

before we undock

782

00:41:35,589 --> 00:41:34,079

from this international space station i

783

00:41:38,550 --> 00:41:35,599

wanted to send this message to you so

784

00:41:41,109 --> 00:41:38,560

you could see atlantis in service

785

00:41:43,510 --> 00:41:41,119

once again on behalf of the united

786

00:41:45,510 --> 00:41:43,520

states of america and all of the people

787

00:41:48,470 --> 00:41:45,520

that have built her and operated her for

788

00:41:49,430 --> 00:41:48,480

the last 25 years this is our 32nd

789

00:41:52,550 --> 00:41:49,440

mission

790

00:41:55,190 --> 00:41:52,560

she has traveled over 100 million miles

791

00:41:57,349 --> 00:41:55,200

and been in space nearly 300 days

792

00:41:58,950 --> 00:41:57,359

and as you look out the window here

793

00:41:59,910 --> 00:41:58,960

you can see the international space

794

00:42:02,950 --> 00:41:59,920

station

795

00:42:03,990 --> 00:42:02,960

and all her glory as atlantis plays a

796

00:42:05,670 --> 00:42:04,000

part

797

00:42:07,910 --> 00:42:05,680

in the final

798

00:42:11,589 --> 00:42:07,920

days of completing her

799

00:42:14,950 --> 00:42:13,190

that's the pma you can see out the

800

00:42:17,670 --> 00:42:14,960

window which is the pressurized mating

801
00:42:19,430 --> 00:42:17,680
adapter and then up above you can see

802
00:42:23,510 --> 00:42:19,440
the truss

803
00:42:28,150 --> 00:42:25,430
and you can see how enormous the

804
00:42:29,910 --> 00:42:28,160
international space station is

805
00:42:31,270 --> 00:42:29,920
and you can appreciate the role that

806
00:42:32,150 --> 00:42:31,280
atlantis

807
00:42:34,390 --> 00:42:32,160
had

808
00:42:40,069 --> 00:42:34,400
in constructing

809
00:42:44,390 --> 00:42:42,630
all right here we are in the cupola of

810
00:42:46,870 --> 00:42:44,400
the international space station

811
00:42:48,790 --> 00:42:46,880
where we can get a great view

812
00:42:51,190 --> 00:42:48,800
at the whole bottom of space station

813
00:42:54,069 --> 00:42:51,200

which of course includes a wonderful

814

00:42:56,470 --> 00:42:54,079

view of atlantis

815

00:42:59,430 --> 00:42:56,480

and there she is near sunset

816

00:43:01,109 --> 00:42:59,440

another sunset of the day

817

00:43:04,390 --> 00:43:01,119

her payload bay

818

00:43:08,230 --> 00:43:04,400

is almost empty there you see the

819

00:43:10,390 --> 00:43:08,240

icc with the old solar ray batteries

820

00:43:11,829 --> 00:43:10,400

and then the empty side of the icc where

821

00:43:15,109 --> 00:43:11,839

there was

822

00:43:16,630 --> 00:43:15,119

an s gan antenna the eotp and the skin

823

00:43:17,990 --> 00:43:16,640

antenna boom

824

00:43:20,390 --> 00:43:18,000

and of course our primary mission

825

00:43:21,910 --> 00:43:20,400

objective the mrm1 module is gone from

826
00:43:25,109 --> 00:43:21,920
the bay

827
00:43:27,109 --> 00:43:25,119
and we can see it as you pan around

828
00:43:28,630 --> 00:43:27,119
the cupola

829
00:43:30,630 --> 00:43:28,640
to see

830
00:43:32,550 --> 00:43:30,640
there's the airlock going by and a solar

831
00:43:35,190 --> 00:43:32,560
array

832
00:43:37,670 --> 00:43:35,200
and that module right there

833
00:43:40,870 --> 00:43:37,680
in the settings sun brightly lit

834
00:43:44,630 --> 00:43:40,880
is the mrm1 module

835
00:43:46,069 --> 00:43:44,640
on atlantis's uh last payload

836
00:43:49,349 --> 00:43:46,079
and

837
00:43:51,829 --> 00:43:49,359
this is a time when we we have

838
00:43:54,870 --> 00:43:51,839

goodbye our friends our colleagues the

839

00:43:55,990 --> 00:43:54,880

actual crew of her struggle atlantis

840

00:43:58,870 --> 00:43:56,000

that

841

00:44:00,710 --> 00:43:58,880

her did an excellent job

842

00:44:01,990 --> 00:44:00,720

performing free evas

843

00:44:03,990 --> 00:44:02,000

installing

844

00:44:06,829 --> 00:44:04,000

the new russian module

845

00:44:10,150 --> 00:44:06,839

and just having the fun

846

00:44:12,870 --> 00:44:10,160

enjoying their living station and

847

00:44:14,069 --> 00:44:12,880

working in space and they

848

00:44:15,109 --> 00:44:14,079

show

849

00:44:17,589 --> 00:44:15,119

that

850

00:44:19,190 --> 00:44:17,599

good example of friendship

851
00:44:22,200 --> 00:44:19,200
professionalism

852
00:44:23,270 --> 00:44:22,210
and classic messages

853
00:44:32,390 --> 00:44:23,280
[Music]

854
00:44:35,589 --> 00:44:32,400
so again thank you thank you ken thank

855
00:44:38,470 --> 00:44:35,599
you all sure thank you for excellent

856
00:44:41,190 --> 00:44:38,480
job for your

857
00:44:43,670 --> 00:44:41,200
patient for your

858
00:44:44,870 --> 00:44:43,680
work for everything

859
00:44:45,640 --> 00:44:44,880
we enjoy

860
00:44:47,589 --> 00:44:45,650
working with you

861
00:44:49,990 --> 00:44:47,599
[Music]

862
00:44:52,390 --> 00:44:50,000
like we are one happy shuttle crew and

863
00:44:53,430 --> 00:44:52,400

we are happy because of all of your

864

00:44:55,030 --> 00:44:53,440

effort too

865

00:44:57,430 --> 00:44:55,040

i think through our entire dock time

866

00:44:59,030 --> 00:44:57,440

frame here we were a 12-person crew that

867

00:45:00,870 --> 00:44:59,040

operated together

868

00:45:03,190 --> 00:45:00,880

and that was the only way that we got

869

00:45:04,950 --> 00:45:03,200

everything done and got mrm installed

870

00:45:05,750 --> 00:45:04,960

and got the edas done

871

00:45:08,870 --> 00:45:05,760

so

872

00:45:11,430 --> 00:45:08,880

we are happy but this one is to

873

00:45:12,390 --> 00:45:11,440

friends we're going to leave behind

874

00:45:14,069 --> 00:45:12,400

and

875

00:45:15,829 --> 00:45:14,079

new friends that we've made close

876

00:45:18,550 --> 00:45:15,839

friends my friend

877

00:45:20,710 --> 00:45:18,560

we've had a great time together

878

00:45:22,150 --> 00:45:20,720

and tj will be home soon two weeks

879

00:45:26,470 --> 00:45:22,160

you'll be home soon

880

00:45:29,270 --> 00:45:27,430

alrighty

881

00:45:31,030 --> 00:45:29,280

we're going to close the hat shortly and

882

00:45:32,790 --> 00:45:31,040

we're going to depart and of course as

883

00:45:34,309 --> 00:45:32,800

always it'll be a little bit sad but

884

00:45:35,350 --> 00:45:34,319

we'll see you all on the surface of

885

00:45:39,510 --> 00:45:35,360

planet earth again soon

886

00:45:44,230 --> 00:45:41,750

houston and station from atlantis

887

00:45:46,950 --> 00:45:44,240

physical separation

888

00:45:49,349 --> 00:45:46,960

houston copies copy

889

00:45:55,430 --> 00:45:49,359

copies

890

00:45:58,790 --> 00:45:57,270

atlantis station is now in attitude

891

00:46:00,470 --> 00:45:58,800

control

892

00:46:02,069 --> 00:46:00,480

i gotta tell you you guys are consummate

893

00:46:04,150 --> 00:46:02,079

professionals with a great sense of

894

00:46:05,589 --> 00:46:04,160

humor we were so glad to see you loved

895

00:46:08,390 --> 00:46:05,599

working with you

896

00:46:11,349 --> 00:46:08,400

see you soon brother stay safe

897

00:46:37,109 --> 00:46:11,359

copy all tj and uh same comments right

898

00:46:41,829 --> 00:46:39,589

the shuttle's now 506 feet away from the

899

00:46:43,550 --> 00:46:41,839

international space station

900

00:46:45,910 --> 00:46:43,560

this fly around is continuing with

901
00:46:51,270 --> 00:46:45,920
sts-132 pilot tony antonelli at the

902
00:46:55,589 --> 00:46:53,430
there you can see the progress

903
00:46:57,030 --> 00:46:55,599
37

904
00:47:00,150 --> 00:46:57,040
that is currently docked with the piers

905
00:47:04,150 --> 00:47:02,230
at the very back toward the lower center

906
00:47:07,270 --> 00:47:04,160
part of your screen you can see the

907
00:47:08,870 --> 00:47:07,280
soyuz tma-17

908
00:47:10,790 --> 00:47:08,880
and then there on the right is the brand

909
00:47:12,150 --> 00:47:10,800
new rosfed module which is now attached

910
00:47:13,750 --> 00:47:12,160
to zarya

911
00:47:14,870 --> 00:47:13,760
that of course came up with atlantis

912
00:47:17,190 --> 00:47:14,880
during this mission and the crew

913
00:47:18,150 --> 00:47:17,200

installed it

914

00:47:25,270 --> 00:47:18,160
as they were docked with the

915

00:47:28,630 --> 00:47:26,630
there you can see the entire

916

00:47:30,470 --> 00:47:28,640
international space station complex

917

00:47:32,390 --> 00:47:30,480
there if you look at the top

918

00:47:38,150 --> 00:47:32,400
atlanta is currently casting a shadow on

919

00:47:42,470 --> 00:47:39,910
here we are on the flight deck of

920

00:47:43,270 --> 00:47:42,480
atlantis again with the entire sts-132

921

00:47:45,510 --> 00:47:43,280
crew

922

00:47:47,750 --> 00:47:45,520
and we have undocked from international

923

00:47:51,030 --> 00:47:47,760
space station yesterday

924

00:47:53,190 --> 00:47:51,040
spent the day inspecting atlantis

925

00:47:54,870 --> 00:47:53,200
thermal protection system and we didn't

926
00:47:55,990 --> 00:47:54,880
see anything wrong at all which is no

927
00:47:57,510 --> 00:47:56,000
surprise

928
00:47:59,430 --> 00:47:57,520
and tomorrow we're going to pack up the

929
00:48:00,230 --> 00:47:59,440
ship to come home to florida the next

930
00:48:02,630 --> 00:48:00,240
day

931
00:48:04,069 --> 00:48:02,640
i'm going to hand the mike to

932
00:48:09,030 --> 00:48:04,079
atlantis pilot

933
00:48:13,109 --> 00:48:09,829
thanks

934
00:48:15,109 --> 00:48:13,119
atlantis is just a fabulous ship she was

935
00:48:17,990 --> 00:48:15,119
a fabulous ship

936
00:48:20,230 --> 00:48:18,000
in the beginning and continues to be

937
00:48:22,630 --> 00:48:20,240
just absolutely amazing if this ends up

938
00:48:24,870 --> 00:48:22,640

uh being spatial atlanta since last

939

00:48:27,750 --> 00:48:24,880

flight we've got an american flag here

940

00:48:29,510 --> 00:48:27,760

that we're honored to fly this american

941

00:48:31,630 --> 00:48:29,520

flag flew on

942

00:48:33,190 --> 00:48:31,640

atlantis first flight

943

00:48:35,589 --> 00:48:33,200

sts-51j

944

00:48:40,870 --> 00:48:35,599

and i'll hand the mic over to navy

945

00:48:44,390 --> 00:48:42,470

it's a real honor to be one among the

946

00:48:47,270 --> 00:48:44,400

191 crew members that have flown on

947

00:48:49,750 --> 00:48:47,280

atlanta's in her over 300 days and over

948

00:48:51,430 --> 00:48:49,760

120 million miles atlantis is actually

949

00:48:53,910 --> 00:48:51,440

named after a ship of research and

950

00:48:56,150 --> 00:48:53,920

discovery from a place i happen to study

951
00:48:57,990 --> 00:48:56,160
woods hole oceanographic institute and

952
00:49:00,309 --> 00:48:58,000
she has definitely lowered up

953
00:49:01,670 --> 00:49:00,319
lived up to her name over the past

954
00:49:03,510 --> 00:49:01,680
20 years or so

955
00:49:06,950 --> 00:49:03,520
and peter sellers who has done his own

956
00:49:10,950 --> 00:49:08,630
atlantis is absolutely my favorite

957
00:49:12,150 --> 00:49:10,960
shuttle i've only flown on two but she's

958
00:49:13,270 --> 00:49:12,160
still my favorite

959
00:49:14,870 --> 00:49:13,280
um

960
00:49:16,309 --> 00:49:14,880
i hope that when she

961
00:49:18,470 --> 00:49:16,319
lands successfully which i'm relying on

962
00:49:19,829 --> 00:49:18,480
these guys up front to do that she goes

963
00:49:22,790 --> 00:49:19,839

somewhere and gets the respect she

964

00:49:23,990 --> 00:49:22,800

deserves as a ship of exploration

965

00:49:25,190 --> 00:49:24,000

people

966

00:49:27,589 --> 00:49:25,200

like to visit ships like the

967

00:49:29,109 --> 00:49:27,599

constellation the constitution see where

968

00:49:35,430 --> 00:49:29,119

they've been and what they've done

969

00:49:39,270 --> 00:49:37,109

i'm garrett riesman mission specialist

970

00:49:42,150 --> 00:49:39,280

on this flight and when i was selected

971

00:49:44,069 --> 00:49:42,160

as an astronaut back in 1998

972

00:49:45,829 --> 00:49:44,079

there were four of us in our class that

973

00:49:47,990 --> 00:49:45,839

were living in the southern california

974

00:49:49,430 --> 00:49:48,000

area and we got together to visit

975

00:49:51,510 --> 00:49:49,440

atlantis we were invited to come up

976

00:49:52,950 --> 00:49:51,520

while she was in for overhaul in

977

00:49:55,030 --> 00:49:52,960

palmdale

978

00:49:57,349 --> 00:49:55,040

and when the four of us got together one

979

00:49:58,870 --> 00:49:57,359

of the other astronauts was also tracy

980

00:50:00,390 --> 00:49:58,880

caldwell who was just with us on the

981

00:50:02,390 --> 00:50:00,400

space station so we were reminiscing

982

00:50:04,630 --> 00:50:02,400

about this just the other night

983

00:50:06,710 --> 00:50:04,640

and we got together saw atlantis and we

984

00:50:08,150 --> 00:50:06,720

all got so very excited about what we

985

00:50:10,150 --> 00:50:08,160

were about to do

986

00:50:11,910 --> 00:50:10,160

becoming astronauts and seeing the

987

00:50:13,670 --> 00:50:11,920

tender loving care that she was given

988

00:50:15,190 --> 00:50:13,680

there in palmdale by all the people that

989

00:50:17,349 --> 00:50:15,200

worked on her

990

00:50:18,230 --> 00:50:17,359

it was hard to believe that here i would

991

00:50:20,710 --> 00:50:18,240

be

992

00:50:23,430 --> 00:50:20,720

some 10 years later

993

00:50:26,549 --> 00:50:23,440

flying on what could be her last flight

994

00:50:30,150 --> 00:50:26,559

but she's been an amazing ship and it's

995

00:50:32,390 --> 00:50:30,160

an honor to have served upon it

996

00:50:35,589 --> 00:50:32,400

and here is air force colonel retired

997

00:50:39,430 --> 00:50:37,430

thanks garrett i've been lucky enough to

998

00:50:41,829 --> 00:50:39,440

have two shuttle flights both of them on

999

00:50:43,270 --> 00:50:41,839

atlanta so it's also my favorite

1000

00:50:46,230 --> 00:50:43,280

space shuttle

1001

00:50:49,030 --> 00:50:46,240

atlantis has been on 32 flights now

1002

00:50:51,190 --> 00:50:49,040

we're on 32 number 32 and perhaps the

1003

00:50:53,589 --> 00:50:51,200

final flight of atlantis she's been to

1004

00:50:54,950 --> 00:50:53,599

many different destinations

1005

00:50:56,710 --> 00:50:54,960

i was lucky enough to go to both the

1006

00:50:58,549 --> 00:50:56,720

hubble space telescope

1007

00:51:00,630 --> 00:50:58,559

and to the space station

1008

00:51:02,069 --> 00:51:00,640

she's also been to mir and many other

1009

00:51:04,309 --> 00:51:02,079

different places so

1010

00:51:05,670 --> 00:51:04,319

she's well traveled and she's served

1011

00:51:07,510 --> 00:51:05,680

many of us well

1012

00:51:10,390 --> 00:51:07,520

and we look forward to bringing her home

1013

00:51:11,750 --> 00:51:10,400

safe and going to visit her someday on

1014

00:51:15,109 --> 00:51:11,760

the ground

1015

00:51:16,470 --> 00:51:15,119

so from the entire crew from sts-132

1016

00:51:24,230 --> 00:51:16,480

thanks to atlantis and all the folks

1017

00:51:29,270 --> 00:51:26,069

space shuttle atlantis now in its final

1018

00:51:32,150 --> 00:51:30,549

five and a half minutes to go till

1019

00:51:34,390 --> 00:51:32,160

touchdown

1020

00:51:36,950 --> 00:51:34,400

atlantis you are on energy approaching

1021

00:51:41,430 --> 00:51:36,960

the hack no changes to winds or weather

1022

00:51:41,440 --> 00:51:45,430

copy no changes

1023

00:51:45,440 --> 00:51:50,870

good read back

1024

00:51:53,750 --> 00:51:52,230

this is a view from the heads-up display

1025

00:52:00,790 --> 00:51:53,760

this is exactly what the crew is seeing

1026
00:52:06,710 --> 00:52:03,430
atlantis's current speed 653 miles per

1027
00:52:08,150 --> 00:52:06,720
hour its altitude nine miles

1028
00:52:24,630 --> 00:52:08,160
its range to the kennedy space center

1029
00:52:24,640 --> 00:52:33,589
so

1030
00:52:37,270 --> 00:52:35,430
pilot tony antonelli now taking control

1031
00:52:38,710 --> 00:52:37,280
of the stick for a few minutes

1032
00:52:40,230 --> 00:52:38,720
steering atlantis around this heading

1033
00:52:43,109 --> 00:52:40,240
alignment circle this is a right

1034
00:52:44,309 --> 00:52:43,119
overhead turn of 320 degrees this will

1035
00:52:48,390 --> 00:52:44,319
set up the shuttle for its final

1036
00:52:50,069 --> 00:52:48,400
approach and landing there on runway 3-3

1037
00:52:52,790 --> 00:52:50,079
now just three minutes to go the shuttle

1038
00:53:01,510 --> 00:52:52,800

is traveling 547 miles per hour its

1039

00:53:01,520 --> 00:53:11,430

good luck with that one

1040

00:53:15,430 --> 00:53:13,430

now the commander ken hem now taking

1041

00:53:17,500 --> 00:53:15,440

control of the shuttle you're on at the

1042

00:53:18,950 --> 00:53:17,510

180.

1043

00:53:21,430 --> 00:53:18,960

[Music]

1044

00:53:24,309 --> 00:53:21,440

it's a beautiful day

1045

00:53:28,470 --> 00:53:25,910

two and a half more minutes to go in

1046

00:53:30,549 --> 00:53:28,480

atlantis flight there you see the

1047

00:53:32,390 --> 00:53:30,559

florida coast coming into view the

1048

00:53:34,150 --> 00:53:32,400

shuttle continuing to turn to the right

1049

00:53:48,069 --> 00:53:34,160

and line up with runway 3-3 at the

1050

00:53:52,390 --> 00:53:49,829

commander ken ham continuing to finish

1051
00:54:02,549 --> 00:53:52,400
up this heading alignment circle turn

1052
00:54:05,589 --> 00:54:04,309
in just a few seconds the shuttle's crew

1053
00:54:13,589 --> 00:54:05,599
will get their first view at the kennedy

1054
00:54:16,710 --> 00:54:15,430
atlanta is now traveling 400 miles per

1055
00:54:18,230 --> 00:54:16,720
hour

1056
00:54:20,549 --> 00:54:18,240
and houston now the left side of the

1057
00:54:24,470 --> 00:54:20,559
cockpit

1058
00:54:26,309 --> 00:54:24,480
copy that on field site

1059
00:54:27,910 --> 00:54:26,319
once again this is the heads-up display

1060
00:54:29,349 --> 00:54:27,920
that commander ken ham is taking a look

1061
00:54:43,910 --> 00:54:29,359
at as he

1062
00:54:47,829 --> 00:54:46,309
space shuttle atlantis now traveling 389

1063
00:54:50,829 --> 00:54:47,839

miles per hour it is now on final

1064

00:54:53,030 --> 00:54:50,839

approach to the kennedy space

1065

00:54:55,030 --> 00:54:53,040

center during this point in the flight

1066

00:54:57,670 --> 00:54:55,040

the shuttle's descent rate is 20 times

1067

00:54:59,430 --> 00:54:57,680

steeper than a commercial airliner

1068

00:55:03,589 --> 00:54:59,440

its angle of attack more than seven

1069

00:55:10,290 --> 00:55:05,349

now under one minute to go in atlantis's

1070

00:55:27,589 --> 00:55:20,980

[Music]

1071

00:55:30,230 --> 00:55:29,109

atlantis now beginning what is known as

1072

00:55:36,390 --> 00:55:30,240

the

1073

00:55:36,400 --> 00:55:44,470

its speed now 320 miles per hour

1074

00:55:44,480 --> 00:55:52,740

the gear is down and locked

1075

00:55:57,030 --> 00:55:54,950

[Music]

1076

00:55:59,190 --> 00:55:57,040

main gear touchdown

1077

00:56:01,270 --> 00:55:59,200

atlantis nose being now rotated down

1078

00:56:02,200 --> 00:56:01,280

toward the runway the chute being

1079

00:56:06,309 --> 00:56:02,210

deployed

1080

00:56:08,710 --> 00:56:06,319

[Music]

1081

00:56:10,630 --> 00:56:08,720

and nose gear touchdown

1082

00:56:12,150 --> 00:56:10,640

space shuttle atlantis now comes home to

1083

00:56:13,349 --> 00:56:12,160

the kennedy space center for the final

1084

00:56:16,950 --> 00:56:13,359

time

1085

00:56:19,030 --> 00:56:16,960

25 years 32 flights and more than 120

1086

00:56:20,390 --> 00:56:19,040

million miles traveled

1087

00:56:24,960 --> 00:56:20,400

the legacy of atlantis now in the

1088

00:57:17,910 --> 00:56:55,870

[Music]

1089

00:57:21,910 --> 00:57:20,069

that uh landing was something that your

1090

00:57:24,150 --> 00:57:21,920

air force crewmate should have really

1091

00:57:27,510 --> 00:57:24,160

been proud of that looked pretty sweet

1092

00:57:30,069 --> 00:57:27,520

uh for you and your crew uh that was uh

1093

00:57:31,829 --> 00:57:30,079

suiting into a incredible mission

1094

00:57:33,349 --> 00:57:31,839

i'm sure the station crew members hated

1095

00:57:34,390 --> 00:57:33,359

to see you leave but we're glad to have

1096

00:57:37,349 --> 00:57:34,400

you back

1097

00:57:39,030 --> 00:57:37,359

and you guys executed flawlessly and not

1098

00:57:41,190 --> 00:57:39,040

only that you had a great time doing it

1099

00:57:42,789 --> 00:57:41,200

that was very evident from the ground

1100

00:57:44,630 --> 00:57:42,799

and everybody down here really enjoyed

1101
00:57:46,069 --> 00:57:44,640
working with you but that will get you

1102
00:57:50,630 --> 00:57:46,079
back to work we'll meet you in the post

1103
00:57:55,109 --> 00:57:52,390
okay scorch thanks and uh thanks to all

1104
00:57:57,190 --> 00:57:55,119
you guys too we'll go over to 5-3

1105
00:57:59,030 --> 00:57:57,200
and we'll finish up post landing and

1106
00:58:00,630 --> 00:57:59,040
turn this incredible machine back over

1107
00:58:02,630 --> 00:58:00,640
to the ground teams to put her back in

1108
00:58:07,990 --> 00:58:02,640
the barn for a little bit

1109
00:58:11,670 --> 00:58:09,910
folks we're uh happy to be back here at

1110
00:58:14,150 --> 00:58:11,680
the cape i think this is one of the few

1111
00:58:16,150 --> 00:58:14,160
flights that uh as my as pilot tony

1112
00:58:18,069 --> 00:58:16,160
antonelli was saying earlier you can

1113
00:58:19,349 --> 00:58:18,079

take that pao pamphlet pamphlet that

1114

00:58:21,030 --> 00:58:19,359

announces the launch date and the

1115

00:58:23,030 --> 00:58:21,040

landing date and time

1116

00:58:25,190 --> 00:58:23,040

and actually keep it because we landed

1117

00:58:27,510 --> 00:58:25,200

exactly on time which is a credit to the

1118

00:58:29,589 --> 00:58:27,520

forces here that got the ship ready and

1119

00:58:30,950 --> 00:58:29,599

in the air on time

1120

00:58:32,309 --> 00:58:30,960

and then

1121

00:58:35,670 --> 00:58:32,319

some great weather and some great

1122

00:58:37,670 --> 00:58:35,680

support for landing got us back on time

1123

00:58:39,430 --> 00:58:37,680

atlantis is an incredible ship

1124

00:58:42,069 --> 00:58:39,440

she was absolutely perfect through this

1125

00:58:43,670 --> 00:58:42,079

entire mission and uh probably our main

1126

00:58:45,270 --> 00:58:43,680

objective besides getting the mission

1127

00:58:47,270 --> 00:58:45,280

done was to bring her back in great

1128

00:58:49,190 --> 00:58:47,280

shape and in one piece so we're happy to

1129

00:59:07,480 --> 00:58:49,200

be home and we're going to go enjoy some