



1
00:00:06,150 --> 00:00:03,909
hi i'm garrett riesman a nasa astronaut

2
00:00:08,310 --> 00:00:06,160
and a graduate of parsippany high school

3
00:00:09,830 --> 00:00:08,320
in parsippany new jersey i can't tell

4
00:00:11,910 --> 00:00:09,840
you that i definitely knew back in high

5
00:00:13,430 --> 00:00:11,920
school that i'd be an astronaut someday

6
00:00:15,110 --> 00:00:13,440
but i can tell you that it would not

7
00:00:17,910 --> 00:00:15,120
have been possible without solid skills

8
00:00:18,870 --> 00:00:17,920
in science technology engineering and

9
00:00:20,630 --> 00:00:18,880
math

10
00:00:22,630 --> 00:00:20,640
so if you're a student take it from me

11
00:00:24,710 --> 00:00:22,640
education is a ticket to an incredible

12
00:00:54,950 --> 00:00:24,720
future what you learned today can help

13
00:00:54,960 --> 00:01:09,830

in the morning

14

00:01:09,840 --> 00:01:43,749

hey

15

00:01:50,630 --> 00:01:45,749

good morning atlantis and a special good

16

00:01:55,990 --> 00:01:52,830

thanks shannon good morning

17

00:01:58,389 --> 00:01:56,000

and morning also to uh

18

00:01:59,590 --> 00:01:58,399

simone it was behind the selection of

19

00:02:02,469 --> 00:01:59,600

that soon

20

00:02:03,429 --> 00:02:02,479

makes us all feel like dancing

21

00:02:04,709 --> 00:02:03,439

and

22

00:02:10,869 --> 00:02:04,719

uh

23

00:02:15,670 --> 00:02:14,229

and we copy thank you

24

00:02:17,510 --> 00:02:15,680

good morning from the johnson space

25

00:02:19,270 --> 00:02:17,520

center this is mission control houston a

26

00:02:21,910 --> 00:02:19,280

beautiful view of the international

27

00:02:24,390 --> 00:02:21,920

space station and space shuttle atlantis

28

00:02:26,229 --> 00:02:24,400

flying high above southeastern russia

29

00:02:28,309 --> 00:02:26,239

just about to make a pass

30

00:02:31,030 --> 00:02:28,319

across the sahelene islands before

31

00:02:33,190 --> 00:02:31,040

heading out across the pacific ocean

32

00:02:35,990 --> 00:02:33,200

today the name of the game is robotics

33

00:02:38,390 --> 00:02:36,000

you'll see quite a bit of robotic arm

34

00:02:40,949 --> 00:02:38,400

activity today both with the shuttle

35

00:02:42,550 --> 00:02:40,959

robotic arm and the station's arm

36

00:02:46,309 --> 00:02:42,560

the

37

00:02:49,110 --> 00:02:46,319

crew before heading to bed yesterday

38

00:02:51,589 --> 00:02:49,120

grappled the payload of choice today

39

00:02:54,630 --> 00:02:51,599

that is the russian mini research module

40

00:02:55,670 --> 00:02:54,640

ras viet the russian word for dawn which

41

00:02:58,390 --> 00:02:55,680

will be

42

00:03:01,190 --> 00:02:58,400

moved from atlantis's payload bay and

43

00:03:04,390 --> 00:03:01,200

handed off to the station's robotic arm

44

00:03:07,509 --> 00:03:04,400

the station's arm was relocated

45

00:03:10,470 --> 00:03:07,519

to the power and data grapple fixture

46

00:03:13,190 --> 00:03:10,480

on the u.s laboratory destiny

47

00:03:14,309 --> 00:03:13,200

it is in a strategic position there to

48

00:03:15,110 --> 00:03:14,319

accept

49

00:03:16,070 --> 00:03:15,120

its

50

00:03:18,630 --> 00:03:16,080

newest

51
00:03:21,430 --> 00:03:18,640
payload the mrm1

52
00:03:24,390 --> 00:03:21,440
which is destined for a final home

53
00:03:27,670 --> 00:03:24,400
on the azaria control modules nader

54
00:03:29,830 --> 00:03:27,680
docking port nader the earth-facing port

55
00:03:32,390 --> 00:03:29,840
of the zarya control module the

56
00:04:07,429 --> 00:03:32,400
station's first element launched

57
00:04:12,550 --> 00:04:09,270
pull over release

58
00:04:19,509 --> 00:04:12,560
for 40 seconds i'll take it off ready on

59
00:04:23,990 --> 00:04:21,909
this is just releasing the locks to it

60
00:04:26,710 --> 00:04:24,000
i've got barbara pull over

61
00:04:28,950 --> 00:04:26,720
it looks like it released

62
00:04:31,270 --> 00:04:28,960
it actually moves

63
00:04:33,590 --> 00:04:31,280

and bar pull over release take the

64

00:04:36,070 --> 00:04:33,600

switch to off

65

00:04:37,990 --> 00:04:36,080

d mate

66

00:04:39,110 --> 00:04:38,000

that's with this one and i should get

67

00:04:40,870 --> 00:04:39,120

released

68

00:04:55,189 --> 00:04:40,880

to verify

69

00:05:00,790 --> 00:04:57,510

weird is the same one that i had from

70

00:05:04,710 --> 00:05:02,310

all right tony so what did you do this

71

00:05:07,029 --> 00:05:04,720

morning yeah i got up this morning and i

72

00:05:08,150 --> 00:05:07,039

got all cleaned up

73

00:05:10,870 --> 00:05:08,160

good shave

74

00:05:11,749 --> 00:05:10,880

and we pulled mrm1 out of the payload

75

00:05:13,270 --> 00:05:11,759

bay

76
00:05:14,550 --> 00:05:13,280
and you probably can see that better in

77
00:05:18,390 --> 00:05:14,560
the monitor

78
00:05:20,390 --> 00:05:18,400
and uh in the bottom view is our camera

79
00:05:22,830 --> 00:05:20,400
looking in our payload bay at mrm1 and

80
00:05:25,510 --> 00:05:22,840
then our top view is the

81
00:05:27,749 --> 00:05:25,520
station's big arm and defector and you

82
00:05:30,710 --> 00:05:27,759
can see we lined it up so they can just

83
00:05:33,830 --> 00:05:30,720
go in and grapple and uh

84
00:05:35,270 --> 00:05:33,840
big cheese over in the cupola

85
00:05:37,029 --> 00:05:35,280
flying the big arm he's going to grapple

86
00:05:40,710 --> 00:05:37,039
the module and plug it into the bottom

87
00:05:45,990 --> 00:05:43,670
and uh big g on the big loop uh the

88
00:05:47,909 --> 00:05:46,000

srms has the mrm1 at the handoff

89

00:05:50,230 --> 00:05:47,919

position with the brakes on you go for

90

00:05:57,830 --> 00:05:50,240

grapple

91

00:06:03,670 --> 00:06:00,950

the mrm is now in a position for uh

92

00:06:06,710 --> 00:06:03,680

handoff to the stations a robotic arm

93

00:06:09,909 --> 00:06:06,720

the end effector for the ss rms or the

94

00:06:11,430 --> 00:06:09,919

canadarm2 off to the left the location

95

00:06:14,309 --> 00:06:11,440

where the shuttle arm is currently

96

00:06:16,230 --> 00:06:14,319

grappled that is a small airlock that

97

00:06:17,350 --> 00:06:16,240

will be used

98

00:06:19,029 --> 00:06:17,360

later

99

00:06:20,390 --> 00:06:19,039

in assembly of the station when the

100

00:06:22,870 --> 00:06:20,400

russian

101
00:06:26,550 --> 00:06:22,880

partner delivers a

102
00:06:27,670 --> 00:06:26,560

multi-purpose laboratory module the mlm

103
00:06:30,390 --> 00:06:27,680

which is

104
00:06:32,390 --> 00:06:30,400

slated to launch in a couple of years on

105
00:06:35,749 --> 00:06:32,400

a proton rocket

106
00:06:37,189 --> 00:06:35,759

the this uh small airlock will be used

107
00:06:40,870 --> 00:06:37,199

for uh

108
00:06:45,430 --> 00:06:40,880

conduct of uh experiments in the vacuum

109
00:06:48,309 --> 00:06:45,440

of space super bueno uh term at 48 and

110
00:07:05,189 --> 00:06:48,319

you have a go for the uh

111
00:07:09,110 --> 00:07:08,070

and houston atlantis on two first cwc i

112
00:07:14,870 --> 00:07:09,120

fill

113
00:07:14,880 --> 00:07:22,710

copy bueno 2103

114

00:07:27,110 --> 00:07:24,309

looks good

115

00:07:29,670 --> 00:07:27,120

this is a live action shot

116

00:07:32,150 --> 00:07:29,680

live action you can't see the angle is

117

00:07:33,350 --> 00:07:32,160

not too good but this is garrett

118

00:07:35,749 --> 00:07:33,360

gravity

119

00:07:37,270 --> 00:07:35,759

grappling mrm1

120

00:07:38,870 --> 00:07:37,280

okay and i'll turn this off quick

121

00:07:40,550 --> 00:07:38,880

because it's not too much of an angle

122

00:07:42,870 --> 00:07:40,560

we'll catch their faces from a better

123

00:07:45,350 --> 00:07:42,880

angle in just a bit all right

124

00:07:47,749 --> 00:07:45,360

now we're in the cupola this is the view

125

00:07:49,110 --> 00:07:47,759

we showed you from the shuttle got it

126
00:07:52,230 --> 00:07:49,120
says the right

127
00:07:56,710 --> 00:07:55,830
the station arm now has a firm grasp of

128
00:07:59,670 --> 00:07:56,720
the

129
00:08:02,150 --> 00:07:59,680
newest module that will be moved from

130
00:08:05,029 --> 00:08:02,160
the shuttle's payload bay now over to

131
00:08:07,749 --> 00:08:05,039
its permanent home the attach point on

132
00:08:15,189 --> 00:08:07,759
the earth-facing port of the zarya

133
00:08:21,749 --> 00:08:17,670
the shuttle's arm will be moved to a

134
00:08:24,710 --> 00:08:21,759
safe distance backing away from the mrm1

135
00:08:26,390 --> 00:08:24,720
once it reaches that safe distance the

136
00:08:28,309 --> 00:08:26,400
shuttle team will give the station team

137
00:08:31,350 --> 00:08:28,319
a go for

138
00:08:33,829 --> 00:08:31,360

mrm-1 operations that would be the

139

00:08:36,790 --> 00:08:33,839

go to start maneuvering the module

140

00:08:38,630 --> 00:08:36,800

up to its uh permanent home on the zarya

141

00:08:44,949 --> 00:08:38,640

control module of the international

142

00:08:50,470 --> 00:08:47,030

and uh big g

143

00:08:52,550 --> 00:08:50,480

this is uh atlantis on the big loop

144

00:08:54,310 --> 00:08:52,560

we're at the mrm1 clearance position

145

00:08:58,150 --> 00:08:54,320

with the brakes on your go to maneuver

146

00:09:03,190 --> 00:08:59,750

okay cappy all we're going to put that

147

00:09:07,990 --> 00:09:05,509

and houston iss robo starting the

148

00:09:13,990 --> 00:09:08,000

aircast

149

00:09:17,990 --> 00:09:16,389

and this is roughly a uh 20 minute

150

00:09:19,430 --> 00:09:18,000

maneuver that will

151
00:09:22,070 --> 00:09:19,440
reposition

152
00:09:24,310 --> 00:09:22,080
the russviet module at its uh

153
00:09:26,550 --> 00:09:24,320
pre-install position

154
00:09:29,670 --> 00:09:26,560
the module has a number of components on

155
00:09:32,070 --> 00:09:29,680
the outside destined for future use

156
00:09:34,630 --> 00:09:32,080
at other locations on the international

157
00:09:37,030 --> 00:09:34,640
space station including some debris

158
00:09:38,150 --> 00:09:37,040
shielding for the new russian laboratory

159
00:09:41,829 --> 00:09:38,160
module

160
00:09:44,389 --> 00:09:41,839
slated for launch in 2012.

161
00:09:45,829 --> 00:09:44,399
other outfitting equipment includes a

162
00:09:47,910 --> 00:09:45,839
radiator the

163
00:09:50,230 --> 00:09:47,920

small air lock that you see

164

00:09:53,910 --> 00:09:50,240

atop the the module that air lock will

165

00:09:54,870 --> 00:09:53,920

be used for external um experiments and

166

00:09:58,389 --> 00:09:54,880

the

167

00:09:59,269 --> 00:09:58,399

european space agency robotic arm elbow

168

00:10:01,910 --> 00:09:59,279

joint

169

00:10:03,350 --> 00:10:01,920

that will become part of a european

170

00:10:05,190 --> 00:10:03,360

robotic arm

171

00:10:07,910 --> 00:10:05,200

the other components of which will be on

172

00:10:10,470 --> 00:10:07,920

that russian laboratory module launched

173

00:10:11,990 --> 00:10:10,480

on a proton rocket

174

00:10:27,990 --> 00:10:12,000

from the baikonur cosmodrome in

175

00:10:30,150 --> 00:10:28,870

the

176

00:10:31,430 --> 00:10:30,160

new

177

00:10:34,069 --> 00:10:31,440

work site

178

00:10:35,430 --> 00:10:34,079

for the robotics of the international

179

00:10:36,949 --> 00:10:35,440

space station

180

00:10:38,069 --> 00:10:36,959

inside the

181

00:10:39,910 --> 00:10:38,079

cupola

182

00:10:41,509 --> 00:10:39,920

which is uh

183

00:10:42,389 --> 00:10:41,519

a multi-window

184

00:10:44,790 --> 00:10:42,399

port

185

00:10:47,030 --> 00:10:44,800

on the international space station

186

00:10:51,509 --> 00:10:47,040

the robotic workstation

187

00:10:54,470 --> 00:10:51,519

now located in that uh cupola as the mrm

188

00:10:56,150 --> 00:10:54,480

one continues in its path

189

00:10:57,350 --> 00:10:56,160

to its uh home

190

00:10:59,509 --> 00:10:57,360

on the russian segment of the

191

00:11:01,030 --> 00:10:59,519

international space station

192

00:11:02,710 --> 00:11:01,040

the mrm

193

00:11:05,350 --> 00:11:02,720

one is uh

194

00:11:07,110 --> 00:11:05,360

has a max a diameter of

195

00:11:11,110 --> 00:11:07,120

just under eight feet

196

00:11:14,470 --> 00:11:11,120

and it has a length of uh 20 feet with a

197

00:11:17,750 --> 00:11:14,480

pressurized volume of 614 cubic feet

198

00:11:20,150 --> 00:11:17,760

and a habitable volume of 207

199

00:11:22,470 --> 00:11:20,160

cubic feet once installed on the

200

00:11:24,550 --> 00:11:22,480

international space station

201
00:11:26,949 --> 00:11:24,560
the overall complex will have a

202
00:11:28,550 --> 00:11:26,959
habitable volume of 12

203
00:11:31,509 --> 00:11:28,560
hundred and five

204
00:11:33,750 --> 00:11:31,519
cubic feet with a pressurized volume of

205
00:11:46,430 --> 00:11:33,760
twenty nine thousand five hundred cubic

206
00:11:50,310 --> 00:11:48,230
214

207
00:11:51,590 --> 00:11:50,320
miles above algeria

208
00:11:52,790 --> 00:11:51,600
headed toward

209
00:11:54,829 --> 00:11:52,800
tunisia

210
00:11:57,990 --> 00:11:54,839
and the coastline of the

211
00:12:01,350 --> 00:11:58,000
mediterranean continuing with the

212
00:12:03,990 --> 00:12:01,360
auto sequence robotic arm movement to

213
00:12:18,310 --> 00:12:04,000

the pre-install or pre-docking position

214

00:12:23,030 --> 00:12:21,350

station houston big loop for robotics

215

00:12:25,509 --> 00:12:23,040

whenever you guys are ready you have a

216

00:12:28,150 --> 00:12:25,519

go let's go number three and nine

217

00:12:30,230 --> 00:12:28,160

decimal two

218

00:12:34,550 --> 00:12:30,240

that's right copy that we are

219

00:12:39,670 --> 00:12:36,870

yeah the crew now is in the process of

220

00:12:40,470 --> 00:12:39,680

uh activating the docking mechanism on

221

00:12:44,949 --> 00:12:40,480

the

222

00:12:48,389 --> 00:12:44,959

probe

223

00:13:02,310 --> 00:12:48,399

the first contact with the docking

224

00:13:05,590 --> 00:13:04,550

station houston for robotics on the big

225

00:13:07,509 --> 00:13:05,600

loop

226

00:13:10,069 --> 00:13:07,519

all those tv cameras are configured

227

00:13:12,470 --> 00:13:10,079

correctly down here you have a go for

228

00:13:14,230 --> 00:13:12,480

docking of mrm1

229

00:13:16,629 --> 00:13:14,240

wow it's funny okay we gotta go for

230

00:13:19,590 --> 00:13:16,639

docking mrm1

231

00:13:23,350 --> 00:13:19,600

and let you know we have a great view of

232

00:13:32,790 --> 00:13:23,360

the docking camera on our rws monitor

233

00:13:38,470 --> 00:13:35,910

and the final procedures for docking of

234

00:13:40,310 --> 00:13:38,480

the rassvet module to its

235

00:14:00,949 --> 00:13:40,320

permanent home on the zarya control

236

00:14:11,350 --> 00:14:05,269

copy

237

00:14:15,430 --> 00:14:14,069

and houston uh iss robot that's the

238

00:14:17,670 --> 00:14:15,440

first bad thing

239

00:14:19,350 --> 00:14:17,680

we uh looked like a pretty good docking

240

00:14:22,150 --> 00:14:19,360

we never got contact one straight down

241

00:14:38,310 --> 00:14:22,160

the middle and got capture and contact

242

00:14:43,269 --> 00:14:41,030

the uh mini research module russ viet

243

00:14:44,949 --> 00:14:43,279

the russian word for dawn now at its

244

00:14:50,870 --> 00:14:44,959

permanent home on the international

245

00:14:54,629 --> 00:14:52,949

and houston atlantis

246

00:15:06,389 --> 00:14:54,639

for obs on birth

247

00:15:12,949 --> 00:15:09,110

the station's robotic arm

248

00:15:15,590 --> 00:15:12,959

is operated from inside the cupola the

249

00:15:18,870 --> 00:15:15,600

view you see here is of garrett riesman

250

00:15:20,629 --> 00:15:18,880

and piers sellers as they have been

251

00:15:23,030 --> 00:15:20,639

pretty much in charge of the station

252

00:15:23,990 --> 00:15:23,040

robotic arm operations throughout the

253

00:15:26,790 --> 00:15:24,000

day

254

00:15:29,110 --> 00:15:26,800

the robotic workstation was relocated

255

00:15:30,550 --> 00:15:29,120

from the u.s lab

256

00:15:33,269 --> 00:15:30,560

destiny

257

00:15:34,470 --> 00:15:33,279

to the robotic workstation a couple of

258

00:15:37,590 --> 00:15:34,480

weeks ago

259

00:15:38,949 --> 00:15:37,600

the cupola always has been the what was

260

00:15:41,110 --> 00:15:38,959

considered the

261

00:15:44,069 --> 00:15:41,120

permanent home of the robotic

262

00:15:46,150 --> 00:15:44,079

workstation because of the unique views

263

00:15:48,230 --> 00:15:46,160

that it can provide

264

00:15:49,350 --> 00:15:48,240

the crew members for situational

265

00:15:51,590 --> 00:15:49,360

awareness

266

00:15:54,069 --> 00:15:51,600

crew members also have

267

00:15:55,269 --> 00:15:54,079

several television monitors computer

268

00:15:56,310 --> 00:15:55,279

screens

269

00:15:59,430 --> 00:15:56,320

that

270

00:16:01,509 --> 00:15:59,440

can also help them with

271

00:16:04,389 --> 00:16:01,519

the location of the station's robotic

272

00:16:06,870 --> 00:16:04,399

arm and proximity to its various work

273

00:16:11,350 --> 00:16:09,030

all right houston copy i'll terminate at

274

00:16:13,670 --> 00:16:11,360

uh 15 48

275

00:16:15,990 --> 00:16:13,680

and uh we'll start go ahead and start up

276

00:16:17,829 --> 00:16:16,000

bag number nine

277

00:16:19,590 --> 00:16:17,839

hey bueno what you doing

278

00:16:21,670 --> 00:16:19,600

hey tony

279

00:16:23,269 --> 00:16:21,680

i'm filling up some water bags here

280

00:16:25,269 --> 00:16:23,279

we're gonna we make a lot of water over

281

00:16:26,389 --> 00:16:25,279

here on the space shuttle with our fuel

282

00:16:27,990 --> 00:16:26,399

cells

283

00:16:29,350 --> 00:16:28,000

and uh since we're docked up here to

284

00:16:32,069 --> 00:16:29,360

station we can't dump it like we

285

00:16:34,230 --> 00:16:32,079

normally would and as luck would have it

286

00:16:36,150 --> 00:16:34,240

they need water since they have solar

287

00:16:38,790 --> 00:16:36,160

arrays they don't make water like this

288

00:16:40,949 --> 00:16:38,800

so it works out pretty well so we fill

289

00:16:42,870 --> 00:16:40,959

up these water bags and we take them

290

00:16:44,790 --> 00:16:42,880

over to the station

291

00:16:46,150 --> 00:16:44,800

it's a pretty important task

292

00:16:47,749 --> 00:16:46,160

and it seems like you're doing a great

293

00:16:51,590 --> 00:16:47,759

job at it

294

00:16:56,710 --> 00:16:55,670

oh this is live action

295

00:17:02,949 --> 00:16:56,720

is working

296

00:17:06,309 --> 00:17:04,789

something this is um

297

00:17:09,110 --> 00:17:06,319

vegetable rice

298

00:17:09,909 --> 00:17:09,120

egg drop soup egg soup oh that sounds

299

00:17:11,990 --> 00:17:09,919

good

300

00:17:30,390 --> 00:17:12,000

thanks

301

00:17:37,830 --> 00:17:34,870

what you doing tj preparing and we copy

302

00:17:41,830 --> 00:17:39,830

one of the experiments for return and we

303

00:17:43,110 --> 00:17:41,840

have to get it ready cleaned up and all

304

00:17:44,549 --> 00:17:43,120

saved and all that kind of stuff before

305

00:17:45,510 --> 00:17:44,559

we get it over to you

306

00:17:47,430 --> 00:17:45,520

so

307

00:17:49,669 --> 00:17:47,440

huntsville has got to

308

00:17:51,430 --> 00:17:49,679

a nice little plant-growing facility and

309

00:17:53,590 --> 00:17:51,440

remove the air cartridges

310

00:17:55,750 --> 00:17:53,600

powering down reflecting out the water

311

00:17:57,510 --> 00:17:55,760

and we'll give it a little later cool

312

00:17:58,789 --> 00:17:57,520

how are the plants growing well right

313

00:18:00,390 --> 00:17:58,799

now they're completely empty they have

314

00:18:01,510 --> 00:18:00,400

been growing very wonderfully so far

315

00:18:03,029 --> 00:18:01,520

it's been really a pretty cool

316

00:18:04,549 --> 00:18:03,039

experiment i've gone through about nine

317

00:18:06,150 --> 00:18:04,559

or ten iterations and i think by about

318

00:18:07,029 --> 00:18:06,160

iteration number seven i got really good

319

00:18:09,029 --> 00:18:07,039

at

320

00:18:16,390 --> 00:18:09,039

all right planting them harvesting them

321

00:18:21,350 --> 00:18:19,110

and the unbirth of the obss or the

322

00:18:26,070 --> 00:18:21,360

orbiter boom sensor system

323

00:18:32,150 --> 00:18:28,630

it will be handed off to the shuttle's

324

00:18:37,029 --> 00:18:34,310

and the that entire

325

00:18:39,590 --> 00:18:37,039

compliment will then be maneuvered to a

326

00:18:42,710 --> 00:18:39,600

viewing position in preparation for

327

00:18:45,430 --> 00:18:42,720

tomorrow's second spacewalk the primary

328

00:18:47,510 --> 00:18:45,440

task of which is to begin the

329

00:18:49,830 --> 00:18:47,520

removal and replacement

330

00:18:55,110 --> 00:18:52,310

six batteries on the p6 truss element

331

00:18:57,590 --> 00:18:55,120

those batteries have been

332

00:18:59,669 --> 00:18:57,600

serving the space station since they

333

00:19:03,510 --> 00:18:59,679

were delivered and activated

334

00:19:06,470 --> 00:19:03,520

back in november december of 2000

335

00:19:08,310 --> 00:19:06,480

the batteries have about a six-hour

336

00:19:10,549 --> 00:19:08,320

projected lifespan of course they've

337

00:19:13,350 --> 00:19:10,559

outlived their

338

00:19:15,190 --> 00:19:13,360

lifetime on board the station

339

00:19:17,990 --> 00:19:15,200

they're still operating

340

00:19:20,470 --> 00:19:18,000

but a new set of batteries is

341

00:19:22,710 --> 00:19:20,480

on its way with installation scheduled

342

00:19:29,909 --> 00:19:22,720

for the second and third spacewalks of

343

00:19:34,390 --> 00:19:33,110

shuttle pilot tony antonelli now under

344

00:19:36,950 --> 00:19:34,400

control

345

00:19:39,029 --> 00:19:36,960

of the shuttle's robotic arm

346

00:19:41,669 --> 00:19:39,039

beginning the process of moving it into

347

00:19:43,990 --> 00:19:41,679

grapple the

348

00:19:46,310 --> 00:19:44,000

orbiter boom sensor system the the

349

00:19:48,230 --> 00:19:46,320

grapple fixture on that boom

350

00:19:50,310 --> 00:19:48,240

it'll take it away from the station arm

351
00:20:00,630 --> 00:19:50,320
and move to a viewing location in

352
00:20:05,590 --> 00:20:03,430
high above the central pacific the

353
00:20:06,950 --> 00:20:05,600
station's robotic arm now has released a

354
00:20:08,789 --> 00:20:06,960
grapple pin

355
00:20:10,310 --> 00:20:08,799
at the midpoint of the orbiter boom

356
00:20:13,350 --> 00:20:10,320
sensor system

357
00:20:18,830 --> 00:20:13,360
that boom now under electrical power and

358
00:20:26,149 --> 00:20:23,190
arm the station robotic arm now being

359
00:20:28,549 --> 00:20:26,159
moved to a safe location away from the

360
00:20:30,950 --> 00:20:28,559
orbiter boom sensor system

361
00:20:33,750 --> 00:20:30,960
the shuttle's arm now firmly grasping

362
00:20:36,149 --> 00:20:33,760
the obss

363
00:20:40,390 --> 00:20:36,159

as it will be repositioned a little bit

364

00:20:57,750 --> 00:20:40,400

later to support activities ahead of

365

00:20:57,760 --> 00:21:03,029

and thanks carrot that's a great view

366

00:21:03,039 --> 00:21:06,549

i'm glad you enjoyed it

367

00:21:13,029 --> 00:21:08,870

and uh swanny pierce said uh that's only

368

00:21:19,990 --> 00:21:14,710

you have no comment on that one we're

369

00:21:24,950 --> 00:21:21,750

ken let me begin with you since you're

370

00:21:29,669 --> 00:21:26,710

this is your first time as commander

371

00:21:31,350 --> 00:21:29,679

here atlanta's last scheduled flight

372

00:21:32,870 --> 00:21:31,360

how does that leave you feeling knowing

373

00:21:35,110 --> 00:21:32,880

that you're coming back for the last

374

00:21:37,270 --> 00:21:35,120

time on atlantis

375

00:21:40,310 --> 00:21:37,280

well it's a fantastic experience and uh

376

00:21:42,070 --> 00:21:40,320

as a crew what we're coining this flight

377

00:21:43,270 --> 00:21:42,080

is the first last flight of atlantis

378

00:21:44,549 --> 00:21:43,280

because obviously there is some

379

00:21:46,390 --> 00:21:44,559

potential for

380

00:21:48,789 --> 00:21:46,400

that great ship to fly again

381

00:21:50,950 --> 00:21:48,799

but uh she's served us very well so far

382

00:21:53,110 --> 00:21:50,960

we're having a ball up here and we

383

00:21:54,630 --> 00:21:53,120

couldn't be happier with her performance

384

00:21:57,029 --> 00:21:54,640

and we'd like to say thanks again to the

385

00:22:01,110 --> 00:21:57,039

entire team that put her together ready

386

00:22:06,070 --> 00:22:03,590

tracy you have been on the international

387

00:22:08,950 --> 00:22:06,080

space station since march i understand

388

00:22:10,390 --> 00:22:08,960

and we sometimes report on the

389

00:22:12,549 --> 00:22:10,400

problems that you encounter throughout

390

00:22:15,510 --> 00:22:12,559

your day we had a generator go out just

391

00:22:17,510 --> 00:22:15,520

this week but overall it seems like you

392

00:22:19,990 --> 00:22:17,520

guys managed to deal pretty well with

393

00:22:21,909 --> 00:22:20,000

whatever challenges come up in front of

394

00:22:23,909 --> 00:22:21,919

you how will that change once the

395

00:22:30,870 --> 00:22:23,919

american shuttles are not going back and

396

00:22:36,149 --> 00:22:33,590

well i think

397

00:22:38,549 --> 00:22:36,159

nasa our nasa and our partners we rise

398

00:22:40,070 --> 00:22:38,559

to the occasion and

399

00:22:42,149 --> 00:22:40,080

whatever challenge comes our way we've

400

00:22:44,470 --> 00:22:42,159

got lots of people lots of bright people

401
00:22:45,830 --> 00:22:44,480
that are committed to making this work

402
00:22:47,830 --> 00:22:45,840
and

403
00:22:49,909 --> 00:22:47,840
exactly how depends on the problem but

404
00:22:52,310 --> 00:22:49,919
we still have vehicles coming up and and

405
00:22:54,390 --> 00:22:52,320
down it's uh it just puts our creative

406
00:22:58,870 --> 00:22:54,400
minds to work exactly how we're going to

407
00:23:02,549 --> 00:23:00,310
well for instance the main mission for

408
00:23:04,230 --> 00:23:02,559
this atlanta shuttle was bringing up a

409
00:23:06,470 --> 00:23:04,240
very large component for the

410
00:23:08,390 --> 00:23:06,480
international space station do you not

411
00:23:09,909 --> 00:23:08,400
foresee any sort of instance where

412
00:23:12,390 --> 00:23:09,919
you're going to need a component that's

413
00:23:17,510 --> 00:23:12,400

so big that it exceeds what the russians

414

00:23:21,190 --> 00:23:20,310

well with the addition of mrm1

415

00:23:23,830 --> 00:23:21,200

that

416

00:23:25,750 --> 00:23:23,840

completes the station assembly uh as far

417

00:23:27,990 --> 00:23:25,760

as the large components go and so

418

00:23:30,390 --> 00:23:28,000

there's nothing planned right now

419

00:23:32,549 --> 00:23:30,400

um but

420

00:23:36,070 --> 00:23:32,559

there's there's

421

00:23:38,710 --> 00:23:36,080

many spares on board there's not much

422

00:23:40,310 --> 00:23:38,720

large-scale eye objects that fit in the

423

00:23:41,110 --> 00:23:40,320

payload bay that

424

00:23:43,029 --> 00:23:41,120

have

425

00:23:44,390 --> 00:23:43,039

been scheduled to come up so

426
00:23:48,549 --> 00:23:44,400
i think that

427
00:23:51,909 --> 00:23:50,390
so let me bring in mission specialist

428
00:23:53,750 --> 00:23:51,919
pier seller

429
00:23:55,669 --> 00:23:53,760
piers i want to ask you you have a phd

430
00:23:57,990 --> 00:23:55,679
in ecology and we've been seeing some

431
00:24:00,789 --> 00:23:58,000
incredible images from space of that

432
00:24:02,230 --> 00:24:00,799
gulf oil slick can you just give me your

433
00:24:03,990 --> 00:24:02,240
perspective

434
00:24:05,510 --> 00:24:04,000
having a background in ecology what it's

435
00:24:09,350 --> 00:24:05,520
like for you to see

436
00:24:11,269 --> 00:24:09,360
that kind of ecological disaster

437
00:24:13,190 --> 00:24:11,279
well i got to report to my boss that i

438
00:24:15,909 --> 00:24:13,200

didn't see uh this oil slick because i

439

00:24:17,990 --> 00:24:15,919

was so busy working

440

00:24:19,430 --> 00:24:18,000

i'm sorry to miss it but we have uh seen

441

00:24:21,430 --> 00:24:19,440

it um

442

00:24:22,870 --> 00:24:21,440

you know on tv before we came before we

443

00:24:24,870 --> 00:24:22,880

uh came up here

444

00:24:25,669 --> 00:24:24,880

uh you know these these things aren't

445

00:24:27,590 --> 00:24:25,679

good

446

00:24:30,230 --> 00:24:27,600

um when you fly around the planet a few

447

00:24:32,390 --> 00:24:30,240

times you get to see the the thumbprint

448

00:24:34,950 --> 00:24:32,400

of man all over the place

449

00:24:35,990 --> 00:24:34,960

most of it good you know cultivation

450

00:24:37,430 --> 00:24:36,000

cities

451
00:24:39,269 --> 00:24:37,440
most of them clean

452
00:24:42,230 --> 00:24:39,279
and sometimes bad you know a lot of

453
00:24:43,110 --> 00:24:42,240
biomass burning and uh pollution

454
00:24:44,789 --> 00:24:43,120
but

455
00:24:46,149 --> 00:24:44,799
we're optimistic i think that people

456
00:24:49,590 --> 00:24:46,159
will eventually learn to look after the

457
00:24:53,750 --> 00:24:51,830
uh and by the way what is that peers on

458
00:25:00,070 --> 00:24:53,760
your leg is that a book that you're

459
00:25:04,870 --> 00:25:02,549
it's my brain

460
00:25:07,029 --> 00:25:04,880
this is a notebook of every uh thing my

461
00:25:08,950 --> 00:25:07,039
instructors tried to teach me before i

462
00:25:11,190 --> 00:25:08,960
left and i couldn't remember it all so

463
00:25:12,630 --> 00:25:11,200

it's all written down there and some of

464

00:25:13,669 --> 00:25:12,640

it i can't read

465

00:25:15,430 --> 00:25:13,679

but um

466

00:25:16,870 --> 00:25:15,440

this actually gets me through the days

467

00:25:20,950 --> 00:25:16,880

and we all have one i'm the only one

468

00:25:25,190 --> 00:25:22,870

i'm sure it takes real talent to be able

469

00:25:27,590 --> 00:25:25,200

to find what you need in a heartbeat all

470

00:25:29,510 --> 00:25:27,600

right last question here to garrett the

471

00:25:31,190 --> 00:25:29,520

space walker out there

472

00:25:33,029 --> 00:25:31,200

have you managed to

473

00:25:34,870 --> 00:25:33,039

go out and have a sense of

474

00:25:36,789 --> 00:25:34,880

accomplishment i mean this is something

475

00:25:38,789 --> 00:25:36,799

i'm sure when you have

476

00:25:40,710 --> 00:25:38,799

grandchildren and great-grandchildren

477

00:25:43,190 --> 00:25:40,720

this is going to be the story that

478

00:25:45,110 --> 00:25:43,200

grandpa garrett was out walking in space

479

00:25:50,070 --> 00:25:45,120

it must leave you with such a feeling of

480

00:25:55,669 --> 00:25:52,310

there is really nothing like it i have

481

00:25:57,830 --> 00:25:55,679

to be honest with you spacewalking is

482

00:26:00,310 --> 00:25:57,840

in my experience the most

483

00:26:02,149 --> 00:26:00,320

outlandish thing i've ever gotten to do

484

00:26:04,710 --> 00:26:02,159

and uh i'm very grateful for the

485

00:26:06,230 --> 00:26:04,720

opportunity uh actually when i first

486

00:26:08,390 --> 00:26:06,240

became an astronaut they looked at how

487

00:26:10,710 --> 00:26:08,400

short i am i'm five foot four

488

00:26:13,029 --> 00:26:10,720

and they they when i talked about doing

489

00:26:15,269 --> 00:26:13,039

spacewalks they laughed at me and uh

490

00:26:18,149 --> 00:26:15,279

here i am today uh after having gone out

491

00:26:20,070 --> 00:26:18,159

there yesterday and steve and i uh

492

00:26:22,470 --> 00:26:20,080

really um worked hard out there

493

00:26:24,549 --> 00:26:22,480

yesterday especially steve uh he had the

494

00:26:25,510 --> 00:26:24,559

lions share of the of the burden out

495

00:26:28,070 --> 00:26:25,520

there and

496

00:26:29,990 --> 00:26:28,080

we managed to accomplish pretty much

497

00:26:30,870 --> 00:26:30,000

everything and then some that we set out

498

00:26:33,029 --> 00:26:30,880

to do

499

00:26:35,269 --> 00:26:33,039

and we had some difficult moments we had

500

00:26:36,950 --> 00:26:35,279

a connector that was stubborn and one of

501
00:26:38,390 --> 00:26:36,960
the things i'll always remember is when

502
00:26:40,950 --> 00:26:38,400
we finally solved that problem and got

503
00:26:42,870 --> 00:26:40,960
that connector hooked up uh it was a

504
00:26:44,950 --> 00:26:42,880
sense of elation that

505
00:26:45,990 --> 00:26:44,960
was difficult to describe

506
00:26:47,830 --> 00:26:46,000
but

507
00:26:49,590 --> 00:26:47,840
i was glad to

508
00:26:52,870 --> 00:26:49,600
shake steve's hand up there and share

509
00:26:55,350 --> 00:26:52,880
the moment it was it was a good feeling

510
00:26:58,870 --> 00:26:55,360
ken and pierce let me start with you

511
00:27:00,950 --> 00:26:58,880
what's it like up there right now

512
00:27:03,350 --> 00:27:00,960
uh wolf it's absolutely fantastic the

513
00:27:06,070 --> 00:27:03,360

place is much bigger than last time i

514

00:27:07,830 --> 00:27:06,080

was here which is only two years ago

515

00:27:10,310 --> 00:27:07,840

i'm not sure why it feels so much bigger

516

00:27:14,630 --> 00:27:12,710

it's the node and the cupola alone the

517

00:27:16,710 --> 00:27:14,640

cupola is this large glass dome we have

518

00:27:18,630 --> 00:27:16,720

that looks down on the earth and being

519

00:27:21,110 --> 00:27:18,640

inside of there and seeing the entire

520

00:27:22,789 --> 00:27:21,120

horizon of the earth all at once just

521

00:27:24,710 --> 00:27:22,799

makes this entire place feel bigger and

522

00:27:28,630 --> 00:27:24,720

it's absolutely fantastic we're having a

523

00:27:32,389 --> 00:27:30,149

if i was here four years ago and this

524

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

place was

525

00:27:36,149 --> 00:27:34,399

placed about one-third the size i got to

526
00:27:37,830 --> 00:27:36,159
tell you now you can you can lose people

527
00:27:39,350 --> 00:27:37,840
in this place now it's really huge so if

528
00:27:44,389 --> 00:27:39,360
you came on up here people probably

529
00:27:48,789 --> 00:27:45,830
let's talk a little bit about how it

530
00:27:55,190 --> 00:27:48,799
feels uh and i'll have tracy weigh in to

531
00:27:59,830 --> 00:27:57,269
well actually well if i came up on a

532
00:28:01,909 --> 00:27:59,840
soyuz and i've been living on the space

533
00:28:04,070 --> 00:28:01,919
station for about five weeks before

534
00:28:04,950 --> 00:28:04,080
these guys got here

535
00:28:06,789 --> 00:28:04,960
but

536
00:28:09,350 --> 00:28:06,799
i can tell you from the perspective of

537
00:28:11,990 --> 00:28:09,360
living here and seeing atlantis and

538
00:28:14,549 --> 00:28:12,000

being inside of atlantis as a

539

00:28:18,230 --> 00:28:14,559

station crew member it um

540

00:28:20,310 --> 00:28:18,240

it's bittersweet and it's also

541

00:28:22,310 --> 00:28:20,320

something that is

542

00:28:24,549 --> 00:28:22,320

i never anticipated being able to see

543

00:28:27,350 --> 00:28:24,559

each one of the shuttles before

544

00:28:32,870 --> 00:28:27,360

their retirement on board my tenure here

545

00:28:37,110 --> 00:28:35,830

atlantis shuttle mission uh as we go

546

00:28:39,669 --> 00:28:37,120

forward

547

00:28:42,470 --> 00:28:39,679

uh i i i also want to bring in uh

548

00:28:45,110 --> 00:28:42,480

garrett reisman uh you you actually do

549

00:28:46,870 --> 00:28:45,120

the space walks how scared are you when

550

00:28:48,870 --> 00:28:46,880

you get out out of that shuttle out of

551
00:28:52,870 --> 00:28:48,880
that space station and actually go

552
00:28:52,880 --> 00:28:57,990
i'm a terrified wolf

553
00:29:02,310 --> 00:29:00,870
um actually the thing is uh i'm one of

554
00:29:03,909 --> 00:29:02,320
three space walkers the other two

555
00:29:05,990 --> 00:29:03,919
fellows are preparing to go outside

556
00:29:07,190 --> 00:29:06,000
tomorrow so they can't be with us now

557
00:29:09,750 --> 00:29:07,200
but uh

558
00:29:12,070 --> 00:29:09,760
it is uh something that we train really

559
00:29:15,029 --> 00:29:12,080
hard for and the way i describe it is a

560
00:29:16,230 --> 00:29:15,039
strange combination of the

561
00:29:17,830 --> 00:29:16,240
familiar

562
00:29:19,750 --> 00:29:17,840
and the outlandish and what i mean by

563
00:29:21,190 --> 00:29:19,760

that is we train so much in this big

564

00:29:21,990 --> 00:29:21,200

pool in houston

565

00:29:23,669 --> 00:29:22,000

that

566

00:29:25,269 --> 00:29:23,679

when we're at our work site and we have

567

00:29:26,389 --> 00:29:25,279

our tools and we're looking at the bolts

568

00:29:28,310 --> 00:29:26,399

we're supposed to turn

569

00:29:29,750 --> 00:29:28,320

it feels just like being in that pool

570

00:29:31,590 --> 00:29:29,760

and we feel very comfortable very

571

00:29:33,430 --> 00:29:31,600

familiar but then you look over your

572

00:29:35,590 --> 00:29:33,440

shoulder and the whole world is flying

573

00:29:37,830 --> 00:29:35,600

by and you can see the entire east coast

574

00:29:39,669 --> 00:29:37,840

of the united states in a single glance

575

00:29:42,070 --> 00:29:39,679

and that is something you can't prepare

576

00:29:46,230 --> 00:29:42,080

for in a pool and that is outlandish and

577

00:29:50,950 --> 00:29:48,070

i want to bring the two russian

578

00:29:53,590 --> 00:29:50,960

cosmonauts into this conversation oleg

579

00:29:56,149 --> 00:29:53,600

first to you when you look out

580

00:29:58,470 --> 00:29:56,159

are you able to see this oil spill

581

00:30:00,789 --> 00:29:58,480

that's engulfing some of the gulf of

582

00:30:02,470 --> 00:30:00,799

mexico right now we spent a lot of time

583

00:30:04,470 --> 00:30:02,480

reporting on that

584

00:30:07,830 --> 00:30:04,480

and are you also able to see any of that

585

00:30:14,070 --> 00:30:07,840

volcanic ash from the volcano in iceland

586

00:30:20,230 --> 00:30:16,389

first of all about the

587

00:30:23,750 --> 00:30:20,240

oil i'm just 30 minutes ago we passed

588

00:30:26,870 --> 00:30:23,760

over there mexican golf and we

589

00:30:28,230 --> 00:30:26,880

took a lot of pictures of this oil spot

590

00:30:30,470 --> 00:30:28,240

on there and

591

00:30:33,830 --> 00:30:30,480

believe me it looks it's very

592

00:30:36,310 --> 00:30:33,840

scared it's uh that's not good and

593

00:30:37,669 --> 00:30:36,320

that's really

594

00:30:41,190 --> 00:30:37,679

feel

595

00:30:44,230 --> 00:30:41,200

not good about that and so that's

596

00:30:46,310 --> 00:30:44,240

about the ash uh yes we can see ash

597

00:30:48,549 --> 00:30:46,320

about the europe it's especially in the

598

00:30:51,350 --> 00:30:48,559

evening hours when there's a low angle

599

00:30:54,070 --> 00:30:51,360

of sun and we see the atmosphere is not

600

00:30:54,870 --> 00:30:54,080

clear as usual in this time of year so

601
00:30:58,310 --> 00:30:54,880
but

602
00:30:59,990 --> 00:30:58,320
we can we cannot see the volcano itself

603
00:31:01,029 --> 00:31:00,000
myself but

604
00:31:04,230 --> 00:31:01,039
many

605
00:31:06,870 --> 00:31:04,240
ecological problems we can observe and

606
00:31:10,470 --> 00:31:06,880
monitor from this space station uh for

607
00:31:12,549 --> 00:31:10,480
example fires some flooding and

608
00:31:14,310 --> 00:31:12,559
some poisoning of

609
00:31:16,950 --> 00:31:14,320
nature so

610
00:31:19,110 --> 00:31:16,960
it's it's very useful from this

611
00:31:20,870 --> 00:31:19,120
perspective

612
00:31:23,350 --> 00:31:20,880
thank you

613
00:31:25,590 --> 00:31:23,360

and alexander very quickly

614

00:31:27,990 --> 00:31:25,600

when you see this cooperation with the

615

00:31:34,630 --> 00:31:28,000

americans uh you must be pretty pleased

616

00:31:40,310 --> 00:31:36,789

i am glad to work with american

617

00:31:43,269 --> 00:31:40,320

cosmonauts and astronauts and i am glad

618

00:31:47,430 --> 00:31:45,830

crew shuttle's crew

619

00:32:12,389 --> 00:31:47,440

i know

620

00:32:12,399 --> 00:32:21,029

that's sasha

621

00:32:25,430 --> 00:32:22,870

i think they're discussing their answers

622

00:32:26,830 --> 00:32:25,440

we don't get nasa tv up here so i didn't

623

00:32:28,710 --> 00:32:26,840

hear what their

624

00:32:31,350 --> 00:32:28,720

answers here the answers or the

625

00:32:35,590 --> 00:32:32,870

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

626

00:32:39,350 --> 00:32:35,600

this in flight day highlights this is uh

627

00:32:40,830 --> 00:32:39,360

definitely one of the highlights this is

628

00:32:44,630 --> 00:32:40,840

of course the

629

00:32:47,070 --> 00:32:44,640

cupola and

630

00:32:53,590 --> 00:32:47,080

we are of course the camera's gonna get

631

00:32:53,600 --> 00:32:58,310

flying over

632

00:33:05,590 --> 00:33:00,870

let's look back here so i can show you

633

00:33:05,600 --> 00:33:10,789

indeed back on

634

00:33:31,430 --> 00:33:27,590

and

635

00:33:32,630 --> 00:33:31,440

earlier

636

00:33:34,389 --> 00:33:32,640

filming

637

00:33:36,870 --> 00:33:34,399

or we tried to film them

638

00:33:38,230 --> 00:33:36,880

uh with mrm1 but

639

00:33:40,310 --> 00:33:38,240

it's hard to get in here with the video

640

00:33:43,029 --> 00:33:40,320

camera with them and they're flying

641

00:33:49,990 --> 00:33:43,039

but uh

642

00:33:53,110 --> 00:33:52,389

that's mostly overexposed in the camera

643

00:33:55,029 --> 00:33:53,120

but