



1
00:00:08,150 --> 00:00:05,829
good day and welcome to mission control

2
00:00:10,470 --> 00:00:08,160
houston i'm kelly humphries uh and this

3
00:00:12,390 --> 00:00:10,480
is shannon walker an astronaut and a

4
00:00:14,870 --> 00:00:12,400
veteran of a long duration space flight

5
00:00:17,990 --> 00:00:14,880
on the international space station and

6
00:00:19,750 --> 00:00:18,000
also a uh expert in what it takes to get

7
00:00:21,429 --> 00:00:19,760
ready and land a soyuz spacecraft

8
00:00:23,109 --> 00:00:21,439
welcome shannon thank you it's good to

9
00:00:25,509 --> 00:00:23,119
be here kelly it's wonderful to have you

10
00:00:27,910 --> 00:00:25,519
here uh tell us a little bit about what

11
00:00:29,910 --> 00:00:27,920
the crew has been doing in the week or

12
00:00:32,310 --> 00:00:29,920
so leading up here and

13
00:00:33,990 --> 00:00:32,320

you might even throw in what the extra

14

00:00:36,069 --> 00:00:34,000

work of doing a spacewalk in the middle

15

00:00:36,950 --> 00:00:36,079

of all that was like probably

16

00:00:38,950 --> 00:00:36,960

yeah

17

00:00:40,790 --> 00:00:38,960

leading up to

18

00:00:43,030 --> 00:00:40,800

an undocking basically the crew has to

19

00:00:45,590 --> 00:00:43,040

get the cargo ready to go that is going

20

00:00:47,590 --> 00:00:45,600

to be packed on the soyuz and since the

21

00:00:49,190 --> 00:00:47,600

soyuz descent module is so small there's

22

00:00:52,310 --> 00:00:49,200

not a lot of room for cargo so they have

23

00:00:55,110 --> 00:00:52,320

to pack it very carefully so on the

24

00:00:56,630 --> 00:00:55,120

the u.s side and with chris cassidy and

25

00:00:58,549 --> 00:00:56,640

tom marshburn and

26

00:01:00,069 --> 00:00:58,559

chris hatfield they've gathered up the

27

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

us cargo that needs to be packed up

28

00:01:03,349 --> 00:01:01,600

packaged it carefully giving it off to

29

00:01:05,830 --> 00:01:03,359

the russians who will then pack it into

30

00:01:07,350 --> 00:01:05,840

the soyuz underneath the seats and in a

31

00:01:09,830 --> 00:01:07,360

few nooks and crannies getting ready to

32

00:01:12,310 --> 00:01:09,840

go so having an eva come in the middle

33

00:01:13,830 --> 00:01:12,320

of your last minute packing uh kind of

34

00:01:15,590 --> 00:01:13,840

makes makes the schedule a little bit

35

00:01:17,030 --> 00:01:15,600

more compact and a little bit a little

36

00:01:19,030 --> 00:01:17,040

bit more busy

37

00:01:20,710 --> 00:01:19,040

well and chris mentioned in

38

00:01:22,550 --> 00:01:20,720

one of the daily planning conferences

39

00:01:24,390 --> 00:01:22,560

that roman was off doing most of that

40

00:01:25,350 --> 00:01:24,400

while they were doing the space walk

41

00:01:27,590 --> 00:01:25,360

does that

42

00:01:29,990 --> 00:01:27,600

logistically make a lot of sense

43

00:01:31,990 --> 00:01:30,000

yeah it does luckily when we do our our

44

00:01:34,710 --> 00:01:32,000

space walks the entire space station is

45

00:01:36,310 --> 00:01:34,720

open and so rahman has access to

46

00:01:38,630 --> 00:01:36,320

anything on the u.s side that he might

47

00:01:39,910 --> 00:01:38,640

need to uh pack at the end and if we've

48

00:01:41,830 --> 00:01:39,920

done our homework right we've got

49

00:01:44,389 --> 00:01:41,840

everything ready to go days ahead of

50

00:01:46,550 --> 00:01:44,399

time ahead of the undock but sometimes

51
00:01:47,910 --> 00:01:46,560
last minute items come up for example

52
00:01:49,429 --> 00:01:47,920
probably today there's probably some

53
00:01:51,109 --> 00:01:49,439
last minute science samples that were

54
00:01:53,030 --> 00:01:51,119
taken that need to be packaged and

55
00:01:54,469 --> 00:01:53,040
packed and and sent down on the soyuz so

56
00:01:56,389 --> 00:01:54,479
there is some last minute packing that

57
00:01:58,469 --> 00:01:56,399
happens just to make sure that the the

58
00:01:59,749 --> 00:01:58,479
science isn't um

59
00:02:01,429 --> 00:01:59,759
well it remains at the proper

60
00:02:02,950 --> 00:02:01,439
temperature on the way home i believe

61
00:02:04,630 --> 00:02:02,960
they were bringing back some japanese

62
00:02:05,670 --> 00:02:04,640
protein crystal growth samples this time

63
00:02:07,990 --> 00:02:05,680

around

64

00:02:10,869 --> 00:02:08,000

well so tell us a little bit about uh

65

00:02:13,990 --> 00:02:10,879

what it's like to get ready in terms of

66

00:02:15,670 --> 00:02:14,000

inside the soyuz it's a fairly cramped

67

00:02:17,830 --> 00:02:15,680

area and i think we've got some images

68

00:02:20,229 --> 00:02:17,840

that will help you describe that

69

00:02:21,830 --> 00:02:20,239

okay yeah this is a picture that you see

70

00:02:23,670 --> 00:02:21,840

of the soyuz descent module so this is

71

00:02:25,670 --> 00:02:23,680

the actual place that the crew

72

00:02:28,309 --> 00:02:25,680

sits all the way down coming home when

73

00:02:29,589 --> 00:02:28,319

they first get into the soyuz before oh

74

00:02:31,430 --> 00:02:29,599

look there's some good pictures of the

75

00:02:33,030 --> 00:02:31,440

soyuz seats where the where the crew

76

00:02:34,710 --> 00:02:33,040

will be sitting you can see they're kind

77

00:02:36,790 --> 00:02:34,720

of small and your knees are up close to

78

00:02:37,990 --> 00:02:36,800

your chest it's not like sitting in a in

79

00:02:40,070 --> 00:02:38,000

an airplane by any stretch of the

80

00:02:41,830 --> 00:02:40,080

imagination but when the crew gets in

81

00:02:43,030 --> 00:02:41,840

they will then put on what's termed

82

00:02:45,110 --> 00:02:43,040

their circle suits these are the

83

00:02:46,630 --> 00:02:45,120

pressurization suits that the crew wears

84

00:02:47,670 --> 00:02:46,640

and they will get into their seats these

85

00:02:50,070 --> 00:02:47,680

are the panels this is the

86

00:02:51,589 --> 00:02:50,080

instrumentation that the the crew sees

87

00:02:52,949 --> 00:02:51,599

on the way home and so they will go

88

00:02:54,550 --> 00:02:52,959

through checks and make sure that all

89

00:02:56,630 --> 00:02:54,560

the systems of the soyuz are working

90

00:02:57,990 --> 00:02:56,640

properly there's valves to be configured

91

00:02:59,190 --> 00:02:58,000

and and

92

00:03:00,390 --> 00:02:59,200

all kinds of

93

00:03:01,990 --> 00:03:00,400

checks obviously you want all your

94

00:03:03,750 --> 00:03:02,000

systems to work properly so they go

95

00:03:06,710 --> 00:03:03,760

through some pretty detailed checks to

96

00:03:08,949 --> 00:03:06,720

making sure everything is is ready to go

97

00:03:11,270 --> 00:03:08,959

and at the appropriate time they will

98

00:03:13,589 --> 00:03:11,280

push the button to unhook

99

00:03:15,750 --> 00:03:13,599

the soyuz from the space station this is

100

00:03:17,190 --> 00:03:15,760

a good view of what the commander has

101
00:03:18,949 --> 00:03:17,200
right in front of him the soyuz

102
00:03:21,830 --> 00:03:18,959
commander he has a periscope where he

103
00:03:24,390 --> 00:03:21,840
can see activity outside that is the

104
00:03:26,070 --> 00:03:24,400
hatch actually that is above the crew

105
00:03:28,229 --> 00:03:26,080
that goes into what's called the orbital

106
00:03:30,149 --> 00:03:28,239
compartment and the orbital compartment

107
00:03:32,149 --> 00:03:30,159
is when on the way up they have lots of

108
00:03:33,430 --> 00:03:32,159
cargo in there and on the way down there

109
00:03:34,789 --> 00:03:33,440
are things that are not going to make it

110
00:03:36,710 --> 00:03:34,799
back to earth because the orbital

111
00:03:38,149 --> 00:03:36,720
compartment will separate from the

112
00:03:39,830 --> 00:03:38,159
descent module and burn up into the

113
00:03:41,589 --> 00:03:39,840

atmosphere so it's a chance to get rid

114

00:03:43,750 --> 00:03:41,599

of some things that you may not need

115

00:03:45,110 --> 00:03:43,760

such as

116

00:03:46,309 --> 00:03:45,120

you know like some hygiene items that

117

00:03:48,630 --> 00:03:46,319

you might have used on the station that

118

00:03:49,830 --> 00:03:48,640

you're not using anymore and then uh

119

00:03:51,430 --> 00:03:49,840

some of the clothes that you actually

120

00:03:52,229 --> 00:03:51,440

wear into the soyuz

121

00:03:53,750 --> 00:03:52,239

okay

122

00:03:56,710 --> 00:03:53,760

um well now you were a member of the

123

00:03:58,390 --> 00:03:56,720

exhibition 24 25 crew how long did you

124

00:04:00,390 --> 00:03:58,400

spend on orbit i was there almost six

125

00:04:02,070 --> 00:04:00,400

months okay

126

00:04:03,589 --> 00:04:02,080

i imagine it's got to be

127

00:04:05,750 --> 00:04:03,599

a little bit bittersweet getting ready

128

00:04:08,309 --> 00:04:05,760

to come home yes of course it is i mean

129

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

you've had a very busy time on orbit it

130

00:04:11,030 --> 00:04:10,239

is a fantastic place to live and work

131

00:04:14,070 --> 00:04:11,040

and

132

00:04:15,589 --> 00:04:14,080

um it is it is sad uh leaving because

133

00:04:17,110 --> 00:04:15,599

for a lot of people you don't know if or

134

00:04:18,629 --> 00:04:17,120

when you might be able to go back to

135

00:04:19,830 --> 00:04:18,639

that wonderful laboratory that we have

136

00:04:21,270 --> 00:04:19,840

in the sky

137

00:04:23,590 --> 00:04:21,280

well and and you're also getting ready

138

00:04:25,830 --> 00:04:23,600

to come back to gravity after not having

139

00:04:28,469 --> 00:04:25,840

had any for quite some time six months

140

00:04:30,550 --> 00:04:28,479

in your case uh we've got some uh

141

00:04:32,550 --> 00:04:30,560

animation that shows the process maybe

142

00:04:33,990 --> 00:04:32,560

you could walk us through that and and

143

00:04:35,749 --> 00:04:34,000

maybe give us a little insight about

144

00:04:37,350 --> 00:04:35,759

what it's feeling like on the inside of

145

00:04:38,469 --> 00:04:37,360

the soyuz is coming up absolutely i

146

00:04:39,670 --> 00:04:38,479

would love to

147

00:04:41,510 --> 00:04:39,680

so of course the first thing that

148

00:04:43,350 --> 00:04:41,520

happens is the soyuz undocks from the

149

00:04:46,710 --> 00:04:43,360

station is actually pushed away by some

150

00:04:48,550 --> 00:04:46,720

springs uh about 15 seconds or so well

151

00:04:50,629 --> 00:04:48,560

actually a couple minutes i'm i'm

152

00:04:52,710 --> 00:04:50,639

misspoke there a couple minutes after it

153

00:04:55,430 --> 00:04:52,720

gets away from the station it fires some

154

00:04:56,550 --> 00:04:55,440

jets and backs further away

155

00:04:58,390 --> 00:04:56,560

it

156

00:05:00,550 --> 00:04:58,400

goes around the earth about one time and

157

00:05:02,629 --> 00:05:00,560

then it will fire its main engine on the

158

00:05:04,629 --> 00:05:02,639

the soyuz spacecraft to slow it down to

159

00:05:05,909 --> 00:05:04,639

bring it back into the atmosphere that

160

00:05:07,350 --> 00:05:05,919

engine burn is about four and a half

161

00:05:10,070 --> 00:05:07,360

minutes long

162

00:05:11,830 --> 00:05:10,080

about 20 30 minutes after that the

163

00:05:13,270 --> 00:05:11,840

compartments separate so there goes the

164

00:05:15,510 --> 00:05:13,280

orbital compartment there goes your main

165

00:05:17,830 --> 00:05:15,520

engine you don't need it anymore and the

166

00:05:19,510 --> 00:05:17,840

sp the descent module is on its own and

167

00:05:20,870 --> 00:05:19,520

it starts coming through the atmosphere

168

00:05:22,710 --> 00:05:20,880

now this is where it gets pretty

169

00:05:24,150 --> 00:05:22,720

exciting right it gets very hot on the

170

00:05:25,590 --> 00:05:24,160

inside of the soyuz the outside is

171

00:05:26,629 --> 00:05:25,600

heating up

172

00:05:29,029 --> 00:05:26,639

it's a

173

00:05:30,950 --> 00:05:29,039

pretty dynamic event a little bit later

174

00:05:33,670 --> 00:05:30,960

the parachute

175

00:05:34,710 --> 00:05:33,680

comes out when you're about 35 000 feet

176

00:05:36,870 --> 00:05:34,720

in the sky so you're up where the

177

00:05:38,870 --> 00:05:36,880

airplanes are flying the parachute comes

178

00:05:40,390 --> 00:05:38,880

out that's another really dynamic event

179

00:05:42,790 --> 00:05:40,400

it's a lot of bouncing and jerking

180

00:05:45,510 --> 00:05:42,800

around and about 15 minutes after that

181

00:05:46,870 --> 00:05:45,520

you will actually uh land on the ground

182

00:05:48,390 --> 00:05:46,880

in kazakhstan

183

00:05:50,150 --> 00:05:48,400

and so do you actually start feeling

184

00:05:51,510 --> 00:05:50,160

gravity while you're in the descent

185

00:05:53,909 --> 00:05:51,520

sequence before you actually hit the

186

00:05:56,550 --> 00:05:53,919

earth yeah you do absolutely once you

187

00:05:58,390 --> 00:05:56,560

start into uh the atmosphere when you

188

00:05:59,909 --> 00:05:58,400

can see things start heating up you can

189

00:06:01,270 --> 00:05:59,919

feel yourself being pulled down into

190

00:06:02,870 --> 00:06:01,280

your seat a little bit more at that

191

00:06:03,990 --> 00:06:02,880

point you really want to tighten your

192

00:06:05,830 --> 00:06:04,000

your straps you've got shoulder

193

00:06:06,790 --> 00:06:05,840

harnesses you've got straps on your

194

00:06:08,790 --> 00:06:06,800

knees and

195

00:06:10,950 --> 00:06:08,800

like a waist belt to make sure that you

196

00:06:12,550 --> 00:06:10,960

are tightly

197

00:06:14,070 --> 00:06:12,560

slightly affixed to your seat so when

198

00:06:16,230 --> 00:06:14,080

you do hit the ground that you're not

199

00:06:18,230 --> 00:06:16,240

going to bounce out and hurt yourself so

200

00:06:19,749 --> 00:06:18,240

with the increasing gravity you have

201
00:06:21,909 --> 00:06:19,759
more opportunity to tighten your straps

202
00:06:23,590 --> 00:06:21,919
and and make sure everything is safe

203
00:06:25,749 --> 00:06:23,600
is it a good feeling coming back and

204
00:06:27,909 --> 00:06:25,759
feeling gravity again or is it or is it

205
00:06:29,670 --> 00:06:27,919
not good it's i would say it's kind of

206
00:06:31,510 --> 00:06:29,680
strange i wouldn't put it in a good or

207
00:06:33,670 --> 00:06:31,520
not good it just it's very different

208
00:06:36,790 --> 00:06:33,680
because you haven't felt it for for six

209
00:06:39,350 --> 00:06:36,800
months and so it's just a very unusual

210
00:06:41,430 --> 00:06:39,360
sensation to have again on your body

211
00:06:43,430 --> 00:06:41,440
and then after you of course have have

212
00:06:45,189 --> 00:06:43,440
the those those uh

213
00:06:48,469 --> 00:06:45,199

earth-facing rockets have fired and

214

00:06:50,309 --> 00:06:48,479

softened uh the blow you land the

215

00:06:51,990 --> 00:06:50,319

recovery teams show up you're pretty

216

00:06:54,790 --> 00:06:52,000

much sitting there in the soyuz waiting

217

00:06:56,950 --> 00:06:54,800

for them to show up uh and getting a

218

00:06:57,830 --> 00:06:56,960

chance to feel gravity even some more

219

00:06:59,189 --> 00:06:57,840

then

220

00:07:01,589 --> 00:06:59,199

tell us a little bit more about the

221

00:07:03,510 --> 00:07:01,599

extrication process yeah that's it's a

222

00:07:06,070 --> 00:07:03,520

very interesting how they help you out

223

00:07:08,309 --> 00:07:06,080

of the soyuz there's basically two cases

224

00:07:10,150 --> 00:07:08,319

you can have the soyuz land upright so

225

00:07:12,230 --> 00:07:10,160

you're actually sitting in your seats

226

00:07:13,909 --> 00:07:12,240

laying on your backs like you would hope

227

00:07:16,390 --> 00:07:13,919

that you're sort of the normal

228

00:07:18,790 --> 00:07:16,400

configuration of the soyuz or a lot of

229

00:07:20,870 --> 00:07:18,800

times the soyuz will bounce depending on

230

00:07:22,390 --> 00:07:20,880

the wind conditions and it'll roll over

231

00:07:23,990 --> 00:07:22,400

on its side in that case you can be

232

00:07:25,350 --> 00:07:24,000

anywhere so you could be

233

00:07:26,790 --> 00:07:25,360

laying on your back you could be hanging

234

00:07:28,870 --> 00:07:26,800

from your straps and that fact was my

235

00:07:31,350 --> 00:07:28,880

case so i was kind of leaning forward on

236

00:07:33,990 --> 00:07:31,360

the low side of the soyuz and so

237

00:07:35,749 --> 00:07:34,000

in that case the search and rescue crew

238

00:07:38,870 --> 00:07:35,759

has to roll the soyuz to the proper

239

00:07:40,150 --> 00:07:38,880

orientation to help you out of the soyuz

240

00:07:41,990 --> 00:07:40,160

and they do help you out they don't want

241

00:07:43,670 --> 00:07:42,000

to have the crew hurt themselves getting

242

00:07:45,990 --> 00:07:43,680

out so they they take you out of the

243

00:07:47,510 --> 00:07:46,000

soyuz if it lands upright then the crew

244

00:07:49,589 --> 00:07:47,520

has to be able to

245

00:07:51,189 --> 00:07:49,599

get out the hatch overhead which is it

246

00:07:52,629 --> 00:07:51,199

takes a considerable amount of effort to

247

00:07:54,309 --> 00:07:52,639

do when you haven't dealt with gravity

248

00:07:55,990 --> 00:07:54,319

it's just some emotions that you haven't

249

00:07:57,589 --> 00:07:56,000

done in a while even though you exercise

250

00:08:00,070 --> 00:07:57,599

every day on orbit it's still just

251

00:08:02,469 --> 00:08:00,080

something new to your body

252

00:08:05,110 --> 00:08:02,479

and but then of course you get the the

253

00:08:07,270 --> 00:08:05,120

smells of earth yes yes and it that is

254

00:08:08,710 --> 00:08:07,280

what it was was really neat um

255

00:08:09,830 --> 00:08:08,720

the a lot of people ask what does the

256

00:08:11,110 --> 00:08:09,840

space station smell like it doesn't

257

00:08:13,430 --> 00:08:11,120

really smell like anything it's just

258

00:08:14,790 --> 00:08:13,440

kind of a neutral smell it's uh there's

259

00:08:16,469 --> 00:08:14,800

there's no special smell of the space

260

00:08:18,309 --> 00:08:16,479

station but when you open the hatch in

261

00:08:20,550 --> 00:08:18,319

kazakhstan you can smell the grass and

262

00:08:22,790 --> 00:08:20,560

it smells very sweet like flowers and

263

00:08:24,070 --> 00:08:22,800

perfume almost even though it's just

264

00:08:26,309 --> 00:08:24,080

grass out there in the steps of

265

00:08:28,309 --> 00:08:26,319

kazakhstan it's an amazing sensation and

266

00:08:30,629 --> 00:08:28,319

it really lets you know that you're

267

00:08:31,990 --> 00:08:30,639

truly home on planet earth it's probably

268

00:08:33,430 --> 00:08:32,000

going to be springtime when these guys

269

00:08:34,949 --> 00:08:33,440

yeah so there might be flowers out there

270

00:08:36,949 --> 00:08:34,959

too so that'll be great that's great

271

00:08:39,350 --> 00:08:36,959

well any last words of advice for uh

272

00:08:40,630 --> 00:08:39,360

chris hadfield or tom marshburn or roman

273

00:08:41,829 --> 00:08:40,640

remain called as they're coming home

274

00:08:43,670 --> 00:08:41,839

well as they're coming home i would just

275

00:08:45,829 --> 00:08:43,680

say to them to truly enjoy the ride

276

00:08:47,990 --> 00:08:45,839

because it is kind of special it is uh

277

00:08:49,910 --> 00:08:48,000

pretty exciting but um

278

00:08:52,070 --> 00:08:49,920

it always always goes according to plan

279

00:08:53,750 --> 00:08:52,080

so enjoy it and we will see them on the

280

00:08:55,190 --> 00:08:53,760

ground here very shortly

281

00:08:57,269 --> 00:08:55,200

all right well shannon walker thank you

282

00:08:59,110 --> 00:08:57,279

so much for bringing your experience and

283

00:09:00,870 --> 00:08:59,120

expertise to mission control with us

284

00:09:02,389 --> 00:09:00,880

today and give people a peek on the

285

00:09:04,070 --> 00:09:02,399

inside of what's going to be happening

286

00:09:06,310 --> 00:09:04,080

later tonight when that