



1  
00:00:24,650 --> 00:00:01,550

[Music]

2  
00:00:28,490 --> 00:00:26,090

good morning from Mission Control

3  
00:00:31,370 --> 00:00:28,500

Houston and welcome to round two of this

4  
00:00:33,290 --> 00:00:31,380

spacewalk as we join it right inside the

5  
00:00:35,209 --> 00:00:33,300

quest airlock live

6  
00:00:41,270 --> 00:00:35,219

based to ground one for the airlock you

7  
00:00:41,280 --> 00:00:45,470

16. okay

8  
00:00:52,549 --> 00:00:49,250

one two zero we will use this here

9  
00:00:57,830 --> 00:00:52,559

number nine for f Theta and serial

10  
00:00:57,840 --> 00:01:02,209

and creature those are good numbers

11  
00:01:07,850 --> 00:01:05,270

and as you can see we're jumping

12  
00:01:10,010 --> 00:01:07,860

we are jumping right into the action as

13  
00:01:11,990 --> 00:01:10,020

we were just hearing Jackson astronaut

14

00:01:14,390 --> 00:01:12,000

koichiwakata talking with Capcom down

15

00:01:15,289 --> 00:01:14,400

here on the ground Megan Levins as we

16

00:01:16,310 --> 00:01:15,299

see

17

00:01:18,950 --> 00:01:16,320

uh

18

00:01:20,870 --> 00:01:18,960

the two crew members Josh cassida and

19

00:01:23,210 --> 00:01:20,880

Frank Rubio suited up inside the quest

20

00:01:26,030 --> 00:01:23,220

airlock and getting ready for this

21

00:01:28,609 --> 00:01:26,040

spacewalk today so their plan to spend

22

00:01:30,950 --> 00:01:28,619

about seven hours working outside in the

23

00:01:33,050 --> 00:01:30,960

vacuum of space with their goal of

24

00:01:35,690 --> 00:01:33,060

installing a new irosa an International

25

00:01:38,690 --> 00:01:35,700

Space Station roll out solar array as

26  
00:01:41,090 --> 00:01:38,700  
part of our continuing work to upgrade

27  
00:01:43,310 --> 00:01:41,100  
the power system on board the Oregon

28  
00:01:45,530 --> 00:01:43,320  
laboratory so we're looking at Frank

29  
00:01:47,929 --> 00:01:45,540  
Rubio and Josh cassida that's cast on

30  
00:01:50,450 --> 00:01:47,939  
the left Rubio on the right Frank Rubio

31  
00:01:52,490 --> 00:01:50,460  
is going to be ev1 or the lead space

32  
00:01:53,990 --> 00:01:52,500  
walker for today and once they're

33  
00:01:56,630 --> 00:01:54,000  
outside you'll be able to pick him out

34  
00:02:00,050 --> 00:01:56,640  
as he's in the suit with the red stripes

35  
00:02:02,870 --> 00:02:00,060  
and the Josh Casa will be ev2 this is

36  
00:02:05,569 --> 00:02:02,880  
the third spacewalk for this Duo they've

37  
00:02:07,249 --> 00:02:05,579  
already done two over just the last

38  
00:02:09,710 --> 00:02:07,259

couple of months going out the door on

39  
00:02:12,350 --> 00:02:09,720  
November 15th and then again on December

40  
00:02:13,910 --> 00:02:12,360  
3rd as they work to install some of the

41  
00:02:16,250 --> 00:02:13,920  
mounting brackets and then I've already

42  
00:02:19,190 --> 00:02:16,260  
completely installed one of the IRA

43  
00:02:20,710 --> 00:02:19,200  
process all arrays that flew up to

44  
00:02:22,850 --> 00:02:20,720  
continue this augmentation work

45  
00:02:24,350 --> 00:02:22,860  
meanwhile down here on the ground in

46  
00:02:26,150 --> 00:02:24,360  
Mission Control Houston will have a

47  
00:02:28,729 --> 00:02:26,160  
couple of key players that you will see

48  
00:02:30,949 --> 00:02:28,739  
and hear today leading the orbit 2 team

49  
00:02:32,990 --> 00:02:30,959  
that just came on console is NASA flight

50  
00:02:34,790 --> 00:02:33,000  
director Fiona turret and then Chris

51  
00:02:36,589 --> 00:02:34,800  
Mundy is going to be the lead spacewalk

52  
00:02:39,890 --> 00:02:36,599  
officer for today he'll be in the back

53  
00:02:42,050 --> 00:02:39,900  
row of the room and then NASA astronaut

54  
00:02:44,690 --> 00:02:42,060  
Nick Hague you can see there right in

55  
00:02:47,150 --> 00:02:44,700  
the center in that gray suit he's going

56  
00:02:48,830 --> 00:02:47,160  
to be our spacewalks poor Capcom also

57  
00:02:52,910 --> 00:02:48,840  
known as our ground IV so we're going to

58  
00:02:56,630 --> 00:02:52,920  
hear him talking directly to Frank and

59  
00:03:00,470 --> 00:02:56,640  
Josh as they're working outside

60  
00:03:02,990 --> 00:03:00,480  
now the goal of today is to install a

61  
00:03:04,790 --> 00:03:03,000  
new iro so one of those roll out solar

62  
00:03:06,229 --> 00:03:04,800  
arrays and this is part of an ongoing

63  
00:03:08,150 --> 00:03:06,239

plan that's been stretched over the last

64

00:03:09,949 --> 00:03:08,160

couple of years that we're starting to

65

00:03:12,250 --> 00:03:09,959

get to the final stages of so in this

66

00:03:14,869 --> 00:03:12,260

graphic you can see

67

00:03:17,149 --> 00:03:14,879

3b1a2a4b each one of those number and

68

00:03:18,890 --> 00:03:17,159

letter combinations correspond to a

69

00:03:21,350 --> 00:03:18,900

power Channel we have eight power

70

00:03:23,149 --> 00:03:21,360

channels supported by the pairs of solar

71

00:03:25,490 --> 00:03:23,159

arrays on board the International Space

72

00:03:28,490 --> 00:03:25,500

Station everything in blue we've already

73

00:03:31,910 --> 00:03:28,500

installed an array and so you can see on

74

00:03:33,890 --> 00:03:31,920

the right side of those smaller arrays

75

00:03:36,949 --> 00:03:33,900

that are kind of canted up at an angle

76  
00:03:38,630 --> 00:03:36,959  
over 4B and 2B that shows you how these

77  
00:03:41,210 --> 00:03:38,640  
look once they're installed and

78  
00:03:43,970 --> 00:03:41,220  
completely unfurled they cover a small

79  
00:03:46,729 --> 00:03:43,980  
amount of the existing the Legacy arrays

80  
00:03:49,009 --> 00:03:46,739  
but once everything is installed once

81  
00:03:50,509 --> 00:03:49,019  
all six eye roses have been completely

82  
00:03:52,369 --> 00:03:50,519  
installed we're going to be increasing

83  
00:03:54,890 --> 00:03:52,379  
the power capability the power

84  
00:03:57,110 --> 00:03:54,900  
generation capability onboard the space

85  
00:03:59,509 --> 00:03:57,120  
station by about 30 percent and these

86  
00:04:02,089 --> 00:03:59,519  
are brand new arrays so they'll be able

87  
00:04:04,550 --> 00:04:02,099  
to last throughout the the remainder of

88  
00:04:07,309 --> 00:04:04,560

the lifetime of the International Space

89

00:04:09,649 --> 00:04:07,319

Station as we're looking at continuing

90

00:04:11,750 --> 00:04:09,659

to have this already laboratory until at

91

00:04:13,009 --> 00:04:11,760

least 2030. so

92

00:04:15,589 --> 00:04:13,019

we're going to be increasing the

93

00:04:18,469 --> 00:04:15,599

station's power generator to about 250

94

00:04:22,069 --> 00:04:18,479

kilowatts total an increase of about 30

95

00:04:25,189 --> 00:04:22,079

percent now today we are going to be

96

00:04:27,530 --> 00:04:25,199

working on 4A so that in the bottom

97

00:04:30,290 --> 00:04:27,540

right side you can see 4A the mounting

98

00:04:31,790 --> 00:04:30,300

hardware has already been installed and

99

00:04:34,610 --> 00:04:31,800

today we're going to be bringing out one

100

00:04:36,770 --> 00:04:34,620

of these eye roses to install them now

101  
00:04:39,710 --> 00:04:36,780  
this is what the irosa looks like after

102  
00:04:42,950 --> 00:04:39,720  
it's unfolded but not completely

103  
00:04:46,189 --> 00:04:42,960  
unfurled so each of these rides up in

104  
00:04:49,129 --> 00:04:46,199  
the trunk of a SpaceX Dragon spacecraft

105  
00:04:51,230 --> 00:04:49,139  
and after they are able to carry them

106  
00:04:52,850 --> 00:04:51,240  
out there so in the top left that's what

107  
00:04:55,430 --> 00:04:52,860  
they look like right now they're folded

108  
00:04:57,230 --> 00:04:55,440  
up and then once they get them out to

109  
00:04:58,550 --> 00:04:57,240  
the work site that top right is what it

110  
00:05:00,770 --> 00:04:58,560  
looks like is they're going to manually

111  
00:05:03,230 --> 00:05:00,780  
unfold them we'll have both Josh and

112  
00:05:07,310 --> 00:05:03,240  
Frank out at the work site one of them

113  
00:05:08,689 --> 00:05:07,320

is going to be uh Josh cast in this in

114

00:05:11,270 --> 00:05:08,699

today's spacewalk is going to be riding

115

00:05:13,490 --> 00:05:11,280

the robotic arm to carry those arrays

116

00:05:16,129 --> 00:05:13,500

from their temporary Stow location out

117

00:05:17,870 --> 00:05:16,139

to the work site to install on four

118

00:05:19,670 --> 00:05:17,880

Alpha 4A

119

00:05:22,129 --> 00:05:19,680

and then they'll work to unfold them and

120

00:05:23,990 --> 00:05:22,139

then there's a number of bolts and then

121

00:05:25,969 --> 00:05:24,000

different cable interfaces so that that

122

00:05:28,969 --> 00:05:25,979

mandrel hinge that assembly bolt that's

123

00:05:30,770 --> 00:05:28,979

going to be hand tightened and that's

124

00:05:33,170 --> 00:05:30,780

what's going to essentially lock them in

125

00:05:38,210 --> 00:05:33,180

place after it's been unfolded uh the

126

00:05:40,969 --> 00:05:38,220

nzgl nzgl stands for the NASA zero

127

00:05:42,350 --> 00:05:40,979

gravity lever that's just a reference to

128

00:05:44,930 --> 00:05:42,360

the cable type that we're going to be

129

00:05:46,490 --> 00:05:44,940

using but those cable interfaces are

130

00:05:50,029 --> 00:05:46,500

what we're going to be attaching to

131

00:05:52,129 --> 00:05:50,039

integrate the new irosa array with the

132

00:05:53,390 --> 00:05:52,139

existing array on the 4A power Channel

133

00:05:55,310 --> 00:05:53,400

and plugging both of those in

134

00:05:57,710 --> 00:05:55,320

essentially a wide Junction so you'll

135

00:05:59,990 --> 00:05:57,720

have one going to the power source from

136

00:06:02,629 --> 00:06:00,000

the existing array one to the new array

137

00:06:04,670 --> 00:06:02,639

that plugs into 4A and then both are

138

00:06:06,469 --> 00:06:04,680

providing power to the channel and then

139

00:06:08,749 --> 00:06:06,479

those blanket tensioner bolts those will

140

00:06:10,850 --> 00:06:08,759

be two of the last things that they're

141

00:06:13,129 --> 00:06:10,860

responsible for releasing once those are

142

00:06:15,350 --> 00:06:13,139

released it engages a mechanism that

143

00:06:18,409 --> 00:06:15,360

pulls down on some wire essentially to

144

00:06:20,390 --> 00:06:18,419

provide some tension as after these are

145

00:06:22,249 --> 00:06:20,400

unfurled just like the existing arrays

146

00:06:24,290 --> 00:06:22,259

they're going to be moved over time

147

00:06:26,450 --> 00:06:24,300

these arrays can automatically track the

148

00:06:28,370 --> 00:06:26,460

Sun make sure we're harvesting as much

149

00:06:29,689 --> 00:06:28,380

energy as possible for the station

150

00:06:31,969 --> 00:06:29,699

systems

151  
00:06:36,890 --> 00:06:31,979  
and so having that extra rigidity will

152  
00:06:36,900 --> 00:06:40,070  
we'll break the uh

153  
00:06:49,129 --> 00:06:42,670  
[Applause]

154  
00:06:54,529 --> 00:06:51,170  
and just continuing real quick through

155  
00:06:55,909 --> 00:06:54,539  
uh the rest so once these high roses are

156  
00:06:59,150 --> 00:06:55,919  
bolted in place they're going to be

157  
00:07:01,490 --> 00:06:59,160  
deployed on the release a special

158  
00:07:03,529 --> 00:07:01,500  
bracket and then two booms on either

159  
00:07:05,510 --> 00:07:03,539  
side will unfurl the arrays in the

160  
00:07:07,730 --> 00:07:05,520  
middle if you look at those pictures on

161  
00:07:10,850 --> 00:07:07,740  
the right the white section are the

162  
00:07:12,529 --> 00:07:10,860  
booms now we'll see those unfurl the

163  
00:07:14,870 --> 00:07:12,539

best way I've heard them described so

164

00:07:17,150 --> 00:07:14,880

far I came from our lead spacewalk

165

00:07:19,730 --> 00:07:17,160

officer for today they essentially work

166

00:07:22,129 --> 00:07:19,740

like if you took a straw split it right

167

00:07:24,950 --> 00:07:22,139

down the middle and rolled it up if you

168

00:07:27,050 --> 00:07:24,960

unfurled it it naturally tries to retain

169

00:07:30,170 --> 00:07:27,060

the circular shape essentially go back

170

00:07:32,749 --> 00:07:30,180

to being a straw that's more or less the

171

00:07:34,670 --> 00:07:32,759

concept behind these booms they also

172

00:07:37,370 --> 00:07:34,680

have these magnets that will lock in

173

00:07:39,050 --> 00:07:37,380

place as it unfurls and those will be

174

00:07:40,490 --> 00:07:39,060

one of the primary visual aids for the

175

00:07:42,830 --> 00:07:40,500

spacewalkers who are just going to be

176

00:07:46,070 --> 00:07:42,840

giving these constant updates as it

177

00:07:47,870 --> 00:07:46,080

unfurls to help lock it in place in

178

00:07:51,110 --> 00:07:47,880

total they're they're pretty large they

179

00:07:53,570 --> 00:07:51,120

weigh just around around 750 pounds each

180

00:07:55,129 --> 00:07:53,580

here's all the dimensions so pretty

181

00:07:57,350 --> 00:07:55,139

sizable

182

00:07:59,450 --> 00:07:57,360

it's good to remember that while weight

183

00:08:01,969 --> 00:07:59,460

isn't necessarily

184

00:08:03,650 --> 00:08:01,979

a concern as we're operating in

185

00:08:05,930 --> 00:08:03,660

microgravity these things still have

186

00:08:08,930 --> 00:08:05,940

mass so once they start moving it can be

187

00:08:10,670 --> 00:08:08,940

pretty hard to stop them moving so a lot

188

00:08:12,350 --> 00:08:10,680

of very slow a lot of very deliberate

189

00:08:15,589 --> 00:08:12,360

movements as we're moving these from

190

00:08:18,469 --> 00:08:15,599

their work site all the way out to 4A to

191

00:08:20,990 --> 00:08:18,479

get installed now if we jump back inside

192

00:08:22,610 --> 00:08:21,000

the airlock we've heard a couple of

193

00:08:24,589 --> 00:08:22,620

updates from the team so they're just

194

00:08:27,710 --> 00:08:24,599

wrapping up what's known as their

195

00:08:29,150 --> 00:08:27,720

pre-breathe inside the airlock and right

196

00:08:32,029 --> 00:08:29,160

as we came in there we heard them

197

00:08:35,870 --> 00:08:32,039

talking about medox canister change out

198

00:08:41,630 --> 00:08:35,880

now Maddox stands for metal oxide

199

00:08:43,730 --> 00:08:41,640

where in Step 17 and Reporting the uh

200

00:08:45,650 --> 00:08:43,740

all the Medics canisters serial numbers

201  
00:08:54,710 --> 00:08:45,660  
are

202  
00:08:58,550 --> 00:08:56,630  
and just there could be true you read

203  
00:09:00,410 --> 00:08:58,560  
another update on metax canister's

204  
00:09:02,930 --> 00:09:00,420  
Maddox canisters are part of the life

205  
00:09:06,170 --> 00:09:02,940  
support system inside these spacesuits

206  
00:09:07,670 --> 00:09:06,180  
it's it's commonly referred to

207  
00:09:09,230 --> 00:09:07,680  
um that these space suits are

208  
00:09:11,690 --> 00:09:09,240  
essentially many spacecraft themselves

209  
00:09:15,470 --> 00:09:11,700  
they have an entire life support system

210  
00:09:17,329 --> 00:09:15,480  
inside heating cooling and then medox is

211  
00:09:20,449 --> 00:09:17,339  
part of the essentially the atmosphere

212  
00:09:22,910 --> 00:09:20,459  
revitalization system inside so just

213  
00:09:26,210 --> 00:09:22,920

like as we're on the space station as

214

00:09:28,430 --> 00:09:26,220

you breathe out you inhale oxygen you

215

00:09:30,530 --> 00:09:28,440

exhale carbon dioxide and you need a way

216

00:09:32,090 --> 00:09:30,540

to actively get rid of that carbon

217

00:09:34,970 --> 00:09:32,100

dioxide otherwise it can just stay in

218

00:09:37,310 --> 00:09:34,980

your suit and the CO<sub>2</sub> builds up that can

219

00:09:41,449 --> 00:09:37,320

start to cause issues for us as humans

220

00:09:43,790 --> 00:09:41,459

and medox is the means at which we're

221

00:09:46,850 --> 00:09:43,800

capturing that carbon essentially inside

222

00:09:49,509 --> 00:09:46,860

these spacesuits it uses a metal oxide

223

00:09:52,730 --> 00:09:49,519

in in this case a silver oxide

224

00:09:56,570 --> 00:09:52,740

that goes through a chemical process

225

00:09:58,730 --> 00:09:56,580

when it's in contact with

226

00:10:01,610 --> 00:09:58,740

um moisture and then carbon dioxide

227

00:10:03,290 --> 00:10:01,620

forms a precipitate so it can

228

00:10:05,630 --> 00:10:03,300

essentially go through this chemical

229

00:10:07,269 --> 00:10:05,640

reaction to constantly capture this

230

00:10:10,009 --> 00:10:07,279

carbon dioxide

231

00:10:11,590 --> 00:10:10,019

as they're exhaling it inside of those

232

00:10:14,930 --> 00:10:11,600

spacesuits and

233

00:10:17,090 --> 00:10:14,940

they're a little bit different from the

234

00:10:20,090 --> 00:10:17,100

systems that we use on board the space

235

00:10:23,829 --> 00:10:20,100

station which are essentially running

236

00:10:26,889 --> 00:10:23,839

around the clock and have more of a

237

00:10:34,190 --> 00:10:26,899

active regenerative process

238

00:10:39,949 --> 00:10:34,200

31 GMT at 12 10 and for Josh's TCB it's

239

00:10:39,959 --> 00:10:53,110

Gabriel

240

00:10:57,290 --> 00:10:55,610

and we're continuing to get some good

241

00:10:59,990 --> 00:10:57,300

some good call outs that we're getting

242

00:11:01,610 --> 00:11:00,000

closer to having the crew move into the

243

00:11:03,110 --> 00:11:01,620

crew lock section they're in equipment

244

00:11:05,150 --> 00:11:03,120

lock right now but they'll be moving

245

00:11:06,889 --> 00:11:05,160

over to the crew lock session section

246

00:11:09,230 --> 00:11:06,899

shortly that's where we'll close the

247

00:11:11,810 --> 00:11:09,240

hatch and use a series of pumps and

248

00:11:13,730 --> 00:11:11,820

valves to bring that down to vacuum one

249

00:11:15,470 --> 00:11:13,740

final note of that Maddox that's able to

250

00:11:17,750 --> 00:11:15,480

to capture that carbon That's The

251

00:11:19,370 --> 00:11:17,760

Meadows canisters like all of the life

252

00:11:22,370 --> 00:11:19,380

support are located in that backpack

253

00:11:25,009 --> 00:11:22,380

section on the spacesuits that you see

254

00:11:27,110 --> 00:11:25,019

the astronauts wearing it actively

255

00:11:29,630 --> 00:11:27,120

captures that carbon dioxide over time

256

00:11:31,990 --> 00:11:29,640

eventually will get saturated though so

257

00:11:35,990 --> 00:11:32,000

that's why it's considered a consumable

258

00:11:37,610 --> 00:11:36,000

you'll often hear the term limiting

259

00:11:38,870 --> 00:11:37,620

consumable used

260

00:11:41,690 --> 00:11:38,880

um whenever we're going through a

261

00:11:43,550 --> 00:11:41,700

spacewalk and you essentially have

262

00:11:46,370 --> 00:11:43,560

three that you're really looking at

263

00:11:48,530 --> 00:11:46,380

we're tracking how much oxygen how much

264

00:11:51,410 --> 00:11:48,540

O2 is inside the space suit how much

265

00:11:54,889 --> 00:11:51,420

carbon dioxide capture we have remaining

266

00:11:56,210 --> 00:11:54,899

that's your your medox and then power as

267

00:11:58,670 --> 00:11:56,220

these suits once they're completely

268

00:12:00,410 --> 00:11:58,680

unplugged or running on batteries you

269

00:12:02,870 --> 00:12:00,420

also have a limited amount of water

270

00:12:05,269 --> 00:12:02,880

that's used inside for all of the

271

00:12:07,310 --> 00:12:05,279

cooling and a couple of other fluid

272

00:12:09,730 --> 00:12:07,320

systems inside so that metal Ox is

273

00:12:12,590 --> 00:12:09,740

typically the limiting consumable

274

00:12:14,449 --> 00:12:12,600

and that just means if we if we looked

275

00:12:17,030 --> 00:12:14,459

at which one we're gonna run out of

276

00:12:19,370 --> 00:12:17,040

first that's your limiting consumable

277

00:12:21,230 --> 00:12:19,380

and so we'll keep a close eye and you'll

278

00:12:22,790 --> 00:12:21,240

you'll typically hear throughout the

279

00:12:26,690 --> 00:12:22,800

spacewalk

280

00:12:29,690 --> 00:12:26,700

um and a Target duration or I mean we're

281

00:12:31,910 --> 00:12:29,700

looking at you know seven hours with

282

00:12:33,829 --> 00:12:31,920

Maddox limiting you'll hear those call

283

00:12:35,690 --> 00:12:33,839

outs up to the crew as they're just

284

00:12:37,550 --> 00:12:35,700

giving them a gradual status so that's

285

00:12:41,870 --> 00:12:37,560

what when you hear about Ox that's what

286

00:12:45,769 --> 00:12:44,030

meanwhile the crew is just finishing up

287

00:12:47,750 --> 00:12:45,779

their pre-breathe

288

00:12:50,449 --> 00:12:47,760

um so it takes a couple of hours just to

289

00:12:53,509 --> 00:12:50,459

get ready for a spacewalk so before they

290

00:12:55,370 --> 00:12:53,519

even get into these suits we have to go

291

00:12:57,949 --> 00:12:55,380

through a couple of steps just to make

292

00:13:00,110 --> 00:12:57,959

sure that we're keeping them safe as

293

00:13:02,810 --> 00:13:00,120

they're moving into essentially a

294

00:13:04,430 --> 00:13:02,820

depressurized environment so on board

295

00:13:06,470 --> 00:13:04,440

the space station just like if you're

296

00:13:09,350 --> 00:13:06,480

walking around here at sea level the

297

00:13:12,769 --> 00:13:09,360

atmospheric pressure in size about 14.7

298

00:13:14,389 --> 00:13:12,779

PSI and when they're outside in the

299

00:13:16,370 --> 00:13:14,399

vacuum of space though

300

00:13:19,790 --> 00:13:16,380

those spacesuits are pressurized but not

301  
00:13:21,350 --> 00:13:19,800  
to 14.7 psi if we were to pressurize the

302  
00:13:23,629 --> 00:13:21,360  
spacesuit that much it'd be almost

303  
00:13:25,610 --> 00:13:23,639  
impossible to move it'd be like fighting

304  
00:13:28,250 --> 00:13:25,620  
against a really

305  
00:13:30,170 --> 00:13:28,260  
stiff balloon essentially it'd be really

306  
00:13:32,569 --> 00:13:30,180  
hard to manipulate fingers move arms

307  
00:13:34,850 --> 00:13:32,579  
things like that and so what we're able

308  
00:13:36,949 --> 00:13:34,860  
to do is have them operate in a lower

309  
00:13:39,410 --> 00:13:36,959  
pressure setting those spacesuits go to

310  
00:13:43,790 --> 00:13:39,420  
about 4.3 PSI

311  
00:13:49,670 --> 00:13:46,550  
once we see them out of the vacuum of

312  
00:13:52,790 --> 00:13:49,680  
space so 4.3 is a lot easier to move

313  
00:13:54,470 --> 00:13:52,800

around it's still pretty intensive to

314

00:13:55,730 --> 00:13:54,480

use your hands in that spacesuit as you

315

00:13:58,670 --> 00:13:55,740

are just constantly fighting against

316

00:14:00,949 --> 00:13:58,680

that pressure but as they're at a lower

317

00:14:02,930 --> 00:14:00,959

pressure they're also breathing a 100

318

00:14:05,090 --> 00:14:02,940

oxygen in the atmosphere essentially

319

00:14:07,430 --> 00:14:05,100

when they're in those suits that way you

320

00:14:09,290 --> 00:14:07,440

can operate at a lower pressure but

321

00:14:13,069 --> 00:14:09,300

you're still getting the the oxygen that

322

00:14:14,470 --> 00:14:13,079

you need and we operate on a lot of the

323

00:14:17,329 --> 00:14:14,480

same

324

00:14:19,610 --> 00:14:17,339

restrictions as anybody who's ever gone

325

00:14:21,050 --> 00:14:19,620

scuba diving as you go deeper and deeper

326

00:14:23,150 --> 00:14:21,060

into the water you're in a higher and

327

00:14:25,550 --> 00:14:23,160

higher pressure environment and then as

328

00:14:28,129 --> 00:14:25,560

you come back to the surface you need to

329

00:14:29,930 --> 00:14:28,139

take your time as you do it or you can

330

00:14:34,670 --> 00:14:29,940

suffer what's known as decompression

331

00:14:37,730 --> 00:14:34,680

sickness and all that really is will be

332

00:14:40,310 --> 00:14:37,740

different gases primary one we look for

333

00:14:42,710 --> 00:14:40,320

is nitrogen when it's in your blood and

334

00:14:44,689 --> 00:14:42,720

then tissues in your body it's a kind of

335

00:14:46,850 --> 00:14:44,699

an ambient pressure or it's an equal

336

00:14:49,189 --> 00:14:46,860

pressure with your ambient surroundings

337

00:14:51,949 --> 00:14:49,199

but if you start to depressurize quickly

338

00:14:54,170 --> 00:14:51,959

the pressure in those gases in your in

339

00:14:56,269 --> 00:14:54,180

your veins in your tissues will be

340

00:14:58,250 --> 00:14:56,279

higher than the pressure around it and

341

00:15:00,170 --> 00:14:58,260

that can form Bubbles and if those

342

00:15:02,389 --> 00:15:00,180

bubbles start to form they can cause

343

00:15:04,730 --> 00:15:02,399

problems one of the most

344

00:15:06,230 --> 00:15:04,740

common ones is as it's starting to

345

00:15:08,569 --> 00:15:06,240

happen as you'll start to get joint pain

346

00:15:10,610 --> 00:15:08,579

things like that but it can eventually

347

00:15:12,069 --> 00:15:10,620

cause some pretty serious issues with

348

00:15:13,970 --> 00:15:12,079

your nervous system

349

00:15:15,769 --> 00:15:13,980

and

350

00:15:18,050 --> 00:15:15,779

so that's why we have to be very careful

351  
00:15:19,550 --> 00:15:18,060  
very deliberate and to prepare them for

352  
00:15:22,069 --> 00:15:19,560  
that lower pressure environment we do

353  
00:15:24,410 --> 00:15:22,079  
what's called a pre-breathe a long time

354  
00:15:26,090 --> 00:15:24,420  
ago we used to have the astronauts

355  
00:15:28,550 --> 00:15:26,100  
actually camp out

356  
00:15:32,689 --> 00:15:28,560  
sleep in the airlock overnight at a

357  
00:15:35,030 --> 00:15:32,699  
lower pressure around 10 psi breathing

358  
00:15:36,889 --> 00:15:35,040  
and increase oxygen atmosphere and that

359  
00:15:39,290 --> 00:15:36,899  
would help just kind of gradually Purge

360  
00:15:42,290 --> 00:15:39,300  
that excess nitrogen from the blood

361  
00:15:43,790 --> 00:15:42,300  
but as the teams have gotten more and

362  
00:15:45,769 --> 00:15:43,800  
more experience they were able to

363  
00:15:49,509 --> 00:15:45,779

develop a new process called in suit

364

00:15:52,670 --> 00:15:49,519

light exercise and in this case the crew

365

00:15:54,889 --> 00:15:52,680

as their morning begins they go inside

366

00:15:56,569 --> 00:15:54,899

the airlock and they are at that reduced

367

00:15:58,610 --> 00:15:56,579

pressure of about 10 psi and they're

368

00:15:59,530 --> 00:15:58,620

breathing pure oxygen that starts to

369

00:16:02,269 --> 00:15:59,540

help

370

00:16:03,949 --> 00:16:02,279

essentially reject that nitrogen out of

371

00:16:05,810 --> 00:16:03,959

the system

372

00:16:08,269 --> 00:16:05,820

but you're doing in a very gradual

373

00:16:10,069 --> 00:16:08,279

fashion and then after they've done that

374

00:16:13,310 --> 00:16:10,079

for a few hours they get suited up

375

00:16:14,870 --> 00:16:13,320

inside of these spacesuits and then they

376

00:16:17,810 --> 00:16:14,880

start doing what's known as in suit

377

00:16:19,370 --> 00:16:17,820

light exercise so they're passed at this

378

00:16:22,069 --> 00:16:19,380

point so we won't see it

379

00:16:24,530 --> 00:16:22,079

but they essentially sit there uh

380

00:16:26,990 --> 00:16:24,540

attached to the wall still moving arms

381

00:16:29,629 --> 00:16:27,000

moving moving legs and they they do it

382

00:16:32,269 --> 00:16:29,639

at kind of timed intervals and this is

383

00:16:34,730 --> 00:16:32,279

just to again consistently reject that

384

00:16:37,610 --> 00:16:34,740

nitrogen get that out of the system

385

00:16:40,069 --> 00:16:37,620

um as we get ready to have them operate

386

00:16:41,449 --> 00:16:40,079

in that pure oxygen environment and so

387

00:16:44,269 --> 00:16:41,459

that's all done

388

00:16:46,569 --> 00:16:44,279

uh we're now in the steps getting ready

389

00:16:49,730 --> 00:16:46,579

for depress

390

00:16:52,189 --> 00:16:49,740

the team here in Mission Control is

391

00:16:54,189 --> 00:16:52,199

actually about to do a go no go for

392

00:16:57,530 --> 00:16:54,199

depress a depressed just referring to

393

00:16:59,870 --> 00:16:57,540

depressurization that's us taking them

394

00:17:02,810 --> 00:16:59,880

into the crew lock section closing the

395

00:17:04,429 --> 00:17:02,820

hatch and then removing all of the

396

00:17:07,370 --> 00:17:04,439

atmosphere in there and bringing it down

397

00:17:09,890 --> 00:17:07,380

to a vacuum so again a vacuum is just an

398

00:17:12,289 --> 00:17:09,900

absence of stuff in this case an absence

399

00:17:14,329 --> 00:17:12,299

of atmosphere and we need to get the

400

00:17:16,069 --> 00:17:14,339

crew lock section down as close to

401  
00:17:18,409 --> 00:17:16,079  
vacuum as possible

402  
00:17:21,350 --> 00:17:18,419  
before they open up the hatch and move

403  
00:17:22,970 --> 00:17:21,360  
out into the vacuum of space so the team

404  
00:17:26,510 --> 00:17:22,980  
here in Mission Control is going to do a

405  
00:17:30,169 --> 00:17:26,520  
go no go right now as we get closer to

406  
00:17:31,669 --> 00:17:30,179  
this go for depress and so before we get

407  
00:17:34,490 --> 00:17:31,679  
there though we see koichiwakada

408  
00:17:37,909 --> 00:17:34,500  
continuing to work he's on Frank Rubio's

409  
00:17:40,549 --> 00:17:37,919  
spacesuit right now you saw them attach

410  
00:17:43,250 --> 00:17:40,559  
something to the bottom of that backpack

411  
00:17:45,950 --> 00:17:43,260  
that life support system and that is the

412  
00:17:49,310 --> 00:17:45,960  
safer device simplified aid for Eva

413  
00:17:52,130 --> 00:17:49,320

rescue and essentially functions as a

414

00:17:53,990 --> 00:17:52,140

small jet pack it's not anything we use

415

00:17:56,870 --> 00:17:54,000

for actual maneuvering when we're

416

00:17:59,510 --> 00:17:56,880

outside on station but it is just

417

00:18:02,029 --> 00:17:59,520

another step in the line of defense of

418

00:18:04,730 --> 00:18:02,039

keeping an astronaut attached to the

419

00:18:06,529 --> 00:18:04,740

station they'll use a series of tethers

420

00:18:08,029 --> 00:18:06,539

a lot of the communication you're going

421

00:18:10,970 --> 00:18:08,039

to hear throughout the spacewalk today

422

00:18:13,850 --> 00:18:10,980

is them assessing where their tethers

423

00:18:15,409 --> 00:18:13,860

are located they practice all of these

424

00:18:16,909 --> 00:18:15,419

where they're going to put tethers for

425

00:18:19,909 --> 00:18:16,919

the different handrails but essentially

426

00:18:21,650 --> 00:18:19,919

that keeps them attached physically to

427

00:18:22,789 --> 00:18:21,660

the station at all times throughout his

428

00:18:25,669 --> 00:18:22,799

face walk

429

00:18:29,390 --> 00:18:25,679

should they become untethered they can

430

00:18:31,610 --> 00:18:29,400

use that safer device to then fly back

431

00:18:34,730 --> 00:18:31,620

to the space station so that's just an

432

00:18:38,750 --> 00:18:34,740

extra layer of safety for these face

433

00:18:43,310 --> 00:18:38,760

walking astronauts for the ev1 for Frank

434

00:18:43,320 --> 00:19:03,490

Houston copies

435

00:19:08,810 --> 00:19:06,289

but koichiwakata Nicole man working

436

00:19:10,909 --> 00:19:08,820

right now to get the safer on to Frank

437

00:19:13,850 --> 00:19:10,919

Rubio who again he's going to be ev1 our

438

00:19:16,250 --> 00:19:13,860

lead spacewalker for today one of the

439

00:19:17,510 --> 00:19:16,260

primary jobs of the leads phase Walker

440

00:19:19,970 --> 00:19:17,520

is going to be doing all the hatch

441

00:19:22,250 --> 00:19:19,980

operations once we're in the airlocks of

442

00:19:24,650 --> 00:19:22,260

both opening the hatch and closing it

443

00:19:26,510 --> 00:19:24,660

when we're at the very end so look at

444

00:19:27,890 --> 00:19:26,520

the safer device on his spacesuit and

445

00:19:30,409 --> 00:19:27,900

then move over

446

00:19:33,110 --> 00:19:30,419

to get the safer device onto Josh

447

00:19:35,289 --> 00:19:33,120

Cassidy's and after that we'll be ready

448

00:19:38,270 --> 00:19:35,299

to start stepping into the actual

449

00:19:40,370 --> 00:19:38,280

depressurization phase of our spacewalk

450

00:19:42,590 --> 00:19:40,380

so they'll move both crew members who

451  
00:19:44,270 --> 00:19:42,600  
have all the tools that they're going to

452  
00:19:45,890 --> 00:19:44,280  
need and we'll go over those tools as

453  
00:19:49,070 --> 00:19:45,900  
they're using them throughout the

454  
00:19:50,630 --> 00:19:49,080  
spacewalk today and they also have on

455  
00:19:52,250 --> 00:19:50,640  
the front of the spacesuits essentially

456  
00:19:53,930 --> 00:19:52,260  
a mini workstation with a lot of those

457  
00:19:55,909 --> 00:19:53,940  
tools to others other things that

458  
00:19:58,010 --> 00:19:55,919  
they'll need they'll also have a small

459  
00:19:59,450 --> 00:19:58,020  
bag that they're going to bring out that

460  
00:20:02,029 --> 00:19:59,460  
has the cables that we're going to be

461  
00:20:04,070 --> 00:20:02,039  
using to integrate that newly installed

462  
00:20:06,950 --> 00:20:04,080  
solar array into the 4A power Channel

463  
00:20:08,870 --> 00:20:06,960

along with the existing one so we're

464

00:20:11,630 --> 00:20:08,880

going to see them bring all of that into

465

00:20:13,909 --> 00:20:11,640

the airlock and then koichi and Nicole

466

00:20:15,650 --> 00:20:13,919

will work to get the half closed between

467

00:20:18,710 --> 00:20:15,660

the two different sections of the quest

468

00:20:20,690 --> 00:20:18,720

airlock we have the equipment lock

469

00:20:22,850 --> 00:20:20,700

that's where they are right now that's

470

00:20:24,110 --> 00:20:22,860

where we store the spacesuits all the

471

00:20:27,230 --> 00:20:24,120

different space walking gear when it's

472

00:20:29,090 --> 00:20:27,240

not in use and then we have the crew

473

00:20:30,970 --> 00:20:29,100

lock section and so that's where we're

474

00:20:33,710 --> 00:20:30,980

going to see frankstar moving to next

475

00:20:35,990 --> 00:20:33,720

and that is what actually gets brought

476  
00:20:38,150 --> 00:20:36,000  
down to vacuum

477  
00:20:41,210 --> 00:20:38,160  
you're also going to see their suits you

478  
00:20:44,270 --> 00:20:41,220  
can see one going into the crew lock the

479  
00:20:47,690 --> 00:20:44,280  
kind of the large white hoses those are

480  
00:20:50,630 --> 00:20:47,700  
known as the scms the services for seu

481  
00:20:52,909 --> 00:20:50,640  
service and cooling umbilicals so their

482  
00:20:54,710 --> 00:20:52,919  
spacesuits are essentially hard line the

483  
00:20:56,890 --> 00:20:54,720  
space station systems right now giving

484  
00:21:00,549 --> 00:20:56,900  
them Communications power

485  
00:21:04,669 --> 00:21:00,559  
fluids for cooling all of that and

486  
00:21:06,529 --> 00:21:04,679  
we don't unplug those until we're about

487  
00:21:10,130 --> 00:21:06,539  
to essentially start the Eva the

488  
00:21:12,350 --> 00:21:10,140

operations teams consider as they switch

489

00:21:14,870 --> 00:21:12,360

their suits to battery power so after

490

00:21:17,029 --> 00:21:14,880

they're unplugged and on battery powered

491

00:21:19,430 --> 00:21:17,039

that'll be the official start

492

00:21:21,710 --> 00:21:19,440

of our spacewalk and that doesn't happen

493

00:21:24,350 --> 00:21:21,720

until we've brought that crew lock

494

00:21:26,990 --> 00:21:24,360

section all the way down to vacuum

495

00:21:28,390 --> 00:21:27,000

and so we see Frank Rubio now over in

496

00:21:30,409 --> 00:21:28,400

the crew lock section helped by

497

00:21:32,690 --> 00:21:30,419

koichiwakata and next up we're going to

498

00:21:35,570 --> 00:21:32,700

get Josh cassida off of the mount there

499

00:21:37,130 --> 00:21:35,580

on the wall get his safer attached and

500

00:22:49,750 --> 00:21:37,140

then move him into the crew lock section

501  
00:22:54,049 --> 00:22:52,730  
all right now we see which we're kind of

502  
00:22:56,450 --> 00:22:54,059  
bringing in the safer device that's

503  
00:23:00,529 --> 00:22:56,460  
going to get attached to Josh Cassidy's

504  
00:23:01,789 --> 00:23:00,539  
suit now we're gonna see these two go

505  
00:23:04,130 --> 00:23:01,799  
out of the airlock and then they're

506  
00:23:06,230 --> 00:23:04,140  
gonna kind of go their separate ways at

507  
00:23:08,570 --> 00:23:06,240  
first before meeting back up for the

508  
00:23:12,169 --> 00:23:08,580  
install so Josh cassida is going to be

509  
00:23:15,049 --> 00:23:12,179  
getting into the apfr the articulating

510  
00:23:18,409 --> 00:23:15,059  
portable foot restraint on the Space

511  
00:23:22,909 --> 00:23:18,419  
Station's robotic arm the canadarm 2 and

512  
00:23:27,890 --> 00:23:22,919  
back inside of the station on a

513  
00:23:33,169 --> 00:23:30,230

on the M1 she's going to be the primary

514

00:23:34,730 --> 00:23:33,179

robotics controller essentially for the

515

00:23:38,750 --> 00:23:34,740

spacewalk and she's going to be

516

00:23:40,370 --> 00:23:38,760

literally flying uh cassida as he's at

517

00:23:43,669 --> 00:23:40,380

the tip of that arm to the different

518

00:23:45,590 --> 00:23:43,679

work sites and so they'll cast it in

519

00:23:48,409 --> 00:23:45,600

Rubio we're going to meet back up over

520

00:23:50,390 --> 00:23:48,419

at the FSE the Flight Support equipment

521

00:23:54,110 --> 00:23:50,400

that's the the temporary Stow location

522

00:23:56,890 --> 00:23:54,120

right now for the last irosa array that

523

00:23:59,870 --> 00:23:56,900

just arrived on a SpaceX cargo dragon

524

00:24:02,510 --> 00:23:59,880

and they're gonna work to release some

525

00:24:07,130 --> 00:24:05,149

um uh the beams that are that are in

526

00:24:09,110 --> 00:24:07,140

place to help keep it secure during

527

00:24:11,029 --> 00:24:09,120

launch all the movement operations

528

00:24:13,490 --> 00:24:11,039

they'll remove those beams and then

529

00:24:18,470 --> 00:24:13,500

they'll release the actual array itself

530

00:24:20,750 --> 00:24:18,480

from irosa and then after that uh

531

00:24:22,610 --> 00:24:20,760

flying on the end of the robotic arm

532

00:24:24,350 --> 00:24:22,620

Josh cassid is going to get moved over

533

00:24:26,450 --> 00:24:24,360

to that work site bringing the array

534

00:24:28,430 --> 00:24:26,460

with them and then once they're there

535

00:24:31,130 --> 00:24:28,440

they'll get into the actual installation

536

00:24:33,049 --> 00:24:31,140

steps and that'll involve as we saw

537

00:24:36,190 --> 00:24:33,059

through some of those Graphics

538

00:24:37,970 --> 00:24:36,200

um actually unfolding the array into its

539

00:24:40,549 --> 00:24:37,980

configuration where it could be

540

00:24:43,909 --> 00:24:40,559

installed first thing they'll do is

541

00:24:45,350 --> 00:24:43,919

essentially get it soft captured it'll

542

00:24:46,630 --> 00:24:45,360

slide into place and there's some soft

543

00:24:49,669 --> 00:24:46,640

capture

544

00:24:51,770 --> 00:24:49,679

mechanisms that put that initial hold on

545

00:24:53,810 --> 00:24:51,780

the array and then there's a number of

546

00:24:55,490 --> 00:24:53,820

bolts that they'll drive

547

00:24:59,029 --> 00:24:55,500

to secure it in place and then after

548

00:25:00,710 --> 00:24:59,039

that's done the tension some of the mid

549

00:25:03,230 --> 00:25:00,720

joints to make sure that it stays

550

00:25:05,270 --> 00:25:03,240

unfolded and then we actually step into

551  
00:25:06,289 --> 00:25:05,280  
deploying

552  
00:25:09,710 --> 00:25:06,299  
um

553  
00:25:12,590 --> 00:25:09,720  
or first we actually will will mate the

554  
00:25:14,710 --> 00:25:12,600  
cables that are responsible for

555  
00:25:17,390 --> 00:25:14,720  
integrating that

556  
00:25:20,450 --> 00:25:17,400  
array into the 4A power Channel along

557  
00:25:22,730 --> 00:25:20,460  
with the existing one so that work has

558  
00:25:24,169 --> 00:25:22,740  
to be done in Eclipse

559  
00:25:26,269 --> 00:25:24,179  
um as the

560  
00:25:28,010 --> 00:25:26,279  
the primary inhibit really the the way

561  
00:25:30,350 --> 00:25:28,020  
we make sure that the arrays aren't

562  
00:25:32,930 --> 00:25:30,360  
transmitting any power down to where

563  
00:25:36,289 --> 00:25:32,940

those cable connections are made is to

564

00:25:38,210 --> 00:25:36,299

be an eclipse be on the dark side of

565

00:25:40,070 --> 00:25:38,220

planet Earth where those are raised

566

00:25:43,070 --> 00:25:40,080

can't see the sun can't generate any

567

00:25:45,049 --> 00:25:43,080

electricity and so the the spacewalk

568

00:25:47,750 --> 00:25:45,059

itself is timed

569

00:25:49,430 --> 00:25:47,760

um per our timeline if you've ever

570

00:25:51,590 --> 00:25:49,440

watched a spacewalk you'll know that

571

00:25:54,590 --> 00:25:51,600

every single step essentially timelined

572

00:25:57,289 --> 00:25:54,600

out and practiced here on the ground in

573

00:25:59,649 --> 00:25:57,299

the pool and through previous spacewalks

574

00:26:02,570 --> 00:25:59,659

but the the entire

575

00:26:05,750 --> 00:26:02,580

all the activities there timelines so by

576

00:26:07,970 --> 00:26:05,760

the time we hit the expected point for

577

00:26:10,430 --> 00:26:07,980

essentially that cable connection cable

578

00:26:12,710 --> 00:26:10,440

mating will be in an eclipse so we'll be

579

00:26:14,630 --> 00:26:12,720

on the dark side of Earth those arrays

580

00:26:16,789 --> 00:26:14,640

not generating any electricity and I'm

581

00:26:19,190 --> 00:26:16,799

able to actually made actually install

582

00:26:21,350 --> 00:26:19,200

those cables to start integrating that

583

00:26:25,549 --> 00:26:21,360

and so after those cables get connected

584

00:26:27,230 --> 00:26:25,559

they will deploy the irosa it'll unfurl

585

00:26:30,649 --> 00:26:27,240

all on its own they just release two

586

00:26:32,269 --> 00:26:30,659

bolts and then the array its internal

587

00:26:34,669 --> 00:26:32,279

mechanisms do the rest of the work

588

00:26:36,529 --> 00:26:34,679

actually on furl

589

00:26:37,370 --> 00:26:36,539

and then I'll do one final tensioning

590

00:26:40,669 --> 00:26:37,380

but

591

00:26:42,950 --> 00:26:40,679

um task to enable a device that's gonna

592

00:26:44,990 --> 00:26:42,960

essentially pull on some wire that adds

593

00:26:47,870 --> 00:26:45,000

some tension to the arrays and then it's

594

00:26:51,289 --> 00:26:47,880

on to to clean up stowing some of the

595

00:26:53,210 --> 00:26:51,299

final beams on the temporary spot where

596

00:26:55,070 --> 00:26:53,220

the arrays are stored and then it'll be

597

00:26:58,430 --> 00:26:55,080

onto Ingress coming back inside the air

598

00:27:01,130 --> 00:26:58,440

lock and we start a spacewalk when we

599

00:27:03,350 --> 00:27:01,140

switch to battery power we end a

600

00:27:05,210 --> 00:27:03,360

spacewalk when they begin repressing

601  
00:27:07,430 --> 00:27:05,220  
that crew lock section of the quest

602  
00:27:09,350 --> 00:27:07,440  
airlock

603  
00:27:11,269 --> 00:27:09,360  
so those will be our start and stop

604  
00:27:13,730 --> 00:27:11,279  
points for today

605  
00:27:16,190 --> 00:27:13,740  
but things progressing really smoothly

606  
00:27:18,950 --> 00:27:16,200  
so far we've already got Frank Rubio in

607  
00:27:21,529 --> 00:27:18,960  
the crew lock section and we can see the

608  
00:27:24,289 --> 00:27:21,539  
safer device getting a fix now that's

609  
00:27:26,090 --> 00:27:24,299  
Nicole man on the right side of Josh

610  
00:27:28,490 --> 00:27:26,100  
cast's space suit and as soon as that's

611  
00:27:30,830 --> 00:27:28,500  
there now they're going to start moving

612  
00:27:33,230 --> 00:27:30,840  
cast it into that crew lock section and

613  
00:27:36,049 --> 00:27:33,240

then we'll get ready to move into the

614

00:27:37,490 --> 00:27:36,059

the depressed steps and the teams down

615

00:27:38,870 --> 00:27:37,500

here in Mission Control Houston did

616

00:27:41,450 --> 00:27:38,880

their go no go

617

00:27:44,750 --> 00:27:41,460

and we are going to be go for depress

618

00:27:46,909 --> 00:27:44,760

once the crew is ready so a lot more to

619

00:27:49,250 --> 00:27:46,919

come and we're going to see cassida now

620

00:27:50,330 --> 00:27:49,260

start to make his way over to that crew

621

00:29:05,890 --> 00:27:50,340

lock section

622

00:29:11,269 --> 00:29:08,690

and now we see koichiwakata and Nicole

623

00:29:14,330 --> 00:29:11,279

man guiding Josh Cassidy into that crew

624

00:29:16,070 --> 00:29:14,340

lock section of the quest airlock

625

00:29:18,590 --> 00:29:16,080

save for attached all the different

626  
00:29:21,649 --> 00:29:18,600  
equipment to others from his backpack to

627  
00:29:23,330 --> 00:29:21,659  
his helmet all engaged

628  
00:29:25,909 --> 00:29:23,340  
and so they're gonna put him in his suit

629  
00:29:28,010 --> 00:29:25,919  
and then you can see his service and

630  
00:29:30,250 --> 00:29:28,020  
cooling umbilical that white hose that's

631  
00:29:33,649 --> 00:29:30,260  
kind of looping outside of the left part

632  
00:29:35,690 --> 00:29:33,659  
that'll get moved in as well

633  
00:29:37,990 --> 00:29:35,700  
and then we'll start to hear the crew

634  
00:29:41,269 --> 00:29:38,000  
step through some of the the actual

635  
00:29:42,730 --> 00:29:41,279  
depressurization of the airlock and

636  
00:29:46,610 --> 00:29:42,740  
that's done

637  
00:29:49,190 --> 00:29:46,620  
using essentially two different means we

638  
00:29:51,490 --> 00:29:49,200

have a actual air pump

639

00:29:55,070 --> 00:29:51,500

that's able to extract the atmosphere

640

00:29:58,130 --> 00:29:55,080

and return it to Simply the station's

641

00:30:00,889 --> 00:29:58,140

supply of atmosphere

642

00:30:02,330 --> 00:30:00,899

that's gonna get engaged and that's

643

00:30:05,750 --> 00:30:02,340

going to bring the pressure down to

644

00:30:07,970 --> 00:30:05,760

about 5 PSI and then once we get there

645

00:30:10,010 --> 00:30:07,980

we're going to turn the pump off

646

00:30:11,389 --> 00:30:10,020

and the crew is going to do leak checks

647

00:30:13,190 --> 00:30:11,399

so they do a leak check on their

648

00:30:16,430 --> 00:30:13,200

spacesuit once they're at a lower

649

00:30:19,070 --> 00:30:16,440

pressure inside the crew airlock so

650

00:30:22,070 --> 00:30:19,080

we'll hear the crew status their leak

651  
00:30:24,649 --> 00:30:22,080  
check they'll they'll give a yes no on

652  
00:30:27,289 --> 00:30:24,659  
successful leak check then after that we

653  
00:30:28,850 --> 00:30:27,299  
can continue with the depress and then

654  
00:30:30,649 --> 00:30:28,860  
after that

655  
00:30:33,110 --> 00:30:30,659  
we start to

656  
00:30:35,210 --> 00:30:33,120  
use the the two different systems so

657  
00:30:38,149 --> 00:30:35,220  
that that depress pump can only work

658  
00:30:41,149 --> 00:30:38,159  
down to about 2 PSI after that it's no

659  
00:30:43,070 --> 00:30:41,159  
longer really capable of extracting

660  
00:30:46,250 --> 00:30:43,080  
atmosphere from that crew lock section

661  
00:30:49,330 --> 00:30:46,260  
and so after that they open what's known

662  
00:30:51,889 --> 00:30:49,340  
as an mpev valve to

663  
00:30:54,470 --> 00:30:51,899

just take all of that remaining

664

00:30:56,570 --> 00:30:54,480

atmosphere and it's used to vented

665

00:30:58,310 --> 00:30:56,580

overboard so we do lose a small amount

666

00:31:01,190 --> 00:30:58,320

of what we call consumables just the

667

00:31:03,049 --> 00:31:01,200

breathable atmosphere every time we do a

668

00:31:06,289 --> 00:31:03,059

spacewalk just because your pump can't

669

00:31:08,029 --> 00:31:06,299

work below 2 PSI but it's once you're

670

00:31:11,510 --> 00:31:08,039

down at that low of pressure it's a

671

00:31:14,510 --> 00:31:11,520

pretty negligible amount and so after

672

00:31:16,070 --> 00:31:14,520

that remaining pressure drops all that

673

00:31:19,730 --> 00:31:16,080

remaining atmosphere is vented overboard

674

00:31:21,710 --> 00:31:19,740

we get down to about half a PSI or lower

675

00:31:24,230 --> 00:31:21,720

and then the crew will get the go to

676

00:31:26,529 --> 00:31:24,240

actually open up the hatch and Frank

677

00:31:29,269 --> 00:31:26,539

Rubio's ev1 he's going to be the one

678

00:31:31,250 --> 00:31:29,279

opening up doing the the external hatch

679

00:31:33,830 --> 00:31:31,260

operations for today

680

00:31:37,090 --> 00:31:33,840

huh so we'll hear that so

681

00:31:40,789 --> 00:31:37,100

we're going to hear the suit IV on board

682

00:31:42,110 --> 00:31:40,799

so in this case uh likely koichi ricotta

683

00:31:45,950 --> 00:31:42,120

we're going to hear him talking to the

684

00:31:49,430 --> 00:31:45,960

crew as they step through the depress up

685

00:31:51,710 --> 00:31:49,440

until we get to that we up until we get

686

00:31:53,930 --> 00:31:51,720

that pressure all the way down and then

687

00:31:56,210 --> 00:31:53,940

it's going to hand over to the ground IV

688

00:31:57,889 --> 00:31:56,220

for today and that's going to be NASA

689

00:32:00,370 --> 00:31:57,899

astronaut Nick Hague he's the one we're

690

00:32:02,570 --> 00:32:00,380

gonna hear talking to the crew members

691

00:32:04,190 --> 00:32:02,580

throughout all the different procedures

692

00:32:06,230 --> 00:32:04,200

today

693

00:32:08,510 --> 00:32:06,240

um essentially being the voice for all

694

00:32:10,190 --> 00:32:08,520

the teams down here on the ground and

695

00:32:12,409 --> 00:32:10,200

just a reminder some of your key players

696

00:32:13,970 --> 00:32:12,419

here in the room today you've got uh

697

00:32:16,549 --> 00:32:13,980

Nick Hague who's going to be that suit

698

00:32:19,310 --> 00:32:16,559

IV and then our flight director leading

699

00:32:22,010 --> 00:32:19,320

the teams is Fiona turret and then in

700

00:32:24,230 --> 00:32:22,020

the very back row we've got Chris Mundy

701  
00:32:26,210 --> 00:32:24,240  
he's the Eva Flight controller leading

702  
00:32:29,210 --> 00:32:26,220  
all of the different flight control

703  
00:32:32,149 --> 00:32:29,220  
teams responsible for building training

704  
00:32:34,490 --> 00:32:32,159  
executing today's spacewalk we always

705  
00:32:36,169 --> 00:32:34,500  
talk about how everybody in this room is

706  
00:32:38,450 --> 00:32:36,179  
essentially just the tip of the spear

707  
00:32:40,430 --> 00:32:38,460  
the tip of the iceberg we've got a

708  
00:32:43,070 --> 00:32:40,440  
couple of other key folks on the Eva

709  
00:32:45,350 --> 00:32:43,080  
team that are going to be working with

710  
00:32:47,750 --> 00:32:45,360  
Chris today some of those primary

711  
00:32:50,289 --> 00:32:47,760  
positions we have an Eva task officer

712  
00:32:52,789 --> 00:32:50,299  
this is somebody who

713  
00:32:56,029 --> 00:32:52,799

understands every procedure in the CVA

714

00:32:57,830 --> 00:32:56,039

front to back and essentially all by

715

00:33:00,409 --> 00:32:57,840

heart at this point and for today that's

716

00:33:02,029 --> 00:33:00,419

going to be Miranda Nelson with the task

717

00:33:04,130 --> 00:33:02,039

support position coming from Lucas

718

00:33:06,649 --> 00:33:04,140

Widener and then we'll have two

719

00:33:07,970 --> 00:33:06,659

essentially technical Specialists on the

720

00:33:10,430 --> 00:33:07,980

Eva team

721

00:33:12,470 --> 00:33:10,440

um today it's Michael Dino he's the Emu

722

00:33:16,009 --> 00:33:12,480

the extra vehicular Mobility unit

723

00:33:19,250 --> 00:33:16,019

specialist essentially knowledgeable and

724

00:33:21,350 --> 00:33:19,260

all all things spacesuit for today and

725

00:33:23,590 --> 00:33:21,360

then Stephen Villano is going to be our

726

00:33:26,029 --> 00:33:23,600

airlock specialist

727

00:33:27,529 --> 00:33:26,039

responsible for overseeing all the

728

00:33:29,330 --> 00:33:27,539

different systems in the airlock which

729

00:33:32,690 --> 00:33:29,340

we're still on right now

730

00:33:34,909 --> 00:33:32,700

um so that team working together to help

731

00:33:50,649 --> 00:33:34,919

the flight control team get ready and to

732

00:33:55,190 --> 00:33:53,149

all right and right now we can see

733

00:33:57,169 --> 00:33:55,200

koichi so

734

00:33:59,029 --> 00:33:57,179

he was just talking they have a Hardline

735

00:34:01,730 --> 00:33:59,039

connection right now between the crew

736

00:34:04,310 --> 00:34:01,740

and the equipment lock and and the crew

737

00:34:07,490 --> 00:34:04,320

both Cassidy and Rubio in their

738

00:34:11,210 --> 00:34:09,409

and then once we get to the actual

739

00:34:13,669 --> 00:34:11,220

depress though we'll start to hear a lot

740

00:34:15,409 --> 00:34:13,679

more chatter you'll hear

741

00:34:19,310 --> 00:34:15,419

um koichi essentially giving them

742

00:34:22,730 --> 00:34:19,320

instructions to as they're switching a

743

00:34:24,950 --> 00:34:22,740

depressed pump on that located on the

744

00:34:28,250 --> 00:34:24,960

UIA the umbilical interface assembly

745

00:34:30,609 --> 00:34:28,260

that's a large control panel

746

00:34:32,990 --> 00:34:30,619

um unit that's inside and that's

747

00:34:34,730 --> 00:34:33,000

connected to those service and cooling

748

00:34:37,730 --> 00:34:34,740

umbilicals that's the main interface

749

00:34:42,829 --> 00:34:37,740

between the spacesuits and the airlock

750

00:34:48,109 --> 00:34:46,010

before we get though before we get there

751  
00:34:50,389 --> 00:34:48,119  
they're making sure they have all of

752  
00:34:52,609 --> 00:34:50,399  
their tools we don't have any extra

753  
00:34:54,169 --> 00:34:52,619  
Hardware in the crew lock itself as

754  
00:34:57,109 --> 00:34:54,179  
again that's about to be exposed to

755  
00:34:59,690 --> 00:34:57,119  
vacuum so they do just a final sweep of

756  
00:35:50,329 --> 00:34:59,700  
that and then we'll see the hatch get

757  
00:36:18,290 --> 00:35:52,550  
station Houston on Space round one for

758  
00:36:21,710 --> 00:36:20,390  
head on one

759  
00:36:23,329 --> 00:36:21,720  
maybe just want to give you a heads up

760  
00:36:28,310 --> 00:36:23,339  
the ground is putting step 80 in place

761  
00:36:28,320 --> 00:36:35,150  
okay who's going hot Mike

762  
00:36:39,589 --> 00:36:37,430  
yeah that was Capcom Megan Levin's

763  
00:36:41,150 --> 00:36:39,599

talking to Nicole man on board the

764

00:36:43,609 --> 00:36:41,160

station giving them a heads up so the

765

00:36:45,170 --> 00:36:43,619

crew inside the suits gosh cast of Frank

766

00:36:47,329 --> 00:36:45,180

Rubio they're going to be hot Mikes so

767

00:36:49,190 --> 00:36:47,339

won't have any push to talk required

768

00:36:50,930 --> 00:36:49,200

they're just gonna be able to talk in

769

00:36:51,410 --> 00:36:50,940

real time throughout the space walk

770

00:36:55,030 --> 00:36:51,420

today

771

00:37:00,349 --> 00:36:57,710

and we see koichiwakada working to get

772

00:37:01,970 --> 00:37:00,359

the hatch close isolating the crew lock

773

00:37:24,100 --> 00:37:01,980

section

774

00:37:33,349 --> 00:37:26,630

[Music]

775

00:37:48,410 --> 00:37:35,510

happy five

776  
00:37:48,420 --> 00:37:50,590  
ES

777  
00:37:50,600 --> 00:38:12,890  
[Music]

778  
00:38:19,310 --> 00:38:14,990  
so now look

779  
00:38:20,930 --> 00:38:19,320  
we're in Step 77 and 76 and 77 are

780  
00:38:27,109 --> 00:38:20,940  
complete

781  
00:38:32,870 --> 00:38:29,750  
and you guys can take care of steps 78

782  
00:38:32,880 --> 00:38:39,170  
copy it didn't work

783  
00:38:43,310 --> 00:38:40,849  
and so with those call Downs great

784  
00:38:45,770 --> 00:38:43,320  
letting the team here in Houston know

785  
00:38:48,410 --> 00:38:45,780  
that the hatch has been closed

786  
00:38:50,390 --> 00:38:48,420  
the emergency empaths or the manual

787  
00:38:53,210 --> 00:38:50,400  
pressure Equalization valve is closed

788  
00:38:55,370 --> 00:38:53,220

that gets closed and before we step into

789

00:38:58,370 --> 00:38:55,380

the actual depress activities again

790

00:39:00,190 --> 00:38:58,380

we're going to be initially using that

791

00:39:04,609 --> 00:39:00,200

pump to

792

00:39:06,890 --> 00:39:04,619

essentially pump the atmosphere out of

793

00:39:08,450 --> 00:39:06,900

out of the crew lock section of the

794

00:39:10,730 --> 00:39:08,460

quest airlock we're going to bring it

795

00:39:14,630 --> 00:39:10,740

down to 5 PSI

796

00:39:17,810 --> 00:39:14,640

and then pause to allow the crew to do a

797

00:39:21,230 --> 00:39:17,820

quick leak check on their suits and then

798

00:39:23,329 --> 00:39:21,240

we'll resume and then we'll get

799

00:39:26,030 --> 00:39:23,339

that defrost prompt bringing it down to

800

00:39:28,010 --> 00:39:26,040

about two PSI and then we start to also

801  
00:39:30,950 --> 00:39:28,020  
use now what's known as the emergency

802  
00:39:33,109 --> 00:39:30,960  
EMP manual pressure Equalization valve

803  
00:39:35,089 --> 00:39:33,119  
and what that's essentially doing is

804  
00:39:37,310 --> 00:39:35,099  
taking the remaining atmosphere out of

805  
00:39:39,829 --> 00:39:37,320  
the crew lock section and dumping it out

806  
00:39:44,630 --> 00:39:39,839  
into the vacuum of space as that pump

807  
00:39:46,970 --> 00:39:44,640  
stops to work once we get down to 2 PSI

808  
00:39:48,349 --> 00:39:46,980  
so all that's coming up meanwhile the

809  
00:39:50,030 --> 00:39:48,359  
the teams here on the ground are just

810  
00:39:52,310 --> 00:39:50,040  
doing some final configuration work we

811  
00:39:54,230 --> 00:39:52,320  
heard the crew go hop mic so they're

812  
00:39:57,230 --> 00:39:54,240  
going to be talking without any push to

813  
00:40:01,430 --> 00:39:59,329

without push to talk being necessary

814

00:40:02,690 --> 00:40:01,440

throughout their space flight or their

815

00:40:05,450 --> 00:40:02,700

spacewalk and we're going to be hearing

816

00:40:08,210 --> 00:40:05,460

them talk directly to the ground IV here

817

00:40:17,200 --> 00:40:08,220

in Houston and that's going to be NASA

818

00:40:17,210 --> 00:40:34,089

[Music]

819

00:40:39,050 --> 00:40:36,710

station Houston on Space to ground one

820

00:40:45,170 --> 00:40:39,060

for airlock step 78 through 80 are

821

00:40:51,890 --> 00:40:48,829

okay copy that thank you and uh both TV

822

00:40:56,770 --> 00:40:51,900

cucumbers hot mic to uh on the space

823

00:40:56,780 --> 00:41:04,730

maybe two copies thanks

824

00:41:13,790 --> 00:41:10,730

okay yeah Josh on UIA please check

825

00:41:17,210 --> 00:41:13,800

defense hour is

826

00:41:20,329 --> 00:41:17,220

the difference from Power offs

827

00:41:23,030 --> 00:41:20,339

and then please verifying

828

00:41:27,250 --> 00:41:23,040

LED on

829

00:41:30,710 --> 00:41:27,260

the first Power enable illuminated

830

00:41:37,930 --> 00:41:30,720

Houston we are in Step 84 with your goal

831

00:41:37,940 --> 00:41:42,890

and station your go

832

00:41:42,900 --> 00:41:46,130

sh thank you

833

00:41:52,670 --> 00:41:49,490

okay Josh we will start the Deep rescue

834

00:41:59,750 --> 00:41:56,870

on UIA which detects from the power to

835

00:42:14,270 --> 00:41:59,760

arm and wait 10 seconds for a complete

836

00:42:16,690 --> 00:42:15,100

S

837

00:42:20,270 --> 00:42:16,700

[Music]

838

00:42:29,290 --> 00:42:20,280

manual ISO valve to open and both of you

839

00:42:29,300 --> 00:42:35,050

gauges less than 5.5

840

00:42:35,060 --> 00:42:51,290

the first pump man I sold is open

841

00:42:56,089 --> 00:42:54,290

and without the depressurization of the

842

00:42:58,910 --> 00:42:56,099

crew lock section of the quest airlock

843

00:43:01,309 --> 00:42:58,920

is in work so we were just listening as

844

00:43:03,770 --> 00:43:01,319

koichiwakata was walking Josh Castle's

845

00:43:06,050 --> 00:43:03,780

ev2 he's working at the UIA the

846

00:43:07,970 --> 00:43:06,060

umbilical interface assembly it's

847

00:43:10,069 --> 00:43:07,980

showing a control panel that they have

848

00:43:11,990 --> 00:43:10,079

inside of the crew lock section that

849

00:43:14,510 --> 00:43:12,000

allows them to access the depress pump

850

00:43:15,710 --> 00:43:14,520

on their surface and cooling umbilicals

851  
00:43:19,370 --> 00:43:15,720  
that are connected to their suits

852  
00:43:21,710 --> 00:43:19,380  
providing power Hardline calm and also

853  
00:43:24,410 --> 00:43:21,720  
fluids at this point so still integrated

854  
00:43:27,170 --> 00:43:24,420  
into the station systems we did get

855  
00:43:29,150 --> 00:43:27,180  
confirmation that the pressure is now

856  
00:43:32,089 --> 00:43:29,160  
dropping inside of the crew lock so

857  
00:43:34,250 --> 00:43:32,099  
we're going to continue to just draw

858  
00:43:35,990 --> 00:43:34,260  
that atmosphere out using the depress

859  
00:43:39,710 --> 00:43:36,000  
pump until the crew lock gets to right

860  
00:43:43,849 --> 00:43:39,720  
about 5 PSI at which point the crew lock

861  
00:43:46,130 --> 00:43:43,859  
is going to get the direction to shut

862  
00:43:49,190 --> 00:43:46,140  
that pump down they're going to close

863  
00:43:50,750 --> 00:43:49,200

that isolation valve and then at that

864

00:43:52,970 --> 00:43:50,760

point they're then going to step into

865

00:43:55,130 --> 00:43:52,980

leak checks so doing quick automated

866

00:43:57,890 --> 00:43:55,140

leak checks using the display and

867

00:44:00,710 --> 00:43:57,900

control module on their spacesuits of

868

00:44:02,230 --> 00:44:00,720

their emu's because again while we still

869

00:44:04,670 --> 00:44:02,240

have pressure inside

870

00:44:07,609 --> 00:44:04,680

the the emus are going to be at a

871

00:44:09,530 --> 00:44:07,619

slightly higher pressure than that 5 PSI

872

00:44:11,210 --> 00:44:09,540

and they're going to do a leak check and

873

00:44:12,589 --> 00:44:11,220

make sure we don't have any atmosphere

874

00:44:15,230 --> 00:44:12,599

or anything like that coming out of the

875

00:44:17,750 --> 00:44:15,240

suit after we get past leak checks we'll

876

00:44:19,849 --> 00:44:17,760

step back into that depress activity

877

00:44:21,349 --> 00:44:19,859

they're going to open that isolation

878

00:44:24,589 --> 00:44:21,359

valve again that's going to allow the

879

00:44:26,690 --> 00:44:24,599

depress pump to continue working they're

880

00:44:29,329 --> 00:44:26,700

also going to open What's called an

881

00:44:32,750 --> 00:44:29,339

emergency mpev manual pressure

882

00:44:36,230 --> 00:44:32,760

Equalization valve we start using that

883

00:44:39,770 --> 00:44:36,240

after we're below 5 PSI essentially

884

00:44:42,710 --> 00:44:39,780

working in conjunction with the the pump

885

00:44:45,650 --> 00:44:42,720

itself and that's going to continue

886

00:44:47,990 --> 00:44:45,660

until the crew lock hits about 2 PSI at

887

00:44:49,130 --> 00:44:48,000

that point uh the pump its valve is

888

00:44:50,870 --> 00:44:49,140

going to get closed and it's going to

889

00:44:53,690 --> 00:44:50,880

get powered off as the pump stops

890

00:44:56,930 --> 00:44:53,700

working once we get to 2 PSI and below

891

00:44:58,849 --> 00:44:56,940

the emergency empah remains opened as

892

00:45:01,190 --> 00:44:58,859

we will continue to watch the pressure

893

00:45:03,829 --> 00:45:01,200

drop we'll get to a little less than

894

00:45:06,530 --> 00:45:03,839

half of a PSI usually a lot closer to

895

00:45:08,569 --> 00:45:06,540

zero at which point we're essentially in

896

00:45:10,849 --> 00:45:08,579

vacuum you'll have essentially an equal

897

00:45:12,589 --> 00:45:10,859

pressure between the crew lock and the

898

00:45:14,410 --> 00:45:12,599

outside of the space station which is a

899

00:45:17,210 --> 00:45:14,420

vacuum

900

00:45:21,250 --> 00:45:17,220

to remove that in afghanisters are

901  
00:45:32,030 --> 00:45:21,260  
serial number 20 and 25th

902  
00:45:38,089 --> 00:45:34,730  
and then I call down right there was

903  
00:45:39,770 --> 00:45:38,099  
um reporting the the removal of

904  
00:45:43,309 --> 00:45:39,780  
um some of the canisters that are used

905  
00:45:47,150 --> 00:45:43,319  
to remove CO2 while everybody's inside

906  
00:45:49,130 --> 00:45:47,160  
of the equipment locks section

907  
00:45:52,490 --> 00:45:49,140  
so at this point all those all of that

908  
00:45:54,470 --> 00:45:52,500  
CO2 removal being done by the normal

909  
00:45:57,950 --> 00:45:54,480  
station systems like the seizure the

910  
00:46:00,410 --> 00:45:57,960  
carbon dioxide removal assembly

911  
00:46:02,990 --> 00:46:00,420  
we talked a little bit earlier about the

912  
00:46:04,790 --> 00:46:03,000  
medox canisters inside the spacesuits

913  
00:46:06,170 --> 00:46:04,800

that's how we're essentially capturing

914

00:46:08,089 --> 00:46:06,180

that carbon dioxide that they're

915

00:46:11,150 --> 00:46:08,099

breathing out throughout their spacewalk

916

00:46:13,490 --> 00:46:11,160

those those are regenerative so they

917

00:46:14,390 --> 00:46:13,500

have essentially a saturation point of

918

00:46:19,370 --> 00:46:14,400

which

919

00:46:21,410 --> 00:46:19,380

remove any more CO<sub>2</sub> as they're using a

920

00:46:24,170 --> 00:46:21,420

chemical process using an oxide inside

921

00:46:26,690 --> 00:46:24,180

once all that oxide is used up we're not

922

00:46:29,930 --> 00:46:26,700

removing any more CO<sub>2</sub> so that's why

923

00:46:31,430 --> 00:46:29,940

we're keeping an eye on that and some of

924

00:46:34,550 --> 00:46:31,440

the other consumables throughout the

925

00:46:36,589 --> 00:46:34,560

spacewalk just to determine how long

926

00:46:39,530 --> 00:46:36,599

we're going to be out the door after

927

00:46:42,170 --> 00:46:39,540

space walks so those medox canisters get

928

00:46:44,809 --> 00:46:42,180

removed and then they get put into a

929

00:46:47,510 --> 00:46:44,819

regenerative system it's essentially an

930

00:46:50,630 --> 00:46:47,520

oven where we heat those canisters up

931

00:46:53,270 --> 00:46:50,640

that breaks the bonds between that oxide

932

00:46:55,309 --> 00:46:53,280

and the carbon dioxide that oxide can

933

00:46:57,550 --> 00:46:55,319

then be used again that carbon dioxide

934

00:47:00,710 --> 00:46:57,560

gets dumped into the larger station

935

00:47:02,930 --> 00:47:00,720

atmosphere and then gets removed using

936

00:47:04,910 --> 00:47:02,940

the the e-close the life support system

937

00:47:07,569 --> 00:47:04,920

on board station so that's how we're

938

00:47:10,670 --> 00:47:07,579

kind of constantly reusing and recycling

939

00:47:13,990 --> 00:47:10,680

these medox canisters used in these

940

00:47:15,950 --> 00:47:14,000

spacesuits for spacewalks

941

00:47:18,050 --> 00:47:15,960

keeping an eye though the crew lock

942

00:47:20,809 --> 00:47:18,060

section's still a little over eight and

943

00:47:23,270 --> 00:47:20,819

a half PSI we're counting down from

944

00:47:25,970 --> 00:47:23,280

about 14.7 which is what the station

945

00:47:27,730 --> 00:47:25,980

atmosphere is kept at it's pretty close

946

00:47:31,190 --> 00:47:27,740

um to what you have here at seed level

947

00:47:33,349 --> 00:47:31,200

14.7 PSI we're gonna see the pressure

948

00:47:36,410 --> 00:47:33,359

continue to tick down in the crew lock

949

00:47:39,730 --> 00:47:36,420

section until we're at about five at

950

00:47:42,050 --> 00:47:39,740

which point uh Josh cassid is going to

951  
00:47:44,809 --> 00:47:42,060  
essentially close the valve turn that

952  
00:47:47,089 --> 00:47:44,819  
pump off stop it from working so they

953  
00:47:50,089 --> 00:47:47,099  
can conduct those leak checks and then

954  
00:47:53,390 --> 00:47:50,099  
after we're past the leak checks we can

955  
00:47:54,829 --> 00:47:53,400  
start to get into the final D press and

956  
00:47:56,569 --> 00:47:54,839  
then the beginning of our spacewalk

957  
00:47:59,690 --> 00:47:56,579  
reminder

958  
00:48:01,550 --> 00:47:59,700  
for the U.S spacewalks operationally we

959  
00:48:02,990 --> 00:48:01,560  
Mark the beginning of a spacewalk is

960  
00:48:05,150 --> 00:48:03,000  
when the crew switches over to battery

961  
00:48:07,010 --> 00:48:05,160  
power so it's after they're off those

962  
00:48:09,530 --> 00:48:07,020  
umbilicals and running solely on

963  
00:48:13,250 --> 00:48:09,540

batteries inside the suits at that point

964

00:48:16,309 --> 00:48:13,260

we will already be in a vacuum setting

965

00:48:18,349 --> 00:48:16,319

inside the airlock and then we're going

966

00:48:20,630 --> 00:48:18,359

to continue the timer until they're back

967

00:48:22,609 --> 00:48:20,640

in the airlock at the very end and once

968

00:48:25,309 --> 00:48:22,619

the hatch is closed and we start to get

969

00:48:37,309 --> 00:48:25,319

the repressurization of the airlock

970

00:48:37,319 --> 00:49:01,490

ah

971

00:49:09,829 --> 00:49:04,550

he'd be running two when the crew lock

972

00:49:17,710 --> 00:49:09,839

gets to 610 PSI expect alert tone give

973

00:49:22,309 --> 00:49:20,390

and the crew lock right now coming up on

974

00:49:25,370 --> 00:49:22,319

7 PSI the crew is gonna need an alert

975

00:49:27,950 --> 00:49:25,380

tone at six and then once we get to five

976  
00:49:30,290 --> 00:49:27,960  
they're gonna close the isolation valve

977  
00:49:32,030 --> 00:49:30,300  
on that depressurization pump it's going

978  
00:49:33,890 --> 00:49:32,040  
to stop it from drawing the atmosphere

979  
00:49:35,510 --> 00:49:33,900  
out and then we'll step into those leak

980  
00:49:38,630 --> 00:49:35,520  
checks you're going to hear them refer

981  
00:49:40,430 --> 00:49:38,640  
to as ev1 ev2 just a reminder ev1 for

982  
00:49:43,309 --> 00:49:40,440  
today's Frank Rubio he's your lead space

983  
00:49:45,470 --> 00:49:43,319  
walker lead spacewalker he's going to be

984  
00:49:47,990 --> 00:49:45,480  
primed for all of the hatch operations

985  
00:49:49,309 --> 00:49:48,000  
when we're getting ready to exit the

986  
00:49:51,589 --> 00:49:49,319  
quests are locked and where we're coming

987  
00:49:54,829 --> 00:49:51,599  
back at the end and then ev2's Josh

988  
00:49:57,410 --> 00:49:54,839

cassida this is the third spacewalk for

989

00:50:00,410 --> 00:49:57,420

this pair they've already completed two

990

00:50:02,990 --> 00:50:00,420

each in excess of seven hours this one

991

00:50:04,250 --> 00:50:03,000

also planned to to last about seven

992

00:50:07,490 --> 00:50:04,260

hours it's

993

00:50:09,470 --> 00:50:07,500

uh I'm gonna look very similar to the

994

00:50:11,569 --> 00:50:09,480

spacewalk that they just did back on

995

00:50:14,390 --> 00:50:11,579

December 3rd where they installed one of

996

00:50:16,430 --> 00:50:14,400

these iOS solar arrays at this point

997

00:50:18,530 --> 00:50:16,440

we're just going to a different Power

998

00:50:21,770 --> 00:50:18,540

channel so

999

00:50:23,930 --> 00:50:21,780

we're continuing to follow along we're

1000

00:50:25,970 --> 00:50:23,940

at about six and a half PSI inside the

1001  
00:50:27,349 --> 00:50:25,980  
crew lock so again that next major

1002  
00:51:24,530 --> 00:50:27,359  
checkpoint is going to be once we hit

1003  
00:51:28,670 --> 00:51:26,630  
and meanwhile in the equipment lock

1004  
00:51:29,930 --> 00:51:28,680  
section we're continuing to see Nicole

1005  
00:51:31,670 --> 00:51:29,940  
man on the left because you were kind of

1006  
00:51:34,549 --> 00:51:31,680  
there in the middle he's got in his hand

1007  
00:51:36,049 --> 00:51:34,559  
what's known as the depress repress Q

1008  
00:51:38,450 --> 00:51:36,059  
card that's where he's reading off the

1009  
00:51:42,170 --> 00:51:38,460  
procedures to get the instructions to

1010  
00:51:43,370 --> 00:51:42,180  
the crew and we're below 6 PSI now so

1011  
00:51:45,710 --> 00:51:43,380  
we're going to be coming up soon on that

1012  
00:51:48,829 --> 00:51:45,720  
5 PSI hold point they're going to

1013  
00:51:51,230 --> 00:51:48,839

continue to put the crew lock or the

1014

00:51:52,370 --> 00:51:51,240

equipment lock section I kind of back in

1015

00:51:54,950 --> 00:51:52,380

order a little bit and then they're

1016

00:51:56,809 --> 00:51:54,960

going to move over to set up for the

1017

00:51:58,250 --> 00:51:56,819

robotic operations for today so they're

1018

00:52:01,609 --> 00:51:58,260

going to be responsible for operating

1019

00:52:04,750 --> 00:52:01,619

the canadarm II the big robotic arm as

1020

00:52:16,849 --> 00:52:04,760

they're going to be using that to

1021

00:52:22,309 --> 00:52:19,069

again I'm going to be using that robotic

1022

00:52:31,309 --> 00:52:22,319

arm uh Josh cast is going to be

1023

00:52:36,230 --> 00:52:33,170

here's an ev1

1024

00:52:37,910 --> 00:52:36,240

sold in my tcv I moved it to six it was

1025

00:53:12,049 --> 00:52:37,920

a

1026

00:53:18,740 --> 00:53:12,059

cold the cooling is inside their suits

1027

00:53:18,750 --> 00:53:26,809

[Applause]

1028

00:53:34,730 --> 00:53:28,849

and coffee the sound creature we are

1029

00:53:39,190 --> 00:53:37,370

I just confirm the deepest Sub menu is

1030

00:53:43,490 --> 00:53:39,200

the valves close

1031

00:53:47,270 --> 00:53:43,500

man Isle valve is closed thank you

1032

00:53:50,930 --> 00:53:47,280

pdu one and two and we do the early

1033

00:54:01,010 --> 00:53:50,940

check so um switch display that until

1034

00:54:07,549 --> 00:54:03,049

reach your question mark for evening two

1035

00:54:21,910 --> 00:54:10,750

switch and follow displayed instructions

1036

00:54:27,109 --> 00:54:24,410

all right so right now we're holding at

1037

00:54:29,630 --> 00:54:27,119

five PSI inside of that crew lock

1038

00:54:31,309 --> 00:54:29,640

section where Frank Ruby on Josh Castle

1039

00:55:07,790 --> 00:54:31,319

are suited up they're now stepping

1040

00:55:17,390 --> 00:55:10,849

complete

1041

00:55:45,829 --> 00:55:17,400

actuator in Eda

1042

00:55:50,930 --> 00:55:48,829

and getting word we've had two good leak

1043

00:55:52,790 --> 00:55:50,940

checks so both suits checked out looking

1044

00:55:54,890 --> 00:55:52,800

good for today

1045

00:55:57,470 --> 00:55:54,900

next up we're going to be able to step

1046

00:56:03,530 --> 00:55:57,480

back in to start continuing with the

1047

00:56:07,490 --> 00:56:05,030

so at this point we're going to hear

1048

00:56:09,650 --> 00:56:07,500

them essentially turn that turn that

1049

00:56:12,950 --> 00:56:09,660

deep press pump back on opening up that

1050

00:56:14,690 --> 00:56:12,960

isolation valve and then also opening up

1051  
00:56:17,030 --> 00:56:14,700  
what's called the emergency hump have

1052  
00:56:21,170 --> 00:56:17,040  
that's a manual pressure Equalization

1053  
00:56:25,069 --> 00:56:23,569  
and those two are going to work in

1054  
00:56:26,809 --> 00:56:25,079  
concert to continue dropping the

1055  
00:56:28,370 --> 00:56:26,819  
pressure down now that

1056  
00:56:30,410 --> 00:56:28,380  
uh deep restaurant's going to continue

1057  
00:56:32,150 --> 00:56:30,420  
working until we're at about 2 PSI

1058  
00:56:35,390 --> 00:56:32,160  
inside the airlock then that's going to

1059  
00:56:37,790 --> 00:56:35,400  
get turned off and then the rest of the

1060  
00:57:05,230 --> 00:56:37,800  
atmosphere will go out via that of that

1061  
00:57:12,710 --> 00:57:08,990  
an O2 position of Eva for ev2

1062  
00:57:15,770 --> 00:57:12,720  
see that thank you for Josh depressed

1063  
00:57:17,809 --> 00:57:15,780

pump manual ISO valve to open and both

1064

00:57:20,210 --> 00:57:17,819

of you expect other tone

1065

00:57:22,670 --> 00:57:20,220

do you want coffee

1066

00:57:24,530 --> 00:57:22,680

you two coffees depressed pump man ISO

1067

00:57:45,910 --> 00:57:24,540

valve coming to open

1068

00:57:50,950 --> 00:57:48,650

is already open right

1069

00:58:00,069 --> 00:57:50,960

he first thought man I feel about this

1070

00:58:04,609 --> 00:58:03,530

81 and two monitor 30 gauge less than

1071

00:58:24,010 --> 00:58:04,619

5.5

1072

00:58:29,809 --> 00:58:26,510

and so by opening up that isolation

1073

00:58:31,970 --> 00:58:29,819

valve the depress is once again in work

1074

00:58:33,650 --> 00:58:31,980

so that depressed pump we're already at

1075

00:58:35,510 --> 00:58:33,660

about four and a quarter PSI so it's

1076

00:58:37,730 --> 00:58:35,520

going to continue taking down

1077

00:58:40,010 --> 00:58:37,740

again until we get to about two and then

1078

00:58:41,809 --> 00:58:40,020

all the work gets done by that manual

1079

00:58:43,250 --> 00:58:41,819

pressure Equalization valve to get the

1080

00:58:45,770 --> 00:58:43,260

rest of the atmosphere that's going to

1081

00:58:46,789 --> 00:58:45,780

get vented out the pump saves all the

1082

00:58:49,549 --> 00:58:46,799

atmosphere

1083

00:58:51,349 --> 00:58:49,559

the valve rejects it out into the vacuum

1084

00:58:54,470 --> 00:58:51,359

of space so we do lose a small amount of

1085

00:58:58,730 --> 00:58:54,480

atmosphere with every single spacewalk

1086

00:59:01,010 --> 00:58:58,740

but it's largely a negligible amount and

1087

00:59:03,230 --> 00:59:01,020

we have the capability to continually

1088

00:59:05,569 --> 00:59:03,240

essentially put breathing gases back

1089

00:59:08,030 --> 00:59:05,579

into the uh the station's atmosphere

1090

00:59:09,890 --> 00:59:08,040

through cargo flights but the majority

1091

00:59:31,970 --> 00:59:09,900

of it just constantly being recycled by

1092

00:59:31,980 --> 01:01:07,730

yes

1093

01:01:57,410 --> 01:01:54,349

foreign

1094

01:02:01,430 --> 01:01:59,750

and just checking in we're continuing

1095

01:02:04,190 --> 01:02:01,440

with the depress of the crew lock

1096

01:02:06,109 --> 01:02:04,200

section of the quest airlock we're down

1097

01:02:08,510 --> 01:02:06,119

just above two

1098

01:02:09,829 --> 01:02:08,520

so again after we get uh to two the

1099

01:02:14,109 --> 01:02:09,839

pump's going to come off and then it's

1100

01:02:24,849 --> 01:02:14,119

over uh to a manual valve to

1101

01:02:33,049 --> 01:02:29,630

man ISO valve is closed okay on UIA

1102

01:02:35,680 --> 01:02:33,059

switch depressed pump power

1103

01:02:35,690 --> 01:02:39,049

[Applause]

1104

01:02:43,990 --> 01:02:41,150

okay thank you and I will hand over to

1105

01:02:46,309 --> 01:02:44,000

Nick for the following

1106

01:02:51,829 --> 01:02:46,319

procedures I will talk with you from the

1107

01:02:51,839 --> 01:02:55,849

amazing job two days in a row

1108

01:02:59,809 --> 01:02:58,130

couldn't agree more thanks Gucci Duke

1109

01:03:01,010 --> 01:02:59,819

for getting them all suited up and ready

1110

01:03:04,370 --> 01:03:01,020

to go

1111

01:03:06,589 --> 01:03:04,380

and good morning slash afternoon Josh

1112

01:03:10,609 --> 01:03:06,599

Frank uh let's start by going through

1113

01:03:14,569 --> 01:03:12,650

okay good morning and uh

1114

01:03:15,829 --> 01:03:14,579

thank you through the entirety for

1115

01:03:17,329 --> 01:03:15,839

getting us here

1116

01:03:19,549 --> 01:03:17,339

good job and looking forward to working

1117

01:03:28,970 --> 01:03:19,559

with YouTube

1118

01:03:28,980 --> 01:03:31,910

that's my way

1119

01:03:31,920 --> 01:03:40,609

ah

1120

01:03:40,619 --> 01:03:44,089

there you go

1121

01:03:52,370 --> 01:03:47,030

hey Red Hook is on my right dealing

1122

01:03:55,789 --> 01:03:53,750

Gabriel

1123

01:03:57,589 --> 01:03:55,799

is on

1124

01:04:03,470 --> 01:03:57,599

my yellow heart Compares over to my

1125

01:04:10,309 --> 01:04:08,329

uh get close there is a mark

1126  
01:04:12,589 --> 01:04:10,319  
and then my anchor hook I was on my mini

1127  
01:04:16,910 --> 01:04:12,599  
Workstation

1128  
01:04:21,589 --> 01:04:19,549  
these are my right viewing extended get

1129  
01:04:25,069 --> 01:04:21,599  
closer clocks back on back

1130  
01:04:28,490 --> 01:04:25,079  
and that goes over to Josh's

1131  
01:04:30,710 --> 01:04:28,500  
garage and I can see both hooks are gate

1132  
01:04:30,720 --> 01:04:35,049  
Joshua go over to you okay

1133  
01:04:41,150 --> 01:04:38,390  
explaining with my left side my left

1134  
01:04:42,770 --> 01:04:41,160  
weight Center if gate close fighter

1135  
01:04:44,870 --> 01:04:42,780  
locks left on black on Mikey range

1136  
01:04:47,510 --> 01:04:44,880  
extender it goes to the d-ring extender

1137  
01:04:49,609 --> 01:04:47,520  
of the air lock that hook is getting

1138  
01:04:54,890 --> 01:04:49,619

close by the Lost black on black

1139

01:04:59,870 --> 01:04:57,049

without any face each other

1140

01:05:02,690 --> 01:04:59,880

to get close by the lock black on black

1141

01:05:05,750 --> 01:05:02,700

is my 55 foot

1142

01:05:07,309 --> 01:05:05,760

is unlocked and goes to my mini

1143

01:05:09,470 --> 01:05:07,319

workstation

1144

01:05:12,829 --> 01:05:09,480

am I right sir

1145

01:05:15,170 --> 01:05:12,839

I've got my safety tether pack my Red

1146

01:05:17,870 --> 01:05:15,180

Hook gate code sorry black on black on

1147

01:05:21,349 --> 01:05:17,880

the Mikey range extender

1148

01:05:24,890 --> 01:05:21,359

preview is unlocked on that red reel is

1149

01:05:26,329 --> 01:05:24,900

a green hook it is unlocked

1150

01:05:29,450 --> 01:05:26,339

the yellow hook

1151  
01:05:32,329 --> 01:05:29,460  
goes to my green reel it is gate closed

1152  
01:05:37,250 --> 01:05:32,339  
right a lot black on black green or that

1153  
01:05:37,260 --> 01:05:45,770  
[Applause]

1154  
01:05:45,780 --> 01:05:49,430  
and finally

1155  
01:05:49,440 --> 01:05:53,690  
I right way feather

1156  
01:05:59,030 --> 01:05:56,270  
is gate clothes a sweater lock black on

1157  
01:06:03,230 --> 01:05:59,040  
black on my right DNA extender and it

1158  
01:06:38,510 --> 01:06:05,990  
and Frank Josh we copy all that is a

1159  
01:06:38,520 --> 01:07:17,650  
foreign

1160  
01:07:23,329 --> 01:07:20,990  
status we just heard uh the ground IV

1161  
01:07:25,309 --> 01:07:23,339  
and that's NASA astronaut Nick he's

1162  
01:07:26,930 --> 01:07:25,319  
going to be talking our two crew members

1163  
01:07:28,309 --> 01:07:26,940

through the spacewalk today so he's the

1164

01:07:30,890 --> 01:07:28,319

voice you'll be hearing from here in

1165

01:07:33,349 --> 01:07:30,900

Mission Control I mean while Frank Rubio

1166

01:07:35,329 --> 01:07:33,359

Evie won Josh casting ev2 in the crew

1167

01:07:36,950 --> 01:07:35,339

lock uh they're getting closer to vacuum

1168

01:07:39,650 --> 01:07:36,960

it's just about one pound per square

1169

01:07:41,510 --> 01:07:39,660

inch of pressure still inside it's going

1170

01:07:45,349 --> 01:07:41,520

to continue to leak down once they get

1171

01:07:47,089 --> 01:07:45,359

to about half of a PSI they'll get the

1172

01:07:49,910 --> 01:07:47,099

go to open enough to hatch and begin

1173

01:07:52,069 --> 01:07:49,920

this spacewalk today again the

1174

01:07:53,990 --> 01:07:52,079

operational start time for today is

1175

01:07:56,029 --> 01:07:54,000

after they get off of those servers and

1176

01:07:58,490 --> 01:07:56,039

Cooling umbilicals and switch their

1177

01:08:00,170 --> 01:07:58,500

suits over to battery power uh just uh

1178

01:08:02,210 --> 01:08:00,180

checking in with you as we wait for uh

1179

01:08:05,390 --> 01:08:02,220

the

1180

01:08:06,829 --> 01:08:05,400

crew lock to get down to zero uh one

1181

01:08:10,430 --> 01:08:06,839

reminder when it gets close you can

1182

01:08:12,829 --> 01:08:10,440

expect some alert tones big picture in

1183

01:08:14,210 --> 01:08:12,839

terms of timeline koichi and Duke did an

1184

01:08:16,490 --> 01:08:14,220

awesome job you guys were super

1185

01:08:17,809 --> 01:08:16,500

efficient and we're 10 15 minutes up on

1186

01:08:20,209 --> 01:08:17,819

the timeline so we're just going to go

1187

01:08:22,970 --> 01:08:20,219

nice and slow and methodical out the uh

1188

01:08:25,970 --> 01:08:22,980

out the hatch and and let the medox

1189

01:08:27,289 --> 01:08:25,980

condition properly uh and then also

1190

01:08:29,630 --> 01:08:27,299

we're going to have a patch of some

1191

01:08:31,729 --> 01:08:29,640

radicom uh we're going to be down KU we

1192

01:08:33,110 --> 01:08:31,739

should have s-band so we'll try to

1193

01:08:35,030 --> 01:08:33,120

maintain Voice through that so we may

1194

01:08:36,169 --> 01:08:35,040

ask you to repeat some things if uh if

1195

01:08:39,709 --> 01:08:36,179

we don't hear them just want to give you

1196

01:08:45,349 --> 01:08:41,410

okay

1197

01:08:47,390 --> 01:08:45,359

thanks so much for the uh overview

1198

01:08:50,450 --> 01:08:47,400

two copies as well enough again just a

1199

01:08:51,769 --> 01:08:50,460

heads up I want TCB to 5.5 here just in

1200

01:08:54,829 --> 01:08:51,779

case we find ourselves in a warm

1201  
01:09:00,950 --> 01:08:58,010  
copy Josh 5.5 on the tcv and I've got

1202  
01:09:28,669 --> 01:09:00,960  
the cuff checklist open

1203  
01:09:32,749 --> 01:09:30,890  
all right so the crew continuing to wait

1204  
01:09:35,150 --> 01:09:32,759  
until we get that crew lock just about

1205  
01:09:37,550 --> 01:09:35,160  
down the vacuum we're less than a PSI

1206  
01:09:39,590 --> 01:09:37,560  
you just heard another reference to tcv

1207  
01:09:41,450 --> 01:09:39,600  
that's the thermal control valve anytime

1208  
01:09:43,189 --> 01:09:41,460  
the crew's altering that they're just

1209  
01:09:45,829 --> 01:09:43,199  
giving a heads up to the team on the

1210  
01:09:47,809 --> 01:09:45,839  
ground it's a small dial that they have

1211  
01:09:49,849 --> 01:09:47,819  
on the front of their suits so what

1212  
01:09:52,970 --> 01:09:49,859  
we're going to look for is the crew lock

1213  
01:09:55,669 --> 01:09:52,980

pressure less than a half PSI and there

1214

01:09:58,310 --> 01:09:55,679

can be uh from our Telemetry down here

1215

01:10:02,030 --> 01:09:58,320

if you see it on the vcm or the hatch

1216

01:10:02,040 --> 01:10:05,810

okay

1217

01:10:09,650 --> 01:10:07,430

and so probably looking at a couple more

1218

01:10:11,030 --> 01:10:09,660

minutes until we get just below half of

1219

01:10:14,209 --> 01:10:11,040

PSI and they'll be able to step through

1220

01:10:17,150 --> 01:10:14,219

the hatch operations but you'll you'll

1221

01:10:19,070 --> 01:10:17,160

hear those tcv values

1222

01:10:21,290 --> 01:10:19,080

standing for thermal control valve it

1223

01:10:23,570 --> 01:10:21,300

it's a small dial that goes between 0

1224

01:10:24,770 --> 01:10:23,580

and 10 on the front of their suits and

1225

01:10:27,350 --> 01:10:24,780

then the higher the number the the

1226

01:10:30,110 --> 01:10:27,360

colder that they're making it as the

1227

01:10:31,910 --> 01:10:30,120

astronauts are working inside of the

1228

01:10:33,410 --> 01:10:31,920

suit again you're in a completely sealed

1229

01:10:35,530 --> 01:10:33,420

environment you're essentially in a

1230

01:10:38,810 --> 01:10:35,540

small space craft yourself

1231

01:10:41,209 --> 01:10:38,820

you're generating heat and so we have an

1232

01:10:43,310 --> 01:10:41,219

active heat rejection system to help

1233

01:10:45,669 --> 01:10:43,320

keep them cool they wear what's known as

1234

01:10:50,030 --> 01:10:45,679

a liquid cooling and ventilation garment

1235

01:10:52,610 --> 01:10:50,040

lcvg mom that looks a little similar to

1236

01:10:54,470 --> 01:10:52,620

long underwear and then it has tubing

1237

01:10:57,290 --> 01:10:54,480

throughout the entire thing that's able

1238

01:10:59,750 --> 01:10:57,300

to run cold water

1239

01:11:02,030 --> 01:10:59,760

um around them and so as they generate

1240

01:11:03,649 --> 01:11:02,040

heat that heat transfers into that

1241

01:11:07,189 --> 01:11:03,659

liquid running around them that then

1242

01:11:10,310 --> 01:11:07,199

goes into the the backpack section of

1243

01:11:12,590 --> 01:11:10,320

the uh of the spacesuit and ultimately

1244

01:11:14,630 --> 01:11:12,600

get to a place called the sublimator

1245

01:11:17,270 --> 01:11:14,640

um and that's going to be using a

1246

01:11:18,709 --> 01:11:17,280

physical process known as sublimation so

1247

01:11:21,229 --> 01:11:18,719

some of that water

1248

01:11:22,970 --> 01:11:21,239

eventually turning into ice as it's

1249

01:11:25,550 --> 01:11:22,980

exposed to vacuum and then that ice

1250

01:11:27,470 --> 01:11:25,560

sublimates them by sublimating if you

1251

01:11:29,689 --> 01:11:27,480

were going directly from a solid to a

1252

01:11:31,850 --> 01:11:29,699

gas that's what sublimation means and so

1253

01:11:35,630 --> 01:11:31,860

that ice turns into a vapor essentially

1254

01:11:37,430 --> 01:11:35,640

is it's exposed to vacuum and the act of

1255

01:11:39,530 --> 01:11:37,440

sublimating draws energy from stuff

1256

01:11:41,209 --> 01:11:39,540

around it that's drawing that heat away

1257

01:11:43,370 --> 01:11:41,219

from the water that's passing through

1258

01:11:45,350 --> 01:11:43,380

the sublimator and then it's cooled down

1259

01:11:47,209 --> 01:11:45,360

and then goes right back through that

1260

01:11:49,070 --> 01:11:47,219

liquid coolant garment so that's

1261

01:11:51,649 --> 01:11:49,080

essentially the process that we're using

1262

01:11:55,010 --> 01:11:51,659

to help keep the crew members cool while

1263

01:11:57,290 --> 01:11:55,020

they're working inside of the spacesuit

1264

01:12:00,110 --> 01:11:57,300

and they can control that

1265

01:12:02,450 --> 01:12:00,120

um freely throughout their spacewalk if

1266

01:12:04,550 --> 01:12:02,460

they either start getting into a more

1267

01:12:06,830 --> 01:12:04,560

intensive activity or spending a lot of

1268

01:12:09,649 --> 01:12:06,840

time indirect sunlight that can tend to

1269

01:12:12,729 --> 01:12:09,659

heat up the suits so they can actively

1270

01:13:08,930 --> 01:12:12,739

turn off and turn down the cooling just

1271

01:13:14,330 --> 01:13:12,169

and right now we're at about 0.6 PSI so

1272

01:13:16,310 --> 01:13:14,340

a little bit further to go at which

1273

01:13:18,169 --> 01:13:16,320

point they'll get to go so Frank Rubio

1274

01:13:20,390 --> 01:13:18,179

he's ev1 today once they're outside

1275

01:13:23,450 --> 01:13:20,400

you'll be able to recognize them by

1276

01:13:24,649 --> 01:13:23,460

having the red stripes around the legs

1277

01:13:27,950 --> 01:13:24,659

of his suit

1278

01:13:29,870 --> 01:13:27,960

and then Josh cast as ev2 this is the

1279

01:13:31,970 --> 01:13:29,880

this is going to be the third spacewalk

1280

01:13:34,550 --> 01:13:31,980

that this pair has done together pretty

1281

01:13:36,229 --> 01:13:34,560

much all these have been focused on this

1282

01:13:39,290 --> 01:13:36,239

work to continue upgrading the power

1283

01:13:41,270 --> 01:13:39,300

generation system on the station just a

1284

01:13:44,630 --> 01:13:41,280

couple of quick stats as we get ready

1285

01:13:46,550 --> 01:13:44,640

this is going to be the 257th spacewalk

1286

01:13:49,310 --> 01:13:46,560

and sport of station assembly and the

1287

01:14:08,750 --> 01:13:49,320

12th one out of the spacewalk this year

1288

01:14:20,229 --> 01:14:11,570

okay I've got a blank screen but I have

1289

01:14:26,030 --> 01:14:23,689

static down through our circle of energy

1290

01:14:27,229 --> 01:14:26,040

and and Frank copy uh your reading on

1291

01:14:28,430 --> 01:14:27,239

the gauge we see a little bit higher

1292

01:14:29,870 --> 01:14:28,440

pressure here we're going to wait just a

1293

01:14:33,709 --> 01:14:29,880

little bit 10 seconds to a hand over

1294

01:14:33,719 --> 01:14:47,890

do you want copy

1295

01:14:51,890 --> 01:14:50,270

and so you just heard we're heading into

1296

01:14:53,689 --> 01:14:51,900

our Handover so we're heading into a

1297

01:14:55,430 --> 01:14:53,699

period where pretty much over the next

1298

01:14:56,990 --> 01:14:55,440

20 minutes we might have our video

1299

01:14:58,850 --> 01:14:57,000

connection with the station and kind of

1300

01:15:01,189 --> 01:14:58,860

cutting in and out

1301

01:15:04,010 --> 01:15:01,199

um as we move through gaps and coverage

1302

01:15:05,990 --> 01:15:04,020

between our teachers are tracking data

1303

01:15:07,610 --> 01:15:06,000

and relay satellites

1304

01:15:10,030 --> 01:15:07,620

um the good thing about space walks is

1305

01:15:12,530 --> 01:15:10,040

we'll pretty much have

1306

01:15:14,570 --> 01:15:12,540

wall-to-wall connection with the station

1307

01:15:16,790 --> 01:15:14,580

in terms of video coverage once we're

1308

01:15:18,350 --> 01:15:16,800

out the door of over the next 20 minutes

1309

01:15:21,430 --> 01:15:18,360

it'll be a little bit ratty so it might

1310

01:15:26,810 --> 01:15:24,530

but quick status both Frank Rubio Josh

1311

01:15:28,790 --> 01:15:26,820

Cassidy in the crew lock section of the

1312

01:15:30,350 --> 01:15:28,800

airlock they had two successful leak

1313

01:15:33,229 --> 01:15:30,360

checks on their suits as we went through

1314

01:15:35,510 --> 01:15:33,239

the depress they have been moving about

1315

01:15:37,250 --> 01:15:35,520

10-15 minutes ahead of the timeline and

1316

01:15:39,910 --> 01:15:37,260

this is the third one this pair has done

1317

01:15:42,530 --> 01:15:39,920

with the help of

1318

01:15:45,470 --> 01:15:42,540

Nicole man to get suited up and get into

1319

01:15:47,390 --> 01:15:45,480

the air lock itself we're coming up on

1320

01:15:48,890 --> 01:15:47,400

half of a PSI once we get a little bit

1321

01:15:50,830 --> 01:15:48,900

below that they'll get the go to start

1322

01:15:53,270 --> 01:15:50,840

moving into some of the hatch operations

1323

01:15:54,950 --> 01:15:53,280

and then getting their suits onto

1324

01:15:58,130 --> 01:15:54,960

battery power which will Mark the

1325

01:16:00,649 --> 01:15:58,140

official start of today's space walk in

1326

01:16:03,830 --> 01:16:00,659

total plan to last about seven hours

1327

01:16:05,630 --> 01:16:03,840

today with the goal of installing a new

1328

01:16:08,090 --> 01:16:05,640

iros and International Space Station

1329

01:16:09,530 --> 01:16:08,100

roll out solar array that's going to

1330

01:16:12,110 --> 01:16:09,540

further augment the station's power

1331

01:16:14,450 --> 01:16:12,120

generation capability so

1332

01:16:16,669 --> 01:16:14,460

they already went through essentially a

1333

01:16:18,110 --> 01:16:16,679

safety tether setup as each of these

1334

01:16:19,669 --> 01:16:18,120

crew members going to be Tethered to the

1335

01:16:22,189 --> 01:16:19,679

station structure at all times

1336

01:16:23,689 --> 01:16:22,199

throughout the spacewalk so the first

1337

01:16:25,250 --> 01:16:23,699

thing they do is just check the location

1338

01:16:27,950 --> 01:16:25,260

of all those tethers before they head

1339

01:16:30,290 --> 01:16:27,960

out the door back with you we see a

1340

01:16:32,870 --> 01:16:30,300

pressure less than 0.5 down here on the

1341

01:16:39,350 --> 01:16:32,880

ground so your go to open and Stow the

1342

01:16:39,360 --> 01:16:55,990

[Music]

1343

01:17:03,410 --> 01:17:00,350

and so Frank Rubio ev1 just got the go

1344

01:17:06,770 --> 01:17:03,420

to open and Stow the EV hatch that's the

1345

01:17:09,110 --> 01:17:06,780

hatch that leads to the outside that's

1346

01:17:11,630 --> 01:17:09,120

going to give them open access out into

1347

01:17:14,390 --> 01:17:11,640

the vacuum of space after which they'll

1348

01:17:18,169 --> 01:17:14,400

egress or exit the station Quest air

1349

01:17:19,850 --> 01:17:18,179

lock and begin the spacewalk today so

1350

01:17:23,390 --> 01:17:19,860

so the first things they're going to do

1351

01:17:26,030 --> 01:17:23,400

is split up Josh cassida moving off to

1352

01:17:31,310 --> 01:17:26,040

get the Space Station's robotic arm

1353

01:17:31,320 --> 01:17:35,680

copy Frank

1354

01:17:41,209 --> 01:17:38,090

[Applause]

1355

01:17:43,669 --> 01:17:41,219

ah but Josh Castle moving off to I get

1356

01:17:46,610 --> 01:17:43,679

the arm ready but also start to prepare

1357

01:17:48,169 --> 01:17:46,620

the irosa for its removal from its

1358

01:17:50,390 --> 01:17:48,179

temporary still location of What's

1359

01:17:53,630 --> 01:17:50,400

called the FSE

1360

01:17:56,530 --> 01:17:53,640

uh he's going to be releasing ards

1361

01:17:59,030 --> 01:17:56,540

anti-rotation devices those are just

1362

01:18:02,810 --> 01:17:59,040

additional locks that are in place to

1363

01:18:05,030 --> 01:18:02,820

help keep the eye rows as secure on that

1364

01:18:07,850 --> 01:18:05,040

temp site when they're backed into the

1365

01:18:09,590 --> 01:18:07,860

trunk part of the Dragon spacecraft I

1366

01:18:11,990 --> 01:18:09,600

mean while Frank Rubio is going to move

1367

01:18:13,550 --> 01:18:12,000

out to the work site and begin routing

1368

01:18:24,729 --> 01:18:13,560

some of the cables

1369

01:18:29,510 --> 01:18:27,410

hey koichiwakata of reporting the

1370

01:18:31,189 --> 01:18:29,520

emergency empez that's the manual

1371

01:18:33,950 --> 01:18:31,199

pressure Equalization valve that we use

1372

01:18:35,750 --> 01:18:33,960

to get rid of the last bits of

1373

01:18:43,490 --> 01:18:35,760

atmosphere just want to confirm you've

1374

01:18:47,990 --> 01:18:45,290

okay so we're going to step into a

1375

01:18:49,430 --> 01:18:48,000

post-d press so both of you you're going

1376

01:18:51,229 --> 01:18:49,440

to want to stagger your switch throws

1377

01:18:57,530 --> 01:18:51,239

expect warning tones but you're going to

1378

01:19:02,510 --> 01:19:00,229

uh copies

1379

01:19:07,070 --> 01:19:02,520

P1 I'm sorry you need two copies I'll

1380

01:19:11,570 --> 01:19:09,830

my power

1381

01:19:28,010 --> 01:19:11,580

that

1382

01:19:33,470 --> 01:19:32,149

E2 is in bat and I said so I'm going to

1383

01:19:37,750 --> 01:19:33,480

play quick release I'll probably restart

1384

01:19:43,550 --> 01:19:41,209

okay copy and uh Frank if you want to

1385

01:19:49,850 --> 01:19:43,560

display uh switch Pro to verify

1386

01:19:52,970 --> 01:19:51,770

I'd be clear Nick I have not done that

1387

01:19:55,250 --> 01:19:52,980

yet

1388

01:20:02,709 --> 01:19:55,260

understand we have a go for Pro

1389

01:20:08,750 --> 01:20:05,450

as well great news

1390

01:20:12,290 --> 01:20:08,760

all right so Josh you want to take power

1391

01:20:19,850 --> 01:20:12,300

for ev1 and 2 to off and verify that all

1392

01:20:24,410 --> 01:20:22,850

right power ev1

1393

01:20:27,410 --> 01:20:24,420

ufs

1394

01:20:32,390 --> 01:20:27,420

or you need to offs

1395

01:20:41,570 --> 01:20:35,450

okay you're both go to disconnect your

1396

01:20:41,580 --> 01:20:52,669

shoot

1397

01:21:00,709 --> 01:20:55,669

hey Josh uh we didn't hear the message

1398

01:21:06,350 --> 01:21:04,430

yeah I had a shooting High

1399

01:21:08,330 --> 01:21:06,360

and I throwed it

1400

01:21:12,530 --> 01:21:08,340

assume that was expected and Josh that

1401  
01:21:12,540 --> 01:21:24,230  
foreign

1402  
01:21:24,240 --> 01:21:29,770  
[Applause]

1403  
01:21:34,370 --> 01:21:33,110  
Josh uh we've got radicom right now I

1404  
01:21:40,610 --> 01:21:34,380  
want to let you know that that message

1405  
01:21:47,330 --> 01:21:43,910  
we agree I'm sure enough coming down to

1406  
01:21:49,970 --> 01:21:47,340  
4.5 now and deleting the FCU

1407  
01:21:52,130 --> 01:21:49,980  
copy and uh your your both go to dmate

1408  
01:21:59,630 --> 01:21:52,140  
the scu's install the DCM cover and then

1409  
01:21:59,640 --> 01:22:17,830  
ES

1410  
01:22:22,250 --> 01:22:20,390  
and so a lot of developments there real

1411  
01:22:24,950 --> 01:22:22,260  
quick so our spacewalk did officially

1412  
01:22:26,870 --> 01:22:24,960  
start both of these uh crew members

1413  
01:22:29,209 --> 01:22:26,880

Frank Rubio and Josh Casas switching

1414

01:22:34,090 --> 01:22:29,219

their suits over to battery power at 7

1415

01:22:34,100 --> 01:22:40,910

your Su Stow is complete you need one

1416

01:22:47,930 --> 01:22:44,450

anyone I can use disconnected and stowed

1417

01:22:50,930 --> 01:22:49,310

copy Frank

1418

01:22:57,229 --> 01:22:50,940

so Josh if you can check that the

1419

01:22:57,239 --> 01:23:02,510

because from manifold he is closed

1420

01:23:12,729 --> 01:23:05,090

so for both of you you'll take your tcv

1421

01:23:19,729 --> 01:23:14,689

New York

1422

01:23:19,739 --> 01:23:31,669

and coffee Josh

1423

01:23:37,250 --> 01:23:34,370

and again the official start time of our

1424

01:23:39,470 --> 01:23:37,260

spacewalk today 7 19 a.m Central Time 8

1425

01:23:42,610 --> 01:23:39,480

19 a.m Eastern

1426

01:23:52,790 --> 01:23:46,010

copy Frank and so your boat go to take

1427

01:23:57,250 --> 01:23:55,910

coffee give you one water is

1428

01:24:00,290 --> 01:23:57,260

um

1429

01:24:02,149 --> 01:24:00,300

water is on

1430

01:24:08,410 --> 01:24:02,159

and you'll check your DCM is blank and

1431

01:24:14,390 --> 01:24:10,910

easy one

1432

01:24:17,030 --> 01:24:14,400

spray break and fight offer YouTube

1433

01:24:21,410 --> 01:24:17,040

copy for both and you're good to set

1434

01:24:27,410 --> 01:24:21,420

your tcv uh as desired and I'm five

1435

01:24:27,420 --> 01:24:47,110

do you want coffee

1436

01:24:51,830 --> 01:24:49,729

and so a quick hand over until we get

1437

01:24:53,570 --> 01:24:51,840

come back but again a lot it's just

1438

01:24:57,169 --> 01:24:53,580

unfolded our spacewalk officially

1439

01:24:59,630 --> 01:24:57,179

started 7 19 a.m Central 8 19 a.m

1440

01:25:01,610 --> 01:24:59,640

Eastern Baltimore crew members in a

1441

01:25:03,470 --> 01:25:01,620

fully depressurized airlock with the

1442

01:25:06,470 --> 01:25:03,480

hatch open switch their suits over to

1443

01:25:09,770 --> 01:25:06,480

battery power kicking things off after

1444

01:25:11,630 --> 01:25:09,780

that they had disconnected and stowed

1445

01:25:14,330 --> 01:25:11,640

the Su the service and coolant umbilical

1446

01:25:16,970 --> 01:25:14,340

that up until that point I was able to

1447

01:25:18,770 --> 01:25:16,980

provide both Power Cooling fluids and

1448

01:25:21,350 --> 01:25:18,780

hard line Communications those get

1449

01:25:23,149 --> 01:25:21,360

stowed with the Special cover over them

1450

01:25:28,850 --> 01:25:23,159

until the very end of our spacewalk when

1451

01:25:34,669 --> 01:25:31,790

they

1452

01:25:36,590 --> 01:25:34,679

I am set at five

1453

01:25:39,649 --> 01:25:36,600

five that's actually five minutes

1454

01:25:42,229 --> 01:25:39,659

BB2 tcv four

1455

01:25:44,149 --> 01:25:42,239

copy five and a half and four

1456

01:25:51,669 --> 01:25:44,159

um we'll take a suit P gauge reading

1457

01:25:51,679 --> 01:25:56,930

two four decimal three

1458

01:26:01,430 --> 01:25:59,209

okay copy and uh just to let you know

1459

01:26:03,470 --> 01:26:01,440

we're good to suit parameters here on

1460

01:26:06,350 --> 01:26:03,480

the ground uh your advisors are going to

1461

01:26:07,850 --> 01:26:06,360

be going out into daylight

1462

01:26:10,250 --> 01:26:07,860

um and

1463

01:26:18,169 --> 01:26:10,260

we are ready Frank for you to open the

1464

01:26:22,250 --> 01:26:20,209

and Frank as you do that you'll Stow the

1465

01:26:24,050 --> 01:26:22,260

hook on the stiffener tether points

1466

01:26:40,370 --> 01:26:24,060

cinch the strap and then report the

1467

01:26:46,010 --> 01:26:43,129

all right so again the crew

1468

01:26:47,510 --> 01:26:46,020

underway with our space walk that clock

1469

01:26:50,810 --> 01:26:47,520

started taking about seven and a half

1470

01:26:53,330 --> 01:26:50,820

minutes ago at 7 19 a.m central time

1471

01:26:54,770 --> 01:26:53,340

they've reconfigured a couple of

1472

01:26:56,450 --> 01:26:54,780

different systems in the gruelock

1473

01:27:00,649 --> 01:26:56,460

section of the service and cooling

1474

01:27:07,250 --> 01:27:00,659

umbilicals they double checked that the

1475

01:27:11,570 --> 01:27:09,890

you're uh go to egress the airlock and

1476

01:27:13,490 --> 01:27:11,580

and just for your guys's essay we're

1477

01:27:17,090 --> 01:27:13,500

still voice only for the next handful of

1478

01:27:17,100 --> 01:27:22,430

you want coffee

1479

01:27:22,440 --> 01:27:30,229

all right Josh you ready you ready

1480

01:27:33,830 --> 01:27:31,970

all right so Ruby on Castle is starting

1481

01:27:36,229 --> 01:27:33,840

to move out of the airlock now if you're

1482

01:27:45,530 --> 01:27:36,239

looking to put your anchor down on the

1483

01:27:50,689 --> 01:27:48,229

Rubio will be first out as ev1 he's

1484

01:27:52,090 --> 01:27:50,699

opening up a thermal cover it's a small

1485

01:27:54,770 --> 01:27:52,100

bit of

1486

01:27:57,470 --> 01:27:54,780

protective covering that sits on the

1487

01:27:59,390 --> 01:27:57,480

outside of the hatchway they're going to

1488

01:28:02,689 --> 01:27:59,400

be able to close that once they get

1489

01:28:04,610 --> 01:28:02,699

outside that just protects the interior

1490

01:28:08,689 --> 01:28:04,620

of the air lock from different thermal

1491

01:28:13,430 --> 01:28:11,270

first thing out is again double checking

1492

01:28:14,450 --> 01:28:13,440

some tether points getting those ready

1493

01:28:16,070 --> 01:28:14,460

and then we're going to see these two

1494

01:28:22,390 --> 01:28:16,080

spacewalkers split off to go do

1495

01:28:27,530 --> 01:28:25,250

so I come back

1496

01:28:29,750 --> 01:28:27,540

Kathy Frank that's a good config uh it's

1497

01:28:33,100 --> 01:28:29,760

your go to put Josh's anchor on the aft

1498

01:28:33,110 --> 01:28:37,850

[Music]

1499

01:28:42,470 --> 01:28:39,470

and so the first tethers are working

1500

01:28:43,910 --> 01:28:42,480

with are the anchor ones these are one

1501

01:28:45,950 --> 01:28:43,920

of several that they're going to use to

1502

01:28:49,250 --> 01:28:45,960

remain Tethered to the station structure

1503

01:28:51,470 --> 01:28:49,260

at all times not Frank's got one two a

1504

01:28:54,290 --> 01:28:51,480

handrail right outside and as these

1505

01:28:56,750 --> 01:28:54,300

first out he'll be able to attach Josh's

1506

01:28:59,510 --> 01:28:56,760

anchor which is currently attached to

1507

01:29:02,090 --> 01:28:59,520

one of his own waste tethers to a

1508

01:29:04,490 --> 01:29:02,100

different uh ring just outside of the

1509

01:29:08,750 --> 01:29:04,500

airlock

1510

01:29:08,760 --> 01:29:12,090

um

1511

01:29:12,100 --> 01:29:16,640

[Music]

1512

01:29:29,629 --> 01:29:21,470

[Applause]

1513

01:29:34,209 --> 01:29:31,090

okay

1514

01:29:36,410 --> 01:29:34,219

all right your uh

1515

01:29:37,910 --> 01:29:36,420

I just wanted to verify it was all

1516

01:29:41,500 --> 01:29:37,920

correct

1517

01:29:41,510 --> 01:29:53,270

[Music]

1518

01:29:53,280 --> 01:30:00,410

next copy all Franco

1519

01:30:05,330 --> 01:30:03,050

yep no Frank we concur good path your uh

1520

01:30:09,240 --> 01:30:05,340

go to release uh Josh you can release

1521

01:30:09,250 --> 01:30:13,270

[Music]

1522

01:30:13,280 --> 01:30:17,900

thank you

1523

01:30:17,910 --> 01:30:37,370

[Music]

1524

01:30:41,510 --> 01:30:39,290

all right so getting those initial

1525

01:30:42,709 --> 01:30:41,520

tether points in place as both move to

1526

01:30:44,629 --> 01:30:42,719

get out of the airlocks we should be

1527

01:30:51,360 --> 01:30:44,639

getting video com back with the station

1528

01:30:58,370 --> 01:30:52,990

[Music]

1529

01:31:06,709 --> 01:31:03,229

hey Nick uh so this is a CRT right on

1530

01:31:09,110 --> 01:31:06,719

the M bag is brt and I'm gonna go ahead

1531

01:31:10,850 --> 01:31:09,120

and release the big Hook from inside and

1532

01:31:15,310 --> 01:31:10,860

we'll take that with us if you agree

1533

01:31:21,340 --> 01:31:18,050

here comes the hook

1534

01:31:26,750 --> 01:31:23,890

[Music]

1535

01:31:29,090 --> 01:31:26,760

to retrieve and hand over a crew lock

1536

01:31:37,189 --> 01:31:29,100

bag that has the power cables that we're

1537

01:31:43,330 --> 01:31:39,110

it sounds at a really bad angle when you

1538

01:31:43,340 --> 01:31:50,870

okay okay thank you

1539

01:31:53,770 --> 01:31:52,669

man Frank Rubio is going to take that

1540

01:31:56,090 --> 01:31:53,780

bag

1541

01:31:58,010 --> 01:31:56,100

Frank you're going to position to the

1542

01:31:59,270 --> 01:31:58,020

forward side of the airlock for Josh's

1543

01:32:10,360 --> 01:31:59,280

egress

1544

01:32:10,370 --> 01:32:34,490

[Music]

1545

01:32:39,229 --> 01:32:36,830

all right

1546

01:32:41,930 --> 01:32:39,239

so again stepping through this initial

1547

01:32:44,149 --> 01:32:41,940

egress exiting of the airlock activity

1548

01:32:46,370 --> 01:32:44,159

Frank Rubio already outside the airlock

1549

01:32:48,649 --> 01:32:46,380

getting ready to give the go for Josh to

1550

01:32:51,169 --> 01:32:48,659

move outside as well now once they get

1551

01:32:52,729 --> 01:32:51,179

outside and we're able to get this video

1552

01:32:55,370 --> 01:32:52,739

com back in the next two to three

1553

01:32:57,590 --> 01:32:55,380

minutes they'll get the girls who turn

1554

01:33:00,709 --> 01:32:57,600

on their hekka which if you love

1555

01:33:02,390 --> 01:33:00,719

acronyms gosh uh once you guys are both

1556

01:33:06,649 --> 01:33:02,400

outside the first thing we'll have you

1557

01:33:06,659 --> 01:33:10,610

everyone copies

1558

01:33:23,290 --> 01:33:12,709

I think it looks like I'm getting

1559

01:33:23,300 --> 01:33:29,649

is clear all right there we go

1560

01:33:29,659 --> 01:33:38,090

yeah I think it was your uh

1561

01:33:38,100 --> 01:33:42,070

I don't care

1562

01:33:50,510 --> 01:33:44,870

goes on

1563

01:33:53,689 --> 01:33:52,250

okay once we get video back they'll be

1564

01:33:56,870 --> 01:33:53,699

turning the heck is on we heard that

1565

01:33:57,890 --> 01:33:56,880

call uh or that go

1566

01:33:59,510 --> 01:33:57,900

um

1567

01:34:02,450 --> 01:33:59,520

from Nike down here on the ground now

1568

01:34:04,970 --> 01:34:02,460

hecca that's h-e-c-a that's an acronym

1569

01:34:07,940 --> 01:34:04,980

with acronyms inside of acronyms that

1570

01:34:13,030 --> 01:34:07,950

hecka stands for the high definition

1571

01:34:19,310 --> 01:34:16,070

high definition extra vehicular activity

1572

01:34:21,290 --> 01:34:19,320

Mobility unit camera assembly

1573

01:34:23,629 --> 01:34:21,300

so there's a thermal cover for a second

1574

01:34:27,430 --> 01:34:23,639

study check

1575

01:34:27,440 --> 01:34:40,750

let me get my effect off

1576  
01:34:46,250 --> 01:34:44,010  
I came about that song

1577  
01:34:47,930 --> 01:34:46,260  
[Music]

1578  
01:34:51,890 --> 01:34:47,940  
thank you

1579  
01:34:51,900 --> 01:34:57,950  
okay

1580  
01:34:57,960 --> 01:35:02,709  
[Music]

1581  
01:35:09,770 --> 01:35:05,270  
my eyes

1582  
01:35:09,780 --> 01:35:15,709  
three counts

1583  
01:35:15,719 --> 01:35:24,890  
and a little bit too relaxing

1584  
01:35:30,770 --> 01:35:26,240  
again

1585  
01:35:35,390 --> 01:35:33,169  
and your

1586  
01:35:38,629 --> 01:35:35,400  
tools and toes

1587  
01:35:42,290 --> 01:35:38,639  
parking around a stupid thing

1588  
01:35:44,390 --> 01:35:42,300

okay copy that got your wvf

1589

01:35:46,970 --> 01:35:44,400

and if you move your left hand just

1590

01:35:46,980 --> 01:35:51,400

oh man I don't see your hecka

1591

01:35:57,229 --> 01:35:53,530

[Applause]

1592

01:36:00,410 --> 01:35:57,239

oh I'm sorry yep I've got both

1593

01:36:02,629 --> 01:36:00,420

and I've got three tabs up and let's see

1594

01:36:08,209 --> 01:36:02,639

your safer handles

1595

01:36:11,510 --> 01:36:09,890

and then rotate to your left so you can

1596

01:36:14,030 --> 01:36:11,520

see

1597

01:36:16,729 --> 01:36:14,040

there we go I got both all right

1598

01:36:21,770 --> 01:36:16,739

the safer handles are down

1599

01:36:27,530 --> 01:36:24,890

the bag is hanging down at your knee but

1600

01:36:31,850 --> 01:36:27,540

I think that'll be fine okay

1601  
01:36:37,930 --> 01:36:34,910  
so I've got a dry hat

1602  
01:36:44,880 --> 01:36:37,940  
and I've got good body jokes

1603  
01:36:48,590 --> 01:36:46,189  
[Music]

1604  
01:36:51,110 --> 01:36:48,600  
yeah copy Frank Josh we're uh we're back

1605  
01:36:53,030 --> 01:36:51,120  
with you and we're picking up KU now uh

1606  
01:36:55,490 --> 01:36:53,040  
we should have video here shortly uh we

1607  
01:36:58,129 --> 01:36:55,500  
copy good buddy checks uh just wanted to

1608  
01:36:59,930 --> 01:36:58,139  
confirm that the reels were unlocked uh

1609  
01:37:01,729 --> 01:36:59,940  
we might have missed that before and

1610  
01:37:10,070 --> 01:37:01,739  
then after that it'll be close the

1611  
01:37:10,080 --> 01:37:16,189  
zero

1612  
01:37:19,490 --> 01:37:17,689  
Daffy thanks for double checking that

1613  
01:37:38,510 --> 01:37:19,500

for us your go to close the thermal

1614

01:37:38,520 --> 01:37:41,820

stand

1615

01:37:41,830 --> 01:37:45,350

[Music]

1616

01:37:49,610 --> 01:37:47,810

I think that uh

1617

01:37:50,920 --> 01:37:49,620

that little d-ring is probably in the

1618

01:37:54,649 --> 01:37:50,930

way

1619

01:37:57,950 --> 01:37:56,570

yeah and that's a good check you want to

1620

01:38:01,250 --> 01:37:57,960

make sure that that d-ring strap's not

1621

01:38:06,229 --> 01:38:04,010

and that is real quick

1622

01:38:08,830 --> 01:38:06,239

I agree looks good

1623

01:38:12,950 --> 01:38:11,030

so Frank you're going to translate out

1624

01:38:15,110 --> 01:38:12,960

to the green hook location uh you're

1625

01:38:19,070 --> 01:38:15,120

leading the way just a reminder for no

1626

01:38:43,129 --> 01:38:29,930

okay

1627

01:38:47,930 --> 01:38:46,310

all right well with that we heard Frank

1628

01:38:49,970 --> 01:38:47,940

and Josh going through what's called

1629

01:38:52,390 --> 01:38:49,980

buddy checks as you can imagine it's

1630

01:38:55,729 --> 01:38:52,400

hard to get a good look at your own suit

1631

01:38:57,470 --> 01:38:55,739

you're following uh just a reminder for

1632

01:39:01,270 --> 01:38:57,480

the caution to watch out for the stuff

1633

01:39:07,729 --> 01:39:02,990

thank you

1634

01:39:10,070 --> 01:39:07,739

and so the body checks each of these

1635

01:39:13,310 --> 01:39:10,080

astronauts gets a look at the other

1636

01:39:16,010 --> 01:39:13,320

verifying uh that they see lights for

1637

01:39:17,689 --> 01:39:16,020

things like their hecka the helmet cams

1638

01:39:25,669 --> 01:39:17,699

um and then the various

1639

01:39:29,390 --> 01:39:27,709

looking at things like the safer handles

1640

01:39:31,070 --> 01:39:29,400

making sure they're not engaged things

1641

01:39:32,689 --> 01:39:31,080

of that nature and it looks like we're

1642

01:39:34,610 --> 01:39:32,699

starting to get our first helmet camera

1643

01:39:37,490 --> 01:39:34,620

view so this is number 20 so this should

1644

01:39:40,310 --> 01:39:37,500

be frank Rubio whose first house is

1645

01:39:42,350 --> 01:39:40,320

going to be to head out to the actual

1646

01:39:45,470 --> 01:39:42,360

site where we're going to be installing

1647

01:39:47,810 --> 01:39:45,480

the irosa today and start routing some

1648

01:39:49,850 --> 01:39:47,820

of the cables and so he's got it's

1649

01:39:51,530 --> 01:39:49,860

essentially two cables but they're going

1650

01:39:54,470 --> 01:39:51,540

to be functioning as two different y

1651  
01:39:57,290 --> 01:39:54,480  
connectors so one end of the cables is

1652  
01:40:00,110 --> 01:39:57,300  
split into two pieces one end goes into

1653  
01:40:01,669 --> 01:40:00,120  
the uh the new iro so once it's there

1654  
01:40:03,649 --> 01:40:01,679  
the other into a connection for the

1655  
01:40:07,010 --> 01:40:03,659  
existing solar array and then those get

1656  
01:40:09,290 --> 01:40:07,020  
plugged in to the 4A power Channel and

1657  
01:40:11,270 --> 01:40:09,300  
so by installing all these once the

1658  
01:40:13,610 --> 01:40:11,280  
eyebrows is in place we're essentially

1659  
01:40:15,890 --> 01:40:13,620  
going to be integrating the irosa and

1660  
01:40:16,850 --> 01:40:15,900  
the existing array into the same power

1661  
01:40:19,790 --> 01:40:16,860  
Channel

1662  
01:40:26,270 --> 01:40:22,729  
yep copy and uh so Frank you're going to

1663  
01:40:27,950 --> 01:40:26,280

be looking for a handrail 3652 that

1664

01:40:33,110 --> 01:40:27,960

should be uh

1665

01:40:33,120 --> 01:40:39,530

oons

1666

01:40:48,200 --> 01:40:41,330

and then each of the handrails on the

1667

01:40:54,010 --> 01:40:49,790

[Applause]

1668

01:40:56,390 --> 01:40:54,020

copy 3651 Nader station

1669

01:40:58,250 --> 01:40:56,400

ERS will have numbers engraved into them

1670

01:41:01,010 --> 01:40:58,260

so that's what they can use to help kind

1671

01:41:04,970 --> 01:41:03,290

and this is just looking right over the

1672

01:41:06,770 --> 01:41:04,980

shoulder of Frank Rubio as he starts to

1673

01:41:09,350 --> 01:41:06,780

head out to the work site to start

1674

01:41:13,209 --> 01:41:09,360

routing some of those cables

1675

01:41:25,669 --> 01:41:13,219

meanwhile Josh cast is splitting off

1676

01:41:25,679 --> 01:41:31,970

and for both

1677

01:41:40,729 --> 01:41:33,709

and copy you're at the starboard seated

1678

01:41:45,530 --> 01:41:43,669

head into your midday meal that Josh and

1679

01:41:46,970 --> 01:41:45,540

Frank are about 10 minutes up on the

1680

01:41:49,609 --> 01:41:46,980

timeline so they may be given that call

1681

01:41:51,109 --> 01:41:49,619

to start robotics Ops a little early you

1682

01:42:10,189 --> 01:41:51,119

guys are go for steps one and two

1683

01:42:23,450 --> 01:42:12,290

and we'll give all of our robotics calls

1684

01:42:27,169 --> 01:42:25,609

Frank Josh while you guys are working on

1685

01:42:28,970 --> 01:42:27,179

your green hooks there I'm going to read

1686

01:42:32,390 --> 01:42:28,980

off some warnings and cautions that's

1687

01:42:38,229 --> 01:42:35,090

next uh just uh be aware of my

1688

01:42:41,990 --> 01:42:38,239

Greenhouse is down on the

1689

01:42:51,430 --> 01:42:42,000

inboard expansion of 3652 I'm in route

1690

01:42:56,930 --> 01:42:54,530

there's a warning for the uh uh grapple

1691

01:42:58,850 --> 01:42:56,940

shafts and the survey coupling teeth

1692

01:43:01,370 --> 01:42:58,860

that they're no touch and then for the

1693

01:43:03,830 --> 01:43:01,380

FSC it's a reminder to translate slow

1694

01:43:05,330 --> 01:43:03,840

less than four inches per second uh wait

1695

01:43:07,570 --> 01:43:05,340

for motion to dampen out before

1696

01:43:11,149 --> 01:43:07,580

importing loads uh don't translate

1697

01:43:16,669 --> 01:43:11,159

simultaneously and uh and avoid contact

1698

01:43:16,679 --> 01:43:29,169

thanks

1699

01:43:34,129 --> 01:43:31,790

and the ground IV from today Nick hey

1700

01:43:36,350 --> 01:43:34,139

reading out a couple of cautions

1701

01:43:37,430 --> 01:43:36,360

um anytime we do these face walks

1702

01:43:39,350 --> 01:43:37,440

a great green hook down you're going to

1703

01:43:41,510 --> 01:43:39,360

work on bundling the cable bag and then

1704

01:43:43,370 --> 01:43:41,520

translating outboard

1705

01:43:46,070 --> 01:43:43,380

um and Josh

1706

01:43:48,290 --> 01:43:46,080

3651 you might have to wait for Frank

1707

01:43:49,729 --> 01:43:48,300

and uh maybe able to give him a hand

1708

01:43:51,709 --> 01:43:49,739

getting that bundle together

1709

01:43:53,760 --> 01:43:51,719

yes

1710

01:43:58,970 --> 01:43:53,770

I agree I think I will have to wait

1711

01:44:02,750 --> 01:44:00,709

and big picture for both of you we're

1712

01:44:04,970 --> 01:44:02,760

about 10 minutes up on the uh the timing

1713

01:44:06,530 --> 01:44:04,980

with our Eclipse so we're good just

1714

01:44:10,370 --> 01:44:06,540

working this little methodical and

1715

01:44:10,380 --> 01:44:17,470

sounds great okay thank you

1716

01:44:17,480 --> 01:44:21,950

TCP is now 5.5

1717

01:44:21,960 --> 01:44:28,669

copy Josh 5.5

1718

01:44:34,010 --> 01:44:31,550

Josh Caster was on another tcv call out

1719

01:44:35,930 --> 01:44:34,020

again just adjusting the simply the

1720

01:44:39,709 --> 01:44:35,940

thermal control valve on his suit just

1721

01:44:41,330 --> 01:44:39,719

how cool he's making it and the number

1722

01:44:46,209 --> 01:44:41,340

goes between 0 and 10 the higher the

1723

01:44:46,219 --> 01:44:54,470

going to the Russian segment

1724

01:44:58,010 --> 01:44:55,750

okay

1725

01:44:59,870 --> 01:44:58,020

Jeff hi

1726

01:45:04,669 --> 01:44:59,880

I think

1727

01:45:07,310 --> 01:45:04,679

that 3651 if you agree doesn't look like

1728

01:45:09,950 --> 01:45:07,320

uh you want to do that let me go past

1729

01:45:12,890 --> 01:45:09,960

you okay

1730

01:45:30,290 --> 01:45:12,900

I can certainly help here if you need it

1731

01:45:34,609 --> 01:45:32,149

if you want me to I can connect this

1732

01:45:36,470 --> 01:45:34,619

large small that's off of them stand

1733

01:45:40,490 --> 01:45:36,480

back to the cable bag but I don't want

1734

01:45:40,500 --> 01:45:46,010

if you think there's a

1735

01:45:49,310 --> 01:45:47,810

baby on the far side there if you want

1736

01:45:50,990 --> 01:45:49,320

to lock it up

1737

01:45:53,390 --> 01:45:51,000

yeah just because I want the bags kind

1738

01:45:54,770 --> 01:45:53,400

of tight together I think

1739

01:45:58,490 --> 01:45:54,780

so you want to retract them correct

1740

01:46:01,729 --> 01:46:00,410

letter retracts all the way and unlock

1741

01:46:05,270 --> 01:46:01,739

it says open

1742

01:46:06,470 --> 01:46:05,280

any further so does that make sense

1743

01:46:08,870 --> 01:46:06,480

but

1744

01:46:11,090 --> 01:46:08,880

I think um if you pull on it when it's

1745

01:46:13,910 --> 01:46:11,100

locked out like that it'll continue to

1746

01:46:15,950 --> 01:46:13,920

let some out not reel back in okay you

1747

01:46:17,629 --> 01:46:15,960

might not want to do that but up to you

1748

01:46:18,830 --> 01:46:17,639

if you want it is connected you let me

1749

01:46:32,390 --> 01:46:18,840

know if you want it left though thank

1750

01:46:39,770 --> 01:46:36,530

so you are a large small from the

1751  
01:46:49,550 --> 01:46:39,780  
handbag go onto the cable bag on one of

1752  
01:47:00,109 --> 01:46:50,990  
yeah it's just not going to give me

1753  
01:47:00,119 --> 01:47:09,770  
yep

1754  
01:47:12,890 --> 01:47:11,629  
are you preferring to switch the VIP to

1755  
01:47:14,689 --> 01:47:12,900  
the cable thing

1756  
01:47:17,450 --> 01:47:14,699  
uh no I just wanted to see if I could

1757  
01:47:17,460 --> 01:47:22,189  
from flopping around too much

1758  
01:47:25,609 --> 01:47:24,050  
I could put the integral on there if you

1759  
01:47:54,890 --> 01:47:25,619  
want instead of the

1760  
01:47:58,510 --> 01:47:56,990  
all right

1761  
01:48:01,850 --> 01:47:58,520  
I'm actually

1762  
01:48:04,850 --> 01:48:01,860  
just fun doing football

1763  
01:48:05,970 --> 01:48:04,860

are you able to now um release it the

1764

01:48:08,510 --> 01:48:05,980

lifestyle um

1765

01:48:12,169 --> 01:48:08,520

[Music]

1766

01:48:15,169 --> 01:48:12,179

I'll keep the large small words

1767

01:48:18,109 --> 01:48:15,179

so I am ready to

1768

01:48:24,729 --> 01:48:18,119

see the uh mic dog and the mic bag is

1769

01:48:30,229 --> 01:48:28,550

okay I can confirm that it is Reddit the

1770

01:48:32,149 --> 01:48:30,239

large small is connected you have the

1771

01:48:35,930 --> 01:48:32,159

other one yep so I'm going to release

1772

01:48:39,830 --> 01:48:35,940

this from the block per square Alpha

1773

01:48:58,430 --> 01:48:41,629

unless you wanted it so if you can hook

1774

01:49:10,129 --> 01:49:00,229

there you go

1775

01:49:14,810 --> 01:49:12,290

and Frank Josh want to let you know that

1776

01:49:17,510 --> 01:49:14,820

we have good hecka and uh are following

1777

01:49:19,250 --> 01:49:17,520

along now with video as well as voice

1778

01:49:21,169 --> 01:49:19,260

um so Frankie got that bundled up good

1779

01:49:24,250 --> 01:49:21,179

work and uh you're going to translate

1780

01:49:28,129 --> 01:49:24,260

out to the work side uh note in here to

1781

01:49:32,570 --> 01:49:28,139

uh about a fairly Zenith of the port TFR

1782

01:49:38,209 --> 01:49:35,649

perfect and yeah thanks to Josh

1783

01:49:43,850 --> 01:49:38,219

all right okay

1784

01:49:43,860 --> 01:49:52,550

all right

1785

01:49:57,350 --> 01:49:54,709

Josh let me uh do you mind if I go first

1786

01:50:20,870 --> 01:49:57,360

here are you again later I haven't made

1787

01:50:25,310 --> 01:50:23,390

all right with the bag handoff now

1788

01:50:26,930 --> 01:50:25,320

complete and our space Walkers are going

1789

01:50:29,209 --> 01:50:26,940

to go two separate directions right now

1790

01:50:32,870 --> 01:50:29,219

for Frank Rubio he's going to be heading

1791

01:50:34,129 --> 01:50:32,880

over to uh the canister essentially the

1792

01:50:36,590 --> 01:50:34,139

area where we're actually going to be

1793

01:50:38,330 --> 01:50:36,600

installing uh the new solar array he's

1794

01:50:40,490 --> 01:50:38,340

going to pre-route some of the cables

1795

01:50:42,410 --> 01:50:40,500

that are going to be required to

1796

01:50:45,109 --> 01:50:42,420

essentially jumper the new solar array

1797

01:50:47,689 --> 01:50:45,119

into the power Channel itself

1798

01:50:50,450 --> 01:50:47,699

so he'll get those laid out and tied

1799

01:50:52,850 --> 01:50:50,460

down in advance of the array itself

1800

01:50:54,950 --> 01:50:52,860

showing up meanwhile Josh Casada going

1801  
01:50:57,350 --> 01:50:54,960  
to move over to the FSC the Flight

1802  
01:51:00,189 --> 01:50:57,360  
Support equipment it's essentially the

1803  
01:51:02,050 --> 01:51:00,199  
the cargo pallet

1804  
01:51:04,129 --> 01:51:02,060  
UMR

1805  
01:51:07,609 --> 01:51:04,139  
there is a

1806  
01:51:09,709 --> 01:51:07,619  
long duration that's holding the brake

1807  
01:51:12,290 --> 01:51:09,719  
arms in place so it's going to keep me

1808  
01:51:14,810 --> 01:51:12,300  
from being able to

1809  
01:51:31,270 --> 01:51:14,820  
Empire

1810  
01:51:38,629 --> 01:51:34,669  
yeah copy Frank uh let's understand the

1811  
01:51:40,970 --> 01:51:38,639  
uh the config ideas to separate you uh

1812  
01:51:43,729 --> 01:51:40,980  
Zenith and and keep Josh Nader so if you

1813  
01:51:49,790 --> 01:51:43,739

can go over and around the the whole TFR

1814

01:51:54,229 --> 01:51:52,490

right yeah that's the problem is uh

1815

01:51:55,550 --> 01:51:54,239

the uh

1816

01:51:57,950 --> 01:51:55,560

I don't know if you can see I'm gonna

1817

01:52:03,470 --> 01:51:57,960

happen here I thought

1818

01:52:09,169 --> 01:52:05,330

doesn't quite have enough

1819

01:52:10,490 --> 01:52:09,179

photography pfr so I'm not able to go up

1820

01:52:12,410 --> 01:52:10,500

and over

1821

01:52:14,270 --> 01:52:12,420

um

1822

01:52:16,370 --> 01:52:14,280

yeah copy that Frank can you can you

1823

01:52:28,149 --> 01:52:16,380

take the tether over the uh the top of

1824

01:52:34,310 --> 01:52:30,470

yeah Frank if you can put it up there it

1825

01:52:38,209 --> 01:52:36,169

okay I'll just put it up and over there

1826  
01:52:56,570 --> 01:52:38,219  
with you'll have a little bit better uh

1827  
01:52:56,580 --> 01:53:12,970  
foreign

1828  
01:53:25,430 --> 01:53:15,590  
as you head out we'll just want to check

1829  
01:53:25,440 --> 01:53:32,810  
got the whole thing

1830  
01:53:36,109 --> 01:53:34,189  
and Frank I'm going to knock out a

1831  
01:53:39,470 --> 01:53:36,119  
couple cautions for you here on the mass

1832  
01:53:41,570 --> 01:53:39,480  
canister so no sudden movements uh slow

1833  
01:53:44,270 --> 01:53:41,580  
motion less than four inches per second

1834  
01:53:46,850 --> 01:53:44,280  
uh on the BGN the mod kit to avoid

1835  
01:53:49,430 --> 01:53:46,860  
cyclic loading uh watch the snag Hazard

1836  
01:53:52,010 --> 01:53:49,440  
on the uh the battery and AP cables on

1837  
01:54:02,450 --> 01:53:52,020  
the iea and you've got a 40 pound Max

1838  
01:54:07,430 --> 01:54:04,790

and so a few quick call outs from ground

1839

01:54:09,950 --> 01:54:07,440

IV Nick Hague there we're just about 35

1840

01:54:11,750 --> 01:54:09,960

minutes into today's space walk so we're

1841

01:54:17,149 --> 01:54:11,760

into the first major task of the day for

1842

01:54:23,090 --> 01:54:21,050

from these safety tethers especially the

1843

01:54:25,430 --> 01:54:23,100

really retracting very well it is

1844

01:54:27,290 --> 01:54:25,440

unlocked it's not real strong

1845

01:54:28,609 --> 01:54:27,300

just craving some snack here so I'm just

1846

01:54:31,209 --> 01:54:28,619

taking some of my time to make sure we

1847

01:54:32,750 --> 01:54:31,219

don't create anything

1848

01:54:35,390 --> 01:54:32,760

for doing that

1849

01:54:43,609 --> 01:54:35,400

[Applause]

1850

01:54:48,229 --> 01:54:46,430

I'm at 5107.

1851  
01:54:51,290 --> 01:54:48,239  
copy that's the handrail for the cable

1852  
01:54:55,370 --> 01:54:52,970  
you want to position the lid hinge

1853  
01:55:03,709 --> 01:54:55,380  
toward the center of the leaf can and

1854  
01:55:08,570 --> 01:55:05,629  
and Josh now that you've got your green

1855  
01:55:11,270 --> 01:55:08,580  
hook down uh it's translating up to the

1856  
01:55:13,970 --> 01:55:11,280  
the crew lock bag Tango uh and so

1857  
01:55:17,330 --> 01:55:13,980  
placing a fair lead on the port seat of

1858  
01:55:22,850 --> 01:55:17,340  
cart and uh going up up and around

1859  
01:55:22,860 --> 01:55:49,810  
perfect

1860  
01:55:54,229 --> 01:55:52,010  
and again at this point a little more

1861  
01:55:56,450 --> 01:55:54,239  
than 36 minutes into today's face we're

1862  
01:55:59,209 --> 01:55:56,460  
on both spacewalkers moving out to their

1863  
01:56:01,609 --> 01:55:59,219

first major tasks ev1 Frank Rubio

1864

01:56:03,649 --> 01:56:01,619

heading out to the work site uh he just

1865

01:56:06,290 --> 01:56:03,659

got some cautions read from

1866

01:56:07,970 --> 01:56:06,300

the ground IV Nick K essentially just

1867

01:56:09,830 --> 01:56:07,980

reminding them not to make any sudden

1868

01:56:11,570 --> 01:56:09,840

movements and part a lot of loads into

1869

01:56:13,189 --> 01:56:11,580

What's called the mass canister the mod

1870

01:56:16,609 --> 01:56:13,199

kit this is the hardware that's

1871

01:56:19,250 --> 01:56:16,619

installed to attach the new rollout

1872

01:56:21,709 --> 01:56:19,260

solar array to position it over the

1873

01:56:25,129 --> 01:56:21,719

existing one he's heading out there with

1874

01:56:27,410 --> 01:56:25,139

the cable bag that has some cables in it

1875

01:56:28,850 --> 01:56:27,420

and he's going to pre-deploy some of

1876

01:56:30,410 --> 01:56:28,860

those

1877

01:56:31,430 --> 01:56:30,420

this is a little bit of an issue coming

1878

01:56:36,410 --> 01:56:31,440

out here

1879

01:56:40,790 --> 01:56:38,270

with my Shirley

1880

01:56:42,350 --> 01:56:40,800

yeah and Josh you've got the best eyes

1881

01:56:43,970 --> 01:56:42,360

on in the situation there these Fair

1882

01:56:45,770 --> 01:56:43,980

leads were intended to keep separation

1883

01:56:48,709 --> 01:56:45,780

but if you don't think it's necessary

1884

01:56:51,470 --> 01:56:48,719

you don't have to do it

1885

01:56:54,229 --> 01:56:51,480

okay sounds good

1886

01:56:57,109 --> 01:56:54,239

Frank if you need it on the CFR uh it'll

1887

01:57:01,490 --> 01:56:57,119

be there for you but uh

1888

01:57:08,030 --> 01:57:04,550

so in this view we can see and we were

1889

01:57:09,709 --> 01:57:08,040

just hearing Josh Cassidy he's ev2 so

1890

01:57:11,629 --> 01:57:09,719

Josh your next task is going to be

1891

01:57:14,270 --> 01:57:11,639

putting an adjustable equipment tether

1892

01:57:17,750 --> 01:57:14,280

on the extension Alpha for the beam

1893

01:57:20,510 --> 01:57:17,760

stove task that's going to happen later

1894

01:57:22,370 --> 01:57:20,520

okay understood

1895

01:57:23,570 --> 01:57:22,380

I'm gonna take another minute and manage

1896

01:57:26,089 --> 01:57:23,580

all the stuff here in my mini

1897

01:57:30,129 --> 01:57:26,099

restriction it's uh

1898

01:57:30,139 --> 01:57:38,390

understand lots of adjustables and reds

1899

01:57:41,030 --> 01:57:39,649

I'm running through just a couple of

1900

01:57:42,950 --> 01:57:41,040

things we're looking at so you can see

1901

01:57:46,250 --> 01:57:42,960

Josh casted there at the bottom left

1902

01:57:49,010 --> 01:57:46,260

just above him the large white palette

1903

01:57:50,450 --> 01:57:49,020

with the Cross Point on the the very top

1904

01:57:52,189 --> 01:57:50,460

that's the FSE the Flight Support

1905

01:57:54,290 --> 01:57:52,199

equipment that's the

1906

01:57:56,810 --> 01:57:54,300

the temporary stowage point right now

1907

01:57:59,030 --> 01:57:56,820

for these iros solar rays that's what

1908

01:58:01,490 --> 01:57:59,040

they were essentially packed on top of

1909

01:58:03,530 --> 01:58:01,500

as they brought up in the trunk of the

1910

01:58:06,649 --> 01:58:03,540

cargo Dragon vehicle those two circular

1911

01:58:08,810 --> 01:58:06,659

pieces you could see that is the iro so

1912

01:58:11,149 --> 01:58:08,820

for today the International Space

1913

01:58:13,250 --> 01:58:11,159

Station robots solar array they arrive

1914

01:58:16,490 --> 01:58:13,260

folded up they're going to be translated

1915

01:58:19,129 --> 01:58:16,500

or moved over to the install point in

1916

01:58:21,350 --> 01:58:19,139

this folded up configuration before they

1917

01:58:24,649 --> 01:58:21,360

get unfolded and unfurled by the

1918

01:58:27,850 --> 01:58:24,659

spacewalkers the first major task for

1919

01:58:30,890 --> 01:58:27,860

Josh Casa is going to be releasing

1920

01:58:32,229 --> 01:58:30,900

ards's anti-rotation devices these are

1921

01:58:35,209 --> 01:58:32,239

just safety

1922

01:58:38,870 --> 01:58:35,219

Connections in place to prevent any

1923

01:58:40,609 --> 01:58:38,880

rotation as the arrays and the the

1924

01:58:42,350 --> 01:58:40,619

equipment carriers getting loads

1925

01:58:45,109 --> 01:58:42,360

imparted on it during any launch or

1926

01:58:47,270 --> 01:58:45,119

Ascent more robotic motion so those are

1927

01:58:49,810 --> 01:58:47,280

going to get released and then they're

1928

01:58:52,910 --> 01:58:49,820

going to get ready to remove the FSE

1929

01:58:56,270 --> 01:58:52,920

beams these are two support beams

1930

01:58:58,310 --> 01:58:56,280

running perpendicular over the top of

1931

01:58:59,930 --> 01:58:58,320

the eye roses that are there to hold

1932

01:59:01,850 --> 01:58:59,940

them in place obviously we need to

1933

01:59:03,530 --> 01:59:01,860

release those before we can slide the

1934

01:59:05,570 --> 01:59:03,540

eyebrows out and begin carrying it over

1935

01:59:08,390 --> 01:59:05,580

to the work site so he's going to first

1936

01:59:09,950 --> 01:59:08,400

release those anti-rotation devices and

1937

01:59:12,350 --> 01:59:09,960

then step into that beam release he's

1938

01:59:14,990 --> 01:59:12,360

going to be joined in that being release

1939

01:59:17,810 --> 01:59:15,000

activity of once Frank Rubio is

1940

01:59:19,729 --> 01:59:17,820

completed routing those initial cables

1941

01:59:22,609 --> 01:59:19,739

again those cables that Frank Rubio's

1942

01:59:23,990 --> 01:59:22,619

routing he's got essentially two but

1943

01:59:26,089 --> 01:59:24,000

there are a couple of cables bundled

1944

01:59:28,790 --> 01:59:26,099

together they're going to be y

1945

01:59:32,149 --> 01:59:28,800

connectors with one end with two points

1946

01:59:34,609 --> 01:59:32,159

one going into the new solar array one

1947

01:59:36,470 --> 01:59:34,619

connecting to the Legacy solar array

1948

01:59:38,270 --> 01:59:36,480

both of those coming together to then

1949

01:59:40,669 --> 01:59:38,280

Connect into the power Channel allowing

1950

01:59:43,129 --> 01:59:40,679

them both to continue to provide power

1951

01:59:44,870 --> 01:59:43,139

to the 4A so looking through Frank

1952

01:59:46,990 --> 01:59:44,880

Rubio's how it came you can see some of

1953

01:59:49,430 --> 01:59:47,000

those cables he's going to get those

1954

01:59:52,270 --> 01:59:49,440

essentially routed through some of the

1955

01:59:54,470 --> 01:59:52,280

different fixtures and wire tied down

1956

01:59:56,209 --> 01:59:54,480

very close to where they're ultimately

1957

01:59:59,689 --> 01:59:56,219

going to be connected we're not going to

1958

02:00:02,870 --> 01:59:59,699

make those connections until the

1959

02:00:05,470 --> 02:00:02,880

solar array itself is in place and we

1960

02:00:11,930 --> 02:00:05,480

are in a

1961

02:00:13,189 --> 02:00:11,940

get the cable out of the cable bag so

1962

02:00:16,010 --> 02:00:13,199

you're going to head over to that left

1963

02:00:20,109 --> 02:00:16,020

side of the market and uh Stow the crew

1964

02:00:20,119 --> 02:00:29,930

that's it

1965

02:00:35,149 --> 02:00:32,390

and looking at Josh Castle he's moving

1966

02:00:36,649 --> 02:00:35,159

up to the FSC again that's the the large

1967

02:00:38,810 --> 02:00:36,659

white palette you can see with the two

1968

02:00:41,570 --> 02:00:38,820

Targets on it

1969

02:00:43,870 --> 02:00:41,580

and then there's the irosa and it's

1970

02:00:46,669 --> 02:00:43,880

folded up and completely furled

1971

02:00:48,890 --> 02:00:46,679

configuration at the very end on either

1972

02:00:51,470 --> 02:00:48,900

end we're looking at

1973

02:00:54,169 --> 02:00:51,480

um are the Booms for the the eyebrowser

1974

02:00:56,030 --> 02:00:54,179

itself and those are after it's

1975

02:00:58,609 --> 02:00:56,040

completely unfolded and unfurled those

1976

02:01:01,070 --> 02:00:58,619

are what's going to provide the actual

1977

02:01:03,169 --> 02:01:01,080

structural support for those solar cells

1978

02:01:05,089 --> 02:01:03,179

in the metal um he got a couple of

1979

02:01:07,129 --> 02:01:05,099

cautions just as he got over here again

1980

02:01:09,950 --> 02:01:07,139

we're not we're trying not to impart any

1981

02:01:13,850 --> 02:01:09,960

major loads so not really rocking

1982

02:01:15,770 --> 02:01:13,860

anything as they work to attach they're

1983

02:01:17,689 --> 02:01:15,780

not going to be moving simultaneously

1984

02:01:19,370 --> 02:01:17,699

once they're both on the FSE and they

1985

02:01:21,589 --> 02:01:19,380

don't want them touching any of the

1986

02:01:23,390 --> 02:01:21,599

blankets where those solar cells are on

1987

02:01:25,070 --> 02:01:23,400

irises so you're going to continually

1988

02:01:33,850 --> 02:01:25,080

hear these call outs for just different

1989

02:01:38,510 --> 02:01:36,770

and affirmative that's handrail 12 on

1990

02:01:47,530 --> 02:01:38,520

that stanchion Alpha right there in your

1991

02:01:54,709 --> 02:01:50,810

and as Casper gets closer to his control

1992

02:01:57,229 --> 02:01:54,719

stopping point he's gonna get himself

1993

02:01:59,089 --> 02:01:57,239

uh tethered in to this area then he's

1994

02:02:01,310 --> 02:01:59,099

going to break out the PGT the pistol

1995

02:02:03,229 --> 02:02:01,320

grip tool you can see it attached to as

1996

02:02:05,270 --> 02:02:03,239

many workstation you can see the small

1997

02:02:07,010 --> 02:02:05,280

number three on it I think we're going

1998

02:02:09,290 --> 02:02:07,020

to use the four expansion so I'm just

1999

02:02:11,689 --> 02:02:09,300

going to leave that hanging

2000

02:02:32,149 --> 02:02:11,699

okay what's up

2001  
02:02:35,750 --> 02:02:34,250  
okay I think you're gonna let me get rid

2002  
02:02:37,250 --> 02:02:35,760  
of this long version type I'm putting

2003  
02:02:39,589 --> 02:02:37,260  
back to murdering

2004  
02:02:48,129 --> 02:02:39,599  
that's that's affirmative that's going

2005  
02:02:53,390 --> 02:02:50,810  
and Frank I see you string in the crew

2006  
02:02:55,669 --> 02:02:53,400  
lock back in between the uh lower strut

2007  
02:02:57,470 --> 02:02:55,679  
and the mid strut uh after you get that

2008  
02:02:58,910 --> 02:02:57,480  
in a good position uh you're going to

2009  
02:03:02,030 --> 02:02:58,920  
retrieve the square Scoop from inside

2010  
02:03:02,040 --> 02:03:27,310  
Ward

2011  
02:03:32,750 --> 02:03:29,810  
and again coming up we're gonna we're

2012  
02:03:35,089 --> 02:03:32,760  
gonna see Josh Casa using the PGT the

2013  
02:03:37,669 --> 02:03:35,099

pistol grip tool it's more or less the

2014

02:03:40,310 --> 02:03:37,679

electric drill that we use to interact

2015

02:03:42,109 --> 02:03:40,320

with pretty much every bolt that you'll

2016

02:03:43,310 --> 02:03:42,119

see

2017

02:03:45,410 --> 02:03:43,320

um we're going to hear a number of

2018

02:03:47,570 --> 02:03:45,420

settings called out that pistol grip

2019

02:03:49,609 --> 02:03:47,580

tool has the capability of dialing in

2020

02:03:52,070 --> 02:03:49,619

exactly how much torque you want to be

2021

02:03:55,189 --> 02:03:52,080

imparting how quickly how many rotations

2022

02:03:56,750 --> 02:03:55,199

per minute it's conducting you can limit

2023

02:04:01,250 --> 02:03:56,760

the amount of torque that it's going to

2024

02:04:03,530 --> 02:04:01,260

impart and then it has a LED display

2025

02:04:07,010 --> 02:04:03,540

readout where the crew member is able to

2026

02:04:09,169 --> 02:04:07,020

see how many turns it's completed and to

2027

02:04:10,970 --> 02:04:09,179

give you an idea we plan these

2028

02:04:12,890 --> 02:04:10,980

spacewalks out to the point where we

2029

02:04:15,410 --> 02:04:12,900

know how many turns that we're expecting

2030

02:04:17,810 --> 02:04:15,420

them to have to do and then giving them

2031

02:04:20,089 --> 02:04:17,820

very precise instructions on just how

2032

02:04:22,010 --> 02:04:20,099

much torque and things of that nature

2033

02:04:24,290 --> 02:04:22,020

scoop over to the mounting bracket

2034

02:04:26,930 --> 02:04:24,300

you're going to install us at that 45

2035

02:04:30,050 --> 02:04:26,940

degree angle as it points uh inboard to

2036

02:04:33,830 --> 02:04:30,060

the to the station you want to confirm

2037

02:04:33,840 --> 02:04:39,890

you know

2038

02:04:45,169 --> 02:04:42,109

and then throughout you might also hear

2039

02:04:48,290 --> 02:04:45,179

reference to a scoop that's another tool

2040

02:04:52,250 --> 02:04:48,300

that the crew members have access to uh

2041

02:04:54,109 --> 02:04:52,260

they're essentially equipment aids for

2042

02:04:56,030 --> 02:04:54,119

handling things they're handles that

2043

02:04:57,970 --> 02:04:56,040

they can attach to different payloads to

2044

02:05:02,000 --> 02:04:57,980

structures

2045

02:05:03,229 --> 02:05:02,010

to the right and it is

2046

02:05:14,629 --> 02:05:03,239

[Applause]

2047

02:05:19,669 --> 02:05:17,270

and so Frank Rubio just installed a

2048

02:05:21,250 --> 02:05:19,679

scoop that essentially a temporary

2049

02:05:23,750 --> 02:05:21,260

handrail for him now

2050

02:05:25,729 --> 02:05:23,760

the long duration on the tower hand rail

2051

02:05:28,010 --> 02:05:25,739

that's a good location for it uh when

2052

02:05:29,689 --> 02:05:28,020

you finish up there

2053

02:05:31,310 --> 02:05:29,699

uh we'll want you to check your left

2054

02:05:35,629 --> 02:05:31,320

safer handle we think we might have seen

2055

02:05:35,639 --> 02:05:44,709

okay

2056

02:05:48,410 --> 02:05:46,910

yeah I'm looking at a brief hand over

2057

02:05:50,450 --> 02:05:48,420

now we should give video back pretty

2058

02:05:52,850 --> 02:05:50,460

quickly this time though we won't have

2059

02:05:54,770 --> 02:05:52,860

another long gap for for quite a while

2060

02:05:56,149 --> 02:05:54,780

uh but we are still into the the first

2061

02:05:58,910 --> 02:05:56,159

major task for each of these

2062

02:06:00,950 --> 02:05:58,920

spacewalkers uh as they continue to work

2063

02:06:03,589 --> 02:06:00,960

through we were about 10 to 15 minutes

2064

02:06:05,990 --> 02:06:03,599

ahead in the timeline so far even if we

2065

02:06:08,510 --> 02:06:06,000

get too far ahead we'll have to wait

2066

02:06:09,950 --> 02:06:08,520

uh at some point in the spacewalk just

2067

02:06:18,609 --> 02:06:09,960

to make sure when we get to the cable

2068

02:06:37,010 --> 02:06:20,870

and we're back with you just had a short

2069

02:06:37,020 --> 02:06:50,020

foreign

2070

02:06:50,030 --> 02:07:05,169

[Applause]

2071

02:07:05,179 --> 02:07:12,890

swap uh for the uh the 12 inch 716.

2072

02:07:12,900 --> 02:07:25,129

profit

2073

02:07:31,729 --> 02:07:27,169

in fact I'm looking at the right side

2074

02:07:38,330 --> 02:07:34,070

um kind of an attached

2075

02:07:43,550 --> 02:07:41,390

yeah copy that Frank

2076

02:07:45,350 --> 02:07:43,560

here

2077

02:07:49,970 --> 02:07:45,360

any words on how it feels when you're

2078

02:07:49,980 --> 02:07:53,930

um it's

2079

02:07:58,310 --> 02:07:56,510

a premium amount of fiction so not quite

2080

02:08:00,589 --> 02:07:58,320

as hard as those are

2081

02:08:02,030 --> 02:08:00,599

on the previous one but not nearly as

2082

02:08:04,129 --> 02:08:02,040

easy as the one on the right on the

2083

02:08:06,649 --> 02:08:04,139

previous one

2084

02:08:08,629 --> 02:08:06,659

understand and uh we're back with a new

2085

02:08:13,910 --> 02:08:08,639

video so I see you're making Headway on

2086

02:08:13,920 --> 02:08:31,330

for me

2087

02:08:36,470 --> 02:08:34,850

and so this view from Frank Rubio's how

2088

02:08:38,089 --> 02:08:36,480

my camera is again he's working to Route

2089

02:08:39,589 --> 02:08:38,099

some of those cables these are going to

2090

02:08:41,750 --> 02:08:39,599

be the the power connection cables

2091

02:08:44,390 --> 02:08:41,760

that's going to integrate uh the newly

2092

02:08:46,250 --> 02:08:44,400

deployed ibrosa into the the 4A power

2093

02:08:48,470 --> 02:08:46,260

Channel onboard the station

2094

02:08:50,510 --> 02:08:48,480

and so he's getting these into

2095

02:08:52,129 --> 02:08:50,520

essentially their their initial

2096

02:08:53,990 --> 02:08:52,139

connection point he's going to tie them

2097

02:08:56,629 --> 02:08:54,000

down using some wire ties and some other

2098

02:08:58,370 --> 02:08:56,639

harnesses to secure these so they're not

2099

02:09:00,470 --> 02:08:58,380

just kind of floating around freely

2100

02:09:02,209 --> 02:09:00,480

making sure he's leaving enough slack

2101  
02:09:05,870 --> 02:09:02,219  
for the eventual connection themselves

2102  
02:09:07,850 --> 02:09:05,880  
uh these won't get connected to the to

2103  
02:09:10,850 --> 02:09:07,860  
the arrays themselves until we're in an

2104  
02:09:14,570 --> 02:09:10,860  
eclipse is uh being out of direct

2105  
02:09:16,310 --> 02:09:14,580  
sunlight is the primary inhibit for

2106  
02:09:18,709 --> 02:09:16,320  
making sure that the solar rays aren't

2107  
02:09:20,089 --> 02:09:18,719  
generating electricity and we're not

2108  
02:09:23,149 --> 02:09:20,099  
plugging into something actively

2109  
02:09:25,729 --> 02:09:23,159  
generating so at some point we will have

2110  
02:09:28,609 --> 02:09:25,739  
to to wait for our Eclipse we are timed

2111  
02:09:31,430 --> 02:09:28,619  
to hopefully hit that pretty pretty much

2112  
02:09:34,370 --> 02:09:31,440  
on the money as we plan out all the

2113  
02:09:36,830 --> 02:09:34,380

other activities as this is now the

2114

02:09:39,109 --> 02:09:36,840

second one of these installs that this

2115

02:09:40,430 --> 02:09:39,119

pair of crew members is done completing

2116

02:09:43,129 --> 02:09:40,440

their last one in just a little over

2117

02:09:45,830 --> 02:09:43,139

seven hours this today a planned seven

2118

02:09:49,070 --> 02:09:45,840

hour spacewalk which one right now we

2119

02:09:55,250 --> 02:09:49,080

are 50 minutes and 40 seconds into so in

2120

02:10:00,410 --> 02:09:56,990

and while Frank Rubio's working on this

2121

02:10:03,530 --> 02:10:00,420

cable routing Josh Casada over at the

2122

02:10:06,050 --> 02:10:03,540

FSE getting ready to release what's

2123

02:10:07,970 --> 02:10:06,060

known as the ards the anti-rotation

2124

02:10:09,890 --> 02:10:07,980

devices in terms of where you're going

2125

02:10:14,689 --> 02:10:09,900

to put that two inch uh your trash bag

2126

02:10:14,699 --> 02:10:19,629

it's got to be one of those things

2127

02:10:28,250 --> 02:10:22,910

yeah copy that that's uh your two

2128

02:10:28,260 --> 02:10:32,149

so he's gonna have two of these

2129

02:10:36,589 --> 02:10:34,850

there's too much

2130

02:10:39,470 --> 02:10:36,599

bag so I'll have to put it on the

2131

02:10:43,850 --> 02:10:41,750

he's gonna have two of these ards to

2132

02:10:45,589 --> 02:10:43,860

release

2133

02:10:48,410 --> 02:10:45,599

and he's got to attach some tethers to

2134

02:10:51,950 --> 02:10:48,420

them as these ones are not what's called

2135

02:10:54,410 --> 02:10:51,960

captive bolts so captive bolt once you

2136

02:10:56,450 --> 02:10:54,420

comfortable once you unscrew it it stays

2137

02:11:00,050 --> 02:10:56,460

in kind of a captive fitting in this

2138

02:11:04,490 --> 02:11:02,990

so he's going to be attaching the tether

2139

02:11:06,649 --> 02:11:04,500

to them to make sure he captures them

2140

02:11:08,810 --> 02:11:06,659

and they can then bring him in his bag

2141

02:11:10,370 --> 02:11:08,820

and not just let them float off in the

2142

02:11:12,709 --> 02:11:10,380

meantime he's also breaking out that

2143

02:11:14,810 --> 02:11:12,719

that PGT the pistol grip tool making

2144

02:11:16,609 --> 02:11:14,820

sure he has the right socket size on it

2145

02:11:18,109 --> 02:11:16,619

and then we'll hear the call out of the

2146

02:11:20,450 --> 02:11:18,119

different settings that he's going to be

2147

02:11:21,770 --> 02:11:20,460

using before he starts using that to

2148

02:11:42,589 --> 02:11:21,780

drive some of these bolts and release

2149

02:11:49,250 --> 02:11:45,950

a good filter I've found the removal

2150

02:11:49,260 --> 02:11:55,490

full drift on the install

2151  
02:12:00,169 --> 02:11:57,410  
and uh so Josh you're going to translate

2152  
02:12:05,450 --> 02:12:00,179  
over to the Charlie 12 bolts and that's

2153  
02:12:05,460 --> 02:12:14,570  
I'll be there

2154  
02:12:19,490 --> 02:12:16,250  
it seems like you're making pretty good

2155  
02:12:19,500 --> 02:12:23,209  
I thank each other

2156  
02:12:33,350 --> 02:12:25,669  
smacked out

2157  
02:12:39,169 --> 02:12:34,910  
and you guys are both making great

2158  
02:12:53,830 --> 02:12:41,490  
thank you

2159  
02:12:53,840 --> 02:13:01,010  
translation on three for mobile

2160  
02:13:01,020 --> 02:13:05,270  
season 513 go ahead

2161  
02:13:11,750 --> 02:13:09,530  
again I'm looking at the um sse20 this

2162  
02:13:16,310 --> 02:13:11,760  
is the um a Heckler camera split screen

2163  
02:13:18,669 --> 02:13:16,320

views but on the left side I see uh

2164

02:13:22,430 --> 02:13:18,679

think of you but the right side

2165

02:13:24,589 --> 02:13:22,440

split screen view shows no WBS

2166

02:13:34,910 --> 02:13:24,599

video and uh

2167

02:13:49,550 --> 02:13:37,129

and I guess I have one wire tie down

2168

02:13:55,310 --> 02:13:52,430

in koichi we copy uh we think we'll need

2169

02:13:57,470 --> 02:13:55,320

to get uh and Frank you need to have two

2170

02:13:59,569 --> 02:13:57,480

wire ties with three twists holding down

2171

02:14:05,870 --> 02:13:59,579

the cable to release it right so we need

2172

02:14:05,880 --> 02:14:22,729

okay thank you

2173

02:14:22,739 --> 02:14:27,890

okay Nick let's talk about

2174

02:14:27,900 --> 02:14:33,530

an ARD I see AR3 here at C12

2175

02:14:38,990 --> 02:14:37,250

okay copy that and uh so you'll attach

2176

02:14:40,790 --> 02:14:39,000

your adjustable

2177

02:14:42,350 --> 02:14:40,800

um from your trash bag to that Ard

2178

02:14:46,189 --> 02:14:42,360

tether point and then when you're ready

2179

02:14:46,199 --> 02:14:52,729

that's great

2180

02:14:57,589 --> 02:14:54,709

and just a reminder that tetherpoint is

2181

02:15:00,830 --> 02:14:57,599

not the long lanyard that's the physical

2182

02:15:29,390 --> 02:15:00,840

metal tether point

2183

02:15:29,400 --> 02:15:39,290

all right

2184

02:15:43,790 --> 02:15:41,930

okay I've got my adjustable on it and

2185

02:15:45,410 --> 02:15:43,800

that's that's what is right back to my

2186

02:15:48,830 --> 02:15:45,420

mini workstation

2187

02:15:54,770 --> 02:15:48,840

and I will go for my PGT

2188

02:15:58,729 --> 02:15:56,149

well I guess we'll see I was going to

2189

02:15:59,990 --> 02:15:58,739

ask if it's gonna that sounds gonna move

2190

02:16:01,850 --> 02:16:00,000

gonna move a penny to reach in there and

2191

02:16:03,830 --> 02:16:01,860

persuade it but I think it might want to

2192

02:16:05,330 --> 02:16:03,840

go once we go kind of clockwise a little

2193

02:16:07,490 --> 02:16:05,340

bit

2194

02:16:09,589 --> 02:16:07,500

yep you're thinking the same thing uh

2195

02:16:11,689 --> 02:16:09,599

that that I am there's no spring loading

2196

02:16:13,310 --> 02:16:11,699

or anything so when you loosen it up if

2197

02:16:16,850 --> 02:16:13,320

it doesn't rotate out of its way you may

2198

02:16:16,860 --> 02:16:57,169

let's go

2199

02:16:57,179 --> 02:17:04,310

okay we are open up and calibrated

2200

02:17:14,270 --> 02:17:07,450

Kathy Josh so it's going to be Bravo 3

2201

02:17:20,330 --> 02:17:17,030

okay I got Bravo three

2202

02:17:21,770 --> 02:17:20,340

nine o'clockwise too

2203

02:17:26,110 --> 02:17:21,780

that's a good read back for someone

2204

02:17:28,669 --> 02:17:26,120

that's six to ten six to ten turns

2205

02:17:30,049 --> 02:17:28,679

uh you're going just to loosen it uh

2206

02:17:38,150 --> 02:17:30,059

don't exceed those ten that's not

2207

02:17:43,429 --> 02:17:40,610

all right like those uh cables are in

2208

02:17:44,690 --> 02:17:43,439

place I had to disconnect the cables

2209

02:17:46,549 --> 02:17:44,700

because

2210

02:17:48,230 --> 02:17:46,559

just to kind of undo the rad smash that

2211

02:17:51,950 --> 02:17:48,240

it forms but do you want me to connect

2212

02:17:53,929 --> 02:17:51,960

them back they both require you

2213

02:17:55,070 --> 02:17:53,939

and that's a negative Frank uh we were

2214

02:17:56,990 --> 02:17:55,080

we were expecting them to be

2215

02:17:59,389 --> 02:17:57,000

disconnected anyway so it's in a good

2216

02:17:59,399 --> 02:18:02,870

oh great

2217

02:18:02,880 --> 02:18:09,530

I counted ten

2218

02:18:14,030 --> 02:18:11,810

if you don't see revolutions on there I

2219

02:18:22,669 --> 02:18:14,040

see

2220

02:18:27,290 --> 02:18:25,310

and that's

2221

02:18:30,589 --> 02:18:27,300

hopefully that block is loosened up and

2222

02:18:30,599 --> 02:18:46,490

let's see

2223

02:18:51,349 --> 02:18:49,910

I like the uh on the left soft capture

2224

02:18:53,629 --> 02:18:51,359

features

2225

02:18:55,370 --> 02:18:53,639

the center most one is engaged in the

2226

02:18:58,190 --> 02:18:55,380

proper config

2227

02:19:02,870 --> 02:18:58,200

and kind of medium fiction

2228

02:19:08,509 --> 02:19:02,880

and uh one is in a capture or correction

2229

02:19:16,129 --> 02:19:11,290

and also set in the right position

2230

02:19:16,139 --> 02:19:20,150

thank you Frank

2231

02:19:20,160 --> 02:19:26,990

ie

2232

02:19:27,000 --> 02:19:30,410

with you Josh

2233

02:19:35,330 --> 02:19:33,230

yeah so I can see

2234

02:19:36,650 --> 02:19:35,340

a pretty good play there with the tab

2235

02:19:41,330 --> 02:19:36,660

and the washers is that what you expect

2236

02:19:41,340 --> 02:19:46,549

it is out of the way now

2237

02:19:50,690 --> 02:19:48,290

yep if it's loosened you should be able

2238

02:19:53,090 --> 02:19:50,700

to pull that uh if you can reach that

2239

02:19:56,150 --> 02:19:53,100

lanyard that's there to assist you in

2240

02:19:59,330 --> 02:19:58,130

I understand that I was being a pretty

2241

02:20:04,010 --> 02:19:59,340

good uh

2242

02:20:10,969 --> 02:20:06,230

for free but some of those contained

2243

02:20:17,690 --> 02:20:13,910

sliding up and down but we got it

2244

02:20:22,670 --> 02:20:20,270

and I'm gonna get set up for driving it

2245

02:20:24,349 --> 02:20:22,680

back in and we can see it just floating

2246

02:20:26,570 --> 02:20:24,359

there in the center that was one of

2247

02:20:30,050 --> 02:20:26,580

those two ards anti-rotation devices

2248

02:20:32,630 --> 02:20:30,060

that Josh cassid is working on removing

2249

02:20:34,310 --> 02:20:32,640

meanwhile Frank Rubio is still over at

2250

02:20:36,290 --> 02:20:34,320

the work site preparing for the arrival

2251

02:20:38,690 --> 02:20:36,300

of the iro so routing those cables he

2252

02:20:41,570 --> 02:20:38,700

also cycled through the three soft

2253

02:20:43,190 --> 02:20:41,580

capture devices there's three they'll

2254

02:20:46,490 --> 02:20:43,200

look very similar to handles when you

2255

02:20:49,190 --> 02:20:46,500

see them on your screen that are

2256

02:20:50,990 --> 02:20:49,200

uh once the eyebrows is slid into place

2257

02:20:53,150 --> 02:20:51,000

those handles will engage and we'll have

2258

02:20:55,010 --> 02:20:53,160

a soft capture so that just helps to

2259

02:20:57,590 --> 02:20:55,020

maintain an alignment and then allows

2260

02:21:00,050 --> 02:20:57,600

these crew members to drive the eight

2261

02:21:03,110 --> 02:21:00,060

mounting brackets that will securely

2262

02:21:08,450 --> 02:21:03,120

fasten the irosa onto that mounting

2263

02:21:12,770 --> 02:21:11,210

and we are a little over an hour and two

2264

02:21:14,750 --> 02:21:12,780

minutes into today's spacewalk again

2265

02:21:16,309 --> 02:21:14,760

everything kicked off at 7 19 a.m

2266

02:21:18,469 --> 02:21:16,319

Central when the crews switch over to

2267

02:21:21,410 --> 02:21:18,479

their battery power on their spacesuits

2268

02:21:24,410 --> 02:21:21,420

still in the first primary task right

2269

02:21:27,710 --> 02:21:24,420

now one of two anti-rotation devices

2270

02:21:29,630 --> 02:21:27,720

over holding the irises in place has

2271

02:21:31,490 --> 02:21:29,640

been removed Josh cast out working on

2272

02:21:33,530 --> 02:21:31,500

movie number two

2273

02:21:35,450 --> 02:21:33,540

I mean while Frank Rubio working on

2274

02:21:37,429 --> 02:21:35,460

securing those power cables that are

2275

02:21:40,070 --> 02:21:37,439

going to get connected after the irosa

2276

02:21:42,130 --> 02:21:40,080

is secured in place also making sure

2277

02:21:45,349 --> 02:21:42,140

that the soft capture system is ready

2278

02:21:47,690 --> 02:21:45,359

for its arrival after he's complete he's

2279

02:21:50,630 --> 02:21:47,700

going to start translating back over to

2280

02:21:52,790 --> 02:21:50,640

where Josh Katz was working at the irosa

2281

02:21:55,610 --> 02:21:52,800

itself on that temporary stove site that

2282

02:21:57,830 --> 02:21:55,620

Flight Support equipment area where we

2283

02:22:00,410 --> 02:21:57,840

can see Casto working right here then

2284

02:22:03,830 --> 02:22:00,420

the two are going to work to release a

2285

02:22:07,250 --> 02:22:03,840

pair of beams there are beams laying

2286

02:22:09,050 --> 02:22:07,260

perpendicular across the irosa itself

2287

02:22:11,270 --> 02:22:09,060

those have been in place to help hold

2288

02:22:12,950 --> 02:22:11,280

them throughout all of the launch and

2289

02:22:15,349 --> 02:22:12,960

arrival and those are going to get

2290

02:22:17,990 --> 02:22:15,359

removed and then after that we'll be

2291

02:22:21,230 --> 02:22:18,000

able to start actually relocating this

2292

02:22:24,290 --> 02:22:21,240

irosa over to its ultimate install site

2293

02:22:26,929 --> 02:22:24,300

in order to do that Josh Castle is going

2294

02:22:30,830 --> 02:22:26,939

to get into a foot restraint on the

2295

02:22:34,849 --> 02:22:34,010

copy Josh that's a good bolt uh so we're

2296

02:22:38,809 --> 02:22:34,859

gonna

2297

02:22:42,290 --> 02:22:38,819

translate over to C11 which is tangent

2298

02:22:46,429 --> 02:22:44,929

and I've seen why we only got four if

2299

02:22:48,050 --> 02:22:46,439

you guys can see it in America if you're

2300

02:22:50,630 --> 02:22:48,060

I'm happy with this config it's

2301

02:22:53,030 --> 02:22:50,640

definitely is not going anywhere

2302

02:22:54,889 --> 02:22:53,040

no we're we're here yeah Josh we're

2303

02:22:57,650 --> 02:22:54,899

happy with the config we can't see it uh

2304

02:23:01,429 --> 02:22:57,660

the hecka just for your essay uh is it's

2305

02:23:06,770 --> 02:23:04,849

got it what happened is the full uh I'm

2306

02:23:08,210 --> 02:23:06,780

sorry the block is rotated

2307

02:23:10,010 --> 02:23:08,220

counterclockwise

2308

02:23:12,530 --> 02:23:10,020

and when I went to drive back in it just

2309

02:23:16,429 --> 02:23:12,540

catches on the it is caught on the uh

2310

02:23:18,469 --> 02:23:16,439

lip of the C12 it is definitely in there

2311

02:23:20,389 --> 02:23:18,479

and not going anywhere

2312

02:23:22,910 --> 02:23:20,399

copy all uh everybody on the ground's

2313

02:23:28,790 --> 02:23:24,889

yeah

2314

02:23:30,530 --> 02:23:28,800

that

2315

02:23:37,750 --> 02:23:30,540

last time

2316

02:24:05,090 --> 02:23:41,150

making Headway with the left wire

2317

02:24:08,990 --> 02:24:07,429

and so on this split screen view we're

2318

02:24:11,150 --> 02:24:09,000

looking over the shoulder of Frank Ruby

2319

02:24:15,110 --> 02:24:11,160

on the left there uv-1 for today's space

2320

02:24:16,790 --> 02:24:15,120

walk on the right that shows Cassidy ev2

2321

02:24:18,710 --> 02:24:16,800

again they're at separate locations

2322

02:24:21,530 --> 02:24:18,720

right now going through these first

2323

02:24:23,870 --> 02:24:21,540

major tasks of getting this new rollout

2324

02:24:27,650 --> 02:24:23,880

solar array installed

2325

02:24:29,570 --> 02:24:27,660

Frank Rubio now working to secure one of

2326

02:24:31,670 --> 02:24:29,580

the wire bundles

2327

02:24:32,990 --> 02:24:31,680

using the number of wire ties he's going

2328

02:24:34,510 --> 02:24:33,000

to be attaching these to different

2329

02:24:36,830 --> 02:24:34,520

handrails

2330

02:24:37,910 --> 02:24:36,840

and this is just to keep those cables

2331

02:24:39,710 --> 02:24:37,920

secure he's going to make sure he has

2332

02:24:41,389 --> 02:24:39,720

enough slack built into that for the

2333

02:24:44,330 --> 02:24:41,399

ultimate connections that these are

2334

02:24:47,450 --> 02:24:44,340

going to make to the the mounting

2335

02:24:49,550 --> 02:24:47,460

bracket area and then ultimately down

2336

02:24:51,650 --> 02:24:49,560

struggle with the uh the lanyards and

2337

02:24:55,730 --> 02:24:51,660

explains why Frank decided to break his

2338

02:24:55,740 --> 02:25:06,130

definitely crossed my mind

2339

02:25:06,140 --> 02:25:15,170

you think it was pretty meditating

2340

02:25:29,190 --> 02:25:19,490

just so long this Ard each other yeah

2341

02:25:29,200 --> 02:25:48,110

[Applause]

2342

02:25:52,690 --> 02:25:50,030

I'm gonna be really delivered about what

2343

02:25:55,429 --> 02:25:52,700

I want to loosen release it's gonna be

2344

02:25:57,650 --> 02:25:55,439

tend to be adjustable that is anchored

2345

02:25:59,510 --> 02:25:57,660

on our mini Workstation

2346

02:26:34,070 --> 02:25:59,520

Little Feather points

2347

02:26:34,080 --> 02:27:11,809

wow

2348

02:27:11,819 --> 02:27:26,889

foreign

2349

02:27:33,349 --> 02:27:29,870

Cable Bundle is down

2350

02:27:36,770 --> 02:27:33,359

and wires out in two locations

2351

02:27:39,290 --> 02:27:36,780

I can see that we have good reach

2352

02:27:45,849 --> 02:27:39,300

to the project location here

2353

02:27:51,309 --> 02:27:49,190

disengaged and then I have three self

2354

02:27:55,429 --> 02:27:51,319

captures in a proper location

2355

02:27:59,330 --> 02:27:55,439

uh anything else you need to do here

2356

02:28:01,309 --> 02:27:59,340

yeah and uh and Frank if you can uh just

2357

02:28:03,590 --> 02:28:01,319

confirm that the Moi is kind of clear

2358

02:28:04,849 --> 02:28:03,600

that the plane on top of the mod kit to

2359

02:28:05,990 --> 02:28:04,859

make sure there's no interference there

2360

02:28:07,790 --> 02:28:06,000

you probably have good eyes for that

2361

02:28:12,370 --> 02:28:07,800

otherwise let's head back to the cable

2362

02:28:30,950 --> 02:28:14,330

both sides

2363

02:28:36,349 --> 02:28:33,410

all right well coming up on one hour 10

2364

02:28:37,969 --> 02:28:36,359

minutes into today's space walk just

2365

02:28:40,790 --> 02:28:37,979

heard some good reports out from Frank

2366

02:28:43,190 --> 02:28:40,800

Rubio ev1 for today right now he's over

2367

02:28:45,410 --> 02:28:43,200

at the ultimate install point for the

2368

02:28:48,170 --> 02:28:45,420

irosa securing two different

2369

02:28:49,610 --> 02:28:48,180

uh cables that we have and each of these

2370

02:28:52,910 --> 02:28:49,620

is essentially going to be a wide jumper

2371

02:28:56,090 --> 02:28:52,920

connecting the newly installed irosa and

2372

02:28:58,490 --> 02:28:56,100

the Legacy solar array down into the

2373

02:29:00,050 --> 02:28:58,500

power Channel itself so

2374

02:29:02,090 --> 02:29:00,060

as part of the preparation work he's

2375

02:29:02,990 --> 02:29:02,100

been securing those cables cable bag is

2376

02:29:04,730 --> 02:29:03,000

closed and then you're going to

2377

02:29:09,710 --> 02:29:04,740

translate inboard to the Port City cart

2378

02:29:14,510 --> 02:29:11,690

okay uh can we just leave it open

2379

02:29:15,889 --> 02:29:14,520

because we're going to be uh bring me my

2380

02:29:24,590 --> 02:29:15,899

uh

2381

02:29:28,130 --> 02:29:26,690

just velcro you don't have to use straps

2382

02:29:46,010 --> 02:29:28,140

to keep it closed but we'd like to have

2383

02:29:48,340 --> 02:29:47,270

all right Mike we're going to try to

2384

02:29:50,389 --> 02:29:48,350

keep that from happening

2385

02:29:51,710 --> 02:29:50,399

[Applause]

2386

02:29:54,170 --> 02:29:51,720

um sounds like I understand we're doing

2387

02:29:55,910 --> 02:29:54,180

Bravo stream counterclockwise two

2388

02:30:13,190 --> 02:29:55,920

those are good settings

2389

02:30:13,200 --> 02:30:18,950

I do have my adjustable on the Ard

2390

02:30:31,150 --> 02:30:22,910

and copy and we can see it in your hekka

2391

02:30:38,150 --> 02:30:34,370

and right now Frank Rubio making his way

2392

02:30:40,250 --> 02:30:38,160

over to join Josh cassida at this FSE

2393

02:30:41,750 --> 02:30:40,260

where the solar array is currently

2394

02:30:44,389 --> 02:30:41,760

stowed

2395

02:30:46,550 --> 02:30:44,399

Cassidy working to remove that second

2396

02:30:48,830 --> 02:30:46,560

anti-rotation device and then once

2397

02:30:51,230 --> 02:30:48,840

that's out he'll be done with that task

2398

02:30:53,929 --> 02:30:51,240

he'll stop he'll swap out one of the

2399

02:30:56,870 --> 02:30:53,939

sockets on his pistol grip tool before

2400

02:31:01,190 --> 02:30:56,880

they get ready to remove the support

2401

02:31:01,200 --> 02:31:10,610

copyton turns shots

2402

02:31:14,150 --> 02:31:12,469

and we'll we'll be able to see the

2403

02:31:15,530 --> 02:31:14,160

support beams once we get into their

2404

02:31:17,690 --> 02:31:15,540

helmet game you can actually see a

2405

02:31:19,190 --> 02:31:17,700

little bit from this view in the lower

2406

02:31:21,650 --> 02:31:19,200

left hand corner if you see that white

2407

02:31:25,429 --> 02:31:21,660

bar that's going across the upper part

2408

02:31:27,530 --> 02:31:25,439

of the array running left to right

2409

02:31:29,750 --> 02:31:27,540

um that is one of the two support beams

2410

02:31:31,790 --> 02:31:29,760

holding eyebrows in place on this

2411

02:31:34,490 --> 02:31:31,800

transporter and those are both going to

2412

02:31:37,910 --> 02:31:34,500

get released before we can roll the iris

2413

02:31:40,969 --> 02:31:37,920

out of its temporary spot

2414

02:31:46,610 --> 02:31:44,110

what kind of noise everything's inside

2415

02:31:49,130 --> 02:31:46,620

very bad

2416

02:31:51,590 --> 02:31:49,140

copy Frank thanks for doing that for us

2417

02:31:54,050 --> 02:31:51,600

and uh so you're gonna head back in uh

2418

02:31:57,230 --> 02:31:54,060

Port C to cart and then you're gonna go

2419

02:32:08,870 --> 02:31:57,240

to stanchion Alpha on the FSC and then

2420

02:32:16,450 --> 02:32:11,809

and Josh uh it's a good video of both

2421

02:32:22,309 --> 02:32:18,530

I'll try to keep him out of the way I

2422

02:32:27,730 --> 02:32:22,319

don't see you way of anchoring them now

2423

02:32:34,670 --> 02:32:30,050

yep understand we're gonna offload those

2424

02:32:39,530 --> 02:32:36,830

and then with that view in those words

2425

02:32:41,809 --> 02:32:39,540

both of the ards the anti-rotation

2426  
02:32:54,610 --> 02:32:41,819  
devices holding 90 degrees you okay with

2427  
02:32:54,620 --> 02:32:58,010  
I'm all clear

2428  
02:32:58,020 --> 02:33:01,250  
yep copy

2429  
02:33:06,710 --> 02:33:03,530  
thank you go to translate and uh Josh is

2430  
02:33:11,809 --> 02:33:08,690  
and Josh the settings are Bravo One

2431  
02:33:17,510 --> 02:33:14,210  
level one clockwise two are you go with

2432  
02:33:19,969 --> 02:33:17,520  
uh dragon here at 90 degrees off

2433  
02:33:21,530 --> 02:33:19,979  
and that's affirmative the orientation

2434  
02:33:23,270 --> 02:33:21,540  
of the block doesn't matter we're just

2435  
02:33:25,969 --> 02:33:23,280  
trying to secure it to so drive to

2436  
02:33:25,979 --> 02:33:29,110  
that's good

2437  
02:33:29,120 --> 02:33:50,590  
thank you

2438  
02:33:55,849 --> 02:33:53,450

let's get it

2439

02:33:57,889 --> 02:33:55,859

four turns

2440

02:33:59,210 --> 02:33:57,899

right here for low torques and we'll put

2441

02:34:14,270 --> 02:33:59,220

it again

2442

02:34:18,170 --> 02:34:16,190

all right now Victory might

2443

02:34:23,090 --> 02:34:18,180

well I'd say four turns are barely moved

2444

02:34:30,170 --> 02:34:26,809

copy Josh that's a good bolt so you're

2445

02:34:32,330 --> 02:34:30,180

good to uh Stow that PGT

2446

02:34:33,889 --> 02:34:32,340

um actually you don't have to still

2447

02:34:35,150 --> 02:34:33,899

you're going to translate over to crew

2448

02:34:38,150 --> 02:34:35,160

lockback T you're going to get rid of

2449

02:34:42,710 --> 02:34:38,160

the yards into uh crew lock back T and

2450

02:34:48,530 --> 02:34:44,990

okay understood

2451  
02:34:52,610 --> 02:34:51,650  
and Frank I see you uh up on the FSC so

2452  
02:34:56,929 --> 02:34:52,620  
we want to make sure that we're not

2453  
02:34:56,939 --> 02:35:02,750  
okay copy that and I am over by Bravo

2454  
02:35:06,830 --> 02:35:05,150  
hey Frank and uh when Josh if you hold

2455  
02:35:09,170 --> 02:35:06,840  
your position there Frank when Josh gets

2456  
02:35:10,490 --> 02:35:09,180  
over by the the crew lock back Tango I'm

2457  
02:35:18,410 --> 02:35:10,500  
gonna have you move over to Alpha and

2458  
02:35:18,420 --> 02:35:27,610  
you want who to hold position

2459  
02:35:32,450 --> 02:35:30,410  
yep uh Frank you hold position Josh is

2460  
02:35:34,309 --> 02:35:32,460  
picking up his brt and translating once

2461  
02:35:35,870 --> 02:35:34,319  
he's in a position then I'll get you

2462  
02:35:51,889 --> 02:35:35,880  
over to Alpha and we'll get you the

2463  
02:35:51,899 --> 02:36:09,110

I think I'm moving

2464

02:36:13,130 --> 02:36:11,210

all right well at this point in the

2465

02:36:18,770 --> 02:36:13,140

spacewalk one hour 17 minutes five

2466

02:36:26,210 --> 02:36:22,490

okay copy that Frank uh so you can head

2467

02:36:29,510 --> 02:36:26,220

over to Alpha and we're gonna drive old

2468

02:36:31,790 --> 02:36:29,520

C7 and C8 on that FSE beam so once

2469

02:36:33,290 --> 02:36:31,800

you're in a good position I'll give you

2470

02:36:35,870 --> 02:36:33,300

the PGT settings

2471

02:36:39,830 --> 02:36:35,880

and Josh you're looking to get rid of

2472

02:36:43,490 --> 02:36:39,840

those ards uh with the adjustable and

2473

02:36:45,050 --> 02:36:43,500

the uh and the red and then also you're

2474

02:36:48,889 --> 02:36:45,060

going to swap back to that two inch

2475

02:36:48,899 --> 02:36:54,410

understood

2476

02:36:57,430 --> 02:36:57,420

uh

2477

02:36:57,430 --> 02:37:04,990

[Music]

2478

02:37:09,230 --> 02:37:07,429

okay copy that Frank and so you're

2479

02:37:11,510 --> 02:37:09,240

looking for Charlie seven and Charlie

2480

02:37:14,450 --> 02:37:11,520

eight bolts on the top of the beam

2481

02:37:16,670 --> 02:37:14,460

uh and you're gonna release those it's a

2482

02:37:25,309 --> 02:37:16,680

Bravo 7 setting so you won't have a good

2483

02:37:31,300 --> 02:37:27,469

oh I've got another set of Earth here to

2484

02:37:31,310 --> 02:37:34,550

[Applause]

2485

02:37:39,650 --> 02:37:37,610

a few views of planet Earth from Frank

2486

02:37:42,830 --> 02:37:39,660

Rubio's helmet cam the station just

2487

02:37:44,990 --> 02:37:42,840

flying uh just to the south of Liberia

2488

02:37:48,170 --> 02:37:45,000

and just banking up house over western

2489

02:37:50,270 --> 02:37:48,180

Africa is we're one hour 18 minutes 40

2490

02:37:52,370 --> 02:37:50,280

seconds in

2491

02:37:53,510 --> 02:37:52,380

two and adjustable met adjustable went

2492

02:37:55,550 --> 02:37:53,520

to

2493

02:37:58,070 --> 02:37:55,560

the previous set of Arts but I'm just

2494

02:38:03,830 --> 02:38:00,710

you know go to

2495

02:38:07,429 --> 02:38:03,840

an adjustable that goes to a wrench

2496

02:38:11,570 --> 02:38:09,290

I'm just looking for my Anchor Point for

2497

02:38:13,790 --> 02:38:11,580

the uh for my deposit here

2498

02:38:20,210 --> 02:38:13,800

yep understand in your go to use any uh

2499

02:38:24,889 --> 02:38:22,429

so the first major task complete for

2500

02:38:27,110 --> 02:38:24,899

both of these spacewalkers

2501  
02:38:28,150 --> 02:38:27,120  
Frank Rubio's successfully setting up

2502  
02:38:29,510 --> 02:38:28,160  
cables

2503  
02:38:31,429 --> 02:38:29,520  
[Music]

2504  
02:38:37,690 --> 02:38:31,439  
Frank it's

2505  
02:38:43,309 --> 02:38:40,429  
counterclockwise too

2506  
02:38:46,070 --> 02:38:43,319  
and you're going to release to 8 to 11

2507  
02:38:49,370 --> 02:38:47,450  
okay it doesn't matter what should I do

2508  
02:39:01,190 --> 02:38:49,380  
first

2509  
02:39:05,809 --> 02:39:02,929  
okay

2510  
02:39:07,130 --> 02:39:05,819  
looks like my Ard

2511  
02:39:10,550 --> 02:39:07,140  
s together

2512  
02:39:11,929 --> 02:39:10,560  
is connected to a different adjustable

2513  
02:39:14,150 --> 02:39:11,939

that's in there but it's not the one

2514

02:39:15,770 --> 02:39:14,160

that has the ards on it before

2515

02:39:18,349 --> 02:39:15,780

I'm going to go ahead and step that in

2516

02:39:23,870 --> 02:39:18,359

and release my red

2517

02:39:28,910 --> 02:39:27,290

hey make uh Charlie H is released my

2518

02:39:42,250 --> 02:39:28,920

turn

2519

02:39:46,370 --> 02:39:44,929

and again Frank Rubio completed his

2520

02:39:49,670 --> 02:39:46,380

first major task of the day he's now

2521

02:39:51,170 --> 02:39:49,680

over at the irosa getting ready to

2522

02:39:53,150 --> 02:39:51,180

release some of these beams we hear I'm

2523

02:39:55,190 --> 02:39:53,160

working with his PGT his pistol grip

2524

02:39:57,410 --> 02:39:55,200

tool that's the drill that they're able

2525

02:40:03,530 --> 02:39:57,420

to manipulate bolts

2526

02:40:03,540 --> 02:40:12,309

earns good release on C7

2527

02:40:14,150 --> 02:40:13,700

that is correct

2528

02:40:19,010 --> 02:40:14,160

[Music]

2529

02:40:26,570 --> 02:40:21,790

[Applause]

2530

02:40:26,580 --> 02:40:32,710

yeah

2531

02:40:46,670 --> 02:40:36,110

and start working on some beans

2532

02:40:52,990 --> 02:40:49,150

[Applause]

2533

02:41:07,190 --> 02:40:56,210

in standby I think we're sorting out the

2534

02:41:07,200 --> 02:41:25,630

foreign

2535

02:41:30,110 --> 02:41:27,889

okay Frank yeah we're going to have you

2536

02:41:31,429 --> 02:41:30,120

pick up what we were not only planning

2537

02:41:34,309 --> 02:41:31,439

so you're going to go over to stanchion

2538

02:41:35,870 --> 02:41:34,319

Bravo uh and we're gonna start work over

2539

02:41:40,250 --> 02:41:35,880

there so you're good to translate over

2540

02:41:40,260 --> 02:41:45,110

okay

2541

02:41:52,010 --> 02:41:47,750

Full Count to the 12 inch on the selfie

2542

02:42:02,809 --> 02:41:54,770

and copy Josh I didn't copy a full test

2543

02:42:10,010 --> 02:42:05,090

that's on the two inch and moving over

2544

02:42:10,020 --> 02:42:26,690

foreign

2545

02:42:26,700 --> 02:42:32,690

stripes

2546

02:42:39,469 --> 02:42:34,969

just cast it on the left you're gonna

2547

02:42:44,510 --> 02:42:41,809

working right now to

2548

02:42:46,670 --> 02:42:44,520

rotate two support beams that are

2549

02:42:53,780 --> 02:42:46,680

currently holding the solar array in

2550

02:42:57,710 --> 02:42:55,790

[Applause]

2551  
02:43:00,770 --> 02:42:57,720  
and copy Frank that's a good pull test

2552  
02:43:03,770 --> 02:43:00,780  
and Tipton's in on Charlie 2. you're

2553  
02:43:06,050 --> 02:43:03,780  
also going to retrieve the rest that

2554  
02:43:09,770 --> 02:43:06,060  
adjustable from the trash bag and hook

2555  
02:43:12,349 --> 02:43:09,780  
that on so the closest beam and real

2556  
02:43:16,510 --> 02:43:13,230  
Christmas

2557  
02:43:19,849 --> 02:43:18,590  
and so they're going to be working in

2558  
02:43:22,370 --> 02:43:19,859  
tandem they're going to go to four

2559  
02:43:25,309 --> 02:43:22,380  
different spots each spot has two bolts

2560  
02:43:26,990 --> 02:43:25,319  
that are holding these beams in place

2561  
02:43:28,670 --> 02:43:27,000  
using their pistol grip tools they're

2562  
02:43:31,070 --> 02:43:28,680  
going to release these bolts eventually

2563  
02:43:33,950 --> 02:43:31,080

rotating these beams about 90 degrees

2564

02:43:36,050 --> 02:43:33,960

and then putting them back in place so

2565

02:43:39,770 --> 02:43:36,060

they can get eyebrows out of the FSE

2566

02:43:41,929 --> 02:43:39,780

this Flight Support equipment holder

2567

02:43:43,969 --> 02:43:41,939

you're gonna hear them get different

2568

02:43:47,570 --> 02:43:43,979

settings called up on that pistol grip

2569

02:43:50,929 --> 02:43:47,580

tool it has you'll hear a letter and a

2570

02:43:53,270 --> 02:43:50,939

number in this case beat Bravo 7.

2571

02:43:55,670 --> 02:43:53,280

we have a one through seven and B one

2572

02:43:58,730 --> 02:43:55,680

through seven that just tells you how

2573

02:44:05,330 --> 02:44:02,030

A1 the least torque Bravo 7 the most

2574

02:44:10,790 --> 02:44:07,929

the sport

2575

02:44:12,770 --> 02:44:10,800

and also hear a direction clockwise or

2576

02:44:14,990 --> 02:44:12,780

clown counterclockwise

2577

02:44:17,210 --> 02:44:15,000

counterclockwise just like down here on

2578

02:44:18,650 --> 02:44:17,220

Earth We're loosening

2579

02:44:20,090 --> 02:44:18,660

sitting at the top of the stanchion

2580

02:44:24,830 --> 02:44:20,100

Charlie is going to be putting that tip

2581

02:44:24,840 --> 02:44:43,610

understood thanks

2582

02:44:47,570 --> 02:44:45,830

and for both of you guys uh just big

2583

02:44:50,570 --> 02:44:47,580

picture we're doing great on time

2584

02:45:10,090 --> 02:44:50,580

relative to the eclipse so uh

2585

02:45:15,710 --> 02:45:13,490

one hour 26 minutes into today's space

2586

02:45:18,650 --> 02:45:15,720

walk station just about to fly over the

2587

02:45:20,450 --> 02:45:18,660

very southern tip of South Africa

2588

02:45:22,250 --> 02:45:20,460

while spacewalker is now working in

2589

02:45:49,309 --> 02:45:22,260

tandem to release these support beams

2590

02:45:49,319 --> 02:45:53,809

ah

2591

02:45:58,730 --> 02:45:56,150

okay

2592

02:46:00,710 --> 02:45:58,740

on C1 yep and good work with that tip

2593

02:46:02,690 --> 02:46:00,720

then Josh so you want to get into a good

2594

02:46:04,070 --> 02:46:02,700

position to drive Charlie three and

2595

02:46:10,990 --> 02:46:04,080

Charlie four right in front of you it's

2596

02:46:19,680 --> 02:46:14,090

Frank I think I'm going to use uh this

2597

02:46:19,690 --> 02:46:23,090

[Applause]

2598

02:46:23,100 --> 02:46:28,790

I was able to do it down Arizona quickly

2599

02:46:28,800 --> 02:46:34,020

decreases of

2600

02:46:51,050 --> 02:46:35,389

[Applause]

2601  
02:46:56,030 --> 02:46:53,809  
I'm looking now through Josh cassida's

2602  
02:46:58,370 --> 02:46:56,040  
helmet Camp when he gets back up top

2603  
02:46:59,690 --> 02:46:58,380  
we'll get a view of the support beams

2604  
02:47:01,429 --> 02:46:59,700  
that they're working on releasing again

2605  
02:47:03,770 --> 02:47:01,439  
they're going to four different points

2606  
02:47:05,090 --> 02:47:03,780  
each point has two different bolts

2607  
02:47:07,370 --> 02:47:05,100  
they're gonna release each of those

2608  
02:47:08,990 --> 02:47:07,380  
bolts each beam is going to get rotated

2609  
02:47:10,010 --> 02:47:09,000  
about 90 degrees to get it out of the

2610  
02:47:11,570 --> 02:47:10,020  
way

2611  
02:47:13,070 --> 02:47:11,580  
around three and four

2612  
02:47:14,770 --> 02:47:13,080  
and there you can see the beam that

2613  
02:47:15,849 --> 02:47:14,780

they're working on

2614

02:47:23,530 --> 02:47:15,859

[Music]

2615

02:47:28,250 --> 02:47:26,630

the Bravo 7 telling you how much torque

2616

02:47:29,990 --> 02:47:28,260

they're using in this case using the

2617

02:47:32,630 --> 02:47:30,000

maximum amount of torque

2618

02:47:35,389 --> 02:47:32,640

that this PGT can put out about 25 and a

2619

02:47:37,490 --> 02:47:35,399

half pounds of 25 and a half foot pounds

2620

02:47:38,870 --> 02:47:37,500

of torque

2621

02:47:41,330 --> 02:47:38,880

uh

2622

02:47:54,710 --> 02:47:41,340

open it counterclockwise and it can also

2623

02:47:54,720 --> 02:48:00,410

you are Reddit that's true I am

2624

02:48:06,410 --> 02:48:03,469

honor still mine are still involved

2625

02:48:09,770 --> 02:48:08,270

and Frankie mustard is talking about you

2626  
02:48:12,050 --> 02:48:09,780  
because you're good to drive your bolts

2627  
02:48:15,790 --> 02:48:12,060  
as well

2628  
02:48:30,230 --> 02:48:19,429  
C3 is popped out copy 10 turns on C3

2629  
02:48:35,690 --> 02:48:32,570  
and Frank it's Bravo 7 counterclockwise

2630  
02:48:35,700 --> 02:48:41,690  
thank you

2631  
02:48:47,270 --> 02:48:43,870  
same on C4

2632  
02:48:51,349 --> 02:48:47,280  
interns and it's called field

2633  
02:48:52,790 --> 02:48:51,359  
copy10 C4 good release

2634  
02:48:55,790 --> 02:48:52,800  
and so Frank you're going to work on

2635  
02:49:04,270 --> 02:48:55,800  
those two bolts uh when you release the

2636  
02:49:04,280 --> 02:49:09,070  
uh Charlie five is released

2637  
02:49:14,450 --> 02:49:12,230  
earns good release on Charlie five

2638  
02:49:15,950 --> 02:49:14,460

and Josh once you've got your PGT stowed

2639

02:49:18,889 --> 02:49:15,960

you're going to translate over to

2640

02:49:38,510 --> 02:49:18,899

stanchion Alpha Charlie to Delta to

2641

02:49:42,650 --> 02:49:40,010

and at this point three of the four

2642

02:49:45,469 --> 02:49:42,660

bolts holding one of the

2643

02:49:47,330 --> 02:49:45,479

support arms support beams have been

2644

02:49:48,010 --> 02:49:47,340

released microbial working on the fourth

2645

02:49:51,170 --> 02:49:48,020

one

2646

02:49:53,990 --> 02:49:51,180

Josh Castle is going to move over to a

2647

02:49:55,910 --> 02:49:54,000

different point on the FSE to help with

2648

02:49:58,130 --> 02:49:55,920

the actual rotation

2649

02:49:59,750 --> 02:49:58,140

and it looks like that first beam is now

2650

02:50:01,670 --> 02:49:59,760

free

2651  
02:50:13,969 --> 02:50:01,680  
copy Josh and Frank we see a good

2652  
02:50:18,230 --> 02:50:16,309  
there we go this uh Hamlet cam looking

2653  
02:50:21,290 --> 02:50:18,240  
from Frank Ruby you can see he's just

2654  
02:50:24,050 --> 02:50:21,300  
rotated that beam just initially I think

2655  
02:50:25,429 --> 02:50:24,060  
you're good just to uh to hold the beam

2656  
02:50:26,750 --> 02:50:25,439  
there Josh will be there in a second to

2657  
02:50:29,809 --> 02:50:26,760  
lend a hand so we can get it strapped

2658  
02:50:29,819 --> 02:50:43,130  
of course

2659  
02:50:47,330 --> 02:50:45,410  
so one of the twos of War beams removed

2660  
02:50:49,790 --> 02:50:47,340  
Frank Rubio is just going to hold it in

2661  
02:50:51,969 --> 02:50:49,800  
place here until Josh castig gets into

2662  
02:51:00,230 --> 02:50:51,979  
position and they can start to

2663  
02:51:07,309 --> 02:51:02,510

hey Frank

2664

02:51:13,429 --> 02:51:09,580

I'm not here too

2665

02:51:13,439 --> 02:51:16,990

nice thanks

2666

02:51:17,000 --> 02:51:25,190

[Applause]

2667

02:51:29,420 --> 02:51:27,110

if you could post it for a second I can

2668

02:51:47,870 --> 02:51:29,430

get my red on it yep

2669

02:51:47,880 --> 02:51:56,410

bye

2670

02:52:02,210 --> 02:52:00,469

by the falls on okay and Josh you want

2671

02:52:04,370 --> 02:52:02,220

to leave yours a little slack so that we

2672

02:52:07,010 --> 02:52:04,380

can release the beam that it's a butted

2673

02:52:09,110 --> 02:52:07,020

against there you go perfect

2674

02:52:10,490 --> 02:52:09,120

see that so are you okay with me

2675

02:52:12,230 --> 02:52:10,500

cinching it down here because that'll

2676

02:52:18,650 --> 02:52:12,240

keep it clear I think

2677

02:52:18,660 --> 02:52:29,090

Frank are you able to finish from there

2678

02:52:35,630 --> 02:52:30,769

um Let me let me check something on the

2679

02:52:44,990 --> 02:52:37,550

all right Nick understand I'm going uh

2680

02:52:50,330 --> 02:52:49,130

oh wait here yeah and guys Frank I see

2681

02:52:51,410 --> 02:52:50,340

you looking down there we just want to

2682

02:52:54,349 --> 02:52:51,420

make sure we got a good clearance with

2683

02:52:54,359 --> 02:53:00,130

yeah um

2684

02:53:04,130 --> 02:53:01,690

well

2685

02:53:05,809 --> 02:53:04,140

they can recruit it over the top of the

2686

02:53:09,590 --> 02:53:05,819

uh

2687

02:53:16,429 --> 02:53:09,600

I don't guarantee that if

2688

02:53:20,150 --> 02:53:18,769

and for and for both of you

2689

02:53:22,309 --> 02:53:20,160

um we're seeing a lot of views in the

2690

02:53:23,929 --> 02:53:22,319

hecka we'd like the configuration uh

2691

02:53:25,190 --> 02:53:23,939

prefer not to put it over the top of the

2692

02:53:26,870 --> 02:53:25,200

POA

2693

02:53:28,429 --> 02:53:26,880

um once we release the other beam and

2694

02:53:29,750 --> 02:53:28,439

get it cinched down we'll do a double

2695

02:53:32,450 --> 02:53:29,760

check to make sure we've got good

2696

02:53:38,690 --> 02:53:34,670

yeah I mean it's a

2697

02:53:40,490 --> 02:53:38,700

it's outside of the edge of the

2698

02:53:42,889 --> 02:53:40,500

um

2699

02:53:47,150 --> 02:53:42,899

what do we call the air

2700

02:53:51,290 --> 02:53:49,070

okay minds are pinched down as he's

2701  
02:53:53,450 --> 02:53:51,300  
gonna get so if you want I'll go over to

2702  
02:53:56,389 --> 02:53:53,460  
uh the delta

2703  
02:54:10,389 --> 02:53:58,730  
yeah nick uh bottom line is I think we

2704  
02:54:23,990 --> 02:54:12,469  
those are the last two bolts holding

2705  
02:54:49,670 --> 02:54:25,670  
s let me know when you're there and I'll

2706  
02:55:05,809 --> 02:54:52,610  
let's go ahead and we're five seconds

2707  
02:55:10,910 --> 02:55:08,750  
all right one hour 36 minutes into

2708  
02:55:12,050 --> 02:55:10,920  
today's space walk continuing to check

2709  
02:55:15,050 --> 02:55:12,060  
there we're pretty much right on the

2710  
02:55:20,690 --> 02:55:17,630  
Frank Rubio Josh Casada working to

2711  
02:55:22,910 --> 02:55:20,700  
finish removing these two support beams

2712  
02:55:24,650 --> 02:55:22,920  
that have been

2713  
02:55:26,269 --> 02:55:24,660

the

2714

02:55:29,030 --> 02:55:26,279

that is a heck of video I'm not going to

2715

02:55:35,650 --> 02:55:29,040

put that yeah well

2716

02:55:40,190 --> 02:55:39,290

so Frank has just repositioned over to

2717

02:55:44,870 --> 02:55:40,200

Charlie

2718

02:55:51,950 --> 02:55:48,410

anywhere station uh rent on the handrail

2719

02:55:59,389 --> 02:55:55,190

copy all that's good config let me know

2720

02:55:59,399 --> 02:56:07,730

foreign

2721

02:56:07,740 --> 02:56:14,830

Bravo 7 counterclockwise two

2722

02:56:14,840 --> 02:56:20,230

seven counter clockwise

2723

02:56:24,950 --> 02:56:23,630

again I'm ready to it

2724

02:56:27,710 --> 02:56:24,960

um

2725

02:56:29,150 --> 02:56:27,720

careful with what you said Frank I'm

2726

02:56:32,030 --> 02:56:29,160

unexpected they're trying to talk off

2727

02:56:34,070 --> 02:56:32,040

yeah it just floats right away so I

2728

02:57:00,230 --> 02:56:34,080

guess I'll just let my pgp float because

2729

02:57:00,240 --> 02:57:04,070

NFL

2730

02:57:08,929 --> 02:57:06,250

I don't really have a handrail to grab

2731

02:57:11,090 --> 02:57:08,939

oh she found two because there's yeah on

2732

02:57:13,370 --> 02:57:11,100

the interior

2733

02:57:15,469 --> 02:57:13,380

I think um

2734

02:57:17,210 --> 02:57:15,479

the support structure here

2735

02:57:18,950 --> 02:57:17,220

is available for me I don't know yeah

2736

02:57:23,830 --> 02:57:18,960

there you go

2737

02:57:37,250 --> 02:57:27,410

no I just kind of grabbed the

2738

02:57:42,349 --> 02:57:40,070

nice certain terms I think there's one

2739

02:58:15,230 --> 02:57:42,359

turn on nine

2740

02:58:21,349 --> 02:58:18,650

and copy we see a good release thank you

2741

02:58:22,969 --> 02:58:21,359

and so the next step guys is you're

2742

02:58:26,389 --> 02:58:22,979

going to move that into position and

2743

02:58:28,670 --> 02:58:26,399

you're going to hand start C9 and C7 uh

2744

02:58:31,250 --> 02:58:28,680

recommend that one of you secure it in

2745

02:58:43,550 --> 02:58:31,260

place and the other one hand start so do

2746

02:58:46,429 --> 02:58:45,349

I'm going to start going for it sounds

2747

02:58:48,650 --> 02:58:46,439

great

2748

02:58:51,650 --> 02:58:48,660

some stabilizers

2749

02:58:53,570 --> 02:58:51,660

and with the second beam now removed

2750

02:58:54,889 --> 02:58:53,580

they're gonna temporarily stow it this

2751

02:58:57,469 --> 02:58:54,899

time instead of using the tethers

2752

02:59:02,450 --> 02:58:57,479

they're gonna hand start those bolts

2753

02:59:07,610 --> 02:59:06,349

but again with with the two beams out of

2754

02:59:14,230 --> 02:59:07,620

the way looks like we got one good hand

2755

02:59:17,929 --> 02:59:16,550

but all this work being done to get

2756

02:59:20,450 --> 02:59:17,939

these beams out of the way to give us

2757

02:59:25,670 --> 02:59:20,460

some clearance to get irosa off of its

2758

02:59:25,680 --> 02:59:30,230

there's two turns

2759

02:59:33,170 --> 02:59:31,550

okay guys

2760

02:59:34,309 --> 02:59:33,180

so you're gonna we have two turns on

2761

02:59:38,030 --> 02:59:34,319

seven

2762

02:59:46,610 --> 02:59:38,040

and so for both of you uh PTT settings

2763

02:59:51,530 --> 02:59:49,490

FX clockwise too

2764

02:59:55,010 --> 02:59:51,540

that's a good read back Frank uh and

2765

02:59:58,309 --> 02:59:56,450

okay

2766

03:00:01,070 --> 02:59:58,319

and a reminder we're going to drive 21

2767

03:00:02,450 --> 03:00:01,080

turns we're going to stop on turns and

2768

03:00:08,910 --> 03:00:02,460

then we're going to change the PGT

2769

03:00:18,889 --> 03:00:09,050

[Applause]

2770

03:00:25,070 --> 03:00:22,429

and you both go to drive simultaneously

2771

03:00:30,050 --> 03:00:25,080

okay we both right

2772

03:00:30,060 --> 03:00:36,170

I'll try not to turn off our Frankie

2773

03:00:41,210 --> 03:00:38,990

turns

2774

03:00:42,410 --> 03:00:41,220

all right we will get video back in just

2775

03:00:44,450 --> 03:00:42,420

a couple of minutes but right now

2776

03:00:46,849 --> 03:00:44,460

they're driving a couple of bolts to get

2777

03:00:48,950 --> 03:00:46,859

that second support beam uh held in

2778

03:00:50,650 --> 03:00:48,960

place a little bit more securely after

2779

03:00:53,450 --> 03:00:50,660

that

2780

03:00:56,210 --> 03:00:53,460

yeah I took down to like five turns six

2781

03:01:01,070 --> 03:00:56,220

and a half for easy two

2782

03:01:26,530 --> 03:01:01,080

uh Nick I took out at uh five turns

2783

03:01:31,910 --> 03:01:29,330

and so just there we heard

2784

03:01:33,349 --> 03:01:31,920

um them getting a little bit fewer turns

2785

03:01:35,870 --> 03:01:33,359

than we were expecting we were expecting

2786

03:01:37,969 --> 03:01:35,880

about 21 turns so they got just about

2787

03:01:39,590 --> 03:01:37,979

five so the team's now going to what's

2788

03:01:42,110 --> 03:01:39,600

called a crib sheet basically your

2789

03:01:44,150 --> 03:01:42,120

backup procedures

2790

03:01:53,510 --> 03:01:44,160

and Frank Josh back with you after the

2791

03:01:58,550 --> 03:01:56,150

two

2792

03:02:01,370 --> 03:01:58,560

okay copy that guys uh so we're in a

2793

03:02:03,349 --> 03:02:01,380

we're in uh crib sheet page here so uh

2794

03:02:06,969 --> 03:02:03,359

we're going to up the torque setting uh

2795

03:02:17,750 --> 03:02:06,979

so new settings are going to be Bravo 7

2796

03:02:22,969 --> 03:02:19,269

yep

2797

03:02:22,979 --> 03:02:25,969

foreign

2798

03:02:25,979 --> 03:02:30,170

counterclockwise

2799

03:02:35,690 --> 03:02:33,590

guys it's Bravo 7 clockwise two

2800

03:02:38,269 --> 03:02:35,700

Josh you're going to do

2801  
03:02:40,130 --> 03:02:38,279  
15 and a half turns Frank you're going

2802  
03:02:49,170 --> 03:02:40,140  
to do 17 turns we're trying to get a

2803  
03:02:49,180 --> 03:02:53,690  
[Applause]

2804  
03:02:56,929 --> 03:02:55,190  
all right so you heard additional

2805  
03:02:58,969 --> 03:02:56,939  
settings called up again both crew

2806  
03:03:02,330 --> 03:02:58,979  
members using their PGT the pistol grip

2807  
03:03:09,410 --> 03:03:05,330  
and going for 17 turns

2808  
03:03:09,420 --> 03:03:13,010  
and again those first values

2809  
03:03:17,150 --> 03:03:14,870  
that Bravo 7 just referring to how much

2810  
03:03:18,710 --> 03:03:17,160  
torque we're using now and we're back

2811  
03:03:20,750 --> 03:03:18,720  
with janheka

2812  
03:03:22,490 --> 03:03:20,760  
a one through seven and Bravo one

2813  
03:03:26,210 --> 03:03:22,500

through seven

2814

03:03:28,190 --> 03:03:26,220

a one the lowest Bravo seven the highest

2815

03:03:30,290 --> 03:03:28,200

and so we've essentially put the drill

2816

03:03:33,349 --> 03:03:30,300

up to its Max torque more than 25 foot

2817

03:03:35,090 --> 03:03:33,359

pounds of torque up from about the eight

2818

03:03:36,769 --> 03:03:35,100

that they were initially using so this

2819

03:03:39,469 --> 03:03:36,779

just if we didn't get the turns we

2820

03:03:44,929 --> 03:03:39,479

wanted we have the torque now the team's

2821

03:03:52,730 --> 03:03:48,950

I got 14.7 turns out

2822

03:03:55,010 --> 03:03:52,740

actual 23.7 copy Josh let us talk about

2823

03:04:10,610 --> 03:03:55,020

it in person

2824

03:04:14,210 --> 03:04:13,429

and then for me I had 17 turns green

2825

03:04:17,620 --> 03:04:14,220

lights

2826

03:04:27,010 --> 03:04:17,630

25 decimal foreign

2827

03:04:27,020 --> 03:04:31,030

[Music]

2828

03:04:34,969 --> 03:04:33,530

Frank and we're just confirming down

2829

03:04:37,910 --> 03:04:34,979

here that we're happy with both of those

2830

03:04:42,710 --> 03:04:37,920

bolts uh and do they look like they're

2831

03:04:42,720 --> 03:04:49,610

thank you sir

2832

03:04:54,889 --> 03:04:52,790

there's a tiny little black line under

2833

03:04:57,830 --> 03:04:54,899

um the head of the boat and minus flush

2834

03:04:57,840 --> 03:05:13,610

thanks for the words we're chatting

2835

03:05:17,510 --> 03:05:15,950

hey guys if you're able uh while we're

2836

03:05:21,290 --> 03:05:17,520

sitting here waiting if you wanted to do

2837

03:05:21,300 --> 03:05:27,769

um perfect

2838

03:05:27,779 --> 03:05:35,030

girls for eating too no changes

2839

03:05:35,040 --> 03:05:44,809

copy Josh

2840

03:06:01,309 --> 03:05:48,950

had anyone pickles try hot changes on my

2841

03:06:01,319 --> 03:06:05,290

foreign

2842

03:06:28,190 --> 03:06:08,450

from six to four

2843

03:06:32,570 --> 03:06:29,929

hey that's why you guys are talking

2844

03:06:34,730 --> 03:06:32,580

about it if needed could I finish that

2845

03:06:37,070 --> 03:06:34,740

both and Josh can get going to the arm

2846

03:06:40,190 --> 03:06:37,080

UPS

2847

03:06:42,650 --> 03:06:40,200

hey hey Frank we've got the words for

2848

03:06:45,469 --> 03:06:42,660

you guys so what we want to do is is

2849

03:06:47,050 --> 03:06:45,479

finish on a lower torque so

2850

03:06:49,370 --> 03:06:47,060

um we're going to have you go Bravo 7

2851  
03:06:51,710 --> 03:06:49,380  
counterclockwise two and release the

2852  
03:06:57,349 --> 03:06:51,720  
bolts one turn and then we're gonna

2853  
03:07:04,010 --> 03:07:00,050  
copy

2854  
03:07:05,809 --> 03:07:04,020  
able to do both sides just so we can get

2855  
03:07:07,730 --> 03:07:05,819  
going on the arm mods are we doing okay

2856  
03:07:11,929 --> 03:07:07,740  
on time

2857  
03:07:19,450 --> 03:07:11,939  
okay to just continue to work this

2858  
03:07:25,490 --> 03:07:23,690  
clockwise two for one turn

2859  
03:07:38,690 --> 03:07:25,500  
those are good words probably seven

2860  
03:07:41,990 --> 03:07:40,490  
all right so both crew members now they

2861  
03:07:44,630 --> 03:07:42,000  
were able to get these bolts in place

2862  
03:07:46,250 --> 03:07:44,640  
but hit what is called essentially a

2863  
03:07:48,349 --> 03:07:46,260

hard stop

2864

03:07:51,230 --> 03:07:48,359

um so not wanting to

2865

03:07:53,090 --> 03:07:51,240

wanting to have overdriven these bolts

2866

03:07:54,170 --> 03:07:53,100

in and leaving them in at too high of a

2867

03:07:55,510 --> 03:07:54,180

torque they're going to back them out

2868

03:07:58,429 --> 03:07:55,520

one

2869

03:08:00,469 --> 03:07:58,439

fairly nice

2870

03:08:11,690 --> 03:08:00,479

so the new settings for the PGT to drive

2871

03:08:16,130 --> 03:08:13,309

good read back

2872

03:08:18,050 --> 03:08:16,140

so instead of leaving these bolts driven

2873

03:08:19,969 --> 03:08:18,060

in with more than 25 foot-pounds of

2874

03:08:22,309 --> 03:08:19,979

torque leaving a lot of potential energy

2875

03:08:24,530 --> 03:08:22,319

in if we're hard stopped they're backing

2876  
03:08:27,110 --> 03:08:24,540  
them out dropping it down to a lower

2877  
03:08:30,710 --> 03:08:27,120  
torque setting that Alpha Four which

2878  
03:08:32,330 --> 03:08:30,720  
gives about six pounds of torque

2879  
03:08:34,910 --> 03:08:32,340  
and then they're going to reseal them

2880  
03:08:38,710 --> 03:08:34,920  
have these bolts securely in place then

2881  
03:08:38,720 --> 03:08:44,230  
[Music]

2882  
03:08:54,650 --> 03:08:46,550  
copy Frank did you get a good green

2883  
03:09:01,670 --> 03:08:56,990  
our green light

2884  
03:09:01,680 --> 03:09:05,889  
and no turns

2885  
03:09:10,910 --> 03:09:09,230  
okay copy for both of you

2886  
03:09:14,750 --> 03:09:10,920  
um if you can uh hold we're still

2887  
03:09:18,910 --> 03:09:17,630  
okay I have not tried mine yet Nick

2888  
03:09:21,349 --> 03:09:18,920

um

2889

03:09:41,889 --> 03:09:21,359

about to start you want me to give it a

2890

03:09:47,570 --> 03:09:44,809

okay Josh Frank appreciate your patience

2891

03:09:50,269 --> 03:09:47,580

uh what we'd like to do is change up the

2892

03:09:53,110 --> 03:09:50,279

torque settings so Alpha seven

2893

03:09:57,710 --> 03:09:53,120

clockwise to we're going to reattempt

2894

03:10:02,630 --> 03:10:00,050

okay for Evie too I think you missed my

2895

03:10:05,269 --> 03:10:02,640

last call I never attempted Alpha 6 I

2896

03:10:06,950 --> 03:10:05,279

see GT power down right as I started

2897

03:10:09,530 --> 03:10:06,960

you want me to try your office express I

2898

03:10:13,070 --> 03:10:09,540

guess 3007.

2899

03:10:13,080 --> 03:10:21,110

it is

2900

03:10:21,120 --> 03:10:24,550

I think I have the same results

2901  
03:10:24,560 --> 03:10:29,330  
from the torque

2902  
03:10:35,889 --> 03:10:32,389  
I think one six turns

2903  
03:10:35,899 --> 03:10:43,370  
free V2 so 0.14

2904  
03:10:54,309 --> 03:10:45,710  
and copy and can we get the torque

2905  
03:11:23,469 --> 03:10:57,830  
copy Josh thanks

2906  
03:11:27,710 --> 03:11:26,090  
and Josh Frank just to let you know

2907  
03:11:31,250 --> 03:11:27,720  
we're discussing down here appreciate

2908  
03:11:31,260 --> 03:12:19,030  
all right no problem

2909  
03:12:22,670 --> 03:12:21,530  
okay guys uh we're happy with this for

2910  
03:12:25,130 --> 03:12:22,680  
now

2911  
03:12:27,950 --> 03:12:25,140  
um so we've got to uh Josh you're going

2912  
03:12:29,330 --> 03:12:27,960  
to move on to the ssrms setup uh Frank

2913  
03:12:30,650 --> 03:12:29,340

you're going to work on releasing C

2914

03:12:32,570 --> 03:12:30,660

bolts we've got to stagger our

2915

03:12:36,050 --> 03:12:32,580

translations here

2916

03:12:39,170 --> 03:12:36,060

um so Josh uh if you want to Stow your

2917

03:12:40,630 --> 03:12:39,180

PGT and then you're gonna translate to

2918

03:12:45,170 --> 03:12:40,640

the Ingress location

2919

03:12:49,730 --> 03:12:45,180

via expansion Alpha down to the the face

2920

03:12:53,929 --> 03:12:51,889

um RPG is still it I'm grabbing my rep

2921

03:12:58,090 --> 03:12:53,939

off of the beam

2922

03:13:03,590 --> 03:12:58,100

and I will make my way back

2923

03:13:08,510 --> 03:13:05,929

see you in a minute here

2924

03:13:27,110 --> 03:13:08,520

I think I'll go to the bag for my uh I

2925

03:13:27,120 --> 03:13:37,450

foreign

2926  
03:13:43,490 --> 03:13:41,450  
54 minutes 30 seconds into today's space

2927  
03:13:47,170 --> 03:13:43,500  
walk the second major activity of the

2928  
03:13:49,429 --> 03:13:47,180  
day complete so so far we've

2929  
03:13:51,230 --> 03:13:49,439  
continued to get all the work sites

2930  
03:13:54,769 --> 03:13:51,240  
ready for the eventual move and install

2931  
03:13:56,870 --> 03:13:54,779  
of this rollout solar array

2932  
03:13:58,190 --> 03:13:56,880  
Frank Rubio started by routing the power

2933  
03:14:01,370 --> 03:13:58,200  
cables that we're going to be connecting

2934  
03:14:04,910 --> 03:14:01,380  
a little bit later on in the spacewalk

2935  
03:14:06,830 --> 03:14:04,920  
well Josh Casada got the various support

2936  
03:14:10,130 --> 03:14:06,840  
equipment ready for removal so we can

2937  
03:14:14,450 --> 03:14:10,140  
release irosa from its current staging

2938  
03:14:18,889 --> 03:14:17,750

so at this point that's complete

2939

03:14:21,769 --> 03:14:18,899

pretty firm you're in a good position

2940

03:14:28,330 --> 03:14:21,779

for it so socket swap uh you're doing a

2941

03:14:35,210 --> 03:14:31,250

and the destination for your two inch is

2942

03:14:35,220 --> 03:14:58,070

thank you

2943

03:15:01,910 --> 03:15:00,469

Frank are you okay with my uh safety

2944

03:15:08,469 --> 03:15:01,920

cutter did it cause any trouble for

2945

03:15:13,429 --> 03:15:11,330

and so after working together to get

2946

03:15:15,590 --> 03:15:13,439

those beams released and moved to their

2947

03:15:16,849 --> 03:15:15,600

temp so locations we will be here at the

2948

03:15:19,190 --> 03:15:16,859

end of the day

2949

03:15:21,710 --> 03:15:19,200

um so we might have some additional bolt

2950

03:15:23,030 --> 03:15:21,720

operations at the very end as we're

2951

03:15:26,150 --> 03:15:23,040

doing the final cleanup but for now

2952

03:15:27,889 --> 03:15:26,160

those in a position to give us plenty of

2953

03:15:30,050 --> 03:15:27,899

clearance to get Iris out of its

2954

03:15:32,269 --> 03:15:30,060

temporary storage location

2955

03:15:35,630 --> 03:15:32,279

and Josh in terms of mile marker for the

2956

03:15:39,889 --> 03:15:35,640

Ingress position here uh looking at the

2957

03:15:39,899 --> 03:15:43,030

that's great thank you

2958

03:15:48,889 --> 03:15:45,830

right now Josh Cassidy ev2 is going to

2959

03:15:50,750 --> 03:15:48,899

be making his way to the robotic arm the

2960

03:15:53,210 --> 03:15:50,760

kenned arm II and he's going to be

2961

03:15:55,490 --> 03:15:53,220

working with an epfr and articulating

2962

03:15:57,650 --> 03:15:55,500

portable foot restraint he's going to be

2963

03:16:00,290 --> 03:15:57,660

tethering and then locking himself into

2964

03:16:02,090 --> 03:16:00,300

that foot restraint on that robotic arm

2965

03:16:03,969 --> 03:16:02,100

going to be controlled by the crew still

2966

03:16:07,010 --> 03:16:03,979

inside station Nicole Mann and

2967

03:16:11,510 --> 03:16:07,020

koichiwakata and he's going to be using

2968

03:16:14,150 --> 03:16:11,520

that method to remove the irosa from its

2969

03:16:17,150 --> 03:16:14,160

Flight Support equipment location and

2970

03:16:20,630 --> 03:16:17,160

then get flown over with iro Zone which

2971

03:16:22,790 --> 03:16:20,640

weighs about 750 pounds over to the

2972

03:16:26,809 --> 03:16:22,800

install location now while he's getting

2973

03:16:28,670 --> 03:16:26,819

into the robotic arm Frank Rubio ev1 for

2974

03:16:31,010 --> 03:16:28,680

today still has a couple more bolt

2975

03:16:33,230 --> 03:16:31,020

operations to get Iris ready to come off

2976

03:16:35,450 --> 03:16:33,240

he's going to go and release what's

2977

03:16:37,730 --> 03:16:35,460

known as C volts there's two of these

2978

03:16:41,870 --> 03:16:37,740

and these are essentially the last thing

2979

03:16:45,410 --> 03:16:41,880

that are holding irosa in place to that

2980

03:16:48,769 --> 03:16:45,420

to the fs see so after these are removed

2981

03:16:54,890 --> 03:16:48,779

they'll be ready to get Iris off and on

2982

03:16:54,900 --> 03:16:59,389

[Music]

2983

03:17:04,190 --> 03:17:01,969

and copy that Frank so you're going to

2984

03:17:10,450 --> 03:17:04,200

translate this stanchion Alpha we're

2985

03:17:18,410 --> 03:17:13,510

real quick

2986

03:17:20,510 --> 03:17:18,420

I'm at one zero zero two zero but it

2987

03:17:22,969 --> 03:17:20,520

looks like I'm pretty far starboard I

2988

03:17:31,870 --> 03:17:22,979

think I want to be port and I have the

2989

03:17:31,880 --> 03:17:42,710

and checking

2990

03:17:48,110 --> 03:17:45,889

I'm sorry you said one zero two zero

2991

03:17:49,969 --> 03:17:48,120

zero and 10 to 200. that makes that

2992

03:18:06,590 --> 03:17:49,979

makes more sense yep now we're on the

2993

03:18:13,429 --> 03:18:09,889

all right Frank how you doing come home

2994

03:18:20,030 --> 03:18:16,130

uh for Charlie 12 and I'll uh go over

2995

03:18:25,309 --> 03:18:22,870

yep copy Frank uh it's Bravo three

2996

03:18:26,630 --> 03:18:25,319

counterclockwise two and it's just brake

2997

03:18:34,010 --> 03:18:26,640

torque you don't even have to do a full

2998

03:18:34,020 --> 03:18:38,210

three counter two

2999

03:18:44,090 --> 03:18:40,550

four three camera two copy thanks

3000

03:18:46,550 --> 03:18:44,100

I'm good okay sounds good thank you M2

3001

03:18:50,230 --> 03:18:46,560

eb2

3002

03:18:56,750 --> 03:18:53,809

UA to published the apfr reconstrate

3003

03:19:04,429 --> 03:18:59,269

thus we will move you to the uh position

3004

03:19:16,849 --> 03:19:08,510

one meter in standby we're setting up

3005

03:19:21,769 --> 03:19:20,030

and here in koichiwakata calling in now

3006

03:19:23,570 --> 03:19:21,779

from the inside of the station he and

3007

03:19:25,429 --> 03:19:23,580

Nicole man at the robotics workstation

3008

03:19:28,550 --> 03:19:25,439

they're going to be moving

3009

03:19:32,030 --> 03:19:28,560

the robotic arm into position for Josh

3010

03:19:34,150 --> 03:19:32,040

cassida to start getting into that foot

3011

03:19:36,650 --> 03:19:34,160

restraint

3012

03:19:38,809 --> 03:19:36,660

you'll hear them use the acronym GCA

3013

03:19:41,269 --> 03:19:38,819

quite a bit GCA stands for ground

3014

03:19:50,230 --> 03:19:41,279

control to assist that's essentially the

3015

03:19:50,240 --> 03:19:57,349

[Applause]

3016

03:20:01,969 --> 03:19:59,389

and we can see right in the center there

3017

03:20:04,190 --> 03:20:01,979

the robotic arm starting to move you can

3018

03:20:05,929 --> 03:20:04,200

see jutting out of the right side that's

3019

03:20:09,950 --> 03:20:05,939

the foot restraint that Cassidy is going

3020

03:20:15,590 --> 03:20:13,150

I'm gonna get GCA just down stands

3021

03:20:17,150 --> 03:20:15,600

stands for ground control desists that's

3022

03:20:20,750 --> 03:20:17,160

the term that we're just going to be

3023

03:20:24,710 --> 03:20:20,760

using as the spacewalkers are giving any

3024

03:20:32,210 --> 03:20:24,720

location guidance uh to the team inside

3025

03:20:32,220 --> 03:20:35,870

nothing else

3026  
03:20:40,130 --> 03:20:37,790  
probably we're going to leave a station

3027  
03:20:43,969 --> 03:20:40,140  
later uh

3028  
03:20:48,710 --> 03:20:45,130  
okay

3029  
03:20:59,389 --> 03:20:48,720  
stations later one meter

3030  
03:21:05,510 --> 03:21:01,670  
okay here comes the motion station later

3031  
03:21:14,710 --> 03:21:05,520  
one meter ready for motion

3032  
03:21:21,769 --> 03:21:15,889  
[Applause]

3033  
03:21:38,929 --> 03:21:26,630  
okay wrap out in three two one

3034  
03:21:44,269 --> 03:21:41,750  
okay underneath finishing off 30

3035  
03:21:49,990 --> 03:21:44,279  
centimeters three zero centimeters

3036  
03:22:01,010 --> 03:21:52,610  
for Trans

3037  
03:22:01,020 --> 03:22:09,530  
um

3038  
03:22:11,809 --> 03:22:09,910

continue

3039

03:22:16,670 --> 03:22:11,819

[Music]

3040

03:22:25,429 --> 03:22:18,290

steps

3041

03:22:28,710 --> 03:22:27,710

can you continue F another 10

3042

03:22:30,110 --> 03:22:28,720

centimeters

3043

03:22:31,490 --> 03:22:30,120

[Music]

3044

03:22:34,130 --> 03:22:31,500

10 meters

3045

03:22:36,710 --> 03:22:34,140

here comes the motion

3046

03:22:40,990 --> 03:22:36,720

I see good motion continue

3047

03:22:43,309 --> 03:22:41,000

and ramp out in three two

3048

03:22:45,650 --> 03:22:43,319

uh let's go ahead and uh we're gonna

3049

03:22:52,550 --> 03:22:45,660

call that good you can go brakes on GTA

3050

03:22:58,870 --> 03:22:54,889

okay yeah Josh the brakes on we have a

3051  
03:23:01,070 --> 03:22:58,880  
go for atfr reconfig and Ingress

3052  
03:23:06,290 --> 03:23:01,080  
and Josh you're going to be looking to

3053  
03:23:06,300 --> 03:23:09,349  
look at that

3054  
03:23:17,450 --> 03:23:13,010  
we expect the config to be nine foxtrot

3055  
03:23:23,809 --> 03:23:20,030  
okay you got a kit

3056  
03:23:28,670 --> 03:23:23,819  
test just to start there I see that's

3057  
03:23:35,330 --> 03:23:33,250  
and we are currently people on the roll

3058  
03:23:42,050 --> 03:23:35,340  
nine on

3059  
03:23:50,269 --> 03:23:45,229  
that's all the dogs are being depressed

3060  
03:23:54,530 --> 03:23:52,910  
showing foxtrot foxtrot I'm Gonna Roll

3061  
03:23:56,210 --> 03:23:54,540  
it's Delta

3062  
03:23:57,370 --> 03:23:56,220  
and then

3063  
03:24:00,530 --> 03:23:57,380

it was a

3064

03:24:00,540 --> 03:24:26,510

Taylor Swift

3065

03:24:33,410 --> 03:24:30,650

okay roll is Delta

3066

03:24:40,070 --> 03:24:33,420

copy Josh good config so next up is that

3067

03:24:40,080 --> 03:24:46,070

okay we'll just give me a second

3068

03:24:46,080 --> 03:25:02,510

all right we're Delta again

3069

03:25:02,520 --> 03:25:13,450

foreign

3070

03:25:13,460 --> 03:25:20,630

with you and just think back up

3071

03:25:20,640 --> 03:25:35,330

um

3072

03:25:35,340 --> 03:25:42,050

copy copy broke torque on C12

3073

03:25:43,849 --> 03:25:42,390

.

3074

03:25:46,070 --> 03:25:43,859

[Music]

3075

03:26:00,889 --> 03:25:46,080

you're welcome

3076

03:26:05,269 --> 03:26:02,570

okay copy so you're going to go over to

3077

03:26:07,729 --> 03:26:05,279

C11 and uh and then we're going to drive

3078

03:26:10,130 --> 03:26:07,739

that out so over to stanchion Delta

3079

03:26:10,140 --> 03:26:17,889

probably

3080

03:26:21,830 --> 03:26:20,750

all right so in this view your choice

3081

03:26:26,150 --> 03:26:21,840

whether you want to go the long way or

3082

03:26:26,160 --> 03:26:32,210

okay

3083

03:26:37,070 --> 03:26:34,250

we can see Frank Rubio on the bottom

3084

03:26:38,450 --> 03:26:37,080

left he's working to break torque uh and

3085

03:26:40,370 --> 03:26:38,460

then release two bolts that are still

3086

03:26:42,170 --> 03:26:40,380

holding eyebrowser in place

3087

03:26:45,220 --> 03:26:42,180

forget my

3088

03:26:46,910 --> 03:26:45,230

daughter yep that works

3089

03:26:48,769 --> 03:26:46,920

[Music]

3090

03:26:51,110 --> 03:26:48,779

on the right side Josh Casada are

3091

03:26:53,450 --> 03:26:51,120

working to reconfigure the apfr they're

3092

03:26:55,610 --> 03:26:53,460

articulating portable foot restraint

3093

03:26:58,370 --> 03:26:55,620

we heard a couple of values being called

3094

03:27:00,650 --> 03:26:58,380

out to him numbers foxtrot Delta those

3095

03:27:04,370 --> 03:27:00,660

are just telling him which settings to

3096

03:27:06,950 --> 03:27:04,380

set the yaw pitch enroll of the foot

3097

03:27:08,450 --> 03:27:06,960

restraint these are determined and

3098

03:27:10,429 --> 03:27:08,460

advanced just to put him in the correct

3099

03:27:11,889 --> 03:27:10,439

orientation for where he's going to need

3100

03:27:13,729 --> 03:27:11,899

to be to work

3101

03:27:26,570 --> 03:27:13,739

black on black

3102

03:27:33,530 --> 03:27:30,670

it's Frank hey Josh can you turn around

3103

03:27:35,570 --> 03:27:33,540

take a quick look

3104

03:27:38,210 --> 03:27:35,580

I think it just broke loose it did

3105

03:27:40,130 --> 03:27:38,220

that's good in a good way

3106

03:27:47,570 --> 03:27:40,140

um this was wrapped room of your teeth

3107

03:27:53,030 --> 03:27:49,070

another down

3108

03:27:55,670 --> 03:27:53,040

a service hey Josh the only um your your

3109

03:28:00,349 --> 03:27:55,680

weight cover is wrapped around the brt

3110

03:28:03,410 --> 03:28:01,969

this episode I have this thing on the

3111

03:28:05,510 --> 03:28:03,420

left I'm gonna take it off for the OT

3112

03:28:06,650 --> 03:28:05,520

off and go over here see if you agree

3113

03:28:08,809 --> 03:28:06,660

with this

3114

03:28:16,010 --> 03:28:08,819

is going between the two Perfect

3115

03:28:23,809 --> 03:28:17,929

thank you for those backup cameras on

3116

03:28:28,429 --> 03:28:26,330

hey copy Josh I see you getting into a

3117

03:28:48,830 --> 03:28:28,439

good config and we uh concur with a good

3118

03:28:52,429 --> 03:28:51,290

and uh Frank Josh

3119

03:28:54,590 --> 03:28:52,439

um

3120

03:28:57,670 --> 03:28:54,600

based on the downlink video Frank your

3121

03:29:00,110 --> 03:28:57,680

your safety tether might be

3122

03:29:01,790 --> 03:29:00,120

going around your back I don't know if

3123

03:29:20,590 --> 03:29:01,800

Josh can turn around and put some eyes

3124

03:29:25,550 --> 03:29:23,389

I can see it's coming off your right

3125

03:29:27,830 --> 03:29:25,560

side yep

3126  
03:29:30,170 --> 03:29:27,840  
but it does appear to go on

3127  
03:29:31,070 --> 03:29:30,180  
between the Twist and the safer at the

3128  
03:29:33,170 --> 03:29:31,080  
bottom

3129  
03:29:34,969 --> 03:29:33,180  
okay

3130  
03:29:37,010 --> 03:29:34,979  
yeah it is

3131  
03:29:38,870 --> 03:29:37,020  
um

3132  
03:29:40,910 --> 03:29:38,880  
keep your

3133  
03:29:44,210 --> 03:29:40,920  
each other on your

3134  
03:29:47,690 --> 03:29:44,220  
my lights on yeah so it is if your wheel

3135  
03:29:51,410 --> 03:29:49,849  
and the tether itself is one right

3136  
03:29:55,070 --> 03:29:51,420  
between the cliffs

3137  
03:29:56,929 --> 03:29:55,080  
and it's safer you know at the bottom

3138  
03:30:00,650 --> 03:29:56,939

of your back

3139

03:30:04,670 --> 03:30:00,660

so my recommendation would be pointing

3140

03:30:07,190 --> 03:30:04,680

your feet uh let's see this is

3141

03:30:15,290 --> 03:30:07,200

find your feet back that way

3142

03:30:15,300 --> 03:30:23,740

keep going yeah still hooks in there um

3143

03:30:27,290 --> 03:30:25,190

[Applause]

3144

03:30:30,170 --> 03:30:27,300

essentially you need to go

3145

03:30:38,929 --> 03:30:30,180

360 degrees

3146

03:30:42,469 --> 03:30:41,030

yeah it sounds like it's all pulling on

3147

03:30:49,190 --> 03:30:42,479

there yeah

3148

03:31:05,330 --> 03:30:50,929

um

3149

03:31:11,450 --> 03:31:07,490

okay

3150

03:31:11,460 --> 03:31:15,110

yes

3151  
03:31:19,130 --> 03:31:17,389  
and guys we're okay if you guys want to

3152  
03:31:21,229 --> 03:31:19,140  
try to translate to close the gap

3153  
03:31:23,030 --> 03:31:21,239  
between each other uh if you wanted to

3154  
03:31:25,190 --> 03:31:23,040  
go over towards stanchion Alpha Frank

3155  
03:31:27,769 --> 03:31:25,200  
and Josh if you wanted to move over

3156  
03:31:29,450 --> 03:31:27,779  
towards the TFR on the cedar car just to

3157  
03:31:34,309 --> 03:31:29,460  
close the gap and be able to help help

3158  
03:31:38,510 --> 03:31:36,650  
put your feet up towards the tower I

3159  
03:31:39,710 --> 03:31:38,520  
think he's going towards the tower now

3160  
03:31:41,809 --> 03:31:39,720  
you got it

3161  
03:31:46,490 --> 03:31:41,819  
now look over to your left

3162  
03:31:46,500 --> 03:31:50,889  
oh you gotta be cool there it is

3163  
03:32:02,740 --> 03:31:53,630

you got it

3164

03:32:02,750 --> 03:32:06,590

[Music]

3165

03:32:11,090 --> 03:32:09,889

okay so um we're good on the 55 foot

3166

03:32:14,750 --> 03:32:11,100

Nick

3167

03:32:16,969 --> 03:32:14,760

um I'll go back uh to the station and

3168

03:32:19,190 --> 03:32:16,979

drop off my Red Hook if you agree if we

3169

03:32:20,450 --> 03:32:19,200

concur uh you've got a good 55 foot just

3170

03:32:57,830 --> 03:32:20,460

let us know where you drop your Red Hook

3171

03:33:01,610 --> 03:33:00,050

and Jack and then both crew members

3172

03:33:04,250 --> 03:33:01,620

continuing

3173

03:33:06,469 --> 03:33:04,260

to get ready to move this eyebrows of

3174

03:33:08,950 --> 03:33:06,479

this rollout solar array

3175

03:33:11,030 --> 03:33:08,960

Josh Castro working to continue

3176  
03:33:14,330 --> 03:33:11,040  
outfitting and getting that foot

3177  
03:33:25,610 --> 03:33:16,990  
and meanwhile Frank Rubio working on

3178  
03:33:25,620 --> 03:33:35,269  
503 counterclockwise too

3179  
03:33:40,969 --> 03:33:37,990  
thank you Red Hook

3180  
03:33:45,769 --> 03:33:40,979  
and release it from my Right theory

3181  
03:33:45,779 --> 03:33:49,790  
thank you Josh

3182  
03:33:54,290 --> 03:33:51,650  
and for Rubio he's working on two

3183  
03:33:56,330 --> 03:33:54,300  
different bolts C11 C12 these are the

3184  
03:34:00,710 --> 03:33:56,340  
last two bolts that are going to be

3185  
03:34:04,490 --> 03:34:02,090  
and

3186  
03:34:13,130 --> 03:34:04,500  
reel is unlocked

3187  
03:34:18,830 --> 03:34:15,250  
awesome

3188  
03:34:20,090 --> 03:34:18,840

okay let's uh I know you can preacher is

3189

03:34:23,510 --> 03:34:20,100

good with it are you okay with the

3190

03:34:25,550 --> 03:34:23,520

Ingress of the apfr

3191

03:34:27,410 --> 03:34:25,560

and that's affirmative uh you're that's

3192

03:34:29,530 --> 03:34:27,420

the next step for you uh Frank you've

3193

03:34:32,210 --> 03:34:29,540

got those settings Bravo 3 counter two

3194

03:34:40,250 --> 03:34:32,220

uh you're releasing approximately 27

3195

03:34:40,260 --> 03:34:43,969

cons of yours Josh

3196

03:34:48,170 --> 03:34:46,550

okay I think we're in a good good spot

3197

03:34:50,870 --> 03:34:48,180

here

3198

03:34:53,269 --> 03:34:50,880

um next year for a good view of the apfr

3199

03:34:55,670 --> 03:34:53,279

itself right here

3200

03:34:57,110 --> 03:34:55,680

really asked because it's a really

3201

03:35:00,110 --> 03:34:57,120

sensitive and raw I just want to make

3202

03:35:04,790 --> 03:35:01,670

yeah we don't have a really great view

3203

03:35:18,950 --> 03:35:04,800

of the uh the boot plate itself uh the

3204

03:35:23,990 --> 03:35:20,510

yeah it looks like your feet are just

3205

03:35:24,000 --> 03:35:26,889

I'm sorry which side

3206

03:35:30,889 --> 03:35:29,150

below and based on The View it looks

3207

03:35:34,330 --> 03:35:30,899

like uh left foot is under the left side

3208

03:35:34,340 --> 03:35:41,809

there we go

3209

03:35:49,729 --> 03:35:43,690

okay

3210

03:35:53,750 --> 03:35:52,010

Frank that's good uh that's what we're

3211

03:35:55,969 --> 03:35:53,760

doing for now you're gonna head back to

3212

03:35:56,990 --> 03:35:55,979

crew lock back T and retrieve the square

3213

03:35:59,330 --> 03:35:57,000

scoop

3214

03:36:17,590 --> 03:35:59,340

and the long duration tie-down tether

3215

03:36:17,600 --> 03:36:22,870

station station

3216

03:36:22,880 --> 03:36:27,650

without correcting the additional GCA

3217

03:36:27,660 --> 03:36:33,170

okay copy that thank you very much

3218

03:36:39,469 --> 03:36:35,929

information that these

3219

03:36:43,309 --> 03:36:41,210

okay my right doesn't feel quite right

3220

03:36:47,450 --> 03:36:43,319

my left feels good yeah your life is

3221

03:36:47,460 --> 03:36:51,830

forward

3222

03:36:57,830 --> 03:36:54,410

I think he might just be too deep on

3223

03:36:57,840 --> 03:37:02,469

okay

3224

03:37:02,479 --> 03:37:06,290

awesome thanks

3225

03:37:16,670 --> 03:37:07,790

yep let me make sure I got all my

3226

03:37:20,990 --> 03:37:20,030

okay I got my Ingress eight in you need

3227

03:37:24,229 --> 03:37:21,000

to come

3228

03:37:26,269 --> 03:37:24,239

uh I'm good yeah I'll grab the scoop

3229

03:37:27,710 --> 03:37:26,279

from the laundry and then head over to

3230

03:37:29,030 --> 03:37:27,720

Charlie 12's okay I'm not sure if

3231

03:37:31,910 --> 03:37:29,040

they're gonna need a GCU if they can

3232

03:37:33,469 --> 03:37:31,920

maneuver okay

3233

03:37:35,269 --> 03:37:33,479

wasn't sure if you could start from this

3234

03:37:38,210 --> 03:37:35,279

position but if you can

3235

03:37:41,990 --> 03:37:38,220

preachy I am go for the maneuver to the

3236

03:37:46,670 --> 03:37:44,630

and this is the money we're not GCA to

3237

03:37:50,030 --> 03:37:46,680

the published trust backup position

3238

03:37:53,670 --> 03:37:50,040

which is the body out or station photo

3239

03:37:59,870 --> 03:37:53,680

in one meter are you ready

3240

03:38:28,090 --> 03:38:03,469

we're sitting at the manual now

3241

03:38:33,370 --> 03:38:30,469

okay just so we are ready for the

3242

03:38:36,590 --> 03:38:33,380

maneuver to the extra deck of position

3243

03:38:43,670 --> 03:38:36,600

1.3 meters uh body out there here comes

3244

03:38:43,680 --> 03:38:47,050

I see good motion

3245

03:38:47,060 --> 03:38:52,429

to set PCV to 2.5

3246

03:38:52,439 --> 03:39:16,429

Josh 2.5

3247

03:39:16,439 --> 03:39:32,530

30 centimeters ago

3248

03:39:40,070 --> 03:39:35,210

position hold and then we will set up a

3249

03:39:48,410 --> 03:39:43,190

ev2 is ready for that showcase

3250

03:39:53,750 --> 03:39:50,030

and Josh I see you're working your

3251

03:39:53,760 --> 03:40:01,610

okay thanks

3252

03:40:06,590 --> 03:40:04,250

two hours 20 minutes into today's space

3253

03:40:09,349 --> 03:40:06,600

walk getting a view we see Josh cast it

3254

03:40:10,849 --> 03:40:09,359

up there in the upper right he is locked

3255

03:40:13,490 --> 03:40:10,859

in and tethered down to the foot

3256

03:40:15,710 --> 03:40:13,500

restraint on the robotic arm being

3257

03:40:17,630 --> 03:40:15,720

driven around now by the crew inside the

3258

03:40:19,610 --> 03:40:17,640

station Nicole man and koichiwakata

3259

03:40:22,010 --> 03:40:19,620

meanwhile Frank Rubio and the suit with

3260

03:40:24,290 --> 03:40:22,020

the red stripes see zv1 today working on

3261

03:40:26,870 --> 03:40:24,300

getting the final bolts holding the eye

3262

03:40:30,590 --> 03:40:26,880

Rosa in place released he's going to

3263

03:40:34,070 --> 03:40:30,600

wait until Josh cassida is in place and

3264

03:40:37,429 --> 03:40:34,080

ready to receive before he releases that

3265

03:40:44,450 --> 03:40:37,439

final bolt holding eyebrows into the FSE

3266

03:40:48,889 --> 03:40:47,870

now after they're able to get these

3267

03:40:51,889 --> 03:40:48,899

bolts

3268

03:40:53,929 --> 03:40:51,899

undone and irosa out

3269

03:40:56,389 --> 03:40:53,939

they're going to maneuver it over to the

3270

03:41:01,910 --> 03:40:56,399

work site they're going to do that by

3271

03:41:17,570 --> 03:41:12,769

Josh

3272

03:41:20,389 --> 03:41:17,580

minute Kill cast this is to pick you up

3273

03:41:22,370 --> 03:41:20,399

90 degrees and translate you to the

3274

03:41:24,469 --> 03:41:22,380

Nader of the irosa are you ready for the

3275

03:41:27,229 --> 03:41:24,479

motion so I'm going to pick

3276

03:41:31,849 --> 03:41:27,239

turn it up

3277

03:41:35,090 --> 03:41:31,859

correct yeah and it's up 90 degrees and

3278

03:41:36,710 --> 03:41:35,100

translate you to the Nader of the irosa

3279

03:41:48,410 --> 03:41:36,720

understood okay

3280

03:41:53,530 --> 03:41:52,250

okay here comes the motion in three two

3281

03:41:55,410 --> 03:41:53,540

one

3282

03:41:59,150 --> 03:41:55,420

arms in motion

3283

03:41:59,160 --> 03:42:27,490

foreign

3284

03:42:33,769 --> 03:42:30,530

Josh good socket swap if you can um

3285

03:42:35,570 --> 03:42:33,779

cycle your wvs for us uh we're trying to

3286

03:42:39,650 --> 03:42:35,580

get that to lock back up to help koichi

3287

03:42:51,050 --> 03:42:40,700

foreign

3288

03:42:55,130 --> 03:42:53,570

okay thanks for that Josh we'll uh we'll

3289

03:42:57,110 --> 03:42:55,140

look at it and let you know if we need

3290

03:43:00,110 --> 03:42:57,120

anything else and Frank I see you moving

3291

03:43:43,070 --> 03:43:00,120

over to uh stanchion Alpha uh towards

3292

03:43:48,229 --> 03:43:45,349

so a short Handover we'll get that video

3293

03:43:50,630 --> 03:43:48,239

back momentarily meanwhile Josh casted a

3294

03:43:52,670 --> 03:43:50,640

fix to the top of the Space Station's

3295

03:43:56,450 --> 03:43:52,680

robotic arm he's getting maneuvered into

3296

03:44:00,349 --> 03:43:58,429

foreign

3297

03:44:14,330 --> 03:44:00,359

Josh Frank back with you after a short

3298

03:44:14,340 --> 03:44:18,590

and Josh Frank uh

3299

03:44:29,750 --> 03:44:20,990

we're back with you now uh after a

3300

03:44:34,790 --> 03:44:31,729

I think I was just curious do you expect

3301

03:44:46,750 --> 03:44:34,800

the transformation over to P4 to be uh

3302

03:44:50,690 --> 03:44:49,670

yeah and Josh uh you should start in

3303

03:44:54,469 --> 03:44:50,700

sunlight you're going to finish an

3304

03:45:00,170 --> 03:44:57,290

okay sounds good

3305

03:45:02,690 --> 03:45:00,180

Josh uh arm is in position hold uh we

3306

03:45:04,429 --> 03:45:02,700

are setting up for manuals in the iris

3307

03:45:07,130 --> 03:45:04,439

or retrieval position

3308

03:45:09,290 --> 03:45:07,140

okay you have a go to for the manual

3309

03:45:11,030 --> 03:45:09,300

maneuver to the Arosa retrieval position

3310

03:45:14,870 --> 03:45:11,040

and Frank I'm just off your right

3311

03:45:18,469 --> 03:45:17,210

you're setting up the Yum now

3312

03:45:22,389 --> 03:45:18,479

okay

3313

03:45:27,830 --> 03:45:22,399

settings you bet it's Bravo 3

3314

03:45:32,870 --> 03:45:30,530

four three five o'clockwise three and I

3315

03:45:34,790 --> 03:45:32,880

am releasing this all the way out 27 of

3316

03:45:37,190 --> 03:45:34,800

this car commercial 54 times correct

3317

03:45:38,690 --> 03:45:37,200

that's affirmative full release 54 turns

3318

03:45:41,389 --> 03:45:38,700

you're going to the bolt Will Spring out

3319

03:45:41,399 --> 03:45:47,389

okay

3320

03:45:51,889 --> 03:45:49,670

so our lead space walker for the day

3321

03:45:55,790 --> 03:45:51,899

Frank Rubio still at it releasing those

3322

03:45:58,849 --> 03:45:55,800

final two bolts they're C11 and C12 he

3323

03:46:01,130 --> 03:45:58,859

so C11 about halfway out now taking C12

3324

03:46:04,010 --> 03:46:01,140

all the way out we won't take C11 all

3325

03:46:06,469 --> 03:46:04,020

the way out and thus release irosa until

3326

03:46:08,990 --> 03:46:06,479

Josh cassida is in place and ready to

3327

03:46:11,870 --> 03:46:09,000

manually receive it

3328

03:46:14,030 --> 03:46:11,880

and he's then going to be flown with

3329

03:46:23,030 --> 03:46:14,040

irosa over to the the work site on the

3330

03:46:29,450 --> 03:46:26,570

okay adjust manual mode is set and this

3331

03:46:32,090 --> 03:46:29,460

is the maneuver per usgca to the

3332

03:46:34,729 --> 03:46:32,100

published iros retrieval position which

3333

03:46:36,309 --> 03:46:34,739

is a body in towards iOS at 1.5 meters

3334

03:46:39,889 --> 03:46:36,319

are you ready

3335

03:46:43,790 --> 03:46:42,110

okay we're ready GCA the publish for our

3336

03:46:47,330 --> 03:46:43,800

Russo retrieval

3337

03:46:52,190 --> 03:46:47,340

okay here comes the motion in three two

3338

03:46:52,200 --> 03:47:12,050

secret ocean

3339

03:47:12,060 --> 03:47:20,630

another minute ago

3340

03:47:25,070 --> 03:47:22,969

looking over the shoulder Josh cassid as

3341

03:47:26,450 --> 03:47:25,080

he moves in iros are right in the center

3342

03:47:29,330 --> 03:47:26,460

of his View

3343

03:47:32,870 --> 03:47:29,340

Frank Rubio appearing upside down in the

3344

03:47:35,630 --> 03:47:32,880

top right getting that final Bolt

3345

03:47:37,729 --> 03:47:35,640

or rather that C12 bolt all the way out

3346

03:47:39,110 --> 03:47:37,739

he's then going to move over to get C11

3347

03:47:41,450 --> 03:47:39,120

after

3348

03:47:50,630 --> 03:47:41,460

uh Josh is fully in position and ready

3349

03:47:56,809 --> 03:47:53,990

I ended up with uh 55 turns standby

3350

03:47:57,769 --> 03:47:56,819

sorry about that

3351  
03:48:04,250 --> 03:47:57,779  
continue

3352  
03:48:12,410 --> 03:48:06,830  
we're about in three

3353  
03:48:12,420 --> 03:48:15,849  
okay yes

3354  
03:48:15,859 --> 03:48:19,190  
this is

3355  
03:48:23,769 --> 03:48:21,410  
that you have a goal for iro Savage

3356  
03:48:27,769 --> 03:48:26,929  
T no sorry I'm

3357  
03:48:30,229 --> 03:48:27,779  
I'm

3358  
03:48:31,870 --> 03:48:30,239  
thinking about 55 turns on Charlie 12

3359  
03:48:35,690 --> 03:48:31,880  
that is released

3360  
03:48:37,370 --> 03:48:35,700  
w55 full release on Charlie 12. and uh

3361  
03:48:40,010 --> 03:48:37,380  
so I see you working to install the

3362  
03:48:45,950 --> 03:48:40,020  
scoop uh with the long duration on that

3363  
03:48:53,690 --> 03:48:47,990

so let's put it on the long duration I

3364

03:49:03,469 --> 03:48:55,070

I think that was a friend right mate

3365

03:49:03,479 --> 03:49:10,250

awesome

3366

03:49:14,570 --> 03:49:12,830

and so this metal device you see Frank

3367

03:49:17,570 --> 03:49:14,580

Rubio working into the screen there

3368

03:49:19,910 --> 03:49:17,580

that's what's called a scoop we have

3369

03:49:21,170 --> 03:49:19,920

both square and circle Scoops just

3370

03:49:22,729 --> 03:49:21,180

depending on what fitting they're

3371

03:49:25,670 --> 03:49:22,739

attaching to and we can use them to

3372

03:49:27,530 --> 03:49:25,680

essentially add temporary handrails

3373

03:49:30,410 --> 03:49:27,540

um handling aids to different payloads

3374

03:49:32,030 --> 03:49:30,420

and so he's working on installing that

3375

03:49:34,550 --> 03:49:32,040

three different settings on a scoop

3376

03:49:36,530 --> 03:49:34,560

we've got a capture release and a lock

3377

03:49:46,370 --> 03:49:36,540

robotics

3378

03:50:00,610 --> 03:49:49,070

little unique so we will take care of

3379

03:50:08,210 --> 03:50:05,530

I'm gonna move in another 10.

3380

03:50:10,250 --> 03:50:08,220

okay okay

3381

03:50:15,710 --> 03:50:10,260

yep hey Nick I'm going to translate over

3382

03:50:19,910 --> 03:50:17,870

yep no that works uh Frank head over to

3383

03:50:21,769 --> 03:50:19,920

Charlie 11 and uh

3384

03:50:27,110 --> 03:50:21,779

and we see the configuration on the

3385

03:50:32,330 --> 03:50:28,610

thank you

3386

03:50:36,170 --> 03:50:34,370

sorry about that I couldn't see where

3387

03:50:38,570 --> 03:50:36,180

the scoop was going to go and I guessed

3388

03:50:41,990 --> 03:50:38,580

wrong so I'm gonna need another uh 15

3389

03:50:51,590 --> 03:50:42,000  
centimeters uh body in

3390

03:50:55,130 --> 03:50:53,809  
the uh crew lock bag

3391

03:51:15,050 --> 03:50:55,140  
to need to make sure you pick up the

3392

03:51:20,750 --> 03:51:17,870  
and right now I'm getting closer to the

3393

03:51:23,929 --> 03:51:20,760  
release of irosa

3394

03:51:25,790 --> 03:51:23,939  
right now Frank Rubio's moving over to

3395

03:51:28,790 --> 03:51:25,800  
the other side of the FSC he's going to

3396

03:51:31,250 --> 03:51:28,800  
be releasing a final Bolt

3397

03:51:33,710 --> 03:51:31,260  
and once that's free they'll be able to

3398

03:51:36,110 --> 03:51:33,720  
get essentially slide hours out of that

3399

03:51:38,889 --> 03:51:36,120  
temporary storage location and begin

3400

03:51:42,530 --> 03:51:38,899  
flying it over we are ready for GCA

3401  
03:51:44,389 --> 03:51:42,540  
ready GPA

3402  
03:51:45,650 --> 03:51:44,399  
um again 15 centimeters spotting in and

3403  
03:51:49,550 --> 03:51:45,660  
I'll call you out

3404  
03:52:04,070 --> 03:51:49,560  
okay 50 centimeters a body in

3405  
03:52:08,809 --> 03:52:06,530  
and we see Frank Rubio grabbing another

3406  
03:52:11,510 --> 03:52:08,819  
one of those scoops

3407  
03:52:13,610 --> 03:52:11,520  
and this is what we can

3408  
03:52:15,710 --> 03:52:13,620  
put on things like irosa to give a

3409  
03:52:16,849 --> 03:52:15,720  
handle too

3410  
03:52:26,090 --> 03:52:16,859  
are you ready

3411  
03:52:26,100 --> 03:52:36,950  
I see good motions continue

3412  
03:52:45,950 --> 03:52:40,309  
at 50 Cent meters continue

3413  
03:53:17,269 --> 03:52:48,229

you seem complete thank you very much I

3414

03:53:17,279 --> 03:53:24,050

uh

3415

03:53:28,190 --> 03:53:26,030

and Frank I see you with the scoop

3416

03:53:29,269 --> 03:53:28,200

headed out to C11

3417

03:53:31,670 --> 03:53:29,279

um

3418

03:53:34,250 --> 03:53:31,680

big picture we're right on the timeline

3419

03:53:39,110 --> 03:53:34,260

so everything's marching along towards

3420

03:53:39,120 --> 03:53:45,229

that's great

3421

03:53:49,849 --> 03:53:47,570

okay well you're moving into position a

3422

03:53:52,190 --> 03:53:49,859

warning uh this one might be obvious

3423

03:53:54,290 --> 03:53:52,200

don't release C11 until you've got our

3424

03:54:04,849 --> 03:53:54,300

go because that will fully release irosa

3425

03:54:09,950 --> 03:54:07,429

so Frank I see in position uh now's a

3426

03:54:12,830 --> 03:54:09,960

good time uh let's do some glove and

3427

03:54:15,590 --> 03:54:12,840

half checks uh Josh's is your chance to

3428

03:54:20,510 --> 03:54:15,600

uh do a once over so let's start with

3429

03:54:25,189 --> 03:54:23,150

and easy one

3430

03:54:27,950 --> 03:54:25,199

because no changes

3431

03:54:30,889 --> 03:54:27,960

and go ahead

3432

03:54:33,590 --> 03:54:30,899

for ub2 no changes to the gloves

3433

03:54:36,110 --> 03:54:33,600

and dry half

3434

03:54:37,550 --> 03:54:36,120

copy for both of you uh so then Josh for

3435

03:54:39,530 --> 03:54:37,560

you want to confirm tools and tethers

3436

03:54:48,189 --> 03:54:39,540

are in a good configuration clear that

3437

03:54:48,199 --> 03:54:53,929

there's a few config interface is

3438

03:54:56,689 --> 03:54:55,490

and I got rid of a lot of the stuff in

3439

03:54:58,189 --> 03:54:56,699

my mini workspace I'm pretty happy about

3440

03:55:00,290 --> 03:54:58,199

that yeah it looks you look super clean

3441

03:55:01,330 --> 03:55:00,300

there thank you appreciate it

3442

03:55:03,170 --> 03:55:01,340

um

3443

03:55:05,450 --> 03:55:03,180

thanks

3444

03:55:07,309 --> 03:55:05,460

okay good uh so then looking at the suit

3445

03:55:08,929 --> 03:55:07,319

advisor glove heaters make sure your

3446

03:55:14,870 --> 03:55:08,939

cooling is where you want it to be your

3447

03:55:18,229 --> 03:55:16,790

I'm good with this cooling I did turn on

3448

03:55:21,050 --> 03:55:18,239

the gloves I used them for about the

3449

03:55:22,550 --> 03:55:21,060

first hour or so fans got pretty warm

3450

03:55:25,670 --> 03:55:22,560

but I think they're going to work out

3451

03:55:27,710 --> 03:55:25,680

well for what we're about to do

3452

03:55:30,349 --> 03:55:27,720

and the visor I guess I'll keep it down

3453

03:55:32,150 --> 03:55:30,359

since it will probably just end up

3454

03:55:34,849 --> 03:55:32,160

any clips

3455

03:55:37,189 --> 03:55:34,859

okay copy that uh and then one last

3456

03:55:39,290 --> 03:55:37,199

chance if you're in a good position to

3457

03:55:41,030 --> 03:55:39,300

to look inside each other's helmets uh

3458

03:55:42,530 --> 03:55:41,040

if you see any signs of water now's a

3459

03:55:54,530 --> 03:55:42,540

good time to do it or to check each

3460

03:55:57,229 --> 03:55:55,250

um

3461

03:55:59,689 --> 03:55:57,239

direct for the scoop that's going to go

3462

03:56:02,450 --> 03:55:59,699

on and I put this somewhere convenience

3463

03:56:17,050 --> 03:56:02,460

like uh

3464

03:56:20,870 --> 03:56:19,370

I think we're getting the chance to kind

3465

03:56:23,330 --> 03:56:20,880

of catch our breath through some checks

3466

03:56:24,950 --> 03:56:23,340

real quick each of them checking gloves

3467

03:56:26,990 --> 03:56:24,960

is that's what we're interacting with

3468

03:56:34,250 --> 03:56:27,000

everything on checking funny Nicks any

3469

03:56:38,150 --> 03:56:36,290

see Josh Casa attaching an equipment

3470

03:56:39,410 --> 03:56:38,160

tether to that second scoop it's going

3471

03:56:44,689 --> 03:56:39,420

to go on the other side and that's how

3472

03:56:44,699 --> 03:56:47,630

where's my body

3473

03:56:47,640 --> 03:56:52,070

yeah

3474

03:56:57,050 --> 03:56:54,590

okay naked I think

3475

03:57:00,650 --> 03:56:57,060

the principal's been a good concern I

3476  
03:57:04,010 --> 03:57:00,660  
agree let me get one okay so I'm ready

3477  
03:57:11,689 --> 03:57:04,020  
okay do we need to go from there

3478  
03:57:15,769 --> 03:57:13,910  
all right big moment coming up releasing

3479  
03:57:19,309 --> 03:57:15,779  
that last Bolt

3480  
03:57:22,729 --> 03:57:19,319  
three counterclockwise two should be

3481  
03:57:28,010 --> 03:57:25,429  
and once this bolt is released irosa

3482  
03:57:31,010 --> 03:57:28,020  
will be free of the FSE

3483  
03:57:35,950 --> 03:57:31,020  
and ready to be on the move

3484  
03:57:41,570 --> 03:57:38,809  
2.4 meters

3485  
03:57:43,490 --> 03:57:41,580  
copy press

3486  
03:57:46,670 --> 03:57:43,500  
and we concur with that Luigi that

3487  
03:57:46,680 --> 03:57:50,269  
okay

3488  
03:57:50,279 --> 03:58:11,870

coffee

3489

03:58:20,269 --> 03:58:14,710

can you do it

3490

03:58:27,170 --> 03:58:23,150

and copy good release

3491

03:58:30,290 --> 03:58:27,180

and we see the bolt is now released

3492

03:58:31,849 --> 03:58:30,300

nothing holding eye Rosa in place now to

3493

03:59:00,130 --> 03:58:31,859

the Flight Support equipment we can

3494

03:59:04,910 --> 03:59:03,170

now that the the second

3495

03:59:07,969 --> 03:59:04,920

attachment point for the scoop you can

3496

03:59:09,480 --> 03:59:07,979

see a small lever on the back yeah I

3497

03:59:12,590 --> 03:59:09,490

know

3498

03:59:14,630 --> 03:59:12,600

[Applause]

3499

03:59:17,510 --> 03:59:14,640

the levers in the middle the scoops and

3500

03:59:19,670 --> 03:59:17,520

kind of its capture mode I think it flip

3501

03:59:21,170 --> 03:59:19,680

it to the left that's and it's locked

3502

03:59:22,670 --> 03:59:21,180

mode

3503

03:59:24,050 --> 03:59:22,680

then swing it back to the right to

3504

03:59:26,290 --> 03:59:24,060

release but it looks like we have two

3505

03:59:30,290 --> 03:59:26,300

scoops now

3506

03:59:30,300 --> 03:59:36,349

I'll put my hand down here

3507

03:59:36,359 --> 03:59:39,070

five scoops

3508

03:59:44,570 --> 03:59:42,950

copy a good release Scoops are on uh and

3509

03:59:49,370 --> 03:59:44,580

Frank if you want to translate over to

3510

03:59:51,700 --> 03:59:50,389

what

3511

03:59:54,550 --> 03:59:51,710

happened

3512

03:59:56,870 --> 03:59:54,560

[Applause]

3513

03:59:59,929 --> 03:59:56,880

so I think you're pumping me just a

3514

04:00:12,010 --> 03:59:59,939

little bit as a heads up that's okay

3515

04:00:12,020 --> 04:00:16,150

let's see

3516

04:00:20,809 --> 04:00:19,130

yeah Josh we we you know based on what

3517

04:00:22,429 --> 04:00:20,819

we can see here you should be pretty

3518

04:00:24,889 --> 04:00:22,439

close to centered right now there's not

3519

04:00:27,170 --> 04:00:24,899

much room to go laterally uh we do see

3520

04:00:31,370 --> 04:00:27,180

it kind of pitching down from you away

3521

04:00:36,050 --> 04:00:33,650

okay

3522

04:00:55,670 --> 04:00:36,060

and if you could pull it when you get

3523

04:00:55,680 --> 04:00:58,849

all right

3524

04:01:04,309 --> 04:01:00,830

I'll pull you down a little bit that'd

3525

04:01:10,729 --> 04:01:07,610

come towards me I think um are we not

3526

04:01:13,189 --> 04:01:10,739

off the pins yet that you are grabbing

3527

04:01:14,570 --> 04:01:13,199

on something I think they were just

3528

04:01:17,809 --> 04:01:14,580

keeping me from

3529

04:01:20,870 --> 04:01:17,819

you know what this is actually okay

3530

04:01:23,030 --> 04:01:20,880

um you'll as you go up

3531

04:01:26,150 --> 04:01:23,040

hold it in place and uh wait until

3532

04:01:28,070 --> 04:01:26,160

you're level and then I'll release it

3533

04:01:30,710 --> 04:01:28,080

okay does that make sense yeah can you

3534

04:01:31,910 --> 04:01:30,720

tell are we free around the perimeter we

3535

04:01:34,790 --> 04:01:31,920

are yes

3536

04:01:37,130 --> 04:01:34,800

okay but obviously I can't tell on the

3537

04:01:39,469 --> 04:01:37,140

uh the drive that's the opposite the uh

3538

04:01:42,969 --> 04:01:39,479

Tower it does seem like we're shifted

3539

04:01:48,530 --> 04:01:46,550

uh I'm sorry opposite desire

3540

04:01:52,670 --> 04:01:48,540

um

3541

04:01:55,370 --> 04:01:52,680

yeah no you're only one inch away from

3542

04:01:56,870 --> 04:01:55,380

Downtown Charlie so I think yeah it's

3543

04:01:58,309 --> 04:01:56,880

just that they're clearing but it works

3544

04:02:01,610 --> 04:01:58,319

about even

3545

04:02:04,250 --> 04:02:01,620

yeah and we discuss guys clearances

3546

04:02:06,050 --> 04:02:04,260

there uh Frank just a heads up uh want

3547

04:02:08,929 --> 04:02:06,060

to watch any of the no touch on that end

3548

04:02:10,729 --> 04:02:08,939

of the irosa and that tab is okay to

3549

04:02:13,189 --> 04:02:10,739

hold on to just don't get your finger in

3550

04:02:15,769 --> 04:02:13,199

that hole

3551  
04:02:19,309 --> 04:02:15,779  
sorry

3552  
04:02:20,630 --> 04:02:19,319  
heads up and then we'll uh I'll turn it

3553  
04:02:22,849 --> 04:02:20,640  
over to you okay

3554  
04:02:24,969 --> 04:02:22,859  
all that is not centered up on the ffe

3555  
04:02:27,769 --> 04:02:24,979  
so somehow

3556  
04:02:30,189 --> 04:02:27,779  
me and the uh

3557  
04:02:34,729 --> 04:02:30,199  
have shifted away from the tower

3558  
04:02:36,650 --> 04:02:34,739  
probably about an inch and a half okay

3559  
04:02:38,809 --> 04:02:36,660  
we'll just keep that for essay

3560  
04:02:40,670 --> 04:02:38,819  
and uh

3561  
04:02:42,229 --> 04:02:40,680  
I am happy to have you drive me around

3562  
04:02:47,269 --> 04:02:42,239  
okay

3563  
04:02:50,570 --> 04:02:47,279

all right I'm on anyone

3564

04:02:51,889 --> 04:02:50,580

okay go ahead thank you you have a go

3565

04:02:54,650 --> 04:02:51,899

for

3566

04:02:58,849 --> 04:02:54,660

a purpose to a rose of removal

3567

04:03:02,630 --> 04:02:58,859

okay uh we copy that and uh this is uh

3568

04:03:05,630 --> 04:03:02,640

Josh's body down for 2.4 meters to the

3569

04:03:11,530 --> 04:03:05,640

published irasa removal position

3570

04:03:18,410 --> 04:03:14,510

that's it cool

3571

04:03:23,809 --> 04:03:18,420

okay here comes the motion in three two

3572

04:03:23,819 --> 04:03:33,830

it's the emotions good motion

3573

04:03:40,550 --> 04:03:38,689

so I'm keeping you um I can see it

3574

04:03:41,689 --> 04:03:40,560

stay on this side and we have about an

3575

04:03:43,729 --> 04:03:41,699

inch so I think you're clear on the

3576

04:03:47,510 --> 04:03:43,739

other side

3577

04:03:54,650 --> 04:03:50,630

perfectly all around continue

3578

04:04:04,130 --> 04:03:56,150

all right Josh with about 10 more

3579

04:04:04,140 --> 04:04:09,769

clear all around continue

3580

04:04:15,290 --> 04:04:12,769

we're going three two

3581

04:04:18,490 --> 04:04:16,790

I'm gonna keep my fingers very lightly

3582

04:04:19,849 --> 04:04:18,500

but not touching

3583

04:04:22,610 --> 04:04:19,859

[Applause]

3584

04:04:25,550 --> 04:04:22,620

away from the tower by about one inch

3585

04:04:29,769 --> 04:04:25,560

they're clear of all the stations

3586

04:04:35,450 --> 04:04:32,889

to hold that current course

3587

04:04:36,889 --> 04:04:35,460

the drawers are clear to feet away from

3588

04:04:39,349 --> 04:04:36,899

the tower a little bit more since you

3589

04:04:42,469 --> 04:04:39,359

have clearance on that side to clear the

3590

04:04:49,130 --> 04:04:45,050

and you're about a quarter of the way

3591

04:04:49,140 --> 04:04:54,469

halfway clearly grapple question

3592

04:04:54,479 --> 04:04:57,890

about five minutes foreign

3593

04:05:26,929 --> 04:05:03,980

[Music]

3594

04:05:26,939 --> 04:05:30,349

nice teamwork guys

3595

04:05:34,969 --> 04:05:32,570

all right

3596

04:05:48,050 --> 04:05:34,979

nothing

3597

04:05:53,030 --> 04:05:49,689

where can I go ahead and start my uh

3598

04:05:57,550 --> 04:05:53,040

that's a firm Frank you're gonna sock

3599

04:06:02,570 --> 04:05:59,929

position hold and we're gonna set up a

3600

04:06:08,090 --> 04:06:02,580

joke yes for outboard jokes

3601  
04:06:11,809 --> 04:06:09,650  
and Frank you're going to drop off your

3602  
04:06:13,010 --> 04:06:11,819  
12 inch onto the socket caddy and then

3603  
04:06:15,950 --> 04:06:13,020  
put the two inch that's in your trash

3604  
04:06:17,630 --> 04:06:15,960  
bag on your PGT just for your essay this

3605  
04:06:21,229 --> 04:06:17,640  
is the last time we're getting in the

3606  
04:06:22,969 --> 04:06:21,239  
the crew lock bag Tango so if you uh

3607  
04:06:25,309 --> 04:06:22,979  
give this good heck of view we can help

3608  
04:06:35,269 --> 04:06:25,319  
with inventory uh not asking for an

3609  
04:06:42,110 --> 04:06:38,210  
two hours 47 minutes 30 seconds into the

3610  
04:06:44,210 --> 04:06:42,120  
spacewalk irosa now released from its

3611  
04:06:45,290 --> 04:06:44,220  
spot on the FSE that Flight Support

3612  
04:06:47,510 --> 04:06:45,300  
equipment

3613  
04:06:48,710 --> 04:06:47,520

probably in the grasp of Josh cassida

3614

04:06:52,130 --> 04:06:48,720

who's riding on the end of the Canada

3615

04:06:53,750 --> 04:06:52,140

arm 2 robotic arm he's got it by Two

3616

04:06:56,570 --> 04:06:53,760

Scoops essentially temporary handles

3617

04:06:59,269 --> 04:06:56,580

that they installed onto the array

3618

04:07:01,729 --> 04:06:59,279

they're also Tethered to him so he's got

3619

04:07:04,130 --> 04:07:01,739

that in his grass meanwhile he's going

3620

04:07:05,990 --> 04:07:04,140

to now get flown

3621

04:07:08,330 --> 04:07:06,000

on top of the robotic arm from his

3622

04:07:10,010 --> 04:07:08,340

current location out to the work site I

3623

04:07:13,389 --> 04:07:10,020

need to take care of this video routing

3624

04:07:19,010 --> 04:07:16,429

and he's getting that the flight

3625

04:07:20,870 --> 04:07:19,020

maneuver courtesy of Nicole man and

3626  
04:07:24,170 --> 04:07:20,880  
koichiwakata at the robotics workstation

3627  
04:07:26,090 --> 04:07:24,180  
inside the station

3628  
04:07:28,189 --> 04:07:26,100  
meanwhile Frank Rubio is going to make

3629  
04:07:30,830 --> 04:07:28,199  
his way by hand over to the same work

3630  
04:07:34,210 --> 04:07:30,840  
site which we're going to start moving

3631  
04:07:37,870 --> 04:07:34,220  
into some of the installation

3632  
04:07:40,490 --> 04:07:37,880  
procedures first thing after we get it

3633  
04:07:43,130 --> 04:07:40,500  
over there is going to be to to get

3634  
04:07:45,650 --> 04:07:43,140  
irosa initially onto its mounting

3635  
04:07:47,090 --> 04:07:45,660  
bracket once we get some soft capture

3636  
04:07:50,210 --> 04:07:47,100  
points in

3637  
04:07:51,889 --> 04:07:50,220  
we'll be able to unfold it so it's you

3638  
04:07:53,330 --> 04:07:51,899

can see it kind of doubled up in its

3639

04:07:56,870 --> 04:07:53,340

configuration right how it's going to be

3640

04:07:59,150 --> 04:07:56,880

unfolded and so it's just one continuous

3641

04:08:03,050 --> 04:07:59,160

array long ways after that they can get

3642

04:08:04,969 --> 04:08:03,060

the final attachment points in place get

3643

04:08:08,570 --> 04:08:04,979

all of the the hard capture bolts

3644

04:08:10,610 --> 04:08:08,580

engaged then start to do the cable

3645

04:08:12,710 --> 04:08:10,620

routing so again at the very beginning

3646

04:08:14,990 --> 04:08:12,720

of the spacewalk Frank Rubio's first

3647

04:08:16,790 --> 04:08:15,000

task was go over and start routing and

3648

04:08:18,530 --> 04:08:16,800

tying down a couple of cables those are

3649

04:08:20,269 --> 04:08:18,540

power connections that's going to

3650

04:08:23,630 --> 04:08:20,279

integrate this new array in with the

3651  
04:08:27,950 --> 04:08:23,640  
Legacy one to the 4A power channel to

3652  
04:08:30,590 --> 04:08:27,960  
let them all get engaged Swap and a good

3653  
04:08:30,600 --> 04:08:34,870  
no problem

3654  
04:08:39,469 --> 04:08:37,729  
now that cable routing activities one

3655  
04:08:42,530 --> 04:08:39,479  
that has some special considerations

3656  
04:08:43,969 --> 04:08:42,540  
with it we have to be in eclipse for

3657  
04:08:46,550 --> 04:08:43,979  
those power connections to be made

3658  
04:08:48,650 --> 04:08:46,560  
that's just the the primary way we can

3659  
04:08:50,929 --> 04:08:48,660  
make sure that no electrical energy is

3660  
04:08:52,790 --> 04:08:50,939  
being generated by those solar arrays so

3661  
04:08:54,769 --> 04:08:52,800  
they will wait until we're on the dark

3662  
04:08:57,349 --> 04:08:54,779  
side of planet Earth before they do that

3663  
04:08:58,910 --> 04:08:57,359

cable connection

3664

04:09:00,650 --> 04:08:58,920

if you can pull a Bobby down a little

3665

04:09:19,610 --> 04:09:00,660

bit it'll get fully in the heck of you

3666

04:09:19,620 --> 04:09:24,290

another good view uh go ahead and

3667

04:09:29,090 --> 04:09:26,389

Frank you can go ahead and start trying

3668

04:09:31,010 --> 04:09:29,100

to pack it all up and then

3669

04:09:33,290 --> 04:09:31,020

we'll we'll do the video review on the

3670

04:09:33,300 --> 04:09:36,349

okay sounds good thanks

3671

04:09:41,570 --> 04:09:39,349

yeah Josh in fact we're ready for the uh

3672

04:09:43,849 --> 04:09:41,580

outboard jocast

3673

04:09:47,269 --> 04:09:43,859

this is a three minute maneuver and

3674

04:09:49,610 --> 04:09:47,279

we'll move Josh uh body left eight

3675

04:09:54,410 --> 04:09:49,620

meters and the body out about three

3676  
04:09:58,189 --> 04:09:54,420  
meters and Josh uh irosa and frgs Tower

3677  
04:10:00,590 --> 04:09:58,199  
clearance will be 73 centimeters so uh

3678  
04:10:08,330 --> 04:10:00,600  
please keep

3679  
04:10:11,450 --> 04:10:08,340  
from media tower

3680  
04:10:12,710 --> 04:10:11,460  
and if you're already we will start the

3681  
04:10:14,330 --> 04:10:12,720  
maneuver

3682  
04:10:16,010 --> 04:10:14,340  
I think we're already clear the tower I

3683  
04:10:18,950 --> 04:10:16,020  
don't have view of it understand going

3684  
04:10:20,450 --> 04:10:18,960  
body left and towards my back as well I

3685  
04:10:23,030 --> 04:10:20,460  
am ready for the maneuver

3686  
04:10:24,290 --> 04:10:23,040  
all of our great visual in the tower and

3687  
04:10:26,330 --> 04:10:24,300  
you are clear

3688  
04:10:49,010 --> 04:10:26,340

okay copy that here comes the motion in

3689

04:10:53,330 --> 04:10:51,530

all right so the relocation of eyebrows

3690

04:10:55,670 --> 04:10:53,340

that now in work we can see the FSE

3691

04:10:57,469 --> 04:10:55,680

palette in the bottom right where uh

3692

04:10:59,570 --> 04:10:57,479

Frank Rubio's doing some final bag

3693

04:11:01,670 --> 04:10:59,580

inventory he had to swap out the socket

3694

04:11:03,830 --> 04:11:01,680

on his pistol grip tool one final time

3695

04:11:07,550 --> 04:11:03,840

as that's going to get used to drive a

3696

04:11:09,469 --> 04:11:07,560

number of bolts on Iris itself to secure

3697

04:11:12,290 --> 04:11:09,479

it but in the meantime the robotic arm

3698

04:11:15,650 --> 04:11:12,300

is in motion Josh cassida it's very top

3699

04:11:17,630 --> 04:11:15,660

with irosa and his grip on his way out

3700

04:11:31,250 --> 04:11:17,640

to the work site

3701

04:11:36,410 --> 04:11:34,070

and Frank your next task is to retrieve

3702

04:12:19,429 --> 04:11:36,420

Josh's red safety tether from the Nader

3703

04:12:19,439 --> 04:12:23,929

s great

3704

04:12:27,710 --> 04:12:26,030

so you know when we get that water in

3705

04:12:45,710 --> 04:12:27,720

the helmet check yeah

3706

04:12:45,720 --> 04:12:51,170

just renting out now

3707

04:12:51,180 --> 04:12:56,450

okay hold on that was pretty abrupt

3708

04:12:56,460 --> 04:13:12,650

okay we got it

3709

04:13:17,510 --> 04:13:15,530

okay okay Josh in position hold are we

3710

04:13:22,210 --> 04:13:17,520

going to set up the next joke guests for

3711

04:13:25,429 --> 04:13:22,220

irises joint okay copy that is

3712

04:13:26,809 --> 04:13:25,439

about uh so quickly on me if you see it

3713

04:13:28,070 --> 04:13:26,819

wrapping out

3714

04:13:30,110 --> 04:13:28,080

excellent

3715

04:13:31,010 --> 04:13:30,120

uh if you give me a heads up that'd be

3716

04:14:11,689 --> 04:13:31,020

awesome

3717

04:14:15,650 --> 04:14:14,269

so just about five minutes away from the

3718

04:14:17,630 --> 04:14:15,660

three hour mark of today's baseball

3719

04:14:20,750 --> 04:14:17,640

again planned to last about seven

3720

04:14:23,389 --> 04:14:20,760

everything moves smoothly so far still a

3721

04:14:26,150 --> 04:14:23,399

couple of minutes ahead of the timeline

3722

04:14:28,130 --> 04:14:26,160

uh the Pair worked together to prepare

3723

04:14:30,650 --> 04:14:28,140

the work site by routing cables Frank

3724

04:14:33,530 --> 04:14:30,660

Rubio knocking that out on his first

3725

04:14:36,170 --> 04:14:33,540

task out of the gate while Josh Casada

3726

04:14:38,269 --> 04:14:36,180

worked to get Iris already to get

3727

04:14:40,790 --> 04:14:38,279

detached from its temporary stowage

3728

04:14:44,030 --> 04:14:40,800

point and get into the robotic arm where

3729

04:14:47,450 --> 04:14:44,040

he is currently standing with thyrosa in

3730

04:14:49,070 --> 04:14:47,460

his grip you heard him asking for heads

3731

04:14:51,410 --> 04:14:49,080

up as we were going to slow down some of

3732

04:14:54,889 --> 04:14:51,420

the motion again these irises weigh

3733

04:14:56,990 --> 04:14:54,899

right around 750 pounds and while they

3734

04:14:58,910 --> 04:14:57,000

are in microgravity it's not too hard

3735

04:15:01,490 --> 04:14:58,920

for them to start moving those

3736

04:15:03,710 --> 04:15:01,500

but something with that much mass can be

3737

04:15:05,210 --> 04:15:03,720

hard to stop moving so definitely

3738

04:15:07,429 --> 04:15:05,220

something for the crew to keep in mind

3739

04:15:09,889 --> 04:15:07,439

as they're doing these very slow and

3740

04:15:11,870 --> 04:15:09,899

delivered movements this of you though

3741

04:15:20,450 --> 04:15:11,880

from Frank Rubio's helmet cam is he's

3742

04:15:25,070 --> 04:15:22,670

you um

3743

04:15:26,830 --> 04:15:25,080

move heads up

3744

04:15:28,309 --> 04:15:26,840

around 90 degrees pitch down

3745

04:15:30,410 --> 04:15:28,319

[Applause]

3746

04:15:33,309 --> 04:15:30,420

and if you're ready we will start the

3747

04:15:37,969 --> 04:15:36,050

90 degrees and I'm going to be ready for

3748

04:15:42,410 --> 04:15:37,979

your countdown sounds great

3749

04:15:49,490 --> 04:15:42,420

here comes the motion in three two one

3750

04:15:49,500 --> 04:16:33,889

secret solution

3751

04:16:33,899 --> 04:16:42,410

where's that planet

3752

04:16:46,130 --> 04:16:45,050

and Frank Garcia picked up the Red Hook

3753

04:17:12,769 --> 04:16:46,140

there you'll want to check your

3754

04:17:12,779 --> 04:17:16,610

okay Josh we are ramping out

3755

04:17:16,620 --> 04:17:34,729

happy

3756

04:17:41,269 --> 04:17:36,349

and so Frank the handrail you're looking

3757

04:17:41,279 --> 04:17:45,469

on the uh opposite sorry correct

3758

04:17:45,479 --> 04:17:54,610

that's a firm

3759

04:18:00,010 --> 04:17:56,750

thank you so much for your help on that

3760

04:18:05,389 --> 04:18:02,450

and Frank if you can you can put a fair

3761

04:19:08,650 --> 04:18:05,399

lead in Josh's uh safety tether at 5114

3762

04:19:14,090 --> 04:19:11,450

and just crossed that three hour mark

3763

04:19:15,469 --> 04:19:14,100

into today's space walk so right now

3764

04:19:17,750 --> 04:19:15,479

we're looking over the shoulder of Frank

3765

04:19:20,450 --> 04:19:17,760

Rubio ev1 our lead space walker for

3766

04:19:22,670 --> 04:19:20,460

today he's making his way over to the P4

3767

04:19:25,910 --> 04:19:22,680

work site this is he was there already

3768

04:19:27,290 --> 04:19:25,920

once as he laid down some of the cables

3769

04:19:28,790 --> 04:19:27,300

that are going to be used to integrate

3770

04:19:34,189 --> 04:19:28,800

the new solar array into the power

3771

04:19:39,889 --> 04:19:36,830

so he's making his way by hand in the

3772

04:19:42,469 --> 04:19:39,899

meantime Josh cassida still in the

3773

04:19:45,229 --> 04:19:42,479

foot restraint on top of the robotic arm

3774

04:19:47,150 --> 04:19:45,239

he's got irosa in his grip there's a

3775

04:19:48,950 --> 04:19:47,160

look through his helmet cam he is a

3776

04:19:50,510 --> 04:19:48,960

little bit of a ways away from station

3777

04:19:52,910 --> 04:19:50,520

structure

3778

04:19:55,370 --> 04:19:52,920

um so the video can kind of come in and

3779

04:19:57,950 --> 04:19:55,380

out as he's getting flown over but he's

3780

04:20:00,950 --> 04:19:57,960

got irosa in his hands which will place

3781

04:20:03,710 --> 04:20:00,960

you under the iea and this is a two

3782

04:20:07,130 --> 04:20:03,720

minute to joke us and we'll move your

3783

04:20:10,010 --> 04:20:07,140

body out about the 5.5 meters and Bobby

3784

04:20:11,929 --> 04:20:10,020

left about a meter and again this is a

3785

04:20:13,910 --> 04:20:11,939

translational jokes so the motion will

3786

04:20:15,650 --> 04:20:13,920

be faster than person

3787

04:20:18,229 --> 04:20:15,660

ready for the mountain

3788

04:20:19,969 --> 04:20:18,239

okay coffee towards my back about a

3789

04:20:22,910 --> 04:20:19,979

little over five and towards my left

3790

04:20:26,269 --> 04:20:22,920

meter and a half do not have the idea in

3791

04:20:29,990 --> 04:20:26,279

sight I'm ready for the maneuver

3792

04:21:27,590 --> 04:20:30,000

okay here comes the motion in three two

3793

04:21:27,600 --> 04:21:32,090

okay Josh so we are ramping out

3794

04:21:32,100 --> 04:21:35,870

hey guys

3795

04:21:35,880 --> 04:21:52,969

I'll be there thank you

3796

04:21:52,979 --> 04:22:02,330

it's awesome hi Frank

3797

04:22:07,610 --> 04:22:04,429

and Frank I see in a good position there

3798

04:22:07,620 --> 04:22:11,730

position

3799

04:22:15,769 --> 04:22:13,809

[Applause]

3800

04:22:21,849 --> 04:22:15,779

told that we're going to set up for

3801  
04:22:26,630 --> 04:22:25,250  
and Frank uh the uh the same cautions

3802  
04:22:29,210 --> 04:22:26,640  
and warnings apply that I've previously

3803  
04:22:31,550 --> 04:22:29,220  
read uh plus a couple here so the

3804  
04:22:33,170 --> 04:22:31,560  
warning is don't put finger in the iOS

3805  
04:22:35,570 --> 04:22:33,180  
of pin slots on the inside and outside

3806  
04:22:37,250 --> 04:22:35,580  
of the root beam and then uh when on the

3807  
04:22:39,469 --> 04:22:37,260  
outside of the mod kit avoid contacting

3808  
04:22:43,010 --> 04:22:39,479  
the Legacy blanket boxes and the

3809  
04:22:43,020 --> 04:22:47,630  
okay copy off thank you

3810  
04:22:51,469 --> 04:22:49,370  
yep and then you've got the cautions

3811  
04:22:54,050 --> 04:22:51,479  
about mod kit uh don't simultaneously

3812  
04:23:16,130 --> 04:22:54,060  
impart loads translate slow and Max load

3813  
04:23:21,229 --> 04:23:18,889

okay Josh and Frank we are ready for the

3814

04:23:25,070 --> 04:23:21,239

manual maneuver to the irosa install

3815

04:23:27,349 --> 04:23:25,080

position this is for your GTA Frank to

3816

04:23:30,590 --> 04:23:27,359

the published position which is the body

3817

04:23:33,469 --> 04:23:30,600

left 2.2 meters are you ready

3818

04:23:36,110 --> 04:23:33,479

okay I am ready

3819

04:23:43,150 --> 04:23:36,120

and you have the currency just to verify

3820

04:23:53,689 --> 04:23:46,570

okay here comes the motion name three

3821

04:24:31,070 --> 04:23:55,790

see motion good motion

3822

04:24:31,080 --> 04:24:52,389

another 1.5 meters to go foreign

3823

04:24:56,929 --> 04:24:54,769

we're maneuvering it into the install

3824

04:25:00,550 --> 04:24:56,939

position so there's going to be two soft

3825

04:25:03,229 --> 04:25:00,560

capture good to go copy filter continue

3826  
04:25:06,469 --> 04:25:03,239  
two soft capture devices that are gonna

3827  
04:25:09,110 --> 04:25:06,479  
to lock in on

3828  
04:25:11,090 --> 04:25:09,120  
uh this first part of irosa

3829  
04:25:13,610 --> 04:25:11,100  
and after those are engaged we'll be

3830  
04:25:15,250 --> 04:25:13,620  
able to get Josh Casta out of the

3831  
04:25:18,590 --> 04:25:15,260  
robotic arm to move around to begin

3832  
04:25:20,689 --> 04:25:18,600  
getting ready for the unfolding of the

3833  
04:25:44,149 --> 04:25:20,699  
array after which they'll engage the

3834  
04:25:49,790 --> 04:25:46,729  
when you sent me this to go

3835  
04:25:57,610 --> 04:25:49,800  
we expect to ramp out in about 10.

3836  
04:26:07,450 --> 04:26:03,250  
[Music]

3837  
04:26:11,689 --> 04:26:09,710  
this is very close to the Public's

3838  
04:26:13,670 --> 04:26:11,699

position yep and this is a great

3839

04:26:17,570 --> 04:26:13,680

location here

3840

04:26:34,750 --> 04:26:19,729

can you get your hand on it

3841

04:26:38,990 --> 04:26:37,130

and should just be a quick video hand

3842

04:26:41,630 --> 04:26:39,000

over we'll get that back quick we're

3843

04:26:43,370 --> 04:26:41,640

approaching the install of Point install

3844

04:26:45,830 --> 04:26:43,380

point

3845

04:26:47,269 --> 04:26:45,840

now once they get there my cassette is

3846

04:26:50,270 --> 04:26:47,279

going to continue to just maintain

3847

04:26:53,090 --> 04:26:50,280

control this grip on irosa

3848

04:26:53,689 --> 04:26:53,100

[Music]

3849

04:26:55,550 --> 04:26:53,699

um

3850

04:27:01,250 --> 04:26:55,560

protective cover is about three

3851  
04:27:05,389 --> 04:27:03,050  
then from a clearance perspective it

3852  
04:27:08,510 --> 04:27:05,399  
might be a good good place to start okay

3853  
04:27:10,309 --> 04:27:08,520  
so we could translate you towards B

3854  
04:27:11,149 --> 04:27:10,319  
odied forward

3855  
04:27:13,130 --> 04:27:11,159  
um

3856  
04:27:14,389 --> 04:27:13,140  
I'll leave that to you I don't know that

3857  
04:27:16,250 --> 04:27:14,399  
that's necessary

3858  
04:27:19,429 --> 04:27:16,260  
um for me

3859  
04:27:22,429 --> 04:27:19,439  
see it looks like my arm is yeah I'm

3860  
04:27:23,630 --> 04:27:22,439  
good I think we're in the same position

3861  
04:27:25,670 --> 04:27:23,640  
complete

3862  
04:27:28,010 --> 04:27:25,680  
[Music]

3863  
04:27:30,590 --> 04:27:28,020

you say complete

3864

04:27:33,130 --> 04:27:30,600

sticks on you have a goal for irosa

3865

04:27:39,290 --> 04:27:36,070

your right arm

3866

04:27:42,649 --> 04:27:39,300

and Frank Josh awesome

3867

04:27:49,130 --> 04:27:44,870

and I just have one caution to confirm

3868

04:27:52,429 --> 04:27:51,290

sorry I'm stepping on you Josh it's just

3869

04:27:54,710 --> 04:27:52,439

one caution to make sure that we don't

3870

04:28:00,590 --> 04:27:54,720

have VGA motion before installing

3871

04:28:05,870 --> 04:28:03,410

okay and we need to remove uh this thing

3872

04:28:07,309 --> 04:28:05,880

left do anything else before we get

3873

04:28:13,910 --> 04:28:07,319

started

3874

04:28:18,590 --> 04:28:16,670

Ed Frankie got it with your uh your

3875

04:28:21,950 --> 04:28:18,600

right hand

3876

04:28:26,149 --> 04:28:21,960

all right give me one second I do

3877

04:28:29,269 --> 04:28:26,159

thank you uh yeah if we can keep from

3878

04:28:32,870 --> 04:28:29,279

it uh towards the planet let's see how

3879

04:28:32,880 --> 04:28:51,830

all right

3880

04:28:57,410 --> 04:28:54,530

so our spacewalker is working in tandem

3881

04:28:59,389 --> 04:28:57,420

again right now Josh Castro working to

3882

04:29:01,370 --> 04:28:59,399

remove that scoop that was just that

3883

04:29:09,649 --> 04:29:01,380

temporary handling Aid that he had on

3884

04:29:09,659 --> 04:29:23,040

all right

3885

04:29:31,790 --> 04:29:25,309

[Applause]

3886

04:29:37,969 --> 04:29:34,250

my girl sure

3887

04:29:45,110 --> 04:29:39,649

okay

3888

04:29:47,149 --> 04:29:45,120

me when you're ready I'm ready and you

3889

04:29:48,950 --> 04:29:47,159

this guy I think you need to pull it

3890

04:29:52,729 --> 04:29:48,960

towards

3891

04:29:56,630 --> 04:29:52,739

thank you not that way I think it's not

3892

04:29:59,809 --> 04:29:56,640

parallel with the uh spot kit right now

3893

04:30:01,610 --> 04:29:59,819

I know it's not yet um

3894

04:30:02,269 --> 04:30:01,620

translated towards me first and then

3895

04:30:05,450 --> 04:30:02,279

we'll

3896

04:30:08,090 --> 04:30:05,460

uh another 10 centimeters

3897

04:30:09,769 --> 04:30:08,100

you didn't you mean uh towards the left

3898

04:30:13,670 --> 04:30:09,779

side of the mat tip not into the market

3899

04:30:14,809 --> 04:30:13,680

go right sorry and it's uh it's at a

3900

04:30:17,630 --> 04:30:14,819

pretty good angle right now so you're

3901  
04:30:19,910 --> 04:30:17,640  
gonna have to pull your hand towards you

3902  
04:30:23,389 --> 04:30:19,920  
there you go

3903  
04:30:25,309 --> 04:30:23,399  
okay so now we're going to roll my end

3904  
04:30:27,349 --> 04:30:25,319  
towards the sea

3905  
04:30:29,149 --> 04:30:27,359  
of 10 degrees okay you're gonna have to

3906  
04:30:35,689 --> 04:30:29,159  
fall a little bit towards you okay or

3907  
04:30:40,350 --> 04:30:39,530  
are you able to push your arm towards

3908  
04:30:40,510 --> 04:30:40,360  
your feet

3909  
04:30:41,750 --> 04:30:40,520  
[Music]

3910  
04:30:44,170 --> 04:30:41,760  
[Applause]

3911  
04:30:46,900 --> 04:30:44,180  
differ

3912  
04:30:51,349 --> 04:30:46,910  
hold on for one second

3913  
04:30:56,809 --> 04:30:54,290

okay for some reason your end is not

3914

04:30:56,819 --> 04:30:59,750

yeah okay

3915

04:31:03,910 --> 04:31:01,670

let's please get going towards the

3916

04:31:03,920 --> 04:31:19,910

just a couple more degrees

3917

04:31:19,920 --> 04:31:27,229

okay

3918

04:31:33,530 --> 04:31:30,670

yeah too far Maybe

3919

04:31:38,389 --> 04:31:33,540

I'm perfect okay okay and now we can

3920

04:31:44,030 --> 04:31:40,370

pitch down it's trying to pitch up a

3921

04:31:44,040 --> 04:31:55,130

give me a second

3922

04:31:55,140 --> 04:32:03,370

there you go

3923

04:32:10,010 --> 04:32:07,429

oh there hey why is it okay I'm gonna

3924

04:32:17,349 --> 04:32:10,020

start bringing this

3925

04:32:22,660 --> 04:32:20,750

that's good you can let go there okay go

3926  
04:32:24,250 --> 04:32:22,670  
let go okay

3927  
04:32:26,510 --> 04:32:24,260  
[Music]

3928  
04:32:30,530 --> 04:32:26,520  
that's okay

3929  
04:32:34,729 --> 04:32:33,500  
just walk your helmet um yep thank you

3930  
04:32:38,330 --> 04:32:34,739  
[Applause]

3931  
04:32:38,340 --> 04:32:41,570  
there you go perfect

3932  
04:32:50,710 --> 04:32:43,790  
nice and slow

3933  
04:32:55,070 --> 04:32:53,750  
the top left you can see some of the

3934  
04:32:56,870 --> 04:32:55,080  
bolts sticking out those are going to be

3935  
04:32:58,370 --> 04:32:56,880  
the hard capture those two handles you

3936  
04:32:59,929 --> 04:32:58,380  
see are going to be our soft capture

3937  
04:33:02,330 --> 04:32:59,939  
mechanism

3938  
04:33:10,310 --> 04:33:02,340

so we're just working on aligning eye

3939

04:33:10,320 --> 04:33:48,070

watch your helmet there you go

3940

04:33:52,150 --> 04:33:50,209

it looks like those go down pretty

3941

04:33:57,051 --> 04:33:52,160

easily is that right um

3942

04:33:58,310 --> 04:33:57,061

yeah your helmet is interest so you know

3943

04:34:01,789 --> 04:33:58,320

okay

3944

04:34:05,209 --> 04:34:01,799

I look like we're lined up here

3945

04:34:06,189 --> 04:34:05,219

laterally yep okay if you're ready to go

3946

04:34:08,750 --> 04:34:06,199

back

3947

04:34:10,470 --> 04:34:08,760

okay let's do that ready

3948

04:34:11,750 --> 04:34:10,480

okay

3949

04:34:36,109 --> 04:34:11,760

[Applause]

3950

04:34:39,070 --> 04:34:37,710

I think that's too far

3951

04:34:42,590 --> 04:34:39,080

[Applause]

3952

04:34:49,631 --> 04:34:42,600

are you able to visually see that uh

3953

04:34:49,641 --> 04:34:55,429

thank you

3954

04:35:01,070 --> 04:34:57,410

let's see if we can get the chance are

3955

04:35:05,150 --> 04:35:01,080

you able to take your um the bar

3956

04:35:09,410 --> 04:35:07,609

er down

3957

04:35:15,949 --> 04:35:09,420

all right you want to pitch like this

3958

04:35:19,490 --> 04:35:17,449

towards me

3959

04:35:22,730 --> 04:35:19,500

uh you mean laterally

3960

04:35:26,510 --> 04:35:22,740

um not only up towards the

3961

04:35:30,650 --> 04:35:26,520

DJ okay so short founder on my here it

3962

04:35:36,949 --> 04:35:33,769

there we go that's not this one yep got

3963

04:35:38,480 --> 04:35:36,959

this one okay hold on we got one in and

3964

04:35:46,189 --> 04:35:38,490

yours closest to you

3965

04:35:46,199 --> 04:35:50,209

come on try to hold it but I'll move it

3966

04:36:01,849 --> 04:35:51,679

sorry

3967

04:36:36,410 --> 04:36:04,429

so why don't we pull that one all the

3968

04:36:39,999 --> 04:36:38,390

I understand those books are lying their

3969

04:36:41,709 --> 04:36:40,009

books

3970

04:36:44,690 --> 04:36:41,719

[Music]

3971

04:36:48,349 --> 04:36:44,700

there we go

3972

04:37:08,990 --> 04:36:51,369

well Nick I think we got two

3973

04:37:12,109 --> 04:37:10,789

yeah Nick I'm not really sure what the

3974

04:37:15,440 --> 04:37:12,119

issue was on that one to be honest we

3975

04:37:17,750 --> 04:37:15,590

[Music]

3976

04:37:23,810 --> 04:37:20,929

yeah it just felt like

3977

04:37:25,310 --> 04:37:23,820

uh able to release in a full engaged

3978

04:37:27,120 --> 04:37:25,320

position and then

3979

04:37:29,990 --> 04:37:27,130

somehow just quick so

3980

04:37:31,970 --> 04:37:30,000

[Applause]

3981

04:37:36,109 --> 04:37:31,980

for you there yeah no worries I

3982

04:37:40,789 --> 04:37:38,449

you are good to release or attach the

3983

04:37:42,230 --> 04:37:40,799

long Direction tie down to the scoop and

3984

04:37:48,769 --> 04:37:42,240

then you'll release that Scoop from the

3985

04:37:52,849 --> 04:37:50,810

I thought I was just releasing the rent

3986

04:37:54,529 --> 04:37:52,859

for the next minute we were leaving the

3987

04:38:00,289 --> 04:37:54,539

stupid long version side outside it on

3988

04:38:00,299 --> 04:38:07,570

and Josh that sounds like a good plan

3989

04:38:07,580 --> 04:38:11,990

it doesn't matter to me

3990

04:38:15,650 --> 04:38:13,789

I just wanted to be able to release my

3991

04:38:18,949 --> 04:38:15,660

best group on that bad boy

3992

04:38:22,369 --> 04:38:18,959

I completely understand I so the last

3993

04:38:22,379 --> 04:38:31,189

and um retrieving my rep from the right

3994

04:38:37,189 --> 04:38:33,109

that leaves the Right Scoop in the long

3995

04:38:46,730 --> 04:38:40,429

huge green dick I'm gonna go ahead and

3996

04:38:46,740 --> 04:38:50,209

Josh that sounds like plane

3997

04:38:50,219 --> 04:38:54,410

all right

3998

04:38:59,810 --> 04:38:56,330

I'm too easy to

3999

04:39:02,929 --> 04:38:59,820

adjust okay I am ready for the I guess

4000

04:39:04,789 --> 04:39:02,939

it's the R6 back position

4001

04:39:07,970 --> 04:39:04,799

yes that's correct the first one is the

4002

04:39:09,890 --> 04:39:07,980

maneuver uh manual maneuver to the irosa

4003

04:39:11,929 --> 04:39:09,900

back off position and after that there's

4004

04:39:17,330 --> 04:39:11,939

a show Castle we're setting up a manual

4005

04:39:28,131 --> 04:39:19,189

awesome it's nicely done get nothing

4006

04:39:32,750 --> 04:39:29,029

um

4007

04:39:35,929 --> 04:39:32,760

okay Josh we are ready for the maneuver

4008

04:39:38,930 --> 04:39:35,939

to the irosa backup position and this is

4009

04:39:41,630 --> 04:39:38,940

to your body right two meters are you

4010

04:39:44,150 --> 04:39:41,640

ready body right two meters 82 is ready

4011

04:39:53,630 --> 04:39:44,160

for the maneuver here comes the motion

4012

04:39:53,640 --> 04:40:08,208

a secret motion

4013

04:40:13,850 --> 04:40:12,050

so after some finessing Frank Rubio Josh

4014

04:40:17,570 --> 04:40:13,860

Castle able to get

4015

04:40:18,948 --> 04:40:17,580

the irosa into its install position we

4016

04:40:20,868 --> 04:40:18,958

were able to engage two of those soft

4017

04:40:23,030 --> 04:40:20,878

capture handles that we watched Frank

4018

04:40:25,670 --> 04:40:23,040

get ultimately installed after they

4019

04:40:28,130 --> 04:40:25,680

tweaked the alignment a little bit next

4020

04:40:30,288 --> 04:40:28,140

up we're going to be moving the arm back

4021

04:40:32,868 --> 04:40:30,298

so koichiwakata Nicole man inside the

4022

04:40:37,788 --> 04:40:32,878

station backing Josh cassida away and

4023

04:40:40,310 --> 04:40:37,798

he's gonna then start to get out pretty

4024

04:40:43,910 --> 04:40:40,320

soon of that of that epfr before that

4025

04:40:46,970 --> 04:40:43,920

he's going to have to release a hinge

4026

04:40:50,150 --> 04:40:46,980

restraint so that's what's in place to

4027

04:40:51,670 --> 04:40:50,160

essentially keep irosa folded once that

4028

04:40:56,330 --> 04:40:51,680

gets released

4029

04:40:58,490 --> 04:40:56,340

there's a one bolt R6 that's going to

4030

04:41:01,430 --> 04:40:58,500

get released and then they're going to

4031

04:41:03,590 --> 04:41:01,440

be able to move into unfolding

4032

04:41:05,150 --> 04:41:03,600

of the array so again first we're going

4033

04:41:07,130 --> 04:41:05,160

to unfold it and then we're going to

4034

04:41:08,868 --> 04:41:07,140

deploy it so it's two different steps so

4035

04:41:10,368 --> 04:41:08,878

right now it's folded up kind of like a

4036

04:41:13,030 --> 04:41:10,378

sandwich

4037

04:41:16,128 --> 04:41:13,040

um we're gonna unfold that and then move

4038

04:41:17,390 --> 04:41:16,138

to secure uh the third soft capture and

4039

04:41:19,310 --> 04:41:17,400

then bolt this thing into place in the

4040

04:41:22,788 --> 04:41:19,320

mounting bracket before we get to Cable

4041

04:41:25,550 --> 04:41:22,798

install and ultimately unfurling the new

4042

04:41:27,830 --> 04:41:25,560

ibrose array so everything continuing to

4043

04:41:30,708 --> 04:41:27,840

go really smoothly for both of our space

4044

04:41:33,110 --> 04:41:30,718

Walkers hitting a couple of sticky

4045

04:41:35,570 --> 04:41:33,120

points but moving and being able to work

4046

04:41:37,310 --> 04:41:35,580

through each of them without any issues

4047

04:41:40,490 --> 04:41:37,320

we're still a little bit ahead on the

4048

04:41:55,788 --> 04:41:40,500

timeline is where three hours 22 and a

4049

04:42:00,170 --> 04:41:57,830

and Frank Josh I just want to give you a

4050

04:42:01,610 --> 04:42:00,180

heads up on time timeline big picture

4051  
04:42:04,490 --> 04:42:01,620  
we're doing good you're seeing the

4052  
04:42:09,610 --> 04:42:04,500  
sunset we're targeting the next eclipse

4053  
04:42:09,620 --> 04:42:30,470  
thanks so much

4054  
04:42:34,250 --> 04:42:32,750  
and so right now we're heading into in a

4055  
04:42:37,310 --> 04:42:34,260  
club so you can see things starting to

4056  
04:42:48,230 --> 04:42:37,320  
get dark on the crew members there and

4057  
04:42:53,030 --> 04:42:51,310  
that last about 90 degrees are you ready

4058  
04:42:56,810 --> 04:42:53,040  
thank you

4059  
04:43:02,230 --> 04:42:56,820  
here comes the motion in three two one

4060  
04:43:08,208 --> 04:43:05,890  
and that call right there so Nicole man

4061  
04:43:10,490 --> 04:43:08,218  
executing another maneuver with the

4062  
04:43:12,170 --> 04:43:10,500  
Space Station's robotic army or Joe cast

4063  
04:43:15,410 --> 04:43:12,180

it stands for joint operating command

4064

04:43:17,628 --> 04:43:15,420

Auto sequence uh just an automated

4065

04:43:20,570 --> 04:43:17,638

sequence for maneuver of the arm helps

4066

04:43:22,550 --> 04:43:20,580

the crew member just be more aware of

4067

04:43:24,770 --> 04:43:22,560

where the uh the different loads the

4068

04:43:27,050 --> 04:43:24,780

Maneuvers are gonna go

4069

04:43:30,230 --> 04:43:27,060

they're maneuvering Josh gasta right now

4070

04:43:33,350 --> 04:43:30,240

in a position to release

4071

04:43:35,990 --> 04:43:33,360

what's known as R6

4072

04:43:39,650 --> 04:43:36,000

and that's what's going to be able to

4073

04:43:41,330 --> 04:43:39,660

let them ultimately unfold the iros

4074

04:43:44,030 --> 04:43:41,340

array

4075

04:43:45,590 --> 04:43:44,040

we are going to be targeting the next

4076

04:43:46,910 --> 04:43:45,600

eclipse though

4077

04:43:50,868 --> 04:43:46,920

um so that's about an hour and a half

4078

04:43:52,850 --> 04:43:50,878

from now before we get into any cable

4079

04:43:55,070 --> 04:43:52,860

meeting because again we have to be in

4080

04:43:57,170 --> 04:43:55,080

eclipse her

4081

04:43:58,850 --> 04:43:57,180

that was sure fire inhibit to make sure

4082

04:44:00,288 --> 04:43:58,860

that the arrays aren't generating any

4083

04:44:02,628 --> 04:44:00,298

electricity that's when we're on the

4084

04:44:04,910 --> 04:44:02,638

dark side of the planet and so we'll

4085

04:44:06,650 --> 04:44:04,920

have to wait for that before we can do

4086

04:44:08,570 --> 04:44:06,660

any of the actual cable connections

4087

04:44:10,430 --> 04:44:08,580

start integrating these arrays together

4088

04:44:13,128 --> 04:44:10,440

into the same power Channel meanwhile

4089

04:44:14,690 --> 04:44:13,138

the crew waiting for this maneuver to

4090

04:44:16,490 --> 04:44:14,700

take place they've got cameras there

4091

04:44:18,890 --> 04:44:16,500

with thermal covers over them be able to

4092

04:44:21,650 --> 04:44:18,900

take pictures of both hardware and other

4093

04:44:23,868 --> 04:44:21,660

things during their spacewalk

4094

04:44:26,750 --> 04:44:23,878

again we're just shy of three and a

4095

04:44:29,930 --> 04:44:26,760

half hours for three hours 25 minutes so

4096

04:44:32,150 --> 04:44:29,940

we are just about halfway through the

4097

04:44:35,090 --> 04:44:32,160

planned timeline for today everything

4098

04:44:37,550 --> 04:44:35,100

going great so far with Josh castada and

4099

04:44:39,470 --> 04:44:37,560

Frank Rubio that we've got irosa in its

4100

04:44:41,150 --> 04:44:39,480

initial capture

4101  
04:44:43,610 --> 04:44:41,160  
stop it

4102  
04:44:45,470 --> 04:44:43,620  
to the three soft capture mechanisms are

4103  
04:44:48,230 --> 04:44:45,480  
engaged the third won't get engaged

4104  
04:44:49,368 --> 04:44:48,240  
until after we're able to unfold then

4105  
04:44:51,670 --> 04:44:49,378  
after that we'll be able to start

4106  
04:44:53,868 --> 04:44:51,680  
bolting everything into place

4107  
04:44:57,170 --> 04:44:53,878  
position cold that we're going to set up

4108  
04:45:00,350 --> 04:44:57,180  
for R6 manual Manila

4109  
04:45:04,550 --> 04:45:00,360  
okay you are a go for the GCA to publish

4110  
04:45:04,560 --> 04:45:08,628  
we are saving that up

4111  
04:45:15,650 --> 04:45:10,910  
and Josh your PGT settings are going to

4112  
04:45:25,970 --> 04:45:17,930  
awesome thank you so much Bravo to

4113  
04:45:31,070 --> 04:45:28,070

and just we are ready for the maneuver

4114

04:45:34,910 --> 04:45:31,080

for ugce to the published R6 approach

4115

04:45:40,430 --> 04:45:34,920

position which is body in one meter

4116

04:45:46,070 --> 04:45:43,310

and uh just because at night we don't

4117

04:45:48,708 --> 04:45:46,080

have good The View on the cameras uh if

4118

04:45:51,530 --> 04:45:48,718

you could manage the questions of the

4119

04:45:54,650 --> 04:45:51,540

Ingress Aid after the structure I got

4120

04:45:58,510 --> 04:45:54,660

interested in we play Team structure

4121

04:46:07,788 --> 04:45:58,520

okay here comes the motion and in three

4122

04:46:19,510 --> 04:46:10,730

pretty good motion

4123

04:46:19,520 --> 04:46:27,650

please continue another 60 centimeters

4124

04:46:27,660 --> 04:46:33,590

we continue

4125

04:46:39,110 --> 04:46:37,850

another 30 interview copies and wrap out

4126  
04:46:39,270 --> 04:46:39,120  
in three

4127  
04:46:40,730 --> 04:46:39,280  
two

4128  
04:46:43,610 --> 04:46:40,740  
[Music]

4129  
04:46:43,620 --> 04:46:47,208  
nothing else

4130  
04:46:47,218 --> 04:46:52,810  
what's gonna work fine uh GC complete

4131  
04:46:56,448 --> 04:46:54,530  
[Applause]

4132  
04:47:00,650 --> 04:46:56,458  
and Josh before you start doing turns

4133  
04:47:00,660 --> 04:47:03,350  
okay

4134  
04:47:06,890 --> 04:47:05,208  
so it's a big picture you're gonna daisy

4135  
04:47:09,110 --> 04:47:06,900  
chain the scoop that's on you and the

4136  
04:47:10,730 --> 04:47:09,120  
scoop uh that's got the long duration in

4137  
04:47:12,650 --> 04:47:10,740  
front of you that's already that's still

4138  
04:47:15,288 --> 04:47:12,660

attached irosa

4139

04:47:16,850 --> 04:47:15,298

um and when those are Daisy chained

4140

04:47:18,170 --> 04:47:16,860

together on that long duration you're

4141

04:47:41,150 --> 04:47:18,180

going to hand that to Frank so he can

4142

04:47:45,948 --> 04:47:43,550

so Josh Castle is still on the end of

4143

04:47:47,930 --> 04:47:45,958

the robotic arm now in place before he

4144

04:47:50,390 --> 04:47:47,940

can remove this final hinge restraint

4145

04:47:52,010 --> 04:47:50,400

he's going to remove the scoop that's on

4146

04:47:54,530 --> 04:47:52,020

the left side of your screen that's the

4147

04:47:56,990 --> 04:47:54,540

temporary handle that was put on irosa

4148

04:48:00,948 --> 04:47:57,000

to assist with him holding onto it as

4149

04:48:00,958 --> 04:48:06,770

after Ed that is attached to the scoop

4150

04:48:13,430 --> 04:48:09,650

you'll see him swing those small lever

4151  
04:48:15,530 --> 04:48:13,440  
that's just below the circular part over

4152  
04:48:19,490 --> 04:48:15,540  
to the right that puts it in its release

4153  
04:48:21,350 --> 04:48:19,500  
position they'll be able to off that off

4154  
04:48:24,470 --> 04:48:21,360  
he's not going to hand it over to Frank

4155  
04:48:30,368 --> 04:48:24,480  
Rubio to go temporarily stow it on the

4156  
04:48:35,630 --> 04:48:33,770  
station is ready to me so

4157  
04:48:40,868 --> 04:48:35,640  
is this

4158  
04:48:46,190 --> 04:48:43,010  
trying to do this right to put on the

4159  
04:48:49,128 --> 04:48:46,200  
lingeration on the long duration yes I

4160  
04:48:57,530 --> 04:48:49,138  
could die

4161  
04:48:57,540 --> 04:49:02,510  
all right it is on

4162  
04:49:10,750 --> 04:49:05,050  
and walked up

4163  
04:49:15,288 --> 04:49:13,070

okay so you're ready to see the long

4164

04:49:17,448 --> 04:49:15,298

duration long version goes to one scoop

4165

04:49:27,948 --> 04:49:17,458

uh the other long version goes to this

4166

04:49:32,270 --> 04:49:29,330

okay

4167

04:49:34,250 --> 04:49:32,280

there's one scoop for you

4168

04:49:37,850 --> 04:49:34,260

and then I will release

4169

04:49:37,860 --> 04:49:47,990

here we go

4170

04:49:55,030 --> 04:49:49,910

if you see the scoop in the release

4171

04:49:58,850 --> 04:49:57,170

you have the Scoops there in the long

4172

04:50:01,368 --> 04:49:58,860

version

4173

04:50:02,690 --> 04:50:01,378

and now both of those Scoops that were

4174

04:50:05,270 --> 04:50:02,700

used to

4175

04:50:07,368 --> 04:50:05,280

give a handle essentially for

4176  
04:50:09,288 --> 04:50:07,378  
Josh cassida now transferred over to

4177  
04:50:10,368 --> 04:50:09,298  
Frank Rubio he's going to go temp Stow

4178  
04:50:13,670 --> 04:50:10,378  
those

4179  
04:50:16,128 --> 04:50:13,680  
onto crew luck bag M between the two of

4180  
04:50:17,570 --> 04:50:16,138  
you will want to put eyes on the soft

4181  
04:50:19,070 --> 04:50:17,580  
capture feature just to make sure it's

4182  
04:50:20,628 --> 04:50:19,080  
in a good position

4183  
04:50:22,788 --> 04:50:20,638  
and then

4184  
04:50:24,350 --> 04:50:22,798  
Josh will wait for Frank to get into a

4185  
04:50:29,050 --> 04:50:24,360  
position to hold irosa because when we

4186  
04:50:35,208 --> 04:50:33,230  
I can see us aside that the other

4187  
04:50:39,590 --> 04:50:35,218  
soft capture

4188  
04:50:41,390 --> 04:50:39,600

is not deployed yet it's sticking up

4189

04:50:42,650 --> 04:50:41,400

if you want Frank to see the other side

4190

04:50:44,448 --> 04:50:42,660

of it

4191

04:50:46,128 --> 04:50:44,458

exactly

4192

04:51:02,868 --> 04:50:46,138

that's a good config thanks for the

4193

04:51:15,050 --> 04:51:04,130

okay

4194

04:51:17,570 --> 04:51:15,060

so we'll just confirm those settings

4195

04:51:20,628 --> 04:51:17,580

it's been a bit Bravo 2 counterclockwise

4196

04:51:22,850 --> 04:51:20,638

two and it's going to be 18 to 20 turns

4197

04:51:25,368 --> 04:51:22,860

the bolts Will Spring out when it's

4198

04:51:28,570 --> 04:51:25,378

fully released

4199

04:51:31,490 --> 04:51:28,580

okay I've got Bravo Two

4200

04:51:36,948 --> 04:51:31,500

counterclockwise to another state of 18

4201  
04:51:47,270 --> 04:51:41,610  
and we're on our sixth all right

4202  
04:51:52,190 --> 04:51:49,850  
so Josh can't stop right now releasing

4203  
04:51:54,170 --> 04:51:52,200  
the final Henderson once this is

4204  
04:51:56,628 --> 04:51:54,180  
released we'll be able to start

4205  
04:52:01,368 --> 04:51:56,638  
unfolding

4206  
04:52:03,948 --> 04:52:01,378  
the irosa array so before that happens

4207  
04:52:06,410 --> 04:52:03,958  
Cass is going to have to Stow his PGT

4208  
04:52:08,750 --> 04:52:06,420  
and then he's going to back off away

4209  
04:52:10,910 --> 04:52:08,760  
from Iris on the robotic Army is going

4210  
04:52:13,910 --> 04:52:10,920  
to get out of that foot restraint and

4211  
04:52:16,128 --> 04:52:13,920  
start making his way back over and then

4212  
04:52:18,288 --> 04:52:16,138  
once he gets into position

4213  
04:52:20,810 --> 04:52:18,298

over on the other side of the mounting

4214

04:52:23,410 --> 04:52:20,820

bracket Frank Rubio is going to slowly

4215

04:52:31,030 --> 04:52:23,420

start to Pivot and that's going to allow

4216

04:52:31,040 --> 04:52:39,470

copy good release

4217

04:52:43,250 --> 04:52:41,448

so Josh uh while Frank holds that in

4218

04:52:50,690 --> 04:52:43,260

position uh you're good to work with uh

4219

04:52:58,190 --> 04:52:55,070

okay up to ev2 is ready for the R6 back

4220

04:53:01,190 --> 04:52:58,200

off maneuver okay copy that just this is

4221

04:53:04,788 --> 04:53:01,200

a buddy house for about 90 centimeters

4222

04:53:10,730 --> 04:53:04,798

here comes the motion I mean three two

4223

04:53:10,740 --> 04:53:43,970

I think of motion nothing

4224

04:53:53,868 --> 04:53:45,650

we are ramping out

4225

04:54:43,250 --> 04:53:56,570

okay Josh question hold we will set up

4226

04:54:48,770 --> 04:54:46,250

okay Josh so we are ready for apfr

4227

04:54:51,170 --> 04:54:48,780

egress setup jocast which is a three

4228

04:54:53,810 --> 04:54:51,180

minute chill cast and we will move you

4229

04:54:56,410 --> 04:54:53,820

your you to the right about 90 degrees

4230

04:55:00,470 --> 04:54:56,420

are you ready

4231

04:55:09,770 --> 04:55:00,480

okay here comes the motion in three two

4232

04:56:41,930 --> 04:55:11,868

a secret motion

4233

04:57:00,770 --> 04:56:44,990

just the arm is wrapping up

4234

04:57:06,890 --> 04:57:03,948

yeah arms in the position hold and we

4235

04:57:08,510 --> 04:57:06,900

will set up for manual to apfr egress

4236

04:57:11,690 --> 04:57:08,520

position

4237

04:57:12,650 --> 04:57:11,700

okay and understand that is a GCA to

4238

04:57:24,830 --> 04:57:12,660

publish

4239

04:57:28,610 --> 04:57:26,448

encourage you when you're set up I'm

4240

04:57:29,628 --> 04:57:28,620

ready for the GCU to publish to the PSR

4241

04:57:33,590 --> 04:57:29,638

egress

4242

04:57:34,420 --> 04:57:33,600

okay Josh this is a body left 70

4243

04:57:36,350 --> 04:57:34,430

centimeters

4244

04:57:40,550 --> 04:57:36,360

[Applause]

4245

04:57:44,510 --> 04:57:40,560

here comes the motion in three two one

4246

04:57:56,628 --> 04:57:47,150

I see good motion

4247

04:57:56,638 --> 04:58:05,810

50 centimeters to go

4248

04:58:11,510 --> 04:58:07,788

30 centimeters to go

4249

04:58:16,490 --> 04:58:13,150

so at this moment Nicole man

4250

04:58:17,690 --> 04:58:16,500

koichiwakata continue GCA another 20

4251  
04:58:22,490 --> 04:58:17,700  
centimeters

4252  
04:58:26,750 --> 04:58:25,368  
[Music]

4253  
04:58:30,170 --> 04:58:26,760  
devotion

4254  
04:58:30,180 --> 04:58:36,170  
position hold PC is complete for me yeah

4255  
04:58:42,470 --> 04:58:38,448  
okay Josh your brakes on you have a go

4256  
04:58:56,590 --> 04:58:45,830  
to understand the egress versus that's

4257  
04:59:02,810 --> 04:58:59,868  
all right so again the robotic arm with

4258  
04:59:05,750 --> 04:59:02,820  
Josh Hassett at the end backed away from

4259  
04:59:08,628 --> 04:59:05,760  
the irosa moved over to the station

4260  
04:59:10,490 --> 04:59:08,638  
structure itself and now he'll be able

4261  
04:59:13,430 --> 04:59:10,500  
to egress or get out of that foot

4262  
04:59:25,490 --> 04:59:15,530  
yes we do I'd like you to get it stowed

4263  
04:59:29,448 --> 04:59:27,530

and once Casco is able to get out of

4264

04:59:30,590 --> 04:59:29,458

this strength he's going to move back

4265

04:59:33,110 --> 04:59:30,600

over

4266

04:59:35,150 --> 04:59:33,120

into position to help Frank Rubio start

4267

04:59:38,390 --> 04:59:35,160

to unfold live Rosa they're going to

4268

04:59:41,628 --> 04:59:38,400

work together to slowly unfold it Casto

4269

04:59:43,670 --> 04:59:41,638

will be ready to engage the the final

4270

04:59:45,770 --> 04:59:43,680

alignment and the final soft capture

4271

04:59:47,868 --> 04:59:45,780

handle we saw the first two get into

4272

04:59:49,970 --> 04:59:47,878

place when they brought Iris over to the

4273

04:59:51,230 --> 04:59:49,980

mounting bracket so we'll have one more

4274

04:59:54,410 --> 04:59:51,240

to go

4275

04:59:55,250 --> 04:59:54,420

after it's unfolded there's two hinge

4276  
04:59:58,390 --> 04:59:55,260  
bolts

4277  
05:00:01,010 --> 04:59:58,400  
and those are going to get

4278  
05:00:03,890 --> 05:00:01,020  
driven into place

4279  
05:00:07,730 --> 05:00:03,900  
I'm using a combination of the PGT or

4280  
05:00:11,150 --> 05:00:07,740  
our drill and also a special tool called

4281  
05:00:12,948 --> 05:00:11,160  
the AMS knob it's essentially a

4282  
05:00:15,190 --> 05:00:12,958  
screwdriver that you can operate by

4283  
05:00:17,690 --> 05:00:15,200  
holding it in the palm of your hand

4284  
05:00:19,788 --> 05:00:17,700  
and this way we're gonna

4285  
05:00:22,250 --> 05:00:19,798  
make sure we're not imparting too much

4286  
05:00:23,990 --> 05:00:22,260  
torque on the final

4287  
05:00:25,430 --> 05:00:24,000  
um on the final install of these bolts

4288  
05:00:28,788 --> 05:00:25,440

and these hinge bolts are what's going

4289

05:00:33,470 --> 05:00:28,798

to securely hold the array in place once

4290

05:00:37,850 --> 05:00:35,868

copy that Josh and so you're going to uh

4291

05:00:40,128 --> 05:00:37,860

move over to the uh

4292

05:00:43,430 --> 05:00:40,138

to the mod kit and uh when you're in a

4293

05:00:54,230 --> 05:00:43,440

good position you'll give uh the ET the

4294

05:00:54,240 --> 05:01:07,310

okay

4295

05:01:10,970 --> 05:01:09,230

and Josh big picture as the arm

4296

05:01:13,430 --> 05:01:10,980

stretches away you'll keep an eye on

4297

05:01:16,310 --> 05:01:13,440

your safety tether and and eventually

4298

05:01:19,670 --> 05:01:16,320

put a fair lead on the right lower strut

4299

05:01:28,850 --> 05:01:20,750

okay

4300

05:01:28,860 --> 05:01:47,270

ah

4301

05:01:47,280 --> 05:02:29,868

it's like I got the same nervous

4302

05:02:33,770 --> 05:02:31,128

um

4303

05:02:36,110 --> 05:02:33,780

okay

4304

05:02:37,550 --> 05:02:36,120

the 55 foot isn't pulling too hard so

4305

05:02:42,610 --> 05:02:37,560

I'm not sure if it's fairly is going to

4306

05:02:45,830 --> 05:02:42,620

stay hey we are fair LED on the lower

4307

05:02:47,510 --> 05:02:45,840

hey Josh just wanted to uh I was

4308

05:02:49,610 --> 05:02:47,520

probably unclear in order Ops we'll put

4309

05:02:51,230 --> 05:02:49,620

the fair lead in afterwards just to make

4310

05:02:53,330 --> 05:02:51,240

sure we stay clear when we unfold Del

4311

05:02:55,070 --> 05:02:53,340

Rosa big picture is leave the fair lead

4312

05:03:00,470 --> 05:02:55,080

out let the arm stretch away so that we

4313

05:03:06,530 --> 05:03:04,128

okay so undo the Fairly registered

4314

05:03:08,270 --> 05:03:06,540

you shouldn't make much of a difference

4315

05:03:11,270 --> 05:03:08,280

nope you're just gonna need to put eyes

4316

05:03:15,430 --> 05:03:13,788

I've got eyes on it

4317

05:03:19,490 --> 05:03:15,440

um

4318

05:03:21,050 --> 05:03:19,500

too you are go to maneuver

4319

05:03:23,090 --> 05:03:21,060

of the arm

4320

05:03:27,830 --> 05:03:23,100

away from the market

4321

05:03:36,708 --> 05:03:31,910

okay

4322

05:03:44,930 --> 05:03:36,718

back up to the market then yeah no

4323

05:03:44,940 --> 05:03:51,110

I'm too easy too did you drop it

4324

05:04:00,410 --> 05:03:54,230

go ahead Josh you are go to maneuver the

4325

05:04:04,850 --> 05:04:02,330

we're going to move to the antenna's

4326

05:04:07,070 --> 05:04:04,860

club position and uh because of the

4327

05:04:09,650 --> 05:04:07,080

night lighting we do not have this

4328

05:04:11,448 --> 05:04:09,660

clearance View and uh

4329

05:04:13,010 --> 05:04:11,458

but it's clear right

4330

05:04:17,150 --> 05:04:13,020

I thought it was clear but I also don't

4331

05:04:22,730 --> 05:04:20,750

okay yes somebody we're gonna check

4332

05:04:24,410 --> 05:04:22,740

hey why don't you guys do that

4333

05:04:37,788 --> 05:04:24,420

I'm gonna get myself in position for the

4334

05:04:43,368 --> 05:04:40,788

for a good deal of uh

4335

05:04:45,770 --> 05:04:43,378

together here

4336

05:04:47,810 --> 05:04:45,780

and clear there you don't want to sweep

4337

05:04:50,570 --> 05:04:47,820

it down to your left side of your body

4338

05:04:52,430 --> 05:04:50,580

it'll go across your body but it'll yeah

4339

05:04:55,010 --> 05:04:52,440

it'll go under your

4340

05:05:02,090 --> 05:04:55,020

um you know under armpit there

4341

05:05:11,890 --> 05:05:04,128

Nick I think we're in a good spot to

4342

05:05:18,288 --> 05:05:14,150

and just just want to make sure that the

4343

05:05:29,708 --> 05:05:22,550

this uh back over my left it is uh

4344

05:05:34,610 --> 05:05:33,110

copy Josh uh we'll wait for uh Duke to

4345

05:05:36,470 --> 05:05:34,620

get the arm where it needs to be then

4346

05:05:38,030 --> 05:05:36,480

we'll confirm that the safety tether is

4347

05:05:40,910 --> 05:05:38,040

going to be out of the plane of the

4348

05:05:45,350 --> 05:05:40,920

unfold uh and then we'll

4349

05:05:45,360 --> 05:05:49,190

sounds good

4350

05:05:54,890 --> 05:05:52,010

okay yeah Johnson Frank uh we are ready

4351  
05:05:57,170 --> 05:05:54,900  
to maneuver us to the table saw position

4352  
05:05:59,628 --> 05:05:57,180  
first we will move to the station

4353  
05:06:02,930 --> 05:05:59,638  
starboard the three meters and then

4354  
05:06:04,730 --> 05:06:02,940  
after that we need to move to meters but

4355  
05:06:06,350 --> 05:06:04,740  
we need to have a better lighting for

4356  
05:06:08,810 --> 05:06:06,360  
that clearance monitoring for the

4357  
05:06:10,670 --> 05:06:08,820  
devious motions that we will start with

4358  
05:06:22,250 --> 05:06:10,680  
the station discover the free meter

4359  
05:06:22,260 --> 05:06:38,050  
we are still setting up the manual mode

4360  
05:06:44,288 --> 05:06:40,610  
and the restaurants inside the station

4361  
05:06:46,610 --> 05:06:44,298  
the Coleman working now to move the

4362  
05:06:48,590 --> 05:06:46,620  
robotic arm a little bit out of the way

4363  
05:06:53,690 --> 05:06:48,600

and then we're gonna be able to continue

4364

05:06:56,330 --> 05:06:53,700

on with this unfolding three two one in

4365

05:07:03,890 --> 05:06:58,430

I see good motion

4366

05:07:03,900 --> 05:07:26,208

together that's good to me

4367

05:07:34,310 --> 05:07:29,448

another 1.5 meters to station's fabric

4368

05:07:37,670 --> 05:07:36,110

I think you've got eyes on my thank you

4369

05:07:40,670 --> 05:07:37,680

Tyler

4370

05:07:42,830 --> 05:07:40,680

oh if they can't go station with Venus

4371

05:07:58,128 --> 05:07:42,840

actually is going to be in the way of

4372

05:08:05,090 --> 05:08:00,490

a long night bathroom

4373

05:08:05,100 --> 05:08:19,490

30 centimeters to go okay

4374

05:08:24,288 --> 05:08:22,070

yes that would maneuver is complete and

4375

05:08:25,788 --> 05:08:24,298

we will need to move to Phoenix for two

4376  
05:08:27,590 --> 05:08:25,798  
meters at this time we don't have good

4377  
05:08:29,690 --> 05:08:27,600  
clearance View

4378  
05:08:31,850 --> 05:08:29,700  
okay uh are you able to move at all

4379  
05:08:34,310 --> 05:08:31,860  
Venus without the

4380  
05:08:39,170 --> 05:08:36,708  
yeah we can move about a meter and we

4381  
05:08:42,070 --> 05:08:39,180  
need to move a two meters total what do

4382  
05:08:48,630 --> 05:08:42,080  
you think Frank with that yeah

4383  
05:08:48,640 --> 05:08:54,230  
[Music]

4384  
05:08:59,030 --> 05:08:55,788  
so if you could monitor that I would

4385  
05:09:01,730 --> 05:08:59,040  
appreciate it okay all right

4386  
05:09:08,090 --> 05:09:01,740  
here comes the motion in the station

4387  
05:09:16,850 --> 05:09:08,100  
Venus three two one starting the motion

4388  
05:09:23,930 --> 05:09:19,190

so we had peeked inside for just a

4389

05:09:27,170 --> 05:09:25,490

copy this

4390

05:09:28,970 --> 05:09:27,180

they're working inside the destiny

4391

05:09:30,590 --> 05:09:28,980

laboratory at the robotics workstation

4392

05:09:33,410 --> 05:09:30,600

you can see them right here Nicole Vans

4393

05:09:36,250 --> 05:09:33,420

are m1r robotics lead she's been the one

4394

05:09:39,230 --> 05:09:36,260

controlling the arm so far today

4395

05:09:42,070 --> 05:09:39,240

takes the cop duties speaking directly

4396

05:09:44,510 --> 05:09:42,080

to Josh Casa and Frank Rubio outside

4397

05:09:47,090 --> 05:09:44,520

meanwhile they're still perched right at

4398

05:09:49,368 --> 05:09:47,100

the irosa's install point we're waiting

4399

05:09:56,390 --> 05:09:49,378

for

4400

05:09:58,030 --> 05:09:56,400

unfold irosa

4401

05:10:00,170 --> 05:09:58,040

meters to go

4402

05:10:03,530 --> 05:10:00,180

they're again going to be working in

4403

05:10:05,510 --> 05:10:03,540

tandem to very slowly unfold irosa at

4404

05:10:07,730 --> 05:10:05,520

which point Josh cassid is going to be

4405

05:10:09,110 --> 05:10:07,740

able to engage the third and final soft

4406

05:10:10,550 --> 05:10:09,120

capture

4407

05:10:21,650 --> 05:10:10,560

hey Frank if you can put a hand on my

4408

05:10:26,868 --> 05:10:24,430

all right I gotta put my arm down

4409

05:10:28,550 --> 05:10:26,878

yep understood we were watching it the

4410

05:10:31,310 --> 05:10:28,560

whole time

4411

05:10:33,170 --> 05:10:31,320

and so Josh if the safety tether is

4412

05:10:35,030 --> 05:10:33,180

clear the original fair lead that I had

4413

05:10:36,530 --> 05:10:35,040

you put in was intended to provide some

4414

05:10:39,770 --> 05:10:36,540

additional clearance of your safety

4415

05:10:41,330 --> 05:10:39,780

tether uh relative to the current uh arm

4416

05:10:45,070 --> 05:10:41,340

position to make sure it stays out of

4417

05:10:50,990 --> 05:10:47,570

do we need it

4418

05:10:51,000 --> 05:10:53,990

um

4419

05:10:57,770 --> 05:10:55,610

it'll be able to get a little extra so

4420

05:10:59,810 --> 05:10:57,780

if you mind

4421

05:11:00,530 --> 05:10:59,820

we need to go like half the distance but

4422

05:11:04,070 --> 05:11:00,540

unfortunately I don't think there's

4423

05:11:05,750 --> 05:11:04,080

anything there no that's okay I'll go do

4424

05:11:07,970 --> 05:11:05,760

it

4425

05:11:13,730 --> 05:11:07,980

sounds like plan guys and uh just to let

4426

05:11:13,740 --> 05:11:45,948

[Applause]

4427

05:11:49,368 --> 05:11:47,810

and Joshua you're working on that

4428

05:11:51,708 --> 05:11:49,378

Frank's holding it closed I've got a

4429

05:11:53,050 --> 05:11:51,718

warning here to avoid the pinch Point uh

4430

05:11:57,590 --> 05:11:53,060

when you're

4431

05:12:48,948 --> 05:12:41,208

okay

4432

05:12:51,948 --> 05:12:48,958

in don't know how long it's gonna stay

4433

05:12:51,958 --> 05:12:59,750

nope

4434

05:13:04,550 --> 05:13:02,990

is this real isn't pulling too hard Nick

4435

05:13:05,570 --> 05:13:04,560

so the family doesn't really want to

4436

05:13:07,610 --> 05:13:05,580

stay in

4437

05:13:09,590 --> 05:13:07,620

we uh just keep a good eye on it while

4438

05:13:11,510 --> 05:13:09,600

we unfold it you think Frank and just

4439

05:13:13,850 --> 05:13:11,520

keep it clear yeah I mean I think it's

4440

05:13:16,190 --> 05:13:13,860

going to be well clear it's just

4441

05:13:18,288 --> 05:13:16,200

that extra extra step right I think we

4442

05:13:25,330 --> 05:13:18,298

have plenty we'll have at least a meter

4443

05:13:25,340 --> 05:13:31,570

just keep eyes on it as it's unfolding

4444

05:13:47,868 --> 05:13:35,330

just uh cheat towards the um iea with

4445

05:13:52,490 --> 05:13:50,090

perfect

4446

05:14:04,250 --> 05:13:52,500

okay one second I'll get myself locked

4447

05:14:17,750 --> 05:14:06,708

okay

4448

05:14:19,390 --> 05:14:17,760

that yeah

4449

05:14:21,788 --> 05:14:19,400

right I am ready

4450

05:14:29,868 --> 05:14:21,798

[Applause]

4451  
05:14:34,610 --> 05:14:32,510  
and there we see irosa starting to

4452  
05:14:36,610 --> 05:14:34,620  
unfold so this whole time Frank Rubio's

4453  
05:14:40,550 --> 05:14:36,620  
been keeping a hand on it is once that

4454  
05:14:44,090 --> 05:14:40,560  
last bolt that R6 bolt was released it

4455  
05:14:47,270 --> 05:14:44,100  
was able to unfold so the slow unfolding

4456  
05:14:52,430 --> 05:14:47,280  
process now underway

4457  
05:15:01,720 --> 05:14:54,770  
okay that's good

4458  
05:15:05,570 --> 05:15:03,650  
[Applause]

4459  
05:15:08,330 --> 05:15:05,580  
we're going to be looking for Josh

4460  
05:15:14,510 --> 05:15:08,340  
cassida to engage another alignment and

4461  
05:15:14,520 --> 05:15:20,270  
trigger are they counterclockwise

4462  
05:15:29,030 --> 05:15:21,170  
um

4463  
05:15:36,948 --> 05:15:31,670

that's quite all the way in yet there we

4464

05:15:39,170 --> 05:15:36,958

go okay okay let's make sure

4465

05:15:40,788 --> 05:15:39,180

okay and make you probably see that in

4466

05:15:43,310 --> 05:15:40,798

the heck I think that's what you're

4467

05:15:51,288 --> 05:15:43,320

engaged there for the Third

4468

05:15:58,850 --> 05:15:53,650

so before you guys go too far

4469

05:16:03,350 --> 05:16:00,530

okay

4470

05:16:04,610 --> 05:16:03,360

uh anyone no changes to my gloves get

4471

05:16:16,550 --> 05:16:04,620

gloves

4472

05:16:18,830 --> 05:16:16,560

and gauntlets are in place

4473

05:16:22,670 --> 05:16:18,840

I can maneuver them if I need to

4474

05:16:27,110 --> 05:16:24,890

okay good checks thanks um so the next

4475

05:16:28,550 --> 05:16:27,120

thing we're going to drive the R7 R8

4476

05:16:31,510 --> 05:16:28,560

bolts so Josh you're going to move into

4477

05:16:35,030 --> 05:16:31,520

position uh to work those hinge bolts

4478

05:16:36,708 --> 05:16:35,040

and Frank you're going to work on you've

4479

05:16:39,110 --> 05:16:36,718

got those long duration with the Scoops

4480

05:16:40,730 --> 05:16:39,120

back at crew lock back and you're going

4481

05:16:43,430 --> 05:16:40,740

to get those stowed but you're also

4482

05:16:49,610 --> 05:16:43,440

going to retrieve the AET with the AMS

4483

05:16:49,620 --> 05:16:54,110

coffee

4484

05:17:02,090 --> 05:16:57,230

all right so a good initial install a

4485

05:17:06,770 --> 05:17:04,190

back out but

4486

05:17:08,868 --> 05:17:06,780

that's all here near the back

4487

05:17:10,850 --> 05:17:08,878

and Frank and uh what we're really

4488

05:17:13,910 --> 05:17:10,860

looking for is just a retrieve of the

4489

05:17:16,550 --> 05:17:13,920

AMS knob with cap Keepers and just your

4490

05:17:19,670 --> 05:17:16,560

essay we're leaving that Reddit back uh

4491

05:17:23,510 --> 05:17:21,830

the matter is our affirmative

4492

05:17:26,570 --> 05:17:23,520

[Music]

4493

05:17:29,090 --> 05:17:26,580

two rocks back to the back

4494

05:17:31,010 --> 05:17:29,100

and so right here in the hands of Frank

4495

05:17:32,690 --> 05:17:31,020

ruia that's the AMS knob that's going to

4496

05:17:33,770 --> 05:17:32,700

be used for hand tightening of some of

4497

05:17:39,230 --> 05:17:33,780

these bolts

4498

05:17:43,628 --> 05:17:39,240

So irosa unfolded In Time the pgp is

4499

05:17:45,830 --> 05:17:43,638

still powered up near uh R7 and R8

4500

05:17:49,610 --> 05:17:45,840

alrighty your setting is Alpha One

4501

05:17:54,948 --> 05:17:52,730

after one clockwise too

4502

05:17:56,030 --> 05:17:54,958

that's a good read back and uh you're

4503

05:18:01,850 --> 05:17:56,040

gonna drive

4504

05:18:05,810 --> 05:18:04,430

14 to 16 seconds I'm going to confirm

4505

05:18:06,948 --> 05:18:05,820

those settings with you again here in a

4506

05:18:09,890 --> 05:18:06,958

second

4507

05:18:13,250 --> 05:18:09,900

these clothes are set and uh

4508

05:18:17,770 --> 05:18:13,260

just killed the power to this thing

4509

05:18:22,670 --> 05:18:20,930

so we're looking through Frank Rubio's

4510

05:18:24,288 --> 05:18:22,680

helmet camera that's Josh Caster there

4511

05:18:26,270 --> 05:18:24,298

with the pistol grip tool he's putting

4512

05:18:28,490 --> 05:18:26,280

the settings in so Alpha One if you

4513

05:18:29,990 --> 05:18:28,500

remember we've got A1 through seven b

4514

05:18:31,550 --> 05:18:30,000

one through seven

4515

05:18:38,750 --> 05:18:31,560

eyes too

4516

05:18:38,760 --> 05:18:42,288

those turns you're going to

4517

05:18:46,490 --> 05:18:44,030

talk

4518

05:18:49,430 --> 05:18:46,500

so looking at putting the minimum torque

4519

05:18:51,050 --> 05:18:49,440

possible on these bolts using the pistol

4520

05:18:53,030 --> 05:18:51,060

grip tool it's actually a little bit

4521

05:18:54,590 --> 05:18:53,040

more torque than these bolts are

4522

05:18:56,868 --> 05:18:54,600

designed for

4523

05:19:00,110 --> 05:18:56,878

so after he drives the vent he's going

4524

05:19:02,570 --> 05:19:00,120

to drive them back about one turn and

4525

05:19:04,190 --> 05:19:02,580

then use that AMS knob to hand tighten

4526

05:19:08,868 --> 05:19:04,200

these bolts and these are just what's

4527

05:19:11,448 --> 05:19:08,878

going to ensure that irosa stays in this

4528

05:19:14,150 --> 05:19:11,458

unfolded position

4529

05:19:16,250 --> 05:19:14,160

so he's got two to go R7 and R8 he'll

4530

05:19:18,110 --> 05:19:16,260

get these first I'll tighten them both

4531

05:19:20,150 --> 05:19:18,120

then we'll see him switch over to a

4532

05:19:20,868 --> 05:19:20,160

counterclockwise to loosen them up one

4533

05:19:23,948 --> 05:19:20,878

turn

4534

05:19:26,810 --> 05:19:23,958

and then Frank Rubio will hand him the

4535

05:19:28,970 --> 05:19:26,820

AMS knob to do some quick hand

4536

05:19:32,330 --> 05:19:28,980

tightening tightening him back about a

4537

05:19:34,070 --> 05:19:32,340

turn at which point we will be done with

4538

05:19:35,110 --> 05:19:34,080

those bolts and they'll be able to step

4539

05:19:37,850 --> 05:19:35,120

into

4540

05:19:39,830 --> 05:19:37,860

securing the eight mounting bracket

4541

05:19:41,750 --> 05:19:39,840

bolts that are going to do essentially

4542

05:19:43,430 --> 05:19:41,760

our hard capture of Iris on this

4543

05:19:45,310 --> 05:19:43,440

mounting bracket

4544

05:19:49,368 --> 05:19:45,320

to say in

4545

05:19:52,128 --> 05:19:49,378

17.58 Victory might and torque at 2.4

4546

05:20:49,128 --> 05:19:52,138

that was R7

4547

05:20:49,138 --> 05:20:55,128

17 and a half

4548

05:20:59,690 --> 05:20:56,110

episode

4549

05:21:01,430 --> 05:20:59,700

17.31 good green light the torque of 2.4

4550

05:21:03,770 --> 05:21:01,440

that's our eight

4551  
05:21:07,010 --> 05:21:03,780  
copy Josh okay so the next step is we're

4552  
05:21:08,390 --> 05:21:07,020  
going to go Alpha One counter two

4553  
05:21:09,650 --> 05:21:08,400  
and we're going to release each of those

4554  
05:21:13,868 --> 05:21:09,660  
bolts

4555  
05:21:20,090 --> 05:21:15,948  
Alpha One

4556  
05:21:47,208 --> 05:21:20,100  
all right clockwise two for one parent

4557  
05:21:51,610 --> 05:21:48,770  
let me know if you need me to hold your

4558  
05:21:54,830 --> 05:21:51,620  
feet oh that wouldn't be bad

4559  
05:21:58,490 --> 05:21:54,840  
yeah I'm gonna come uh horizontal here

4560  
05:21:58,500 --> 05:22:03,590  
perfect thank you

4561  
05:22:03,600 --> 05:22:09,590  
very counterclockwise

4562  
05:22:09,600 --> 05:22:24,128  
one

4563  
05:22:24,138 --> 05:22:27,368

foreign

4564

05:22:55,670 --> 05:22:30,770

R8 uh so once you Stow the PGT uh

4565

05:23:01,310 --> 05:22:58,490

come on

4566

05:23:09,850 --> 05:23:01,320

okay can we do the same thing Frank yep

4567

05:23:16,970 --> 05:23:13,128

there we go

4568

05:23:19,128 --> 05:23:16,980

let's see the hard one first we'll do R7

4569

05:23:21,410 --> 05:23:19,138

copy Josh and it's just a hand tight

4570

05:23:29,628 --> 05:23:21,420

less than 30 inch pounds should be less

4571

05:23:34,910 --> 05:23:31,250

and

4572

05:23:36,590 --> 05:23:34,920

so again Josh Cassidy using that pistol

4573

05:23:38,990 --> 05:23:36,600

grip tool first to do the initial

4574

05:23:42,470 --> 05:23:39,000

turning on these final two bolts to

4575

05:23:47,570 --> 05:23:44,628

secure eye Rosa in the unfolded position

4576

05:23:49,550 --> 05:23:47,580

he then backed them off one turn each

4577

05:23:52,250 --> 05:23:49,560

and now just using this to hand tighten

4578

05:23:53,750 --> 05:23:52,260

this we didn't want too much torque on

4579

05:23:55,550 --> 05:23:53,760

these bolts they're actually designed

4580

05:23:57,770 --> 05:23:55,560

for a little bit less than the minimum

4581

05:24:00,170 --> 05:23:57,780

torque possible using that pistol grip

4582

05:24:02,990 --> 05:24:00,180

tool so this hand tool our work around

4583

05:24:05,030 --> 05:24:03,000

we used the pistol grip tool at first

4584

05:24:06,830 --> 05:24:05,040

because otherwise doing the full

4585

05:24:08,810 --> 05:24:06,840

tightening with the hand tool would be

4586

05:24:11,090 --> 05:24:08,820

pretty torturous on a crew member so

4587

05:24:13,490 --> 05:24:11,100

lesson learned from earlier spacewalks

4588

05:24:15,530 --> 05:24:13,500

something you could install on R7 it

4589

05:24:19,030 --> 05:24:15,540

looks like R7 complete next up is going

4590

05:24:24,010 --> 05:24:22,490

and then once this is done calcity is

4591

05:24:28,010 --> 05:24:24,020

going to hand off

4592

05:24:30,288 --> 05:24:28,020

the AMS knob over to Frank who's going

4593

05:24:32,650 --> 05:24:30,298

to store him in that crew bag then

4594

05:24:35,448 --> 05:24:32,660

they're going to move into securing

4595

05:24:38,510 --> 05:24:35,458

irisa to this mounting bracket with

4596

05:24:41,570 --> 05:24:38,520

eight additional bolts so it'll be over

4597

05:24:44,770 --> 05:24:41,580

to Frank Rubio and his PGT to get those

4598

05:24:50,868 --> 05:24:48,350

copy Josh good R8

4599

05:24:53,930 --> 05:24:50,878

and uh from a translation Aid

4600

05:24:56,510 --> 05:24:53,940

perspective you can use the base of

4601  
05:25:01,368 --> 05:24:56,520  
those bolts the bolt cam but try to not

4602  
05:25:08,330 --> 05:25:05,570  
okay let me talk about the M1 38 volts

4603  
05:25:11,868 --> 05:25:10,310  
okay

4604  
05:25:13,850 --> 05:25:11,878  
soon enough because Frank's going to

4605  
05:25:19,070 --> 05:25:13,860  
take care of them I think are you ready

4606  
05:25:19,080 --> 05:25:22,010  
affirmative

4607  
05:25:22,020 --> 05:25:30,770  
God

4608  
05:25:55,970 --> 05:25:32,630  
all right here's three four

4609  
05:25:55,980 --> 05:26:02,090  
three

4610  
05:26:14,770 --> 05:26:05,390  
tell me this all right head over to my

4611  
05:26:28,070 --> 05:26:17,030  
I'm gonna pull down here a little bit

4612  
05:26:33,770 --> 05:26:30,470  
so right now they're removing some of

4613  
05:26:36,470 --> 05:26:33,780

the Caps from the connection points

4614

05:26:38,708 --> 05:26:36,480

for these cables reminder that we won't

4615

05:26:41,810 --> 05:26:38,718

be able to do the entire

4616

05:26:43,550 --> 05:26:41,820

electrical mating until we're in an

4617

05:26:45,890 --> 05:26:43,560

eclipse as we're going to be plugging

4618

05:26:48,970 --> 05:26:45,900

into the Legacy array which is obviously

4619

05:26:56,150 --> 05:26:48,980

unforlton generating electricity

4620

05:27:02,208 --> 05:27:00,288

gonna work with uh with koichi for

4621

05:27:04,610 --> 05:27:02,218

the arm to get into the tether swap

4622

05:27:04,620 --> 05:27:08,868

okay

4623

05:27:16,960 --> 05:27:10,788

I'm gonna move over there friends thank

4624

05:27:20,930 --> 05:27:19,128

[Music]

4625

05:27:22,490 --> 05:27:20,940

affirmative uh just while you're in

4626

05:27:23,930 --> 05:27:22,500

there I've got a caution for you to

4627

05:27:27,590 --> 05:27:23,940

avoid inadvertent contact with the

4628

05:27:29,208 --> 05:27:27,600

cables and NG in zgl connectors uh that

4629

05:27:31,670 --> 05:27:29,218

are attached to the irosa

4630

05:27:34,490 --> 05:27:31,680

um but yeah we're going to start with uh

4631

05:27:35,930 --> 05:27:34,500

any order is good so whatever is

4632

05:27:40,750 --> 05:27:35,940

convenient and when you're ready I'll

4633

05:27:40,760 --> 05:28:03,230

real quick

4634

05:28:07,670 --> 05:28:06,530

uh I was in a position and maybe we'll

4635

05:28:46,010 --> 05:28:07,680

take it

4636

05:28:48,970 --> 05:28:47,330

all right Nick I'm ready for those

4637

05:28:52,970 --> 05:28:48,980

things

4638

05:28:56,930 --> 05:28:52,980

okay Frank the settings are Bravo 5

4639

05:28:56,940 --> 05:28:59,990

probably

4640

05:29:03,530 --> 05:29:02,150

yep that's a good read back and uh

4641

05:29:23,510 --> 05:29:03,540

you'll check that the black line is

4642

05:29:27,948 --> 05:29:25,788

so a little over four hours ten minutes

4643

05:29:29,570 --> 05:29:27,958

into today's space walk another quick

4644

05:29:30,770 --> 05:29:29,580

momentary Handover we'll get that video

4645

05:29:33,350 --> 05:29:30,780

back

4646

05:29:35,570 --> 05:29:33,360

um so we're now stepping into some of

4647

05:29:38,868 --> 05:29:35,580

the final bolt driving that we're gonna

4648

05:29:41,270 --> 05:29:38,878

need to do in order to secure irosa to

4649

05:29:43,310 --> 05:29:41,280

its mounting bracket over to get

4650

05:29:45,350 --> 05:29:43,320

integrated into the 4A power channel so

4651  
05:29:46,788 --> 05:29:45,360  
there's going to be eight bolts and it's

4652  
05:29:48,410 --> 05:29:46,798  
going to be over to Frank Rubio who's

4653  
05:29:51,230 --> 05:29:48,420  
going to be using that pistol grip tool

4654  
05:29:54,350 --> 05:29:51,240  
again to secure those in place

4655  
05:29:56,750 --> 05:29:54,360  
real it is locked so I'm gonna go put it

4656  
05:29:59,690 --> 05:29:56,760  
on my right gearing extender

4657  
05:30:01,850 --> 05:29:59,700  
Josh Castle is doing a little bit of

4658  
05:30:03,110 --> 05:30:01,860  
housekeeping right now with his various

4659  
05:30:05,208 --> 05:30:03,120  
tethers

4660  
05:30:07,670 --> 05:30:05,218  
and meanwhile Frank Rubio getting into

4661  
05:30:09,230 --> 05:30:07,680  
position to use that pistol grip tool

4662  
05:30:10,910 --> 05:30:09,240  
he's going to be using

4663  
05:30:13,310 --> 05:30:10,920

a little bit more torque we're going to

4664

05:30:15,590 --> 05:30:13,320

be a Bravo 5 so again one through seven

4665

05:30:18,110 --> 05:30:15,600

fives your highest

4666

05:30:19,730 --> 05:30:18,120

or seven is your highest so we're not

4667

05:30:21,590 --> 05:30:19,740

quite at Max torque on this but we're

4668

05:30:24,708 --> 05:30:21,600

getting pretty close

4669

05:30:26,448 --> 05:30:24,718

there's four bolts on the left side and

4670

05:30:29,570 --> 05:30:26,458

then four bolts on the right

4671

05:31:00,830 --> 05:30:29,580

on my 31.

4672

05:31:25,128 --> 05:31:02,810

hey Frank just want to confirm on M31

4673

05:31:31,250 --> 05:31:28,190

my Red Hook is on my right d-ring center

4674

05:31:33,288 --> 05:31:31,260

okay close so I lost black on black I

4675

05:31:45,110 --> 05:31:33,298

treat my rep

4676

05:31:50,030 --> 05:31:46,970

okay could you copy

4677

05:32:10,850 --> 05:31:50,040

yep copy Josh uh see you working to uh

4678

05:32:17,930 --> 05:32:13,930

uh the next boat was Mike

4679

05:32:20,448 --> 05:32:17,940

34. so I have 12 turns green light

4680

05:32:21,890 --> 05:32:20,458

22 decimal one on the torque black line

4681

05:32:36,128 --> 05:32:21,900

is flush

4682

05:32:42,350 --> 05:32:39,350

I'm gonna go up and get my

4683

05:32:44,208 --> 05:32:42,360

55 foot anchor off of the arm

4684

05:33:09,650 --> 05:32:44,218

affirmative Josh you got a good tether

4685

05:33:16,010 --> 05:33:13,070

I'm back on bike 32.

4686

05:33:19,850 --> 05:33:16,020

actually had 14 turns green light 22

4687

05:34:22,310 --> 05:33:28,670

copy Frank

4688

05:34:41,570 --> 05:34:22,320

side bolts filled transition over to the

4689

05:35:00,170 --> 05:34:45,590

okay I've got my 55 foot

4690

05:35:00,180 --> 05:35:10,810

foreign

4691

05:35:16,910 --> 05:35:13,670

[Music]

4692

05:35:20,270 --> 05:35:19,010

[Applause]

4693

05:35:21,770 --> 05:35:20,280

thank you I'm just going to get out of

4694

05:35:24,288 --> 05:35:21,780

the way go back to the market and then

4695

05:35:27,230 --> 05:35:24,298

I'll give you a go of whatever is your

4696

05:35:31,128 --> 05:35:29,570

just cut

4697

05:35:34,030 --> 05:35:31,138

the three moons that we can maneuver

4698

05:36:03,410 --> 05:35:34,040

through the IA backup position

4699

05:36:03,420 --> 05:36:18,650

ah

4700

05:36:25,788 --> 05:36:23,030

like 35 I had

4701  
05:36:27,890 --> 05:36:25,798  
a 13 turns green light 21 decimal 9

4702  
05:36:34,550 --> 05:36:27,900  
torque Blackline flush

4703  
05:36:34,560 --> 05:36:44,060  
foreign

4704  
05:37:05,628 --> 05:37:02,410  
[Music]

4705  
05:37:05,638 --> 05:37:15,850  
foreign

4706  
05:37:46,070 --> 05:37:22,580  
[Music]

4707  
05:37:48,650 --> 05:37:46,080  
I counted 11 turns it might have been 12

4708  
05:37:51,288 --> 05:37:48,660  
so green lights

4709  
05:37:55,788 --> 05:37:51,298  
um 21 decimal nine on the torque and

4710  
05:37:55,798 --> 05:38:13,550  
copy Goodwill

4711  
05:38:13,560 --> 05:38:16,368  
there you are

4712  
05:38:53,090 --> 05:38:19,270  
I think that's you on my background

4713  
05:38:53,100 --> 05:38:58,368

Nick how long till that next eclipse

4714

05:39:05,570 --> 05:39:00,410

and we got uh

4715

05:39:08,628 --> 05:39:07,128

Okay so

4716

05:39:12,948 --> 05:39:08,638

we're gonna go ahead

4717

05:39:15,948 --> 05:39:14,990

and uh Josh I was waiting for this bold

4718

05:39:30,170 --> 05:39:15,958

stuff and then I was going to give you

4719

05:39:34,190 --> 05:39:32,270

like um

4720

05:39:37,190 --> 05:39:34,200

everybody was

4721

05:39:39,110 --> 05:39:37,200

12 times Green Line 22 decimal one on

4722

05:39:41,030 --> 05:39:39,120

this work

4723

05:39:42,530 --> 05:39:41,040

is

4724

05:39:45,590 --> 05:39:42,540

make sure it's flushed if I look at it

4725

05:39:47,868 --> 05:39:45,600

with the chemistry around as well

4726

05:39:50,930 --> 05:39:47,878

yep copy that's a good Bowl

4727

05:39:52,910 --> 05:39:50,940

um and so Frank you can throw the PGT uh

4728

05:39:54,890 --> 05:39:52,920

big picture we're a little over 35

4729

05:39:57,470 --> 05:39:54,900

minutes before the start of the working

4730

05:39:59,690 --> 05:39:57,480

Eclipse our next activity gets us into

4731

05:40:01,490 --> 05:39:59,700

the cable mate so we're able to start a

4732

05:40:03,410 --> 05:40:01,500

few of those steps and work on the irosa

4733

05:40:05,090 --> 05:40:03,420

mating uh and then we're going to break

4734

05:40:08,390 --> 05:40:05,100

out of that and try to do some of our

4735

05:40:10,390 --> 05:40:08,400

cleanup uh all with the objective of

4736

05:40:13,250 --> 05:40:10,400

getting back into position for the

4737

05:40:16,550 --> 05:40:13,260

finish of the cable mate before we start

4738

05:40:26,810 --> 05:40:18,530

uh

4739

05:40:28,250 --> 05:40:26,820

move into position on the right side

4740

05:40:30,530 --> 05:40:28,260

Frank you're going to move into position

4741

05:40:32,810 --> 05:40:30,540

on the left side you can

4742

05:40:35,030 --> 05:40:32,820

you can you can work in the middle I

4743

05:40:35,690 --> 05:40:35,040

guess they're all located right there

4744

05:40:40,368 --> 05:40:35,700

um

4745

05:40:43,368 --> 05:40:40,378

and we're going to work P3 j3 P1 J1 on

4746

05:40:43,378 --> 05:40:51,890

okay Josh I'm clear sounds good thanks

4747

05:40:51,900 --> 05:40:57,350

oh my God it started on uh P1 J1

4748

05:41:03,288 --> 05:40:59,510

affirmative uh you're gonna make P1 to

4749

05:41:23,590 --> 05:41:03,298

irisa J1 uh looking for good checks and

4750

05:41:30,350 --> 05:41:26,570

that orientation brought my safety

4751  
05:41:32,270 --> 05:41:30,360  
tether behind me but hopefully I didn't

4752  
05:41:41,750 --> 05:41:32,280  
create a problem but uh

4753  
05:41:51,470 --> 05:41:44,270  
just off my right side yes

4754  
05:41:51,480 --> 05:41:55,310  
you know if I'm in your way here

4755  
05:42:05,090 --> 05:41:56,868  
I think we're supposed to be each

4756  
05:42:05,100 --> 05:42:08,990  
all right for j3

4757  
05:42:15,350 --> 05:42:12,770  
no fraud no ground pens

4758  
05:42:18,230 --> 05:42:15,360  
ium iban

4759  
05:42:20,448 --> 05:42:18,240  
or full aft

4760  
05:42:22,190 --> 05:42:20,458  
over Center

4761  
05:42:24,590 --> 05:42:22,200  
and go on the maze

4762  
05:42:26,448 --> 05:42:24,600  
so it's gonna be good check a little bit

4763  
05:42:30,530 --> 05:42:26,458

more Slack

4764

05:42:33,830 --> 05:42:30,540

like I have the same for P1 to j1s good

4765

05:42:41,330 --> 05:42:33,840

things good Emi band no fraud and it is

4766

05:42:41,340 --> 05:42:51,470

so Frank could go for P2 to J2

4767

05:42:58,730 --> 05:42:53,590

yeah the black line was uh

4768

05:43:00,230 --> 05:42:58,740

by the uh oh I see it's up there there

4769

05:43:02,170 --> 05:43:00,240

um it should be it should be by the wire

4770

05:43:04,250 --> 05:43:02,180

down here yeah

4771

05:43:05,448 --> 05:43:04,260

I might be able to just pull because the

4772

05:43:11,810 --> 05:43:05,458

other side's just

4773

05:43:16,788 --> 05:43:13,850

come

4774

05:43:20,510 --> 05:43:16,798

not sure why

4775

05:43:21,770 --> 05:43:20,520

wait what can I yeah I head over there

4776

05:43:23,810 --> 05:43:21,780

I'm gonna try to

4777

05:43:38,810 --> 05:43:23,820

fight it through if you could

4778

05:43:44,390 --> 05:43:41,448

all right and make our pe2s made it to

4779

05:43:47,208 --> 05:43:44,400

get to uh good Pen City of my band no

4780

05:43:51,288 --> 05:43:47,218

fog and it is

4781

05:43:56,390 --> 05:43:53,750

you're sorry yep it's just catching on

4782

05:43:59,448 --> 05:43:56,400

these uh knots that are tried to keep

4783

05:44:01,548 --> 05:43:59,458

them together can you rep to it make

4784

05:44:04,070 --> 05:44:01,558

sure it's secure I'm gonna undo this one

4785

05:44:05,510 --> 05:44:04,080

okay let's just get too good of a job

4786

05:44:09,770 --> 05:44:05,520

it's too tight

4787

05:44:13,730 --> 05:44:11,390

is there an indicator where this one's

4788

05:44:15,770 --> 05:44:13,740

supposed to be no that one's got plenty

4789

05:44:17,930 --> 05:44:15,780

of a but that one's not a big deal okay

4790

05:44:22,330 --> 05:44:17,940

uh I don't know if it's gonna go past

4791

05:44:22,340 --> 05:44:36,770

okay here it comes

4792

05:44:45,048 --> 05:44:41,628

okay can you pull your direction oops

4793

05:44:45,058 --> 05:45:00,170

one second

4794

05:45:04,430 --> 05:45:01,970

okay

4795

05:45:16,010 --> 05:45:04,440

and uh in fact if you want to just meet

4796

05:45:22,190 --> 05:45:19,430

and like uh P4 to j4

4797

05:45:32,750 --> 05:45:22,200

and D3 and j3 coach

4798

05:45:37,670 --> 05:45:35,330

all right 54 has made it to day four I

4799

05:45:40,548 --> 05:45:37,680

had good things to DMI band no fog

4800

05:45:49,850 --> 05:45:40,558

Alternatives over Center okay got the

4801  
05:45:55,850 --> 05:45:52,788  
and P3 has made it took A3 good band

4802  
05:45:56,930 --> 05:45:55,860  
City in my band no fraud and we are over

4803  
05:46:00,708 --> 05:45:56,940  
there

4804  
05:46:02,270 --> 05:46:00,718  
Duffy good P3 j3 mate

4805  
05:46:06,890 --> 05:46:02,280  
so that's the end of the cable mating

4806  
05:46:11,030 --> 05:46:08,810  
so Frank we're going to have you head

4807  
05:46:12,948 --> 05:46:11,040  
over to the crew lock bag in and we're

4808  
05:46:15,770 --> 05:46:12,958  
going to spend a little time cleaning

4809  
05:46:15,780 --> 05:46:20,510  
okay

4810  
05:46:25,910 --> 05:46:23,030  
and so a quick check in four hours 27

4811  
05:46:28,610 --> 05:46:25,920  
minutes into today's space walk

4812  
05:46:28,620 --> 05:46:34,910  
seriously

4813  
05:46:39,770 --> 05:46:37,250

Frank Rubio and Josh Casada just

4814

05:46:43,850 --> 05:46:39,780

completed some pretty important tasks to

4815

05:46:47,090 --> 05:46:43,860

secure the irosa solar array

4816

05:46:47,100 --> 05:46:50,270

hear that

4817

05:46:50,280 --> 05:46:56,390

you think I mean

4818

05:47:01,430 --> 05:46:58,128

hey Frank hold on opening that side

4819

05:47:01,440 --> 05:47:04,368

perfect

4820

05:47:14,890 --> 05:47:07,970

and let me know what you can see here

4821

05:47:19,548 --> 05:47:17,510

and Frank yeah what we want you to do is

4822

05:47:22,310 --> 05:47:19,558

work on trying to uh Stow everything in

4823

05:47:24,170 --> 05:47:22,320

the other half of crew lock back in and

4824

05:47:27,070 --> 05:47:24,180

then we're going to move that over to

4825

05:47:29,270 --> 05:47:27,080

the cable bag and put it inside

4826

05:47:30,890 --> 05:47:29,280

realizing that we still have to retrieve

4827

05:47:32,690 --> 05:47:30,900

a scoop off the bottom of the mod kit

4828

05:47:41,530 --> 05:47:32,700

but we'll take care of that later Josh

4829

05:47:41,540 --> 05:47:50,990

stuff away

4830

05:47:56,208 --> 05:47:53,810

and uh and Frank I can confirm we've got

4831

05:47:59,810 --> 05:47:56,218

a good inventory of the bag via your

4832

05:48:17,030 --> 05:47:59,820

hecca so you're good to close it all up

4833

05:48:22,190 --> 05:48:20,208

again at this moment in our spacewalk

4834

05:48:25,490 --> 05:48:22,200

today we're just shy of four and a half

4835

05:48:27,590 --> 05:48:25,500

hours the iros the solar array has been

4836

05:48:31,970 --> 05:48:27,600

installed onto its mounting bracket both

4837

05:48:34,610 --> 05:48:31,980

Frank Rubio uh driving all eight bolts

4838

05:48:37,610 --> 05:48:34,620

to secure it in place after working with

4839

05:48:39,970 --> 05:48:37,620

Josh Cassidy to get it unfolded they

4840

05:48:42,048 --> 05:48:39,980

started some of the cable mating work

4841

05:48:45,470 --> 05:48:42,058

connecting the

4842

05:48:48,048 --> 05:48:45,480

uh cables to the nzgls the NASA zero

4843

05:48:49,610 --> 05:48:48,058

gravity levers that's just the cable

4844

05:48:52,610 --> 05:48:49,620

interface that they have on these power

4845

05:48:55,430 --> 05:48:52,620

cables they've started some of that

4846

05:49:00,048 --> 05:48:55,440

cable routing with the connections made

4847

05:49:05,030 --> 05:49:00,058

to the irosa we will not do

4848

05:49:11,270 --> 05:49:08,868

we will not do the routing to integrate

4849

05:49:12,830 --> 05:49:11,280

those in with the existing Solar Ray

4850

05:49:14,810 --> 05:49:12,840

until we're in eclipse and that's coming

4851  
05:49:15,948 --> 05:49:14,820  
up in a little less than 30 minutes from

4852  
05:49:20,570 --> 05:49:15,958  
now

4853  
05:49:25,250 --> 05:49:22,970  
get those cats in there while I hold

4854  
05:49:27,470 --> 05:49:25,260  
yeah

4855  
05:49:35,770 --> 05:49:27,480  
a lot of things one minute to

4856  
05:49:39,110 --> 05:49:38,270  
hey Frank we understand it's a tight fit

4857  
05:49:40,910 --> 05:49:39,120  
in there

4858  
05:49:42,530 --> 05:49:40,920  
um big picture we're going to put this

4859  
05:49:44,208 --> 05:49:42,540  
inside of the cable bag so if you have

4860  
05:49:45,770 --> 05:49:44,218  
to put something on the outside of crew

4861  
05:49:47,090 --> 05:49:45,780  
lock bag in we're okay with that because

4862  
05:49:50,750 --> 05:49:47,100  
you're getting ready to put everything

4863  
05:49:50,760 --> 05:49:57,350

okay coffee thanks

4864

05:49:57,360 --> 05:50:27,730

almost there Frank

4865

05:50:34,368 --> 05:50:31,730

so again as we wait for our Eclipse uh

4866

05:50:46,630 --> 05:50:34,378

which is coming in about 20 minutes from

4867

05:50:50,090 --> 05:50:48,410

[Music]

4868

05:50:52,250 --> 05:50:50,100

I would just like to tell nice that I

4869

05:50:55,548 --> 05:50:52,260

had to leave one thing out

4870

05:50:57,048 --> 05:50:55,558

and copy Frank we see it uh and uh so

4871

05:51:03,770 --> 05:50:57,058

now you're gonna move the crew lock bag

4872

05:51:03,780 --> 05:51:08,090

okay

4873

05:51:13,368 --> 05:51:10,070

I'm happy to help unless you picked up

4874

05:51:15,530 --> 05:51:13,378

too many cooks okay now this one I might

4875

05:51:21,830 --> 05:51:15,540

take you up on because yeah it's a bear

4876  
05:51:27,948 --> 05:51:24,708  
and and big picture guys we've got 25

4877  
05:51:29,390 --> 05:51:27,958  
minutes until the working Eclipse uh

4878  
05:51:31,910 --> 05:51:29,400  
this is the last thing we're going to

4879  
05:51:33,890 --> 05:51:31,920  
have you do uh and then we're gonna have

4880  
05:51:35,810 --> 05:51:33,900  
you get into position catch your breath

4881  
05:51:39,170 --> 05:51:35,820  
and then get ready to do all the cable

4882  
05:51:39,180 --> 05:51:57,970  
it sounds great thanks

4883  
05:52:02,090 --> 05:52:00,048  
you just heard the voice of the ground

4884  
05:52:04,490 --> 05:52:02,100  
IV today Nick hey he's the one here in

4885  
05:52:07,910 --> 05:52:04,500  
Mission Control talking Frank and Josh

4886  
05:52:11,330 --> 05:52:07,920  
throughout this entire spacewalk

4887  
05:52:12,948 --> 05:52:11,340  
so they're doing uh one small task out

4888  
05:52:14,750 --> 05:52:12,958

of order so they're doing some of their

4889

05:52:17,270 --> 05:52:14,760

cleanup

4890

05:52:21,708 --> 05:52:17,280

that should keep us

4891

05:52:27,880 --> 05:52:24,948

and I should be more useful on the idea

4892

05:52:39,490 --> 05:52:35,150

[Music]

4893

05:52:45,410 --> 05:52:41,690

is there a handle on the back side of

4894

05:52:53,090 --> 05:52:47,708

all right

4895

05:52:53,100 --> 05:53:09,250

easier yeah

4896

05:53:28,490 --> 05:53:11,628

remember that first DVA where you had

4897

05:53:28,500 --> 05:53:33,250

foreign

4898

05:53:40,548 --> 05:53:35,810

back to me

4899

05:53:42,910 --> 05:53:40,558

well I found her in my uh iea

4900

05:53:44,868 --> 05:53:42,920

that sounds good yep

4901  
05:53:51,770 --> 05:53:44,878  
[Applause]

4902  
05:53:56,270 --> 05:53:53,990  
all right uh

4903  
05:53:57,770 --> 05:53:56,280  
you ready with mbag

4904  
05:54:00,110 --> 05:53:57,780  
I'll try this

4905  
05:54:02,868 --> 05:54:00,120  
open fairly quickly

4906  
05:54:07,548 --> 05:54:04,610  
s that's great uh let's see and you're

4907  
05:54:11,150 --> 05:54:07,558  
going to take a large small inside

4908  
05:54:12,410 --> 05:54:11,160  
to Anchor it yeah yeah hey Frank I can

4909  
05:54:14,448 --> 05:54:12,420  
get back to you and just put it up just

4910  
05:54:16,368 --> 05:54:14,458  
want to uh offer up uh if you think it's

4911  
05:54:19,250 --> 05:54:16,378  
going to be too crowded on the inside of

4912  
05:54:24,310 --> 05:54:19,260  
the cable bag we're okay if you bundle

4913  
05:54:28,250 --> 05:54:27,090

you're the expert on subscribe

4914

05:54:30,590 --> 05:54:28,260

[Music]

4915

05:54:32,930 --> 05:54:30,600

let's try opening it uh real quick okay

4916

05:54:33,890 --> 05:54:32,940

and then if it doesn't work uh it's

4917

05:54:37,250 --> 05:54:33,900

probably going to want to go in the

4918

05:54:38,750 --> 05:54:37,260

middle compartment which has other stuff

4919

05:54:39,770 --> 05:54:38,760

in it I just I don't know what the

4920

05:54:41,690 --> 05:54:39,780

doctor arm is going to have enough

4921

05:54:43,480 --> 05:54:41,700

height

4922

05:54:48,410 --> 05:54:43,490

um

4923

05:54:53,030 --> 05:54:51,048

back over so we could do this right

4924

05:54:57,730 --> 05:54:53,040

we could connect that and hold it down

4925

05:54:57,740 --> 05:55:12,430

right here foreign

4926

05:55:12,440 --> 05:55:18,470

[Music]

4927

05:55:23,390 --> 05:55:20,868

guys while you're putting the bag inside

4928

05:55:25,190 --> 05:55:23,400

there we will want to end up with a red

4929

05:55:28,970 --> 05:55:25,200

that comes from the inside to the

4930

05:55:28,980 --> 05:55:31,788

right there

4931

05:55:38,570 --> 05:55:34,250

grab it

4932

05:55:43,368 --> 05:55:40,490

and if you want you can just use that

4933

05:55:47,590 --> 05:55:43,378

one that's right there at the bag lid uh

4934

05:55:53,628 --> 05:55:51,470

right I got the large small uh anchored

4935

05:55:55,850 --> 05:55:53,638

in there on a d-ring okay and that

4936

05:55:58,548 --> 05:55:55,860

bearing appears to be part of the bag it

4937

05:56:03,650 --> 05:55:58,558

is the only kicked off my mind right

4938

05:56:07,490 --> 05:56:05,090

yeah

4939

05:56:09,288 --> 05:56:07,500

it's gonna get two in there first if you

4940

05:56:10,670 --> 05:56:09,298

don't mind but

4941

05:56:29,570 --> 05:56:10,680

um

4942

05:56:35,690 --> 05:56:32,810

so close I can taste it here we go all

4943

05:56:39,770 --> 05:56:35,700

right go ahead and grab your

4944

05:56:42,770 --> 05:56:39,780

Brad we got two large hooks connected

4945

05:56:42,780 --> 05:56:52,740

ammo all right ready

4946

05:56:52,750 --> 05:57:10,250

[Music]

4947

05:57:15,350 --> 05:57:12,410

oh

4948

05:57:20,750 --> 05:57:17,628

is that strap naked

4949

05:57:46,368 --> 05:57:20,760

yeah can you hold me close oh yeah

4950

05:57:52,010 --> 05:57:49,868

that's on okay

4951

05:57:59,230 --> 05:57:52,020

well let's see the other one is used as

4952

05:58:07,070 --> 05:58:01,368

it comes from the corner but it's not

4953

05:58:12,230 --> 05:58:09,170

yes there's is there an anchor somewhere

4954

05:58:18,230 --> 05:58:15,288

we go to the same one you just went to

4955

05:58:29,628 --> 05:58:20,208

remember this is the one

4956

05:58:34,190 --> 05:58:32,510

all right thank you that one because

4957

05:58:36,170 --> 05:58:34,200

I'll hold it closed you go to the same

4958

05:58:39,230 --> 05:58:36,180

spot you just want to no it's not going

4959

05:58:39,240 --> 05:58:43,368

here I mean

4960

05:58:48,530 --> 05:58:44,930

you can yeah

4961

05:58:50,628 --> 05:58:48,540

so right now we are just shy of four

4962

05:58:51,890 --> 05:58:50,638

hours and 40 minutes into today's space

4963

05:58:54,048 --> 05:58:51,900

walk which

4964

05:58:58,490 --> 05:58:54,058

I kicked off earlier this morning about

4965

05:59:00,590 --> 05:58:58,500

7 19 a.m central time when our two space

4966

05:59:02,350 --> 05:59:00,600

Walkers Frank Rubio and Josh Casada

4967

05:59:04,548 --> 05:59:02,360

turned their suits over to battery power

4968

05:59:06,830 --> 05:59:04,558

since then they've been able to

4969

05:59:08,628 --> 05:59:06,840

accomplish every single task laid out in

4970

05:59:12,650 --> 05:59:08,638

front of them so far in order to get

4971

05:59:15,708 --> 05:59:12,660

this new rollout solar array in place

4972

05:59:17,208 --> 05:59:15,718

and over to its installation point on a

4973

05:59:19,310 --> 05:59:17,218

support bracket

4974

05:59:21,470 --> 05:59:19,320

that's going to have it perched it's

4975

05:59:23,330 --> 05:59:21,480

only right over the existing array for

4976

05:59:26,570 --> 05:59:23,340

the 4A power Channel

4977

05:59:28,490 --> 05:59:26,580

they were able to work together to get

4978

05:59:30,830 --> 05:59:28,500

it released from its temporary stowage

4979

05:59:33,530 --> 05:59:30,840

point and then ultimately moved over to

4980

05:59:38,990 --> 05:59:33,540

where it now sits they've been able to

4981

05:59:39,000 --> 05:59:42,708

your right hand

4982

05:59:48,890 --> 05:59:46,190

they're able to successfully bolt Bolt

4983

05:59:50,628 --> 05:59:48,900

the array to the support bracket and

4984

05:59:53,030 --> 05:59:50,638

started at least some of the cable

4985

05:59:58,310 --> 05:59:53,040

routing connecting the four

4986

06:00:02,628 --> 06:00:00,830

at this point we are just having them do

4987

06:00:19,250 --> 06:00:02,638

a couple of cleanup tasks ahead of time

4988

06:00:22,850 --> 06:00:20,750

of course I don't know that that's going

4989

06:00:33,948 --> 06:00:22,860

to hold

4990

06:00:33,958 --> 06:00:41,020

that's laundry here

4991

06:00:54,368 --> 06:00:42,660

[Music]

4992

06:00:58,970 --> 06:00:56,390

what if we're losing and go to that

4993

06:01:01,810 --> 06:00:58,980

other hook say you just want to it'll

4994

06:01:11,270 --> 06:01:04,970

the one we just did right to that list

4995

06:01:11,280 --> 06:01:26,090

here we go

4996

06:01:37,070 --> 06:01:27,830

does our wives get back at us we're not

4997

06:01:37,080 --> 06:01:44,530

look at that perfect just textbook

4998

06:01:44,540 --> 06:01:48,650

beautiful work

4999

06:01:48,660 --> 06:01:52,250

okay in the airlock

5000

06:01:52,260 --> 06:02:00,410

all right

5001

06:02:00,420 --> 06:02:06,170

that one doesn't want to stay

5002

06:02:18,368 --> 06:02:10,250

there we go and we still have our

5003

06:02:23,030 --> 06:02:21,708

our panels yeah everybody's happy so

5004

06:02:24,410 --> 06:02:23,040

it's uh

5005

06:02:26,690 --> 06:02:24,420

Josh if you want to head over to the

5006

06:02:29,390 --> 06:02:26,700

right side and uh Frank if you want to

5007

06:02:30,830 --> 06:02:29,400

head over to the left side

5008

06:02:34,190 --> 06:02:30,840

um I'll read out some warnings as you're

5009

06:02:36,890 --> 06:02:34,200

translating over so you must not be mate

5010

06:02:38,990 --> 06:02:36,900

the solar right-wing connectors until

5011

06:02:40,850 --> 06:02:39,000

Eclipse plus two minutes

5012

06:02:42,948 --> 06:02:40,860

and you must maintain a one foot keep

5013

06:02:45,530 --> 06:02:42,958

out Zone from demated Saw connectors

5014

06:02:49,670 --> 06:02:45,540

starting two minutes prior to and during

5015

06:02:53,930 --> 06:02:52,548

got this coffee

5016

06:02:56,090 --> 06:02:53,940

so you're gonna have some time on your

5017

06:02:59,510 --> 06:02:56,100

hands we've got uh a little over 10

5018

06:03:01,788 --> 06:02:59,520

minutes before we can get you to work so

5019

06:03:04,010 --> 06:03:01,798

get in position get nice and stable

5020

06:03:05,930 --> 06:03:04,020

throw down a brt take some good photos

5021

06:03:27,230 --> 06:03:05,940

I'll give you a heads up as we get

5022

06:03:32,868 --> 06:03:29,750

and as we approach the four hour 45

5023

06:03:35,810 --> 06:03:32,878

minute Mark the crew

5024

06:03:37,670 --> 06:03:35,820

Josh cassida Frank Rubio done with that

5025

06:03:38,990 --> 06:03:37,680

short get ahead task wrangling some of

5026  
06:03:41,570 --> 06:03:39,000  
the cables and connectors that they've

5027  
06:03:43,610 --> 06:03:41,580  
been using so far right now they're

5028  
06:03:45,948 --> 06:03:43,620  
going to start making their way over to

5029  
06:03:47,868 --> 06:03:45,958  
their next worksite position where

5030  
06:03:50,530 --> 06:03:47,878  
they're going to be connecting a series

5031  
06:03:53,090 --> 06:03:50,540  
of cables they already started this work

5032  
06:03:55,730 --> 06:03:53,100  
plugging in the sides of the cables into

5033  
06:03:58,368 --> 06:03:55,740  
the connection points on the irosa solar

5034  
06:04:00,170 --> 06:03:58,378  
array but then had to stop until we hit

5035  
06:04:02,868 --> 06:04:00,180  
Eclipse as they're going to be

5036  
06:04:05,030 --> 06:04:02,878  
essentially tying those cables in to

5037  
06:04:07,430 --> 06:04:05,040  
some additional connection points on the

5038  
06:04:09,170 --> 06:04:07,440

solar array Wing itself the existing one

5039

06:04:12,650 --> 06:04:09,180

and then they're going to be plugging

5040

06:04:16,430 --> 06:04:12,660

those in to integrate both the existing

5041

06:04:19,190 --> 06:04:16,440

solar array and the new irosa into the

5042

06:04:21,770 --> 06:04:19,200

same tie-in to the same power Channel

5043

06:04:23,510 --> 06:04:21,780

it's okay so we're gonna wait until it

5044

06:04:25,670 --> 06:04:23,520

Clips to make sure that that array is

5045

06:04:29,990 --> 06:04:25,680

not actively generating any electricity

5046

06:04:34,128 --> 06:04:32,628

all the way back or should I turn here

5047

06:04:43,490 --> 06:04:34,138

it almost seems like it's not coming

5048

06:04:58,670 --> 06:04:47,030

all the way to your body is clear

5049

06:04:58,680 --> 06:05:01,990

all right

5050

06:05:02,000 --> 06:05:12,410

okay it's all good

5051  
06:05:19,540 --> 06:05:14,390  
it's up to me next time I'm not going to

5052  
06:05:19,550 --> 06:05:26,090  
[Music]

5053  
06:05:30,230 --> 06:05:27,948  
unfortunately I think that's Miranda's

5054  
06:05:43,070 --> 06:05:30,240  
way of us

5055  
06:05:46,610 --> 06:05:45,350  
and in the meantime we're about five

5056  
06:05:49,490 --> 06:05:46,620  
minutes away from getting that video

5057  
06:05:51,590 --> 06:05:49,500  
signal back with the space station so in

5058  
06:05:54,048 --> 06:05:51,600  
a bit of a hold Point as they get to

5059  
06:05:56,690 --> 06:05:54,058  
their position for the the final cable

5060  
06:06:00,530 --> 06:05:56,700  
mating steps uh to start integrating

5061  
06:06:01,850 --> 06:06:00,540  
this High Rosa into the whole electrical

5062  
06:06:04,788 --> 06:06:01,860  
power system

5063  
06:06:08,410 --> 06:06:04,798

for the station itself

5064

06:06:11,930 --> 06:06:08,420

and these eye roses this is going to be

5065

06:06:13,250 --> 06:06:11,940

the fourth of six planned

5066

06:06:15,470 --> 06:06:13,260

um this will be the fourth one to get

5067

06:06:18,708 --> 06:06:15,480

installed and all of these designed to

5068

06:06:20,990 --> 06:06:18,718

actually boost the overall output

5069

06:06:22,970 --> 06:06:21,000

of the electrical system on board the

5070

06:06:25,190 --> 06:06:22,980

station by about 30 percent bring it up

5071

06:06:28,610 --> 06:06:25,200

to about 250 kilowatts of electricity

5072

06:06:30,230 --> 06:06:28,620

available for payloads scientific

5073

06:06:33,650 --> 06:06:30,240

research any of the hardware that we

5074

06:06:35,330 --> 06:06:33,660

have on board to use on all segments of

5075

06:06:37,368 --> 06:06:35,340

the station so

5076

06:06:40,310 --> 06:06:37,378

there's a multi-year process that's been

5077

06:06:42,530 --> 06:06:40,320

underway each time requiring several

5078

06:06:45,288 --> 06:06:42,540

spacewalks to install these first to

5079

06:06:47,330 --> 06:06:45,298

install a mod kit a mounting bracket

5080

06:06:50,270 --> 06:06:47,340

essentially all the hardware you need to

5081

06:06:53,448 --> 06:06:50,280

put the array in place and then flying

5082

06:06:55,970 --> 06:06:53,458

up the arrays two at a time in the trunk

5083

06:06:58,490 --> 06:06:55,980

of a SpaceX cargo dragon

5084

06:07:00,288 --> 06:06:58,500

so this will be array number four and

5085

06:07:03,948 --> 06:07:00,298

once we see it deployed it's going to

5086

06:07:05,810 --> 06:07:03,958

cover up some of the existing array with

5087

06:07:08,270 --> 06:07:05,820

its increased efficiency is going to be

5088

06:07:09,708 --> 06:07:08,280

able to to boost the otherwise lost

5089

06:07:12,770 --> 06:07:09,718

power that you would have had from

5090

06:07:15,048 --> 06:07:12,780

covering up those cells

5091

06:07:18,708 --> 06:07:15,058

after they're able to get the cables

5092

06:07:22,310 --> 06:07:18,718

mated the last major step is going to be

5093

06:07:25,490 --> 06:07:22,320

unfurling of or deploying the the

5094

06:07:26,930 --> 06:07:25,500

rollout solar array and it's all a name

5095

06:07:28,970 --> 06:07:26,940

so it's it's rolled up there's

5096

06:07:31,250 --> 06:07:28,980

essentially just two bolts that are

5097

06:07:44,948 --> 06:07:31,260

holding it in that rolled up

5098

06:07:50,750 --> 06:07:47,628

but again there's just about two bolts

5099

06:07:52,610 --> 06:07:50,760

that are holding it in this rolled up uh

5100

06:07:55,190 --> 06:07:52,620

configuration right now and so after

5101  
06:07:56,750 --> 06:07:55,200  
those are released uh the array actually

5102  
06:07:58,610 --> 06:07:56,760  
does all the work itself it's got

5103  
06:08:02,330 --> 06:07:58,620  
built-in tension that will cause it to

5104  
06:08:04,368 --> 06:08:02,340  
slowly unfurl you have the solar blanket

5105  
06:08:06,890 --> 06:08:04,378  
with all of the cells in the center and

5106  
06:08:09,048 --> 06:08:06,900  
on either side of that you have booms

5107  
06:08:12,048 --> 06:08:09,058  
which are really providing a lot of the

5108  
06:08:13,788 --> 06:08:12,058  
structural support and as we see those

5109  
06:08:15,410 --> 06:08:13,798  
start to unfurl

5110  
06:08:17,208 --> 06:08:15,420  
uh right now they're in a flat

5111  
06:08:19,490 --> 06:08:17,218  
configuration they're going to curl up

5112  
06:08:22,128 --> 06:08:19,500  
and a series of magnets are going to go

5113  
06:08:24,590 --> 06:08:22,138

into place to help hold them into that

5114

06:08:26,990 --> 06:08:24,600

form we talked about it a little bit

5115

06:08:31,190 --> 06:08:27,000

earlier so those Booms The the best

5116

06:08:33,890 --> 06:08:31,200

analogy we've gotten so far for uh heads

5117

06:08:35,628 --> 06:08:33,900

up we're down hecka right now just to KU

5118

06:08:38,628 --> 06:08:35,638

outage it should come back here shortly

5119

06:08:41,628 --> 06:08:38,638

coming up on a short Handover uh we've

5120

06:08:46,930 --> 06:08:41,638

got just under eight minutes to go so

5121

06:08:46,940 --> 06:08:53,350

thank you

5122

06:08:53,360 --> 06:08:59,868

but again as we as we see those

5123

06:08:59,878 --> 06:09:09,530

soak it up

5124

06:09:13,730 --> 06:09:12,230

and our two space Walkers Frank Rubio

5125

06:09:15,708 --> 06:09:13,740

and Josh hassetta getting a moment

5126  
06:09:17,510 --> 06:09:15,718  
catching their breath before we head

5127  
06:09:18,948 --> 06:09:17,520  
into eclipse and we can give them the

5128  
06:09:21,288 --> 06:09:18,958  
green light to start finishing this

5129  
06:09:23,030 --> 06:09:21,298  
cable routing I will head into the

5130  
06:09:26,030 --> 06:09:23,040  
eclipse then we'll wait about two

5131  
06:09:28,610 --> 06:09:26,040  
minutes until we get them to go and the

5132  
06:09:32,510 --> 06:09:28,620  
clock will be ticking they'll have

5133  
06:09:35,690 --> 06:09:32,520  
a little less than 30 minutes total to

5134  
06:09:37,970 --> 06:09:35,700  
complete as we need to essentially stop

5135  
06:09:40,490 --> 06:09:37,980  
any work if we're not done before the

5136  
06:09:42,890 --> 06:09:40,500  
eclipse is over and the Sun starts

5137  
06:09:45,890 --> 06:09:42,900  
coming up but they already knocked out

5138  
06:09:47,690 --> 06:09:45,900

some of the initial cable routing that's

5139

06:09:50,390 --> 06:09:47,700

going to be on their task they made it

5140

06:09:51,770 --> 06:09:50,400

all of the four connections to the irosa

5141

06:09:54,650 --> 06:09:51,780

panel itself

5142

06:09:57,910 --> 06:09:54,660

so they'll just have a handful of four

5143

06:10:02,150 --> 06:09:57,920

different connections to make to the

5144

06:10:05,810 --> 06:10:02,160

existing solar array panels and then two

5145

06:10:08,530 --> 06:10:05,820

final connections to integrate on both

5146

06:10:12,350 --> 06:10:08,540

the existing solar rays and the newly

5147

06:10:15,170 --> 06:10:12,360

installed internet hirosa

5148

06:10:16,310 --> 06:10:15,180

integrate them together into the 4A

5149

06:10:18,048 --> 06:10:16,320

power Channel

5150

06:10:19,850 --> 06:10:18,058

and so all that's going to be coming up

5151  
06:10:21,230 --> 06:10:19,860  
in a couple of minutes we should get our

5152  
06:10:23,810 --> 06:10:21,240  
KU

5153  
06:10:25,970 --> 06:10:23,820  
um our our our high data raid signal

5154  
06:10:29,570 --> 06:10:25,980  
which allows us to get that live video

5155  
06:10:31,788 --> 06:10:29,580  
in just a minute or so and we'll get

5156  
06:10:34,788 --> 06:10:31,798  
back over the shoulders of Frank Rubio

5157  
06:10:37,250 --> 06:10:34,798  
Josh Cassidy four hours 51 minutes 28

5158  
06:11:26,930 --> 06:10:37,260  
seconds and counting into today's space

5159  
06:11:36,048 --> 06:11:28,970  
guys we're back with you now and we've

5160  
06:11:40,430 --> 06:11:38,030  
okay coffee

5161  
06:11:42,830 --> 06:11:40,440  
doctor

5162  
06:11:45,310 --> 06:11:42,840  
and we still have another five minutes

5163  
06:11:48,110 --> 06:11:45,320

um Josh if you're in a decent position

5164

06:11:50,690 --> 06:11:48,120

uh teams on the ground would like to get

5165

06:11:53,510 --> 06:11:50,700

a heck of view of your load alleviating

5166

06:11:55,368 --> 06:11:53,520

strap on your red reel

5167

06:11:56,810 --> 06:11:55,378

um in some of the video frames before we

5168

06:12:01,970 --> 06:11:56,820

thought we saw some red stitching

5169

06:12:05,708 --> 06:12:04,548

yeah there's a tiny bit uh showing maybe

5170

06:12:08,990 --> 06:12:05,718

about

5171

06:12:10,070 --> 06:12:09,000

uh two millimeters three millimeters

5172

06:12:12,708 --> 06:12:10,080

um

5173

06:12:13,850 --> 06:12:12,718

super good position right now for for

5174

06:12:15,230 --> 06:12:13,860

work

5175

06:12:16,548 --> 06:12:15,240

um would it be a problem if we just do

5176

06:12:18,410 --> 06:12:16,558

this afterwards

5177

06:12:19,910 --> 06:12:18,420

we will wait

5178

06:12:29,990 --> 06:12:19,920

and we'll take the words in the meantime

5179

06:12:34,910 --> 06:12:32,570

Pauline my tether pack was falling quite

5180

06:12:37,910 --> 06:12:34,920

a bit and so he kept getting hung up on

5181

06:12:41,330 --> 06:12:37,920

the uh Brighton expansion Charlie when

5182

06:13:34,368 --> 06:12:41,340

we were working up there on ffe

5183

06:13:38,868 --> 06:13:37,010

and Josh Frank uh looking at about three

5184

06:13:40,610 --> 06:13:38,878

minutes although we're gonna wait on

5185

06:13:42,230 --> 06:13:40,620

Spartan's go and so we'll get words for

5186

06:13:43,490 --> 06:13:42,240

us it's going to get dark we're gonna

5187

06:13:45,470 --> 06:13:43,500

wait a few more minutes and then we'll

5188

06:13:48,590 --> 06:13:45,480

give you the go to uh start with the

5189

06:13:50,510 --> 06:13:48,600

cable offs the eclipse is almost 30

5190

06:13:58,390 --> 06:13:50,520

minutes long so we've got a lot of time

5191

06:13:58,400 --> 06:15:10,430

that was great thank you for that stuff

5192

06:15:15,770 --> 06:15:13,490

and as we can see through the cameras

5193

06:15:16,788 --> 06:15:15,780

things starting to dim so again we're

5194

06:15:19,190 --> 06:15:16,798

going to wait

5195

06:15:21,650 --> 06:15:19,200

until we're at least about two minutes

5196

06:15:23,570 --> 06:15:21,660

into the eclipse

5197

06:15:26,090 --> 06:15:23,580

Spartan flight controller responsible

5198

06:15:28,310 --> 06:15:26,100

for the electrical Power Systems aboard

5199

06:15:31,310 --> 06:15:28,320

the station I'll do some safing

5200

06:15:33,830 --> 06:15:31,320

commanding and then the astronauts will

5201

06:15:35,270 --> 06:15:33,840

get the go to start mating these

5202

06:15:38,810 --> 06:15:35,280

different cables so they've already

5203

06:15:41,090 --> 06:15:38,820

connected the cables to the irosa

5204

06:15:45,368 --> 06:15:41,100

connections those were done ahead of

5205

06:15:49,850 --> 06:15:47,690

so it'll be coming up next is

5206

06:15:52,070 --> 06:15:49,860

essentially installing jumper cables

5207

06:15:55,070 --> 06:15:52,080

they're going to be connecting

5208

06:15:59,690 --> 06:15:57,948

uh two different points on a panel for

5209

06:16:01,490 --> 06:15:59,700

the solar array wing

5210

06:16:03,708 --> 06:16:01,500

and then having this jumper cable

5211

06:16:07,190 --> 06:16:03,718

installed and then those are all going

5212

06:16:09,350 --> 06:16:07,200

to then get tied in to the irosa cables

5213

06:16:11,810 --> 06:16:09,360

which then get tied into the ultimate

5214

06:16:15,350 --> 06:16:11,820

power panel which will then safely

5215

06:16:18,708 --> 06:16:15,360

integrate both the existing arrays and

5216

06:16:57,288 --> 06:16:18,718

this new solar in the new irosa into the

5217

06:17:01,730 --> 06:16:59,510

okay Josh Frank appreciate your patience

5218

06:17:04,548 --> 06:17:01,740

you are a go to start working the cables

5219

06:17:07,788 --> 06:17:04,558

uh Frank that's going to be a demate of

5220

06:17:16,548 --> 06:17:07,798

p7 from panel p7

5221

06:17:20,448 --> 06:17:18,470

7

5222

06:17:22,970 --> 06:17:20,458

from town

5223

06:17:30,190 --> 06:17:22,980

87 that is disconnected

5224

06:17:30,200 --> 06:17:34,570

P9 is the native

5225

06:17:34,580 --> 06:17:38,510

is going to the panel

5226  
06:17:42,708 --> 06:17:39,830  
copy

5227  
06:17:50,510 --> 06:17:42,718  
59 good demate from panel P9 you're

5228  
06:17:50,520 --> 06:17:55,670  
00

5229  
06:17:59,270 --> 06:17:56,868  
copy

5230  
06:18:01,610 --> 06:17:59,280  
hey no fraud

5231  
06:18:05,330 --> 06:18:01,620  
ible

5232  
06:18:07,128 --> 06:18:05,340  
and good EMR around

5233  
06:18:13,430 --> 06:18:07,138  
the same

5234  
06:18:13,440 --> 06:18:41,510  
got the good checks both go to mate

5235  
06:18:49,490 --> 06:18:45,770  
hi become an office made it there

5236  
06:18:52,690 --> 06:18:49,500  
proper seven and I had a great click

5237  
06:18:59,448 --> 06:18:57,650  
good mate for p7 Alpha to panel p7 and

5238  
06:19:03,110 --> 06:18:59,458

it was quick to the hard stop so you're

5239

06:19:11,390 --> 06:19:03,120

good to mate j7 Alpha to the array cable

5240

06:19:11,400 --> 06:19:42,770

uh

5241

06:19:42,780 --> 06:20:54,770

um

5242

06:20:54,780 --> 06:20:58,610

and they're just working through some

5243

06:21:04,070 --> 06:21:01,310

it's getting memory on this table here

5244

06:21:30,230 --> 06:21:04,080

I'll keep you posted

5245

06:21:35,448 --> 06:21:33,590

okay I got P9 Alpha mated

5246

06:21:38,930 --> 06:21:35,458

if you have a good details it does not

5247

06:21:43,070 --> 06:21:40,670

just for the hard stuff so it sounds

5248

06:21:45,830 --> 06:21:43,080

like you got a good mate on P9 Alpha to

5249

06:22:06,948 --> 06:21:45,840

panel P9 so now you're working j9 Alpha

5250

06:22:10,730 --> 06:22:08,570

okay

5251

06:22:12,670 --> 06:22:10,740

open pins

5252

06:22:17,390 --> 06:22:12,680

outside

5253

06:22:24,410 --> 06:22:17,400

and good Ami band on the star cable

5254

06:22:32,410 --> 06:22:27,110

copy a good mate on j7 Alpha to pop

5255

06:22:38,570 --> 06:22:35,570

rotation all the way around I could pins

5256

06:22:40,788 --> 06:22:38,580

pretty in my band no problem

5257

06:22:47,090 --> 06:22:40,798

okay Frank with that your go to dmate

5258

06:22:47,100 --> 06:23:01,190

of it

5259

06:23:08,510 --> 06:23:06,350

I have uh off of 21 also with

5260

06:23:11,390 --> 06:23:08,520

good things

5261

06:23:13,970 --> 06:23:11,400

pretty in my bands and no far going to

5262

06:23:45,708 --> 06:23:13,980

call the 21 Channel 21.

5263

06:23:49,970 --> 06:23:48,170

so we're coming up on five hours five

5264

06:23:53,628 --> 06:23:49,980

minutes into today's space walk the

5265

06:23:56,090 --> 06:23:53,638

cable routing is still underway

5266

06:23:59,208 --> 06:23:56,100

again all of this being done to to

5267

06:24:01,310 --> 06:23:59,218

integrate both the new ibrose array and

5268

06:24:03,288 --> 06:24:01,320

the existing solar array into

5269

06:24:06,830 --> 06:24:03,298

essentially the same power connection to

5270

06:24:09,230 --> 06:24:06,840

provide a power on this 4A Channel

5271

06:24:11,628 --> 06:24:09,240

there's four total connections that were

5272

06:24:13,010 --> 06:24:11,638

made to the new array

5273

06:24:15,170 --> 06:24:13,020

and then

5274

06:24:18,530 --> 06:24:15,180

after we were able to complete that

5275

06:24:20,510 --> 06:24:18,540

prior to an eclipse now that we're in

5276

06:24:22,250 --> 06:24:20,520

Eclipse we're able to start making the

5277

06:24:23,868 --> 06:24:22,260

connections to the existing arrays and

5278

06:24:26,030 --> 06:24:23,878

then tying them together to the panels

5279

06:24:29,650 --> 06:24:26,040

so those first four were already knocked

5280

06:24:37,368 --> 06:24:33,350

the first time but I got it now

5281

06:24:41,150 --> 06:24:37,378

Dr Josh good mate on j9 Alpha to P9

5282

06:24:47,730 --> 06:24:41,160

so you are good to uh demate Papa 23

5283

06:24:47,740 --> 06:25:02,570

[Applause]

5284

06:25:06,650 --> 06:25:05,270

I'm just looking at p24 here do you want

5285

06:25:11,830 --> 06:25:06,660

that horizontal

5286

06:25:16,610 --> 06:25:15,230

yes but we'd like you to focus on mating

5287

06:25:22,090 --> 06:25:16,620

the cables first and we'll clean up

5288

06:25:27,288 --> 06:25:25,250

all right p23 Alpha

5289

06:25:35,270 --> 06:25:27,298

sitting in my van

5290

06:25:35,280 --> 06:25:42,110

and then a shortcom hand over right now

5291

06:25:46,070 --> 06:25:44,330

sure com hand over so we'll get that

5292

06:25:49,490 --> 06:25:46,080

signal back so they're continuing to

5293

06:25:51,650 --> 06:25:49,500

step through uh this final cable mating

5294

06:25:53,030 --> 06:25:51,660

cable connections um to integrate it so

5295

06:25:55,430 --> 06:25:53,040

essentially what we're doing is we have

5296

06:25:57,530 --> 06:25:55,440

four connections that went into the

5297

06:25:59,330 --> 06:25:57,540

irosa and then we have a series of

5298

06:26:02,090 --> 06:25:59,340

jumper cables that are going in between

5299

06:26:05,390 --> 06:26:02,100

the existing connections between the

5300

06:26:07,490 --> 06:26:05,400

Legacy array and the power panels so

5301  
06:26:09,530 --> 06:26:07,500  
they've made four connections to the new

5302  
06:26:12,410 --> 06:26:09,540  
iro survey and then a total of eight

5303  
06:26:15,230 --> 06:26:12,420  
connections are going to jumper them in

5304  
06:26:16,970 --> 06:26:15,240  
and continue to connect the the Legacy

5305  
06:26:18,530 --> 06:26:16,980  
solar arrays as they were there were

5306  
06:26:23,930 --> 06:26:18,540  
four

5307  
06:26:25,310 --> 06:26:23,940  
to the panels themselves so to put a

5308  
06:26:28,368 --> 06:26:25,320  
jumper between all of those we're

5309  
06:26:30,948 --> 06:26:28,378  
looking at eight so all told we're gonna

5310  
06:26:32,270 --> 06:26:30,958  
be making 12 connections today four of

5311  
06:26:47,410 --> 06:26:32,280  
those were knocked out before eclipse

5312  
06:26:53,570 --> 06:26:50,628  
Alpha and I had a good click

5313  
06:26:54,708 --> 06:26:53,580

yep copy that Frank and and Frank you're

5314

06:26:58,250 --> 06:26:54,718

right there

5315

06:27:00,770 --> 06:26:58,260

um the papa 22 on the panel that tab is

5316

06:27:03,590 --> 06:27:00,780

is uh not horizontal if you can lock it

5317

06:27:08,990 --> 06:27:05,810

okay yep that's good okay so now you're

5318

06:27:14,270 --> 06:27:11,800

sorry Papa doesn't uh

5319

06:27:15,650 --> 06:27:14,280

[Music]

5320

06:27:18,110 --> 06:27:15,660

did not set up a good click and I see

5321

06:27:19,910 --> 06:27:18,120

the blue so you want to get picked up

5322

06:27:22,190 --> 06:27:19,920

no you got to do a hard stop so it's a

5323

06:27:27,650 --> 06:27:22,200

good mate

5324

06:27:36,548 --> 06:27:31,548

okay say Frank you're working Julia 23

5325

06:27:47,510 --> 06:27:39,650

21 my bad reading the wrong columns

5326

06:27:53,628 --> 06:27:50,628

all right Alpha 23 Alpha is made it

5327

06:27:57,708 --> 06:27:53,638

did get a First Connect there it just

5328

06:28:00,110 --> 06:27:57,718

wasn't quite as uh convincing as P9 but

5329

06:28:01,850 --> 06:28:00,120

it definitely you can see I cannot undo

5330

06:28:06,650 --> 06:28:01,860

it

5331

06:28:06,660 --> 06:28:10,250

okay

5332

06:28:10,260 --> 06:28:16,670

all right

5333

06:28:22,610 --> 06:28:20,510

and understand p23 from the saw after

5334

06:28:28,090 --> 06:28:22,620

this last remaining one

5335

06:28:28,100 --> 06:28:35,948

[Applause]

5336

06:28:35,958 --> 06:28:42,170

BMI bands here um

5337

06:29:09,650 --> 06:28:44,510

[Applause]

5338

06:29:19,910 --> 06:29:13,570

okay there's p23 saw

5339

06:29:24,590 --> 06:29:22,850

and just looking at these black lines

5340

06:29:26,810 --> 06:29:24,600

you can see the black lines all line up

5341

06:29:30,948 --> 06:29:26,820

on e23

5342

06:29:33,110 --> 06:29:30,958

yes you have like more of a turn there

5343

06:29:36,048 --> 06:29:33,120

if you see it

5344

06:29:38,030 --> 06:29:36,058

yep we uh we see that in uh hecca Josh

5345

06:29:40,190 --> 06:29:38,040

and the black lines are are rough guide

5346

06:29:41,390 --> 06:29:40,200

It's the Hard stop that is is what

5347

06:29:42,708 --> 06:29:41,400

counts

5348

06:29:44,270 --> 06:29:42,718

um with that we show all four

5349

06:29:46,430 --> 06:29:44,280

connections are good for you if you

5350

06:29:48,350 --> 06:29:46,440

wanted to double check that the uh two

5351  
06:29:50,570 --> 06:29:48,360  
that we did not touch on the panel that

5352  
06:29:53,990 --> 06:29:50,580  
those saw tabs on the connectors are

5353  
06:29:57,470 --> 06:29:55,310  
yeah

5354  
06:29:58,548 --> 06:29:57,480  
um I'm happy to do that p24 to come

5355  
06:30:00,170 --> 06:29:58,558  
horizontal actually comes

5356  
06:30:05,570 --> 06:30:00,180  
counterclockwise is that really what you

5357  
06:30:10,070 --> 06:30:07,970  
see if I go clockwise it's not going any

5358  
06:30:13,850 --> 06:30:10,080  
further yep clockwise to a hard stop

5359  
06:30:19,490 --> 06:30:17,390  
I I didn't do the hard stuff for p24 but

5360  
06:30:21,410 --> 06:30:19,500  
um it is more than clockwise so it is

5361  
06:30:23,570 --> 06:30:21,420  
not horizontal but I think that's what

5362  
06:30:25,788 --> 06:30:23,580  
you want

5363  
06:30:27,350 --> 06:30:25,798

okay uh coffee we're good with those

5364

06:30:30,048 --> 06:30:27,360

checks so that looks like a good cable

5365

06:30:34,070 --> 06:30:31,850

okay

5366

06:30:36,650 --> 06:30:34,080

so the next step Josh would just be

5367

06:30:44,990 --> 06:30:36,660

tidying up the slack on those remaining

5368

06:30:48,830 --> 06:30:47,510

20 years later because Julia 21 Alpha I

5369

06:30:50,570 --> 06:30:48,840

wasn't getting a quote but I think I

5370

06:30:52,310 --> 06:30:50,580

just wasn't feeling it

5371

06:30:55,730 --> 06:30:52,320

I felt that that last time there good

5372

06:30:58,548 --> 06:30:55,740

connection okay copy good mate on j21

5373

06:31:00,350 --> 06:30:58,558

Alpha the p21 so you'll work the same

5374

06:31:02,810 --> 06:31:00,360

just trying to tidy up any of the cable

5375

06:31:10,570 --> 06:31:02,820

slacks

5376  
06:31:16,430 --> 06:31:13,788  
and with Frank Rubio calling out that

5377  
06:31:18,410 --> 06:31:16,440  
last one that Julia 21 Alpha that was

5378  
06:31:20,030 --> 06:31:18,420  
the eighth and final connection we were

5379  
06:31:22,850 --> 06:31:20,040  
looking to make during the eclipse

5380  
06:31:25,010 --> 06:31:22,860  
period so as right now looks like all

5381  
06:31:27,590 --> 06:31:25,020  
power connections to integrate the new

5382  
06:31:29,750 --> 06:31:27,600  
iros that have been done successfully so

5383  
06:31:32,628 --> 06:31:29,760  
without the crew is going to get the go

5384  
06:31:35,750 --> 06:31:32,638  
to just start cleaning up some of the

5385  
06:31:38,150 --> 06:31:35,760  
extra slack on these cables uh just

5386  
06:31:39,708 --> 06:31:38,160  
making sure they're not free-floating

5387  
06:31:41,930 --> 06:31:39,718  
too much they've got a series of wire

5388  
06:31:45,170 --> 06:31:41,940

ties and other means to secure them in

5389

06:31:47,208 --> 06:31:45,180

place and after that they'll likely do

5390

06:31:49,430 --> 06:31:47,218

another what we call glove hap and

5391

06:31:54,170 --> 06:31:49,440

Gauntlet check

5392

06:31:54,180 --> 06:31:58,910

and it looks beautiful

5393

06:31:58,920 --> 06:32:03,430

okay

5394

06:32:12,170 --> 06:32:07,128

so Josh uh since you finished that up uh

5395

06:32:17,208 --> 06:32:13,850

okay

5396

06:32:21,530 --> 06:32:17,218

no change to gloves

5397

06:32:24,890 --> 06:32:22,850

and

5398

06:32:27,830 --> 06:32:24,900

chocolate

5399

06:32:29,628 --> 06:32:27,840

are covered

5400

06:32:32,990 --> 06:32:29,638

where the gauntlets are covering the uh

5401

06:32:36,048 --> 06:32:33,000

the restraint I might have the address

5402

06:32:37,250 --> 06:32:36,058

okay copy Josh those are good checks and

5403

06:32:39,590 --> 06:32:37,260

uh

5404

06:32:42,048 --> 06:32:39,600

that finishes up the cablemate activity

5405

06:32:44,270 --> 06:32:42,058

next will be deployment so you're gonna

5406

06:32:49,310 --> 06:32:44,280

move into position to be able to drive

5407

06:32:53,990 --> 06:32:52,128

okay sounds good

5408

06:32:55,128 --> 06:32:54,000

all right next uh cables are kind of

5409

06:32:57,110 --> 06:32:55,138

clouded up here

5410

06:33:00,410 --> 06:32:57,120

uh did you guys get the views you needed

5411

06:33:04,128 --> 06:33:02,390

everybody down here is very happy Frank

5412

06:33:06,048 --> 06:33:04,138

so

5413

06:33:15,250 --> 06:33:06,058

um I'll take a glove half and Gauntlet

5414

06:33:24,708 --> 06:33:19,548

uh on my left glove my ring finger I've

5415

06:33:29,150 --> 06:33:26,750

the um

5416

06:33:31,730 --> 06:33:29,160

proper that's making but it's

5417

06:33:33,470 --> 06:33:31,740

um the tiny chip and everything beneath

5418

06:33:35,150 --> 06:33:33,480

it is intact

5419

06:33:37,070 --> 06:33:35,160

for the return

5420

06:33:40,128 --> 06:33:37,080

and otherwise guards are a little bit

5421

06:33:42,770 --> 06:33:40,138

dirtier but uh no changes

5422

06:33:49,128 --> 06:33:42,780

and

5423

06:33:52,128 --> 06:33:49,138

covering what they need to cover

5424

06:33:55,310 --> 06:33:52,138

got the all Frank and uh with that if

5425

06:33:58,490 --> 06:33:55,320

you want to maneuver into position to

5426  
06:34:01,250 --> 06:33:58,500  
observe the tower magnets on your side

5427  
06:34:04,010 --> 06:34:01,260  
of the boom so that we can see that when

5428  
06:34:06,708 --> 06:34:04,020  
we do the deploy

5429  
06:34:10,310 --> 06:34:06,718  
come on

5430  
06:34:19,910 --> 06:34:10,320  
Target handrail is on

5431  
06:34:19,920 --> 06:34:39,410  
okay

5432  
06:34:43,670 --> 06:34:41,810  
and uh just to let you guys know we've

5433  
06:34:46,250 --> 06:34:43,680  
got about 10 minutes left in the eclipse

5434  
06:34:48,170 --> 06:34:46,260  
so as usual you're making it look easy

5435  
06:34:50,208 --> 06:34:48,180  
and getting done ahead of time so we'll

5436  
06:34:52,610 --> 06:34:50,218  
get you into position and then we'll

5437  
06:34:58,970 --> 06:34:52,620  
we'll wait for the sun to come up

5438  
06:34:58,980 --> 06:35:04,750

[Music]

5439

06:35:04,760 --> 06:35:17,030

we will uh deploy in sunlight

5440

06:35:22,490 --> 06:35:20,628

yes at 5203 correct

5441

06:35:24,410 --> 06:35:22,500

p201 is what I called out but you're

5442

06:35:26,270 --> 06:35:24,420

looking to get into your call for a good

5443

06:35:28,730 --> 06:35:26,280

position to look back and see that base

5444

06:35:34,868 --> 06:35:28,740

of the uh boom as it deploys and you see

5445

06:35:34,878 --> 06:35:51,610

better off

5446

06:35:51,620 --> 06:35:57,048

yeah we'll go with 5202

5447

06:35:57,058 --> 06:36:06,250

copy

5448

06:36:11,690 --> 06:36:08,810

and with all of those cable connections

5449

06:36:13,490 --> 06:36:11,700

made successfully to space Walkers Frank

5450

06:36:16,368 --> 06:36:13,500

Rubio Josh castle and now we're going to

5451  
06:36:19,910 --> 06:36:16,378  
get into position to release the final

5452  
06:36:22,910 --> 06:36:19,920  
launch restraints and deploy the iros of

5453  
06:36:29,810 --> 06:36:22,920  
solar array so screaming so I can

5454  
06:36:33,470 --> 06:36:31,910  
so once they do get in position Joss

5455  
06:36:35,628 --> 06:36:33,480  
cassid is going to break out the pistol

5456  
06:36:38,990 --> 06:36:35,638  
grip tool again and then we'll have two

5457  
06:36:41,690 --> 06:36:39,000  
restraint bolts R9 and r10

5458  
06:36:44,448 --> 06:36:41,700  
to release and after those are fully

5459  
06:36:47,448 --> 06:36:44,458  
released gyrosa will start to unfurl

5460  
06:36:49,730 --> 06:36:47,458  
itself just using the stored energy in

5461  
06:36:52,310 --> 06:36:49,740  
the solar array itself

5462  
06:36:54,708 --> 06:36:52,320  
so no mechanism other than releasing

5463  
06:36:56,448 --> 06:36:54,718

those bolts for Frank Rubio is going to

5464

06:36:58,730 --> 06:36:56,458

get into a position just to monitor the

5465

06:37:00,350 --> 06:36:58,740

deploy and get a good view from his

5466

06:37:02,628 --> 06:37:00,360

helmet camera on the ground there will

5467

06:37:06,230 --> 06:37:02,638

be several cameras pointed at the deploy

5468

06:37:07,970 --> 06:37:06,240

as teams watch it on furl uh we're going

5469

06:37:10,788 --> 06:37:07,980

to be paying special attention to the

5470

06:37:13,490 --> 06:37:10,798

two booms really the structural support

5471

06:37:16,850 --> 06:37:13,500

on either side of the solar array

5472

06:37:24,288 --> 06:37:20,330

this one's another Bravo 7 is there

5473

06:37:36,230 --> 06:37:24,298

affirmative Bravo 7 counter clockwise

5474

06:37:41,448 --> 06:37:39,530

and yeah and we're uh we've got uh about

5475

06:37:44,030 --> 06:37:41,458

seven minutes of uh

5476  
06:37:45,770 --> 06:37:44,040  
probably about nine minutes of eclipse

5477  
06:37:48,470 --> 06:37:45,780  
left and then Spartan's gonna have to

5478  
06:37:50,570 --> 06:37:48,480  
run some checks before uh we give you

5479  
06:37:53,510 --> 06:37:50,580  
the go once the sun's come up so there's

5480  
06:37:53,520 --> 06:38:02,390  
thanks

5481  
06:38:06,590 --> 06:38:04,430  
the Ruby on Council are continuing to

5482  
06:38:08,510 --> 06:38:06,600  
work incredibly efficiently so far

5483  
06:38:09,530 --> 06:38:08,520  
they've been moving to reach of the

5484  
06:38:12,110 --> 06:38:09,540  
tasks

5485  
06:38:13,850 --> 06:38:12,120  
on completing them all a little bit

5486  
06:38:15,708 --> 06:38:13,860  
ahead of time we've had a couple of

5487  
06:38:18,110 --> 06:38:15,718  
Weights just because of eclipse

5488  
06:38:19,250 --> 06:38:18,120

conditions and now we're going to be

5489

06:38:21,470 --> 06:38:19,260

doing the opposite we're going to wait

5490

06:38:23,868 --> 06:38:21,480

until the sun comes up to deploy the

5491

06:38:26,270 --> 06:38:23,878

boom because enough

5492

06:38:28,730 --> 06:38:26,280

good views to confirm that it's

5493

06:38:31,010 --> 06:38:28,740

deploying

5494

06:38:32,570 --> 06:38:31,020

read a warning to you so prior to

5495

06:38:34,490 --> 06:38:32,580

releasing the deployment launch

5496

06:38:46,610 --> 06:38:34,500

restraint votes positioned to stay clear

5497

06:38:46,620 --> 06:38:55,788

I don't go skill on that Legacy array

5498

06:39:05,448 --> 06:38:58,610

it's definitely not Center about

5499

06:39:42,970 --> 06:39:07,730

okay

5500

06:39:48,948 --> 06:39:45,830

so at this point we've got about another

5501  
06:39:52,128 --> 06:39:48,958  
five minute wait at least until we're

5502  
06:39:54,410 --> 06:39:52,138  
starting to get out of the eclipse

5503  
06:39:56,628 --> 06:39:54,420  
and then the Spartan flight controller

5504  
06:39:58,788 --> 06:39:56,638  
here in Mission Control Houston going to

5505  
06:40:01,368 --> 06:39:58,798  
run a couple of quick power checks

5506  
06:40:03,830 --> 06:40:01,378  
so again we made all of the necessary

5507  
06:40:05,390 --> 06:40:03,840  
connections to start to integrate the

5508  
06:40:06,948 --> 06:40:05,400  
new solar array into the electrical

5509  
06:40:10,368 --> 06:40:06,958  
power system so they'll check it out

5510  
06:40:12,350 --> 06:40:10,378  
before we give the crew the go to

5511  
06:40:15,590 --> 06:40:12,360  
actually release those launch restraint

5512  
06:40:16,930 --> 06:40:15,600  
bolts and let the roll of solar array

5513  
06:40:20,030 --> 06:40:16,940

unroll

5514

06:40:23,030 --> 06:40:20,040

after that we will essentially be done

5515

06:40:25,368 --> 06:40:23,040

for the day at least on the plan task

5516

06:40:27,470 --> 06:40:25,378

timeline there will be some additional

5517

06:40:29,270 --> 06:40:27,480

cleanup steps both with the robotic arm

5518

06:40:31,788 --> 06:40:29,280

and all the gear that they brought out

5519

06:40:33,650 --> 06:40:31,798

with them we were able to see them again

5520

06:40:37,850 --> 06:40:33,660

at least a little bit of that done

5521

06:40:40,430 --> 06:40:37,860

wrangling the pretty big mass of cables

5522

06:40:42,288 --> 06:40:40,440

connectors and other items into a cable

5523

06:40:45,350 --> 06:40:42,298

bag to get ready to bring back inside

5524

06:40:47,510 --> 06:40:45,360

and then we'll stand by to hear if we're

5525

06:40:48,708 --> 06:40:47,520

going to be attempting any get aheads

5526  
06:40:51,048 --> 06:40:48,718  
for today

5527  
06:40:53,750 --> 06:40:51,058  
or if the crew will get the go to just

5528  
06:40:55,910 --> 06:40:53,760  
head back inside so all of that still to

5529  
06:40:58,190 --> 06:40:55,920  
come uh probably one of the most visual

5530  
06:41:00,948 --> 06:40:58,200  
moments of the spacewalk though coming

5531  
06:41:03,650 --> 06:41:00,958  
up with the deployment of this irosa

5532  
06:41:07,490 --> 06:41:03,660  
solar array and this is the fourth of

5533  
06:41:10,150 --> 06:41:07,500  
six planned additional arrays to augment

5534  
06:41:14,030 --> 06:41:10,160  
the station power system where

5535  
06:41:15,650 --> 06:41:14,040  
increasing the amount of electrical of

5536  
06:41:18,230 --> 06:41:15,660  
electricity that we're generating by

5537  
06:41:20,930 --> 06:41:18,240  
about 30 percent once all of these are

5538  
06:41:23,270 --> 06:41:20,940

deployed and as they are new arrays are

5539

06:41:25,970 --> 06:41:23,280

coming in with a brand new efficiency

5540

06:41:27,650 --> 06:41:25,980

all these focused on just continuing to

5541

06:41:30,110 --> 06:41:27,660

provide energy for existing station

5542

06:41:32,030 --> 06:41:30,120

Hardware experiments but also with an

5543

06:41:35,330 --> 06:41:32,040

eye to the Future as we're operating

5544

06:41:38,030 --> 06:41:35,340

through at least 20 30 to continue to

5545

06:41:40,670 --> 06:41:38,040

support new commercial modules things of

5546

06:41:42,470 --> 06:41:40,680

that nature all bound for the station in

5547

06:41:44,930 --> 06:41:42,480

the years to come so really critical

5548

06:41:47,208 --> 06:41:44,940

infrastructure upgrades this will be the

5549

06:41:50,750 --> 06:41:47,218

fourth of six as I mentioned we'll look

5550

06:41:52,670 --> 06:41:50,760

for the fifth and 6 to fly as soon as

5551  
06:41:54,948 --> 06:41:52,680  
next year to complete the full power

5552  
06:41:57,650 --> 06:41:54,958  
upgrade but for now

5553  
06:42:01,310 --> 06:41:57,660  
standing by for a few more minutes until

5554  
06:42:04,010 --> 06:42:01,320  
we get to the actual deployment phase

5555  
06:42:06,890 --> 06:42:04,020  
everything has been completed so far in

5556  
06:42:09,410 --> 06:42:06,900  
the timeline they went out the door just

5557  
06:42:11,090 --> 06:42:09,420  
five hours 23 minutes ago and turned

5558  
06:42:14,350 --> 06:42:11,100  
their suits to battery power starting

5559  
06:42:18,170 --> 06:42:14,360  
our spacewalk able to do all of the

5560  
06:42:20,150 --> 06:42:18,180  
pre-steps to get the irosa ready to get

5561  
06:42:22,548 --> 06:42:20,160  
extracted from its temporary holding

5562  
06:42:24,530 --> 06:42:22,558  
Point releasing a number of support

5563  
06:42:28,128 --> 06:42:24,540

beams that we're holding it in place

5564

06:42:29,628 --> 06:42:28,138

before Josh cassida

5565

06:42:38,270 --> 06:42:29,638

nope

5566

06:42:44,530 --> 06:42:40,670

I should say yes everything's good out

5567

06:43:40,430 --> 06:42:47,270

emu's are just the most amazing little

5568

06:43:45,470 --> 06:43:42,410

but again we're just standing by for a

5569

06:43:47,570 --> 06:43:45,480

couple more minutes both Frank Rubio and

5570

06:43:51,470 --> 06:43:47,580

Josh Cassidy in position

5571

06:43:53,930 --> 06:43:51,480

to get ready for this irosa deployment

5572

06:43:56,448 --> 06:43:53,940

it's going to be Jazz cut Josh cassida

5573

06:43:58,250 --> 06:43:56,458

with the pistol grip tool once more he's

5574

06:44:08,810 --> 06:43:58,260

going to be releasing the two restraint

5575

06:44:08,820 --> 06:44:16,670

the view is starting to look good

5576  
06:44:20,750 --> 06:44:19,190  
you guys just need to enjoy the sunrise

5577  
06:44:22,490 --> 06:44:20,760  
should be in about a minute and then

5578  
06:44:26,810 --> 06:44:22,500  
we're going to have a a couple minutes

5579  
06:44:26,820 --> 06:45:29,930  
of course

5580  
06:45:34,850 --> 06:45:31,910  
right now we're looking through the

5581  
06:45:37,190 --> 06:45:34,860  
helmet cam of Frank Rubio Evo on our

5582  
06:45:39,170 --> 06:45:37,200  
lead space walker for the day just at

5583  
06:45:41,750 --> 06:45:39,180  
the very bottom you can see

5584  
06:45:43,430 --> 06:45:41,760  
that thin line of blue the limb of the

5585  
06:45:49,810 --> 06:45:43,440  
earth starting to illuminate as we move

5586  
06:45:55,368 --> 06:45:52,368  
and then after a couple minutes we'll be

5587  
06:45:57,948 --> 06:45:55,378  
in full sunlight again as we run a

5588  
06:45:59,270 --> 06:45:57,958

couple of quick tests by the Spartan

5589

06:46:01,570 --> 06:45:59,280

flight controller here measure control

5590

06:46:04,548 --> 06:46:01,580

will be ready to start stepping through

5591

06:46:07,788 --> 06:46:04,558

the deployment phase getting Iris

5592

06:46:10,788 --> 06:46:07,798

unfurled and one step closer to being a

5593

06:46:36,948 --> 06:46:10,798

new Full addition to the electrical

5594

06:46:42,288 --> 06:46:39,650

and as we continue to look through Frank

5595

06:46:43,610 --> 06:46:42,298

Rubio's helmet camera you might be

5596

06:46:44,690 --> 06:46:43,620

wondering why it looks like Christmas

5597

06:46:46,968 --> 06:46:44,700

lights

5598

06:46:50,090 --> 06:46:46,978

speckled throughout the view those are

5599

06:46:52,610 --> 06:46:50,100

actually dead pixels from the image

5600

06:46:54,410 --> 06:46:52,620

sensor in the helmet cam as a different

5601  
06:46:56,208 --> 06:46:54,420  
photographic equipment on board the

5602  
06:46:58,330 --> 06:46:56,218  
space station is exposed to radiation

5603  
06:47:01,968 --> 06:46:58,340  
for longer and longer periods of time

5604  
06:47:05,448 --> 06:47:01,978  
those image sensors can start to degrade

5605  
06:47:07,788 --> 06:47:05,458  
and those typically show up as a dead

5606  
06:47:09,548 --> 06:47:07,798  
pixel so if you're wondering what all

5607  
06:47:12,830 --> 06:47:09,558  
the different multi-colored dots are

5608  
06:47:14,448 --> 06:47:12,840  
that is what you're looking at they've

5609  
06:47:16,190 --> 06:47:14,458  
become very apparent anytime we're

5610  
06:47:18,770 --> 06:47:16,200  
looking at something very dark at night

5611  
06:48:07,930 --> 06:47:18,780  
time but we'll start to get washed out

5612  
06:48:13,788 --> 06:48:11,150  
and this is the view right now from Josh

5613  
06:48:16,610 --> 06:48:13,798

Cassidy's helmet cam he's going to be

5614

06:48:20,208 --> 06:48:16,620

jumping in next to release those two

5615

06:48:21,890 --> 06:48:20,218

launch restraint bolts R9 and r10

5616

06:48:23,510 --> 06:48:21,900

is going to be using his pistol grip

5617

06:48:25,610 --> 06:48:23,520

tool he got those settings you heard

5618

06:48:27,590 --> 06:48:25,620

called down Bravo 7 Cloud

5619

06:48:29,810 --> 06:48:27,600

counterclockwise too

5620

06:48:32,270 --> 06:48:29,820

again on our pistol grip tool we have

5621

06:48:34,128 --> 06:48:32,280

that first value is just how much torque

5622

06:48:35,868 --> 06:48:34,138

you're imparting you've got alpha one

5623

06:48:39,650 --> 06:48:35,878

through seven Bravo one through seven

5624

06:48:43,250 --> 06:48:39,660

Alpha One is the low foot torque as you

5625

06:48:45,708 --> 06:48:43,260

could do 507 the max so he's going to be

5626  
06:48:47,510 --> 06:48:45,718  
maxing out the torque on this one and

5627  
06:48:51,288 --> 06:48:47,520  
then moving it counterclockwise which is

5628  
06:48:56,208 --> 06:48:53,510  
it's uh

5629  
06:48:57,530 --> 06:48:56,218  
okay excitement I'll just stay here

5630  
06:49:00,170 --> 06:48:57,540  
oh yeah

5631  
06:49:05,930 --> 06:49:00,180  
I can't make a shadow puppets during the

5632  
06:49:05,940 --> 06:49:11,390  
you see the spacecraft

5633  
06:49:15,890 --> 06:49:12,948  
apparently I just don't spend any time

5634  
06:49:17,930 --> 06:49:15,900  
okay guys the uh the teams down here

5635  
06:49:20,628 --> 06:49:17,940  
have have given their thumbs up so we're

5636  
06:49:24,048 --> 06:49:20,638  
go to deploy so Josh you're going to

5637  
06:49:28,070 --> 06:49:24,058  
work on R9 and r10 settings are Bravo 7

5638  
06:49:28,080 --> 06:49:32,270

all right we'll start with r10

5639

06:49:36,110 --> 06:49:34,788

and that's Bravo 7 counterclockwise two

5640

06:49:39,170 --> 06:49:36,120

and how many turns are we expecting the

5641

06:49:51,110 --> 06:49:39,180

first concept yeah 17 to 20 and a white

5642

06:49:51,120 --> 06:50:06,410

the last 10 minutes

5643

06:50:10,730 --> 06:50:08,690

all right so this is the view from Frank

5644

06:50:12,410 --> 06:50:10,740

Rubio's helmet camera we can see Josh

5645

06:50:14,750 --> 06:50:12,420

Casa on the left there we're starting to

5646

06:50:18,350 --> 06:50:14,760

work those bolts just in front of him

5647

06:50:20,810 --> 06:50:18,360

the irosa array the center part is where

5648

06:50:22,788 --> 06:50:20,820

the solar cells are contained and then

5649

06:50:24,948 --> 06:50:22,798

that white section you see on the right

5650

06:50:27,708 --> 06:50:24,958

side so that's the boom so it's flat

5651  
06:50:30,170 --> 06:50:27,718  
right now the best way to think of how

5652  
06:50:32,690 --> 06:50:30,180  
the boom deploys and adds that having

5653  
06:50:35,030 --> 06:50:32,700  
that structural support the rigidity

5654  
06:50:38,628 --> 06:50:35,040  
um it functions similar to if you took a

5655  
06:50:44,330 --> 06:50:38,638  
drinking straw here on Earth and cut it

5656  
06:50:47,750 --> 06:50:46,368  
but it actually popped earlier I could

5657  
06:50:50,690 --> 06:50:47,760  
feel it

5658  
06:50:59,090 --> 06:50:50,700  
all right one bolt released

5659  
06:50:59,100 --> 06:51:03,968  
again Bravo seven counterclockwise

5660  
06:51:50,550 --> 06:51:06,708  
second bolt driving once it's released

5661  
06:51:55,548 --> 06:51:51,890  
[Music]

5662  
06:51:55,558 --> 06:52:00,830  
happy we see the release and deployment

5663  
06:52:07,190 --> 06:52:05,270

second bolt release irosa now deploying

5664

06:52:09,410 --> 06:52:07,200

we're gonna see and again there's no

5665

06:52:11,990 --> 06:52:09,420

mechanism to make this unfurl is doing

5666

06:52:16,910 --> 06:52:12,000

it all with the stored energy of the

5667

06:52:21,890 --> 06:52:19,910

in the the white sections you see on

5668

06:52:24,910 --> 06:52:21,900

either side so those are the booms those

5669

06:52:27,830 --> 06:52:24,920

are going to unfurl and tend to curl up

5670

06:52:29,510 --> 06:52:27,840

similar to as we were talking about if

5671

06:52:32,150 --> 06:52:29,520

you were to take a straw cut it

5672

06:52:33,830 --> 06:52:32,160

lengthwise roll it up and then just let

5673

06:52:35,930 --> 06:52:33,840

it go it would naturally just try to

5674

06:52:37,850 --> 06:52:35,940

curve back into that circular structure

5675

06:52:40,010 --> 06:52:37,860

and that's what those booms are going to

5676  
06:52:41,390 --> 06:52:40,020  
be doing there's a series of magnets the

5677  
06:52:44,330 --> 06:52:41,400  
crew is also going to be keeping an eye

5678  
06:52:49,310 --> 06:52:44,340  
on body back about three or four degrees

5679  
06:52:49,320 --> 06:52:54,430  
how's that

5680  
06:53:19,730 --> 06:52:57,048  
that's much better thank you a little

5681  
06:53:24,468 --> 06:53:22,190  
Frank we can just barely make out those

5682  
06:53:28,120 --> 06:53:24,478  
magnets I think all five of them clicked

5683  
06:53:28,130 --> 06:53:50,090  
[Music]

5684  
06:53:50,100 --> 06:53:53,390  
foreign

5685  
06:54:12,230 --> 06:53:55,310  
I finally run that microwave we've been

5686  
06:54:21,410 --> 06:54:14,150  
Nick do you know where we are over the

5687  
06:54:26,868 --> 06:54:23,930  
yeah you're just uh south of Alaska

5688  
06:54:31,788 --> 06:54:26,878

getting ready to go uh do a pass down

5689

06:54:37,070 --> 06:54:35,208

awesome supportive

5690

06:54:40,850 --> 06:54:37,080

you might even be over Houston by the

5691

06:54:40,860 --> 06:55:58,670

that's pretty cool

5692

06:55:58,680 --> 06:56:51,128

wow

5693

06:56:56,990 --> 06:56:54,468

so the array continuing to unfurl this

5694

06:56:59,690 --> 06:56:57,000

the view that Josh Castle is getting

5695

06:57:02,090 --> 06:56:59,700

right now as it referrals away from him

5696

06:57:05,708 --> 06:57:02,100

after he released those two launch

5697

06:57:11,448 --> 06:57:08,468

you can see air traffic

5698

06:57:24,250 --> 06:57:11,458

yeah there's a culture

5699

06:57:28,850 --> 06:57:26,810

and that view from

5700

06:57:30,650 --> 06:57:28,860

Frank Rubio's if you look at the booms

5701  
06:57:33,708 --> 06:57:30,660  
in the side you can see they they kind

5702  
06:57:35,930 --> 06:57:33,718  
of curl up after they continue to deploy

5703  
06:57:38,690 --> 06:57:35,940  
this is a look at the very far and you

5704  
06:57:41,390 --> 06:57:38,700  
can see all the solar cells middle there

5705  
06:57:44,030 --> 06:57:41,400  
and those booms as they continue to

5706  
06:57:45,048 --> 06:57:44,040  
stretch out their essentially snap

5707  
06:57:48,048 --> 06:57:45,058  
together

5708  
06:57:50,090 --> 06:57:48,058  
into that circular structure and then

5709  
06:57:52,310 --> 06:57:50,100  
they have magnets that are helping to

5710  
06:58:34,628 --> 06:57:52,320  
help them maintain that structure one

5711  
06:58:39,890 --> 06:58:37,850  
and Frank Josh while we uh hold position

5712  
06:58:41,868 --> 06:58:39,900  
and wait for the deployment to finish

5713  
06:58:43,548 --> 06:58:41,878

just kind of give you a heads up on the

5714

06:58:45,350 --> 06:58:43,558

way forward at least near-term steps

5715

06:58:47,628 --> 06:58:45,360

we've got the tensioner bolts that we're

5716

06:58:49,730 --> 06:58:47,638

going to do and then we'll move in to

5717

06:58:52,190 --> 06:58:49,740

kind of cleaning up the scoop and the

5718

06:58:55,010 --> 06:58:52,200

cable bag and then we'll focus on trying

5719

06:58:59,330 --> 06:58:55,020

to get the arm clean and FSC in a good

5720

06:58:59,340 --> 06:59:10,310

okay sounds great copy that

5721

06:59:10,320 --> 06:59:24,650

uh

5722

06:59:29,208 --> 06:59:26,990

we're continuing to watch as these

5723

06:59:31,610 --> 06:59:29,218

unfurl again as you can see they're

5724

06:59:33,288 --> 06:59:31,620

covering up some of the uh the solar

5725

06:59:35,448 --> 06:59:33,298

cells on the existing arrays which are

5726

06:59:37,250 --> 06:59:35,458

still tied in to the power Channel but

5727

06:59:39,530 --> 06:59:37,260

uh these new ones coming in with a

5728

06:59:41,090 --> 06:59:39,540

higher efficiency obviously brand new so

5729

06:59:43,490 --> 06:59:41,100

I haven't lost any of that efficiency

5730

06:59:45,650 --> 06:59:43,500

that you lose over time and being

5731

06:59:47,810 --> 06:59:45,660

exposed to that harsh environment of

5732

06:59:51,468 --> 06:59:47,820

space we're going to be able to increase

5733

06:59:53,570 --> 06:59:51,478

our actual power outputs so we're aiming

5734

06:59:55,070 --> 06:59:53,580

to have six of these total eventually

5735

06:59:56,868 --> 06:59:55,080

deployed on the International Space

5736

06:59:58,910 --> 06:59:56,878

Station this rollout solar array

5737

07:00:02,208 --> 06:59:58,920

technology

5738

07:00:05,150 --> 07:00:02,218

um we did an initial test of these this

5739

07:00:07,910 --> 07:00:05,160

type of array several years ago on the

5740

07:00:09,410 --> 07:00:07,920

space station just to see how the

5741

07:00:11,810 --> 07:00:09,420

mechanisms worked how the power

5742

07:00:14,330 --> 07:00:11,820

generation worked and then ultimately

5743

07:00:16,730 --> 07:00:14,340

culminating in some permanent additions

5744

07:00:19,368 --> 07:00:16,740

to the station uh this same type of

5745

07:00:22,548 --> 07:00:19,378

rollout solar array technology used on

5746

07:00:24,410 --> 07:00:22,558

the NASA Dart Mission which was our

5747

07:00:28,190 --> 07:00:24,420

asteroid redirect

5748

07:00:34,430 --> 07:00:28,200

it's that storm yeah it's crazy

5749

07:00:42,850 --> 07:00:37,788

and we are passing

5750

07:00:48,590 --> 07:00:45,230

just about to pass over the Pacific

5751  
07:00:50,628 --> 07:00:48,600  
Northwest and as any of our viewers in

5752  
07:00:53,330 --> 07:00:50,638  
America are aware there's some pretty

5753  
07:00:54,830 --> 07:00:53,340  
significant winter weather hitting a lot

5754  
07:00:56,570 --> 07:00:54,840  
of the country so

5755  
07:01:00,788 --> 07:00:56,580  
our crew members getting a view from

5756  
07:01:03,830 --> 07:01:00,798  
about 260 statute miles above

5757  
07:01:06,830 --> 07:01:03,840  
while this rollout's overrate almost

5758  
07:01:08,690 --> 07:01:06,840  
done deploying we'll note the same type

5759  
07:01:10,310 --> 07:01:08,700  
of solar array this rollout technology

5760  
07:01:13,250 --> 07:01:10,320  
going to be used on NASA's Gateway

5761  
07:01:15,048 --> 07:01:13,260  
station around the Moon as well that's

5762  
07:01:16,788 --> 07:01:15,058  
going to be our launching point for the

5763  
07:01:18,948 --> 07:01:16,798

Artemis program and future lunar

5764

07:01:45,128 --> 07:01:18,958

Landings eventually establishing that

5765

07:01:50,750 --> 07:01:47,628

so our crew members continuing to stand

5766

07:01:52,968 --> 07:01:50,760

by observing the rollout after this

5767

07:01:57,110 --> 07:01:52,978

deployment sequence is complete we'll

5768

07:02:02,390 --> 07:01:59,810

for Josh cassida he's going to have two

5769

07:02:04,368 --> 07:02:02,400

blanket tensioner bolts that he's going

5770

07:02:06,288 --> 07:02:04,378

to release these essentially activated

5771

07:02:09,410 --> 07:02:06,298

spring that are going to pull on some

5772

07:02:12,708 --> 07:02:09,420

internal wire to the Solar Ray itself to

5773

07:02:15,830 --> 07:02:12,718

add some tension which will be necessary

5774

07:02:17,810 --> 07:02:15,840

as we're maneuvering and gimbling the

5775

07:02:22,670 --> 07:02:17,820

solar raises we always try to point them

5776

07:02:22,680 --> 07:02:27,948

oh look at the fountains

5777

07:02:33,650 --> 07:02:30,410

I'll throw a rice

5778

07:02:36,530 --> 07:02:33,660

okay great meter right now

5779

07:02:42,410 --> 07:02:36,540

between I don't know if you can see

5780

07:02:42,420 --> 07:02:48,368

I figure if you're on the road

5781

07:02:54,288 --> 07:02:51,350

okay guys we have confirmed we've got a

5782

07:02:56,750 --> 07:02:54,298

good deployment on irosa so Josh you're

5783

07:03:00,350 --> 07:02:56,760

go to move into positions to do the

5784

07:03:10,010 --> 07:03:00,360

tensioner bolts are 11 and 12.

5785

07:03:43,610 --> 07:03:12,230

and for both of you I've got a Handover

5786

07:03:48,890 --> 07:03:45,890

and just a short hand over we'll get

5787

07:03:50,448 --> 07:03:48,900

that video signal back as uh the crew

5788

07:03:53,570 --> 07:03:50,458

now stepping into some of the final

5789

07:03:56,750 --> 07:03:53,580

steps of the day as they're gonna

5790

07:03:59,150 --> 07:03:56,760

work to now release to blanket tensioner

5791

07:04:01,250 --> 07:03:59,160

bolts Josh Cassidy using his pistol grip

5792

07:04:03,890 --> 07:04:01,260

tool to to make that happen those are

5793

07:04:05,570 --> 07:04:03,900

going to trigger some Springs that are

5794

07:04:07,190 --> 07:04:05,580

going to pull on some tensioning wire in

5795

07:04:10,490 --> 07:04:07,200

the arrays to add some structural

5796

07:04:14,150 --> 07:04:10,500

rigidity uh to this now fully deployed

5797

07:04:19,968 --> 07:04:17,030

after that we'll get into some work site

5798

07:04:23,330 --> 07:04:19,978

cleanup likely get another glove half

5799

07:04:25,910 --> 07:04:23,340

and Gauntlet check just to walk through

5800

07:04:27,468 --> 07:04:25,920

those again uh so crew members obviously

5801  
07:04:30,048 --> 07:04:27,478  
using their hands for everything on a

5802  
07:04:35,208 --> 07:04:30,058  
spacewalk not actually using their feet

5803  
07:04:39,770 --> 07:04:37,310  
so they'll do periodic checks of their

5804  
07:04:42,410 --> 07:04:39,780  
glove Services looking for model loss of

5805  
07:04:44,868 --> 07:04:42,420  
any of the grip or anything of that

5806  
07:04:46,368 --> 07:04:44,878  
nature just looking for next Cuts things

5807  
07:04:53,890 --> 07:04:46,378  
like that let me know and I'll get you

5808  
07:04:53,900 --> 07:04:58,910  
goes across the front of me

5809  
07:05:01,990 --> 07:04:59,390  
[Music]

5810  
07:05:02,000 --> 07:05:08,628  
got it

5811  
07:05:14,700 --> 07:05:10,310  
hey Kathy and we're locked back up on

5812  
07:05:14,710 --> 07:05:40,968  
[Applause]

5813  
07:05:46,850 --> 07:05:44,930

okay Nick I am going for my PGT I'm over

5814

07:05:51,548 --> 07:05:46,860

at r11.

5815

07:05:55,850 --> 07:05:51,558

copy that R11 PGT settings are alpha one

5816

07:06:03,110 --> 07:06:00,650

Alpha One counterclockwise two of R11

5817

07:06:56,890 --> 07:06:03,120

yep and you're going to release uh five

5818

07:07:01,730 --> 07:06:59,628

Turtle clockwise too

5819

07:07:35,448 --> 07:07:01,740

affirmative Alpha One counterclockwise

5820

07:07:41,090 --> 07:07:38,030

all right Alpha One counterclockwave Two

5821

07:07:52,490 --> 07:07:41,100

start returns copy five to six turns it

5822

07:07:56,090 --> 07:07:54,048

about that a little bit that I

5823

07:07:58,010 --> 07:07:56,100

definitely felt the tensioner you can

5824

07:08:00,410 --> 07:07:58,020

see the white line that I thought that

5825

07:08:01,670 --> 07:08:00,420

quarter of an inch copy that's a good

5826  
07:08:32,570 --> 07:08:01,680  
release

5827  
07:08:32,580 --> 07:08:47,208  
all right turn on R12 copy

5828  
07:08:52,190 --> 07:08:49,670  
again they're Stars

5829  
07:08:56,628 --> 07:08:52,200  
is out

5830  
07:08:56,638 --> 07:09:01,010  
and it's about a quarter inch

5831  
07:09:07,670 --> 07:09:03,048  
definitely top out do you want it uh do

5832  
07:09:11,990 --> 07:09:08,868  
and we're good with some more

5833  
07:09:16,670 --> 07:09:14,208  
okay you can see in the heck I can see

5834  
07:09:19,910 --> 07:09:16,680  
that it's uh

5835  
07:09:22,368 --> 07:09:19,920  
the teams are no longer engaged

5836  
07:09:29,930 --> 07:09:22,378  
all the tensioner itself yeah and we you

5837  
07:09:40,430 --> 07:09:32,750  
I forget on the r12. copy good release

5838  
07:09:45,890 --> 07:09:44,750

and so Josh once you uh steal your PGT

5839

07:09:47,270 --> 07:09:45,900

um you know we'll want to do it once

5840

07:09:49,430 --> 07:09:47,280

over on the mod kit to make sure all the

5841

07:09:51,468 --> 07:09:49,440

mli is in place

5842

07:09:54,048 --> 07:09:51,478

um the one piece of equipment we've

5843

07:10:00,770 --> 07:09:54,058

still got out there is the scoop so if

5844

07:10:00,780 --> 07:10:05,510

let's say about one second Frank

5845

07:10:11,090 --> 07:10:07,730

the uh the threat is not going back

5846

07:10:18,350 --> 07:10:14,150

around your

5847

07:10:18,360 --> 07:10:25,368

against your hearing center

5848

07:10:29,510 --> 07:10:26,030

um

5849

07:10:33,890 --> 07:10:29,520

I think you might just want to let it be

5850

07:10:37,430 --> 07:10:33,900

or you'll have to undo your PCT

5851  
07:10:39,530 --> 07:10:37,440  
and go um oh I see I understand maybe

5852  
07:10:45,640 --> 07:10:39,540  
when I'm close to you we'll just uh take

5853  
07:10:45,650 --> 07:11:03,730  
[Applause]

5854  
07:11:08,150 --> 07:11:05,750  
my understanding is I'm going to get

5855  
07:11:10,030 --> 07:11:08,160  
this rent we'll uh send it over to the

5856  
07:11:12,730 --> 07:11:10,040  
cable bag

5857  
07:11:15,350 --> 07:11:12,740  
and and that's affirmative

5858  
07:11:17,390 --> 07:11:15,360  
so Josh you can write to that scoop you

5859  
07:11:19,430 --> 07:11:17,400  
can take it over the cable bag

5860  
07:11:21,048 --> 07:11:19,440  
um we were talking about whether it it's

5861  
07:11:22,548 --> 07:11:21,058  
worth you guys working together to try

5862  
07:11:24,110 --> 07:11:22,558  
to put it in that cable bag because it

5863  
07:11:26,150 --> 07:11:24,120

did take you a little bit to get it

5864

07:11:29,270 --> 07:11:26,160

closed up so we're also good if you want

5865

07:11:35,628 --> 07:11:29,280

to just put it on your mws and translate

5866

07:11:41,390 --> 07:11:38,868

um there's a there's a good amount on

5867

07:11:46,690 --> 07:11:41,400

here but maybe it'll keep that detailer

5868

07:11:46,700 --> 07:11:53,948

we're good on time

5869

07:11:58,070 --> 07:11:56,390

Josh I just try to figure out what you

5870

07:12:01,190 --> 07:11:58,080

want to do with the scoop I can put it

5871

07:12:04,070 --> 07:12:01,200

on me right here or we can uh go with

5872

07:12:06,590 --> 07:12:04,080

that plan and put it in the cable bag

5873

07:12:10,968 --> 07:12:08,690

I think if we can avoid opening the bag

5874

07:12:12,410 --> 07:12:10,978

imagine oh yeah let's not do that I was

5875

07:12:15,048 --> 07:12:12,420

thinking we were gonna tether it and

5876

07:12:18,430 --> 07:12:15,058

then try to kill it in the side

5877

07:12:23,030 --> 07:12:20,330

[Applause]

5878

07:12:25,910 --> 07:12:24,890

I mean we can't put it in here we'll try

5879

07:12:35,710 --> 07:12:25,920

it

5880

07:12:35,720 --> 07:12:41,628

[Music]

5881

07:12:47,990 --> 07:12:42,890

all right

5882

07:12:48,000 --> 07:12:52,750

sure

5883

07:13:00,708 --> 07:12:55,010

let me try to get a little closer to you

5884

07:13:14,090 --> 07:13:01,850

you ready

5885

07:13:14,100 --> 07:13:20,930

for yours already

5886

07:13:20,940 --> 07:13:35,930

that's right I got it thank you

5887

07:13:49,628 --> 07:13:38,270

oh it's the verdict did it go in okay

5888

07:13:55,190 --> 07:13:53,030

so with the iris installed deployed and

5889

07:13:58,190 --> 07:13:55,200

connected successfully we're moving into

5890

07:13:59,810 --> 07:13:58,200

some of the cleanup steps uh one that

5891

07:14:01,670 --> 07:13:59,820

we're seeing them work right now is

5892

07:14:03,940 --> 07:14:01,680

getting one of those Scoops which are

5893

07:14:06,410 --> 07:14:03,950

the Chris

5894

07:14:09,170 --> 07:14:06,420

[Music]

5895

07:14:14,750 --> 07:14:09,180

sounds good um

5896

07:14:19,430 --> 07:14:16,910

so Frank you're going to uh put the

5897

07:14:22,310 --> 07:14:19,440

cable bag on your brt and uh translate

5898

07:14:24,288 --> 07:14:22,320

that back in board uh leading the way

5899

07:14:26,510 --> 07:14:24,298

and uh Josh you're gonna have to

5900

07:14:30,948 --> 07:14:26,520

translate out around the other side of

5901

07:14:32,270 --> 07:14:30,958

the idea before you start that I'll check

5902

07:14:33,530 --> 07:14:32,280

that once you get to where you're going

5903

07:14:37,490 --> 07:14:33,540

we're gonna have you do a glove and half

5904

07:14:44,510 --> 07:14:40,070

okay let's go to the opposite side of

5905

07:14:44,520 --> 07:15:27,890

yep you've got uh

5906

07:15:34,430 --> 07:15:30,830

you can make a couple things here

5907

07:15:35,930 --> 07:15:34,440

to totally being strep on that uh

5908

07:15:41,150 --> 07:15:35,940

red

5909

07:15:46,250 --> 07:15:43,368

I've got one two three four in fact so

5910

07:15:48,048 --> 07:15:46,260

you can see if I won't mess with it you

5911

07:15:49,788 --> 07:15:48,058

can see it's kind of came unrolled there

5912

07:15:50,868 --> 07:15:49,798

was just a matter of rolling that back

5913

07:15:54,468 --> 07:15:50,878

up

5914

07:15:56,868 --> 07:15:54,478

I do see four on the other side

5915

07:15:59,868 --> 07:15:56,878

okay copy uh thanks for the words Josh

5916

07:16:02,690 --> 07:15:59,878

looks good uh and uh also wanted to know

5917

07:16:04,788 --> 07:16:02,700

if you had adjusted your tcz at all we

5918

07:16:08,090 --> 07:16:04,798

saw some data indications down here that

5919

07:16:11,690 --> 07:16:09,890

no I don't think I changed it without

5920

07:16:12,830 --> 07:16:11,700

talking to you

5921

07:16:16,610 --> 07:16:12,840

um

5922

07:16:19,070 --> 07:16:16,620

you remember making it cooler

5923

07:16:21,230 --> 07:16:19,080

or when I did that last

5924

07:16:22,968 --> 07:16:21,240

I'm pretty sure I didn't submit any

5925

07:16:29,868 --> 07:16:22,978

calls

5926

07:16:33,110 --> 07:16:31,610

um I did get a little cooler while I was

5927

07:16:34,310 --> 07:16:33,120

there on the market but I figured we'll

5928

07:16:35,330 --> 07:16:34,320

just live with it so we're gonna start

5929

07:16:38,090 --> 07:16:35,340

moving

5930

07:16:41,448 --> 07:16:38,100

in terms of gloves I've got uh

5931

07:16:44,810 --> 07:16:41,458

no changes to the gloves

5932

07:16:49,190 --> 07:16:47,150

copy thanks for the checks Josh and so

5933

07:16:52,010 --> 07:16:49,200

once Frank gets the crew lock back or

5934

07:16:55,250 --> 07:16:52,020

the cable bag on his brt uh he's gonna

5935

07:16:55,260 --> 07:16:58,490

okay copy that

5936

07:16:58,500 --> 07:17:06,288

is kind of a behemoth yeah

5937

07:17:12,350 --> 07:17:09,468

you need anything from me

5938

07:17:14,810 --> 07:17:12,360

um just moral support you got that

5939

07:17:18,890 --> 07:17:14,820

Adventure

5940

07:17:22,490 --> 07:17:18,900

good news is to be on my VRT in 15

5941

07:17:23,690 --> 07:17:22,500

minutes yeah uh I wish it was actually a

5942

07:17:35,810 --> 07:17:23,700

way I could keep it once you have this

5943

07:17:40,250 --> 07:17:38,750

you think it's worth it to uh

5944

07:17:44,330 --> 07:17:40,260

work on this

5945

07:17:48,230 --> 07:17:46,010

um no I think I think it'll be good all

5946

07:17:50,210 --> 07:17:48,240

the way in but don't worry about it no I

5947

07:17:52,368 --> 07:17:50,220

wouldn't so much

5948

07:17:54,830 --> 07:17:52,378

[Music]

5949

07:18:31,310 --> 07:17:54,840

I hope you're right next to you in a

5950

07:18:31,320 --> 07:18:48,170

ah

5951  
07:18:52,610 --> 07:18:50,090  
and Joshua you're waiting there for uh

5952  
07:18:56,868 --> 07:18:52,620  
Frank to lead the translation back

5953  
07:18:59,390 --> 07:18:56,878  
um we wanted to look at the the mli on

5954  
07:19:00,650 --> 07:18:59,400  
the lower struts of the mod kit we're

5955  
07:19:02,448 --> 07:19:00,660  
trying to make sure that those are in a

5956  
07:19:06,650 --> 07:19:02,458  
good configuration and wrapped around

5957  
07:19:14,150 --> 07:19:09,890  
okay I'm the inboard edge of the iea

5958  
07:19:18,708 --> 07:19:16,490  
affirmative Josh if you can uh translate

5959  
07:19:20,208 --> 07:19:18,718  
back toward the mod kits on the path

5960  
07:19:22,670 --> 07:19:20,218  
that you

5961  
07:19:26,750 --> 07:19:22,680  
just finished translating on uh we'd

5962  
07:19:26,760 --> 07:19:33,350  
okay give me a minute

5963  
07:19:39,590 --> 07:19:35,570

Josh you want me to stick around or

5964

07:19:43,490 --> 07:19:42,110

I think we're okay but I guess I'll

5965

07:19:46,788 --> 07:19:43,500

prefer to think on that one I don't know

5966

07:19:49,128 --> 07:19:46,798

yeah Frank you're good to uh

5967

07:19:52,670 --> 07:19:49,138

uh it shouldn't take it shouldn't take

5968

07:19:55,548 --> 07:19:52,680

Josh long to uh to work on the mli the

5969

07:19:58,368 --> 07:19:55,558

area of Interest Josh is on the lower

5970

07:20:05,090 --> 07:19:58,378

struts uh just below the base of the mod

5971

07:20:48,110 --> 07:20:07,490

the lower struts put up high

5972

07:20:52,670 --> 07:20:50,628

and Frank while Josh checks out that mli

5973

07:20:59,230 --> 07:20:52,680

uh you're you're heading to the Port

5974

07:21:03,350 --> 07:21:01,190

I could have told you about this earlier

5975

07:21:05,868 --> 07:21:03,360

I know what you talked about uh there is

5976  
07:21:08,030 --> 07:21:05,878  
no way to get those up over the bowl

5977  
07:21:10,250 --> 07:21:08,040  
themselves I don't I gave it a really

5978  
07:21:11,868 --> 07:21:10,260  
good poll earlier

5979  
07:21:15,048 --> 07:21:11,878  
there's a hole that's the bolt is

5980  
07:21:18,288 --> 07:21:15,058  
supposed to go through and it will the

5981  
07:21:20,510 --> 07:21:18,298  
MRI will not reach

5982  
07:21:22,310 --> 07:21:20,520  
I think the uh when this was installed

5983  
07:21:24,708 --> 07:21:22,320  
that was probably the case

5984  
07:21:27,770 --> 07:21:24,718  
I get and at least on the right side

5985  
07:21:32,270 --> 07:21:29,690  
the wires

5986  
07:21:34,850 --> 07:21:32,280  
structure is to try to get the hold off

5987  
07:21:36,650 --> 07:21:34,860  
yeah copy that you can just hold

5988  
07:21:39,830 --> 07:21:36,660

position there we've got a good video of

5989

07:21:39,840 --> 07:21:55,788

okay

5990

07:21:55,798 --> 07:22:00,770

and Frank and Frank you're good

5991

07:22:04,610 --> 07:22:03,048

uh so I don't know if you can see this

5992

07:22:06,650 --> 07:22:04,620

it looks like when I put

5993

07:22:10,610 --> 07:22:06,660

Ash's uh red

5994

07:22:18,590 --> 07:22:15,170

there's a full two wraps here

5995

07:22:20,810 --> 07:22:18,600

um I think I'm gonna go to the uh

5996

07:22:22,910 --> 07:22:20,820

I see I just want to make sure you guys

5997

07:22:29,390 --> 07:22:22,920

see that you're okay with it

5998

07:22:29,400 --> 07:22:33,110

and Frank your go to continue

5999

07:22:33,120 --> 07:22:36,230

drink coffee

6000

07:22:43,490 --> 07:22:39,070

and uh I'm sorry Richard

6001  
07:22:43,500 --> 07:22:46,990  
it's important

6002  
07:22:50,990 --> 07:22:49,250  
uh you're just dropping the bag off temp

6003  
07:23:05,510 --> 07:22:51,000  
stove so that we can go work the FSC

6004  
07:23:10,490 --> 07:23:08,208  
okay Josh uh thanks for the views and

6005  
07:23:12,350 --> 07:23:10,500  
the close inspection we're happy with

6006  
07:23:15,890 --> 07:23:12,360  
the condition that it's in and so your

6007  
07:23:15,900 --> 07:24:13,430  
okay

6008  
07:24:18,948 --> 07:24:15,590  
and Josh as you translate back in board

6009  
07:24:21,948 --> 07:24:18,958  
uh next step is going to be working for

6010  
07:24:23,390 --> 07:24:21,958  
the apr removal so when you get into a

6011  
07:24:26,090 --> 07:24:23,400  
good position you're going to work with

6012  
07:24:30,910 --> 07:24:26,100  
the koichi and Duke to retrieve that

6013  
07:24:30,920 --> 07:24:55,910

[Applause]

6014

07:24:55,920 --> 07:25:14,288

ah

6015

07:25:18,770 --> 07:25:17,270

Frank as you head over to the FSC uh

6016

07:25:20,448 --> 07:25:18,780

give you those cautions again slow

6017

07:25:22,010 --> 07:25:20,458

translation

6018

07:25:24,650 --> 07:25:22,020

um wait for any kind of motion to damp

6019

07:25:27,530 --> 07:25:24,660

out before I'm parting loads uh we can't

6020

07:25:41,570 --> 07:25:27,540

simultaneously translate and

6021

07:25:41,580 --> 07:25:45,708

hey I'm over at Alpha

6022

07:25:49,968 --> 07:25:47,628

hey Frank uh so you're going to loosen

6023

07:25:51,948 --> 07:25:49,978

the adjustable equipment tether from the

6024

07:25:54,708 --> 07:25:51,958

uh the beam so that you've got some play

6025

07:26:13,430 --> 07:25:54,718

with the beam and then position it into

6026  
07:26:13,440 --> 07:26:24,650  
foreign

6027  
07:26:24,660 --> 07:26:48,650  
[Applause]

6028  
07:26:48,660 --> 07:27:35,990  
all right

6029  
07:27:43,788 --> 07:27:38,390  
so we are six hours eight and a half

6030  
07:27:49,190 --> 07:27:46,010  
here for a little bit

6031  
07:27:49,200 --> 07:27:53,810  
and coming back around that uh

6032  
07:27:58,670 --> 07:27:55,490  
shoots each other

6033  
07:28:01,010 --> 07:27:58,680  
going above me right now

6034  
07:28:03,170 --> 07:28:01,020  
so I will come around that A-frame just

6035  
07:28:04,430 --> 07:28:03,180  
got the hooked above me but I think it's

6036  
07:28:07,610 --> 07:28:04,440  
gonna be okay

6037  
07:28:10,490 --> 07:28:07,620  
so no rush but when you get eyes on

6038  
07:28:14,150 --> 07:28:10,500

probably when I go uh the past year

6039

07:28:23,390 --> 07:28:15,770

I'm actually going to need to pay you

6040

07:28:37,448 --> 07:28:25,010

give me one second I don't know what

6041

07:28:42,770 --> 07:28:41,030

and again we're almost six hours nine

6042

07:28:46,190 --> 07:28:42,780

and a half minutes into today's space

6043

07:28:48,650 --> 07:28:46,200

walk the primary objective of the day

6044

07:28:51,288 --> 07:28:48,660

was to get that new rollout solar

6045

07:28:52,368 --> 07:28:51,298

already installed deployed and

6046

07:28:56,330 --> 07:28:52,378

integrated

6047

07:28:58,670 --> 07:28:56,340

into the power system

6048

07:29:01,010 --> 07:28:58,680

and we were able to do that successfully

6049

07:29:03,110 --> 07:29:01,020

it's now been fully deployed all the

6050

07:29:04,968 --> 07:29:03,120

connections made

6051  
07:29:06,948 --> 07:29:04,978  
so at this point they're going through

6052  
07:29:08,810 --> 07:29:06,958  
some of their cleanup steps Frank Rubio

6053  
07:29:11,628 --> 07:29:08,820  
he's on the left there

6054  
07:29:13,430 --> 07:29:11,638  
and uh Frank so you're going to try to

6055  
07:29:15,948 --> 07:29:13,440  
hand start that

6056  
07:29:17,628 --> 07:29:15,958  
um there you go it shouldn't overlap the

6057  
07:29:20,510 --> 07:29:17,638  
end of the stanchion

6058  
07:29:26,270 --> 07:29:20,520  
yep

6059  
07:29:31,490 --> 07:29:28,850  
so right now Frank Rubio working to more

6060  
07:29:38,030 --> 07:29:31,500  
permanently we're looking for two turns

6061  
07:29:42,110 --> 07:29:40,070  
looking to more permanently uh secure

6062  
07:29:44,270 --> 07:29:42,120  
this FSE beam

6063  
07:29:50,810 --> 07:29:47,510

again okay that looks good and so you'll

6064

07:29:54,170 --> 07:29:50,820

translate over to stanchion Bravo and do

6065

07:29:54,180 --> 07:30:15,410

everybody

6066

07:30:20,090 --> 07:30:17,270

let's go ahead

6067

07:30:21,890 --> 07:30:20,100

I'm ready for the GCA for the published

6068

07:30:24,110 --> 07:30:21,900

for the apfr

6069

07:30:28,030 --> 07:30:24,120

retrieval

6070

07:30:31,788 --> 07:30:28,040

okay uh copy that this will be um

6071

07:30:36,650 --> 07:30:31,798

maneuvered to ISS apps for one meter to

6072

07:30:43,490 --> 07:30:38,868

and while setting up the manual mode

6073

07:30:49,310 --> 07:30:47,208

yeah wow Frank Rubio secures those beams

6074

07:30:50,990 --> 07:30:49,320

which are moved out towards the

6075

07:30:52,850 --> 07:30:51,000

beginning of our space walk to clear the

6076  
07:30:55,250 --> 07:30:52,860  
way for the iro so they're now going to

6077  
07:30:57,128 --> 07:30:55,260  
get permanently attached there to the

6078  
07:31:00,048 --> 07:30:57,138  
FSE

6079  
07:31:03,048 --> 07:31:00,058  
three two one

6080  
07:31:08,090 --> 07:31:05,150  
meanwhile Josh cassid is doing some

6081  
07:31:10,670 --> 07:31:08,100  
cleanup work on the robotic arm

6082  
07:31:12,890 --> 07:31:10,680  
that's a good motion we're hearing the

6083  
07:31:15,170 --> 07:31:12,900  
voice now of koichiwakada who's at the

6084  
07:31:17,690 --> 07:31:15,180  
mobile workstation inside the station's

6085  
07:31:19,610 --> 07:31:17,700  
Destiny laboratory right next to 10

6086  
07:31:21,288 --> 07:31:19,620  
meters to go right next to NASA

6087  
07:31:24,490 --> 07:31:21,298  
astronaut Nicole man who's at the

6088  
07:31:30,708 --> 07:31:27,910

they're moving the robotic arm closer

6089

07:31:32,390 --> 07:31:30,718

closer to Josh cassida so he can access

6090

07:31:35,030 --> 07:31:32,400

that articulating portable foot

6091

07:31:36,830 --> 07:31:35,040

restraint continue the additional 20.

6092

07:31:38,150 --> 07:31:36,840

additional 20.

6093

07:31:43,060 --> 07:31:38,160

he's going to be taking that foot

6094

07:31:47,330 --> 07:31:43,070

restraint off the arm three two one

6095

07:31:52,250 --> 07:31:49,850

position hold that's gonna work we're

6096

07:31:53,288 --> 07:31:52,260

gonna call that DCA complete

6097

07:31:56,208 --> 07:31:53,298

okay

6098

07:31:58,550 --> 07:31:56,218

brakes on and you have a go for apfr

6099

07:32:01,448 --> 07:31:58,560

removal

6100

07:32:05,030 --> 07:32:01,458

[Applause]

6101  
07:32:08,628 --> 07:32:05,040  
okay Frank uh saw a good hand start on

6102  
07:32:08,638 --> 07:32:15,890  
Roger

6103  
07:32:22,548 --> 07:32:17,930  
and Frank your PGT settings are going to

6104  
07:32:22,558 --> 07:32:25,788  
0

6105  
07:32:53,468 --> 07:32:27,530  
and we're going to stop on turns you're

6106  
07:32:58,010 --> 07:32:56,628  
and we're watching Frank Rubio once

6107  
07:33:00,708 --> 07:32:58,020  
again using that episode we're totally

6108  
07:33:02,690 --> 07:33:00,718  
securing these beams through the FSE the

6109  
07:33:04,490 --> 07:33:02,700  
Flight Support equipment this is the

6110  
07:33:07,368 --> 07:33:04,500  
temporary pallet that wrote up in the

6111  
07:33:10,490 --> 07:33:07,378  
trunk of dragon with the two Iris arrays

6112  
07:33:10,500 --> 07:33:15,288  
the paddles are out

6113  
07:33:19,190 --> 07:33:17,208

while he's doing this

6114

07:33:21,048 --> 07:33:19,200

and

6115

07:33:23,510 --> 07:33:21,058

I think I might take care of a couple

6116

07:33:26,868 --> 07:33:23,520

settings now

6117

07:33:28,628 --> 07:33:26,878

we get there it's going to be

6118

07:33:39,730 --> 07:33:28,638

yeah

6119

07:33:44,030 --> 07:33:42,410

while Rubio's securing these beams Josh

6120

07:33:45,770 --> 07:33:44,040

cassid is working to get that foot

6121

07:33:47,810 --> 07:33:45,780

restraint off the end of the robotic arm

6122

07:33:50,448 --> 07:33:47,820

it'll make more sense

6123

07:33:52,368 --> 07:33:50,458

we heard call out papa papa foxtrot six

6124

07:33:55,730 --> 07:33:52,378

those are giving him the yaw pitch and

6125

07:33:58,368 --> 07:33:55,740

roll settings to configure that foot

6126  
07:34:00,350 --> 07:33:58,378  
restraint in where

6127  
07:34:03,830 --> 07:34:00,360  
okay Frank and so we're going to change

6128  
07:34:09,590 --> 07:34:03,840  
our settings to Bravo One clockwise two

6129  
07:34:15,530 --> 07:34:13,070  
if you know that seemed like it was our

6130  
07:34:16,628 --> 07:34:15,540  
pretty close to uh

6131  
07:34:19,730 --> 07:34:16,638  
um

6132  
07:34:21,830 --> 07:34:19,740  
507 so I have a feeling we make it into

6133  
07:34:24,410 --> 07:34:21,840  
the same scenario we had earlier

6134  
07:34:26,208 --> 07:34:24,420  
yep copy that and so we'd like you to go

6135  
07:34:33,770 --> 07:34:26,218  
ahead and drive it to torque on Bravo

6136  
07:35:09,708 --> 07:34:37,310  
okay uh Bravo One

6137  
07:35:09,718 --> 07:35:12,830  
grabbing

6138  
07:35:25,610 --> 07:35:15,530

and Frank once you stole your PGT we'd

6139

07:35:25,620 --> 07:35:28,310

s

6140

07:35:28,320 --> 07:35:31,788

pretty tight

6141

07:35:38,030 --> 07:35:34,610

and and we expect that Frank uh the turn

6142

07:35:44,810 --> 07:35:39,770

okay

6143

07:35:46,910 --> 07:35:44,820

both is super solid so

6144

07:35:51,010 --> 07:35:46,920

the actual beam itself has the movement

6145

07:35:51,020 --> 07:36:37,910

copy Frank stand by

6146

07:36:40,850 --> 07:36:39,530

like I would say it's about

6147

07:36:45,830 --> 07:36:40,860

[Applause]

6148

07:36:45,840 --> 07:36:53,208

see Frank we're talking it

6149

07:36:57,350 --> 07:36:55,490

and Frank we are good with Charlie five

6150

07:37:00,410 --> 07:36:57,360

so you go to translate back over to

6151  
07:37:19,968 --> 07:37:03,530  
should I call the uh

6152  
07:37:19,978 --> 07:37:24,548  
foreign

6153  
07:37:28,300 --> 07:37:27,230  
we can maneuver the arm to the spark

6154  
07:37:31,190 --> 07:37:28,310  
position

6155  
07:37:33,468 --> 07:37:31,200  
[Applause]

6156  
07:37:35,868 --> 07:37:33,478  
let's stand by for one minute I'll get

6157  
07:37:42,548 --> 07:37:35,878  
on to see the curve and give you

6158  
07:37:48,530 --> 07:37:44,690  
and Josh when you get over there it's

6159  
07:37:48,540 --> 07:37:54,770  
okay

6160  
07:37:54,780 --> 07:38:06,968  
foreign

6161  
07:38:11,628 --> 07:38:09,410  
we can see Josh Castle he's got that

6162  
07:38:13,250 --> 07:38:11,638  
foot restraint off of the robotic arm

6163  
07:38:14,868 --> 07:38:13,260

he's going to be

6164

07:38:16,510 --> 07:38:14,878

attaching that to what's known as the

6165

07:38:19,548 --> 07:38:16,520

seated cart the crew in a crow plant

6166

07:38:21,948 --> 07:38:19,558

translation Aid save each other when you

6167

07:38:22,490 --> 07:38:21,958

can okay

6168

07:38:30,190 --> 07:38:22,500

um

6169

07:38:30,200 --> 07:38:39,830

walked out

6170

07:38:44,030 --> 07:38:41,708

where's the kill back

6171

07:38:50,390 --> 07:38:44,040

oh geez

6172

07:38:50,400 --> 07:38:59,840

oh you're on the computer yeah foreign

6173

07:38:59,850 --> 07:39:23,990

[Applause]

6174

07:39:24,000 --> 07:39:27,468

super awesome thank you

6175

07:39:33,468 --> 07:39:30,650

a lot of gymnastics to get rid of that

6176  
07:39:35,270 --> 07:39:33,478  
I'm gonna go above you here give me just

6177  
07:39:38,570 --> 07:39:35,280  
one second

6178  
07:39:39,708 --> 07:39:38,580  
I'll stand by your uh

6179  
07:39:45,650 --> 07:39:39,718  
you want to make sure you don't get

6180  
07:40:01,368 --> 07:39:46,360  
foreign

6181  
07:40:06,708 --> 07:40:04,128  
oh yeah yeah when uh

6182  
07:40:08,090 --> 07:40:06,718  
when I put your uh pick what happened

6183  
07:40:13,128 --> 07:40:08,100  
and then I put your

6184  
07:40:17,690 --> 07:40:15,350  
if I can quickly put this in it looks

6185  
07:40:40,610 --> 07:40:17,700  
like if I go uh more servers we're gonna

6186  
07:40:45,650 --> 07:40:42,890  
this is as close as I got into an apfr

6187  
07:40:52,968 --> 07:40:45,660  
and three uh pvas

6188  
07:40:57,890 --> 07:40:55,070

I think I've got papa papa

6189

07:41:02,690 --> 07:40:57,900

and can't be depressed

6190

07:41:08,208 --> 07:41:04,910

and then clock you know six in yep

6191

07:41:11,868 --> 07:41:09,830

and understand if you need to hold

6192

07:41:13,670 --> 07:41:11,878

position Frank for the safety tethers

6193

07:41:17,530 --> 07:41:13,680

but uh you've got to go uh for Charlie

6194

07:41:17,540 --> 07:41:29,288

to get a little bit thanks

6195

07:41:34,610 --> 07:41:32,390

so this view from Frank Rubio's helmet

6196

07:41:35,868 --> 07:41:34,620

cam just below him there Josh Cassidy

6197

07:41:38,448 --> 07:41:35,878

working to get that foot restraint

6198

07:41:41,090 --> 07:41:38,458

stored on the seat of cart the crew

6199

07:41:44,448 --> 07:41:41,100

equipment and translation Aid having

6200

07:41:47,150 --> 07:41:44,458

taken it off of the canadarm 2 robotic

6201

07:41:49,910 --> 07:41:47,160

arm that he was riding a little bit

6202

07:41:52,610 --> 07:41:49,920

earlier in today's space walk

6203

07:41:55,910 --> 07:41:52,620

if you're just now joining we had a

6204

07:41:57,410 --> 07:41:55,920

successful completion I just want to uh

6205

07:41:59,690 --> 07:41:57,420

check with you guys we think you're

6206

07:42:06,450 --> 07:41:59,700

clear of the arms so that uh Duke can

6207

07:42:06,460 --> 07:42:11,270

[Music]

6208

07:42:16,310 --> 07:42:13,730

okay yeah that's something they're going

6209

07:42:21,770 --> 07:42:16,320

to go station forward

6210

07:42:28,128 --> 07:42:23,810

okay well manure to the parking position

6211

07:42:28,138 --> 07:42:32,450

foreign

6212

07:42:32,460 --> 07:43:11,868

[Music]

6213

07:43:22,070 --> 07:43:14,990

got a grateful trip there and we are

6214

07:43:28,968 --> 07:43:24,410

and and Josh copy uh the pitch knob

6215

07:43:33,288 --> 07:43:30,948

now it can be defect

6216

07:43:35,150 --> 07:43:33,298

copy thank you

6217

07:43:36,708 --> 07:43:35,160

before I get out of here you guys are

6218

07:43:44,090 --> 07:43:36,718

happy with that configured

6219

07:43:50,150 --> 07:43:47,048

okay Josh uh so with that uh

6220

07:43:52,430 --> 07:43:50,160

atfr stowed you'll grab the cable bag to

6221

07:43:57,350 --> 07:43:52,440

put that on your brt and then we'll uh

6222

07:44:01,850 --> 07:43:59,750

nothing

6223

07:44:35,270 --> 07:44:01,860

you watch that cable back just off your

6224

07:44:38,570 --> 07:44:37,070

and Frank Josh we're working through a

6225

07:44:49,010 --> 07:44:38,580

little bit of blockage I want to let you

6226  
07:44:53,690 --> 07:44:52,010  
Craig can you just verify that is uh

6227  
07:44:57,410 --> 07:44:53,700  
that's probably can you make sure that's

6228  
07:45:01,740 --> 07:44:57,420  
Fox6 on it and I have

6229  
07:45:06,048 --> 07:45:03,128  
[Music]

6230  
07:45:09,468 --> 07:45:06,058  
I can't really see

6231  
07:45:12,170 --> 07:45:09,478  
uh from from this angle

6232  
07:45:13,490 --> 07:45:12,180  
it looks right though I'm ready for the

6233  
07:45:15,468 --> 07:45:13,500  
bag

6234  
07:45:30,048 --> 07:45:15,478  
s are closed

6235  
07:45:35,030 --> 07:45:32,150  
all right things I made without hitting

6236  
07:45:38,030 --> 07:45:36,890  
and with a catching mirror seized each

6237  
07:45:58,490 --> 07:45:38,040  
other

6238  
07:46:03,040 --> 07:46:00,530

all right hey look at what's going on

6239

07:46:03,050 --> 07:46:12,650

[Applause]

6240

07:46:16,128 --> 07:46:14,390

okay

6241

07:46:18,480 --> 07:46:16,138

degree that these tethers are going to

6242

07:46:18,650 --> 07:46:18,490

be clear as soon as I cross over

6243

07:46:48,170 --> 07:46:18,660

[Music]

6244

07:46:48,180 --> 07:46:53,830

there's uh there's a cross here

6245

07:46:59,750 --> 07:46:56,628

yeah they're so fun

6246

07:47:03,288 --> 07:46:59,760

and we still uh

6247

07:47:05,390 --> 07:47:03,298

I'm now underneath you okay

6248

07:47:07,330 --> 07:47:05,400

I'll just take the cross back

6249

07:47:10,190 --> 07:47:07,340

I guess to the airlock

6250

07:47:12,530 --> 07:47:10,200

should work

6251  
07:47:15,350 --> 07:47:12,540  
make outbreak settings for

6252  
07:47:22,968 --> 07:47:18,410  
yeah and and copy all Josh you're headed

6253  
07:47:25,190 --> 07:47:22,978  
to your green hook on 3651 and those PTT

6254  
07:47:28,250 --> 07:47:25,200  
settings are going to be Bravo 7

6255  
07:47:34,090 --> 07:47:28,260  
clockwise too Frank

6256  
07:47:34,100 --> 07:48:09,010  
we're looking for 19 turns one nine

6257  
07:48:15,468 --> 07:48:12,288  
so right now we are six hours 29 minutes

6258  
07:48:17,570 --> 07:48:15,478  
into today's space walk the primary goal

6259  
07:48:20,390 --> 07:48:17,580  
of installing and deploying this new

6260  
07:48:21,770 --> 07:48:20,400  
eyebrow so it was done successfully we

6261  
07:48:23,810 --> 07:48:21,780  
did get a confirmation if we haven't

6262  
07:48:25,490 --> 07:48:23,820  
reported it yet from the Spartan flight

6263  
07:48:28,250 --> 07:48:25,500

controller here in Mission Control

6264

07:48:30,650 --> 07:48:28,260

Houston that that new iros are already

6265

07:48:34,490 --> 07:48:30,660

generating power all signatures from it

6266

07:48:36,230 --> 07:48:34,500

look great so another addition to the

6267

07:48:38,570 --> 07:48:36,240

power system on board the space station

6268

07:48:41,330 --> 07:48:38,580

is successfully installed today and

6269

07:48:43,788 --> 07:48:41,340

connected to continue

6270

07:48:46,310 --> 07:48:43,798

our upgrades to the power system

6271

07:48:48,708 --> 07:48:46,320

eventually adding six of these arrays

6272

07:48:50,930 --> 07:48:48,718

this was the fourth out of six

6273

07:48:52,670 --> 07:48:50,940

I'm just when augmenting the 4A power

6274

07:48:54,888 --> 07:48:52,680

channel so again that I rows are

6275

07:48:57,620 --> 07:48:54,898

deployed integrated successfully already

6276  
07:48:59,330 --> 07:48:57,630  
into the station power system

6277  
07:49:13,070 --> 07:48:59,340  
[Music]

6278  
07:49:15,530 --> 07:49:13,080  
that's a good read back

6279  
07:49:23,590 --> 07:49:15,540  
this is not going to work in fact uh

6280  
07:49:27,170 --> 07:49:25,788  
thanks for tellers here I think I've got

6281  
07:49:33,590 --> 07:49:27,180  
a plan I want to make sure you're on

6282  
07:49:43,010 --> 07:49:36,770  
uh stand by Josh we'll get this uh PGT

6283  
07:49:59,628 --> 07:49:44,750  
all right I have two turns green light

6284  
07:50:05,690 --> 07:50:02,510  
foreign

6285  
07:50:07,548 --> 07:50:05,700  
okay Kathy Frank that is a good bolt um

6286  
07:50:23,330 --> 07:50:07,558  
so you're good to store your PGT and

6287  
07:50:23,340 --> 07:50:33,910  
foreign

6288  
07:50:38,388 --> 07:50:37,070

okay so I took down my hacker hopefully

6289

07:50:40,310 --> 07:50:38,398

you can see

6290

07:50:42,410 --> 07:50:40,320

sure how it happened but we've got this

6291

07:50:45,170 --> 07:50:42,420

cross right here

6292

07:50:48,770 --> 07:50:45,180

this is and and Joshua we're negative

6293

07:50:54,590 --> 07:50:48,780

together this is my vote

6294

07:50:56,510 --> 07:50:54,600

[Applause]

6295

07:50:58,788 --> 07:50:56,520

so just just to let you know current

6296

07:51:00,948 --> 07:50:58,798

config we've got uh good hecka on Frank

6297

07:51:08,090 --> 07:51:00,958

but I don't have any video off your

6298

07:51:15,770 --> 07:51:10,548

Chris I've got a green light

6299

07:51:15,780 --> 07:51:24,128

and copy that

6300

07:51:24,138 --> 07:51:30,530

and we're re-established Josh

6301  
07:51:44,330 --> 07:51:36,048  
okay

6302  
07:51:48,468 --> 07:51:46,548  
I think the best option

6303  
07:51:50,150 --> 07:51:48,478  
I'm not sure

6304  
07:51:54,048 --> 07:51:50,160  
I got here I want to make sure we're not

6305  
07:51:57,288 --> 07:51:54,058  
get things worse but I think

6306  
07:52:00,070 --> 07:51:57,298  
like disconnect his green hooks

6307  
07:52:03,850 --> 07:52:00,080  
and I take my whole path

6308  
07:52:08,240 --> 07:52:03,860  
discovered of his green reel

6309  
07:52:11,030 --> 07:52:08,250  
so essentially the spiritual very true

6310  
07:52:13,990 --> 07:52:11,040  
[Applause]

6311  
07:52:18,128 --> 07:52:14,000  
men if we have a cross

6312  
07:52:21,770 --> 07:52:18,138  
and Joshua copy the plan

6313  
07:52:23,810 --> 07:52:21,780

and we concur that's a good plan you'll

6314

07:52:30,948 --> 07:52:23,820

just carry the the cross all the way

6315

07:52:30,958 --> 07:52:41,150

okay sounds good

6316

07:52:55,510 --> 07:52:43,190

I think I'm gonna move your green hook a

6317

07:52:59,930 --> 07:52:58,070

and right now Josh Castle are just doing

6318

07:53:02,270 --> 07:52:59,940

a little bit of rearranging on those

6319

07:53:04,190 --> 07:53:02,280

tethers uh they'll have multiple engaged

6320

07:53:06,530 --> 07:53:04,200

at any given time just to keep them

6321

07:53:07,850 --> 07:53:06,540

secure to both the station and all the

6322

07:53:09,048 --> 07:53:07,860

various equipment that they're working

6323

07:53:10,968 --> 07:53:09,058

on they have a couple of different

6324

07:53:13,010 --> 07:53:10,978

safety tethers equipment tethers all

6325

07:53:15,468 --> 07:53:13,020

available to them throughout these

6326  
07:53:17,930 --> 07:53:15,478  
spacewalks but we're largely in the

6327  
07:53:20,868 --> 07:53:17,940  
cleanup and ending phase of the

6328  
07:53:22,490 --> 07:53:20,878  
spacewalk so far today Casa's primary

6329  
07:53:24,468 --> 07:53:22,500  
cleanup job was to get the foot

6330  
07:53:26,388 --> 07:53:24,478  
restraint off the robotic arm and get it

6331  
07:53:29,448 --> 07:53:26,398  
stowed on the seat of cart the crew

6332  
07:53:32,208 --> 07:53:29,458  
equipment in Translation assist card and

6333  
07:53:34,430 --> 07:53:32,218  
he was able to do that successfully and

6334  
07:53:37,128 --> 07:53:34,440  
meanwhile Frank Rubio is just wrapping

6335  
07:53:41,030 --> 07:53:37,138  
up driving a couple of bolts to secure

6336  
07:53:43,250 --> 07:53:41,040  
the FSE beams that had previously been

6337  
07:53:47,110 --> 07:53:43,260  
holding the eye Rosa in place on the

6338  
07:53:50,030 --> 07:53:47,120

equipment palette that it arrived on

6339

07:53:50,810 --> 07:53:50,040

Tango and so you're gonna end up picking

6340

07:53:53,270 --> 07:53:50,820

that up

6341

07:53:56,090 --> 07:53:53,280

uh your choice as to whether you want to

6342

07:54:02,468 --> 07:53:56,100

uh stuff those adjustables inside or

6343

07:54:07,010 --> 07:54:05,150

put them in our can I put them on the

6344

07:54:08,868 --> 07:54:07,020

outside

6345

07:54:19,788 --> 07:54:08,878

affirmative if you want to you can put

6346

07:54:25,010 --> 07:54:22,548

okay I think we cleared it

6347

07:54:28,610 --> 07:54:25,020

all right

6348

07:54:30,830 --> 07:54:28,620

no problem and then Frank Rubio's final

6349

07:54:32,628 --> 07:54:30,840

job for cleanup is grabbing some of

6350

07:54:35,270 --> 07:54:32,638

these adjustable equipment tethers as

6351  
07:54:37,910 --> 07:54:35,280  
again as they're working with the judge

6352  
07:54:39,530 --> 07:54:37,920  
I see it translating back in

6353  
07:54:40,910 --> 07:54:39,540  
as they're working with any equipment on

6354  
07:54:42,770 --> 07:54:40,920  
board they try to keep it tethered to

6355  
07:54:44,388 --> 07:54:42,780  
them make sure we don't have tools or

6356  
07:54:47,468 --> 07:54:44,398  
any other items floating away during

6357  
07:54:52,788 --> 07:54:50,570  
and so he's just stowing some of those

6358  
07:54:54,350 --> 07:54:52,798  
tethers on the crew lock bag and then

6359  
07:54:56,868 --> 07:54:54,360  
Frank will be done with his cleanup

6360  
07:54:59,750 --> 07:54:56,878  
steps we'll start to see the crew make

6361  
07:55:02,868 --> 07:54:59,760  
their way back to the airlock to be in

6362  
07:55:04,788 --> 07:55:02,878  
the Ingress and finishing steps of the

6363  
07:55:07,128 --> 07:55:04,798

spacewalk itself

6364

07:55:09,468 --> 07:55:07,138

again right now we're six hours 36

6365

07:55:13,788 --> 07:55:09,478

minutes in duration things kicked off at

6366

07:55:15,048 --> 07:55:13,798

7 19 a.m Central 8 19 a.m Eastern when

6367

07:55:16,788 --> 07:55:15,058

they took their suits over to battery

6368

07:55:17,690 --> 07:55:16,798

power and clock's going to continue to

6369

07:55:19,850 --> 07:55:17,700

count

6370

07:55:21,590 --> 07:55:19,860

until they get inside the airlock get

6371

07:55:23,628 --> 07:55:21,600

the hatch closed and the

6372

07:55:25,610 --> 07:55:23,638

repressurization of the quest airlock

6373

07:55:27,110 --> 07:55:25,620

begins once we start to see the pressure

6374

07:55:29,448 --> 07:55:27,120

tick up

6375

07:55:47,868 --> 07:55:29,458

that will be the operational completion

6376  
07:55:52,070 --> 07:55:50,448  
you doing okay Frank yeah yeah just

6377  
07:55:56,530 --> 07:55:52,080  
working this out back

6378  
07:55:56,540 --> 07:57:20,388  
transferring adjustable

6379  
07:58:19,490 --> 07:57:23,150  
okay find somebody to see this fur

6380  
07:58:19,500 --> 07:58:33,708  
foreign

6381  
07:58:38,388 --> 07:58:35,570  
hey Josh I see you

6382  
07:58:45,410 --> 07:58:38,398  
arriving at the airlock so you're going

6383  
07:58:45,420 --> 07:58:49,490  
the yeah

6384  
07:58:54,860 --> 07:58:51,708  
copy Frank I see you heading back in

6385  
07:58:54,870 --> 07:59:05,830  
[Applause]

6386  
07:59:10,190 --> 07:59:08,868  
and Frank as you come off the FSC we're

6387  
07:59:23,810 --> 07:59:10,200  
going to want you to do the seated cart

6388  
07:59:28,128 --> 07:59:26,570

all right we see Josh Cassidy's back at

6389

07:59:29,208 --> 07:59:28,138

the quest airlock just opened the

6390

07:59:30,468 --> 07:59:29,218

thermal cover

6391

08:00:00,830 --> 07:59:30,478

I'm gonna start moving some of the

6392

08:00:06,288 --> 08:00:04,250

Lucas is going to make his way inside of

6393

08:00:08,930 --> 08:00:06,298

the airlock first

6394

08:00:10,850 --> 08:00:08,940

and it will start or he will be prime

6395

08:00:13,968 --> 08:00:10,860

rather for starting to get some of the

6396

08:00:16,190 --> 08:00:13,978

uh additional connections that they're

6397

08:00:19,190 --> 08:00:16,200

going to go into the suits unstowed as

6398

08:00:21,830 --> 08:00:19,200

we get ready to basically integrate the

6399

08:00:23,448 --> 08:00:21,840

emu's back into the station systems get

6400

08:00:24,530 --> 08:00:23,458

back on those servers and Cooling

6401  
08:00:26,628 --> 08:00:24,540  
umbilicals

6402  
08:00:27,888 --> 08:00:26,638  
but all that's still to come Frank Ruby

6403  
08:00:29,030 --> 08:00:27,898  
is going to be going in second he's

6404  
08:00:30,650 --> 08:00:29,040  
going to be prime as the lead

6405  
08:00:44,410 --> 08:00:30,660  
spacewalker for getting that thermal

6406  
08:00:44,420 --> 08:00:47,810  
[Music]

6407  
08:00:47,820 --> 08:00:56,350  
copy good release on the Port City cart

6408  
08:01:02,690 --> 08:00:59,930  
ER fret is hooked up the ID of a bag I'm

6409  
08:01:08,570 --> 08:01:02,700  
getting my VRT

6410  
08:01:08,580 --> 08:01:41,750  
copy Josh

6411  
08:01:41,760 --> 08:01:53,208  
yes

6412  
08:02:04,368 --> 08:01:57,948  
okay the Ida bag is inside I assume

6413  
08:02:09,288 --> 08:02:05,868

and Josh the only thing left for you is

6414

08:02:10,910 --> 08:02:09,298

to hook up your waist tether and Ingress

6415

08:02:14,030 --> 08:02:10,920

Frank you're working on your green hook

6416

08:02:17,510 --> 08:02:14,040

I see a just a Nader of the Cedar Park

6417

08:02:17,520 --> 08:02:41,330

sorry

6418

08:02:47,150 --> 08:02:44,868

okay my left leg tether is on the d-ring

6419

08:02:49,910 --> 08:02:47,160

extender okay closed cider lock black on

6420

08:02:51,708 --> 08:02:49,920

black as is the hook that goes my left

6421

08:02:54,110 --> 08:02:51,718

the ring extender a bit closer left

6422

08:03:01,010 --> 08:02:54,120

black and black

6423

08:03:01,020 --> 08:03:29,690

okay

6424

08:03:36,170 --> 08:03:31,060

unlocked

6425

08:03:40,070 --> 08:03:38,930

okay copy that uh if you can do the

6426  
08:03:44,868 --> 08:03:40,080  
brick release on the starboard seated

6427  
08:03:44,878 --> 08:03:49,548  
front

6428  
08:04:00,530 --> 08:03:52,128  
and Josh once you're inside the air lock

6429  
08:04:00,540 --> 08:04:08,208  
I forget

6430  
08:04:08,218 --> 08:04:13,368  
twice

6431  
08:04:44,510 --> 08:04:15,048  
copy good break release on the

6432  
08:04:44,520 --> 08:05:33,610  
foreign

6433  
08:05:39,350 --> 08:05:37,070  
46 minutes and we are moving towards the

6434  
08:05:41,208 --> 08:05:39,360  
conclusion of today's space walk right

6435  
08:05:42,830 --> 08:05:41,218  
now Josh Castle already back inside of

6436  
08:05:45,708 --> 08:05:42,840  
the crew lock section of the quest

6437  
08:05:47,690 --> 08:05:45,718  
airlock Frank Rubio making his way there

6438  
08:05:50,590 --> 08:05:47,700

now they've finished all their cleanup

6439

08:05:50,600 --> 08:06:04,730

and soon we'll be going back inside to

6440

08:06:08,810 --> 08:06:07,070

I'm a rather there so they're moving

6441

08:06:11,510 --> 08:06:08,820

back inside of the airlock reminder our

6442

08:06:13,910 --> 08:06:11,520

spacewalk will officially conclude the

6443

08:06:16,190 --> 08:06:13,920

repress of the airlock begins so first

6444

08:06:18,350 --> 08:06:16,200

we have to get them inside get them

6445

08:06:19,788 --> 08:06:18,360

hooked up back to these umbilicals go

6446

08:06:22,070 --> 08:06:19,798

through a couple of additional steps in

6447

08:06:31,490 --> 08:06:22,080

the repress Q card I get the hatch

6448

08:06:31,500 --> 08:06:47,708

foreign

6449

08:06:51,948 --> 08:06:49,910

Josh has already got his waist tether

6450

08:06:54,288 --> 08:06:51,958

down on the inside so he's got a good

6451  
08:06:56,270 --> 08:06:54,298  
boat path the next step for you is going

6452  
08:06:58,250 --> 08:06:56,280  
to be uh

6453  
08:07:37,610 --> 08:06:58,260  
grabbing his anchor hook and hooking it

6454  
08:07:43,010 --> 08:07:41,030  
uh Joshua okay

6455  
08:07:45,170 --> 08:07:43,020  
yeah thanks

6456  
08:07:45,480 --> 08:07:45,180  
we've been out there good to be here

6457  
08:07:49,070 --> 08:07:45,490  
[Music]

6458  
08:07:53,510 --> 08:07:50,868  
I don't know how you drew the Short

6459  
08:07:55,968 --> 08:07:53,520  
Straw to work on those beams again

6460  
08:07:59,800 --> 08:07:55,978  
it's all good surprise could you give me

6461  
08:07:59,810 --> 08:08:36,110  
[Music]

6462  
08:08:40,490 --> 08:08:38,448  
all right I have uh

6463  
08:08:43,628 --> 08:08:40,500

process

6464

08:08:46,548 --> 08:08:43,638

anchor hook on my way Center both

6465

08:08:49,190 --> 08:08:46,558

here's Anchorage and my weight Center

6466

08:08:51,288 --> 08:08:49,200

are they closer

6467

08:08:53,150 --> 08:08:51,298

okay copy that good config so you're

6468

08:09:00,110 --> 08:08:53,160

good to pull up your anchor Hook off of

6469

08:09:05,388 --> 08:09:02,930

do you want to bring in the keys the

6470

08:09:07,430 --> 08:09:05,398

Tango bag in first

6471

08:09:09,888 --> 08:09:07,440

if you want to take or get in with you I

6472

08:09:34,110 --> 08:09:11,030

I think we tried

6473

08:09:34,120 --> 08:09:42,288

[Applause]

6474

08:09:47,270 --> 08:09:43,490

forward

6475

08:09:50,388 --> 08:09:47,280

but you drive your dick together however

6476  
08:09:54,310 --> 08:09:50,398  
you want since it's mine I've got your

6477  
08:09:57,708 --> 08:09:56,868  
absolutely so I got a good right on

6478  
08:09:59,948 --> 08:09:57,718  
there

6479  
08:10:02,810 --> 08:09:59,958  
Here Comes Your Earth

6480  
08:10:06,410 --> 08:10:02,820  
it is wrapped around this

6481  
08:10:09,530 --> 08:10:06,420  
fire tie thank you

6482  
08:10:13,190 --> 08:10:09,540  
oh I see this large head with this

6483  
08:10:16,788 --> 08:10:14,690  
Don't Let It Go

6484  
08:10:20,690 --> 08:10:16,798  
to get out of your way

6485  
08:10:22,250 --> 08:10:20,700  
Nick while I'm maneuvering

6486  
08:10:27,230 --> 08:10:22,260  
let's go to go ahead and start working

6487  
08:10:32,868 --> 08:10:30,170  
yeah affirmative your go to

6488  
08:10:40,968 --> 08:10:32,878

start working mating your seu to your

6489

08:10:44,750 --> 08:10:43,430

and Frank when it's convenient if you

6490

08:10:48,770 --> 08:10:44,760

want to turn off your hekka you can do

6491

08:10:48,780 --> 08:10:56,628

okay

6492

08:10:56,638 --> 08:11:26,690

the haircut

6493

08:11:31,548 --> 08:11:29,628

okay because right SSU does not have the

6494

08:11:34,910 --> 08:11:31,558

satisfying click

6495

08:11:46,968 --> 08:11:34,920

push out it does not come off so I have

6496

08:12:21,530 --> 08:11:48,650

I'm not sure to get out of your way as

6497

08:12:29,270 --> 08:12:24,080

foreign

6498

08:12:33,048 --> 08:12:31,548

copy that and I've got a few checks here

6499

08:12:37,250 --> 08:12:33,058

to

6500

08:12:55,628 --> 08:12:37,260

d-ring cinch the strap and Report the

6501  
08:13:01,128 --> 08:12:59,330  
and 6 hours 53 coming up about 54

6502  
08:13:03,650 --> 08:13:01,138  
minutes into the spacewalk that clock's

6503  
08:13:06,530 --> 08:13:03,660  
going to continue counting until we get

6504  
08:13:07,610 --> 08:13:06,540  
something's for me

6505  
08:13:11,530 --> 08:13:07,620  
[Music]

6506  
08:13:11,540 --> 08:13:17,690  
I think it was the first Maybe

6507  
08:13:17,700 --> 08:13:26,990  
a roll right I'll say roll left

6508  
08:13:31,368 --> 08:13:29,270  
but again that clock can I continue to

6509  
08:13:34,310 --> 08:13:31,378  
count so right now they've worked to get

6510  
08:13:36,410 --> 08:13:34,320  
the thermal cover closed so we're into

6511  
08:13:41,990 --> 08:13:36,420  
the very end stages of our spacewalk

6512  
08:13:47,810 --> 08:13:44,570  
so after they get the thermal

6513  
08:13:49,548 --> 08:13:47,820

cover close we're now stepping into both

6514

08:13:51,288 --> 08:13:49,558

crew members working to get their seus

6515

08:13:53,150 --> 08:13:51,298

their service and cool in umbilicals

6516

08:13:55,490 --> 08:13:53,160

from where they've been stowed

6517

08:13:57,708 --> 08:13:55,500

throughout the spacewalk they're going

6518

08:13:59,208 --> 08:13:57,718

to remove covers

6519

08:14:01,190 --> 08:13:59,218

on those and they're going to connect

6520

08:14:03,230 --> 08:14:01,200

the service and cooling umbilicals the

6521

08:14:04,610 --> 08:14:03,240

scus to their display and control module

6522

08:14:06,948 --> 08:14:04,620

on their spacesuit that's going to

6523

08:14:08,448 --> 08:14:06,958

essentially hard line them back in to

6524

08:14:10,850 --> 08:14:08,458

station systems and then they're going

6525

08:14:13,010 --> 08:14:10,860

to start stepping through some of the

6526

08:14:25,070 --> 08:14:13,020

settings including turning the one the

6527

08:14:33,948 --> 08:14:28,070

copy that there's another check for the

6528

08:14:39,350 --> 08:14:35,750

positive

6529

08:14:41,270 --> 08:14:39,360

okay with that you're good to remove the

6530

08:14:55,710 --> 08:14:41,280

SCU from its stowage pouch and install

6531

08:15:00,230 --> 08:14:57,110

[Music]

6532

08:15:01,010 --> 08:15:00,240

a little bit further apart

6533

08:15:06,170 --> 08:15:01,020

um

6534

08:15:14,090 --> 08:15:09,070

I can go a little

6535

08:15:14,100 --> 08:15:33,490

bit

6536

08:15:38,270 --> 08:15:36,468

yeah if you can find good Velcro

6537

08:15:41,150 --> 08:15:38,280

I would do it otherwise that's going to

6538

08:15:41,160 --> 08:16:15,530

I'm just going to connect real quick

6539

08:16:19,910 --> 08:16:17,930

so again right now the crew in the crew

6540

08:16:21,590 --> 08:16:19,920

locks section of the airlock we've got

6541

08:16:27,410 --> 08:16:21,600

the thermal cover closed next up they're

6542

08:16:31,850 --> 08:16:29,030

okay with that you guys are both

6543

08:16:34,070 --> 08:16:31,860

connected back up to the vehicle uh you

6544

08:16:37,548 --> 08:16:34,080

are good to take your water switches to

6545

08:16:43,570 --> 08:16:37,558

the off off position and expect an H2O

6546

08:16:43,580 --> 08:16:48,430

[Music]

6547

08:16:52,490 --> 08:16:50,750

water drops

6548

08:16:55,250 --> 08:16:52,500

okay copy that uh we're starting the two

6549

08:16:56,750 --> 08:16:55,260

minute timer down here and uh well we

6550

08:17:00,288 --> 08:16:56,760

got the two minutes and I still got you

6551  
08:17:08,930 --> 08:17:00,298  
just want to say outstanding job today

6552  
08:17:12,948 --> 08:17:11,090  
so much uh to you and our entire team

6553  
08:17:14,510 --> 08:17:12,958  
great job again

6554  
08:17:16,548 --> 08:17:14,520  
uh

6555  
08:17:18,230 --> 08:17:16,558  
all those people who helped land of

6556  
08:17:21,270 --> 08:17:18,240  
execute there so thank you guys

6557  
08:17:25,368 --> 08:17:23,090  
[Applause]

6558  
08:17:27,048 --> 08:17:25,378  
uh same words can't thank you guys

6559  
08:17:29,090 --> 08:17:27,058  
enough I don't know about routine

6560  
08:17:31,490 --> 08:17:29,100  
surgery didn't feel that way it never

6561  
08:17:33,110 --> 08:17:31,500  
does that one felt like a lion fight but

6562  
08:17:35,388 --> 08:17:33,120  
uh

6563  
08:17:38,090 --> 08:17:35,398

I think the program was asking Santa for

6564

08:17:40,490 --> 08:17:38,100

a new in uh that team just made it

6565

08:17:44,090 --> 08:17:42,288

well I gotta say you've got a lot of

6566

08:17:50,350 --> 08:17:44,100

people who are very glad that their

6567

08:17:55,190 --> 08:17:53,448

hey we're incredibly happy that that's

6568

08:17:56,930 --> 08:17:55,200

the case

6569

08:18:00,830 --> 08:17:56,940

Frank and I are going to put in for some

6570

08:18:00,840 --> 08:18:19,190

Chuckles all around the room

6571

08:18:22,850 --> 08:18:20,990

and some words there at the end of a

6572

08:18:25,010 --> 08:18:22,860

long but very successful day from our

6573

08:18:27,888 --> 08:18:25,020

two spacewalkers Frank Rubio and Josh

6574

08:18:29,208 --> 08:18:27,898

cassida as well as our ground IV The

6575

08:18:31,010 --> 08:18:29,218

Voice you've heard from Mission Control

6576  
08:18:33,888 --> 08:18:31,020  
walking them through all the procedures

6577  
08:18:35,930 --> 08:18:33,898  
today NASA astronaut Nick Hague

6578  
08:18:37,368 --> 08:18:35,940  
at this point we're just waiting we've

6579  
08:18:39,288 --> 08:18:37,378  
got a two minute timer after the water

6580  
08:18:41,628 --> 08:18:39,298  
turns off before we start moving into

6581  
08:18:43,548 --> 08:18:41,638  
the actual repressurization of that

6582  
08:18:46,010 --> 08:18:43,558  
section of the quest to airlock so

6583  
08:18:47,750 --> 08:18:46,020  
coming up next Frank Rubio our lead

6584  
08:18:50,388 --> 08:18:47,760  
spacewalker for the day is going to get

6585  
08:18:53,690 --> 08:18:50,398  
the go to close the hatch

6586  
08:18:56,448 --> 08:18:53,700  
so as of right now the crew lock section

6587  
08:18:57,948 --> 08:18:56,458  
still has an open hatchway into the

6588  
08:18:59,810 --> 08:18:57,958

vacuum of space so he's going to close

6589

08:19:01,730 --> 08:18:59,820

that up then we'll jump over to the

6590

08:19:04,250 --> 08:19:01,740

repress cue card

6591

08:19:07,310 --> 08:19:04,260

up so you can verify the handle position

6592

08:19:09,530 --> 08:19:07,320

per the hatch decal make sure that the

6593

08:19:14,510 --> 08:19:09,540

outer hatch is clear of hardware and

6594

08:19:14,520 --> 08:20:40,548

coffee good work

6595

08:20:42,960 --> 08:20:42,708

okay Nick we are last and in the lock

6596

08:20:45,048 --> 08:20:42,970

position

6597

08:20:47,270 --> 08:20:45,058

[Applause]

6598

08:20:50,868 --> 08:20:47,280

happy Frank so Josh you're going to

6599

08:20:57,968 --> 08:20:50,878

check on the UIA that the Emu one and

6600

08:21:05,930 --> 08:21:03,110

oxygen emu1 and mu2 open

6601  
08:21:09,170 --> 08:21:05,940  
you're going to switch power for ev1 and

6602  
08:21:10,490 --> 08:21:09,180  
2 to the on position o n check that

6603  
08:21:21,850 --> 08:21:10,500  
you've got

6604  
08:21:21,860 --> 08:21:28,010  
LED and volts 186 power easy two

6605  
08:21:33,830 --> 08:21:29,690  
is on

6606  
08:21:35,090 --> 08:21:33,840  
the LED is 18 6 on Volts

6607  
08:21:37,850 --> 08:21:35,100  
copy

6608  
08:21:40,730 --> 08:21:37,860  
and then you are go on your dcms to

6609  
08:21:46,670 --> 08:21:40,740  
switch power to SCU and expect the

6610  
08:22:04,430 --> 08:21:49,128  
coffee Powers your FPU

6611  
08:22:04,440 --> 08:22:09,410  
foreign

6612  
08:22:18,350 --> 08:22:11,810  
copy Frank and so with that I will hand

6613  
08:22:22,670 --> 08:22:20,810

hey thanks again

6614

08:22:24,468 --> 08:22:22,680

you guys enjoy and uh enjoy your new

6615

08:22:26,570 --> 08:22:24,478

year

6616

08:22:28,128 --> 08:22:26,580

think of us

6617

08:22:30,170 --> 08:22:28,138

thanks for everything Nick

6618

08:22:33,708 --> 08:22:30,180

it's a big team effort enjoyed working

6619

08:22:36,048 --> 08:22:33,718

with you okay Nick excellent job and

6620

08:22:38,510 --> 08:22:36,058

I'll take over from here

6621

08:22:40,670 --> 08:22:38,520

welcome my welcome back guys

6622

08:22:43,850 --> 08:22:40,680

um if you wanted to

6623

08:22:46,840 --> 08:22:43,860

um o2x Trader to press

6624

08:22:46,850 --> 08:23:17,030

[Applause]

6625

08:23:17,040 --> 08:23:47,628

wow

6626  
08:23:52,910 --> 08:23:49,850  
and this is Mission Control Houston just

6627  
08:24:05,350 --> 08:23:52,920  
about one step away until we can call

6628  
08:24:05,360 --> 08:24:21,310  
still working

6629  
08:24:29,510 --> 08:24:25,250  
I moved my PCB to six

6630  
08:24:33,948 --> 08:24:29,520  
hey copy tcv6 or ev1

6631  
08:24:33,958 --> 08:24:37,548  
um

6632  
08:24:46,610 --> 08:24:40,788  
good price and often it says uh

6633  
08:24:46,620 --> 08:24:51,770  
okay

6634  
08:24:51,780 --> 08:24:55,250  
and ev2

6635  
08:24:55,260 --> 08:24:57,480  
um

6636  
08:25:07,320 --> 08:24:58,500  
[Music]

6637  
08:25:07,330 --> 08:25:26,448  
[Applause]

6638  
08:25:26,458 --> 08:25:35,750

thank you

6639

08:25:48,110 --> 08:25:41,990

okay

6640

08:25:50,090 --> 08:25:48,120

press so with both of you in plus

6641

08:25:52,070 --> 08:25:50,100

position we will start the

6642

08:25:54,770 --> 08:25:52,080

pressurization with the IV HC

6643

08:25:57,230 --> 08:25:54,780

coordination valve and if the rate is

6644

08:25:59,930 --> 08:25:57,240

too fast let me know I will start slowly

6645

08:26:02,930 --> 08:25:59,940

okay can you stand by for one second

6646

08:26:05,208 --> 08:26:02,940

happy standing back and Megan uh for

6647

08:26:15,968 --> 08:26:05,218

easy food you sure press I'm not showing

6648

08:26:15,978 --> 08:26:20,990

we see ev2 in press

6649

08:26:24,590 --> 08:26:22,910

and we're still waiting on data for

6650

08:26:28,910 --> 08:26:24,600

everyone

6651  
08:26:28,920 --> 08:26:36,410  
okay we see both your go-to press

6652  
08:26:41,388 --> 08:26:38,868  
okay thank you

6653  
08:26:43,430 --> 08:26:41,398  
okay yeah with that then um we will

6654  
08:26:46,850 --> 08:26:43,440  
start to repressed with the IP hatch

6655  
08:26:49,430 --> 08:26:46,860  
Equalization valve and uh let us know if

6656  
08:26:52,368 --> 08:26:49,440  
that's uh if the rate is too fast and

6657  
08:27:21,850 --> 08:26:52,378  
then I expect the alert tone

6658  
08:27:27,468 --> 08:27:24,708  
and confirmation that the

6659  
08:27:29,150 --> 08:27:27,478  
repressurization of the quest airlock

6660  
08:27:32,690 --> 08:27:29,160  
has begun

6661  
08:27:36,288 --> 08:27:32,700  
stopping our timer for today

6662  
08:27:40,968 --> 08:27:36,298  
and we finished right in the dot 2 27

6663  
08:27:43,788 --> 08:27:40,978

p.m Central Time 3 27 p.m Eastern for

6664

08:27:45,888 --> 08:27:43,798

total elapsed time of seven hours and

6665

08:27:48,468 --> 08:27:45,898

eight minutes in today's space walk

6666

08:27:52,190 --> 08:27:48,478

again seven hours eight minutes the

6667

08:27:56,048 --> 08:27:52,200

repress starting at 2 27 PM Central 3 27

6668

08:27:59,230 --> 08:27:56,058

p.m Eastern that's 2027 GMT

6669

08:28:06,610 --> 08:27:59,240

would you expect me to see anything

6670

08:28:06,620 --> 08:28:18,410

we're checking

6671

08:28:22,310 --> 08:28:20,510

if you wanted me to the house the

6672

08:28:23,930 --> 08:28:22,320

repress rate

6673

08:28:31,150 --> 08:28:23,940

good for everyone

6674

08:28:35,090 --> 08:28:33,230

so right now we're seeing the pressure

6675

08:28:37,610 --> 08:28:35,100

inside the crew lock start to tick up

6676  
08:28:39,948 --> 08:28:37,620  
and this is a manual process using a

6677  
08:28:41,868 --> 08:28:39,958  
valve on that hatchway between the crew

6678  
08:28:44,270 --> 08:28:41,878  
lock and the equipment unlock Section

6679  
08:28:46,670 --> 08:28:44,280  
where koichi makata and Nicole Manor are

6680  
08:28:49,490 --> 08:28:46,680  
going to be standing by to help Josh and

6681  
08:28:52,128 --> 08:28:49,500  
Frank get out of their suits

6682  
08:28:53,510 --> 08:28:52,138  
so you're hearing that airlock start to

6683  
08:28:57,410 --> 08:28:53,520  
fill up with air

6684  
08:28:59,510 --> 08:28:57,420  
it's a manually operated valve called

6685  
08:29:02,810 --> 08:28:59,520  
the IV or intra vehicular hatch

6686  
08:29:04,968 --> 08:29:02,820  
Equalization valve they're able to just

6687  
08:29:07,190 --> 08:29:04,978  
throttle it between off and a normal

6688  
08:29:10,910 --> 08:29:07,200

fill they also have another setting

6689

08:29:14,270 --> 08:29:10,920

where we can very rapidly start to

6690

08:29:16,968 --> 08:29:14,280

repressurize but that not necessarily on

6691

08:29:19,128 --> 08:29:16,978

a normal end of today's spacewalk again

6692

08:29:20,388 --> 08:29:19,138

that total elapsed time seven hours and

6693

08:29:22,368 --> 08:29:20,398

eight minutes

6694

08:29:24,708 --> 08:29:22,378

thank you

6695

08:29:28,610 --> 08:29:24,718

we're going to continue to pressurize up

6696

08:29:32,690 --> 08:29:31,010

and then once we get there we will pause

6697

08:29:34,670 --> 08:29:32,700

for about two minutes just to let

6698

08:29:36,948 --> 08:29:34,680

pressure stabilize

6699

08:29:40,270 --> 08:29:36,958

and then after that two minute clock

6700

08:29:40,280 --> 08:29:46,430

[Music]

6701  
08:29:50,690 --> 08:29:48,590  
and difficult to hear but koichi just

6702  
08:29:53,150 --> 08:29:50,700  
told both crew members who expect an

6703  
08:29:58,368 --> 08:29:53,160  
alert tone once we hit 4 PSI which we

6704  
08:29:58,378 --> 08:30:02,948  
foreign

6705  
08:30:08,990 --> 08:30:05,448  
expecting to continue until we hit about

6706  
08:30:13,310 --> 08:30:09,000  
five and then kuichi will close that

6707  
08:30:17,590 --> 08:30:15,770  
we'll pause for a moment to allow the

6708  
08:30:20,628 --> 08:30:17,600  
pressure to stabilize before we continue

6709  
08:30:24,770 --> 08:30:20,638  
with the repress all the way up to about

6710  
08:30:32,330 --> 08:30:29,448  
okay you want to do I uh turn off the IV

6711  
08:32:18,310 --> 08:30:32,340  
hatch Equalization valve and checking

6712  
08:32:22,610 --> 08:32:20,388  
and this is Mission Control Houston

6713  
08:32:24,530 --> 08:32:22,620

again we're continuing with the

6714

08:32:26,030 --> 08:32:24,540

repressurization of the crew lock

6715

08:32:28,430 --> 08:32:26,040

section of quest

6716

08:32:31,250 --> 08:32:28,440

uh we're pausing at this five to allow

6717

08:32:33,830 --> 08:32:31,260

the pressure to equalize and after about

6718

08:32:35,330 --> 08:32:33,840

a two minute timer a quiche wakata

6719

08:32:36,888 --> 08:32:35,340

waiting inside the equivalent lock will

6720

08:32:39,830 --> 08:32:36,898

be able to open up that valve again to

6721

08:32:42,888 --> 08:32:39,840

continue the repress all the way up to

6722

08:32:46,010 --> 08:32:42,898

about 14.7 so that'll equalize it with

6723

08:32:47,990 --> 08:32:46,020

the equipment lock section get both Josh

6724

08:32:49,750 --> 08:32:48,000

and Frank back into

6725

08:32:51,770 --> 08:32:49,760

essentially a sea level

6726

08:32:55,430 --> 08:32:51,780

atmosphere we're going to do it

6727

08:32:57,048 --> 08:32:55,440

gradually again very similar to any

6728

08:32:58,968 --> 08:32:57,058

pressure changes you go through here on

6729

08:33:01,850 --> 08:32:58,978

Earth you don't want to shock the system

6730

08:33:05,570 --> 08:33:01,860

by going too quickly so it's a very

6731

08:33:08,510 --> 08:33:05,580

gradual repress for them today after

6732

08:33:10,788 --> 08:33:08,520

that hatch pressure gets equalized on

6733

08:33:13,010 --> 08:33:10,798

either side we'll be able to open up the

6734

08:33:14,868 --> 08:33:13,020

hatches bring them in and then begin

6735

08:33:16,910 --> 08:33:14,878

what's known as soup Doffing essentially

6736

08:33:18,830 --> 08:33:16,920

just getting helmets off and then the

6737

08:33:22,968 --> 08:33:18,840

remainder of the suit and bringing it

6738

08:33:26,350 --> 08:33:22,978

into the day for both Josh cassida

6739

08:33:30,048 --> 08:33:26,360

and Frank Rubio this

6740

08:33:34,010 --> 08:33:30,058

was a fully successful spacewalk today

6741

08:33:36,948 --> 08:33:34,020

now where they were able to remove and

6742

08:33:38,690 --> 08:33:36,958

install a new rollout solar array and we

6743

08:33:39,830 --> 08:33:38,700

did get confirmation from the Spartan

6744

08:33:41,810 --> 08:33:39,840

flight controller here in Mission

6745

08:33:44,330 --> 08:33:41,820

Control at that solar array already

6746

08:33:48,170 --> 08:33:44,340

integrated and providing power checked

6747

08:33:50,650 --> 08:33:48,180

out great so the primary yeah we had

6748

08:33:54,110 --> 08:33:50,660

good good luck we check

6749

08:33:55,850 --> 08:33:54,120

please check the switch of glass heaters

6750

08:34:05,868 --> 08:33:55,860

off

6751  
08:34:09,170 --> 08:34:05,878  
pressure check good words thank you

6752  
08:34:12,048 --> 08:34:09,180  
okay great and uh check gloves for

6753  
08:34:19,128 --> 08:34:12,058  
contamination and if you see anything

6754  
08:34:26,570 --> 08:34:23,810  
okay next Next Step both ev1 and ed2 O2

6755  
08:34:28,548 --> 08:34:26,580  
actuator to IV

6756  
08:34:35,770 --> 08:34:28,558  
fast

6757  
08:34:39,110 --> 08:34:37,310  
[Applause]

6758  
08:34:40,490 --> 08:34:39,120  
and station Houston one Josh we'll go

6759  
08:34:42,350 --> 08:34:40,500  
ahead and confirm that transition for

6760  
08:34:44,330 --> 08:34:42,360  
you since your dcms

6761  
08:34:45,948 --> 08:34:44,340  
not showing you anything

6762  
08:34:47,810 --> 08:34:45,958  
okay

6763  
08:34:53,750 --> 08:34:47,820

copy that thank you I believe I'm an IV

6764

08:34:53,760 --> 08:35:02,708

Josh standby

6765

08:35:33,288 --> 08:35:04,850

and station we're just waiting on data

6766

08:35:38,150 --> 08:35:35,690

and so just standing by for another

6767

08:35:40,070 --> 08:35:38,160

moment we'll get a quick day to pass and

6768

08:35:41,690 --> 08:35:40,080

get all of the suit readouts down here

6769

08:35:44,270 --> 08:35:41,700

to the team on the ground just to double

6770

08:35:46,490 --> 08:35:44,280

confirm everything was still looking

6771

08:35:49,310 --> 08:35:46,500

good and then koichiwakata will be able

6772

08:35:52,250 --> 08:35:49,320

to open up that valve and complete the

6773

08:35:53,990 --> 08:35:52,260

final stage of our repress today we'll

6774

08:35:56,750 --> 08:35:54,000

have stats and everything before we sign

6775

08:35:58,910 --> 08:35:56,760

off for you for today's space walk which

6776  
08:36:01,250 --> 08:35:58,920  
again lasts seven hours and eight

6777  
08:36:03,830 --> 08:36:01,260  
minutes in total fully accomplished its

6778  
08:36:05,868 --> 08:36:03,840  
goal of both Josh and cast out and Frank

6779  
08:36:07,670 --> 08:36:05,878  
Rubio working to install that new solar

6780  
08:36:11,388 --> 08:36:07,680  
array

6781  
08:36:15,468 --> 08:36:11,398  
I can see it it's it is NIV

6782  
08:36:20,628 --> 08:36:17,628  
awesome thanks

6783  
08:36:32,990 --> 08:36:20,638  
okay yeah with that

6784  
08:36:46,968 --> 08:36:35,150  
can you be running two expect other

6785  
08:36:52,070 --> 08:36:49,250  
and so that hatch Equalization valve

6786  
08:36:53,990 --> 08:36:52,080  
open once more seeing the pressure climb

6787  
08:36:55,270 --> 08:36:54,000  
they're going to continue until the

6788  
08:36:58,250 --> 08:36:55,280

difference and

6789

08:37:00,770 --> 08:36:58,260

pressure between the crew lock and the

6790

08:37:02,930 --> 08:37:00,780

equipment lock is essentially zero so

6791

08:37:04,850 --> 08:37:02,940

they'll be equal in pressure

6792

08:37:06,830 --> 08:37:04,860

after which case will be out of the

6793

08:37:08,448 --> 08:37:06,840

repress cue card and

6794

08:37:10,730 --> 08:37:08,458

Ouija Nicole be able to open up the

6795

08:37:13,128 --> 08:37:10,740

hatch bring Josh and Frank back inside

6796

08:37:45,790 --> 08:37:13,138

and get them out of their suits and and

6797

08:37:45,800 --> 08:37:57,410

[Applause]

6798

08:37:57,420 --> 08:38:03,630

foreign

6799

08:38:13,570 --> 08:38:10,030

[Applause]

6800

08:38:16,850 --> 08:38:13,580

PSI I'm looking to get to right around

6801  
08:38:18,590 --> 08:38:16,860  
14.7 looks like we're a shade under but

6802  
08:38:21,110 --> 08:38:18,600  
that's roughly the sea level pressure

6803  
08:38:24,948 --> 08:38:21,120  
that the entirety of the stations kept

6804  
08:38:30,170 --> 08:38:27,590  
just over 11 we'll see that pressure

6805  
08:38:31,870 --> 08:38:30,180  
start to equalize out pretty soon and

6806  
08:39:03,048 --> 08:38:31,880  
the hatch will come open

6807  
08:39:03,058 --> 08:39:22,170  
foreign

6808  
08:39:22,180 --> 08:39:30,110  
[Music]

6809  
08:39:30,120 --> 08:39:36,430  
foreign

6810  
08:39:41,810 --> 08:39:38,930  
and the pressure inside the crew lock

6811  
08:39:44,208 --> 08:39:41,820  
just crawling over 14 PSI so we should

6812  
08:39:55,140 --> 08:39:44,218  
be getting real close now to that

6813  
08:39:55,150 --> 08:39:59,750

[Music]

6814

08:40:39,230 --> 08:40:02,280

foreign

6815

08:40:53,270 --> 08:40:43,910

okay Ivana dv2 we will open the IB hatch

6816

08:40:58,548 --> 08:40:56,690

and with the pressure now equalized

6817

08:41:00,468 --> 08:40:58,558

which we're kind of working to open up

6818

08:41:06,048 --> 08:41:00,478

that hatch between the crew and

6819

08:41:20,880 --> 08:41:08,810

and once that hatch is open uh he and

6820

08:41:26,310 --> 08:41:23,448

[Music]

6821

08:41:29,708 --> 08:41:26,320

little scissors

6822

08:41:29,718 --> 08:41:38,620

all set thanks

6823

08:41:53,590 --> 08:41:41,930

[Music]

6824

08:41:59,690 --> 08:41:56,868

the hatch now open

6825

08:42:01,968 --> 08:41:59,700

and with that koichiwakata and Nicole

6826

08:42:04,788 --> 08:42:01,978

man able to start bringing

6827

08:42:06,410 --> 08:42:04,798

Frank Rubio Josh cassida back inside of

6828

08:42:08,690 --> 08:42:06,420

the equipment lock they're gonna help

6829

08:42:10,430 --> 08:42:08,700

them get helmets off get out of their

6830

08:42:12,288 --> 08:42:10,440

suits make their way back into the

6831

08:42:14,990 --> 08:42:12,298

station after an extremely successful

6832

08:42:17,628 --> 08:42:15,000

day today again just a recap seven hours

6833

08:42:21,048 --> 08:42:17,638

eight minutes of space walking time

6834

08:42:22,910 --> 08:42:21,058

today fully successful able to remove

6835

08:42:26,030 --> 08:42:22,920

that rollout solar array from its temp

6836

08:42:29,288 --> 08:42:26,040

style location get it out to its new

6837

08:42:31,910 --> 08:42:29,298

home powering the 4A power Channel

6838

08:42:33,948 --> 08:42:31,920

successfully installed unfurled

6839

08:42:36,410 --> 08:42:33,958

integrated in and already generating

6840

08:42:38,690 --> 08:42:36,420

electricity so that's four out of six

6841

08:42:40,730 --> 08:42:38,700

irosa arrays now

6842

08:42:42,770 --> 08:42:40,740

installed on the International Space

6843

08:42:46,310 --> 08:42:42,780

Station so very successful day the third

6844

08:42:47,990 --> 08:42:46,320

Space Walk for this Duo just in the last

6845

08:42:50,570 --> 08:42:48,000

couple of months and in their careers

6846

08:42:53,230 --> 08:42:50,580

together so a couple of quick stats for

6847

08:42:56,270 --> 08:42:53,240

you before we go away this was the

6848

08:42:59,208 --> 08:42:56,280

257th spacewalk in support of station

6849

08:43:02,810 --> 08:42:59,218

assembly maintenance and upgrades

6850

08:43:06,048 --> 08:43:02,820

this was the 12th spacewalk on the

6851  
08:43:08,750 --> 08:43:06,058  
station in 2022 and the fourth that was

6852  
08:43:12,230 --> 08:43:08,760  
accomplished during Expedition 68 third

6853  
08:43:16,788 --> 08:43:12,240  
rush or third U.S one and the first

6854  
08:43:21,590 --> 08:43:19,430  
and this was the third spacewalk of both

6855  
08:43:23,628 --> 08:43:21,600  
cassida and Rubio's career both of them

6856  
08:43:27,410 --> 08:43:23,638  
now with a cumulative spacewalking time

6857  
08:43:31,548 --> 08:43:27,420  
of 21 hours and 24 minutes

6858  
08:43:33,670 --> 08:43:31,558  
so all told these 257 spacewalks now

6859  
08:43:38,810 --> 08:43:33,680  
give us a lifetime

6860  
08:43:41,930 --> 08:43:38,820  
of over 1600 hours 1630 hours 26 minutes

6861  
08:43:46,190 --> 08:43:41,940  
of space walking that translates to 67

6862  
08:43:49,250 --> 08:43:46,200  
days 22 hours and 26 minutes

6863  
08:43:51,708 --> 08:43:49,260

but with the crew back safely inside

6864

08:43:54,650 --> 08:43:51,718

being helped out now by their expedition

6865

08:43:57,170 --> 08:43:54,660

68 crewmates a very successful spacewalk

6866

08:44:00,650 --> 08:43:57,180

today we are going to head going to go

6867

08:44:05,270 --> 08:44:00,660

ahead and wrap up our live coverage of

6868

08:44:08,090 --> 08:44:05,280

Eva number 83 us EV 83 here on NASA TV

6869

08:44:10,250 --> 08:44:08,100

thanks for following along watching Josh

6870

08:44:11,208 --> 08:44:10,260

and Frank work in the vacuum of space

6871

08:44:14,990 --> 08:44:11,218

and

6872

08:44:16,730 --> 08:44:15,000

uh make a successful upgrade to the

6873

08:44:18,948 --> 08:44:16,740

station's power generation system to

6874

08:44:21,650 --> 08:44:18,958

help power more research more technology

6875

08:44:23,810 --> 08:44:21,660

for many years to come be sure to tune

6876  
08:44:27,468 --> 08:44:23,820  
in for all our upcoming Dynamic

6877  
08:44:29,090 --> 08:44:27,478  
activities in 2023 as the action never

6878  
08:44:30,708 --> 08:44:29,100  
really stops on board the station will

6879  
08:44:33,350 --> 08:44:30,718  
have a lot more space walks cargo

6880  
08:44:35,510 --> 08:44:33,360  
vehicles upgrade science all happening

6881  
08:44:38,030 --> 08:44:35,520  
throughout next year but if we don't

6882  
08:44:40,670 --> 08:44:38,040  
talk to you again have a very wonderful

6883  
08:44:41,990 --> 08:44:40,680  
holiday a very Happy New Year we will

6884  
08:44:43,910 --> 08:44:42,000  
see you next time on board the

6885  
08:44:49,190 --> 08:44:43,920  
International Space Station so signing

6886  
08:45:18,770 --> 08:44:57,070  
[Music]

6887  
08:45:18,780 --> 08:45:22,640  
foreign

6888  
08:45:49,910 --> 08:45:28,100

[Music]

6889

08:45:49,920 --> 08:45:55,150

foreign

6890

08:46:19,968 --> 08:46:12,910

[Music]

6891

08:46:19,978 --> 08:46:23,380

foreign

6892

08:46:55,730 --> 08:46:41,140

[Music]

6893

08:47:08,530 --> 08:46:58,370

foreign

6894

08:47:25,770 --> 08:47:16,570

[Music]