



1  
00:00:02,170 --> 00:00:07,030

[Music]

2  
00:00:07,040 --> 00:00:12,170

between countries

3  
00:00:12,180 --> 00:00:16,150

[Applause]

4  
00:00:16,160 --> 00:00:29,349

clears the tower

5  
00:00:29,359 --> 00:00:33,430  
to get us discoveries we are today

6  
00:00:33,440 --> 00:00:45,350

[Music]

7  
00:00:50,869 --> 00:00:47,670  
you're looking live at the crew dragon

8  
00:00:52,950 --> 00:00:50,879  
spacecraft on top of a falcon 9 rocket

9  
00:00:55,029 --> 00:00:52,960  
set to launch four astronauts to the

10  
00:00:57,350 --> 00:00:55,039  
international space station in just a

11  
00:00:59,590 --> 00:00:57,360  
few hours today a crew of three

12  
00:01:01,590 --> 00:00:59,600  
americans and one european astronaut

13  
00:01:04,549 --> 00:01:01,600

will set off on a six-month science

14

00:01:06,550 --> 00:01:04,559

mission to the world's only orbiting

15

00:01:08,310 --> 00:01:06,560

laboratory

16

00:01:10,230 --> 00:01:08,320

and welcome everyone to the kennedy

17

00:01:12,870 --> 00:01:10,240

space center in florida for live

18

00:01:15,429 --> 00:01:12,880

coverage of nasa and spacex's launch of

19

00:01:19,270 --> 00:01:15,439

crew 3. i'm daryl nail with nasa and

20

00:01:20,950 --> 00:01:19,280

this is nasa's astronaut shannon walker

21

00:01:23,510 --> 00:01:20,960

so thrilled to have you here with our

22

00:01:26,310 --> 00:01:23,520

launch broadcast first time for somebody

23

00:01:28,630 --> 00:01:26,320

who's actually flown on the dragon yes i

24

00:01:30,550 --> 00:01:28,640

am so excited to be here i figure if i

25

00:01:32,469 --> 00:01:30,560

can't actually be on the dragon this is

26

00:01:34,230 --> 00:01:32,479

the next place best place to be there

27

00:01:35,670 --> 00:01:34,240

you go and we left the model behind us

28

00:01:38,550 --> 00:01:35,680

with the with the door open just good

29

00:01:40,950 --> 00:01:38,560

just i'll go get it yep hey listen so

30

00:01:42,069 --> 00:01:40,960

we're the top story right now we're

31

00:01:44,310 --> 00:01:42,079

seeing a little bit of weather you can

32

00:01:46,630 --> 00:01:44,320

see it in the picture we got some clouds

33

00:01:49,429 --> 00:01:46,640

behind us but we currently sit at 70

34

00:01:50,710 --> 00:01:49,439

percent go hopeful that that holds yep

35

00:01:52,710 --> 00:01:50,720

hopefully it will hold we've had a

36

00:01:54,630 --> 00:01:52,720

little bit of misty rain today but uh it

37

00:01:56,630 --> 00:01:54,640

seems to be pushing out so keep our

38

00:01:58,550 --> 00:01:56,640

fingers crossed it'll keep keep on going

39

00:01:59,749 --> 00:01:58,560

we're hoping for that and if you folks

40

00:02:01,749 --> 00:01:59,759

want to ask

41

00:02:03,749 --> 00:02:01,759

shannon some questions and gain some of

42

00:02:07,030 --> 00:02:03,759

her expertise and what it was like to

43

00:02:09,270 --> 00:02:07,040

fly to space you can participate by

44

00:02:12,949 --> 00:02:09,280

asking that question on twitter just

45

00:02:14,710 --> 00:02:12,959

send a tweet with the hashtag ask nasa

46

00:02:16,869 --> 00:02:14,720

and we'll get the question to her at

47

00:02:19,110 --> 00:02:16,879

various times throughout the broadcast

48

00:02:21,910 --> 00:02:19,120

let's begin now with a mission overview

49

00:02:25,350 --> 00:02:21,920

in just over four hours at 9 03 pm

50

00:02:28,070 --> 00:02:25,360

eastern time nasa astronauts raja chari

51  
00:02:30,309 --> 00:02:28,080  
tom marshburn caleb barron and european

52  
00:02:33,190 --> 00:02:30,319  
space agency astronaut matthias maurer

53  
00:02:35,270 --> 00:02:33,200  
will lift off from launch complex 39a at

54  
00:02:37,750 --> 00:02:35,280  
nasa's kennedy space center

55  
00:02:40,309 --> 00:02:37,760  
as part of the commercial crew program

56  
00:02:43,430 --> 00:02:40,319  
now when they lift off this will be the

57  
00:02:45,750 --> 00:02:43,440  
third operational mission yes indeed you

58  
00:02:47,190 --> 00:02:45,760  
were the first i was at first yes our

59  
00:02:49,589 --> 00:02:47,200  
crew went up for six months and now

60  
00:02:52,309 --> 00:02:49,599  
we're on our third six month

61  
00:02:55,190 --> 00:02:52,319  
crew going to space station and so the

62  
00:02:57,270 --> 00:02:55,200  
crew crew 3 will be flying a brand new

63  
00:02:59,830 --> 00:02:57,280

dragon so they got that brand new

64

00:03:03,110 --> 00:02:59,840

spacecraft smell when they go inside so

65

00:03:04,869 --> 00:03:03,120

important it's called endurance and

66

00:03:06,390 --> 00:03:04,879

it's been named by the crew of course

67

00:03:08,470 --> 00:03:06,400

and their patch as well we'll talk more

68

00:03:11,110 --> 00:03:08,480

about that in a bit and it's on top of a

69

00:03:12,229 --> 00:03:11,120

refurbished falcon 9 that launched crs

70

00:03:14,790 --> 00:03:12,239

22

71

00:03:16,710 --> 00:03:14,800

back in june so covering all of the

72

00:03:18,710 --> 00:03:16,720

action around the country our teams at

73

00:03:21,350 --> 00:03:18,720

spacex headquarters in hawthorne

74

00:03:23,830 --> 00:03:21,360

california nasa's mission control center

75

00:03:26,149 --> 00:03:23,840

in houston and of course right here in

76

00:03:27,910 --> 00:03:26,159

florida hello folks

77

00:03:29,990 --> 00:03:27,920

so we'll also talk with the crew 2

78

00:03:32,070 --> 00:03:30,000

astronauts about how they prepared for

79

00:03:34,070 --> 00:03:32,080

crew 3's arrival before they came back

80

00:03:35,910 --> 00:03:34,080

home and of course we'll answer those

81

00:03:38,070 --> 00:03:35,920

social media questions throughout the

82

00:03:40,470 --> 00:03:38,080

countdown and you can send them in as we

83

00:03:43,430 --> 00:03:40,480

mentioned by just using the hashtag

84

00:03:44,550 --> 00:03:43,440

asknasa on twitter okay let's talk about

85

00:03:46,630 --> 00:03:44,560

the crew and what they did you're

86

00:03:48,309 --> 00:03:46,640

familiar with this prior to today's

87

00:03:51,110 --> 00:03:48,319

flight the crew shifted their sleep

88

00:03:52,949 --> 00:03:51,120

schedule always a fun thing yes waking

89

00:03:54,789 --> 00:03:52,959

up late morning and one of the first

90

00:03:57,270 --> 00:03:54,799

things they did was this let's take a

91

00:03:59,830 --> 00:03:57,280

look at some video here they stuck their

92

00:04:01,509 --> 00:03:59,840

sticker on the wall literally right

93

00:04:03,190 --> 00:04:01,519

below crew one sticker there's crew

94

00:04:04,630 --> 00:04:03,200

three and then they gave it a tap

95

00:04:05,750 --> 00:04:04,640

slapped it on the wall it's a new

96

00:04:07,429 --> 00:04:05,760

tradition

97

00:04:09,670 --> 00:04:07,439

and shaman i guess you started that

98

00:04:11,830 --> 00:04:09,680

right your crew well yep uh well i

99

00:04:13,509 --> 00:04:11,840

believe demo two is there as well but uh

100

00:04:15,350 --> 00:04:13,519

something crews like to do leave their

101  
00:04:17,430 --> 00:04:15,360  
stickers wherever they are so we put it

102  
00:04:19,749 --> 00:04:17,440  
on inside crew quarters and then you see

103  
00:04:21,270 --> 00:04:19,759  
them here they are awaiting breakfast

104  
00:04:23,270 --> 00:04:21,280  
they looked hungry they didn't look the

105  
00:04:24,230 --> 00:04:23,280  
food hadn't been served yet nope ready

106  
00:04:28,390 --> 00:04:24,240  
to eat

107  
00:04:30,070 --> 00:04:28,400  
pre-launch meal and so we're of course

108  
00:04:31,990 --> 00:04:30,080  
we're ready to to chow down on the

109  
00:04:32,870 --> 00:04:32,000  
launch if we can uh get that to happen

110  
00:04:35,270 --> 00:04:32,880  
today

111  
00:04:37,749 --> 00:04:35,280  
so now just about 90 minutes ago that

112  
00:04:40,550 --> 00:04:37,759  
last meal that will prepare them for

113  
00:04:42,390 --> 00:04:40,560

liftoff and what did you eat before you

114

00:04:44,070 --> 00:04:42,400

went to space yeah everyone in our crew

115

00:04:46,070 --> 00:04:44,080

ate something different but i was in the

116

00:04:48,390 --> 00:04:46,080

mood for a good old hamburger so i had a

117

00:04:49,909 --> 00:04:48,400

cheeseburger and an arugula salad to

118

00:04:51,030 --> 00:04:49,919

offset it

119

00:04:53,749 --> 00:04:51,040

a good

120

00:04:55,830 --> 00:04:53,759

beefy hamburger huh yes you went big

121

00:04:58,070 --> 00:04:55,840

that's great well lunch was followed by

122

00:05:00,230 --> 00:04:58,080

medical checks flight date preparations

123

00:05:01,909 --> 00:05:00,240

and then getting dressed and suited up

124

00:05:04,070 --> 00:05:01,919

for space light space flight and the

125

00:05:05,430 --> 00:05:04,080

nasa helicopter we want you to know is

126

00:05:07,350 --> 00:05:05,440

here getting right there yeah we're

127

00:05:08,230 --> 00:05:07,360

hoping to get some great uh aerial shots

128

00:05:10,230 --> 00:05:08,240

as well

129

00:05:12,710 --> 00:05:10,240

at t minus four hours and five minutes

130

00:05:14,870 --> 00:05:12,720

nasa will turn crew three over to the

131

00:05:16,790 --> 00:05:14,880

spacex team and then we'll see some key

132

00:05:19,749 --> 00:05:16,800

milestones along the way to lift off the

133

00:05:21,590 --> 00:05:19,759

first one is suit up inside nasa's neil

134

00:05:24,230 --> 00:05:21,600

armstrong operations and checkout

135

00:05:26,310 --> 00:05:24,240

building or the onc after their dress

136

00:05:28,310 --> 00:05:26,320

the suits are then pressure checked

137

00:05:30,790 --> 00:05:28,320

after suit up we'll see the crew walk

138

00:05:32,790 --> 00:05:30,800

out the astronauts will leave the onc

139

00:05:34,710 --> 00:05:32,800

building and give their final goodbyes

140

00:05:36,710 --> 00:05:34,720

and this can be an emotional moment for

141

00:05:38,469 --> 00:05:36,720

some following the goodbyes the crew

142

00:05:41,749 --> 00:05:38,479

will then get in their teslas and begin

143

00:05:44,230 --> 00:05:41,759

the roughly 20 minute drive to pad 39a

144

00:05:46,870 --> 00:05:44,240

and once there the four astronauts will

145

00:05:49,189 --> 00:05:46,880

ascend to the 255 foot level of the

146

00:05:52,150 --> 00:05:49,199

fixed service structure crew ingress

147

00:05:54,310 --> 00:05:52,160

follows basically astronauts boarding or

148

00:05:56,469 --> 00:05:54,320

getting inside the spacecraft and then

149

00:05:58,950 --> 00:05:56,479

after all the vehicle and crew checkouts

150

00:06:01,189 --> 00:05:58,960

are completed the spacex closeout team

151  
00:06:04,150 --> 00:06:01,199  
will close dragon's side hatch with the

152  
00:06:06,309 --> 00:06:04,160  
crew safely inside at t minus 40 minutes

153  
00:06:08,710 --> 00:06:06,319  
the crew access arm which is the long

154  
00:06:10,710 --> 00:06:08,720  
suspended uh walkway that you can see

155  
00:06:13,430 --> 00:06:10,720  
there there it is in the shot they'll

156  
00:06:15,510 --> 00:06:13,440  
use that to board dragon and then that

157  
00:06:17,909 --> 00:06:15,520  
will retract followed by the arming of

158  
00:06:20,469 --> 00:06:17,919  
the launch escape system propellant

159  
00:06:22,950 --> 00:06:20,479  
loading on falcon 9 follows then at t

160  
00:06:24,870 --> 00:06:22,960  
minus 5 minutes dragon will be

161  
00:06:28,309 --> 00:06:24,880  
configured for what is called terminal

162  
00:06:30,950 --> 00:06:28,319  
count and then finally at t 0 crew

163  
00:06:34,070 --> 00:06:30,960

dragon and falcon 9 will lift off and

164

00:06:36,790 --> 00:06:34,080

roughly 12 minutes after that separation

165

00:06:39,590 --> 00:06:36,800

from falcon 9 second stage and then

166

00:06:41,590 --> 00:06:39,600

dragonflies to the destination the

167

00:06:43,749 --> 00:06:41,600

international space station

168

00:06:46,150 --> 00:06:43,759

that entire timeline you lived it you

169

00:06:47,909 --> 00:06:46,160

rehearsed it shannon um i wonder about

170

00:06:49,749 --> 00:06:47,919

that moment where you're saying goodbye

171

00:06:52,070 --> 00:06:49,759

we're going to see that not long from

172

00:06:54,550 --> 00:06:52,080

now to your family and friends yeah that

173

00:06:56,629 --> 00:06:54,560

it is an emotional moment um so

174

00:06:59,110 --> 00:06:56,639

everybody's here down wishing you well

175

00:07:01,670 --> 00:06:59,120

but uh saying saying goodbye to your

176

00:07:04,550 --> 00:07:01,680

family it's it's hard on both sides all

177

00:07:06,950 --> 00:07:04,560

right well we begin with crew suit up

178

00:07:08,309 --> 00:07:06,960

just a few minutes away but we want to

179

00:07:10,230 --> 00:07:08,319

introduce our team at spacex

180

00:07:14,070 --> 00:07:10,240

headquarters in california to show us

181

00:07:18,469 --> 00:07:16,150

hello from spacex headquarters in

182

00:07:20,469 --> 00:07:18,479

hawthorne california i'm nasa's courtney

183

00:07:22,950 --> 00:07:20,479

beasley and thank you for joining us

184

00:07:24,790 --> 00:07:22,960

live for the fourth flight of astronauts

185

00:07:27,589 --> 00:07:24,800

on crew dragon to the international

186

00:07:29,430 --> 00:07:27,599

space station i'm jesse anderson a

187

00:07:31,510 --> 00:07:29,440

production and engineering manager here

188

00:07:33,110 --> 00:07:31,520

at spacex and right next to us is

189

00:07:34,870 --> 00:07:33,120

mission control hawthorne where our

190

00:07:36,870 --> 00:07:34,880

teams are monitoring the vehicle

191

00:07:39,430 --> 00:07:36,880

checking in on all of its systems and

192

00:07:41,430 --> 00:07:39,440

the capsule is currently go for launch

193

00:07:43,110 --> 00:07:41,440

that's right and once the crew lifts off

194

00:07:44,869 --> 00:07:43,120

it will take them about 22 hours to

195

00:07:46,629 --> 00:07:44,879

reach their destination the

196

00:07:49,029 --> 00:07:46,639

international space station with dragons

197

00:07:50,710 --> 00:07:49,039

flying autonomously the entire way but

198

00:07:52,869 --> 00:07:50,720

the crew will have the ability to take

199

00:07:54,550 --> 00:07:52,879

manual control of endurance at any time

200

00:07:56,710 --> 00:07:54,560

if necessary

201  
00:07:58,309 --> 00:07:56,720  
to help make sure the crew has a safe

202  
00:08:01,350 --> 00:07:58,319  
journey our team in mission control will

203  
00:08:03,350 --> 00:08:01,360  
be monitoring the progress along the way

204  
00:08:05,029 --> 00:08:03,360  
on console or headset are six key

205  
00:08:06,950 --> 00:08:05,039  
positions who are monitoring the health

206  
00:08:08,869 --> 00:08:06,960  
of the vehicle and the crew the mission

207  
00:08:11,270 --> 00:08:08,879  
director who is responsible for mission

208  
00:08:12,629 --> 00:08:11,280  
success is in charge in the room

209  
00:08:14,629 --> 00:08:12,639  
the person that you'll hear talking to

210  
00:08:16,629 --> 00:08:14,639  
the astronauts is the crew operations

211  
00:08:18,950 --> 00:08:16,639  
and resources engineer what you'll hear

212  
00:08:20,790 --> 00:08:18,960  
is called the core the other positions

213  
00:08:23,589 --> 00:08:20,800

are focused on vehicle systems like

214

00:08:25,510 --> 00:08:23,599

navigation and control avionics software

215

00:08:27,830 --> 00:08:25,520

propulsion life support and

216

00:08:30,710 --> 00:08:27,840

communications with ground segments and

217

00:08:32,389 --> 00:08:30,720

nasa has its own team members in mission

218

00:08:34,070 --> 00:08:32,399

control houston where they've been

219

00:08:36,469 --> 00:08:34,080

preparing the international space

220

00:08:38,149 --> 00:08:36,479

station for crew dragon's arrival we'll

221

00:08:39,909 --> 00:08:38,159

meet several of the key players later

222

00:08:41,829 --> 00:08:39,919

when we check in with houston for now

223

00:08:43,509 --> 00:08:41,839

though let's go to john insbrecker for

224

00:08:46,790 --> 00:08:43,519

an operational update on the launch

225

00:08:48,790 --> 00:08:46,800

countdown john hi i'm john inspector

226

00:08:51,590 --> 00:08:48,800

falcon 9 principal integration engineer

227

00:08:53,670 --> 00:08:51,600

here at spacex for just over four hours

228

00:08:56,070 --> 00:08:53,680

to launch and over the next few minutes

229

00:08:58,150 --> 00:08:56,080

the spacex nasa teams will undergo a

230

00:09:00,470 --> 00:08:58,160

series of polls to verify that the

231

00:09:02,949 --> 00:09:00,480

advanced team and the crew are ready to

232

00:09:04,470 --> 00:09:02,959

enter the pad and the spacecraft there's

233

00:09:06,230 --> 00:09:04,480

also going to be a countdown briefing

234

00:09:08,870 --> 00:09:06,240

that goes over items such as crew

235

00:09:10,790 --> 00:09:08,880

weather and vehicle status now leading

236

00:09:13,030 --> 00:09:10,800

up to tonight's launch the spacex team

237

00:09:16,070 --> 00:09:13,040

performed a static fire of the falcon

238

00:09:17,509 --> 00:09:16,080

with dragon vehicle back on 27 october

239

00:09:19,350 --> 00:09:17,519

just ran the team and the flight

240

00:09:21,509 --> 00:09:19,360

hardware through the countdown we ran

241

00:09:23,750 --> 00:09:21,519

the engines for seven seconds

242

00:09:25,910 --> 00:09:23,760

now following the static fire we drained

243

00:09:27,829 --> 00:09:25,920

the rocket of propellants we did a full

244

00:09:30,470 --> 00:09:27,839

dress rehearsal for the crew on october

245

00:09:32,550 --> 00:09:30,480

28th the crew suited up they entered the

246

00:09:34,790 --> 00:09:32,560

capsule and they performed the countdown

247

00:09:36,389 --> 00:09:34,800

steps with the dragon flight team

248

00:09:38,630 --> 00:09:36,399

now once the rehearsal is complete the

249

00:09:40,630 --> 00:09:38,640

crew was out of the capsule the spacex

250

00:09:42,870 --> 00:09:40,640

and nasa teams loaded the final cargo

251  
00:09:44,389 --> 00:09:42,880  
into lockers on the floor of the dragon

252  
00:09:46,870 --> 00:09:44,399  
capsule

253  
00:09:48,949 --> 00:09:46,880  
as you see on the video there the falcon

254  
00:09:51,750 --> 00:09:48,959  
9 with dragon has remained vertical on

255  
00:09:53,430 --> 00:09:51,760  
pad 39a since those tests waiting out

256  
00:09:55,910 --> 00:09:53,440  
weather and the schedule for tonight's

257  
00:09:57,829 --> 00:09:55,920  
launch attempt our next major activity

258  
00:10:00,550 --> 00:09:57,839  
is going to be arrival of the crew just

259  
00:10:01,990 --> 00:10:00,560  
inside t-minus three hours

260  
00:10:03,590 --> 00:10:02,000  
now while the crew and the hardware

261  
00:10:05,190 --> 00:10:03,600  
currently go we're also keeping an eye

262  
00:10:06,710 --> 00:10:05,200  
on the weather is another important

263  
00:10:08,230 --> 00:10:06,720

factor in a launch

264

00:10:09,990 --> 00:10:08,240

the astronauts just received their

265

00:10:12,389 --> 00:10:10,000

weather briefing about 10 minutes ago

266

00:10:14,310 --> 00:10:12,399

before we went live with the broadcast

267

00:10:16,790 --> 00:10:14,320

while we're watching cumulus crowds

268

00:10:18,230 --> 00:10:16,800

possible precipitation we expect that

269

00:10:19,990 --> 00:10:18,240

the weather will stay west of the launch

270

00:10:22,550 --> 00:10:20,000

pad and it will be improving through the

271

00:10:23,590 --> 00:10:22,560

evening so currently no issues with the

272

00:10:25,190 --> 00:10:23,600

weather

273

00:10:28,310 --> 00:10:25,200

now in the event things don't go as

274

00:10:29,910 --> 00:10:28,320

planned such as an abort spacex and nasa

275

00:10:32,310 --> 00:10:29,920

are coordinating with the u.s coast

276

00:10:33,590 --> 00:10:32,320

guard to ensure crew safety upon

277

00:10:36,230 --> 00:10:33,600

splashdown

278

00:10:38,310 --> 00:10:36,240

this includes extra ships and air assets

279

00:10:40,630 --> 00:10:38,320

to patrol the 10 nautical mile keep out

280

00:10:42,710 --> 00:10:40,640

zone this is to help mitigate safety

281

00:10:44,630 --> 00:10:42,720

concerns for any boaters approaching the

282

00:10:46,710 --> 00:10:44,640

landing area

283

00:10:49,030 --> 00:10:46,720

as usual for dragon flights we have an

284

00:10:50,870 --> 00:10:49,040

instantaneous launch window

285

00:10:52,310 --> 00:10:50,880

that means we can't move the launch time

286

00:10:54,470 --> 00:10:52,320

we have to go right on the planned

287

00:10:56,389 --> 00:10:54,480

minute and second but if we do need to

288

00:10:58,550 --> 00:10:56,399

delay there is a backup launch

289

00:11:01,030 --> 00:10:58,560

opportunity from kennedy space center

290

00:11:03,190 --> 00:11:01,040

the evening of 11 november about 23

291

00:11:05,110 --> 00:11:03,200

minutes earlier than tonight but right

292

00:11:07,590 --> 00:11:05,120

now with everything go at the pad let's

293

00:11:14,630 --> 00:11:07,600

head over to houston where nasa's sandra

294

00:11:18,870 --> 00:11:16,550

thanks john and welcome to mission

295

00:11:20,550 --> 00:11:18,880

control houston you're inside the

296

00:11:22,949 --> 00:11:20,560

international space station flight

297

00:11:25,110 --> 00:11:22,959

control room in houston texas at nasa's

298

00:11:26,949 --> 00:11:25,120

johnson space center mission control

299

00:11:28,630 --> 00:11:26,959

houston is the nerve center for

300

00:11:30,870 --> 00:11:28,640

operating the international space

301

00:11:33,190 --> 00:11:30,880

station working in tandem with our

302

00:11:35,350 --> 00:11:33,200

partner agencies and providers around

303

00:11:37,750 --> 00:11:35,360

the globe together we've ensured the

304

00:11:40,150 --> 00:11:37,760

station is ready to welcome crew 3 as

305

00:11:42,710 --> 00:11:40,160

the four astronauts arrive and join the

306

00:11:44,630 --> 00:11:42,720

current expedition 66 crew

307

00:11:46,949 --> 00:11:44,640

leading the team inside the room right

308

00:11:48,949 --> 00:11:46,959

now is flight director rebecca wingfield

309

00:11:51,190 --> 00:11:48,959

as the crew on board station has just

310

00:11:53,829 --> 00:11:51,200

entered their sleep period to prepare to

311

00:11:55,590 --> 00:11:53,839

support approach monitoring tomorrow

312

00:11:57,430 --> 00:11:55,600

wingfield will return as nasa flight

313

00:11:59,829 --> 00:11:57,440

director for dragon's approach and

314

00:12:02,389 --> 00:11:59,839

docking and shall lead the joint nasa

315

00:12:04,629 --> 00:12:02,399

spacex go no goes once we're in joint

316

00:12:07,350 --> 00:12:04,639

operations with mission controls here in

317

00:12:09,350 --> 00:12:07,360

houston and at spacex in hawthorne

318

00:12:11,430 --> 00:12:09,360

working in sync to bring crew dragon to

319

00:12:13,350 --> 00:12:11,440

its new home in space

320

00:12:16,389 --> 00:12:13,360

earlier today the international space

321

00:12:19,110 --> 00:12:16,399

station's russian progress 79 engines

322

00:12:22,069 --> 00:12:19,120

fired for six minutes two seconds at 2

323

00:12:24,470 --> 00:12:22,079

15 pm central time in a planned maneuver

324

00:12:26,870 --> 00:12:24,480

to raise the altitude of station as a

325

00:12:28,710 --> 00:12:26,880

reboost replacing up

326

00:12:30,790 --> 00:12:28,720

replacing a planned station maneuver

327

00:12:32,949 --> 00:12:30,800

next week designed to set up the correct

328

00:12:35,829 --> 00:12:32,959

phasing conditions for the launch of the

329

00:12:37,750 --> 00:12:35,839

preshell node module on november 24th

330

00:12:39,430 --> 00:12:37,760

and the launch of the soyuz ms-20

331

00:12:41,269 --> 00:12:39,440

spacecraft next month

332

00:12:43,110 --> 00:12:41,279

the maneuver had the collateral effect

333

00:12:45,269 --> 00:12:43,120

of placing the station well away from

334

00:12:47,190 --> 00:12:45,279

the predicted path of a small piece of

335

00:12:49,269 --> 00:12:47,200

chinese satellite debris identified

336

00:12:51,430 --> 00:12:49,279

yesterday by ballistics officials who

337

00:12:53,350 --> 00:12:51,440

track such objects in orbit

338

00:12:56,069 --> 00:12:53,360

the maneuver raised the station's orbit

339

00:12:58,629 --> 00:12:56,079

by 1.1 miles at apogee and three-tenths

340

00:13:01,949 --> 00:12:58,639

of a mile at perigee the complex is now

341

00:13:03,870 --> 00:13:01,959

orbiting at an attitude an altitude of

342

00:13:06,470 --> 00:13:03,880

265.3 by

343

00:13:08,470 --> 00:13:06,480

257.3 statute miles

344

00:13:10,310 --> 00:13:08,480

although ballistics specialists reported

345

00:13:12,470 --> 00:13:10,320

that the debris posed no threat to the

346

00:13:15,030 --> 00:13:12,480

station or the crew we proceeded with

347

00:13:17,509 --> 00:13:15,040

the maneuver to avoid any issues to the

348

00:13:19,190 --> 00:13:17,519

crew dragon rendezvous after launch

349

00:13:20,870 --> 00:13:19,200

docking by the spacex crew dragon

350

00:13:23,670 --> 00:13:20,880

endurance to the international space

351

00:13:25,590 --> 00:13:23,680

station is still planned for 6 10 pm

352

00:13:27,430 --> 00:13:25,600

central time tomorrow night

353

00:13:29,509 --> 00:13:27,440

a little bit later i'll go through more

354

00:13:31,350 --> 00:13:29,519

of the work we've been doing in space

355

00:13:33,750 --> 00:13:31,360

and on the ground to prepare the station

356

00:13:35,750 --> 00:13:33,760

for crew 3's arrival until then we'll

357

00:13:38,069 --> 00:13:35,760

keep an eye on today's countdown and

358

00:13:40,230 --> 00:13:38,079

we'll check back in with you soon so for

359

00:13:41,990 --> 00:13:40,240

now let's head back to daryl in florida

360

00:13:44,389 --> 00:13:42,000

at the kennedy space center for the

361

00:13:46,389 --> 00:13:44,399

latest with launch preparations daryl

362

00:13:49,670 --> 00:13:46,399

all right thank you sandra and we are

363

00:13:52,470 --> 00:13:49,680

now live inside the suit-up room where

364

00:13:55,030 --> 00:13:52,480

the crew 3 astronauts are getting their

365

00:13:57,990 --> 00:13:55,040

final checks of their spacesuits you can

366

00:14:00,790 --> 00:13:58,000

see it there this is a suit-up room very

367

00:14:02,949 --> 00:14:00,800

familiar to you shannon you were here

368

00:14:04,310 --> 00:14:02,959

not too long ago not too long ago just a

369

00:14:05,750 --> 00:14:04,320

year ago it's hard to believe it's

370

00:14:07,509 --> 00:14:05,760

already been a year

371

00:14:10,949 --> 00:14:07,519

imagine that and there we see the

372

00:14:13,110 --> 00:14:10,959

commander for this mission raja chari he

373

00:14:14,949 --> 00:14:13,120

is uh seated and getting his suit

374

00:14:17,189 --> 00:14:14,959

checked out tell me a little bit shannon

375

00:14:19,750 --> 00:14:17,199

about this process what all is going to

376

00:14:21,670 --> 00:14:19,760

happen as they sit there and the suit

377

00:14:23,269 --> 00:14:21,680

techs work on them yeah so what they're

378

00:14:25,110 --> 00:14:23,279

doing is they're checking what we call

379

00:14:26,629 --> 00:14:25,120

the integrity of the suit so it's two

380

00:14:28,629 --> 00:14:26,639

things they're looking for they're

381

00:14:31,030 --> 00:14:28,639

looking forward to uh that the suit will

382

00:14:32,470 --> 00:14:31,040

hold pressure in case the astronauts

383

00:14:33,990 --> 00:14:32,480

need it in an emergency and they're

384

00:14:35,990 --> 00:14:34,000

checking to make sure that the

385

00:14:38,150 --> 00:14:36,000

communication links inside the suit are

386

00:14:39,990 --> 00:14:38,160

working

387

00:14:42,949 --> 00:14:40,000

and those suit techs they all have

388

00:14:45,189 --> 00:14:42,959

numbers on their backs and they are

389

00:14:47,269 --> 00:14:45,199

attending to the astronauts uh why are

390

00:14:49,750 --> 00:14:47,279

they all numbered they're numbered so we

391

00:14:51,750 --> 00:14:49,760

can keep track of who is whom out there

392

00:14:54,310 --> 00:14:51,760

um some of those suteks will be going on

393

00:14:56,069 --> 00:14:54,320

to the launch pad to uh work with the

394

00:14:58,470 --> 00:14:56,079

the technical teams at the launch pad

395

00:15:00,710 --> 00:14:58,480

and so just so we can keep track of who

396

00:15:03,670 --> 00:15:00,720

is doing what where and this is a very

397

00:15:05,670 --> 00:15:03,680

historic room shannon of course uh

398

00:15:07,829 --> 00:15:05,680

astronauts have been suiting up here and

399

00:15:10,230 --> 00:15:07,839

getting checked out uh you know since

400

00:15:11,829 --> 00:15:10,240

the gemini program yes indeed it is

401  
00:15:13,350 --> 00:15:11,839  
historic you can see some of the old

402  
00:15:15,430 --> 00:15:13,360  
equipment there in the background we're

403  
00:15:17,430 --> 00:15:15,440  
not using it now but uh

404  
00:15:19,590 --> 00:15:17,440  
we left it in there with uh spacex left

405  
00:15:21,910 --> 00:15:19,600  
it in there so just to remind us of what

406  
00:15:23,590 --> 00:15:21,920  
our history is it's a nice touch along

407  
00:15:25,509 --> 00:15:23,600  
with the paintings on the wall the

408  
00:15:27,430 --> 00:15:25,519  
pictures on the wall

409  
00:15:29,030 --> 00:15:27,440  
as you mentioned those are gauges and

410  
00:15:31,269 --> 00:15:29,040  
dials back there but they're not

411  
00:15:33,110 --> 00:15:31,279  
currently in use

412  
00:15:35,590 --> 00:15:33,120  
as this as they're sitting there these

413  
00:15:37,910 --> 00:15:35,600

seats i understand are

414

00:15:39,269 --> 00:15:37,920

just like the ones inside the dragon

415

00:15:41,110 --> 00:15:39,279

that's correct they're going to check

416

00:15:43,110 --> 00:15:41,120

things out just as they are going to be

417

00:15:45,430 --> 00:15:43,120

in the dragon so that's why they have

418

00:15:47,910 --> 00:15:45,440

those seats the crew will get strapped

419

00:15:49,829 --> 00:15:47,920

in get their seat belts on uh before

420

00:15:51,590 --> 00:15:49,839

they pressurize

421

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

and there's a wide shot of the room with

422

00:15:56,550 --> 00:15:54,079

the four crew three astronauts we have

423

00:15:58,470 --> 00:15:56,560

commander raj achary pilot thomas

424

00:16:01,110 --> 00:15:58,480

marshburn mission specialist kayla

425

00:16:03,030 --> 00:16:01,120

barron and matthias maurer

426  
00:16:05,670 --> 00:16:03,040  
and we have other astronauts in the room

427  
00:16:08,150 --> 00:16:05,680  
as well shannon you can see them

428  
00:16:10,870 --> 00:16:08,160  
surrounding some of the astronauts who

429  
00:16:13,189 --> 00:16:10,880  
are flying and what is their role today

430  
00:16:15,590 --> 00:16:13,199  
so there's a a couple of different uh

431  
00:16:18,310 --> 00:16:15,600  
sets of people in there we have uh their

432  
00:16:20,389 --> 00:16:18,320  
flight doctors associated with the crew

433  
00:16:22,790 --> 00:16:20,399  
so there's uh i believe three flight

434  
00:16:25,030 --> 00:16:22,800  
doctors in there watching this process

435  
00:16:27,509 --> 00:16:25,040  
and then we have another astronaut what

436  
00:16:29,509 --> 00:16:27,519  
we call our crew support astronaut who

437  
00:16:31,590 --> 00:16:29,519  
is has been training with the crew

438  
00:16:34,069 --> 00:16:31,600

working with the crew and also is there

439

00:16:36,629 --> 00:16:34,079

just to help out for all the stuff

440

00:16:38,310 --> 00:16:36,639

that's happening today

441

00:16:41,910 --> 00:16:38,320

and you see they've got equipment there

442

00:16:43,990 --> 00:16:41,920

on the table um i imagine they're

443

00:16:46,310 --> 00:16:44,000

looking to check whether that suit

444

00:16:48,470 --> 00:16:46,320

pressurizes properly exactly that

445

00:16:49,670 --> 00:16:48,480

equipment is is exactly designed for

446

00:16:51,749 --> 00:16:49,680

that to check the pressure and the

447

00:16:53,910 --> 00:16:51,759

communications and it's not it's not the

448

00:16:55,910 --> 00:16:53,920

only pressure check right no once the

449

00:16:57,990 --> 00:16:55,920

crew gets back in or gets into the

450

00:16:59,670 --> 00:16:58,000

capsule they will do a pressure check of

451  
00:17:02,710 --> 00:16:59,680  
their suits inside the capsule to make

452  
00:17:04,870 --> 00:17:02,720  
sure that nothing happens

453  
00:17:07,350 --> 00:17:04,880  
the clock continues countdown to a lift

454  
00:17:10,630 --> 00:17:07,360  
off time of

455  
00:17:11,750 --> 00:17:10,640  
903 31 pm local with an instantaneous

456  
00:17:13,829 --> 00:17:11,760  
window

457  
00:17:17,110 --> 00:17:13,839  
we have no cola closures for tonight's

458  
00:17:19,189 --> 00:17:17,120  
t0 and likely not a surprise but launch

459  
00:17:21,270 --> 00:17:19,199  
recycle is not an option for our

460  
00:17:22,630 --> 00:17:21,280  
instantaneous window this evening

461  
00:17:25,669 --> 00:17:22,640  
at the time the crew is at the onc

462  
00:17:27,029 --> 00:17:25,679  
building and stepping into suit donning

463  
00:17:29,590 --> 00:17:27,039

launch pad is cleared shortly after one

464

00:17:31,430 --> 00:17:29,600

this afternoon at this time falcon 92vs

465

00:17:33,590 --> 00:17:31,440

are at me up and the majority of the

466

00:17:34,870 --> 00:17:33,600

pre-launch checkouts are complete

467

00:17:36,070 --> 00:17:34,880

with deception a few engine checkouts

468

00:17:38,390 --> 00:17:36,080

that will occur

469

00:17:40,470 --> 00:17:38,400

after tms2 hours

470

00:17:41,430 --> 00:17:40,480

the primary countdown master sequence

471

00:17:42,789 --> 00:17:41,440

continues to work through nominal

472

00:17:44,230 --> 00:17:42,799

pre-launch

473

00:17:46,230 --> 00:17:44,240

reps with the next milestone being

474

00:17:47,750 --> 00:17:46,240

initiated locked gc system chill around

475

00:17:49,110 --> 00:17:47,760

tms three hours

476  
00:17:50,710 --> 00:17:49,120  
uh one follow-up on the drone ship which

477  
00:17:52,870 --> 00:17:50,720  
is watch item coming into today the

478  
00:17:54,549 --> 00:17:52,880  
drone ship and sport bob arrived on the

479  
00:17:56,710 --> 00:17:54,559  
landing zone with planning margin around

480  
00:17:58,070 --> 00:17:56,720  
2 minus 5 hours and 30 minutes and

481  
00:17:59,909 --> 00:17:58,080  
stepping into the final day of launch

482  
00:18:03,190 --> 00:17:59,919  
checkouts and we'll be on station to

483  
00:18:06,470 --> 00:18:05,110  
and now level wins uh look great for

484  
00:18:09,510 --> 00:18:06,480  
tonight's step tracking while our

485  
00:18:10,710 --> 00:18:09,520  
allowables at 70 on gimbal and 81 on

486  
00:18:12,549 --> 00:18:10,720  
loads

487  
00:18:14,870 --> 00:18:12,559  
and as brief with the crew at tmi

488  
00:18:16,549 --> 00:18:14,880

t-minus 4 hours in 20 minutes launch pp

489

00:18:17,750 --> 00:18:16,559

for this evening is at 30 percent the

490

00:18:19,990 --> 00:18:17,760

primary watch item is being cumulus

491

00:18:21,590 --> 00:18:20,000

cloud rule and flight through precept

492

00:18:23,029 --> 00:18:21,600

weather is forecast to improve

493

00:18:24,150 --> 00:18:23,039

throughout the evening

494

00:18:26,310 --> 00:18:24,160

independent of what it looks like out

495

00:18:27,430 --> 00:18:26,320

the window at this time

496

00:18:28,470 --> 00:18:27,440

there are no constraints to the

497

00:18:29,909 --> 00:18:28,480

performance of any sections of the

498

00:18:31,510 --> 00:18:29,919

falcon or dragon launch countdown

499

00:18:34,870 --> 00:18:31,520

procedures and one note for all

500

00:18:36,230 --> 00:18:34,880

operators that 52.911 is open and to be

501  
00:18:37,990 --> 00:18:36,240  
utilized for any required crew

502  
00:18:39,830 --> 00:18:38,000  
contingency action

503  
00:18:42,630 --> 00:18:39,840  
for all operators in firing report at

504  
00:18:44,789 --> 00:18:42,640  
ksc and those at mccx main and support

505  
00:18:47,110 --> 00:18:44,799  
room all three control rooms go into a

506  
00:18:48,630 --> 00:18:47,120  
lockdown at t minus 45 minutes and all

507  
00:18:50,150 --> 00:18:48,640  
operators shall remain at the console

508  
00:18:51,350 --> 00:18:50,160  
monitoring the system and maintaining

509  
00:18:53,510 --> 00:18:51,360  
full focus while the launch escape

510  
00:18:54,950 --> 00:18:53,520  
system is armed please note in the event

511  
00:18:56,549 --> 00:18:54,960  
of a scrub that the launch ecosystem

512  
00:18:58,789 --> 00:18:56,559  
will remain armed until the completion

513  
00:19:00,549 --> 00:18:58,799

of propellant offload i will reiterate

514

00:19:02,150 --> 00:19:00,559

this note to the team around t minus 1

515

00:19:04,710 --> 00:19:02,160

hour

516

00:19:06,390 --> 00:19:04,720

ce can please provide a status of falcon

517

00:19:08,789 --> 00:19:06,400

9 health

518

00:19:10,549 --> 00:19:08,799

ce here falcon 9 is healthy and we're

519

00:19:13,990 --> 00:19:10,559

tracking no issues that would preclude

520

00:19:14,000 --> 00:19:20,070

thanks sir

521

00:19:24,070 --> 00:19:22,070

all right that's a good call out by the

522

00:19:26,230 --> 00:19:24,080

launch director there for spacex

523

00:19:28,310 --> 00:19:26,240

everything sounding good i particularly

524

00:19:29,990 --> 00:19:28,320

uh appreciated that he said despite what

525

00:19:33,590 --> 00:19:30,000

the way it looks outside the window it's

526

00:19:34,710 --> 00:19:33,600

very cloudy yeah and a little rainy yep

527

00:19:36,070 --> 00:19:34,720

hopefully it's going to pass and we'll

528

00:19:39,750 --> 00:19:36,080

be able to launch today md could you

529

00:19:43,110 --> 00:19:39,760

please provide a status on dragon health

530

00:19:44,789 --> 00:19:43,120

picking no issues for launch today

531

00:19:46,549 --> 00:19:44,799

thank you man that's good to hear at

532

00:19:47,990 --> 00:19:46,559

this time there are no additional notes

533

00:19:49,590 --> 00:19:48,000

for the countdown briefing if there are

534

00:19:51,909 --> 00:19:49,600

no additional

535

00:19:53,350 --> 00:19:51,919

comments or questions this will conclude

536

00:19:55,590 --> 00:19:53,360

the briefing we'll proceed in tonight's

537

00:19:57,270 --> 00:19:55,600

attempt

538

00:19:59,750 --> 00:19:57,280

really quick want to note on the screen

539

00:20:04,870 --> 00:19:59,760

number 23. that's astronaut stephanie

540

00:20:08,390 --> 00:20:06,870

veteran of uh space shuttle flights yes

541

00:20:09,990 --> 00:20:08,400

she's had three space shuttle flights

542

00:20:12,070 --> 00:20:10,000

and she's been training as a backup to

543

00:20:14,470 --> 00:20:12,080

this crew so she is the one that's there

544

00:20:16,230 --> 00:20:14,480

uh helping them out being the most uh

545

00:20:17,590 --> 00:20:16,240

the astronaut most engaged with this

546

00:20:20,549 --> 00:20:17,600

particular crew and she'll go all the

547

00:20:22,549 --> 00:20:20,559

way out to the pad yes yes

548

00:20:24,549 --> 00:20:22,559

it's a great shot of her there as she uh

549

00:20:25,830 --> 00:20:24,559

provides that support that that's really

550

00:20:27,190 --> 00:20:25,840

important to the astronaut it is

551  
00:20:28,710 --> 00:20:27,200  
important it's really important to have

552  
00:20:31,190 --> 00:20:28,720  
somebody that knows what you're going

553  
00:20:33,110 --> 00:20:31,200  
through uh to lend a hand this is the

554  
00:20:34,870 --> 00:20:33,120  
third rotational crew to fly on a

555  
00:20:36,789 --> 00:20:34,880  
commercial spacecraft and of course they

556  
00:20:38,870 --> 00:20:36,799  
bring a diverse set of experiences to

557  
00:20:41,909 --> 00:20:38,880  
today's flight let's uh break them all

558  
00:20:43,990 --> 00:20:41,919  
down crew dragon commander roger chari

559  
00:20:45,510 --> 00:20:44,000  
he's a colonel in the u.s air force he

560  
00:20:47,909 --> 00:20:45,520  
holds degrees in aeronautical

561  
00:20:50,230 --> 00:20:47,919  
engineering and aeronautics charity is

562  
00:20:55,830 --> 00:20:50,240  
also a combat veteran having flown the

563  
00:21:00,390 --> 00:20:58,230

ce check how do you read me i got you

564

00:21:08,390 --> 00:21:00,400

five by five tell me

565

00:21:11,110 --> 00:21:10,070

okay great got you five by five as well

566

00:21:13,590 --> 00:21:11,120

thanks

567

00:21:16,630 --> 00:21:15,110

and we'll hear these communication

568

00:21:18,310 --> 00:21:16,640

checks throughout the launch broadcast

569

00:21:19,750 --> 00:21:18,320

and we'll try to pause so that you can

570

00:21:21,669 --> 00:21:19,760

hear those

571

00:21:23,350 --> 00:21:21,679

and all often times they include some

572

00:21:25,990 --> 00:21:23,360

big milestones

573

00:21:27,510 --> 00:21:26,000

we were talking about rajachary he

574

00:21:29,830 --> 00:21:27,520

he actually deployed to the korean

575

00:21:32,789 --> 00:21:29,840

peninsula as a test pilot he has

576

00:21:35,430 --> 00:21:32,799

accumulated more than 2500 hours of

577

00:21:37,110 --> 00:21:35,440

flight time in various military aircraft

578

00:21:38,950 --> 00:21:37,120

shannon it's his first trip to space and

579

00:21:41,350 --> 00:21:38,960

he's the commander i know that is

580

00:21:43,190 --> 00:21:41,360

actually quite unusual but uh it's just

581

00:21:44,710 --> 00:21:43,200

a testament to all the experience he

582

00:21:46,630 --> 00:21:44,720

brought to the office and and all the

583

00:21:48,310 --> 00:21:46,640

hard work he's been putting in getting

584

00:21:50,789 --> 00:21:48,320

trained up for this flight absolutely

585

00:21:53,190 --> 00:21:50,799

pilot tom marshburn is suiting up for

586

00:21:55,190 --> 00:21:53,200

his third space flight he's the veteran

587

00:21:57,590 --> 00:21:55,200

he previously flew on the space shuttle

588

00:21:59,590 --> 00:21:57,600

endeavour in sts-127

589

00:22:02,230 --> 00:21:59,600

and on the russian soyuz and expedition

590

00:22:05,510 --> 00:22:02,240

3435 while helping assemble the

591

00:22:07,750 --> 00:22:05,520

international space station on sts-127

592

00:22:10,390 --> 00:22:07,760

marshburn performed three spacewalks

593

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

totaling almost 19 hours the north

594

00:22:14,549 --> 00:22:12,559

carolina native holds degrees in physics

595

00:22:16,470 --> 00:22:14,559

and medicine and shannon he's the crew 3

596

00:22:18,870 --> 00:22:16,480

pilot and you were both in the same

597

00:22:20,870 --> 00:22:18,880

astronaut graduating class of 2004 i

598

00:22:22,630 --> 00:22:20,880

understand we were we were and it's

599

00:22:24,630 --> 00:22:22,640

really nice to be able to see some of my

600

00:22:25,830 --> 00:22:24,640

uh classmates going up into space and

601  
00:22:27,750 --> 00:22:25,840  
he's got

602  
00:22:29,350 --> 00:22:27,760  
he came from emergency medicine so he's

603  
00:22:31,029 --> 00:22:29,360  
a good guy to have on board he's a good

604  
00:22:32,870 --> 00:22:31,039  
guy to have on board absolutely mission

605  
00:22:35,190 --> 00:22:32,880  
specialist kayla barron is about to make

606  
00:22:37,029 --> 00:22:35,200  
her first trip to space the washington

607  
00:22:39,510 --> 00:22:37,039  
state native has degrees in nuclear

608  
00:22:41,430 --> 00:22:39,520  
engineering and systems engineering as a

609  
00:22:43,190 --> 00:22:41,440  
submarine warfare officer she was a

610  
00:22:44,870 --> 00:22:43,200  
member of the first class of women

611  
00:22:47,430 --> 00:22:44,880  
commissioned into the submarine

612  
00:22:50,789 --> 00:22:47,440  
community and she deployed three times

613  
00:22:52,390 --> 00:22:50,799

while serving uh aboard the uss maine

614

00:22:54,310 --> 00:22:52,400

shannon she's doing your role back in

615

00:22:55,510 --> 00:22:54,320

crew one the mission specialist that's

616

00:22:57,190 --> 00:22:55,520

right so the role of the mission

617

00:22:58,950 --> 00:22:57,200

specialist in the dragon spacecraft is

618

00:23:00,630 --> 00:22:58,960

to assist the commander and pilot in

619

00:23:02,710 --> 00:23:00,640

their duty so everybody is working

620

00:23:05,350 --> 00:23:02,720

together to make sure uh the crews get

621

00:23:07,350 --> 00:23:05,360

into space safely she seems comfortable

622

00:23:09,590 --> 00:23:07,360

calm there's a nice little wave from her

623

00:23:11,669 --> 00:23:09,600

hello kayla and good luck and she

624

00:23:13,990 --> 00:23:11,679

actually interestingly enough has not

625

00:23:15,430 --> 00:23:14,000

seen a launch that is true her first

626  
00:23:17,510 --> 00:23:15,440  
launch is going to be from the inside of

627  
00:23:19,110 --> 00:23:17,520  
a capsule that is uh pretty exciting

628  
00:23:20,630 --> 00:23:19,120  
that's going to be something else

629  
00:23:22,630 --> 00:23:20,640  
the second mission specialist is

630  
00:23:25,190 --> 00:23:22,640  
matthias maurer he too will be making

631  
00:23:27,750 --> 00:23:25,200  
his debut space flight he will be the

632  
00:23:31,430 --> 00:23:27,760  
second european astronaut there he is to

633  
00:23:33,909 --> 00:23:31,440  
fly on crew dragon bauer is from zant

634  
00:23:36,390 --> 00:23:33,919  
vendel germany and is a doctor of

635  
00:23:38,390 --> 00:23:36,400  
material science engineering he is the

636  
00:23:40,630 --> 00:23:38,400  
inventor of more than 10 patent

637  
00:23:44,310 --> 00:23:40,640  
applications and joined the european

638  
00:23:46,549 --> 00:23:44,320

astronaut corps in 2015. maura has spent

639

00:23:48,630 --> 00:23:46,559

16 days underwater during the nasa

640

00:23:50,870 --> 00:23:48,640

extreme environment mission operations

641

00:23:54,070 --> 00:23:50,880

challenge and he has trained in sea

642

00:23:55,669 --> 00:23:54,080

survival training off the coast of china

643

00:23:57,990 --> 00:23:55,679

kind of like having a mcdiver on board i

644

00:23:59,909 --> 00:23:58,000

guess with all those yes exactly he's

645

00:24:02,310 --> 00:23:59,919

going to bring a lot of talent to the

646

00:24:04,470 --> 00:24:02,320

science program going on the station

647

00:24:07,110 --> 00:24:04,480

each of these four crew members will be

648

00:24:10,230 --> 00:24:07,120

part of expedition 66 once they arrive

649

00:24:12,230 --> 00:24:10,240

at the international space station and

650

00:24:16,230 --> 00:24:12,240

we'll give you a closer look at each of

651  
00:24:18,870 --> 00:24:16,240  
them as we get closer to launch time

652  
00:24:20,390 --> 00:24:18,880  
as the crews continue to work

653  
00:24:21,669 --> 00:24:20,400  
when you're in this

654  
00:24:23,990 --> 00:24:21,679  
position and you're getting checked out

655  
00:24:25,029 --> 00:24:24,000  
are you mainly focused on the task at

656  
00:24:27,110 --> 00:24:25,039  
hand

657  
00:24:29,430 --> 00:24:27,120  
or do you allow yourself to kind of

658  
00:24:31,510 --> 00:24:29,440  
think about just what's about to happen

659  
00:24:33,029 --> 00:24:31,520  
in a few hours i think all of it is

660  
00:24:34,870 --> 00:24:33,039  
going on you're trying to enjoy the

661  
00:24:36,789 --> 00:24:34,880  
moment but obviously you have a very

662  
00:24:38,390 --> 00:24:36,799  
serious job to do so you think about

663  
00:24:40,630 --> 00:24:38,400

that so you sort of bounce back and

664

00:24:42,230 --> 00:24:40,640

forth and have all the emotions

665

00:24:44,630 --> 00:24:42,240

pretty much at the same time i've heard

666

00:24:47,430 --> 00:24:44,640

that that you know sometimes in fact

667

00:24:49,510 --> 00:24:47,440

kayla baron on uh a pat a podcast

668

00:24:51,430 --> 00:24:49,520

recently said that she was in and out of

669

00:24:53,430 --> 00:24:51,440

this of these

670

00:24:55,510 --> 00:24:53,440

strong emotions sometimes

671

00:24:57,669 --> 00:24:55,520

pinching herself going i can't believe

672

00:24:59,909 --> 00:24:57,679

that i'm gonna do this and then because

673

00:25:01,430 --> 00:24:59,919

you're training so much you just kind of

674

00:25:03,669 --> 00:25:01,440

fall into that regimen of training and

675

00:25:05,269 --> 00:25:03,679

it doesn't seem real exactly exactly

676

00:25:06,549 --> 00:25:05,279

that that is the what's so interesting

677

00:25:07,669 --> 00:25:06,559

about this because you have trained so

678

00:25:09,990 --> 00:25:07,679

much you've gone through all these

679

00:25:12,149 --> 00:25:10,000

procedures and processes and then now

680

00:25:13,510 --> 00:25:12,159

now is the actual one that's going to

681

00:25:14,710 --> 00:25:13,520

take you to orbit

682

00:25:16,549 --> 00:25:14,720

we see

683

00:25:18,470 --> 00:25:16,559

thomas marshburn talking to the suit

684

00:25:20,390 --> 00:25:18,480

techs and i understand

685

00:25:22,230 --> 00:25:20,400

you develop a bit of a relationship with

686

00:25:24,549 --> 00:25:22,240

the suitex right because these things

687

00:25:26,149 --> 00:25:24,559

first of all are custom fitted

688

00:25:28,070 --> 00:25:26,159

down to touch the center meter

689

00:25:29,430 --> 00:25:28,080

apparently absolutely so one of the

690

00:25:31,510 --> 00:25:29,440

first things that happens when you get

691

00:25:33,430 --> 00:25:31,520

assigned to a spacex flight is you go

692

00:25:34,789 --> 00:25:33,440

out to hawthorne and you get measured

693

00:25:36,789 --> 00:25:34,799

the advanced team has arrived at the

694

00:25:38,950 --> 00:25:36,799

white room and additionally all four

695

00:25:40,830 --> 00:25:38,960

crew are through successful leak checks

696

00:25:42,789 --> 00:25:40,840

at this time while ahead of

697

00:25:44,549 --> 00:25:42,799

schedule sounds like we're ahead of

698

00:25:46,310 --> 00:25:44,559

schedule but you were you were saying

699

00:25:48,070 --> 00:25:46,320

yep how the schedule is good better than

700

00:25:49,430 --> 00:25:48,080

being behind schedule for sure

701  
00:25:51,590 --> 00:25:49,440  
so you get measured for your spacesuit

702  
00:25:53,269 --> 00:25:51,600  
and so they do build it just for you and

703  
00:25:54,630 --> 00:25:53,279  
they spend a lot of time making sure

704  
00:25:57,110 --> 00:25:54,640  
everything is right and in fact when

705  
00:25:58,630 --> 00:25:57,120  
you're in training in hawthorne they are

706  
00:26:00,149 --> 00:25:58,640  
there to help you get suited up each

707  
00:26:02,230 --> 00:26:00,159  
time you need to get suited up and so

708  
00:26:03,430 --> 00:26:02,240  
you have familiar faces here uh while

709  
00:26:07,669 --> 00:26:03,440  
you're getting suited up ready for

710  
00:26:13,350 --> 00:26:10,710  
crew 3 is scheduled to arrive to station

711  
00:26:15,029 --> 00:26:13,360  
just days

712  
00:26:17,269 --> 00:26:15,039  
after astronauts from crew 2 have

713  
00:26:20,549 --> 00:26:17,279

already returned home from a record

714

00:26:23,430 --> 00:26:20,559

setting space flight at 10 33 pm eastern

715

00:26:26,310 --> 00:26:23,440

time on monday night crew 2 safely

716

00:26:29,110 --> 00:26:26,320

splashed down in the gulf off the coast

717

00:26:31,750 --> 00:26:29,120

of pensacola um the international crew

718

00:26:33,669 --> 00:26:31,760

of astronauts you see them there shane

719

00:26:36,470 --> 00:26:33,679

kimbrough megan macarthur jackson

720

00:26:40,470 --> 00:26:36,480

astronaut aki hoshide and east astronaut

721

00:26:42,789 --> 00:26:40,480

tomorrow pesky spent 199 days in orbit

722

00:26:45,830 --> 00:26:42,799

and this was the shot of them coming

723

00:26:48,230 --> 00:26:45,840

back down from the infrared camera there

724

00:26:51,110 --> 00:26:48,240

was splash down a beautiful splash down

725

00:26:53,269 --> 00:26:51,120

here the applause there

726  
00:26:56,950 --> 00:26:53,279  
they surpassed the record the previous

727  
00:26:58,710 --> 00:26:56,960  
record of 168 days set by

728  
00:26:59,990 --> 00:26:58,720  
shannon walker and her crew won

729  
00:27:02,070 --> 00:27:00,000  
astronauts

730  
00:27:03,909 --> 00:27:02,080  
yeah we figured that uh that record

731  
00:27:06,470 --> 00:27:03,919  
would be uh broken

732  
00:27:09,029 --> 00:27:06,480  
just about any time so

733  
00:27:10,870 --> 00:27:09,039  
the first operation right exactly

734  
00:27:13,269 --> 00:27:10,880  
so everybody that's coming after us will

735  
00:27:14,149 --> 00:27:13,279  
probably break the record

736  
00:27:15,669 --> 00:27:14,159  
right

737  
00:27:17,590 --> 00:27:15,679  
well you know it's interesting because

738  
00:27:19,990 --> 00:27:17,600

of what developed with the delay of this

739

00:27:22,070 --> 00:27:20,000

launch um you know initially there was

740

00:27:24,310 --> 00:27:22,080

the weather and then we had an astronaut

741

00:27:26,070 --> 00:27:24,320

with a minor illness yep so we delayed

742

00:27:29,430 --> 00:27:26,080

10 days initially this was supposed to

743

00:27:30,789 --> 00:27:29,440

be on halloween right um so it they had

744

00:27:32,950 --> 00:27:30,799

to spend a little bit a little bit

745

00:27:35,510 --> 00:27:32,960

longer than they may have they did they

746

00:27:37,190 --> 00:27:35,520

spent a little bit extra time the crew 3

747

00:27:39,909 --> 00:27:37,200

crew spent a little extra time in

748

00:27:42,070 --> 00:27:39,919

quarantine and the crew 2 crew got to

749

00:27:44,789 --> 00:27:42,080

come home

750

00:27:46,470 --> 00:27:44,799

and there you see uh thomas marshburn

751

00:27:48,870 --> 00:27:46,480

having a

752

00:27:50,310 --> 00:27:48,880

spirited conversation with somebody

753

00:27:52,070 --> 00:27:50,320

yep because they're ahead of schedule

754

00:27:53,830 --> 00:27:52,080

they get to uh take a little time and

755

00:27:57,990 --> 00:27:53,840

and talk to the folks in the in the

756

00:28:03,110 --> 00:28:00,230

those crew two astronauts they were in

757

00:28:05,909 --> 00:28:03,120

these very seats shannon back in april

758

00:28:08,470 --> 00:28:05,919

we'll dive deeper into the work they did

759

00:28:10,149 --> 00:28:08,480

up on station a little bit later in the

760

00:28:11,909 --> 00:28:10,159

show

761

00:28:13,110 --> 00:28:11,919

you know what ended up happening because

762

00:28:15,510 --> 00:28:13,120

of delay

763

00:28:17,350 --> 00:28:15,520

there was no direct handover

764

00:28:19,990 --> 00:28:17,360

on the international space station so

765

00:28:20,870 --> 00:28:20,000

now it's an indirect handover crew 2 is

766

00:28:24,710 --> 00:28:20,880

down

767

00:28:26,630 --> 00:28:24,720

and crew 3 is going up today hopefully

768

00:28:27,590 --> 00:28:26,640

yes so they won't see crew 2. what does

769

00:28:29,350 --> 00:28:27,600

that mean

770

00:28:31,830 --> 00:28:29,360

yes they won't see crew 2 on the space

771

00:28:34,470 --> 00:28:31,840

station so normally we like to have our

772

00:28:37,590 --> 00:28:34,480

crews overlap a little bit so that the

773

00:28:39,830 --> 00:28:37,600

outgoing crew can really make sure that

774

00:28:41,909 --> 00:28:39,840

the incoming crew is all set up to be

775

00:28:44,549 --> 00:28:41,919

efficient on orbit and that means that

776

00:28:46,389 --> 00:28:44,559

they need to be told where everything is

777

00:28:48,310 --> 00:28:46,399

stowed how things happen on the space

778

00:28:50,389 --> 00:28:48,320

station so they can really hit the

779

00:28:52,470 --> 00:28:50,399

ground running or fly the ground running

780

00:28:54,230 --> 00:28:52,480

or whatever is appropriate to stay in

781

00:28:58,470 --> 00:28:54,240

the space station

782

00:29:00,549 --> 00:28:58,480

float around float around efficiently

783

00:29:02,710 --> 00:29:00,559

the crew has been training together for

784

00:29:04,310 --> 00:29:02,720

months and each has their own unique

785

00:29:06,149 --> 00:29:04,320

connection to the mission let's talk a

786

00:29:08,389 --> 00:29:06,159

little bit about that

787

00:29:11,190 --> 00:29:08,399

tom marshburn he flew on the space

788

00:29:12,389 --> 00:29:11,200

shuttle he flew on the russian soyuz and

789

00:29:14,389 --> 00:29:12,399

now dragon

790

00:29:16,549 --> 00:29:14,399

and it is the first time tom marshburn

791

00:29:18,549 --> 00:29:16,559

is the only veteran on a space flight

792

00:29:20,310 --> 00:29:18,559

he's with three rookies but he says he

793

00:29:23,029 --> 00:29:20,320

can't wait to see the looks of joy on

794

00:29:25,510 --> 00:29:23,039

his crew members faces in microgravity

795

00:29:27,269 --> 00:29:25,520

when they hit orbit for the first time

796

00:29:29,110 --> 00:29:27,279

you got to see that i got to see that i

797

00:29:30,950 --> 00:29:29,120

was sitting next to uh victor glover and

798

00:29:32,630 --> 00:29:30,960

it was his first ride into space and so

799

00:29:34,710 --> 00:29:32,640

it was pretty exciting when he

800

00:29:36,470 --> 00:29:34,720

officially crossed the line and became a

801  
00:29:38,230 --> 00:29:36,480  
space faring astronaut and who let him

802  
00:29:40,230 --> 00:29:38,240  
know that he crossed the line oh that

803  
00:29:42,230 --> 00:29:40,240  
was me yeah so he was busy doing work

804  
00:29:43,990 --> 00:29:42,240  
and i was watching the altitude so as

805  
00:29:46,389 --> 00:29:44,000  
soon as we crossed i gave him a big

806  
00:29:48,710 --> 00:29:46,399  
congratulations that was nice

807  
00:29:50,950 --> 00:29:48,720  
and so raj atari he's accumulated more

808  
00:29:54,389 --> 00:29:50,960  
than 2 000 hours of flight time as we

809  
00:29:57,909 --> 00:29:54,399  
mentioned he flew the f-35 f-15 f-16

810  
00:30:00,310 --> 00:29:57,919  
the f-18 he flew combat missions and

811  
00:30:02,310 --> 00:30:00,320  
upright operation iraqi freedom and he

812  
00:30:03,430 --> 00:30:02,320  
deployed in in support of the korean

813  
00:30:05,510 --> 00:30:03,440

peninsula

814

00:30:07,029 --> 00:30:05,520

raja is the commander of the spacecraft

815

00:30:09,430 --> 00:30:07,039

but it's also his first time flying to

816

00:30:12,630 --> 00:30:09,440

space and he's a member of the nasa

817

00:30:14,549 --> 00:30:12,640

astronaut class 22 known as the turtles

818

00:30:15,510 --> 00:30:14,559

and and they're talking about taking

819

00:30:17,510 --> 00:30:15,520

over

820

00:30:19,830 --> 00:30:17,520

yes we have a couple of turtles on this

821

00:30:21,669 --> 00:30:19,840

flight so it's good to it's good to see

822

00:30:23,990 --> 00:30:21,679

the the new kids getting their turn in

823

00:30:26,630 --> 00:30:24,000

space absolutely and then the other one

824

00:30:28,950 --> 00:30:26,640

is kayla barron it will be her first

825

00:30:31,669 --> 00:30:28,960

flight lieutenant commander in the u.s

826

00:30:33,669 --> 00:30:31,679

navy and a submarine warfare officer she

827

00:30:35,190 --> 00:30:33,679

was lucky enough to meet an astronaut

828

00:30:37,909 --> 00:30:35,200

and hear about flying on the space

829

00:30:40,310 --> 00:30:37,919

shuttle and heard what it was like to

830

00:30:41,430 --> 00:30:40,320

build the space station she says that's

831

00:30:45,190 --> 00:30:41,440

what

832

00:30:47,269 --> 00:30:45,200

inspired her to get into space she sees

833

00:30:49,350 --> 00:30:47,279

parallels between working on submarines

834

00:30:51,909 --> 00:30:49,360

underwater where humans are not supposed

835

00:30:53,830 --> 00:30:51,919

to be with working in the vacuum of

836

00:30:55,909 --> 00:30:53,840

space you can attest to that because you

837

00:30:59,029 --> 00:30:55,919

did an underwater mission and you've

838

00:31:01,830 --> 00:30:59,039

been to space i i did i did and it is a

839

00:31:03,509 --> 00:31:01,840

very good uh analog um working

840

00:31:06,710 --> 00:31:03,519

underwater we do that we do that

841

00:31:08,149 --> 00:31:06,720

training to give crews um a taste of

842

00:31:09,750 --> 00:31:08,159

what it's like when you're on the space

843

00:31:11,509 --> 00:31:09,760

station you have a schedule you've got a

844

00:31:13,269 --> 00:31:11,519

ground control team dictating what

845

00:31:14,710 --> 00:31:13,279

you're going to do each day and so it's

846

00:31:17,190 --> 00:31:14,720

a very good experience and you're

847

00:31:19,190 --> 00:31:17,200

isolated to that environment yes which

848

00:31:21,590 --> 00:31:19,200

is something that is very real

849

00:31:22,950 --> 00:31:21,600

with these long duration space flights

850

00:31:24,950 --> 00:31:22,960

yes yes

851

00:31:27,110 --> 00:31:24,960

absolutely you don't have a quick trip

852

00:31:29,110 --> 00:31:27,120

home to uh to solve any problems that

853

00:31:31,190 --> 00:31:29,120

you might encounter right matthias

854

00:31:34,230 --> 00:31:31,200

maurer's first time flying

855

00:31:37,269 --> 00:31:34,240

issa named his mission cosmic kiss which

856

00:31:40,389 --> 00:31:37,279

is basically a declaration of love for

857

00:31:42,789 --> 00:31:40,399

space he'll be working on 35 different

858

00:31:45,430 --> 00:31:42,799

experiments over six months shannon's

859

00:31:47,269 --> 00:31:45,440

pretty appropriate title for as busy as

860

00:31:49,750 --> 00:31:47,279

he's going to be

861

00:31:50,549 --> 00:31:49,760

yes yes indeed cosmic kiss that's that's

862

00:31:52,549 --> 00:31:50,559

great

863

00:31:54,230 --> 00:31:52,559

when you were up there working in in

864

00:31:56,470 --> 00:31:54,240

space during your mission with crew one

865

00:31:57,830 --> 00:31:56,480

what was what was the thing you enjoyed

866

00:31:59,430 --> 00:31:57,840

the most

867

00:32:01,509 --> 00:31:59,440

oh goodness there's so many great things

868

00:32:03,110 --> 00:32:01,519

to enjoy about being in space um i

869

00:32:04,789 --> 00:32:03,120

certainly enjoyed the work we were doing

870

00:32:06,870 --> 00:32:04,799

all the science but i also really

871

00:32:08,870 --> 00:32:06,880

enjoyed the camaraderie that i had with

872

00:32:11,909 --> 00:32:08,880

uh the crew we were very close crew we

873

00:32:14,389 --> 00:32:11,919

had five people on the

874

00:32:16,470 --> 00:32:14,399

the usos side of the space station and

875

00:32:18,310 --> 00:32:16,480

two russians and we spent a lot of

876

00:32:19,750 --> 00:32:18,320

dinners together just talking about

877

00:32:21,990 --> 00:32:19,760

things

878

00:32:23,029 --> 00:32:22,000

some sometimes that's the best it is it

879

00:32:24,950 --> 00:32:23,039

is the best

880

00:32:27,190 --> 00:32:24,960

during one of their many trips to train

881

00:32:29,909 --> 00:32:27,200

at spacex facilities in hawthorne our

882

00:32:35,110 --> 00:32:29,919

team had an opportunity to chat with

883

00:32:38,870 --> 00:32:37,110

i wake up every day

884

00:32:41,990 --> 00:32:38,880

can't wait to work with this crew i am

885

00:32:44,470 --> 00:32:42,000

totally inspired by watching them work

886

00:32:46,470 --> 00:32:44,480

everyone's contributed a huge amount tom

887

00:32:48,630 --> 00:32:46,480

marshburn he does an amazing job of

888

00:32:50,789 --> 00:32:48,640

taking in all these

889

00:32:53,269 --> 00:32:50,799

off nominal situations and just sort of

890

00:32:56,149 --> 00:32:53,279

dealing with him methodically as we go

891

00:32:58,389 --> 00:32:56,159

through he's been to space for two times

892

00:33:00,549 --> 00:32:58,399

and so he has a lot of knowledge and a

893

00:33:02,950 --> 00:33:00,559

lot of experience which he shares i've

894

00:33:04,950 --> 00:33:02,960

gotten the chance to work with raja for

895

00:33:07,029 --> 00:33:04,960

several years now he's just such a great

896

00:33:07,909 --> 00:33:07,039

communicator he really cares about his

897

00:33:10,549 --> 00:33:07,919

team

898

00:33:12,789 --> 00:33:10,559

and finding ways to get the best out of

899

00:33:14,549 --> 00:33:12,799

everybody what kayla brings to the crew

900

00:33:16,230 --> 00:33:14,559

that i think is unique to her is she's

901  
00:33:18,870 --> 00:33:16,240  
an amazing communicator

902  
00:33:20,470 --> 00:33:18,880  
just a great job of of team cohesion

903  
00:33:22,070 --> 00:33:20,480  
dynamics and identifying things that

904  
00:33:24,310 --> 00:33:22,080  
would make us better and she's done that

905  
00:33:26,789 --> 00:33:24,320  
with our crew i feel like that i'm

906  
00:33:28,870 --> 00:33:26,799  
probably the only real rookie on this

907  
00:33:31,990 --> 00:33:28,880  
one but i think i bring the european

908  
00:33:34,149 --> 00:33:32,000  
spice i bring european humour mathias is

909  
00:33:36,389 --> 00:33:34,159  
an amazing innovator he's got a lot of

910  
00:33:38,870 --> 00:33:36,399  
ability to take on a project and really

911  
00:33:40,630 --> 00:33:38,880  
work his way through it he always has

912  
00:33:42,389 --> 00:33:40,640  
a really interesting way of looking at

913  
00:33:44,470 --> 00:33:42,399

things always has a question i've never

914

00:33:46,630 --> 00:33:44,480

thought of before mathias we've decided

915

00:33:48,630 --> 00:33:46,640

to call him hollywood he's most artistic

916

00:33:49,990 --> 00:33:48,640

one of us he's always got the camera he

917

00:33:51,990 --> 00:33:50,000

knows what would be a good shot i

918

00:33:53,750 --> 00:33:52,000

couldn't feel luckier to be a part of a

919

00:33:55,190 --> 00:33:53,760

crew and we also just have a lot of fun

920

00:33:57,509 --> 00:33:55,200

together we kind of goof off a little

921

00:33:59,110 --> 00:33:57,519

bit we will have fun in space i can't

922

00:34:00,710 --> 00:33:59,120

wait to be in space with them i think

923

00:34:03,190 --> 00:34:00,720

they're going to be lifelong friends as

924

00:34:06,950 --> 00:34:05,029

it's nice to hear them talk about

925

00:34:09,349 --> 00:34:06,960

lifelong friendships that we as we go

926  
00:34:10,550 --> 00:34:09,359  
back into the suit-up room i i imagine

927  
00:34:12,710 --> 00:34:10,560  
that's happened for you as well

928  
00:34:14,550 --> 00:34:12,720  
absolutely you know once you work as a

929  
00:34:15,990 --> 00:34:14,560  
crew your family forever

930  
00:34:18,470 --> 00:34:16,000  
love it

931  
00:34:21,190 --> 00:34:18,480  
and so now let's check in with john

932  
00:34:26,069 --> 00:34:21,200  
inspucker in california for another

933  
00:34:31,430 --> 00:34:28,310  
thanks daryl

934  
00:34:33,109 --> 00:34:31,440  
we're at t minus 3 hours 42 minutes

935  
00:34:35,669 --> 00:34:33,119  
everything continues to go well for

936  
00:34:37,669 --> 00:34:35,679  
launch we did hear over the countdown

937  
00:34:40,069 --> 00:34:37,679  
net the t minus four hour briefing by

938  
00:34:41,829 --> 00:34:40,079

the spacex launch director the good news

939

00:34:43,990 --> 00:34:41,839

was there wasn't anything significant to

940

00:34:46,310 --> 00:34:44,000

report on the rocket

941

00:34:48,389 --> 00:34:46,320

now at t minus five hours the team began

942

00:34:51,190 --> 00:34:48,399

clearing the hazard and building hazard

943

00:34:53,430 --> 00:34:51,200

area and the buildings around pad 39a

944

00:34:55,109 --> 00:34:53,440

this is known as the blast danger area

945

00:34:57,109 --> 00:34:55,119

or bda

946

00:34:58,550 --> 00:34:57,119

the only people remaining on the pad are

947

00:35:00,710 --> 00:34:58,560

the ones who are going to be needed for

948

00:35:02,870 --> 00:35:00,720

ingress of the astronauts they were

949

00:35:04,710 --> 00:35:02,880

cleared to enter the pad at the t-minus

950

00:35:06,069 --> 00:35:04,720

four hour mark they're up there right

951  
00:35:09,030 --> 00:35:06,079  
now and they've actually just opened the

952  
00:35:11,190 --> 00:35:09,040  
side hatch on dragon now crew arrival is

953  
00:35:14,470 --> 00:35:11,200  
expected to happen in about 40 minutes

954  
00:35:16,470 --> 00:35:14,480  
or so just inside t minus three hours

955  
00:35:18,390 --> 00:35:16,480  
so currently we're running uh on the

956  
00:35:20,230 --> 00:35:18,400  
dragon site about 15 minutes ahead of

957  
00:35:23,349 --> 00:35:20,240  
schedule good thing

958  
00:35:25,030 --> 00:35:23,359  
at the launch pad falcon 9 is powered on

959  
00:35:26,950 --> 00:35:25,040  
we've performed engine and stage

960  
00:35:28,630 --> 00:35:26,960  
checkout several hours ago

961  
00:35:30,710 --> 00:35:28,640  
currently the team's on station they're

962  
00:35:32,870 --> 00:35:30,720  
monitoring channel a tree we're looking

963  
00:35:34,470 --> 00:35:32,880

at pressures in the gas storage vessels

964

00:35:36,390 --> 00:35:34,480

everything's pretty much pressurized

965

00:35:39,589 --> 00:35:36,400

we'll top it off inside the last 30

966

00:35:41,430 --> 00:35:39,599

minutes after the crews on board dragon

967

00:35:43,349 --> 00:35:41,440

now on top of falcon 9 the dragon

968

00:35:44,790 --> 00:35:43,359

spacecraft is ready for the crew as i

969

00:35:46,310 --> 00:35:44,800

mentioned the ground team has got the

970

00:35:47,829 --> 00:35:46,320

side hatch open

971

00:35:49,750 --> 00:35:47,839

uh the crew as you can see they're

972

00:35:51,510 --> 00:35:49,760

finishing up their uh suit checks

973

00:35:53,430 --> 00:35:51,520

they're getting ready we've done

974

00:35:55,829 --> 00:35:53,440

functional checkouts on the dragon and

975

00:35:57,990 --> 00:35:55,839

most recently in the last half hour the

976  
00:35:59,990 --> 00:35:58,000  
dragon propellant system was pressurized

977  
00:36:01,990 --> 00:36:00,000  
to the final flight pressure so

978  
00:36:03,510 --> 00:36:02,000  
currently all the spacecraft systems are

979  
00:36:05,910 --> 00:36:03,520  
also go

980  
00:36:07,750 --> 00:36:05,920  
a launch range is working

981  
00:36:09,030 --> 00:36:07,760  
no issues they're ready to support at

982  
00:36:10,630 --> 00:36:09,040  
this time

983  
00:36:13,270 --> 00:36:10,640  
and as we've heard the weather is

984  
00:36:14,550 --> 00:36:13,280  
cooperating we actually heard a report

985  
00:36:16,790 --> 00:36:14,560  
we're starting to see a little bit of

986  
00:36:19,109 --> 00:36:16,800  
blue sky in the late afternoon early

987  
00:36:20,790 --> 00:36:19,119  
evening down at kennedy space center so

988  
00:36:22,950 --> 00:36:20,800

the countdown to liftoff everything

989

00:36:25,030 --> 00:36:22,960

continuing to look good and as we're

990

00:36:26,950 --> 00:36:25,040

getting ready for the crew to walk out

991

00:36:31,030 --> 00:36:26,960

let's go back to our team at kennedy

992

00:36:36,310 --> 00:36:34,230

thanks john it's now t-minus three hours

993

00:36:38,790 --> 00:36:36,320

and 39 minutes and counting here at

994

00:36:41,270 --> 00:36:38,800

kennedy space center in florida the crew

995

00:36:43,910 --> 00:36:41,280

ate their pre-launch meal at roughly

996

00:36:45,910 --> 00:36:43,920

around 4 30 p.m eastern time and then

997

00:36:47,430 --> 00:36:45,920

they were given a weather briefing and

998

00:36:50,310 --> 00:36:47,440

we just watched the suit techs from

999

00:36:53,030 --> 00:36:50,320

spacex fit each crew member into their

1000

00:36:54,710 --> 00:36:53,040

own custom space suits inside their crew

1001  
00:36:57,430 --> 00:36:54,720  
quarters and now you see them chatting

1002  
00:36:59,750 --> 00:36:57,440  
it up in a few minutes at t minus three

1003  
00:37:02,310 --> 00:36:59,760  
hours and 25 minutes the crew will be

1004  
00:37:05,349 --> 00:37:02,320  
making their way out of this famed suit

1005  
00:37:07,670 --> 00:37:05,359  
up room down the hall into an elevator

1006  
00:37:09,430 --> 00:37:07,680  
down to the first floor and then outside

1007  
00:37:11,829 --> 00:37:09,440  
to be greeted by their families in a

1008  
00:37:14,790 --> 00:37:11,839  
small group of well-wishers and that

1009  
00:37:17,030 --> 00:37:14,800  
will be before they head out to the pad

1010  
00:37:18,390 --> 00:37:17,040  
and the three teslas are outside and

1011  
00:37:20,550 --> 00:37:18,400  
ready to go and

1012  
00:37:22,710 --> 00:37:20,560  
uh that drive out shannon what's that

1013  
00:37:24,870 --> 00:37:22,720

like well the drive out uh to the launch

1014

00:37:27,030 --> 00:37:24,880

pad is pretty darn exciting because you

1015

00:37:29,109 --> 00:37:27,040

know you are heading out to your rocket

1016

00:37:33,670 --> 00:37:29,119

to go somewhere

1017

00:37:34,950 --> 00:37:33,680

in space

1018

00:37:36,950 --> 00:37:34,960

and so now

1019

00:37:38,470 --> 00:37:36,960

on countdown all four suit league checks

1020

00:37:40,790 --> 00:37:38,480

are complete with data collection

1021

00:37:43,109 --> 00:37:40,800

successful

1022

00:37:43,990 --> 00:37:43,119

okay so the call out that the suit

1023

00:37:45,510 --> 00:37:44,000

we've got

1024

00:37:46,710 --> 00:37:45,520

good yep yeah

1025

00:37:48,150 --> 00:37:46,720

that's a great sign that's a good

1026

00:37:49,750 --> 00:37:48,160

milestone

1027

00:37:52,710 --> 00:37:49,760

and you said you were noticing something

1028

00:37:55,270 --> 00:37:52,720

about uh the the tech on number 10 right

1029

00:37:57,670 --> 00:37:55,280

there to the right of rajachary yes uh i

1030

00:37:58,870 --> 00:37:57,680

was just noticing that he was actually

1031

00:37:59,910 --> 00:37:58,880

on the ship

1032

00:38:03,190 --> 00:37:59,920

with me

1033

00:38:05,430 --> 00:38:03,200

for the crew to splash down so they are

1034

00:38:06,790 --> 00:38:05,440

working hard getting everything done

1035

00:38:08,950 --> 00:38:06,800

getting a crew home and getting a crew

1036

00:38:11,109 --> 00:38:08,960

into space wow and that was just days

1037

00:38:13,510 --> 00:38:11,119

ago and you were on the boat too i was

1038

00:38:14,950 --> 00:38:13,520

on the boat too you're working hard

1039

00:38:17,510 --> 00:38:14,960

we all work hard

1040

00:38:19,430 --> 00:38:17,520

we appreciate you being here after after

1041

00:38:21,030 --> 00:38:19,440

a long night i know you were up

1042

00:38:22,069 --> 00:38:21,040

well into the night and the morning on

1043

00:38:23,910 --> 00:38:22,079

that

1044

00:38:26,710 --> 00:38:23,920

now there are three teslas waiting to

1045

00:38:29,430 --> 00:38:26,720

drive the crew out to launch complex 39a

1046

00:38:31,109 --> 00:38:29,440

and there they are under hazy skies

1047

00:38:32,710 --> 00:38:31,119

they'll be riding in the

1048

00:38:34,470 --> 00:38:32,720

the the first car riding in the first

1049

00:38:36,870 --> 00:38:34,480

car will be the suit techs and the

1050

00:38:40,150 --> 00:38:36,880

spacecraft closeout lead in the second

1051  
00:38:42,550 --> 00:38:40,160  
tesla commander raj achary and pilot tom

1052  
00:38:44,950 --> 00:38:42,560  
marshburn they'll be sharing a ride with

1053  
00:38:47,349 --> 00:38:44,960  
the nasa flight surgeon a position

1054  
00:38:49,670 --> 00:38:47,359  
marshburn once held and in the third

1055  
00:38:52,230 --> 00:38:49,680  
vehicle will be kayla baron

1056  
00:38:54,550 --> 00:38:52,240  
and matthias maurer and another closeout

1057  
00:38:57,589 --> 00:38:54,560  
lead and of course we will follow the

1058  
00:38:59,990 --> 00:38:57,599  
convoy every step of the way live

1059  
00:39:03,190 --> 00:39:00,000  
watching them go to their destination at

1060  
00:39:05,190 --> 00:39:03,200  
39 a the launch pad a historic launch

1061  
00:39:06,390 --> 00:39:05,200  
pad here at the kennedy space center

1062  
00:39:08,310 --> 00:39:06,400  
we're going to get you as close as we

1063  
00:39:11,270 --> 00:39:08,320

possibly can without actually being

1064

00:39:12,310 --> 00:39:11,280

inside the car with them shannon

1065

00:39:13,750 --> 00:39:12,320

yes

1066

00:39:15,670 --> 00:39:13,760

i suppose we could put a little camera

1067

00:39:18,150 --> 00:39:15,680

in there but anyway we will we will

1068

00:39:20,790 --> 00:39:18,160

track their progress from the onc

1069

00:39:23,109 --> 00:39:20,800

building out to the sp launch pad

1070

00:39:25,589 --> 00:39:23,119

we have another uh guest close by for

1071

00:39:27,109 --> 00:39:25,599

launch today who worked for years on

1072

00:39:28,790 --> 00:39:27,119

certifying the spacex crew

1073

00:39:31,270 --> 00:39:28,800

transportation system

1074

00:39:32,870 --> 00:39:31,280

earlier nasa's marie lewis caught up to

1075

00:39:34,870 --> 00:39:32,880

one woman who has been part of the

1076

00:39:37,270 --> 00:39:34,880

commercial crew team since the very

1077

00:39:40,470 --> 00:39:37,280

beginning

1078

00:39:41,750 --> 00:39:40,480

brittany sims launch operations engineer

1079

00:39:43,910 --> 00:39:41,760

for nasa

1080

00:39:45,589 --> 00:39:43,920

thank you for joining us thank you

1081

00:39:47,510 --> 00:39:45,599

so we are sitting inside the mission

1082

00:39:49,829 --> 00:39:47,520

director center that is on the cape

1083

00:39:51,910 --> 00:39:49,839

canaveral space force station this is

1084

00:39:52,950 --> 00:39:51,920

one of several control rooms around the

1085

00:39:56,310 --> 00:39:52,960

country

1086

00:39:58,069 --> 00:39:56,320

that hold nasa and spacex teams and so

1087

00:40:00,390 --> 00:39:58,079

you are sitting in here on launch day

1088

00:40:03,030 --> 00:40:00,400

with the chief engineer for nasa along

1089

00:40:04,950 --> 00:40:03,040

with other engineers on the nasa side

1090

00:40:06,390 --> 00:40:04,960

tell me what are you focusing on what

1091

00:40:08,630 --> 00:40:06,400

are you working on when you're sitting

1092

00:40:10,950 --> 00:40:08,640

on console as the crew is suiting up

1093

00:40:12,950 --> 00:40:10,960

yeah so during suit up the crew the

1094

00:40:15,109 --> 00:40:12,960

engineering team we're monitoring our

1095

00:40:17,349 --> 00:40:15,119

systems ensuring that everything's

1096

00:40:19,589 --> 00:40:17,359

looking um good as it should so from the

1097

00:40:21,430 --> 00:40:19,599

spacecraft to the launch vehicle to even

1098

00:40:23,750 --> 00:40:21,440

the ground systems just making sure

1099

00:40:25,430 --> 00:40:23,760

everything is happening as expected um

1100

00:40:27,270 --> 00:40:25,440

so in the event something's not looking

1101  
00:40:28,630 --> 00:40:27,280  
quite right we'll have a discussion

1102  
00:40:31,510 --> 00:40:28,640  
about it and bring it to the chief

1103  
00:40:33,990 --> 00:40:31,520  
engineer who i directly support and so

1104  
00:40:35,670 --> 00:40:34,000  
to ensure that we're still good to go so

1105  
00:40:37,910 --> 00:40:35,680  
part of the task that i'm responsible

1106  
00:40:39,589 --> 00:40:37,920  
for is making sure that we keep track of

1107  
00:40:41,910 --> 00:40:39,599  
all those issues and kind of work

1108  
00:40:43,349 --> 00:40:41,920  
through them um and then as we proceed

1109  
00:40:45,829 --> 00:40:43,359  
down the account there's certain

1110  
00:40:47,430 --> 00:40:45,839  
critical times in the account where the

1111  
00:40:49,510 --> 00:40:47,440  
nasa engineering team is asked if we're

1112  
00:40:50,870 --> 00:40:49,520  
still continually good to go and so

1113  
00:40:52,950 --> 00:40:50,880

making sure the engineering team is

1114

00:40:54,950 --> 00:40:52,960

ready for those particular polls is also

1115

00:40:56,470 --> 00:40:54,960

part of my responsibility and then at

1116

00:40:57,349 --> 00:40:56,480

the end as we get closer we'll give our

1117

00:40:59,430 --> 00:40:57,359

final

1118

00:41:01,510 --> 00:40:59,440

thumbs up to the nasa launch manager and

1119

00:41:03,670 --> 00:41:01,520

who will provide that final response to

1120

00:41:06,150 --> 00:41:03,680

spacex on behalf of the nasa team so

1121

00:41:08,390 --> 00:41:06,160

pretty exciting time very focused and

1122

00:41:10,470 --> 00:41:08,400

ready to go awesome and i know you've

1123

00:41:12,069 --> 00:41:10,480

been with the commercial crew program

1124

00:41:14,390 --> 00:41:12,079

supporting as an engineer from the

1125

00:41:16,870 --> 00:41:14,400

beginning almost more than 10 years ago

1126

00:41:19,430 --> 00:41:16,880

in fact so and you've had the

1127

00:41:21,510 --> 00:41:19,440

opportunity to work here on console for

1128

00:41:23,430 --> 00:41:21,520

every mission and watch every crew suit

1129

00:41:25,190 --> 00:41:23,440

up what is it like in here when you're

1130

00:41:26,790 --> 00:41:25,200

working as part of that team and you're

1131

00:41:28,950 --> 00:41:26,800

watching the crew suit up when you

1132

00:41:30,950 --> 00:41:28,960

you've seen firsthand all of the work

1133

00:41:32,630 --> 00:41:30,960

that's gone into certifying the spacex

1134

00:41:34,470 --> 00:41:32,640

system it's like a dream you know

1135

00:41:36,790 --> 00:41:34,480

sometimes i just want to pinch myself

1136

00:41:38,710 --> 00:41:36,800

because i remember when i first started

1137

00:41:40,309 --> 00:41:38,720

very early in my nasa career supporting

1138

00:41:42,069 --> 00:41:40,319

commercial crew program and it was

1139

00:41:44,870 --> 00:41:42,079

really just a concept very early in

1140

00:41:46,550 --> 00:41:44,880

development on paper and now we're here

1141

00:41:47,910 --> 00:41:46,560

sitting at another spacex launch as

1142

00:41:49,510 --> 00:41:47,920

they're launching our astronauts to the

1143

00:41:51,349 --> 00:41:49,520

international space station and and

1144

00:41:53,109 --> 00:41:51,359

they're certified so it's really

1145

00:41:55,109 --> 00:41:53,119

exciting you know the fact that i was

1146

00:41:57,349 --> 00:41:55,119

able to see it and see it where it was

1147

00:41:58,710 --> 00:41:57,359

at in the very beginning and now here

1148

00:42:01,430 --> 00:41:58,720

still being a part of the team where

1149

00:42:03,190 --> 00:42:01,440

it's operational it just i just get even

1150

00:42:04,470 --> 00:42:03,200

more excited to think about where are we

1151  
00:42:06,790 --> 00:42:04,480  
going to go with these commercial

1152  
00:42:09,829 --> 00:42:06,800  
partnerships in the future are there any

1153  
00:42:12,309 --> 00:42:09,839  
superstitions or traditions that you

1154  
00:42:14,829 --> 00:42:12,319  
have with the launch team in this room i

1155  
00:42:18,790 --> 00:42:14,839  
actually do i wear a special pair of

1156  
00:42:20,069 --> 00:42:18,800  
shoes since the very first mission and i

1157  
00:42:22,150 --> 00:42:20,079  
learned about this through the chief

1158  
00:42:24,950 --> 00:42:22,160  
engineer who wears a special jacket

1159  
00:42:27,030 --> 00:42:24,960  
every time and so yeah i have a special

1160  
00:42:29,109 --> 00:42:27,040  
pair of shoes that i wear each mission

1161  
00:42:30,950 --> 00:42:29,119  
and just just to be a part of it to make

1162  
00:42:32,630 --> 00:42:30,960  
sure we're all successful to add my part

1163  
00:42:35,430 --> 00:42:32,640

to it very nice and i heard something

1164

00:42:36,790 --> 00:42:35,440

about chili after long yeah yeah this is

1165

00:42:38,150 --> 00:42:36,800

a tradition all the way back from

1166

00:42:39,829 --> 00:42:38,160

shuttle i imagine they might have did it

1167

00:42:41,829 --> 00:42:39,839

in apollo 2 where

1168

00:42:44,150 --> 00:42:41,839

after every successful launch we'll have

1169

00:42:46,230 --> 00:42:44,160

a cup of chili and a piece of cornbread

1170

00:42:48,470 --> 00:42:46,240

when we walk out the door celebrating

1171

00:42:50,550 --> 00:42:48,480

our success for another mission so yeah

1172

00:42:52,150 --> 00:42:50,560

it's pretty pretty cool pretty fantastic

1173

00:42:54,150 --> 00:42:52,160

well i hope you get to enjoy that and

1174

00:42:55,349 --> 00:42:54,160

lastly i want to ask you about i know

1175

00:42:57,910 --> 00:42:55,359

years ago

1176

00:42:59,589 --> 00:42:57,920

you used to keep a photo of the first

1177

00:43:01,349 --> 00:42:59,599

commercial the first astronauts who were

1178

00:43:03,190 --> 00:43:01,359

assigned to the commercial crew program

1179

00:43:03,990 --> 00:43:03,200

the cadre they called them the original

1180

00:43:05,829 --> 00:43:04,000

four

1181

00:43:07,990 --> 00:43:05,839

um and two of them have since flown

1182

00:43:09,829 --> 00:43:08,000

already on the spacex system doug hurley

1183

00:43:12,550 --> 00:43:09,839

and bob benkin and you used to keep

1184

00:43:14,790 --> 00:43:12,560

their photo in your cubicle at the

1185

00:43:16,790 --> 00:43:14,800

operations and checkout building tell me

1186

00:43:18,790 --> 00:43:16,800

why you kept that photo there

1187

00:43:21,430 --> 00:43:18,800

you know there's two reasons you know

1188

00:43:23,670 --> 00:43:21,440

looking at that photo first is just a

1189

00:43:25,829 --> 00:43:23,680

reminder of the importance of what we're

1190

00:43:28,069 --> 00:43:25,839

doing and and who's on these vehicles

1191

00:43:30,390 --> 00:43:28,079

right their fathers their sons they have

1192

00:43:32,150 --> 00:43:30,400

families and so they're entrusting us to

1193

00:43:34,790 --> 00:43:32,160

get them there safely to their

1194

00:43:36,470 --> 00:43:34,800

destination and so it's a reminder to

1195

00:43:38,550 --> 00:43:36,480

continue to always be vigilant in

1196

00:43:40,630 --> 00:43:38,560

anything i do when i as i get to support

1197

00:43:42,230 --> 00:43:40,640

this team and so it was always important

1198

00:43:43,670 --> 00:43:42,240

for me to have that photo there because

1199

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

i've gotten the opportunity to interact

1200

00:43:48,150 --> 00:43:46,000

with them prior to their flight and then

1201  
00:43:50,069 --> 00:43:48,160  
also the second part of it it was also a

1202  
00:43:53,190 --> 00:43:50,079  
reminder to the fact that that was my

1203  
00:43:55,670 --> 00:43:53,200  
dream to come to nasa and fly astronauts

1204  
00:43:57,910 --> 00:43:55,680  
safely to wherever their destination is

1205  
00:43:59,750 --> 00:43:57,920  
and so it's a reminder that you know you

1206  
00:44:02,150 --> 00:43:59,760  
honestly can accomplish anything you set

1207  
00:44:03,670 --> 00:44:02,160  
your mind to because i'm a living living

1208  
00:44:05,190 --> 00:44:03,680  
example and i was able to do it and i'm

1209  
00:44:07,990 --> 00:44:05,200  
doing it here today

1210  
00:44:10,150 --> 00:44:08,000  
all right brittany sims launch engineer

1211  
00:44:11,910 --> 00:44:10,160  
best of luck to you and the team on this

1212  
00:44:15,670 --> 00:44:11,920  
launch of the crew 3 mission thank you

1213  
00:44:20,870 --> 00:44:17,829

all right and there you see a live view

1214

00:44:22,870 --> 00:44:20,880

as we head towards sunset here on the

1215

00:44:24,470 --> 00:44:22,880

florida coast which is

1216

00:44:26,470 --> 00:44:24,480

right about now right about now it's

1217

00:44:29,190 --> 00:44:26,480

getting dark we don't see the sun mind

1218

00:44:31,430 --> 00:44:29,200

you no we see gray skies and clouds all

1219

00:44:33,430 --> 00:44:31,440

around uh but there's a look at it there

1220

00:44:34,710 --> 00:44:33,440

with the iconic vehicle assembly

1221

00:44:36,870 --> 00:44:34,720

building there

1222

00:44:39,430 --> 00:44:36,880

but these clouds were told

1223

00:44:42,230 --> 00:44:39,440

are hoping to clear a little bit and i

1224

00:44:45,910 --> 00:44:42,240

talked to um our our launch weather

1225

00:44:47,349 --> 00:44:45,920

officer uh brian sizzik with uh

1226

00:44:49,750 --> 00:44:47,359

the 45th

1227

00:44:52,710 --> 00:44:49,760

space wing he says that

1228

00:44:55,510 --> 00:44:52,720

these clouds are somewhat thin the

1229

00:44:57,670 --> 00:44:55,520

moisture is thin and so there's some dry

1230

00:44:59,190 --> 00:44:57,680

air in the mid-level

1231

00:45:01,750 --> 00:44:59,200

area of the atmosphere that's kind of

1232

00:45:04,630 --> 00:45:01,760

drying it out so it it doesn't look good

1233

00:45:06,950 --> 00:45:04,640

but in fact um very thin level of

1234

00:45:09,270 --> 00:45:06,960

moisture up there uh with those clouds

1235

00:45:11,190 --> 00:45:09,280

that you see on the screen right there

1236

00:45:13,270 --> 00:45:11,200

yeah that uh having these types of

1237

00:45:14,790 --> 00:45:13,280

clouds is is the good kind of clouds we

1238

00:45:16,230 --> 00:45:14,800

have what we really want to avoid is

1239

00:45:17,670 --> 00:45:16,240

lightning we cannot launch when there's

1240

00:45:19,349 --> 00:45:17,680

lightning around the lawn

1241

00:45:21,670 --> 00:45:19,359

absolutely right and there are many

1242

00:45:24,230 --> 00:45:21,680

criteria that govern

1243

00:45:25,430 --> 00:45:24,240

exactly whether the spacecraft can

1244

00:45:28,230 --> 00:45:25,440

launch

1245

00:45:30,470 --> 00:45:28,240

through weather and the conditions of

1246

00:45:31,430 --> 00:45:30,480

lightning as shannon mentioned

1247

00:45:33,430 --> 00:45:31,440

so

1248

00:45:35,910 --> 00:45:33,440

those apparently the only concerns we

1249

00:45:38,150 --> 00:45:35,920

have in this are the cumulus cloud rule

1250

00:45:40,870 --> 00:45:38,160

and flight through precipitation right

1251  
00:45:44,470 --> 00:45:40,880  
which we hope will only be a 30 chance

1252  
00:45:48,630 --> 00:45:46,470  
let's uh check in uh the hallway and

1253  
00:45:51,349 --> 00:45:48,640  
look at the beautiful art inside

1254  
00:45:52,150 --> 00:45:51,359  
astronaut crew quarters 23 000 square

1255  
00:45:54,390 --> 00:45:52,160  
feet

1256  
00:45:57,510 --> 00:45:54,400  
of crew quarters there and they have

1257  
00:45:59,109 --> 00:45:57,520  
dorm rooms that uh are very homey and

1258  
00:46:01,349 --> 00:45:59,119  
comfortable you've stayed there shannon

1259  
00:46:03,589 --> 00:46:01,359  
and you've seen that art that's a nice

1260  
00:46:05,190 --> 00:46:03,599  
touch that's just been added recently it

1261  
00:46:07,510 --> 00:46:05,200  
is a nice touch and they have all

1262  
00:46:10,069 --> 00:46:07,520  
different kinds of art that uh really

1263  
00:46:12,630 --> 00:46:10,079

cover the whole history of our

1264

00:46:15,510 --> 00:46:12,640

space flight um that we've done in this

1265

00:46:17,990 --> 00:46:15,520

country and so we've got various artists

1266

00:46:19,670 --> 00:46:18,000

making their um you know donating stuff

1267

00:46:23,030 --> 00:46:19,680

to us which is really nice and it's

1268

00:46:25,190 --> 00:46:23,040

space themed art so it fits uh you know

1269

00:46:27,589 --> 00:46:25,200

the area it certainly fits the the

1270

00:46:30,309 --> 00:46:27,599

location and as you look there you're

1271

00:46:32,230 --> 00:46:30,319

looking at the uh the backs of the

1272

00:46:34,150 --> 00:46:32,240

teslas that will drive out to the pad

1273

00:46:36,630 --> 00:46:34,160

you can see all three of them

1274

00:46:39,270 --> 00:46:36,640

um lined up and ready to go and the

1275

00:46:41,910 --> 00:46:39,280

folks to the right of the rope

1276  
00:46:43,510 --> 00:46:41,920  
family friends and some media as well

1277  
00:46:44,309 --> 00:46:43,520  
you can see they've got their umbrellas

1278  
00:46:45,270 --> 00:46:44,319  
out

1279  
00:46:47,030 --> 00:46:45,280  
um

1280  
00:46:49,030 --> 00:46:47,040  
ready for a little more

1281  
00:46:51,030 --> 00:46:49,040  
content to come down the oil seals have

1282  
00:46:53,990 --> 00:46:51,040  
been removed and installation of the lyo

1283  
00:46:56,470 --> 00:46:54,000  
cartridge is complete

1284  
00:46:57,750 --> 00:46:56,480  
ahead of t minus 3 hours 29 minutes we

1285  
00:47:01,109 --> 00:46:57,760  
are more than 15 minutes ahead of

1286  
00:47:04,790 --> 00:47:02,870  
again head of schedule that's a good

1287  
00:47:07,910 --> 00:47:04,800  
thing and i believe the license plate on

1288  
00:47:10,790 --> 00:47:07,920

that car in the back said send it

1289

00:47:12,550 --> 00:47:10,800

is i think uh is the

1290

00:47:14,710 --> 00:47:12,560

is how we all feel

1291

00:47:16,069 --> 00:47:14,720

yes indeed each time the tesla seem to

1292

00:47:19,109 --> 00:47:16,079

have a different license plate with

1293

00:47:20,390 --> 00:47:19,119

another uh nice little message they do

1294

00:47:22,309 --> 00:47:20,400

they do i've seen quite a few and

1295

00:47:24,069 --> 00:47:22,319

they've all been great hey how about we

1296

00:47:26,069 --> 00:47:24,079

take a few questions on social that have

1297

00:47:28,710 --> 00:47:26,079

come in that'd be great

1298

00:47:31,030 --> 00:47:28,720

kyle on twitter asks since three out of

1299

00:47:33,270 --> 00:47:31,040

the four crew members are rookies

1300

00:47:35,349 --> 00:47:33,280

well nasa and spacex have the camera

1301  
00:47:37,430 --> 00:47:35,359  
inside crew dragon turned on so we can

1302  
00:47:39,270 --> 00:47:37,440  
see the astronauts first reaction when

1303  
00:47:41,109 --> 00:47:39,280  
they reach space

1304  
00:47:43,109 --> 00:47:41,119  
and see earth down below

1305  
00:47:45,750 --> 00:47:43,119  
i suspect that they will we usually have

1306  
00:47:47,109 --> 00:47:45,760  
the cameras on inside the capsule the

1307  
00:47:49,270 --> 00:47:47,119  
real question is do we have the

1308  
00:47:50,950 --> 00:47:49,280  
satellite link ups to get that video

1309  
00:47:52,950 --> 00:47:50,960  
feed back to the ground

1310  
00:47:54,549 --> 00:47:52,960  
a live video feed

1311  
00:47:57,190 --> 00:47:54,559  
would be best but i'm not sure we'll

1312  
00:47:59,589 --> 00:47:57,200  
have that um but they do have cameras

1313  
00:48:02,390 --> 00:47:59,599

and so the next question

1314

00:48:04,790 --> 00:48:02,400

is from mad dog on twitter and she asks

1315

00:48:07,510 --> 00:48:04,800

i'm assuming that um

1316

00:48:09,910 --> 00:48:07,520

why did spacex decide to reuse its

1317

00:48:11,190 --> 00:48:09,920

booster but not its space capsule which

1318

00:48:13,190 --> 00:48:11,200

is brand new

1319

00:48:15,750 --> 00:48:13,200

yeah that's an interesting question so

1320

00:48:18,309 --> 00:48:15,760

um and as a general rule

1321

00:48:19,990 --> 00:48:18,319

spacex will reuse both boosters and

1322

00:48:22,309 --> 00:48:20,000

capsules and so a lot of it just has to

1323

00:48:24,309 --> 00:48:22,319

do with the time it takes to refurbish

1324

00:48:25,990 --> 00:48:24,319

things versus getting

1325

00:48:29,910 --> 00:48:26,000

new capsules built so they will have

1326

00:48:32,309 --> 00:48:29,920

more capsules in the future okay

1327

00:48:34,710 --> 00:48:32,319

well there's a beautiful shot outside

1328

00:48:37,030 --> 00:48:34,720

with the clouds overhead

1329

00:48:39,510 --> 00:48:37,040

as light begins to dim we've passed

1330

00:48:41,910 --> 00:48:39,520

sunset here on the east coast of florida

1331

00:48:43,910 --> 00:48:41,920

and a look out over the atlantic where

1332

00:48:46,630 --> 00:48:43,920

we still see a little bit of light you

1333

00:48:48,549 --> 00:48:46,640

can see that the clouds uh they're not

1334

00:48:50,710 --> 00:48:48,559

completely covering the sky we do have

1335

00:48:52,230 --> 00:48:50,720

some holes and one of those holes is

1336

00:48:55,109 --> 00:48:52,240

what we're hoping for

1337

00:48:55,119 --> 00:48:58,950

as time goes by

1338

00:48:58,960 --> 00:49:01,750

hey

1339

00:49:05,109 --> 00:49:03,750

it'll be nice to see the astronauts when

1340

00:49:05,910 --> 00:49:05,119

they walk through

1341

00:49:12,630 --> 00:49:05,920

the

1342

00:49:15,190 --> 00:49:12,640

completely dark

1343

00:49:16,790 --> 00:49:15,200

you can see them inside absolutely you

1344

00:49:22,630 --> 00:49:16,800

will have a good view of them going out

1345

00:49:22,640 --> 00:49:26,549

uh love that another question

1346

00:49:31,510 --> 00:49:28,390

as we look out

1347

00:49:34,069 --> 00:49:31,520

the lights on the crew dragon and falcon

1348

00:49:38,309 --> 00:49:34,079

9 rocket

1349

00:49:40,309 --> 00:49:38,319

the capsule named endurance by the crew

1350

00:49:42,710 --> 00:49:40,319

and here's our question

1351

00:49:45,910 --> 00:49:42,720

shannon how can you compare the g's when

1352

00:49:48,230 --> 00:49:45,920

flying soyuz versus falcon 9 dragon

1353

00:49:49,589 --> 00:49:48,240

spacecraft oh that's a very interesting

1354

00:49:52,230 --> 00:49:49,599

question

1355

00:49:54,470 --> 00:49:52,240

for both spacecraft the maximum amount

1356

00:49:56,710 --> 00:49:54,480

of g-load that you get is about four and

1357

00:49:58,390 --> 00:49:56,720

a half g's what's different between the

1358

00:50:00,309 --> 00:49:58,400

two is the profile

1359

00:50:02,470 --> 00:50:00,319

when those g loads come on you know when

1360

00:50:04,870 --> 00:50:02,480

the g's come on and when they go away so

1361

00:50:06,470 --> 00:50:04,880

on the soyuz you pretty much got up to a

1362

00:50:08,549 --> 00:50:06,480

g peak of four and a half and then it

1363

00:50:11,990 --> 00:50:08,559

tailed off with the

1364

00:50:14,710 --> 00:50:12,000

falcon 9 in the second stage uh you just

1365

00:50:17,510 --> 00:50:14,720

keep accelerating g so you start off

1366

00:50:19,910 --> 00:50:17,520

pretty slow and then as it as you get

1367

00:50:21,430 --> 00:50:19,920

further along in that uh period of time

1368

00:50:23,030 --> 00:50:21,440

where you're on the second stage the

1369

00:50:24,549 --> 00:50:23,040

gilo's just increased the whole time so

1370

00:50:25,829 --> 00:50:24,559

when the engine cuts off you're at four

1371

00:50:28,069 --> 00:50:25,839

and a half g's and have been there for a

1372

00:50:30,710 --> 00:50:28,079

little bit of time so it's a slow steady

1373

00:50:32,470 --> 00:50:30,720

increase you just it's just go go go you

1374

00:50:33,990 --> 00:50:32,480

feel the pressure on your chest yes it's

1375

00:50:35,190 --> 00:50:34,000

pushing you into your it's pushing you

1376

00:50:36,650 --> 00:50:35,200

into your seat you kind of feel like

1377

00:50:38,549 --> 00:50:36,660

you're being smooshed like a cartoon

1378

00:50:41,589 --> 00:50:38,559

[Laughter]

1379

00:50:44,549 --> 00:50:41,599

like a cartoon well

1380

00:50:46,950 --> 00:50:44,559

but it's gotta be an amazing experience

1381

00:50:48,790 --> 00:50:46,960

when that engine cuts off absolutely it

1382

00:50:50,790 --> 00:50:48,800

is it is so fascinating when the engine

1383

00:50:53,270 --> 00:50:50,800

cuts off because all the vibrations and

1384

00:50:54,870 --> 00:50:53,280

noise that you've been hearing goes away

1385

00:50:56,309 --> 00:50:54,880

and you know you are floating even

1386

00:50:57,670 --> 00:50:56,319

though you're still strapped down into

1387

00:51:01,829 --> 00:50:57,680

your seats you know that you are

1388

00:51:05,270 --> 00:51:03,349

we have one more question we'll take

1389

00:51:06,710 --> 00:51:05,280

from social media

1390

00:51:09,750 --> 00:51:06,720

and we appreciate if you want to send

1391

00:51:12,710 --> 00:51:09,760

your questions in send to

1392

00:51:14,230 --> 00:51:12,720

ask nasa on twitter

1393

00:51:18,230 --> 00:51:14,240

and our next question what do the

1394

00:51:20,950 --> 00:51:18,240

astronauts do to keep morale boosted

1395

00:51:22,950 --> 00:51:20,960

oh well i think in general astronauts

1396

00:51:24,870 --> 00:51:22,960

have pretty good morale because they

1397

00:51:26,630 --> 00:51:24,880

know the end goal is a chance to go into

1398

00:51:28,230 --> 00:51:26,640

space but in times like this when

1399

00:51:30,950 --> 00:51:28,240

there's a lot of delays

1400

00:51:32,630 --> 00:51:30,960

yeah it can uh kind of your morale may

1401  
00:51:33,990 --> 00:51:32,640  
lag a little bit but you get to spend

1402  
00:51:36,390 --> 00:51:34,000  
time with your families you get to

1403  
00:51:39,270 --> 00:51:36,400  
review the task ahead so

1404  
00:51:40,950 --> 00:51:39,280  
most the time they just stay focused

1405  
00:51:42,870 --> 00:51:40,960  
and it's interesting you mentioned that

1406  
00:51:44,069 --> 00:51:42,880  
you know the delay and what the crew did

1407  
00:51:46,309 --> 00:51:44,079  
we actually

1408  
00:51:48,790 --> 00:51:46,319  
heard or got a note from the program

1409  
00:51:50,790 --> 00:51:48,800  
manager of the commercial crew program

1410  
00:51:52,950 --> 00:51:50,800  
who uh had received an email from roger

1411  
00:51:56,150 --> 00:51:52,960  
chari and he expressed his uh

1412  
00:51:57,910 --> 00:51:56,160  
appreciation for all the work that goes

1413  
00:51:59,510 --> 00:51:57,920

on behind the scenes

1414

00:52:01,430 --> 00:51:59,520

for the commercial crew program to get

1415

00:52:03,510 --> 00:52:01,440

ready for a launch like this

1416

00:52:05,750 --> 00:52:03,520

i know shannon you can appreciate that

1417

00:52:08,470 --> 00:52:05,760

and he said that um

1418

00:52:11,030 --> 00:52:08,480

they've spent their time

1419

00:52:13,349 --> 00:52:11,040

doing dry runs dry running the heck out

1420

00:52:15,670 --> 00:52:13,359

of the evas that they're planning to do

1421

00:52:17,430 --> 00:52:15,680

and getting smarter about dragon so we

1422

00:52:19,750 --> 00:52:17,440

hope that that will pay dividends in

1423

00:52:22,470 --> 00:52:19,760

execution shortly

1424

00:52:25,270 --> 00:52:22,480

working hard and here they are the four

1425

00:52:26,630 --> 00:52:25,280

crew three astronauts as they walk down

1426

00:52:28,390 --> 00:52:26,640

the hallway

1427

00:52:29,589 --> 00:52:28,400

on their way out of astronaut crew

1428

00:52:31,910 --> 00:52:29,599

quarters

1429

00:52:33,910 --> 00:52:31,920

yep and they're waving to the folks that

1430

00:52:35,829 --> 00:52:33,920

work there in crew quarters to get them

1431

00:52:38,069 --> 00:52:35,839

ready to go and they'll be stepping into

1432

00:52:39,670 --> 00:52:38,079

the elevator that you see there and at

1433

00:52:42,230 --> 00:52:39,680

the back of the elevator there should be

1434

00:52:43,829 --> 00:52:42,240

a big sign that a lot of people from the

1435

00:52:45,589 --> 00:52:43,839

kennedy space center have signed we see

1436

00:52:48,309 --> 00:52:45,599

that there you can see the signatures on

1437

00:52:49,670 --> 00:52:48,319

the left-hand side yep yep it's a nice

1438

00:52:51,270 --> 00:52:49,680

uh piece of history that's done every

1439

00:52:52,549 --> 00:52:51,280

time you get a chance to see that when

1440

00:52:53,829 --> 00:52:52,559

you walked in shannon you gotta look

1441

00:52:55,349 --> 00:52:53,839

quick cause once you turn around it's

1442

00:52:57,109 --> 00:52:55,359

hard to crane your neck around to look

1443

00:52:58,710 --> 00:52:57,119

behind you we've noticed that once

1444

00:53:00,470 --> 00:52:58,720

you're in the suit uh you know you've

1445

00:53:01,910 --> 00:53:00,480

gotta completely move your entire body

1446

00:53:03,190 --> 00:53:01,920

in order to get to the direction of

1447

00:53:05,910 --> 00:53:03,200

where you want to look

1448

00:53:07,750 --> 00:53:05,920

but certainly uh a a wonderful moment

1449

00:53:09,750 --> 00:53:07,760

for everyone as we were talking about

1450

00:53:11,829 --> 00:53:09,760

all the people who support this program

1451

00:53:13,510 --> 00:53:11,839

to put their signature on and have it

1452

00:53:15,510 --> 00:53:13,520

seen by the astronauts as they go down

1453

00:53:17,510 --> 00:53:15,520

that elevator and on their way out to

1454

00:53:19,670 --> 00:53:17,520

the launch pad yes it says crew we are

1455

00:53:22,150 --> 00:53:19,680

well aware of the little thousands of

1456

00:53:24,069 --> 00:53:22,160

people that work to make space flight

1457

00:53:24,710 --> 00:53:24,079

happen and we are so indebted to all of

1458

00:53:27,270 --> 00:53:24,720

them

1459

00:53:30,549 --> 00:53:27,280

crew 3 actually spent uh

1460

00:53:32,950 --> 00:53:30,559

the time together watching crew 2 land

1461

00:53:34,230 --> 00:53:32,960

yes which i imagine you know they didn't

1462

00:53:36,710 --> 00:53:34,240

they didn't know that they were going to

1463

00:53:37,829 --> 00:53:36,720

be here on the ground uh initially they

1464

00:53:38,710 --> 00:53:37,839

thought they were going to see them in

1465

00:53:40,390 --> 00:53:38,720

space

1466

00:53:42,150 --> 00:53:40,400

but they all got together

1467

00:53:44,950 --> 00:53:42,160

you know like uh the family that they've

1468

00:53:47,510 --> 00:53:44,960

become exactly and watch them come down

1469

00:53:49,270 --> 00:53:47,520

in fact i've and the whole office

1470

00:53:52,790 --> 00:53:49,280

tends to get together whenever we can to

1471

00:53:56,470 --> 00:53:54,470

and i'm sure the astronauts who are

1472

00:53:59,510 --> 00:53:56,480

flying appreciate that

1473

00:54:01,190 --> 00:53:59,520

oh yeah yes uh each you know you have

1474

00:54:03,750 --> 00:54:01,200

different levels of family so you've got

1475

00:54:06,230 --> 00:54:03,760

your tight-knit family as the uh crew on

1476

00:54:08,630 --> 00:54:06,240

uh one space flight together and then

1477

00:54:10,549 --> 00:54:08,640

you've got the astronaut family which

1478

00:54:12,470 --> 00:54:10,559

really encompasses all the international

1479

00:54:14,390 --> 00:54:12,480

astronauts as well

1480

00:54:16,710 --> 00:54:14,400

and we are just moments away from seeing

1481

00:54:18,950 --> 00:54:16,720

crew 3 astronauts exit the operations

1482

00:54:21,030 --> 00:54:18,960

and checkout building you're staring

1483

00:54:24,230 --> 00:54:21,040

at the doorway on countdown crew

1484

00:54:29,190 --> 00:54:24,240

displays are configured for crew ingress

1485

00:54:34,470 --> 00:54:30,950

and that's the advanced team that's out

1486

00:54:37,990 --> 00:54:35,750

that's right

1487

00:54:39,349 --> 00:54:38,000

so we've got a pause here because as

1488

00:54:40,789 --> 00:54:39,359

you've noted everything happens

1489

00:54:43,109 --> 00:54:40,799

according to a timeline we're a little

1490

00:54:45,349 --> 00:54:43,119

bit ahead so we're gonna the crew may

1491

00:54:47,109 --> 00:54:45,359

not walk out immediately but when they

1492

00:54:48,390 --> 00:54:47,119

do they'll be right on the timeline to

1493

00:54:49,430 --> 00:54:48,400

get them out to the pad at the right

1494

00:54:51,510 --> 00:54:49,440

time

1495

00:54:54,069 --> 00:54:51,520

that shot there you see some members of

1496

00:54:56,230 --> 00:54:54,079

the media and uh press corps

1497

00:54:58,710 --> 00:54:56,240

looking to get uh photos and pictures of

1498

00:55:00,309 --> 00:54:58,720

the astronauts as they walk out and have

1499

00:55:02,950 --> 00:55:00,319

been walking out of this building uh

1500

00:55:04,870 --> 00:55:02,960

going back to the apollo program a sense

1501  
00:55:07,510 --> 00:55:04,880  
of history do do you

1502  
00:55:09,430 --> 00:55:07,520  
does that come over you as you are

1503  
00:55:11,750 --> 00:55:09,440  
walking through the following the

1504  
00:55:13,510 --> 00:55:11,760  
footsteps of some of the most amazing

1505  
00:55:16,069 --> 00:55:13,520  
astronauts that have uh you know dared

1506  
00:55:17,750 --> 00:55:16,079  
to go into space and and accomplish

1507  
00:55:20,150 --> 00:55:17,760  
these great achievements like going to

1508  
00:55:21,589 --> 00:55:20,160  
the moon yeah it certainly did for me i

1509  
00:55:23,829 --> 00:55:21,599  
can't speak for all astronauts but i

1510  
00:55:25,910 --> 00:55:23,839  
suspect so because you know

1511  
00:55:27,670 --> 00:55:25,920  
growing up we have seen this walk out so

1512  
00:55:29,750 --> 00:55:27,680  
many times on tv and then now you're

1513  
00:55:34,549 --> 00:55:29,760

actually getting to do it yourself it is

1514

00:55:34,559 --> 00:55:38,710

looks like we're still waiting

1515

00:55:48,069 --> 00:55:41,829

and we are just seconds away from the

1516

00:55:52,950 --> 00:55:49,589

you can see them back there behind the

1517

00:55:54,710 --> 00:55:52,960

window of the door um gathering a little

1518

00:55:56,470 --> 00:55:54,720

bit waiting for their queue

1519

00:55:58,069 --> 00:55:56,480

waiting for the queue to come out and be

1520

00:55:59,750 --> 00:55:58,079

able to greet their families before they

1521

00:56:02,150 --> 00:55:59,760

head off to the launch pad

1522

00:56:03,910 --> 00:56:02,160

and this is oftentimes the the shot that

1523

00:56:06,390 --> 00:56:03,920

you see repeated in you know the

1524

00:56:08,950 --> 00:56:06,400

newsreels and and on the internet uh

1525

00:56:12,549 --> 00:56:08,960

when they walk out to to go to their

1526

00:56:14,309 --> 00:56:12,559

rides and head to the launch pad

1527

00:56:15,990 --> 00:56:14,319

and there's stickers around this as well

1528

00:56:18,950 --> 00:56:16,000

shannon i believe you've got one up

1529

00:56:20,789 --> 00:56:18,960

there yep as i mentioned before crews

1530

00:56:23,190 --> 00:56:20,799

like to put their stickers on just about

1531

00:56:26,069 --> 00:56:23,200

anything they can so just above the door

1532

00:56:28,150 --> 00:56:26,079

uh next to the nasa meatball there there

1533

00:56:29,829 --> 00:56:28,160

are stickers from each crew i think

1534

00:56:31,430 --> 00:56:29,839

yours is covering a little bit of the a

1535

00:56:32,710 --> 00:56:31,440

on the end of nasa it's getting a little

1536

00:56:34,150 --> 00:56:32,720

bit it's getting a little crowded there

1537

00:56:36,230 --> 00:56:34,160

so we did the best we could here they

1538

00:56:38,630 --> 00:56:36,240

come and here they are

1539

00:56:41,030 --> 00:56:38,640

indeed the crew 3 astronauts taking

1540

00:56:43,290 --> 00:56:41,040

their first steps outside before their

1541

00:56:46,470 --> 00:56:43,300

journey to space

1542

00:56:50,470 --> 00:56:48,390

all stations

1543

00:57:00,549 --> 00:56:50,480

countdown crew have walked out and are

1544

00:57:00,559 --> 00:57:05,770

we are four minutes

1545

00:57:15,430 --> 00:57:11,440

[Music]

1546

00:57:19,349 --> 00:57:17,510

so the suit techs had their umbrellas on

1547

00:57:27,349 --> 00:57:19,359

hand and ready yup you don't want to go

1548

00:57:30,630 --> 00:57:28,870

okay now each crew member is standing in

1549

00:57:34,950 --> 00:57:30,640

front of their family

1550

00:57:40,390 --> 00:57:37,670

keep it a safe distance yes

1551  
00:57:41,910 --> 00:57:40,400  
as required before they go yeah who's

1552  
00:57:49,349 --> 00:57:41,920  
been in quarantine and they remain in

1553  
00:57:54,789 --> 00:57:51,349  
there's laughter and we have a raving

1554  
00:57:54,799 --> 00:58:17,030  
right

1555  
00:58:21,910 --> 00:58:19,430  
what was this moment like for you sir

1556  
00:58:24,870 --> 00:58:21,920  
well it was a bit surreal because it was

1557  
00:58:26,870 --> 00:58:24,880  
a you know my turn to go to the launch

1558  
00:58:29,270 --> 00:58:26,880  
pad for real but it was really nice to

1559  
00:58:31,430 --> 00:58:29,280  
see my husband there and and and get to

1560  
00:58:33,670 --> 00:58:31,440  
greet him before i got on a rocket of

1561  
00:58:35,510 --> 00:58:33,680  
course he's an astronaut too so i've

1562  
00:58:36,950 --> 00:58:35,520  
been in the other position watching him

1563  
00:58:38,549 --> 00:58:36,960

launch into space

1564

00:58:40,150 --> 00:58:38,559

so you know the feeling on both sides i

1565

00:58:43,030 --> 00:58:40,160

do know the feeling on both sides former

1566

00:58:44,390 --> 00:58:43,040

nasa astronaut uh andy thomas yes andy

1567

00:58:47,270 --> 00:58:44,400

thomas

1568

00:58:49,589 --> 00:58:47,280

who um flew on space shuttle believed

1569

00:58:52,789 --> 00:58:49,599

the return to flight after he did he was

1570

00:58:54,870 --> 00:58:52,799

on sts-114 he flew into space four times

1571

00:58:58,710 --> 00:58:54,880

and actually spent four months on the

1572

00:59:03,190 --> 00:59:00,309

more waves more waves there to the

1573

00:59:06,950 --> 00:59:04,950

the way the doors are configured on

1574

00:59:08,150 --> 00:59:06,960

those teslas gives you

1575

00:59:09,349 --> 00:59:08,160

plenty of view

1576

00:59:11,510 --> 00:59:09,359

yes at least more important for the

1577

00:59:15,750 --> 00:59:11,520

astronaut and it makes it easier to get

1578

00:59:19,910 --> 00:59:17,670

oh they're shutting the doors so soon

1579

00:59:21,589 --> 00:59:19,920

they'll be heading off to the launch pad

1580

00:59:23,349 --> 00:59:21,599

and these seats are assigned these

1581

00:59:25,430 --> 00:59:23,359

astronauts knew exactly which car to go

1582

00:59:35,270 --> 00:59:25,440

to

1583

00:59:37,829 --> 00:59:35,280

marshburn are in the

1584

00:59:41,670 --> 00:59:37,839

uh the second car the second tesla

1585

00:59:42,950 --> 00:59:41,680

matthias maurer in the third tesla

1586

00:59:45,109 --> 00:59:42,960

and there's another moment now and the

1587

00:59:47,829 --> 00:59:45,119

families get to come around the car they

1588

00:59:49,510 --> 00:59:47,839

get to come a little bit closer for

1589

00:59:52,230 --> 00:59:49,520

one last uh moment with their crew

1590

00:59:56,630 --> 00:59:53,910

it didn't used to be this way

1591

00:59:58,710 --> 00:59:56,640

no this is actually a tradition that we

1592

01:00:00,390 --> 00:59:58,720

picked up from the russians and crews

1593

01:00:02,069 --> 01:00:00,400

launching on the soyuz

1594

01:00:04,870 --> 01:00:02,079

so the russians have a space where the

1595

01:00:06,470 --> 01:00:04,880

crew walks out getting ready to

1596

01:00:08,710 --> 01:00:06,480

go to actually to where they're going to

1597

01:00:11,430 --> 01:00:08,720

suit up and the families are there to

1598

01:00:13,829 --> 01:00:11,440

greet them before they head off

1599

01:00:15,990 --> 01:00:13,839

it was a great move to copy that i think

1600

01:00:17,349 --> 01:00:16,000

so here to the kennedy space center i

1601  
01:00:22,870 --> 01:00:17,359  
think so it really shows what an

1602  
01:00:27,270 --> 01:00:24,870  
now these astronauts are

1603  
01:00:29,670 --> 01:00:27,280  
about to take a 20-minute drive shannon

1604  
01:00:30,470 --> 01:00:29,680  
there's going to be a little rocking out

1605  
01:00:35,270 --> 01:00:30,480  
yes

1606  
01:00:36,870 --> 01:00:35,280  
get to pick a have a little playlist and

1607  
01:00:38,870 --> 01:00:36,880  
they will be cranking up the tunes as

1608  
01:00:41,430 --> 01:00:38,880  
they're heading out to the launch pad

1609  
01:00:42,549 --> 01:00:41,440  
so mentioning that playlist tom and raja

1610  
01:00:43,750 --> 01:00:42,559  
i'm going to tell you a couple of the

1611  
01:00:45,270 --> 01:00:43,760  
songs that we were sent that they're

1612  
01:00:48,390 --> 01:00:45,280  
going to be listening to

1613  
01:00:50,789 --> 01:00:48,400

welcome to the jungle by guns and roses

1614

01:00:53,270 --> 01:00:50,799

kickstart my heart by motley crue

1615

01:00:55,270 --> 01:00:53,280

and don't stop me now by queen

1616

01:00:57,510 --> 01:00:55,280

that is a great collection of music for

1617

01:00:58,630 --> 01:00:57,520

sure if that doesn't get you going i

1618

01:01:00,710 --> 01:00:58,640

think so

1619

01:01:02,230 --> 01:01:00,720

they will not be sleeping in that car

1620

01:01:04,230 --> 01:01:02,240

and it's interesting that the playlist

1621

01:01:05,750 --> 01:01:04,240

is actually 10 to 12 songs long i'm not

1622

01:01:07,510 --> 01:01:05,760

going to read them all but they've

1623

01:01:10,360 --> 01:01:07,520

actually sampled portions and there they

1624

01:01:13,510 --> 01:01:10,370

go

1625

01:01:15,589 --> 01:01:13,520

[Music]

1626  
01:01:17,109 --> 01:01:15,599  
when does the music start oh the music

1627  
01:01:18,470 --> 01:01:17,119  
starts immediately

1628  
01:01:20,150 --> 01:01:18,480  
yes

1629  
01:01:22,150 --> 01:01:20,160  
so as we can see the crew is departing

1630  
01:01:24,150 --> 01:01:22,160  
from the neil armstrong operations and

1631  
01:01:25,510 --> 01:01:24,160  
checkout building now beginning that 20

1632  
01:01:29,349 --> 01:01:25,520  
minutes

1633  
01:01:31,589 --> 01:01:29,359  
security escort crew are departing

1634  
01:01:36,710 --> 01:01:31,599  
the onc building on schedule at three

1635  
01:01:42,150 --> 01:01:39,190  
and we are back on time

1636  
01:01:43,990 --> 01:01:42,160  
that escort there a full security escort

1637  
01:01:45,990 --> 01:01:44,000  
across nasa's kennedy space center to

1638  
01:01:48,549 --> 01:01:46,000

that location right there

1639

01:01:50,230 --> 01:01:48,559

launch pad 39a

1640

01:01:51,990 --> 01:01:50,240

as we follow the convoy we'd like to

1641

01:01:54,069 --> 01:01:52,000

take a closer look at the crew 3

1642

01:01:56,630 --> 01:01:54,079

spacecraft commander riding in this

1643

01:01:59,750 --> 01:01:56,640

convoy we'll start with him he is nasa

1644

01:02:01,829 --> 01:01:59,760

astronaut raja chari

1645

01:02:03,270 --> 01:02:01,839

i'm raj achary the commander of the nasa

1646

01:02:05,750 --> 01:02:03,280

spacex crew 3 mission to the

1647

01:02:08,150 --> 01:02:05,760

international space station i was born

1648

01:02:10,549 --> 01:02:08,160

in milwaukee wisconsin but moved within

1649

01:02:11,990 --> 01:02:10,559

a week to cedar falls iowa my dad had

1650

01:02:13,589 --> 01:02:12,000

come to the united states to get his

1651

01:02:15,029 --> 01:02:13,599

master's degree where he met my mom he

1652

01:02:16,390 --> 01:02:15,039

got a job at john deere and that's why

1653

01:02:17,750 --> 01:02:16,400

they moved to iowa

1654

01:02:20,309 --> 01:02:17,760

one of the biggest things i took from my

1655

01:02:22,390 --> 01:02:20,319

iowa bringing is sort of that inherent

1656

01:02:24,309 --> 01:02:22,400

community strength and the interest

1657

01:02:27,589 --> 01:02:24,319

people had and everyone else succeeding

1658

01:02:29,589 --> 01:02:27,599

and having a tight-knit community

1659

01:02:31,750 --> 01:02:29,599

i think i first became interested in

1660

01:02:33,510 --> 01:02:31,760

flying at a pretty young age

1661

01:02:35,029 --> 01:02:33,520

my mom has pictures of me from back as a

1662

01:02:36,230 --> 01:02:35,039

kindergartner being really interested in

1663

01:02:38,069 --> 01:02:36,240

space flight

1664

01:02:39,910 --> 01:02:38,079

and i think as i got into junior high

1665

01:02:42,150 --> 01:02:39,920

the idea of going to the air force or

1666

01:02:43,190 --> 01:02:42,160

flying became very appealing to me as

1667

01:02:44,549 --> 01:02:43,200

well

1668

01:02:45,750 --> 01:02:44,559

and so astronomical engineering was a

1669

01:02:47,589 --> 01:02:45,760

great way to be involved in the

1670

01:02:49,349 --> 01:02:47,599

engineering for space

1671

01:02:51,190 --> 01:02:49,359

so at the air force academy there's all

1672

01:02:52,630 --> 01:02:51,200

kinds of different engineering paths you

1673

01:02:54,630 --> 01:02:52,640

have the opportunity to continue on and

1674

01:02:56,390 --> 01:02:54,640

do graduate school programs it allowed

1675

01:02:58,470 --> 01:02:56,400

me to go on and get a graduate degree at

1676

01:03:00,710 --> 01:02:58,480

mit and it was a wonderful opportunity

1677

01:03:02,549 --> 01:03:00,720

to take it to the next level one path

1678

01:03:03,750 --> 01:03:02,559

that is pilot trading in my life and

1679

01:03:05,670 --> 01:03:03,760

another path is to continue this

1680

01:03:07,270 --> 01:03:05,680

engineering i found i really liked

1681

01:03:09,190 --> 01:03:07,280

engineering a lot more than i

1682

01:03:10,710 --> 01:03:09,200

thought i would and then a friend of

1683

01:03:12,150 --> 01:03:10,720

mine had started talking about test pod

1684

01:03:13,670 --> 01:03:12,160

school in which i realized oh that's

1685

01:03:18,950 --> 01:03:13,680

actually a combination of both of these

1686

01:03:22,150 --> 01:03:21,029

so for me i think i first started

1687

01:03:24,549 --> 01:03:22,160

thinking about the idea of being an

1688

01:03:26,789 --> 01:03:24,559

astronaut was about the 2008 time frame

1689

01:03:28,950 --> 01:03:26,799

but it dawned on me that oh man this is

1690

01:03:30,950 --> 01:03:28,960

not just some weird like i want to be an

1691

01:03:32,470 --> 01:03:30,960

astronaut when i grow up it's actually

1692

01:03:32,990 --> 01:03:32,480

in the path that's realistically

1693

01:03:34,150 --> 01:03:33,000

achievable

1694

01:03:36,549 --> 01:03:34,160

[Applause]

1695

01:03:38,630 --> 01:03:36,559

so what do you say how about i introduce

1696

01:03:41,029 --> 01:03:38,640

the 2017

1697

01:03:43,029 --> 01:03:41,039

astronaut candidates

1698

01:03:45,109 --> 01:03:43,039

roger is a 39 year old lieutenant

1699

01:03:47,270 --> 01:03:45,119

colonel in the united states air force

1700

01:03:49,589 --> 01:03:47,280

from cedar falls iowa

1701  
01:03:52,069 --> 01:03:49,599  
and so that was how i wound up on the

1702  
01:03:53,829 --> 01:03:52,079  
path of applying

1703  
01:03:56,309 --> 01:03:53,839  
so on the spacex vehicle my job as a

1704  
01:03:58,549 --> 01:03:56,319  
commander is a few fold i don't need to

1705  
01:03:59,589 --> 01:03:58,559  
tell kayla tom or matias how to do their

1706  
01:04:01,270 --> 01:03:59,599  
jobs they already know how to do their

1707  
01:04:02,470 --> 01:04:01,280  
jobs that's really more a batter for

1708  
01:04:03,829 --> 01:04:02,480  
that one percent of the time where

1709  
01:04:05,670 --> 01:04:03,839  
something off nominal happened what is

1710  
01:04:07,190 --> 01:04:05,680  
the best split of resources of you know

1711  
01:04:08,710 --> 01:04:07,200  
what is the best interactions between

1712  
01:04:11,670 --> 01:04:08,720  
those players to get the best result and

1713  
01:04:13,670 --> 01:04:11,680

so managing those different uh pieces of

1714

01:04:16,710 --> 01:04:13,680

the puzzle is really i think what the

1715

01:04:18,150 --> 01:04:16,720

crew part of the commander job is

1716

01:04:20,630 --> 01:04:18,160

it's really mind-boggling when you think

1717

01:04:22,230 --> 01:04:20,640

about how much effort it takes to put

1718

01:04:23,190 --> 01:04:22,240

people in space and then to sustain them

1719

01:04:25,589 --> 01:04:23,200

in space

1720

01:04:27,510 --> 01:04:25,599

i think what's cool and why i like nasa

1721

01:04:29,029 --> 01:04:27,520

is none of those people are doing it for

1722

01:04:30,150 --> 01:04:29,039

the money

1723

01:04:31,270 --> 01:04:30,160

they're doing it because they believe in

1724

01:04:33,109 --> 01:04:31,280

the mission they're doing it please

1725

01:04:34,309 --> 01:04:33,119

because they believe in in solving

1726

01:04:35,589 --> 01:04:34,319

humanities problems and pushing

1727

01:04:37,430 --> 01:04:35,599

exploration that's the reason people are

1728

01:04:39,510 --> 01:04:37,440

doing it i think if anything it's taught

1729

01:04:41,109 --> 01:04:39,520

us that we as humans have this great

1730

01:04:42,630 --> 01:04:41,119

ability to endure through just about

1731

01:04:43,240 --> 01:04:42,640

anything just have to put your mind to

1732

01:04:51,109 --> 01:04:43,250

it

1733

01:04:56,150 --> 01:04:53,510

and riding alongside raj atari is crew

1734

01:04:58,069 --> 01:04:56,160

dragon pilot and nasa astronaut tom

1735

01:04:59,910 --> 01:04:58,079

marshburn the north carolina native is

1736

01:05:01,430 --> 01:04:59,920

about to embark on his third space

1737

01:05:03,349 --> 01:05:01,440

flight

1738

01:05:05,829 --> 01:05:03,359

my name is tom marshburn i'm the pilot

1739

01:05:07,910 --> 01:05:05,839

of nasa's spacex crew 3 mission to the

1740

01:05:10,069 --> 01:05:07,920

international space station not quite

1741

01:05:12,309 --> 01:05:10,079

sure why space flight grabbed me the way

1742

01:05:14,390 --> 01:05:12,319

it did it found me really

1743

01:05:15,990 --> 01:05:14,400

more than me deciding to become

1744

01:05:17,670 --> 01:05:16,000

fascinated with it

1745

01:05:20,069 --> 01:05:17,680

there's something about

1746

01:05:21,589 --> 01:05:20,079

leaving everything we know behind

1747

01:05:24,870 --> 01:05:21,599

everything not just our friends or

1748

01:05:26,789 --> 01:05:24,880

family or home but even the planet

1749

01:05:28,870 --> 01:05:26,799

going to places that we knew almost

1750

01:05:30,390 --> 01:05:28,880

nothing about at the time i was reading

1751

01:05:32,630 --> 01:05:30,400

about it

1752

01:05:35,029 --> 01:05:32,640

and understanding how somebody could

1753

01:05:37,190 --> 01:05:35,039

change so it was almost like going up

1754

01:05:39,589 --> 01:05:37,200

into heaven or something and coming back

1755

01:05:41,109 --> 01:05:39,599

that was just infinitely fascinating to

1756

01:05:43,990 --> 01:05:41,119

me

1757

01:05:45,589 --> 01:05:44,000

i have three brothers and three sisters

1758

01:05:47,510 --> 01:05:45,599

five of them that decided to become

1759

01:05:49,109 --> 01:05:47,520

doctors so the one thing i knew i was

1760

01:05:51,029 --> 01:05:49,119

never going to be was a doctor because i

1761

01:05:52,789 --> 01:05:51,039

didn't want to be just like them

1762

01:05:55,109 --> 01:05:52,799

but while i was in graduate school and

1763

01:05:56,390 --> 01:05:55,119

engineering physics i realized that

1764

01:05:58,230 --> 01:05:56,400

everybody i was hanging out with

1765

01:06:01,029 --> 01:05:58,240

everybody i enjoyed being with were

1766

01:06:03,190 --> 01:06:01,039

either medical students or doctors maybe

1767

01:06:06,069 --> 01:06:03,200

medicine something for me and turned out

1768

01:06:08,710 --> 01:06:06,079

i loved it got so immersed with it that

1769

01:06:11,190 --> 01:06:08,720

i actually forgot about space for a few

1770

01:06:13,109 --> 01:06:11,200

years i began to practice after that in

1771

01:06:14,549 --> 01:06:13,119

toledo ohio where they had a life flight

1772

01:06:16,470 --> 01:06:14,559

program and that's where i did my

1773

01:06:18,950 --> 01:06:16,480

residency for emergency medicine i

1774

01:06:20,630 --> 01:06:18,960

wanted to fly and so i applied for the

1775

01:06:23,910 --> 01:06:20,640

first class of what was then the space

1776

01:06:26,630 --> 01:06:23,920

medicine fellowship and in 93 it showed

1777

01:06:29,029 --> 01:06:26,640

up at nasa i was all starry-eyed excited

1778

01:06:31,349 --> 01:06:29,039

and ready to start learning about space

1779

01:06:32,630 --> 01:06:31,359

medicine i got to know the patients i

1780

01:06:34,230 --> 01:06:32,640

got to know the astronauts and the

1781

01:06:35,990 --> 01:06:34,240

pilots that i would be working with

1782

01:06:38,230 --> 01:06:36,000

later and that was enormous amount of

1783

01:06:39,910 --> 01:06:38,240

fun one of my first jobs then as a

1784

01:06:42,470 --> 01:06:39,920

flight surgeon was to get shipped out to

1785

01:06:44,470 --> 01:06:42,480

russia to support the phase one program

1786

01:06:46,549 --> 01:06:44,480

which is when we took nasa astronauts

1787

01:06:47,750 --> 01:06:46,559

put them on the mere space station

1788

01:06:49,510 --> 01:06:47,760

so that we could learn about

1789

01:06:51,029 --> 01:06:49,520

long-duration spaceflight before we

1790

01:06:53,109 --> 01:06:51,039

started sending astronauts to the

1791

01:06:54,390 --> 01:06:53,119

international space station

1792

01:06:55,910 --> 01:06:54,400

there's something about working at

1793

01:06:58,230 --> 01:06:55,920

johnson space center i think that if

1794

01:07:00,470 --> 01:06:58,240

anybody has ever considered flying in

1795

01:07:01,510 --> 01:07:00,480

space or wanting to when you show up and

1796

01:07:03,190 --> 01:07:01,520

you see

1797

01:07:05,589 --> 01:07:03,200

incredible things that everybody's doing

1798

01:07:09,109 --> 01:07:05,599

it's hard not to get the bug to want to

1799

01:07:14,950 --> 01:07:11,589

so i did three space walks and supported

1800

01:07:17,990 --> 01:07:14,960

a fourth as the inside crew member the

1801  
01:07:20,549 --> 01:07:18,000  
main goal for us was to take these

1802  
01:07:22,710 --> 01:07:20,559  
batteries each weighing about 200 250

1803  
01:07:24,309 --> 01:07:22,720  
pounds and move them from the robotic

1804  
01:07:25,829 --> 01:07:24,319  
arm that was holding them from the space

1805  
01:07:27,990 --> 01:07:25,839  
shuttle and move them onto the space

1806  
01:07:29,670 --> 01:07:28,000  
station this had not been done before so

1807  
01:07:31,430 --> 01:07:29,680  
they're very thrilling

1808  
01:07:32,710 --> 01:07:31,440  
the long duration mission is quite a bit

1809  
01:07:34,950 --> 01:07:32,720  
different from the shuttle mission you

1810  
01:07:38,549 --> 01:07:34,960  
really feel like you've become a

1811  
01:07:39,910 --> 01:07:38,559  
resident of space a resident of zero g

1812  
01:07:43,510 --> 01:07:39,920  
and you start to feel like you're

1813  
01:07:45,190 --> 01:07:43,520

getting an idea of how this works

1814

01:07:46,710 --> 01:07:45,200

i'm looking forward more to flying with

1815

01:07:48,789 --> 01:07:46,720

three people that haven't flown in space

1816

01:07:51,349 --> 01:07:48,799

before this is a very unique crew they

1817

01:07:52,549 --> 01:07:51,359

are incredibly operationally savvy

1818

01:07:55,589 --> 01:07:52,559

already

1819

01:07:57,589 --> 01:07:55,599

i imagine from their prior jobs at esa

1820

01:07:59,520 --> 01:07:57,599

and in the military i know they can do

1821

01:08:00,789 --> 01:07:59,530

the job there's no question about that

1822

01:08:02,549 --> 01:08:00,799

[Music]

1823

01:08:04,710 --> 01:08:02,559

one of the great legacies of the space

1824

01:08:06,870 --> 01:08:04,720

station is not just going to be

1825

01:08:09,829 --> 01:08:06,880

the science but very importantly the

1826

01:08:12,390 --> 01:08:09,839

international cooperation it's not for

1827

01:08:14,549 --> 01:08:12,400

survival it's not for competition in the

1828

01:08:16,950 --> 01:08:14,559

marketplace it is for

1829

01:08:18,390 --> 01:08:16,960

just exploration and it's just a vibrant

1830

01:08:27,749 --> 01:08:18,400

wonderful place

1831

01:08:32,870 --> 01:08:29,829

and there you see a live view of the

1832

01:08:35,430 --> 01:08:32,880

crew 3 astronauts making their way to

1833

01:08:37,030 --> 01:08:35,440

the launch pad here at the kennedy space

1834

01:08:39,829 --> 01:08:37,040

center in florida you're watching

1835

01:08:40,709 --> 01:08:39,839

coverage of the launch of crew 3

1836

01:08:42,709 --> 01:08:40,719

just

1837

01:08:44,149 --> 01:08:42,719

three hours and seven minutes away from

1838

01:08:46,950 --> 01:08:44,159

lifting off and

1839

01:08:48,550 --> 01:08:46,960

shannon you drove out at night just like

1840

01:08:49,510 --> 01:08:48,560

these astronauts you don't see a whole

1841

01:08:51,510 --> 01:08:49,520

lot

1842

01:08:53,349 --> 01:08:51,520

well we were still a little bit uh

1843

01:08:55,510 --> 01:08:53,359

daylight while we well i drove out

1844

01:08:57,430 --> 01:08:55,520

because we launched right after sunset

1845

01:08:58,870 --> 01:08:57,440

so i could see a few people on the side

1846

01:09:00,789 --> 01:08:58,880

of the road waving us on and cheering

1847

01:09:01,829 --> 01:09:00,799

for us it was pretty special i was just

1848

01:09:04,149 --> 01:09:01,839

going to say

1849

01:09:05,430 --> 01:09:04,159

there are folks outlining the road now

1850

01:09:07,030 --> 01:09:05,440

we may not see them because of the

1851

01:09:09,189 --> 01:09:07,040

darkness but uh

1852

01:09:11,430 --> 01:09:09,199

they're there to support yes absolutely

1853

01:09:14,149 --> 01:09:11,440

it's a great feeling

1854

01:09:16,229 --> 01:09:14,159

one thing you didn't miss as it drove by

1855

01:09:18,229 --> 01:09:16,239

was the vehicle assembly buildings

1856

01:09:19,990 --> 01:09:18,239

it's hard to miss it's hard to miss that

1857

01:09:21,669 --> 01:09:20,000

even in the the dim light that it's

1858

01:09:24,309 --> 01:09:21,679

currently uh

1859

01:09:26,149 --> 01:09:24,319

that's currently shining on it right now

1860

01:09:28,309 --> 01:09:26,159

but we are here in the middle of a

1861

01:09:29,590 --> 01:09:28,319

wildlife refuge and so

1862

01:09:31,030 --> 01:09:29,600

you're not going to see a lot of city

1863

01:09:34,390 --> 01:09:31,040

lights you're not going to see a lot of

1864

01:09:37,030 --> 01:09:34,400

infrastructure around that illuminates

1865

01:09:38,630 --> 01:09:37,040

but uh you can see the three tesla's

1866

01:09:40,630 --> 01:09:38,640

being led by a

1867

01:09:41,590 --> 01:09:40,640

kennedy security vehicle out there out

1868

01:09:47,430 --> 01:09:41,600

front

1869

01:09:51,749 --> 01:09:49,349

and they're getting ready to turn onto

1870

01:09:57,910 --> 01:09:51,759

the road that goes right in front

1871

01:10:01,669 --> 01:09:59,910

we've got our helicopter up

1872

01:10:05,030 --> 01:10:01,679

i do watching the action from above

1873

01:10:07,110 --> 01:10:05,040

that's good watching the convoy

1874

01:10:09,830 --> 01:10:07,120

as they go along

1875

01:10:12,470 --> 01:10:09,840

and as they drive by here shannon

1876

01:10:17,350 --> 01:10:12,480

two of our astronauts raj atari and

1877

01:10:19,189 --> 01:10:17,360

kayla baron are part of the artemis 18.

1878

01:10:21,430 --> 01:10:19,199

as they drive by the vab they're well

1879

01:10:23,510 --> 01:10:21,440

aware that there is a

1880

01:10:25,990 --> 01:10:23,520

a fully stacked

1881

01:10:29,590 --> 01:10:26,000

space launch system rocket that is going

1882

01:10:31,990 --> 01:10:29,600

to send an orion spacecraft on a test

1883

01:10:33,669 --> 01:10:32,000

flight to the moon that's right i know

1884

01:10:35,990 --> 01:10:33,679

they're aware of it they're probably not

1885

01:10:37,510 --> 01:10:36,000

thinking about that right now but uh

1886

01:10:39,270 --> 01:10:37,520

they know it's there and we are all

1887

01:10:41,910 --> 01:10:39,280

looking forward to its launch early next

1888

01:10:45,709 --> 01:10:41,920

year sometime in fact this camera angle

1889

01:10:48,709 --> 01:10:45,719

is from on top of the vab looking down

1890

01:10:49,669 --> 01:10:48,719

525 feet up it's a huge building

1891

01:10:51,510 --> 01:10:49,679

it is

1892

01:10:54,149 --> 01:10:51,520

one of the largest buildings in the

1893

01:10:56,630 --> 01:10:54,159

world by volume

1894

01:10:58,790 --> 01:10:56,640

and there you can see it passing by the

1895

01:11:00,390 --> 01:10:58,800

press side area yes we can see them off

1896

01:11:02,390 --> 01:11:00,400

to the right here

1897

01:11:06,950 --> 01:11:02,400

we can see them from our host desk

1898

01:11:11,350 --> 01:11:09,669

passing right by the vab on the way

1899

01:11:14,870 --> 01:11:11,360

to pad 39

1900

01:11:19,350 --> 01:11:17,189

now the crew convoy is approaching the

1901

01:11:22,709 --> 01:11:19,360

pad and entering what is known as the

1902

01:11:25,430 --> 01:11:22,719

blast danger area or bda

1903

01:11:27,430 --> 01:11:25,440

before any pad technicians engineers or

1904

01:11:29,590 --> 01:11:27,440

astronauts enter this area around the

1905

01:11:32,070 --> 01:11:29,600

launch pad the spacex and nasa teams

1906

01:11:34,390 --> 01:11:32,080

have conducted internal go and no-go

1907

01:11:36,709 --> 01:11:34,400

poles to make sure that the area

1908

01:11:39,030 --> 01:11:36,719

is safe to enter

1909

01:11:40,630 --> 01:11:39,040

and on that ride is mission specialist

1910

01:11:42,310 --> 01:11:40,640

kayla barron

1911

01:11:44,709 --> 01:11:42,320

riding along with matthias maurer she

1912

01:11:46,950 --> 01:11:44,719

has a unique background as a submarine

1913

01:11:49,110 --> 01:11:46,960

warfare officer she was a member of the

1914

01:11:51,590 --> 01:11:49,120

first class of women commissioned into

1915

01:11:54,390 --> 01:11:51,600

the submarine community and this is her

1916

01:11:56,390 --> 01:11:54,400

first trip to space

1917

01:11:58,709 --> 01:11:56,400

i'm kayla barron a mission specialist

1918

01:12:02,950 --> 01:11:58,719

for nasa's spacex crew 3 mission to the

1919

01:12:06,870 --> 01:12:05,030

i was born in idaho my family moved a

1920

01:12:09,590 --> 01:12:06,880

lot when we were kids we lived in

1921

01:12:12,630 --> 01:12:09,600

montana colorado but for most of my

1922

01:12:14,229 --> 01:12:12,640

middle school time and high school lived

1923

01:12:15,910 --> 01:12:14,239

in washington state

1924

01:12:18,229 --> 01:12:15,920

in a town called richland which is in

1925

01:12:19,830 --> 01:12:18,239

southeastern washington i'm the middle

1926

01:12:22,070 --> 01:12:19,840

of three girls

1927

01:12:24,390 --> 01:12:22,080

my dad's an engineer my mom's a math

1928

01:12:25,510 --> 01:12:24,400

whiz and a runner they always really

1929

01:12:28,630 --> 01:12:25,520

raised

1930

01:12:29,990 --> 01:12:28,640

us to be ourselves

1931

01:12:32,149 --> 01:12:30,000

which was really cool for me and my

1932

01:12:34,390 --> 01:12:32,159

sisters to all kind of find our own

1933

01:12:36,709 --> 01:12:34,400

paths

1934

01:12:39,590 --> 01:12:36,719

i knew that i would want to

1935

01:12:41,030 --> 01:12:39,600

find ways to challenge myself and become

1936

01:12:42,870 --> 01:12:41,040

a leader that's how i first got

1937

01:12:44,470 --> 01:12:42,880

interested in joining the military and

1938

01:12:46,149 --> 01:12:44,480

ultimately got interested in attending

1939

01:12:48,630 --> 01:12:46,159

the naval academy where i studied

1940

01:12:50,229 --> 01:12:48,640

control systems and robotics engineering

1941

01:12:51,669 --> 01:12:50,239

when i showed up at the naval academy i

1942

01:12:53,110 --> 01:12:51,679

thought i wanted to be a fighter pilot

1943

01:12:55,270 --> 01:12:53,120

and we have this really cool training

1944

01:12:57,030 --> 01:12:55,280

between our sophomore and junior year i

1945

01:12:59,030 --> 01:12:57,040

kind of think of it at like the navy's

1946

01:13:01,189 --> 01:12:59,040

job fair you go spend a week with every

1947

01:13:04,149 --> 01:13:01,199

single major warfare community surface

1948

01:13:05,910 --> 01:13:04,159

shifts submarines aviation and when i

1949

01:13:10,229 --> 01:13:05,920

got to go underway on a submarine i just

1950

01:13:14,630 --> 01:13:12,550

it's not for everyone

1951

01:13:16,390 --> 01:13:14,640

it's kind of a fascinating world you

1952

01:13:19,110 --> 01:13:16,400

develop your own little microcosm under

1953

01:13:21,510 --> 01:13:19,120

the sea because you have to be able to

1954

01:13:23,030 --> 01:13:21,520

provide everything you need to live and

1955

01:13:26,149 --> 01:13:23,040

work safely and also accomplish a

1956

01:13:27,910 --> 01:13:26,159

mission within your own crew

1957

01:13:29,990 --> 01:13:27,920

the time on my submarine was the most

1958

01:13:32,390 --> 01:13:30,000

developmental period of my life for a

1959

01:13:34,709 --> 01:13:32,400

lot of reasons but especially because of

1960

01:13:36,470 --> 01:13:34,719

the operational experience and

1961

01:13:40,870 --> 01:13:36,480

operational teamwork i got to do while

1962

01:13:44,790 --> 01:13:43,110

i actually never even thought about

1963

01:13:46,950 --> 01:13:44,800

becoming an astronaut until after

1964

01:13:49,750 --> 01:13:46,960

serving on a submarine for me it was all

1965

01:13:51,910 --> 01:13:49,760

those parallels that really inspired me

1966

01:13:53,910 --> 01:13:51,920

to want to apply and to believe that i

1967

01:13:57,440 --> 01:13:53,920

even could all right nasa family and

1968

01:14:00,790 --> 01:13:57,450

friends our first astronaut kayla baron

1969

01:14:03,189 --> 01:14:00,800

[Applause]

1970

01:14:05,189 --> 01:14:03,199

i found out that i was officially on

1971

01:14:07,110 --> 01:14:05,199

crew 3 when i was on my way to the

1972

01:14:09,270 --> 01:14:07,120

neutral buoyancy lab for spacewalk

1973

01:14:10,630 --> 01:14:09,280

training and i got a text from the chief

1974

01:14:12,310 --> 01:14:10,640

of the office and he said if you're

1975

01:14:14,550 --> 01:14:12,320

awake give me a call so i gave him a

1976

01:14:16,630 --> 01:14:14,560

call on my way into work and he said

1977

01:14:19,030 --> 01:14:16,640

kayla you're on crew three

1978

01:14:20,310 --> 01:14:19,040

and i was just so

1979

01:14:22,790 --> 01:14:20,320

excited

1980

01:14:24,630 --> 01:14:22,800

crew 3 is just such an amazing group of

1981

01:14:26,149 --> 01:14:24,640

people it's a really special crew

1982

01:14:28,390 --> 01:14:26,159

because i think everybody brings a

1983

01:14:30,070 --> 01:14:28,400

really unique perspective and different

1984

01:14:32,470 --> 01:14:30,080

background and so there's always

1985

01:14:34,390 --> 01:14:32,480

something to learn and whenever we're

1986

01:14:36,229 --> 01:14:34,400

faced with a problem or have a decision

1987

01:14:38,870 --> 01:14:36,239

to make it's really interesting to see

1988

01:14:41,430 --> 01:14:38,880

the different perspectives and how

1989

01:14:43,430 --> 01:14:41,440

together we make better decisions and

1990

01:14:46,070 --> 01:14:43,440

come up with more interesting solutions

1991

01:14:48,229 --> 01:14:46,080

i just feel super lucky to be

1992

01:14:50,790 --> 01:14:48,239

with people who all have such diverse

1993

01:14:52,070 --> 01:14:50,800

perspectives and experiences but have

1994

01:14:54,630 --> 01:14:52,080

really learned how to mesh and work

1995

01:14:56,950 --> 01:14:54,640

together as a team

1996

01:14:59,590 --> 01:14:56,960

i definitely would want to thank my

1997

01:15:00,870 --> 01:14:59,600

family for supporting me on this journey

1998

01:15:02,709 --> 01:15:00,880

they've always

1999

01:15:05,350 --> 01:15:02,719

been there for me and pushed me to chase

2000

01:15:07,270 --> 01:15:05,360

my dreams and been super supportive

2001

01:15:09,830 --> 01:15:07,280

every time i stumble or fall helping me

2002

01:15:11,669 --> 01:15:09,840

get back up and try again without them

2003

01:15:14,470 --> 01:15:11,679

you know to hold me accountable to push

2004

01:15:15,490 --> 01:15:14,480

me i definitely wouldn't be standing

2005

01:15:22,950 --> 01:15:15,500

here today

2006

01:15:28,709 --> 01:15:25,350

i love kayla's story yeah it's a

2007

01:15:30,950 --> 01:15:28,719

fantastic story yeah and uh you know

2008

01:15:33,270 --> 01:15:30,960

has a degree in nuclear engineering you

2009

01:15:34,950 --> 01:15:33,280

know and has served on the uss maine

2010

01:15:37,030 --> 01:15:34,960

impressive

2011

01:15:38,470 --> 01:15:37,040

um there is a shot of the pad the

2012

01:15:40,310 --> 01:15:38,480

astronauts are heading out there and

2013

01:15:42,550 --> 01:15:40,320

it's funny we we're we're talking about

2014

01:15:44,950 --> 01:15:42,560

kayla we're about to uh introduce a

2015

01:15:46,870 --> 01:15:44,960

piece with matthias or matthias rather

2016

01:15:48,709 --> 01:15:46,880

and those two are riding in a tesla

2017

01:15:50,870 --> 01:15:48,719

together you gotta check out their

2018

01:15:53,510 --> 01:15:50,880

playlist because it's a it's an eclectic

2019

01:15:55,110 --> 01:15:53,520

mix they're listening to lose yourself

2020

01:15:56,709 --> 01:15:55,120

by eminem

2021

01:15:59,350 --> 01:15:56,719

sun by

2022

01:16:00,470 --> 01:15:59,360

ramstein i hope i said that right german

2023

01:16:02,870 --> 01:16:00,480

band

2024

01:16:05,510 --> 01:16:02,880

thunder by imagine dragons and then

2025

01:16:08,470 --> 01:16:05,520

dream on the aerosmith cover by ronnie

2026

01:16:10,470 --> 01:16:08,480

james dio you imagine that is quite a

2027

01:16:13,189 --> 01:16:10,480

collection of music there

2028

01:16:15,350 --> 01:16:13,199

but it'll get them in the mood it will

2029

01:16:18,870 --> 01:16:15,360

it will and there they are driving up to

2030

01:16:21,270 --> 01:16:18,880

pad 39a shannon and they might have uh

2031

01:16:23,669 --> 01:16:21,280

spotted two rockets because

2032

01:16:26,390 --> 01:16:23,679

spacex actually has a second rocket up

2033

01:16:27,990 --> 01:16:26,400

on pad 40 for the starlink launch

2034

01:16:29,830 --> 01:16:28,000

there's a static fire tomorrow so as

2035

01:16:31,430 --> 01:16:29,840

they drive out there one rocket on the

2036

01:16:33,110 --> 01:16:31,440

left one rock on the right let's hope

2037

01:16:34,149 --> 01:16:33,120

they pick the right rocket to go too it

2038

01:16:36,229 --> 01:16:34,159

looks like they're headed the right

2039

01:16:37,030 --> 01:16:36,239

direction that's a good thing and here

2040

01:16:53,990 --> 01:16:37,040

comes

2041

01:16:57,510 --> 01:16:55,990

all stations core on countdown crew have

2042

01:16:59,990 --> 01:16:57,520

arrived at the pad five minutes ahead of

2043

01:17:04,229 --> 01:17:01,990

so they're going to pull the cars around

2044

01:17:08,149 --> 01:17:04,239

and park right at the base

2045

01:17:10,229 --> 01:17:08,159

of the uh the launch structure there

2046

01:17:11,830 --> 01:17:10,239

pull right up to the pad right up to the

2047

01:17:13,510 --> 01:17:11,840

pad

2048

01:17:16,149 --> 01:17:13,520

was it this close

2049

01:17:18,550 --> 01:17:16,159

for shuttle and apollo would you know in

2050

01:17:20,950 --> 01:17:18,560

terms of the vehicle uh getting

2051  
01:17:22,390 --> 01:17:20,960  
access there to the pad i believe it was

2052  
01:17:23,750 --> 01:17:22,400  
now i did not fly on the shuttle so i

2053  
01:17:26,390 --> 01:17:23,760  
can't tell you for sure but i believe

2054  
01:17:28,709 --> 01:17:26,400  
they did bring the bus that was carrying

2055  
01:17:30,630 --> 01:17:28,719  
the crew out there right up close to the

2056  
01:17:33,189 --> 01:17:30,640  
launch pad as well that's a great shot

2057  
01:17:35,830 --> 01:17:33,199  
uh as they make their way

2058  
01:17:38,790 --> 01:17:35,840  
the three vehicles

2059  
01:17:40,390 --> 01:17:38,800  
to the rocket to the rocket beautiful

2060  
01:17:42,229 --> 01:17:40,400  
now before the crew makes their way to

2061  
01:17:44,149 --> 01:17:42,239  
the elevator at the ground level of pad

2062  
01:17:46,229 --> 01:17:44,159  
39a let's get a look at mission

2063  
01:17:49,590 --> 01:17:46,239

specialist and esa astronaut matthias

2064

01:17:51,669 --> 01:17:49,600

maurer about him making his first flight

2065

01:17:53,590 --> 01:17:51,679

into orbit

2066

01:17:56,310 --> 01:17:53,600

i'm isa astronaut matthias mata i will

2067

01:17:57,990 --> 01:17:56,320

be mission specialist on the nasa spacex

2068

01:17:59,910 --> 01:17:58,000

crew 3 mission to the international

2069

01:18:01,669 --> 01:17:59,920

space station

2070

01:18:03,750 --> 01:18:01,679

i was born in germany i grew up there

2071

01:18:06,390 --> 01:18:03,760

and for the first 20 years i actually

2072

01:18:08,870 --> 01:18:06,400

stayed in the more or less the same area

2073

01:18:10,790 --> 01:18:08,880

i was an ambulance driver for almost two

2074

01:18:13,669 --> 01:18:10,800

years and i also financed my studies

2075

01:18:15,669 --> 01:18:13,679

later on by working on the weekend

2076

01:18:18,310 --> 01:18:15,679

i started two years in germany material

2077

01:18:19,990 --> 01:18:18,320

science then i went for here to the uk

2078

01:18:22,950 --> 01:18:20,000

studied their material science and

2079

01:18:25,350 --> 01:18:22,960

discovered how much you can learn

2080

01:18:27,270 --> 01:18:25,360

while being in a different country that

2081

01:18:29,189 --> 01:18:27,280

was a huge inspiration for me and i

2082

01:18:31,110 --> 01:18:29,199

decided to keep on learning more

2083

01:18:32,229 --> 01:18:31,120

languages and continue in different

2084

01:18:35,430 --> 01:18:32,239

countries

2085

01:18:37,350 --> 01:18:35,440

in 2008 isa started the call to for new

2086

01:18:40,229 --> 01:18:37,360

astronauts out of eight and a half

2087

01:18:41,910 --> 01:18:40,239

thousand applicants only 10 candidates

2088

01:18:44,149 --> 01:18:41,920

passed all the tests and were considered

2089

01:18:45,430 --> 01:18:44,159

suitable for astronauts i was one of

2090

01:18:47,910 --> 01:18:45,440

them

2091

01:18:49,910 --> 01:18:47,920

i was always fascinated by space and

2092

01:18:51,510 --> 01:18:49,920

what does an astronaut actually do so an

2093

01:18:54,550 --> 01:18:51,520

astronaut works with a lot of

2094

01:18:57,270 --> 01:18:54,560

engineering stuff we do science in space

2095

01:18:59,350 --> 01:18:57,280

we work in international teams and the

2096

01:19:00,950 --> 01:18:59,360

adventure that we are able to live as

2097

01:19:03,189 --> 01:19:00,960

astronauts in a combination of these

2098

01:19:05,669 --> 01:19:03,199

four facts engineering on the edge of

2099

01:19:07,590 --> 01:19:05,679

what is possible science

2100

01:19:10,870 --> 01:19:07,600

international teams and adventure that's

2101

01:19:13,350 --> 01:19:10,880

only possible as an astronaut

2102

01:19:16,310 --> 01:19:13,360

i think crew 3 is

2103

01:19:18,470 --> 01:19:16,320

a kind of a rookie crew with only one

2104

01:19:20,390 --> 01:19:18,480

experienced space flyer tom

2105

01:19:22,470 --> 01:19:20,400

but on the other hand i don't feel like

2106

01:19:25,110 --> 01:19:22,480

that we have rookies at all raja has a

2107

01:19:27,669 --> 01:19:25,120

huge background in flying kayla she has

2108

01:19:29,430 --> 01:19:27,679

a huge background in working in a very

2109

01:19:31,510 --> 01:19:29,440

difficult and highly technical

2110

01:19:33,990 --> 01:19:31,520

environment i don't consider both of

2111

01:19:36,950 --> 01:19:34,000

them rookies

2112

01:19:39,189 --> 01:19:36,960

i believe we are an extremely good team

2113

01:19:40,709 --> 01:19:39,199

and after a few days in space i think we

2114

01:19:42,630 --> 01:19:40,719

will be there and it will be our

2115

01:19:44,070 --> 01:19:42,640

environment

2116

01:19:45,910 --> 01:19:44,080

once we arrive on the international

2117

01:19:48,470 --> 01:19:45,920

space station we will run a lot of

2118

01:19:50,550 --> 01:19:48,480

experiments my focus will be lots of

2119

01:19:52,149 --> 01:19:50,560

experiments in the materials science

2120

01:19:54,310 --> 01:19:52,159

domain

2121

01:19:57,189 --> 01:19:54,320

the name of my mission is cosmic is it's

2122

01:20:00,550 --> 01:19:57,199

a declaration of life to space and

2123

01:20:03,510 --> 01:20:00,560

especially to the two only oasis that we

2124

01:20:05,750 --> 01:20:03,520

have in space our beautiful planet earth

2125

01:20:08,229 --> 01:20:05,760

in the international space station

2126  
01:20:11,189 --> 01:20:08,239  
the patch is inspired by guidance of

2127  
01:20:13,110 --> 01:20:11,199  
nebra it's a 4 000 year old disc that

2128  
01:20:17,110 --> 01:20:13,120  
was found in germany

2129  
01:20:18,709 --> 01:20:17,120  
and it shows to me that people already 4

2130  
01:20:20,310 --> 01:20:18,719  
000 years ago

2131  
01:20:23,189 --> 01:20:20,320  
watch the night sky and they're

2132  
01:20:25,590 --> 01:20:23,199  
fascinated with the universe and they

2133  
01:20:28,629 --> 01:20:25,600  
probably ask the same questions that we

2134  
01:20:30,790 --> 01:20:28,639  
ask ourselves how did the universe start

2135  
01:20:32,470 --> 01:20:30,800  
how did life come to our planet earth is

2136  
01:20:34,629 --> 01:20:32,480  
there life somewhere else in the

2137  
01:20:37,110 --> 01:20:34,639  
universe

2138  
01:20:40,950 --> 01:20:37,120

there's a huge number of people in

2139

01:20:43,189 --> 01:20:40,960

europe in the us in russia in canada in

2140

01:20:44,870 --> 01:20:43,199

japan all those people that contribute

2141

01:20:47,430 --> 01:20:44,880

that human space flight is actually

2142

01:20:50,310 --> 01:20:47,440

possible i want to say thank you to

2143

01:20:52,390 --> 01:20:50,320

everyone who helped me to arrive that

2144

01:20:55,750 --> 01:20:52,400

point that i'm today i would be thinking

2145

01:21:00,270 --> 01:20:55,760

of you when i fly to space and i send

2146

01:21:09,510 --> 01:21:00,280

all my life to you down on the ground

2147

01:21:12,470 --> 01:21:09,520

[Music]

2148

01:21:14,149 --> 01:21:12,480

great hearing from matthias maurer

2149

01:21:16,229 --> 01:21:14,159

especially is inspiring how he worked as

2150

01:21:18,070 --> 01:21:16,239

a paramedic to pay for his schooling on

2151  
01:21:19,750 --> 01:21:18,080  
the weekends such a diverse background

2152  
01:21:21,669 --> 01:21:19,760  
which is what we need is astronauts we

2153  
01:21:22,629 --> 01:21:21,679  
need people with all kinds of skills so

2154  
01:21:24,790 --> 01:21:22,639  
true

2155  
01:21:26,629 --> 01:21:24,800  
he calls it a rookie crew but you know

2156  
01:21:28,470 --> 01:21:26,639  
but they bring a lot of experience so

2157  
01:21:31,430 --> 01:21:28,480  
rookie and name only i think

2158  
01:21:33,830 --> 01:21:31,440  
we're looking live now at the base of

2159  
01:21:36,310 --> 01:21:33,840  
launch complex 39a the base of the

2160  
01:21:39,110 --> 01:21:36,320  
launch pad itself those elevators the

2161  
01:21:41,669 --> 01:21:39,120  
same elevators that took space shuttle

2162  
01:21:42,390 --> 01:21:41,679  
astronauts up to the top of the launch

2163  
01:21:44,070 --> 01:21:42,400

tower

2164

01:21:47,590 --> 01:21:44,080

and we're expecting an announcement any

2165

01:21:49,350 --> 01:21:47,600

moment now that the crew is on the pad

2166

01:21:52,149 --> 01:21:49,360

we'll see them walk

2167

01:21:53,590 --> 01:21:52,159

up to those elevators but oftentimes

2168

01:21:54,950 --> 01:21:53,600

it's interrupted

2169

01:21:57,110 --> 01:21:54,960

maybe it's planned

2170

01:21:59,110 --> 01:21:57,120

by a little look up at the rocket yes

2171

01:22:00,709 --> 01:21:59,120

the crews definitely want to take a one

2172

01:22:02,310 --> 01:22:00,719

last look at the rocket before they go

2173

01:22:04,149 --> 01:22:02,320

climb inside and so you will see them

2174

01:22:05,910 --> 01:22:04,159

sort of leaning back and looking up and

2175

01:22:07,750 --> 01:22:05,920

the reason they lean back is again you

2176  
01:22:09,669 --> 01:22:07,760  
don't have much maneuverability in those

2177  
01:22:12,070 --> 01:22:09,679  
suits when you're standing up

2178  
01:22:24,310 --> 01:22:12,080  
not a lot of maneuverability but a lot

2179  
01:22:29,110 --> 01:22:26,870  
as we look at the elevators there

2180  
01:22:29,990 --> 01:22:29,120  
there is a specific path that you must

2181  
01:22:31,910 --> 01:22:30,000  
take

2182  
01:22:35,270 --> 01:22:31,920  
to get to the rocket and you're looking

2183  
01:22:37,270 --> 01:22:35,280  
at uh some of the shots of inside the

2184  
01:22:40,229 --> 01:22:37,280  
launch tower and

2185  
01:22:42,470 --> 01:22:40,239  
shannon it's not a a kind of find your

2186  
01:22:44,229 --> 01:22:42,480  
way or even have anybody lead you you've

2187  
01:22:46,390 --> 01:22:44,239  
rehearsed this a number of times you do

2188  
01:22:48,149 --> 01:22:46,400

you do come out and and practice getting

2189

01:22:49,750 --> 01:22:48,159

your suits going out to the launch pad

2190

01:22:51,750 --> 01:22:49,760

so you know what uh

2191

01:22:52,709 --> 01:22:51,760

what is what needs to happen the day of

2192

01:22:54,229 --> 01:22:52,719

launch

2193

01:22:56,470 --> 01:22:54,239

and what are the white chevrons on the

2194

01:22:58,470 --> 01:22:56,480

floor that we see there those chevrons

2195

01:23:00,790 --> 01:22:58,480

are actually part of the safe safety

2196

01:23:02,550 --> 01:23:00,800

system that we have on the launch pad so

2197

01:23:04,790 --> 01:23:02,560

if anything should happen while the crew

2198

01:23:07,270 --> 01:23:04,800

is out there by themselves before they

2199

01:23:09,430 --> 01:23:07,280

lift off and they need to exit the

2200

01:23:11,510 --> 01:23:09,440

capsule quickly those chevrons will give

2201  
01:23:13,510 --> 01:23:11,520  
them the direction that they need to run

2202  
01:23:15,189 --> 01:23:13,520  
um or walk quickly we don't really want

2203  
01:23:17,189 --> 01:23:15,199  
them to run in their spacesuits and hurt

2204  
01:23:19,189 --> 01:23:17,199  
themselves but you know it could be it

2205  
01:23:20,629 --> 01:23:19,199  
could be dark it could be

2206  
01:23:23,189 --> 01:23:20,639  
you might have

2207  
01:23:24,629 --> 01:23:23,199  
fog rain smoke who knows so you just

2208  
01:23:26,709 --> 01:23:24,639  
need to make sure you are heading the

2209  
01:23:29,430 --> 01:23:26,719  
correct direction and they stand out

2210  
01:23:30,629 --> 01:23:29,440  
brightly against that black background

2211  
01:23:33,110 --> 01:23:30,639  
and there

2212  
01:23:35,990 --> 01:23:33,120  
is the dragon capsule

2213  
01:23:38,390 --> 01:23:36,000

won't be long until there's crew inside

2214

01:23:41,030 --> 01:23:38,400

it certainly won't and you can see the

2215

01:23:43,669 --> 01:23:41,040

uh the systems that are connected inside

2216

01:23:45,669 --> 01:23:43,679

um those are temporary until they get

2217

01:23:47,189 --> 01:23:45,679

them sealed up that's right so you've

2218

01:23:49,030 --> 01:23:47,199

got uh

2219

01:23:51,510 --> 01:23:49,040

that hose going in there is providing

2220

01:23:53,350 --> 01:23:51,520

some air circulation to keep everything

2221

01:23:55,910 --> 01:23:53,360

temperate for the crew and once they're

2222

01:23:57,669 --> 01:23:55,920

inside then the crew will hook up to the

2223

01:23:59,590 --> 01:23:57,679

systems of the dragon and they will get

2224

01:24:02,070 --> 01:23:59,600

air flowing through their suits very

2225

01:24:04,870 --> 01:24:02,080

good they pre-chill the engines with

2226

01:24:06,629 --> 01:24:04,880

fuel and they also pre-chill now i know

2227

01:24:08,950 --> 01:24:06,639

the capsule they pre-killed the castle

2228

01:24:10,470 --> 01:24:08,960

absolutely

2229

01:24:11,990 --> 01:24:10,480

it's called the white room that area

2230

01:24:14,790 --> 01:24:12,000

right there and there's a lot of history

2231

01:24:17,110 --> 01:24:14,800

behind that room as well yes that is uh

2232

01:24:18,629 --> 01:24:17,120

that is the room that um all the shuttle

2233

01:24:19,830 --> 01:24:18,639

astronauts were in before they stepped

2234

01:24:24,470 --> 01:24:19,840

into

2235

01:24:27,189 --> 01:24:24,480

we have the same white room uh in use

2236

01:24:28,629 --> 01:24:27,199

for the dragon flights

2237

01:24:31,110 --> 01:24:28,639

once again we're back at the base of the

2238

01:24:33,110 --> 01:24:31,120

launch pad with the elevators and we

2239

01:24:35,110 --> 01:24:33,120

should see the astronauts walking in at

2240

01:24:36,870 --> 01:24:35,120

any moment now

2241

01:24:38,550 --> 01:24:36,880

yes any moment what's interesting about

2242

01:24:40,870 --> 01:24:38,560

uh

2243

01:24:43,189 --> 01:24:40,880

the trip up for the dragon versus the

2244

01:24:45,030 --> 01:24:43,199

shuttle is the shuttle was actually the

2245

01:24:47,270 --> 01:24:45,040

ingress was a little bit lower down than

2246

01:24:49,350 --> 01:24:47,280

we have for the dragon so you'll see

2247

01:24:50,870 --> 01:24:49,360

after they step out of the elevators the

2248

01:24:52,550 --> 01:24:50,880

crew actually has to go up a flight of

2249

01:24:54,229 --> 01:24:52,560

stairs look i see one of the crew

2250

01:24:59,669 --> 01:24:54,239

members right there comes

2251  
01:25:05,189 --> 01:25:03,270  
and uh pilot tom marshburn yep and it

2252  
01:25:07,110 --> 01:25:05,199  
looks like they are going to take a look

2253  
01:25:10,149 --> 01:25:07,120  
at the rocket there they are bending

2254  
01:25:10,159 --> 01:25:17,750  
happy little chat as they look

2255  
01:25:22,070 --> 01:25:20,870  
at about two hours and 35 minutes

2256  
01:25:24,390 --> 01:25:22,080  
just a few minutes from now the

2257  
01:25:26,310 --> 01:25:24,400  
astronauts will ingress or climb into

2258  
01:25:28,629 --> 01:25:26,320  
dragon with the assistance of the suit

2259  
01:25:30,790 --> 01:25:28,639  
techs that you have seen right next to

2260  
01:25:34,950 --> 01:25:30,800  
them all along they'll help them get

2261  
01:25:38,950 --> 01:25:37,430  
getting a nice good gaze yes

2262  
01:25:40,390 --> 01:25:38,960  
good luck so

2263  
01:25:43,110 --> 01:25:40,400

now they're heading to the elevators for

2264

01:25:45,110 --> 01:25:43,120

their trip to the top

2265

01:25:47,830 --> 01:25:45,120

it is nightfall here at the kennedy

2266

01:25:50,390 --> 01:25:47,840

space center and we had clouds earlier

2267

01:25:52,950 --> 01:25:50,400

on it's a little harder to see

2268

01:25:55,270 --> 01:25:52,960

but the mist the misty rain that was

2269

01:25:57,110 --> 01:25:55,280

coming down earlier shannon and managed

2270

01:25:58,870 --> 01:25:57,120

to blow in here on the host desk a

2271

01:26:00,149 --> 01:25:58,880

little bit that stopped and that's a

2272

01:26:06,550 --> 01:26:00,159

good sign it is a good sign that the

2273

01:26:12,229 --> 01:26:08,870

they've made of course upgrades to pad

2274

01:26:14,550 --> 01:26:12,239

39a over the years in the 1960s of

2275

01:26:17,669 --> 01:26:14,560

course it launched the saturn 5 for the

2276

01:26:19,830 --> 01:26:17,679

apollo program it was then upgraded to

2277

01:26:23,629 --> 01:26:19,840

support the space shuttle

2278

01:26:25,350 --> 01:26:23,639

and then spacex took a lease of it in

2279

01:26:26,790 --> 01:26:25,360

2014

2280

01:26:29,910 --> 01:26:26,800

and the first flight after it was

2281

01:26:31,110 --> 01:26:29,920

reconfigured was a crs flight in

2282

01:26:33,510 --> 01:26:31,120

february of

2283

01:26:35,590 --> 01:26:33,520

2017.

2284

01:26:37,830 --> 01:26:35,600

yes and there they are

2285

01:26:40,229 --> 01:26:37,840

popping up from the elevator

2286

01:26:41,750 --> 01:26:40,239

having to look around

2287

01:26:43,830 --> 01:26:41,760

that's right and you'll see them head to

2288

01:26:45,750 --> 01:26:43,840

the stairs to go up one more level with

2289

01:26:48,390 --> 01:26:45,760

the suit techs and the team following

2290

01:26:50,550 --> 01:26:48,400

behind and exactly what you mentioned um

2291

01:26:52,629 --> 01:26:50,560

this is the additional uh flight that

2292

01:26:55,830 --> 01:26:52,639

they must take to get to the top of uh

2293

01:27:00,070 --> 01:26:58,149

and it looks like stephanie wilson is in

2294

01:27:02,310 --> 01:27:00,080

their group

2295

01:27:04,149 --> 01:27:02,320

yep she will be there with the crew just

2296

01:27:12,390 --> 01:27:04,159

as long as possible to aid them in any

2297

01:27:15,350 --> 01:27:13,189

the

2298

01:27:17,510 --> 01:27:15,360

mission specialists i understand now are

2299

01:27:19,430 --> 01:27:17,520

also in the elevator and headed on their

2300

01:27:21,990 --> 01:27:19,440

way up and in this particular view

2301  
01:27:25,830 --> 01:27:22,000  
shannon we know that there's a telephone

2302  
01:27:27,189 --> 01:27:25,840  
there to the right of the pathway

2303  
01:27:28,709 --> 01:27:27,199  
that's right so

2304  
01:27:30,229 --> 01:27:28,719  
when they're up at the top of the launch

2305  
01:27:33,189 --> 01:27:30,239  
pad the crew will actually get an

2306  
01:27:34,709 --> 01:27:33,199  
opportunity to call their families and

2307  
01:27:37,350 --> 01:27:34,719  
so someone's got the phone numbers

2308  
01:27:39,189 --> 01:27:37,360  
they'll be dialing for the crew and hand

2309  
01:27:40,709 --> 01:27:39,199  
the phone over

2310  
01:27:42,629 --> 01:27:40,719  
to the crew member and i have to say

2311  
01:27:44,629 --> 01:27:42,639  
it's a little bit hard to hear because

2312  
01:27:46,070 --> 01:27:44,639  
you've got that helmet around you so

2313  
01:27:47,750 --> 01:27:46,080

it's not like you get the phone right up

2314

01:27:49,430 --> 01:27:47,760

to your ear

2315

01:27:51,590 --> 01:27:49,440

and it's got big buttons you showed me a

2316

01:27:53,510 --> 01:27:51,600

picture on your phone i appreciate uh

2317

01:27:55,270 --> 01:27:53,520

you know maybe it's if for those who

2318

01:27:57,270 --> 01:27:55,280

have gloves on still manage to punch

2319

01:27:58,629 --> 01:27:57,280

them exactly we want to make sure those

2320

01:28:00,550 --> 01:27:58,639

phone calls happen

2321

01:28:03,669 --> 01:28:00,560

this is a split screen view that we just

2322

01:28:05,270 --> 01:28:03,679

saw as you see the mission specialist

2323

01:28:07,910 --> 01:28:05,280

kayla barron and

2324

01:28:09,590 --> 01:28:07,920

matthias maurer making his way up

2325

01:28:14,629 --> 01:28:09,600

the steps there and they are all

2326

01:28:16,709 --> 01:28:14,639

gathered now on that 255 foot level

2327

01:28:18,950 --> 01:28:16,719

of 39a

2328

01:28:20,550 --> 01:28:18,960

yes and so they're waiting uh either for

2329

01:28:21,910 --> 01:28:20,560

the phone calls or for their cue that

2330

01:28:23,830 --> 01:28:21,920

it's actually time to ingress the

2331

01:28:25,350 --> 01:28:23,840

capsule

2332

01:28:27,430 --> 01:28:25,360

and now that we're here at the launch

2333

01:28:29,270 --> 01:28:27,440

pad and at the top it's a good time to

2334

01:28:31,830 --> 01:28:29,280

introduce you to the team

2335

01:28:34,149 --> 01:28:31,840

that would lead a rescue operation in

2336

01:28:35,750 --> 01:28:34,159

the case of an emergency let's take a

2337

01:28:37,350 --> 01:28:35,760

look

2338

01:28:39,350 --> 01:28:37,360

safety is critical we're in the business

2339

01:28:41,350 --> 01:28:39,360

of launching people into space and it is

2340

01:28:42,790 --> 01:28:41,360

a dangerous job and we want to make sure

2341

01:28:44,229 --> 01:28:42,800

that the people who are going on the

2342

01:28:46,629 --> 01:28:44,239

rocket know that their lives are in good

2343

01:28:48,550 --> 01:28:46,639

hands my role is to make sure all ground

2344

01:28:50,310 --> 01:28:48,560

operations run smoothly

2345

01:28:52,310 --> 01:28:50,320

we take human space flight safety very

2346

01:28:53,910 --> 01:28:52,320

seriously and we are ready to jump in at

2347

01:28:56,310 --> 01:28:53,920

a moment's notice with the team of fire

2348

01:28:58,470 --> 01:28:56,320

rescue decontamination triage and

2349

01:29:00,470 --> 01:28:58,480

medevac forces ready to respond at a

2350

01:29:03,030 --> 01:29:00,480

moment's notice we're there as a

2351  
01:29:04,870 --> 01:29:03,040  
specially trained group of folks because

2352  
01:29:06,709 --> 01:29:04,880  
these people are inside the blast danger

2353  
01:29:08,550 --> 01:29:06,719  
area and it's called that because

2354  
01:29:09,669 --> 01:29:08,560  
they're operating next to a fully fueled

2355  
01:29:11,430 --> 01:29:09,679  
rocket

2356  
01:29:12,790 --> 01:29:11,440  
nasa prides itself on putting safety

2357  
01:29:14,709 --> 01:29:12,800  
first and foremost and we've got a great

2358  
01:29:16,229 --> 01:29:14,719  
record of that the fulfillment that

2359  
01:29:17,189 --> 01:29:16,239  
comes from seeing that rocket lift off

2360  
01:29:23,510 --> 01:29:17,199  
the pad

2361  
01:29:27,830 --> 01:29:25,189  
one of the really cool features of

2362  
01:29:29,430 --> 01:29:27,840  
dragon is that it can fly itself

2363  
01:29:31,669 --> 01:29:29,440

here's a look at the team responsible

2364

01:29:37,510 --> 01:29:31,679

for making that happen as well as a

2365

01:29:41,830 --> 01:29:39,350

the dragon software team is responsible

2366

01:29:43,990 --> 01:29:41,840

for all the code that lives on the

2367

01:29:46,149 --> 01:29:44,000

vehicle to be able to fly in an

2368

01:29:48,470 --> 01:29:46,159

autonomous way

2369

01:29:51,189 --> 01:29:48,480

autonomy in the vehicle basically means

2370

01:29:53,590 --> 01:29:51,199

that dragon can fly itself dragon is

2371

01:29:55,830 --> 01:29:53,600

able to take a set of inputs make a

2372

01:29:58,310 --> 01:29:55,840

decision and then output those things to

2373

01:30:00,709 --> 01:29:58,320

a particular system so we put a lot of

2374

01:30:03,590 --> 01:30:00,719

brains or a lot of code onto the dragon

2375

01:30:07,030 --> 01:30:03,600

capsule directly to be able to fly the

2376

01:30:08,550 --> 01:30:07,040

station and back

2377

01:30:10,790 --> 01:30:08,560

we're also responsible for all the

2378

01:30:12,149 --> 01:30:10,800

displays code so all the software that

2379

01:30:14,550 --> 01:30:12,159

lives on the displays and through

2380

01:30:16,070 --> 01:30:14,560

displays that the astronauts are using

2381

01:30:18,310 --> 01:30:16,080

there's a lot of information available

2382

01:30:20,950 --> 01:30:18,320

on the displays overall there are

2383

01:30:23,270 --> 01:30:20,960

overview plots of all the major systems

2384

01:30:25,750 --> 01:30:23,280

that fly on dragon so for example the

2385

01:30:27,669 --> 01:30:25,760

propulsion system the thermal systems

2386

01:30:29,590 --> 01:30:27,679

the life support systems the avionics

2387

01:30:31,189 --> 01:30:29,600

systems we provide block diagrams

2388

01:30:33,590 --> 01:30:31,199

available for the crew to be able to get

2389

01:30:36,310 --> 01:30:33,600

a general sense of awareness of each of

2390

01:30:38,870 --> 01:30:36,320

these systems their health their status

2391

01:30:40,629 --> 01:30:38,880

if they're any faults or failures so we

2392

01:30:42,149 --> 01:30:40,639

write all the code and then we also

2393

01:30:44,070 --> 01:30:42,159

validate it and test it to make sure

2394

01:30:49,270 --> 01:30:44,080

that it works in the ways that we expect

2395

01:30:52,310 --> 01:30:50,870

it's fascinating the effort that goes

2396

01:30:54,550 --> 01:30:52,320

into making that software and there's a

2397

01:30:56,870 --> 01:30:54,560

view inside the crew access arm raj

2398

01:30:59,189 --> 01:30:56,880

achary tom marshburn as they make their

2399

01:31:01,350 --> 01:30:59,199

way looking out the windows

2400

01:31:03,669 --> 01:31:01,360

towards their spacecraft

2401

01:31:05,669 --> 01:31:03,679

it's a great shot inside that uh that is

2402

01:31:07,669 --> 01:31:05,679

a great shot an access arm and there

2403

01:31:09,830 --> 01:31:07,679

they are approaching the end the capsule

2404

01:31:11,270 --> 01:31:09,840

is just off to the left right there's a

2405

01:31:12,390 --> 01:31:11,280

little tradition that happens inside

2406

01:31:14,709 --> 01:31:12,400

there

2407

01:31:15,510 --> 01:31:14,719

yes we will sign the wall of the white

2408

01:31:17,830 --> 01:31:15,520

room

2409

01:31:19,430 --> 01:31:17,840

got to make our mark

2410

01:31:20,790 --> 01:31:19,440

and they're starting to do that there

2411

01:31:25,910 --> 01:31:20,800

and getting a little guidance from one

2412

01:31:30,390 --> 01:31:28,470

all stations if you're just joining us

2413

01:31:31,990 --> 01:31:30,400

have arrived at the white room we are 10

2414

01:31:33,910 --> 01:31:32,000

minutes ahead of schedule

2415

01:31:36,070 --> 01:31:33,920

the announcement of arrival if you're

2416

01:31:38,310 --> 01:31:36,080

just joining us you are watching live

2417

01:31:39,750 --> 01:31:38,320

coverage of nasa's spacex mission known

2418

01:31:41,430 --> 01:31:39,760

as crew 3.

2419

01:31:43,350 --> 01:31:41,440

good evening and welcome to the kennedy

2420

01:31:45,750 --> 01:31:43,360

space center here in florida i'm daryl

2421

01:31:48,229 --> 01:31:45,760

nail along with a recent passenger

2422

01:31:49,990 --> 01:31:48,239

aboard a spacex crew dragon nasa

2423

01:31:52,550 --> 01:31:50,000

astronaut shannon walker thank you for

2424

01:31:54,070 --> 01:31:52,560

being here absolutely i am so excited to

2425

01:31:55,510 --> 01:31:54,080

be here tonight you've given us some

2426

01:31:57,110 --> 01:31:55,520

great insight

2427

01:31:58,470 --> 01:31:57,120

uh and not only that i get to watch a

2428

01:32:00,550 --> 01:31:58,480

launch with an astronaut which is pretty

2429

01:32:03,030 --> 01:32:00,560

cool i get to watch a launch too so it's

2430

01:32:04,310 --> 01:32:03,040

all good it's all working out

2431

01:32:06,390 --> 01:32:04,320

so we are watching the first two

2432

01:32:07,910 --> 01:32:06,400

astronauts uh get ready to board and

2433

01:32:10,070 --> 01:32:07,920

there's been some mist out there so we

2434

01:32:12,149 --> 01:32:10,080

got to dry off the helmets yes yes as i

2435

01:32:14,390 --> 01:32:12,159

said previously you don't want to have a

2436

01:32:17,189 --> 01:32:14,400

wetsuit when you get into the capsule so

2437

01:32:19,590 --> 01:32:17,199

the the suit tech there will make sure

2438

01:32:24,470 --> 01:32:19,600

that everything is just right before the

2439

01:32:28,229 --> 01:32:26,310

and it's a bit of a maneuver to get

2440

01:32:30,149 --> 01:32:28,239

inside shannon uh

2441

01:32:32,310 --> 01:32:30,159

that you practice and we're about to see

2442

01:32:35,110 --> 01:32:32,320

that yeah you'll see that the astronaut

2443

01:32:37,110 --> 01:32:35,120

has to carefully bend down and step over

2444

01:32:38,790 --> 01:32:37,120

the hatchway uh they do this for a

2445

01:32:39,910 --> 01:32:38,800

couple of reasons one

2446

01:32:41,910 --> 01:32:39,920

obviously you don't want to hit your

2447

01:32:44,790 --> 01:32:41,920

head on the capsule going inside you

2448

01:32:47,110 --> 01:32:44,800

don't want to hurt your uh helmet at all

2449

01:32:49,110 --> 01:32:47,120

and then two you don't want to nick the

2450

01:32:50,950 --> 01:32:49,120

seals on that hatchway because you need

2451

01:32:55,030 --> 01:32:50,960

those seals to work properly to maintain

2452

01:32:59,110 --> 01:32:57,350

and we just saw raja step inside and uh

2453

01:33:00,790 --> 01:32:59,120

next up is tom

2454

01:33:03,350 --> 01:33:00,800

and it's uh

2455

01:33:05,110 --> 01:33:03,360

they're carefully

2456

01:33:07,590 --> 01:33:05,120

placed inside i saw one of the texts you

2457

01:33:09,590 --> 01:33:07,600

know hold him up say well hold on right

2458

01:33:11,669 --> 01:33:09,600

right we do this uh just so the

2459

01:33:13,510 --> 01:33:11,679

choreography needs to be just right so

2460

01:33:15,990 --> 01:33:13,520

roger's getting settled inside he will

2461

01:33:17,590 --> 01:33:16,000

be followed by tom and then after that

2462

01:33:19,590 --> 01:33:17,600

you'll probably see the suit techs go

2463

01:33:22,470 --> 01:33:19,600

inside and start assisting we're gonna

2464

01:33:27,669 --> 01:33:22,480

be stretching out

2465

01:33:32,709 --> 01:33:29,430

and good evening raja i have you loud

2466

01:33:34,470 --> 01:33:32,719

and clear welcome to endurance

2467

01:33:37,750 --> 01:33:34,480

all right for now let's i've got you a

2468

01:33:39,990 --> 01:33:37,760

lot of clear as well

2469

01:33:42,229 --> 01:33:40,000

had a communication check there and

2470

01:33:45,030 --> 01:33:42,239

we'll watch tom

2471

01:33:46,070 --> 01:33:45,040

ingress to the dragon capsule

2472

01:33:48,149 --> 01:33:46,080

carefully

2473

01:33:53,510 --> 01:33:48,159

watch your head

2474

01:33:55,669 --> 01:33:53,520

as he goes inside and takes a seat right

2475

01:33:58,070 --> 01:33:55,679

next to the commander

2476

01:33:59,590 --> 01:33:58,080

raj achary

2477

01:34:01,510 --> 01:33:59,600

and for now let's check back in with

2478

01:34:03,189 --> 01:34:01,520

jesse and courtney back at spacex

2479

01:34:06,149 --> 01:34:03,199

headquarters in hawthorne california

2480

01:34:10,229 --> 01:34:07,990

thanks darrell right now we're watching

2481

01:34:13,430 --> 01:34:10,239

the crew ingressing dragon which is just

2482

01:34:15,590 --> 01:34:13,440

a space flight term for climbing aboard

2483

01:34:17,910 --> 01:34:15,600

ingress is what we use when crew members

2484

01:34:19,830 --> 01:34:17,920

are getting into a spacecraft or airlock

2485

01:34:21,990 --> 01:34:19,840

while egress means the opposite they're

2486

01:34:23,750 --> 01:34:22,000

exiting before climbing into the capsule

2487

01:34:26,390 --> 01:34:23,760

today the crew completed a foreign

2488

01:34:28,070 --> 01:34:26,400

objects debris check or fod check that

2489

01:34:30,229 --> 01:34:28,080

means they themselves have to be

2490

01:34:31,990 --> 01:34:30,239

inspected for any substance or debris

2491

01:34:33,750 --> 01:34:32,000

that isn't supposed to be on them or

2492

01:34:36,149 --> 01:34:33,760

their suits which could potentially

2493

01:34:38,470 --> 01:34:36,159

cause damage to dragon

2494

01:34:40,070 --> 01:34:38,480

to help protect against debris the crew

2495

01:34:42,229 --> 01:34:40,080

has covers on their boots as well as

2496

01:34:44,830 --> 01:34:42,239

their umbilical port on their suits that

2497

01:34:47,669 --> 01:34:44,840

need to be removed before they can

2498

01:34:50,550 --> 01:34:47,679

ingress as you can see on your screen

2499

01:34:54,390 --> 01:34:50,560

they are now uh

2500

01:34:56,870 --> 01:34:54,400

getting actually crossing the crew arm

2501

01:34:59,350 --> 01:34:56,880

right now and soon they will start

2502

01:35:01,830 --> 01:34:59,360

ingressing into the vehicle and then

2503

01:35:04,310 --> 01:35:01,840

start attaching um their umbilicals to

2504

01:35:06,870 --> 01:35:04,320

their suits from dragon and the suit

2505

01:35:09,510 --> 01:35:06,880

techs are there to help them

2506

01:35:10,629 --> 01:35:09,520

as needed along the way and what a great

2507

01:35:12,709 --> 01:35:10,639

shot of

2508

01:35:15,750 --> 01:35:12,719

a couple of our crew members crossing

2509

01:35:17,669 --> 01:35:15,760

the crew access arm waving hello

2510

01:35:19,350 --> 01:35:17,679

the umbilicals allow the crew to have

2511

01:35:21,669 --> 01:35:19,360

calms through their suit air to help

2512

01:35:23,990 --> 01:35:21,679

keep them cool as well as delivers

2513

01:35:26,070 --> 01:35:24,000

nitrox for the suit pressurization now

2514

01:35:27,750 --> 01:35:26,080

as we mentioned earlier in the broadcast

2515

01:35:29,910 --> 01:35:27,760

the suit's primary function is to

2516

01:35:32,470 --> 01:35:29,920

protect the crew in the event of a cabin

2517

01:35:33,830 --> 01:35:32,480

depressurization

2518

01:35:36,070 --> 01:35:33,840

yeah that's right and there are four

2519

01:35:38,550 --> 01:35:36,080

seats configured right now inside of

2520

01:35:40,870 --> 01:35:38,560

dragon and they are numbered one to four

2521

01:35:43,350 --> 01:35:40,880

from right to left when looking at the

2522

01:35:45,109 --> 01:35:43,360

seats raj achari will be in seat two or

2523

01:35:47,590 --> 01:35:45,119

the commander seat and tom marshburn

2524

01:35:50,070 --> 01:35:47,600

will be beside him in seat three which

2525

01:35:51,750 --> 01:35:50,080

for crew dragon is the pilot seat kayla

2526

01:35:54,310 --> 01:35:51,760

baron will be in seat one and matthias

2527

01:35:55,830 --> 01:35:54,320

mauer will be in seat four directly in

2528

01:35:57,750 --> 01:35:55,840

front of the crew members are three

2529

01:36:00,070 --> 01:35:57,760

displays which they'll use throughout

2530

01:36:02,550 --> 01:36:00,080

flight getting inside into dragon

2531

01:36:05,189 --> 01:36:02,560

systems seeing any alerts or issues with

2532

01:36:08,310 --> 01:36:05,199

the vehicle if and if required taking

2533

01:36:09,910 --> 01:36:08,320

control and manually flying dragon

2534

01:36:12,149 --> 01:36:09,920

now we're getting some great shots of

2535

01:36:15,350 --> 01:36:12,159

the crew members signing that white wall

2536

01:36:16,950 --> 01:36:15,360

room um and once they ingress uh and get

2537

01:36:19,270 --> 01:36:16,960

buckled in and strapped into their seats

2538

01:36:21,030 --> 01:36:19,280

they will do a comm check to make sure

2539

01:36:22,950 --> 01:36:21,040

that they can hear mission control and

2540

01:36:27,830 --> 01:36:22,960

then their seats will be rotated into

2541

01:36:31,270 --> 01:36:30,149

and the crew looks happy as ever as

2542

01:36:34,629 --> 01:36:31,280

they're running through some of these

2543

01:36:37,270 --> 01:36:34,639

final steps before climbing into dragon

2544

01:36:41,510 --> 01:36:37,280

again this is really their last stop on

2545

01:36:45,590 --> 01:36:43,109

looks like they're trying to

2546

01:36:49,030 --> 01:36:45,600

say hello to the camera there

2547

01:36:55,189 --> 01:36:51,350

again wiping off those helmets there was

2548

01:36:57,030 --> 01:36:55,199

a little bit of rain outside before they

2549

01:36:58,629 --> 01:36:57,040

entered the building so

2550

01:37:00,390 --> 01:36:58,639

they just have to make sure that their

2551  
01:37:01,750 --> 01:37:00,400  
suits are clean their helmets are clean

2552  
01:37:03,910 --> 01:37:01,760  
they also have a protective layer on

2553  
01:37:05,910 --> 01:37:03,920  
their boots that's taken off before they

2554  
01:37:07,669 --> 01:37:05,920  
get inside of dragon you can almost

2555  
01:37:08,709 --> 01:37:07,679  
think of it as if you just cleaned your

2556  
01:37:09,910 --> 01:37:08,719  
floors and you have something on your

2557  
01:37:11,189 --> 01:37:09,920  
shoes that you don't want to bring into

2558  
01:37:13,350 --> 01:37:11,199  
your house you would take those off at

2559  
01:37:14,310 --> 01:37:13,360  
the back door and that's basically some

2560  
01:37:16,149 --> 01:37:14,320  
of those steps that they're running

2561  
01:37:18,149 --> 01:37:16,159  
through right now

2562  
01:37:20,790 --> 01:37:18,159  
and as you mentioned courtney you

2563  
01:37:22,550 --> 01:37:20,800

mentioned fod foreign object debris even

2564

01:37:24,709 --> 01:37:22,560

water a foreign object debris is

2565

01:37:27,430 --> 01:37:24,719

basically anything that is not supposed

2566

01:37:30,709 --> 01:37:27,440

to be where we expect it to be and that

2567

01:37:32,310 --> 01:37:30,719

includes that water that rain um any of

2568

01:37:33,750 --> 01:37:32,320

the dirt if they were while they were

2569

01:37:35,350 --> 01:37:33,760

walking outside

2570

01:37:36,550 --> 01:37:35,360

so we want to make sure that we keep

2571

01:37:38,950 --> 01:37:36,560

that out

2572

01:37:41,270 --> 01:37:38,960

side of the dragon capsule and keep that

2573

01:37:49,189 --> 01:37:41,280

clean room environment inside of that

2574

01:37:49,199 --> 01:37:53,830

and tom great to hear your voice welcome

2575

01:37:59,830 --> 01:37:55,669

that's why i'm clear sarah good to hear

2576

01:38:03,270 --> 01:38:01,109

and we'll hear some of those informal

2577

01:38:05,590 --> 01:38:03,280

comm checks as they climb aboard dragon

2578

01:38:07,030 --> 01:38:05,600

and get hooked in to their umbilicals

2579

01:38:09,910 --> 01:38:07,040

and into their seats getting a view

2580

01:38:12,310 --> 01:38:09,920

right now inside of dragon

2581

01:38:17,910 --> 01:38:12,320

rashichari closest to us right now this

2582

01:38:22,390 --> 01:38:19,750

kayla i have you loud and clear great to

2583

01:38:25,910 --> 01:38:22,400

have you on board welcome

2584

01:38:28,310 --> 01:38:25,920

have you run clear as well thanks man

2585

01:38:30,149 --> 01:38:28,320

and again an informal comm check from

2586

01:38:31,830 --> 01:38:30,159

kayla baron mission specialist on this

2587

01:38:34,070 --> 01:38:31,840

mission and you just saw them already

2588

01:38:36,070 --> 01:38:34,080

getting working on those displays those

2589

01:38:37,990 --> 01:38:36,080

gloves that they have um have touch

2590

01:38:39,990 --> 01:38:38,000

screen capabilities so they're able to

2591

01:38:41,669 --> 01:38:40,000

just get into their seats and get right

2592

01:38:43,430 --> 01:38:41,679

to it

2593

01:38:45,270 --> 01:38:43,440

that must be pretty exciting as soon as

2594

01:38:47,030 --> 01:38:45,280

they got into their seats they started

2595

01:38:54,310 --> 01:38:47,040

to check it out and we can see matthias

2596

01:38:58,629 --> 01:38:57,030

and dragon is designed for up to seven

2597

01:39:00,550 --> 01:38:58,639

crew members but today we only have four

2598

01:39:03,910 --> 01:39:00,560

crew members so it is configured for the

2599

01:39:06,550 --> 01:39:03,920

four crew members on board crew 3 today

2600

01:39:09,430 --> 01:39:06,560

but underneath their seats is where uh

2601  
01:39:11,590 --> 01:39:09,440  
the extra three seats would be since we

2602  
01:39:13,830 --> 01:39:11,600  
don't have them we actually use that um

2603  
01:39:15,109 --> 01:39:13,840  
space underneath their seats for cargo

2604  
01:39:16,870 --> 01:39:15,119  
yeah and you'll actually get to see some

2605  
01:39:19,109 --> 01:39:16,880  
of that cargo once those seats get

2606  
01:39:20,790 --> 01:39:19,119  
rotated into launch position which is

2607  
01:39:22,070 --> 01:39:20,800  
one of those visual milestones that

2608  
01:39:24,229 --> 01:39:22,080  
we'll run through but right now we're

2609  
01:39:26,470 --> 01:39:24,239  
standing by for some official comm

2610  
01:39:28,470 --> 01:39:26,480  
checks from all of the crew we've

2611  
01:39:30,070 --> 01:39:28,480  
already heard some informal comm checks

2612  
01:39:31,910 --> 01:39:30,080  
the crew getting excited as they get

2613  
01:39:33,990 --> 01:39:31,920

into their seats get hooked up to their

2614

01:39:36,070 --> 01:39:34,000

umbilicals those umbilicals of course

2615

01:39:38,070 --> 01:39:36,080

providing air and calms through their

2616

01:39:43,669 --> 01:39:38,080

suits

2617

01:39:46,070 --> 01:39:43,679

astronaut from the gloves to the top the

2618

01:39:48,149 --> 01:39:46,080

bottom and the boots

2619

01:39:50,709 --> 01:39:48,159

yeah they are custom made and we always

2620

01:39:54,390 --> 01:39:50,719

say that it's basically an extension of

2621

01:39:55,350 --> 01:39:54,400

the dragon capsule um because of how

2622

01:39:57,109 --> 01:39:55,360

uh

2623

01:40:01,830 --> 01:39:57,119

basically

2624

01:40:08,790 --> 01:40:01,840

unit dragon

2625

01:40:13,510 --> 01:40:10,870

i have you loud and clear yes good on

2626

01:40:23,270 --> 01:40:15,990

wonderful sarah i also have you loud and

2627

01:40:27,830 --> 01:40:25,350

and another successful informal comm

2628

01:40:29,350 --> 01:40:27,840

check from matthias maurer

2629

01:40:33,430 --> 01:40:29,360

again all four

2630

01:40:36,070 --> 01:40:33,440

crew members of crew 3 now inside dragon

2631

01:40:38,390 --> 01:40:36,080

and you can see the suit techs are there

2632

01:40:40,149 --> 01:40:38,400

helping them get strapped in this is a

2633

01:40:43,830 --> 01:40:40,159

five-point harness

2634

01:40:47,990 --> 01:40:46,310

looks like raja chari and tom marshburn

2635

01:40:51,750 --> 01:40:48,000

are already buckled in

2636

01:40:53,350 --> 01:40:51,760

as matthias and kayla uh finish up

2637

01:40:56,229 --> 01:40:53,360

getting connected

2638

01:41:00,390 --> 01:40:56,239

to their umbilicals and get their

2639

01:41:04,470 --> 01:41:02,470

again the suit techs are following

2640

01:41:06,629 --> 01:41:04,480

procedures specific procedures to make

2641

01:41:07,910 --> 01:41:06,639

sure that they do check everything

2642

01:41:09,669 --> 01:41:07,920

um

2643

01:41:11,270 --> 01:41:09,679

and once they're all once the crew

2644

01:41:12,950 --> 01:41:11,280

members are all buckled in they'll also

2645

01:41:14,790 --> 01:41:12,960

check around the cabinet and make sure

2646

01:41:15,910 --> 01:41:14,800

that the cargo

2647

01:41:18,470 --> 01:41:15,920

is

2648

01:41:20,470 --> 01:41:18,480

packed away exactly how

2649

01:41:22,870 --> 01:41:20,480

they planned make sure that there are no

2650

01:41:24,709 --> 01:41:22,880

loose objects inside of the cabin and

2651  
01:41:28,070 --> 01:41:24,719  
finishing out their closeout procedures

2652  
01:41:29,270 --> 01:41:28,080  
before they close the hatch

2653  
01:41:31,590 --> 01:41:29,280  
one of the things we've mentioned

2654  
01:41:33,910 --> 01:41:31,600  
several times are those umbilicals that

2655  
01:41:35,990 --> 01:41:33,920  
they get hooked into once they're seated

2656  
01:41:37,590 --> 01:41:36,000  
those umbilicals allow the crew to

2657  
01:41:40,149 --> 01:41:37,600  
receive communications through their

2658  
01:41:42,550 --> 01:41:40,159  
suit they also provide air to help keep

2659  
01:41:44,149 --> 01:41:42,560  
them cool and comfortable as well as

2660  
01:41:46,310 --> 01:41:44,159  
delivering nitrox for suit

2661  
01:41:48,870 --> 01:41:46,320  
pressurization of course the suit's

2662  
01:41:50,709 --> 01:41:48,880  
primary function is to protect the crew

2663  
01:41:55,510 --> 01:41:50,719

in the unlikely event of a cabin

2664

01:41:59,350 --> 01:41:57,350

yeah that's right courtney so they'll

2665

01:42:00,629 --> 01:41:59,360

they'll keep these suits on all the way

2666

01:42:03,590 --> 01:42:00,639

through ascent

2667

01:42:04,870 --> 01:42:03,600

once they get out into orbit

2668

01:42:07,350 --> 01:42:04,880

as they cruise to the international

2669

01:42:09,910 --> 01:42:07,360

space station they'll be able to um

2670

01:42:11,510 --> 01:42:09,920

doff their suits or or get out of their

2671

01:42:13,030 --> 01:42:11,520

suits and get a little bit more

2672

01:42:17,189 --> 01:42:13,040

comfortable on the ride to the

2673

01:42:20,070 --> 01:42:18,709

so again we've run through some informal

2674

01:42:22,390 --> 01:42:20,080

comm checks there will be some more

2675

01:42:24,470 --> 01:42:22,400

formal com checks coming up they'll be

2676  
01:42:27,590 --> 01:42:24,480  
doing multiple com checks through multi

2677  
01:42:29,270 --> 01:42:27,600  
multiple paths to dragon they'll do thro

2678  
01:42:31,109 --> 01:42:29,280  
do some through tdrs and that's our

2679  
01:42:33,669 --> 01:42:31,119  
tracking data and realize

2680  
01:42:35,270 --> 01:42:33,679  
relay satellite system we use that for

2681  
01:42:37,590 --> 01:42:35,280  
communications with the international

2682  
01:42:39,510 --> 01:42:37,600  
space station as well they'll also do

2683  
01:42:41,030 --> 01:42:39,520  
some ground checks you'll hear the term

2684  
01:42:43,350 --> 01:42:41,040  
ground which refers to the ground

2685  
01:42:45,910 --> 01:42:43,360  
stations around the globe

2686  
01:42:48,149 --> 01:42:45,920  
allowing us to get communications to

2687  
01:42:50,790 --> 01:42:48,159  
dragon to the multiple

2688  
01:42:52,629 --> 01:42:50,800

ground stations again here in hawthorne

2689

01:42:54,870 --> 01:42:52,639

mission control hawthorne where jesse

2690

01:42:57,910 --> 01:42:54,880

and i are as well as mission control

2691

01:43:00,310 --> 01:42:57,920

houston being two of the main players

2692

01:43:02,149 --> 01:43:00,320

in the climb up hill

2693

01:43:03,750 --> 01:43:02,159

once those comm checks are completed

2694

01:43:06,470 --> 01:43:03,760

their seats will be rotated into

2695

01:43:08,070 --> 01:43:06,480

position for launch

2696

01:43:09,430 --> 01:43:08,080

yeah and it's getting pretty exciting

2697

01:43:11,430 --> 01:43:09,440

this is like one of the most exciting

2698

01:43:13,990 --> 01:43:11,440

parts when they start getting settled

2699

01:43:15,590 --> 01:43:14,000

into their seats in dragon starts really

2700

01:43:18,229 --> 01:43:15,600

getting real and they start doing those

2701

01:43:19,990 --> 01:43:18,239

closeout procedures to

2702

01:43:22,950 --> 01:43:20,000

close everything out inside of the

2703

01:43:24,390 --> 01:43:22,960

capsule and then close the hatch

2704

01:43:27,270 --> 01:43:24,400

and as courtney mentioned we are just

2705

01:43:29,109 --> 01:43:27,280

waiting for comm checks coming up next

2706

01:43:32,390 --> 01:43:29,119

and then following comm checks they will

2707

01:43:37,350 --> 01:43:32,400

do um seat rotation followed by

2708

01:43:41,109 --> 01:43:39,510

you can see tom marshburn and raj atari

2709

01:43:43,109 --> 01:43:41,119

really starting to work on those

2710

01:43:45,510 --> 01:43:43,119

displays above them but as we mentioned

2711

01:43:46,950 --> 01:43:45,520

once they do get rotated into launch

2712

01:43:48,709 --> 01:43:46,960

position they'll be able to see those

2713

01:43:50,470 --> 01:43:48,719

displays much easier

2714

01:43:52,870 --> 01:43:50,480

their arms will be able to reach them

2715

01:43:54,790 --> 01:43:52,880

much easier and like i mentioned before

2716

01:44:02,709 --> 01:43:54,800

they do have touch screen capabilities

2717

01:44:02,719 --> 01:44:19,510

information right now

2718

01:44:24,229 --> 01:44:21,590

so if you're just joining us the crew

2719

01:44:27,430 --> 01:44:24,239

already arrived at pad 39a they walked

2720

01:44:29,750 --> 01:44:27,440

down the crew access arm to where they

2721

01:44:31,590 --> 01:44:29,760

are now inside of dragon of course they

2722

01:44:33,990 --> 01:44:31,600

made that stop in the white room they

2723

01:44:35,990 --> 01:44:34,000

got to sign the wall before climbing in

2724

01:44:37,750 --> 01:44:36,000

they also did a fog check or foreign

2725

01:44:38,870 --> 01:44:37,760

objects debris check to make sure they

2726

01:44:41,590 --> 01:44:38,880

weren't bringing anything that could

2727

01:44:43,430 --> 01:44:41,600

potentially harm dragon or them on their

2728

01:44:45,430 --> 01:44:43,440

climb uphill to the international space

2729

01:44:48,709 --> 01:44:45,440

station getting views now inside of

2730

01:44:54,149 --> 01:44:51,189

commander tom commander raj achary

2731

01:44:56,070 --> 01:44:54,159

closest to us tom marshburn to the right

2732

01:45:05,189 --> 01:44:56,080

of him on your screen right now giving a

2733

01:45:10,709 --> 01:45:07,510

yep and everything is still on track

2734

01:45:13,030 --> 01:45:10,719

right now for an on-time launch today so

2735

01:45:14,950 --> 01:45:13,040

let's check in with john insbrucker for

2736

01:45:17,350 --> 01:45:14,960

the latest with the health of both of

2737

01:45:18,229 --> 01:45:17,360

the vehicles john what's the status so

2738

01:45:19,510 --> 01:45:18,239

far

2739

01:45:21,750 --> 01:45:19,520

well the good news courtney is

2740

01:45:23,750 --> 01:45:21,760

everything's looking good we've got just

2741

01:45:25,990 --> 01:45:23,760

over two and a half hours remaining in

2742

01:45:27,990 --> 01:45:26,000

the countdown until falcon 9 lifts off

2743

01:45:29,669 --> 01:45:28,000

with dragon and crew three aboard

2744

01:45:30,709 --> 01:45:29,679

heading for the international space

2745

01:45:32,709 --> 01:45:30,719

station

2746

01:45:34,390 --> 01:45:32,719

now the dragon launch ops team has

2747

01:45:35,669 --> 01:45:34,400

completed their major activities to

2748

01:45:37,750 --> 01:45:35,679

prepare the spacecraft for the

2749

01:45:39,910 --> 01:45:37,760

astronauts obviously now that we've got

2750

01:45:41,750 --> 01:45:39,920

the crew inside we've done checkouts of

2751  
01:45:44,070 --> 01:45:41,760  
the major systems including the escape

2752  
01:45:46,149 --> 01:45:44,080  
system we've got all four crew members

2753  
01:45:47,750 --> 01:45:46,159  
inside the capsule getting strapped down

2754  
01:45:49,830 --> 01:45:47,760  
getting ready for their comp checks

2755  
01:45:51,750 --> 01:45:49,840  
there are no issues in work right now on

2756  
01:45:53,350 --> 01:45:51,760  
the dragon spacecraft

2757  
01:45:54,790 --> 01:45:53,360  
on the next few minutes we should be

2758  
01:45:57,270 --> 01:45:54,800  
starting up the comp checks with the

2759  
01:45:59,990 --> 01:45:57,280  
crew and dragon we heard the informal

2760  
01:46:01,750 --> 01:46:00,000  
ones as each member got hooked up but

2761  
01:46:04,229 --> 01:46:01,760  
there are three sets of contracts that

2762  
01:46:06,709 --> 01:46:04,239  
get done as courtney mentioned the first

2763  
01:46:08,629 --> 01:46:06,719

one is the umbilical comp checks that's

2764

01:46:11,270 --> 01:46:08,639

essentially a hard line harness that's

2765

01:46:13,750 --> 01:46:11,280

attached from the ground up through the

2766

01:46:15,590 --> 01:46:13,760

launch tower into the dragon capsule

2767

01:46:17,430 --> 01:46:15,600

right to the spacesuits

2768

01:46:19,030 --> 01:46:17,440

one then we'll do a check with the

2769

01:46:20,950 --> 01:46:19,040

ground station

2770

01:46:23,590 --> 01:46:20,960

that's essentially where we bring up by

2771

01:46:25,270 --> 01:46:23,600

uh spacex ground station here on earth

2772

01:46:27,109 --> 01:46:25,280

and we talk to the crew through the

2773

01:46:29,990 --> 01:46:27,119

radio frequency link

2774

01:46:32,390 --> 01:46:30,000

and then lastly when we're on orbit we

2775

01:46:35,189 --> 01:46:32,400

will also use the nasa tracking and data

2776

01:46:37,030 --> 01:46:35,199

relay satellites called titrus that's a

2777

01:46:39,030 --> 01:46:37,040

constellation of 10 geosynchronous

2778

01:46:40,790 --> 01:46:39,040

satellites that allows us to be in

2779

01:46:42,709 --> 01:46:40,800

communication with dragon most of the

2780

01:46:45,350 --> 01:46:42,719

time when it's in orbit and especially

2781

01:46:47,350 --> 01:46:45,360

when we may not be over a ground station

2782

01:46:49,109 --> 01:46:47,360

so we're waiting to hear those call outs

2783

01:46:51,590 --> 01:46:49,119

right now in the dragon countdown

2784

01:46:53,350 --> 01:46:51,600

procedure and once they're complete then

2785

01:46:55,590 --> 01:46:53,360

we'll move on into the next step which

2786

01:46:57,510 --> 01:46:55,600

is essentially getting the crew

2787

01:46:59,109 --> 01:46:57,520

into launch configuration and backing

2788

01:47:01,669 --> 01:46:59,119

the ground support team out of the

2789

01:47:06,950 --> 01:47:04,310

now over on the falcon 9 side

2790

01:47:08,709 --> 01:47:06,960

the team is located in firing room 4 in

2791

01:47:09,669 --> 01:47:08,719

the launch control center at kennedy

2792

01:47:12,470 --> 01:47:09,679

space

2793

01:47:14,470 --> 01:47:12,480

they're settling in for their final

2794

01:47:15,590 --> 01:47:14,480

checkouts and propellant loading and

2795

01:47:17,830 --> 01:47:15,600

launch

2796

01:47:19,430 --> 01:47:17,840

now the falcon 9 team will also undergo

2797

01:47:21,910 --> 01:47:19,440

comp checks with the crew that happens

2798

01:47:24,149 --> 01:47:21,920

about t minus two hours when the various

2799

01:47:26,310 --> 01:47:24,159

responsible engineers who bring

2800

01:47:28,470 --> 01:47:26,320

information to the crew during ascent

2801  
01:47:30,870 --> 01:47:28,480  
the avionics engineer the guidance navi

2802  
01:47:32,310 --> 01:47:30,880  
control engineer the propulsion engineer

2803  
01:47:34,790 --> 01:47:32,320  
they all make sure that the crew can

2804  
01:47:38,310 --> 01:47:34,800  
hear them as they report the status of

2805  
01:47:40,229 --> 01:47:38,320  
falcon 9 as we head uphill into orbit

2806  
01:47:41,990 --> 01:47:40,239  
now currently on the range the third of

2807  
01:47:44,149 --> 01:47:42,000  
what we call the four factors to support

2808  
01:47:46,470 --> 01:47:44,159  
the launch spacecraft rocket and we've

2809  
01:47:48,470 --> 01:47:46,480  
got range they continue to report no

2810  
01:47:51,030 --> 01:47:48,480  
problems they're releasing the weather

2811  
01:47:52,790 --> 01:47:51,040  
balloons for us and we're gathering the

2812  
01:47:54,310 --> 01:47:52,800  
data as the balloons get up to altitude

2813  
01:47:55,109 --> 01:47:54,320

to let us know what the wind sure looks

2814

01:47:57,669 --> 01:47:55,119

like

2815

01:47:58,629 --> 01:47:57,679

good news is the weather the fourth

2816

01:48:00,870 --> 01:47:58,639

element

2817

01:48:03,910 --> 01:48:00,880

is looking good for launch we're still

2818

01:48:05,270 --> 01:48:03,920

showing a 30 probability of violation

2819

01:48:06,629 --> 01:48:05,280

but the

2820

01:48:08,070 --> 01:48:06,639

things haven't changed weather

2821

01:48:09,750 --> 01:48:08,080

forecaster still believes that the

2822

01:48:11,910 --> 01:48:09,760

weather will stay to the west of the

2823

01:48:13,109 --> 01:48:11,920

launch pad and will have good conditions

2824

01:48:14,950 --> 01:48:13,119

for launch

2825

01:48:17,669 --> 01:48:14,960

now we're looking at weather not only at

2826

01:48:20,470 --> 01:48:17,679

the launch site but around the world

2827

01:48:22,149 --> 01:48:20,480

we need to be able to get dragons safely

2828

01:48:23,830 --> 01:48:22,159

down if there's a splashdown in the

2829

01:48:26,229 --> 01:48:23,840

atlantic for example in the case of an

2830

01:48:28,629 --> 01:48:26,239

escape maneuver we're also monitoring

2831

01:48:30,390 --> 01:48:28,639

contingency splashdown locations if the

2832

01:48:32,790 --> 01:48:30,400

crew had to come back to earth before

2833

01:48:34,790 --> 01:48:32,800

docking with the space station

2834

01:48:36,870 --> 01:48:34,800

now if this were to happen spacex and

2835

01:48:38,790 --> 01:48:36,880

nasa as i mentioned earlier we are

2836

01:48:41,510 --> 01:48:38,800

coordinating with the u.s coast guard to

2837

01:48:43,990 --> 01:48:41,520

ensure crew safety upon splashdown that

2838

01:48:46,870 --> 01:48:44,000

includes extra ships and air assets to

2839

01:48:48,870 --> 01:48:46,880

patrol a 10 nautical mile keep out zone

2840

01:48:50,310 --> 01:48:48,880

this helps mitigate safety concerns for

2841

01:48:52,310 --> 01:48:50,320

any boaters who might be trying to

2842

01:48:54,310 --> 01:48:52,320

approach the landing area

2843

01:48:57,109 --> 01:48:54,320

the good news is the clock continues to

2844

01:49:00,390 --> 01:48:57,119

count down at t minus 2 hours 27 minutes

2845

01:49:01,910 --> 01:49:00,400

and 35 seconds all systems are go

2846

01:49:03,510 --> 01:49:01,920

we're going to head back over to jesse

2847

01:49:05,350 --> 01:49:03,520

and courtney here just across from me

2848

01:49:08,229 --> 01:49:05,360

and hawthorne as we wait for the

2849

01:49:10,790 --> 01:49:08,239

communication checks with the career 3

2850

01:49:16,870 --> 01:49:13,430

thanks john as john just mentioned we

2851  
01:49:18,950 --> 01:49:16,880  
are waiting for the formal comm checks

2852  
01:49:22,470 --> 01:49:18,960  
and in order to get to where we are

2853  
01:49:23,990 --> 01:49:22,480  
today it did take years of hard work the

2854  
01:49:26,709 --> 01:49:24,000  
development of crew dragon really

2855  
01:49:29,030 --> 01:49:26,719  
started with the cargo dragon dragon was

2856  
01:49:31,510 --> 01:49:29,040  
designed from the beginning for flying

2857  
01:49:32,950 --> 01:49:31,520  
humans to space so much so

2858  
01:49:36,470 --> 01:49:32,960  
that

2859  
01:49:39,030 --> 01:49:36,480  
even the first dragon cargo cargo dragon

2860  
01:49:41,030 --> 01:49:39,040  
had a window before we could fly humans

2861  
01:49:42,790 --> 01:49:41,040  
our teams implemented a number of design

2862  
01:49:44,709 --> 01:49:42,800  
upgrades to make sure that both dragon

2863  
01:49:47,030 --> 01:49:44,719

and falcon 9 are suitable for flying

2864

01:49:48,709 --> 01:49:47,040

people and then put both vehicles

2865

01:49:50,229 --> 01:49:48,719

through thousands of tests to prove

2866

01:49:53,189 --> 01:49:50,239

their safety

2867

01:49:55,350 --> 01:49:53,199

since demo 2 in may of 2020 spacex has

2868

01:49:57,669 --> 01:49:55,360

been regularly flying crude missions for

2869

01:49:59,510 --> 01:49:57,679

nasa at the cadence of about one flight

2870

01:50:01,669 --> 01:49:59,520

every six months

2871

01:50:03,669 --> 01:50:01,679

the today marks our fourth human space

2872

01:50:05,830 --> 01:50:03,679

flight mission for nasa and fifth

2873

01:50:07,910 --> 01:50:05,840

overall for those following along we

2874

01:50:10,790 --> 01:50:07,920

launched the first all-civilian mission

2875

01:50:12,709 --> 01:50:10,800

to space last month from this very same

2876

01:50:15,109 --> 01:50:12,719

launch pad

2877

01:50:17,830 --> 01:50:15,119

with inspiration for the four civilian

2878

01:50:19,430 --> 01:50:17,840

astronauts jared isaacman dr cyan

2879

01:50:22,070 --> 01:50:19,440

proctor haley arsenault and chris

2880

01:50:24,629 --> 01:50:22,080

sombroski marked the first time that no

2881

01:50:26,870 --> 01:50:24,639

one on board had a day job as an

2882

01:50:28,790 --> 01:50:26,880

astronaut the crew orbited the earth for

2883

01:50:30,950 --> 01:50:28,800

three days flying higher than the space

2884

01:50:32,310 --> 01:50:30,960

station and further than dragons ever

2885

01:50:34,550 --> 01:50:32,320

gone before

2886

01:50:36,709 --> 01:50:34,560

after three days taking in amazing views

2887

01:50:38,950 --> 01:50:36,719

of the earth conducting valuable science

2888

01:50:41,350 --> 01:50:38,960

to further human space exploration and

2889

01:50:44,149 --> 01:50:41,360

chatting with many earthlings below

2890

01:50:46,310 --> 01:50:44,159

on saturday september 18th the four

2891

01:50:48,629 --> 01:50:46,320

civilian astronauts safely splashed down

2892

01:50:51,109 --> 01:50:48,639

just off the coast of florida

2893

01:50:53,350 --> 01:50:51,119

inspiration four really was a historic

2894

01:50:55,750 --> 01:50:53,360

first and what's really exciting is it

2895

01:50:57,750 --> 01:50:55,760

certainly won't be the last of its kind

2896

01:50:59,669 --> 01:50:57,760

low earth orbit is an incredible space

2897

01:51:02,310 --> 01:50:59,679

for scientific research technology

2898

01:51:04,310 --> 01:51:02,320

development and astronaut training its

2899

01:51:05,910 --> 01:51:04,320

value has been proven through thousands

2900

01:51:08,790 --> 01:51:05,920

of experiments and decades of

2901  
01:51:10,470 --> 01:51:08,800  
international and commercial cooperation

2902  
01:51:12,070 --> 01:51:10,480  
nasa's efforts particularly with the

2903  
01:51:14,550 --> 01:51:12,080  
commercial crew program and the

2904  
01:51:17,430 --> 01:51:14,560  
certification of spacex dragon are

2905  
01:51:19,669 --> 01:51:17,440  
building the foundation for a robust u.s

2906  
01:51:20,390 --> 01:51:19,679  
led commercial economy in low earth

2907  
01:51:22,950 --> 01:51:20,400  
orbit

2908  
01:51:25,430 --> 01:51:22,960  
commercial transportation to space is

2909  
01:51:27,990 --> 01:51:25,440  
but one element of nasa's larger plan

2910  
01:51:30,229 --> 01:51:28,000  
for commercialization we're enabling the

2911  
01:51:31,750 --> 01:51:30,239  
development of commercial space stations

2912  
01:51:33,990 --> 01:51:31,760  
private astronaut missions to the

2913  
01:51:37,030 --> 01:51:34,000

station demand for in-space

2914

01:51:38,790 --> 01:51:37,040

manufacturing and more with u.s industry

2915

01:51:41,030 --> 01:51:38,800

leading the way in low earth orbit our

2916

01:51:42,310 --> 01:51:41,040

sites can focus even more on the moon

2917

01:51:44,390 --> 01:51:42,320

and mars

2918

01:51:46,229 --> 01:51:44,400

it's a fascinating time to be part of

2919

01:51:48,629 --> 01:51:46,239

the space industry and we have a lot of

2920

01:51:50,950 --> 01:51:48,639

work to do to meet those goals namely

2921

01:51:52,950 --> 01:51:50,960

aboard the international space station

2922

01:51:57,990 --> 01:51:52,960

and that work continues with today's

2923

01:52:02,470 --> 01:52:01,030

so again the the team inside of dragon

2924

01:52:04,709 --> 01:52:02,480

right now crew 3 has been running

2925

01:52:06,870 --> 01:52:04,719

through some of those final procedures

2926  
01:52:09,990 --> 01:52:06,880  
next up is our comms check we'll hear

2927  
01:52:11,270 --> 01:52:10,000  
those come over um on the live broadcast

2928  
01:52:12,629 --> 01:52:11,280  
right here you'll hear them as well

2929  
01:52:13,910 --> 01:52:12,639  
there will be several that the crew will

2930  
01:52:16,149 --> 01:52:13,920  
run through

2931  
01:52:19,270 --> 01:52:16,159  
right before we came back on we saw the

2932  
01:52:22,149 --> 01:52:19,280  
crew giving the the closeout team some

2933  
01:52:24,070 --> 01:52:22,159  
fist bumps and some high fives before

2934  
01:52:26,310 --> 01:52:24,080  
they departed

2935  
01:52:28,390 --> 01:52:26,320  
and went outside you can see them on

2936  
01:52:31,750 --> 01:52:28,400  
your screen right now strapped in ready

2937  
01:52:34,070 --> 01:52:31,760  
to go in their seats again up until this

2938  
01:52:35,430 --> 01:52:34,080

point uh they've been able to ingress

2939

01:52:37,830 --> 01:52:35,440

the vehicle get strapped into their

2940

01:52:39,510 --> 01:52:37,840

seats um and now they're ready for those

2941

01:52:41,470 --> 01:52:39,520

comm checks that we're waiting for they

2942

01:52:43,270 --> 01:52:41,480

did do

2943

01:52:44,390 --> 01:52:43,280

um

2944

01:52:49,669 --> 01:52:44,400

1.3

2945

01:53:01,350 --> 01:52:51,589

copy dragon standby for umbilical comp

2946

01:53:09,350 --> 01:53:04,629

seat one seat two seat three seat four

2947

01:53:15,189 --> 01:53:12,709

c1 has you loud and clear

2948

01:53:17,910 --> 01:53:15,199

c2 how's your mountain clerk

2949

01:53:24,950 --> 01:53:17,920

c3 as you're loud and clear

2950

01:53:28,629 --> 01:53:26,790

and core loud and clear as well

2951  
01:54:23,350 --> 01:53:28,639  
umbilical comp checks complete standby

2952  
01:54:23,360 --> 01:54:27,030  
dragon spacex come check

2953  
01:54:27,040 --> 01:54:31,109  
endurance actually

2954  
01:54:34,790 --> 01:54:32,790  
core loud and clear ground station come

2955  
01:55:37,510 --> 01:54:34,800  
check complete standby for tdrs com

2956  
01:55:37,520 --> 01:55:42,149  
dragon spacex come check

2957  
01:55:42,159 --> 01:55:45,990  
endurance how do you live

2958  
01:55:50,149 --> 01:55:47,589  
loud and clear teachers calm check

2959  
01:55:54,629 --> 01:55:50,159  
complete standby for com checks with md

2960  
01:55:54,639 --> 01:56:00,149  
dragon md on countdown 1 comcheck

2961  
01:56:04,790 --> 01:56:02,870  
mmd endurance has you unclear

2962  
01:56:09,270 --> 01:56:04,800  
md loud and clear stand by for com

2963  
01:56:09,280 --> 01:56:14,550

dragon md on dragon to ground calm check

2964

01:56:18,870 --> 01:56:17,350

md endurance on clear over dragon ground

2965

01:56:22,790 --> 01:56:18,880

md loud and clear stand by for com

2966

01:56:22,800 --> 01:56:28,229

dragon ld on countdown one comp check

2967

01:56:34,229 --> 01:56:29,750

ld endurance has to be mountain clearing

2968

01:56:42,550 --> 01:56:36,629

and endurance ld loud and clear standby

2969

01:56:48,390 --> 01:56:44,950

dragon ld on dragon the ground calm

2970

01:56:54,310 --> 01:56:49,910

lv endurance has be loud and clear

2971

01:56:54,320 --> 01:56:59,910

ld line clear

2972

01:57:04,229 --> 01:57:02,149

dragon spacex launch configuration come

2973

01:57:23,430 --> 01:57:04,239

checks complete report when ready for

2974

01:57:32,149 --> 01:57:25,109

and spacex endurance we are ready for

2975

01:57:57,270 --> 01:57:33,589

copy dragon we will report when

2976

01:58:01,830 --> 01:57:59,669

and there we just had it official comm

2977

01:58:04,310 --> 01:58:01,840

checks are now complete next up will be

2978

01:58:06,070 --> 01:58:04,320

seat rotation so in the meantime let's

2979

01:58:07,669 --> 01:58:06,080

go over to houston to check in on what's

2980

01:58:09,750 --> 01:58:07,679

been done on board the international

2981

01:58:16,790 --> 01:58:09,760

space station to prepare for crew 3's

2982

01:58:21,030 --> 01:58:19,350

thanks jesse as we said earlier the team

2983

01:58:23,030 --> 01:58:21,040

here in mission control houston is

2984

01:58:25,270 --> 01:58:23,040

actively controlling and monitoring the

2985

01:58:28,310 --> 01:58:25,280

space station as they await dragon's

2986

01:58:30,629 --> 01:58:28,320

arrival the expedition 66 crew is in

2987

01:58:32,830 --> 01:58:30,639

their sleep period for the day however

2988

01:58:35,350 --> 01:58:32,840

just a short time ago we did hear

2989

01:58:38,550 --> 01:58:35,360

confirmation initiating rotation shortly

2990

01:58:46,830 --> 01:58:38,560

with teams on the ground in order

2991

01:58:51,030 --> 01:58:49,350

copyright nasa astronaut mark vanda high

2992

01:58:53,430 --> 01:58:51,040

did work with teams on the ground in

2993

01:58:55,669 --> 01:58:53,440

order to get the broadcast streamed up

2994

01:58:58,149 --> 01:58:55,679

to the space station so he's going to

2995

01:59:00,470 --> 01:58:58,159

watch his soon-to-be crewmates

2996

01:59:02,149 --> 01:59:00,480

launch live as well the crew on board

2997

01:59:04,149 --> 01:59:02,159

have completed a number of other tasks

2998

01:59:06,790 --> 01:59:04,159

as well to prepare the station for crew

2999

01:59:08,709 --> 01:59:06,800

3's arrival nasa astronaut mark vande

3000

01:59:10,790 --> 01:59:08,719

high received some additional onboard

3001  
01:59:12,950 --> 01:59:10,800  
training for monitoring dragon during

3002  
01:59:14,629 --> 01:59:12,960  
its final approach which he'll do from

3003  
01:59:16,870 --> 01:59:14,639  
the station's cupola

3004  
01:59:18,870 --> 01:59:16,880  
in addition he will set up computers and

3005  
01:59:21,430 --> 01:59:18,880  
control panels needed for approach

3006  
01:59:23,910 --> 01:59:21,440  
monitoring and hatch operations and

3007  
01:59:25,910 --> 01:59:23,920  
pre-position emergency equipment

3008  
01:59:27,910 --> 01:59:25,920  
back here in houston our rotating flight

3009  
01:59:30,229 --> 01:59:27,920  
directors and their teams will be in

3010  
01:59:32,470 --> 01:59:30,239  
constant communication with the spacex

3011  
01:59:42,310 --> 01:59:32,480  
mission director for the duration of the

3012  
01:59:46,310 --> 01:59:44,390  
once we get to integrated operations the

3013  
01:59:48,550 --> 01:59:46,320

nasa flight director will be conducting

3014

01:59:50,550 --> 01:59:48,560

the series of go no-go polls at the

3015

01:59:52,629 --> 01:59:50,560

predetermined checkpoints for dragon's

3016

01:59:54,070 --> 01:59:52,639

approach for now we'll continue to

3017

01:59:56,310 --> 01:59:54,080

follow along from here in mission

3018

01:59:58,390 --> 01:59:56,320

control houston so i'll send it back

3019

01:59:59,270 --> 01:59:58,400

down to the team at kennedy over to you

3020

02:00:01,270 --> 01:59:59,280

daryl

3021

02:00:03,189 --> 02:00:01,280

all right thanks sandra and as you look

3022

02:00:06,229 --> 02:00:03,199

live inside the capsule you can see that

3023

02:00:08,310 --> 02:00:06,239

the seats have been rotated up

3024

02:00:09,990 --> 02:00:08,320

so that they can have clear visibility

3025

02:00:12,229 --> 02:00:10,000

of those monitors shannon that's right

3026  
02:00:14,229 --> 02:00:12,239  
you uh there's a rotation position where

3027  
02:00:15,910 --> 02:00:14,239  
the seats are where you get in and then

3028  
02:00:18,310 --> 02:00:15,920  
they rotate them in the position for

3029  
02:00:21,669 --> 02:00:18,320  
launch if you're just joining us it is t

3030  
02:00:24,070 --> 02:00:21,679  
minus two hours and 16 minutes until the

3031  
02:00:26,390 --> 02:00:24,080  
fourth astronaut launch for spacex and

3032  
02:00:28,070 --> 02:00:26,400  
nasa's commercial crew program

3033  
02:00:30,950 --> 02:00:28,080  
there you see in the foreground

3034  
02:00:33,430 --> 02:00:30,960  
commander raja chari next to him pilot

3035  
02:00:34,629 --> 02:00:33,440  
tom marshburn and to either side of

3036  
02:00:37,270 --> 02:00:34,639  
those two

3037  
02:00:39,270 --> 02:00:37,280  
are our mission specialists both kayla

3038  
02:00:41,430 --> 02:00:39,280

barron and matthias maurer are strapped

3039

02:00:43,669 --> 02:00:41,440

into their seats inside crew dragon

3040

02:00:45,350 --> 02:00:43,679

endurance the next milestones coming up

3041

02:00:46,870 --> 02:00:45,360

are seat rotation we've actually just

3042

02:00:50,470 --> 02:00:46,880

had that but the next one

3043

02:00:55,350 --> 02:00:53,510

and at this moment if we pop outside the

3044

02:00:57,109 --> 02:00:55,360

spacecraft it is interesting we have a

3045

02:00:59,669 --> 02:00:57,119

little rain shower we do have a little

3046

02:01:01,990 --> 02:00:59,679

rain shower uh joining us here hopefully

3047

02:01:03,830 --> 02:01:02,000

it will push on out and not interrupt

3048

02:01:06,229 --> 02:01:03,840

the launch sequence well you have

3049

02:01:07,910 --> 02:01:06,239

predicted correctly because i was just

3050

02:01:09,990 --> 02:01:07,920

texting with launch weather officer

3051

02:01:11,990 --> 02:01:10,000

brian sisik he tells me we're still

3052

02:01:13,830 --> 02:01:12,000

holding at 30 percent probability of

3053

02:01:16,149 --> 02:01:13,840

violation which means still 70 percent

3054

02:01:17,030 --> 02:01:16,159

that's where we stand but a rain shower

3055

02:01:18,629 --> 02:01:17,040

has

3056

02:01:20,310 --> 02:01:18,639

pushed through it's a light shower it is

3057

02:01:22,709 --> 02:01:20,320

a light shower and they're hoping that

3058

02:01:25,109 --> 02:01:22,719

that will uh clear out

3059

02:01:27,270 --> 02:01:25,119

behind that and give us that clear

3060

02:01:28,870 --> 02:01:27,280

weather to launch but indeed

3061

02:01:31,030 --> 02:01:28,880

we've got rain coming down at the launch

3062

02:01:34,470 --> 02:01:31,040

pad and right here at the host dash yes

3063

02:01:38,390 --> 02:01:36,550

while we wait for the hatch closure

3064

02:01:39,270 --> 02:01:38,400

let's take a minute now to learn more

3065

02:01:41,910 --> 02:01:39,280

about

3066

02:01:44,950 --> 02:01:41,920

what crew 3 astronauts will be doing

3067

02:01:47,270 --> 02:01:44,960

after they arrive on station

3068

02:01:50,709 --> 02:01:47,280

[Music]

3069

02:01:52,629 --> 02:01:50,719

i'm kayla barron a mission specialist

3070

02:01:55,109 --> 02:01:52,639

hi i'm isa astronaut matthias mata i

3071

02:01:58,709 --> 02:01:55,119

will be mission specialist

3072

02:02:00,709 --> 02:01:58,719

my name is tom marshburn i'm the pilot

3073

02:02:02,229 --> 02:02:00,719

i'm raj achary the commander of the nasa

3074

02:02:15,460 --> 02:02:02,239

spacex crew 3 mission to the

3075

02:02:19,510 --> 02:02:17,270

[Music]

3076

02:02:22,070 --> 02:02:19,520

so the crew 3 mission is on the nasa

3077

02:02:24,229 --> 02:02:22,080

spacex commercial space vehicle

3078

02:02:25,910 --> 02:02:24,239

to the international space station we

3079

02:02:28,149 --> 02:02:25,920

will be working on the international

3080

02:02:29,990 --> 02:02:28,159

space station for around six months

3081

02:02:33,109 --> 02:02:30,000

doing lots of experiments lots of

3082

02:02:35,750 --> 02:02:33,119

science and crew dragon is one of our

3083

02:02:37,510 --> 02:02:35,760

newest ways to get there um there have

3084

02:02:39,430 --> 02:02:37,520

been soyuz that have flown to the

3085

02:02:40,629 --> 02:02:39,440

international space station with crew

3086

02:02:42,550 --> 02:02:40,639

the space shuttle flew to the

3087

02:02:44,709 --> 02:02:42,560

international space station and now the

3088

02:02:46,310 --> 02:02:44,719

crew dragon is taking human beings to

3089

02:02:48,149 --> 02:02:46,320

the international space station so we've

3090

02:02:49,350 --> 02:02:48,159

partnered with spacex in the commercial

3091

02:02:51,030 --> 02:02:49,360

crew program

3092

02:02:53,589 --> 02:02:51,040

they design build and operate these

3093

02:02:55,270 --> 02:02:53,599

vehicles that take us transport us to

3094

02:02:56,790 --> 02:02:55,280

the international space station so that

3095

02:02:58,550 --> 02:02:56,800

we can contribute to the amazing work

3096

02:03:00,310 --> 02:02:58,560

that we're doing up there

3097

02:03:02,870 --> 02:03:00,320

yeah you know it's it's exciting to fly

3098

02:03:05,189 --> 02:03:02,880

on a new spaceship for sure and uh newly

3099

02:03:06,870 --> 02:03:05,199

designed a new design of a spaceship but

3100

02:03:08,629 --> 02:03:06,880

i'm looking forward more to flying with

3101  
02:03:09,589 --> 02:03:08,639  
three people that haven't flown in space

3102  
02:03:11,510 --> 02:03:09,599  
before

3103  
02:03:14,709 --> 02:03:11,520  
this is a very unique crew they are

3104  
02:03:17,189 --> 02:03:14,719  
incredibly operationally savvy already

3105  
02:03:18,709 --> 02:03:17,199  
so what i try to do is if there's any

3106  
02:03:19,990 --> 02:03:18,719  
gaps in their knowledge of how they're

3107  
02:03:22,149 --> 02:03:20,000  
going to feel how they're going to

3108  
02:03:25,030 --> 02:03:22,159  
operate what is the zero gravity going

3109  
02:03:29,270 --> 02:03:25,040  
to be like how that might challenge our

3110  
02:03:31,750 --> 02:03:29,280  
expectations for what we can get done

3111  
02:03:35,430 --> 02:03:31,760  
so you really feel like you've become a

3112  
02:03:36,870 --> 02:03:35,440  
resident of space a resident of zero g

3113  
02:03:39,430 --> 02:03:36,880

and you start to feel like you're

3114

02:03:42,070 --> 02:03:39,440

getting an idea of how this works

3115

02:03:43,189 --> 02:03:42,080

every day is a long series of problem

3116

02:03:45,030 --> 02:03:43,199

solving you got to figure out where to

3117

02:03:47,430 --> 02:03:45,040

put your pencil where to put your drink

3118

02:03:49,109 --> 02:03:47,440

if you have it so maybe 10 000 times a

3119

02:03:51,750 --> 02:03:49,119

day you're solving little problems like

3120

02:03:52,870 --> 02:03:51,760

this and when that becomes fluid then

3121

02:03:54,629 --> 02:03:52,880

you really feel like you can be

3122

02:03:56,390 --> 02:03:54,639

efficient and

3123

02:03:58,390 --> 02:03:56,400

get a lot of work done and there's a lot

3124

02:03:59,350 --> 02:03:58,400

of work to get done on the space station

3125

02:04:00,709 --> 02:03:59,360

right now

3126

02:04:02,390 --> 02:04:00,719

we spend a lot of our time training in

3127

02:04:04,790 --> 02:04:02,400

dragon because that's a really dynamic

3128

02:04:06,950 --> 02:04:04,800

phase of the mission but it's just such

3129

02:04:09,109 --> 02:04:06,960

a tiny fraction the whole point is going

3130

02:04:11,109 --> 02:04:09,119

to the space station and doing some

3131

02:04:13,430 --> 02:04:11,119

incredible work up there so our time on

3132

02:04:15,189 --> 02:04:13,440

the space station is spent one keeping

3133

02:04:16,709 --> 02:04:15,199

the space station healthy

3134

02:04:18,550 --> 02:04:16,719

it's been up there for 20 years there's

3135

02:04:19,830 --> 02:04:18,560

a lot of systems that need maintenance

3136

02:04:21,669 --> 02:04:19,840

and upgrades

3137

02:04:23,510 --> 02:04:21,679

and operators there to keep them working

3138

02:04:24,470 --> 02:04:23,520

well but we also do some incredible

3139

02:04:25,990 --> 02:04:24,480

science

3140

02:04:27,830 --> 02:04:26,000

the space station is a national

3141

02:04:30,470 --> 02:04:27,840

laboratory orbiting around the earth and

3142

02:04:31,910 --> 02:04:30,480

it's a really really unique environment

3143

02:04:33,750 --> 02:04:31,920

once we arrive on the international

3144

02:04:36,229 --> 02:04:33,760

space station we will run a lot of

3145

02:04:38,950 --> 02:04:36,239

experiments i'm a material science

3146

02:04:40,950 --> 02:04:38,960

engineer and so my focus will be lots of

3147

02:04:43,430 --> 02:04:40,960

experiments in the materials science

3148

02:04:44,709 --> 02:04:43,440

domain but also life sciences will be

3149

02:04:46,470 --> 02:04:44,719

very important

3150

02:04:48,229 --> 02:04:46,480

there's all kinds of research going on

3151

02:04:49,669 --> 02:04:48,239

on a daily basis that lead to just

3152

02:04:51,510 --> 02:04:49,679

fundamental changes in the way we

3153

02:04:53,910 --> 02:04:51,520

understand how our world works i will

3154

02:04:55,350 --> 02:04:53,920

definitely be the eyes ears hands and

3155

02:04:57,510 --> 02:04:55,360

the actuator for the experiments that

3156

02:04:59,990 --> 02:04:57,520

help lead to the science the discoveries

3157

02:05:02,069 --> 02:05:00,000

that can push our species further both

3158

02:05:04,390 --> 02:05:02,079

beyond the planet and just understand

3159

02:05:06,229 --> 02:05:04,400

and operate on our earth even better

3160

02:05:08,310 --> 02:05:06,239

one of the great legacies of the space

3161

02:05:09,510 --> 02:05:08,320

station is not just going to be

3162

02:05:11,189 --> 02:05:09,520

the science

3163

02:05:14,069 --> 02:05:11,199

but very importantly the international

3164

02:05:16,310 --> 02:05:14,079

cooperation this is one of the first

3165

02:05:17,910 --> 02:05:16,320

certainly today's perhaps most prominent

3166

02:05:20,629 --> 02:05:17,920

international cooperation for

3167

02:05:22,950 --> 02:05:20,639

exploration it's not for survival it's

3168

02:05:26,229 --> 02:05:22,960

not for competition in the marketplace

3169

02:05:29,189 --> 02:05:26,239

it is for just exploration i think we're

3170

02:05:31,589 --> 02:05:29,199

now about to enter a new era of human

3171

02:05:33,350 --> 02:05:31,599

space flight in the past the astronaut

3172

02:05:36,149 --> 02:05:33,360

flew to the international space station

3173

02:05:38,149 --> 02:05:36,159

to do purely science now the station

3174

02:05:39,910 --> 02:05:38,159

will become more and more commercial

3175

02:05:42,470 --> 02:05:39,920

there are commercial experiments on one

3176

02:05:44,629 --> 02:05:42,480

side but they're also commercial

3177

02:05:47,510 --> 02:05:44,639

astronauts who come up to run maybe

3178

02:05:48,390 --> 02:05:47,520

their own science programs but also to

3179

02:05:50,870 --> 02:05:48,400

enjoy

3180

02:05:53,830 --> 02:05:50,880

just being up in space to experience

3181

02:05:56,550 --> 02:05:53,840

space and to convey this message the

3182

02:06:03,750 --> 02:05:56,560

fascination of space to all the people

3183

02:06:08,149 --> 02:06:05,830

and as we're back live inside the dragon

3184

02:06:09,669 --> 02:06:08,159

capsule watching the crew prepare and

3185

02:06:11,830 --> 02:06:09,679

get ready

3186

02:06:14,470 --> 02:06:11,840

raj achary working out that suit a

3187

02:06:17,430 --> 02:06:14,480

little bit and uh popping up

3188

02:06:21,430 --> 02:06:18,709

not that they can't breathe when it's

3189

02:06:22,709 --> 02:06:21,440

closed but um certainly is you can have

3190

02:06:24,390 --> 02:06:22,719

a little bit of

3191

02:06:26,069 --> 02:06:24,400

dragon we see the same with the helmet

3192

02:06:27,669 --> 02:06:26,079

open close-up team will perform final

3193

02:06:29,510 --> 02:06:27,679

close-out steps and then egress the

3194

02:06:32,149 --> 02:06:29,520

capsule report when ready for hatch

3195

02:06:36,790 --> 02:06:34,310

and there you heard the call out for

3196

02:06:37,750 --> 02:06:36,800

uh the upcoming endurances ready perhaps

3197

02:06:39,109 --> 02:06:37,760

question

3198

02:06:40,629 --> 02:06:39,119

hatch closure

3199

02:06:42,950 --> 02:06:40,639

yes and we heard that call out that they

3200

02:06:45,510 --> 02:06:42,960

had four good suit leak checks and so

3201

02:06:46,950 --> 02:06:45,520

that is a very important step that has

3202

02:06:48,229 --> 02:06:46,960

to be done before they can close the

3203

02:06:50,149 --> 02:06:48,239

hatch

3204

02:06:51,830 --> 02:06:50,159

sounds like everything is on schedule

3205

02:06:53,910 --> 02:06:51,840

and that's great news

3206

02:06:55,270 --> 02:06:53,920

and so let's take another look at some

3207

02:06:57,830 --> 02:06:55,280

of the crew members here if you're just

3208

02:07:00,790 --> 02:06:57,840

joining us live coverage of crew 3 from

3209

02:07:03,109 --> 02:07:00,800

the kennedy space center in florida

3210

02:07:04,550 --> 02:07:03,119

let's introduce you if you have not

3211

02:07:06,790 --> 02:07:04,560

met him yet

3212

02:07:09,189 --> 02:07:06,800

to commander raj achary

3213

02:07:13,109 --> 02:07:09,199

he is an astronaut and military test

3214

02:07:16,629 --> 02:07:15,109

i'm raj achary the commander of the nasa

3215

02:07:18,470 --> 02:07:16,639

spacex crew 3 mission to the

3216

02:07:20,390 --> 02:07:18,480

international space station so on the

3217

02:07:23,109 --> 02:07:20,400

spacex vehicle my job as the commander

3218

02:07:24,950 --> 02:07:23,119

is a few fold i don't need to tell kayla

3219

02:07:26,470 --> 02:07:24,960

tom or matias how to do their jobs they

3220

02:07:27,589 --> 02:07:26,480

already know how to do their jobs that's

3221

02:07:29,030 --> 02:07:27,599

really more a matter of for that one

3222

02:07:30,470 --> 02:07:29,040

percent of the time where something off

3223

02:07:32,229 --> 02:07:30,480

nominal happened what is the best split

3224

02:07:33,750 --> 02:07:32,239

of resources of you know what is the

3225

02:07:35,990 --> 02:07:33,760

best interactions between those players

3226

02:07:38,310 --> 02:07:36,000

to get the best result and so managing

3227

02:07:40,550 --> 02:07:38,320

those different uh pieces of the puzzle

3228

02:07:42,790 --> 02:07:40,560

is really i think what the crew part of

3229

02:07:44,229 --> 02:07:42,800

the commander job is

3230

02:07:46,709 --> 02:07:44,239

it's really mind-boggling when you think

3231

02:07:48,310 --> 02:07:46,719

about how much effort it takes to put

3232

02:07:49,270 --> 02:07:48,320

people in space and then to sustain them

3233

02:07:51,669 --> 02:07:49,280

in space

3234

02:07:53,589 --> 02:07:51,679

i think what's cool and why i like nasa

3235

02:07:55,189 --> 02:07:53,599

is none of those people are doing it for

3236

02:07:56,229 --> 02:07:55,199

the money

3237

02:07:57,589 --> 02:07:56,239

they're doing it because they believe in

3238

02:07:59,750 --> 02:07:57,599

the mission they're doing police because

3239

02:08:01,030 --> 02:07:59,760

they believe in in solving humanity's

3240

02:08:02,709 --> 02:08:01,040

problems and pushing exploration that's

3241

02:08:04,550 --> 02:08:02,719

the reason people are doing it i think

3242

02:08:06,550 --> 02:08:04,560

if anything it's taught us that we as

3243

02:08:08,069 --> 02:08:06,560

humans have this great ability to endure

3244

02:08:09,340 --> 02:08:08,079

through just about anything just have to

3245

02:08:16,709 --> 02:08:09,350

put your mind to it

3246

02:08:21,589 --> 02:08:18,950

seated next to raja chary is crew dragon

3247

02:08:23,950 --> 02:08:21,599

pilot and nasa astronaut tom marshburn

3248

02:08:26,550 --> 02:08:23,960

he is a veteran of two space flights

3249

02:08:30,629 --> 02:08:26,560

sts-127 on the space shuttle endeavor

3250

02:08:32,629 --> 02:08:30,639

and expedition 3435 on the russian soyuz

3251

02:08:35,030 --> 02:08:32,639

my name is tom marshburn i'm the pilot

3252

02:08:36,790 --> 02:08:35,040

of nasa's spacex crew 3 mission to the

3253

02:08:38,950 --> 02:08:36,800

international space station not quite

3254

02:08:41,109 --> 02:08:38,960

sure why space flight grabbed me the way

3255

02:08:43,270 --> 02:08:41,119

it did it found me really

3256

02:08:44,870 --> 02:08:43,280

more than me deciding to become

3257

02:08:46,550 --> 02:08:44,880

fascinated with it

3258

02:08:48,950 --> 02:08:46,560

there's something about

3259

02:08:51,270 --> 02:08:48,960

leaving everything we know behind

3260

02:08:53,750 --> 02:08:51,280

everything it was almost like going up

3261

02:08:56,069 --> 02:08:53,760

into heaven or something and coming back

3262

02:08:58,069 --> 02:08:56,079

and that was just infinitely fascinating

3263

02:08:59,430 --> 02:08:58,079

to me the long duration mission is quite

3264

02:09:01,830 --> 02:08:59,440

a bit different from the shuttle mission

3265

02:09:05,350 --> 02:09:01,840

if you really feel like you've become a

3266

02:09:07,109 --> 02:09:05,360

resident of space a resident of zero g

3267

02:09:09,109 --> 02:09:07,119

one of the great legacies of the space

3268

02:09:11,109 --> 02:09:09,119

station is not just going to be the

3269

02:09:14,069 --> 02:09:11,119

science but very importantly the

3270

02:09:16,629 --> 02:09:14,079

international cooperation it's not for

3271

02:09:19,109 --> 02:09:16,639

survival it's not for competition in the

3272

02:09:21,669 --> 02:09:19,119

marketplace it is just exploration and

3273

02:09:24,350 --> 02:09:21,679

it's just a vibrant wonderful place

3274

02:09:27,270 --> 02:09:24,360

where great science is happening

3275

02:09:28,160 --> 02:09:27,280

[Music]

3276

02:09:30,550 --> 02:09:28,170

[Applause]

3277

02:09:32,149 --> 02:09:30,560

[Music]

3278

02:09:33,830 --> 02:09:32,159

we were wondering about the helmet there

3279

02:09:35,510 --> 02:09:33,840

with raja chari and why he's just got it

3280

02:09:37,990 --> 02:09:35,520

half open and of course

3281

02:09:40,149 --> 02:09:38,000

our expert astronaut shannon walker here

3282

02:09:42,069 --> 02:09:40,159

explained it to me yeah you want uh so

3283

02:09:43,430 --> 02:09:42,079

you see that white band on the bottom of

3284

02:09:44,709 --> 02:09:43,440

the helmet so if it's in the wrong

3285

02:09:46,629 --> 02:09:44,719

location you won't have as good

3286

02:09:48,149 --> 02:09:46,639

visibility to read the items that you

3287

02:09:49,669 --> 02:09:48,159

need to read on the screen so he's got

3288

02:09:52,149 --> 02:09:49,679

it positioned to help him read the

3289

02:09:54,069 --> 02:09:52,159

screen he can look further lower as well

3290

02:09:55,350 --> 02:09:54,079

it appears that he's got a checklist on

3291

02:09:58,470 --> 02:09:55,360

his knee there

3292

02:10:01,510 --> 02:09:58,480

yes on each uh leg of the crew there is

3293

02:10:03,510 --> 02:10:01,520

a satchel that holds a tablet with

3294

02:10:05,189 --> 02:10:03,520

procedures and other information it

3295

02:10:07,270 --> 02:10:05,199

looks like roger's tablet he probably

3296

02:10:09,189 --> 02:10:07,280

has it placed on the

3297

02:10:10,629 --> 02:10:09,199

display above him but you will see

3298

02:10:12,870 --> 02:10:10,639

before they launch they will take that

3299

02:10:14,709 --> 02:10:12,880

down and replace it on their satchel on

3300

02:10:17,189 --> 02:10:14,719

the knee holds better there i imagine

3301  
02:10:18,629 --> 02:10:17,199  
with the forces of launch exactly you do

3302  
02:10:20,950 --> 02:10:18,639  
not want that falling on you as you're

3303  
02:10:23,990 --> 02:10:20,960  
launching into space seat number one is

3304  
02:10:26,550 --> 02:10:24,000  
uh behind this camera shot and that is

3305  
02:10:28,870 --> 02:10:26,560  
mission specialist and nasa astronaut

3306  
02:10:30,870 --> 02:10:28,880  
kayla barron she'll be making her first

3307  
02:10:33,510 --> 02:10:30,880  
trip to space today the submarine

3308  
02:10:36,149 --> 02:10:33,520  
warfare officer has deployed three times

3309  
02:10:38,149 --> 02:10:36,159  
aboard the uss maine

3310  
02:10:40,550 --> 02:10:38,159  
i'm kayla barron a mission specialist

3311  
02:10:42,470 --> 02:10:40,560  
for nasa's spacex crew 3 mission to the

3312  
02:10:44,950 --> 02:10:42,480  
international space station

3313  
02:10:46,870 --> 02:10:44,960

when 9 11 happened watching new york

3314

02:10:49,030 --> 02:10:46,880

city respond and how we came together as

3315

02:10:51,189 --> 02:10:49,040

a country really cemented for me a

3316

02:10:53,030 --> 02:10:51,199

desire to serve that's how i first got

3317

02:10:54,629 --> 02:10:53,040

interested in joining the military and

3318

02:10:56,629 --> 02:10:54,639

ultimately got interested in attending

3319

02:10:58,870 --> 02:10:56,639

the naval academy i found myself really

3320

02:11:00,950 --> 02:10:58,880

drawn to the submarine warfare officers

3321

02:11:03,030 --> 02:11:00,960

as mentors and when i got to go underway

3322

02:11:05,510 --> 02:11:03,040

on a submarine i just felt like this is

3323

02:11:07,830 --> 02:11:05,520

where i belong

3324

02:11:09,350 --> 02:11:07,840

if i hadn't had that experience

3325

02:11:11,109 --> 02:11:09,360

i don't think that i would have believed

3326

02:11:13,589 --> 02:11:11,119

i could become an astronaut

3327

02:11:15,430 --> 02:11:13,599

crew 3 is just such an amazing group of

3328

02:11:17,030 --> 02:11:15,440

people it's a really special crew

3329

02:11:19,270 --> 02:11:17,040

because i think everybody brings a

3330

02:11:22,870 --> 02:11:19,280

really unique perspective and different

3331

02:11:25,030 --> 02:11:22,880

background i just feel super lucky to be

3332

02:11:26,870 --> 02:11:25,040

with people who all have such diverse

3333

02:11:28,229 --> 02:11:26,880

experiences but

3334

02:11:32,500 --> 02:11:28,239

have really learned how to match and

3335

02:11:32,510 --> 02:11:36,550

[Music]

3336

02:11:40,950 --> 02:11:38,629

and finally in seat number four is crew

3337

02:11:43,750 --> 02:11:40,960

3 mission specialist and european space

3338

02:11:47,589 --> 02:11:43,760

agency astronaut matthias maurer today

3339

02:11:49,669 --> 02:11:47,599

will also mark his first space flight

3340

02:11:52,229 --> 02:11:49,679

i'm is astronaut matthias mata i will be

3341

02:11:53,910 --> 02:11:52,239

mission specialist on the nasa spacex

3342

02:11:57,030 --> 02:11:53,920

crew 3 mission to the international

3343

02:11:59,589 --> 02:11:57,040

space station in 2008 isis started the

3344

02:12:01,910 --> 02:11:59,599

call to 4 new astronauts out of 8 and a

3345

02:12:04,149 --> 02:12:01,920

half thousand applicants only 10

3346

02:12:07,350 --> 02:12:04,159

candidates passed all the tests i was

3347

02:12:09,270 --> 02:12:07,360

one of them i was always fascinated by

3348

02:12:11,430 --> 02:12:09,280

space and what does an astronaut

3349

02:12:13,910 --> 02:12:11,440

actually do so an astronaut works with a

3350

02:12:16,950 --> 02:12:13,920

lot of engineering stuff we do science

3351  
02:12:19,270 --> 02:12:16,960  
in space we work in international teams

3352  
02:12:21,030 --> 02:12:19,280  
and the adventure that we are able to

3353  
02:12:23,430 --> 02:12:21,040  
live as astronauts in a combination of

3354  
02:12:25,990 --> 02:12:23,440  
these four facts engineering on the edge

3355  
02:12:27,910 --> 02:12:26,000  
of what is possible science

3356  
02:12:30,470 --> 02:12:27,920  
international teams and adventure that's

3357  
02:12:33,270 --> 02:12:30,480  
only possible as an astronaut i want to

3358  
02:12:35,830 --> 02:12:33,280  
say thank you to everyone who helped me

3359  
02:12:37,750 --> 02:12:35,840  
to arrive that point that i'm today i

3360  
02:12:40,870 --> 02:12:37,760  
would be thinking of you when i fly to

3361  
02:12:47,990 --> 02:12:40,880  
space and i send all my life to you down

3362  
02:12:52,390 --> 02:12:50,709  
back live inside the dragon capsule as

3363  
02:12:57,910 --> 02:12:52,400

the crew goes through their various

3364

02:13:04,709 --> 02:13:00,709

as they prepare to have the hatch closed

3365

02:13:09,990 --> 02:13:07,350

and by the way

3366

02:13:12,870 --> 02:13:10,000

if you would like to ask us a question

3367

02:13:15,189 --> 02:13:12,880

and by us i mean shannon

3368

02:13:19,109 --> 02:13:15,199

just pop on over to twitter and use the

3369

02:13:21,510 --> 02:13:19,119

hashtag ask nasa that will send us the

3370

02:13:23,669 --> 02:13:21,520

question we'd love to have them shannon

3371

02:13:25,589 --> 02:13:23,679

has been uh answering them throughout

3372

02:13:28,069 --> 02:13:25,599

the show and doing a great job with it

3373

02:13:32,470 --> 02:13:28,079

we really appreciate her being here and

3374

02:13:34,790 --> 02:13:33,669

even

3375

02:13:36,709 --> 02:13:34,800

the patch

3376

02:13:39,109 --> 02:13:36,719

which i know you're you're you're big

3377

02:13:40,709 --> 02:13:39,119

into your crew patch of course i like

3378

02:13:42,229 --> 02:13:40,719

our crew patch i think it's pretty good

3379

02:13:45,109 --> 02:13:42,239

you know it's hard to deny i love the

3380

02:13:47,589 --> 02:13:45,119

blue i love the dragon but the crew 3

3381

02:13:49,510 --> 02:13:47,599

patch is pretty cool as well the logo

3382

02:13:51,430 --> 02:13:49,520

was designed for this mission by the

3383

02:13:54,069 --> 02:13:51,440

astronauts themselves just as you did

3384

02:13:56,709 --> 02:13:54,079

shannon they say that the capsule flies

3385

02:13:59,030 --> 02:13:56,719

upward while the flames below under the

3386

02:14:01,990 --> 02:13:59,040

thousands of workers who worked on crew

3387

02:14:04,149 --> 02:14:02,000

three the number three is prominent

3388

02:14:06,550 --> 02:14:04,159

in the shape of the exhaust below and is

3389

02:14:08,629 --> 02:14:06,560

next to a dragon and the highlighted

3390

02:14:10,629 --> 02:14:08,639

stars represent crew three

3391

02:14:13,350 --> 02:14:10,639

as you can see there and the four red

3392

02:14:15,750 --> 02:14:13,360

planets they represent humanity's dream

3393

02:14:17,669 --> 02:14:15,760

to explore mars a beautiful patch there

3394

02:14:19,750 --> 02:14:17,679

oh it is a lovely patch it is very well

3395

02:14:21,030 --> 02:14:19,760

crafted you work with the artist that

3396

02:14:22,950 --> 02:14:21,040

puts it together

3397

02:14:24,550 --> 02:14:22,960

yes so each crew can either design it

3398

02:14:26,149 --> 02:14:24,560

themselves or they have a choice to work

3399

02:14:28,229 --> 02:14:26,159

with an artist and so the crews are

3400

02:14:30,390 --> 02:14:28,239

trying to take elements of what's what

3401

02:14:32,950 --> 02:14:30,400

they feel really represents their flight

3402

02:14:35,589 --> 02:14:32,960

and put it into a patch

3403

02:14:38,629 --> 02:14:35,599

and i imagine has anybody like drawn one

3404

02:14:40,310 --> 02:14:38,639

themselves oh sure how about that

3405

02:14:42,709 --> 02:14:40,320

especially the artist you know nicole

3406

02:14:44,390 --> 02:14:42,719

stott former shuttle astronaut yes she's

3407

02:14:46,069 --> 02:14:44,400

a she's she's a she's definitely an

3408

02:14:48,629 --> 02:14:46,079

artist i love her work as you can see

3409

02:14:50,470 --> 02:14:48,639

they're preparing for the hatch closure

3410

02:14:53,030 --> 02:14:50,480

it looks like they are documenting the

3411

02:14:55,030 --> 02:14:53,040

seal around the hatch

3412

02:14:57,430 --> 02:14:55,040

yes they will they're looking very

3413

02:14:59,189 --> 02:14:57,440

carefully to make sure that that seal is

3414

02:15:00,470 --> 02:14:59,199

completely intact because that's what's

3415

02:15:02,950 --> 02:15:00,480

going to hold the pressure inside the

3416

02:15:05,589 --> 02:15:02,960

capsule you don't want any foreign

3417

02:15:08,390 --> 02:15:05,599

object debris what we know here at nasa

3418

02:15:09,510 --> 02:15:08,400

as fod right which is anything that's

3419

02:15:11,109 --> 02:15:09,520

not supposed to be there anything that's

3420

02:15:12,550 --> 02:15:11,119

not supposed to be there and it can be

3421

02:15:14,790 --> 02:15:12,560

they're looking for really tiny things

3422

02:15:17,510 --> 02:15:14,800

something as small as a human hair

3423

02:15:23,109 --> 02:15:17,520

will uh cause that seal to not operate

3424

02:15:27,030 --> 02:15:25,669

and uh they're using um

3425

02:15:28,310 --> 02:15:27,040

it appears to be smartphones to take

3426

02:15:29,910 --> 02:15:28,320

these pictures they do i mean the

3427

02:15:31,910 --> 02:15:29,920

cameras on the phones are so good these

3428

02:15:33,910 --> 02:15:31,920

days that you can take some pictures and

3429

02:15:35,830 --> 02:15:33,920

blow them up and really get a good view

3430

02:15:37,589 --> 02:15:35,840

of what that hatch seal looks like they

3431

02:15:40,149 --> 02:15:37,599

are good cameras indeed

3432

02:15:42,069 --> 02:15:40,159

flying just before the last flight of

3433

02:15:45,350 --> 02:15:42,079

the crew dragon i should say was the

3434

02:15:47,669 --> 02:15:45,360

crew from inspiration four and our nasa

3435

02:15:50,229 --> 02:15:47,679

social team was uh putting together our

3436

02:15:51,669 --> 02:15:50,239

page for uh this launch from the kennedy

3437

02:15:52,550 --> 02:15:51,679

space center and

3438

02:15:54,310 --> 02:15:52,560

they

3439

02:15:57,270 --> 02:15:54,320

as you can see the hatch being closed

3440

02:16:00,870 --> 02:15:59,189

they're going to push on that to make

3441

02:16:02,550 --> 02:16:00,880

sure it seals up really good they're

3442

02:16:04,709 --> 02:16:02,560

going to put you've got to overcome that

3443

02:16:07,350 --> 02:16:04,719

force uh to get

3444

02:16:09,750 --> 02:16:07,360

uh the latches to latch on that hatch

3445

02:16:12,069 --> 02:16:09,760

so we'll hold the thought on the uh

3446

02:16:13,030 --> 02:16:12,079

nasa social video as we look looks like

3447

02:16:14,950 --> 02:16:13,040

uh

3448

02:16:16,709 --> 02:16:14,960

the crew closeout number 36 was putting

3449

02:16:18,629 --> 02:16:16,719

a fair amount of force yes it did look

3450

02:16:20,629 --> 02:16:18,639

like he was pushing hard but that's good

3451

02:16:24,229 --> 02:16:20,639

we'll get that hatch closed

3452

02:16:26,149 --> 02:16:24,239

and now begins the process of them

3453

02:16:27,910 --> 02:16:26,159

sealing it up sealing it up and doing

3454

02:16:29,030 --> 02:16:27,920

all kinds of checks and cross checks so

3455

02:16:30,629 --> 02:16:29,040

they'll seal it up there'll be a

3456

02:16:32,870 --> 02:16:30,639

pressure check to make sure the pressure

3457

02:16:34,389 --> 02:16:32,880

does in fact hold inside the capsule and

3458

02:16:36,230 --> 02:16:34,399

you'll see

3459

02:16:38,549 --> 02:16:36,240

teams of people here working together to

3460

02:16:39,830 --> 02:16:38,559

make sure every step is done

3461

02:16:41,589 --> 02:16:39,840

exactly so

3462

02:16:43,629 --> 02:16:41,599

carefully and methodically working their

3463

02:16:46,389 --> 02:16:43,639

way

3464

02:16:47,349 --> 02:16:46,399

255 feet up in the air we might add in

3465

02:16:58,469 --> 02:16:47,359

the

3466

02:16:59,910 --> 02:16:58,479

closing up that hatch

3467

02:17:02,150 --> 02:16:59,920

let's head out to california and catch

3468

02:17:05,990 --> 02:17:02,160

up with john i for an update on the

3469

02:17:09,509 --> 02:17:07,750

countdown is proceeding nominally at

3470

02:17:11,990 --> 02:17:09,519

this point and thanks darrell for that

3471

02:17:13,669 --> 02:17:12,000

handoff we're coming up just inside t

3472

02:17:15,429 --> 02:17:13,679

minus two hours

3473

02:17:17,349 --> 02:17:15,439

now on board the brand new dragon

3474

02:17:19,190 --> 02:17:17,359

spacecraft endurance we've heard a lot

3475

02:17:21,429 --> 02:17:19,200

of the communication between the crew

3476  
02:17:23,669 --> 02:17:21,439  
and the ground contracts were complete

3477  
02:17:25,509 --> 02:17:23,679  
we saw the astronaut seats rotated to

3478  
02:17:27,589 --> 02:17:25,519  
the flight position the suit leaked

3479  
02:17:29,429 --> 02:17:27,599  
checks were successfully completed and

3480  
02:17:31,910 --> 02:17:29,439  
we've been watching the closeout leads

3481  
02:17:33,669 --> 02:17:31,920  
lean into that hatch getting it secure

3482  
02:17:36,150 --> 02:17:33,679  
and we're getting ready now to begin

3483  
02:17:37,750 --> 02:17:36,160  
what will be the hatch leaks checks to

3484  
02:17:39,509 --> 02:17:37,760  
make sure that all the seals are good

3485  
02:17:40,870 --> 02:17:39,519  
everything's bolted down tight ready to

3486  
02:17:43,110 --> 02:17:40,880  
go

3487  
02:17:44,950 --> 02:17:43,120  
once we finish the final leak checks the

3488  
02:17:47,110 --> 02:17:44,960

team will begin the steps to close out

3489

02:17:49,349 --> 02:17:47,120

the white room and get the access arm

3490

02:17:50,950 --> 02:17:49,359

ready to retract and then that closeout

3491

02:17:53,669 --> 02:17:50,960

team that you see there will leave the

3492

02:17:55,589 --> 02:17:53,679

pad by about t minus one hour that'll

3493

02:17:57,030 --> 02:17:55,599

leave just the four astronauts on the

3494

02:17:59,429 --> 02:17:57,040

pad

3495

02:18:01,589 --> 02:17:59,439

now for falcon 9 their team for

3496

02:18:03,270 --> 02:18:01,599

countdown is on console here you can see

3497

02:18:04,870 --> 02:18:03,280

firing room four

3498

02:18:06,790 --> 02:18:04,880

they're preparing for communication

3499

02:18:08,549 --> 02:18:06,800

checks with the astronauts coming up in

3500

02:18:10,870 --> 02:18:08,559

just a few minutes

3501  
02:18:12,790 --> 02:18:10,880  
currently at falcon 9 the engineers have

3502  
02:18:14,549 --> 02:18:12,800  
pressurized launch vehicle gas storage

3503  
02:18:17,030 --> 02:18:14,559  
bottles that was done before we cleared

3504  
02:18:19,349 --> 02:18:17,040  
the pad these are composite over wrapped

3505  
02:18:21,190 --> 02:18:19,359  
pressure vessels they hold gases that

3506  
02:18:23,589 --> 02:18:21,200  
are used to fill the propellant tanks

3507  
02:18:24,950 --> 02:18:23,599  
with hot helium as that propellant is

3508  
02:18:27,509 --> 02:18:24,960  
pulled out of the first and second

3509  
02:18:29,110 --> 02:18:27,519  
stages by the merlin turbo pumps

3510  
02:18:31,030 --> 02:18:29,120  
as we get into the last half hour of the

3511  
02:18:32,950 --> 02:18:31,040  
countdown we'll do a final top off of

3512  
02:18:34,790 --> 02:18:32,960  
those pressure vessels make sure that

3513  
02:18:36,950 --> 02:18:34,800

we're at flight load

3514

02:18:39,270 --> 02:18:36,960

we also use these pressurized gases to

3515

02:18:41,750 --> 02:18:39,280

spin the merlin engine turbo pump when

3516

02:18:43,830 --> 02:18:41,760

we have to start an engine in space so

3517

02:18:46,309 --> 02:18:43,840

the second stage mvac engine has to

3518

02:18:47,910 --> 02:18:46,319

start up after the first stage separates

3519

02:18:49,669 --> 02:18:47,920

and the first stage engines we've got

3520

02:18:51,669 --> 02:18:49,679

three of them need to restart to begin

3521

02:18:53,589 --> 02:18:51,679

the entry and then one engine for the

3522

02:18:55,429 --> 02:18:53,599

final landing sequence

3523

02:18:57,110 --> 02:18:55,439

so all of those engines need the helium

3524

02:18:59,509 --> 02:18:57,120

gas to be able to spin and start the

3525

02:19:01,509 --> 02:18:59,519

engines the gases are also used for

3526

02:19:03,509 --> 02:19:01,519

attitude control systems

3527

02:19:05,509 --> 02:19:03,519

not so much on the way up but it helps

3528

02:19:07,750 --> 02:19:05,519

orient the vehicle after the first stage

3529

02:19:10,150 --> 02:19:07,760

separates and comes back down for the

3530

02:19:12,309 --> 02:19:10,160

landing on the drone ship and we also

3531

02:19:14,150 --> 02:19:12,319

use the gas to deploy the grid fins and

3532

02:19:17,030 --> 02:19:14,160

to kick the landing legs out just before

3533

02:19:18,950 --> 02:19:17,040

we land on the drone ship

3534

02:19:20,870 --> 02:19:18,960

we're continuing to monitor weather at

3535

02:19:23,429 --> 02:19:20,880

the launch site and around the world at

3536

02:19:25,509 --> 02:19:23,439

contingency abort and landing zones

3537

02:19:26,870 --> 02:19:25,519

concerns we're looking at continue to be

3538

02:19:28,309 --> 02:19:26,880

the same too since we started the

3539

02:19:30,070 --> 02:19:28,319

webcast

3540

02:19:31,509 --> 02:19:30,080

cumulus clouds and flight through

3541

02:19:34,070 --> 02:19:31,519

precipitation

3542

02:19:36,629 --> 02:19:34,080

now a moment ago the range did report

3543

02:19:39,509 --> 02:19:36,639

that currently right now we are no go on

3544

02:19:41,589 --> 02:19:39,519

weather for flying through precipitation

3545

02:19:43,110 --> 02:19:41,599

but they also expect that to clear up

3546

02:19:44,870 --> 02:19:43,120

and for us to be go when we get to

3547

02:19:46,950 --> 02:19:44,880

launch so this is just a temporary they

3548

02:19:48,950 --> 02:19:46,960

have to tell us when we're not meeting

3549

02:19:51,429 --> 02:19:48,960

all of the weather rules but right now

3550

02:19:53,190 --> 02:19:51,439

it doesn't look like a concern

3551  
02:19:55,990 --> 02:19:53,200  
so the good news is weather's looking

3552  
02:19:57,910 --> 02:19:56,000  
good dragon's right on time falcon 9 is

3553  
02:20:00,389 --> 02:19:57,920  
quiet getting ready for its big events

3554  
02:20:01,830 --> 02:20:00,399  
coming up here in another hour so and so

3555  
02:20:03,670 --> 02:20:01,840  
with that we're going to hand it back to

3556  
02:20:05,990 --> 02:20:03,680  
the team at kennedy

3557  
02:20:07,910 --> 02:20:06,000  
all right thank you john i and yes

3558  
02:20:09,270 --> 02:20:07,920  
indeed we can confirm there was some

3559  
02:20:11,990 --> 02:20:09,280  
weather that came through here yes there

3560  
02:20:13,750 --> 02:20:12,000  
was it was a little bit of rain um a

3561  
02:20:16,309 --> 02:20:13,760  
light storm our launch weather officer

3562  
02:20:17,910 --> 02:20:16,319  
tells us ryan sisik informing us that it

3563  
02:20:19,190 --> 02:20:17,920

was a light one it was passing through

3564

02:20:21,270 --> 02:20:19,200

but in fact

3565

02:20:23,590 --> 02:20:21,280

when it's here it does

3566

02:20:24,950 --> 02:20:23,600

cause that to go red exactly if it's

3567

02:20:26,710 --> 02:20:24,960

raining here we would probably not

3568

02:20:28,389 --> 02:20:26,720

launch into it thankfully there is no

3569

02:20:30,309 --> 02:20:28,399

lightning which is another

3570

02:20:33,030 --> 02:20:30,319

uh criteria that we use to determine

3571

02:20:34,710 --> 02:20:33,040

whether or not we are go for launch

3572

02:20:36,790 --> 02:20:34,720

we're back inside the capsule now we're

3573

02:20:38,950 --> 02:20:36,800

awaiting uh a couple of things they're

3574

02:20:41,190 --> 02:20:38,960

gonna do some comm checks uh you know

3575

02:20:43,030 --> 02:20:41,200

they're uh gonna do some suit leak

3576

02:20:45,990 --> 02:20:43,040

checks and in fact i think you were able

3577

02:20:47,990 --> 02:20:46,000

to eye when that happens

3578

02:20:49,990 --> 02:20:48,000

the suit leak checked oh the suit the

3579

02:20:51,429 --> 02:20:50,000

suit lead checks yeah you can tell um

3580

02:20:53,349 --> 02:20:51,439

when they are doing a leak checks i

3581

02:20:55,190 --> 02:20:53,359

believe they've already occurred but uh

3582

02:20:57,429 --> 02:20:55,200

one of the things that happens is you

3583

02:20:59,030 --> 02:20:57,439

have your visors closed all your zippers

3584

02:21:01,590 --> 02:20:59,040

zipped up and they will pressurize the

3585

02:21:03,110 --> 02:21:01,600

suit so you'll get extra uh air volume

3586

02:21:05,030 --> 02:21:03,120

inside your suit so the suits will kind

3587

02:21:07,830 --> 02:21:05,040

of puff up you can see that when they

3588

02:21:10,150 --> 02:21:07,840

when the leak check happens

3589

02:21:11,510 --> 02:21:10,160

and now the half down visor look is uh

3590

02:21:15,270 --> 02:21:11,520

it's very fashionable the look of the

3591

02:21:19,510 --> 02:21:17,510

in this moment

3592

02:21:21,510 --> 02:21:19,520

as they wait

3593

02:21:23,910 --> 02:21:21,520

what is that like because i mean there

3594

02:21:26,550 --> 02:21:23,920

are waiting to go to space launching on

3595

02:21:28,950 --> 02:21:26,560

a rocket yes yes they know they've got

3596

02:21:32,070 --> 02:21:28,960

just under two hours to wait so a couple

3597

02:21:33,670 --> 02:21:32,080

of things are going on um of course each

3598

02:21:35,590 --> 02:21:33,680

crew member there is thinking about

3599

02:21:36,870 --> 02:21:35,600

their role during the launch they're

3600

02:21:39,030 --> 02:21:36,880

probably chit-chatting a little bit

3601  
02:21:41,110 --> 02:21:39,040  
amongst themselves uh trying to stay

3602  
02:21:43,110 --> 02:21:41,120  
comfortable in those suits and probably

3603  
02:21:45,110 --> 02:21:43,120  
just trying to enjoy the experience of

3604  
02:21:47,030 --> 02:21:45,120  
actually being in there exactly spacex

3605  
02:21:48,710 --> 02:21:47,040  
we will be commencing health checks for

3606  
02:21:50,710 --> 02:21:48,720  
the launch escape system expect

3607  
02:21:52,389 --> 02:21:50,720  
momentary flight computer state change

3608  
02:22:01,270 --> 02:21:52,399  
followed by a transition back to pad

3609  
02:22:06,230 --> 02:22:03,590  
that's a call out to

3610  
02:22:08,630 --> 02:22:06,240  
check the health of the emergency escape

3611  
02:22:11,510 --> 02:22:08,640  
system yes this is what's primarily

3612  
02:22:14,150 --> 02:22:11,520  
happening in those last uh hours before

3613  
02:22:15,750 --> 02:22:14,160

launches the spacex team is checking all

3614

02:22:17,990 --> 02:22:15,760

the systems on the spacecraft to make

3615

02:22:19,429 --> 02:22:18,000

sure everything is working properly and

3616

02:22:21,030 --> 02:22:19,439

of course the launch escape system is

3617

02:22:23,910 --> 02:22:21,040

one of the main systems that we need to

3618

02:22:26,230 --> 02:22:23,920

work properly during a launch especially

3619

02:22:27,349 --> 02:22:26,240

especially with that hatch close yes

3620

02:22:29,349 --> 02:22:27,359

exactly

3621

02:22:31,429 --> 02:22:29,359

so we've got about an hour now until the

3622

02:22:33,349 --> 02:22:31,439

pad team wraps up the final checks and

3623

02:22:34,870 --> 02:22:33,359

clears the white room and that's when

3624

02:22:36,790 --> 02:22:34,880

the action will pick up with the crew

3625

02:22:38,230 --> 02:22:36,800

access arm retracting

3626

02:22:40,790 --> 02:22:38,240

we'll have the arming of the launch

3627

02:22:43,429 --> 02:22:40,800

escape system as we just mentioned and

3628

02:22:45,270 --> 02:22:43,439

then prop loading will follow so we'll

3629

02:22:47,030 --> 02:22:45,280

keep a live view of the crew here as

3630

02:22:49,030 --> 02:22:47,040

they're sitting tight for the next hour

3631

02:22:50,469 --> 02:22:49,040

or so and provide you with some more

3632

02:22:52,550 --> 02:22:50,479

context about

3633

02:22:54,710 --> 02:22:52,560

this mission but for now let's head over

3634

02:22:56,550 --> 02:22:54,720

to houston for a closer look at what the

3635

02:23:03,510 --> 02:22:56,560

crew will be doing when they reach their

3636

02:23:07,670 --> 02:23:05,990

thanks daryl once crew dragon arrives at

3637

02:23:10,070 --> 02:23:07,680

the international space station they'll

3638

02:23:12,630 --> 02:23:10,080

be welcomed by their expedition 66

3639

02:23:14,550 --> 02:23:12,640

crewmates since the crew ii astronauts

3640

02:23:16,389 --> 02:23:14,560

splash down monday evening off the coast

3641

02:23:18,630 --> 02:23:16,399

of pensacola florida we're doing

3642

02:23:20,150 --> 02:23:18,640

something called an indirect handover

3643

02:23:22,309 --> 02:23:20,160

which just means a new crew of

3644

02:23:23,910 --> 02:23:22,319

astronauts arrives at station after

3645

02:23:26,070 --> 02:23:23,920

another crew departs

3646

02:23:28,630 --> 02:23:26,080

this mission will also continue keeping

3647

02:23:31,429 --> 02:23:28,640

the long duration crew size on station

3648

02:23:33,590 --> 02:23:31,439

at seven on the u.s side we'll have four

3649

02:23:35,830 --> 02:23:33,600

astronauts to conduct research until

3650

02:23:37,830 --> 02:23:35,840

nasa astronaut mark vande high returns

3651  
02:23:40,070 --> 02:23:37,840  
to earth in march of next year

3652  
02:23:42,630 --> 02:23:40,080  
that jump from three to four astronauts

3653  
02:23:44,870 --> 02:23:42,640  
takes our average of 30 to 40 hours of

3654  
02:23:47,590 --> 02:23:44,880  
science work a week on station all the

3655  
02:23:49,429 --> 02:23:47,600  
way up to sometimes 80 to 100 hours

3656  
02:23:51,349 --> 02:23:49,439  
effectively doubling our amount of time

3657  
02:23:53,750 --> 02:23:51,359  
dedicated to research

3658  
02:23:55,910 --> 02:23:53,760  
as the station is first and foremost a

3659  
02:23:58,550 --> 02:23:55,920  
laboratory the crew will jump right into

3660  
02:24:00,550 --> 02:23:58,560  
conducting experiments with new research

3661  
02:24:03,110 --> 02:24:00,560  
still to be delivered on upcoming cargo

3662  
02:24:05,270 --> 02:24:03,120  
flights including another spacex dragon

3663  
02:24:07,270 --> 02:24:05,280

scheduled right now in december

3664

02:24:08,710 --> 02:24:07,280

i'll toss it over to marie now where we

3665

02:24:11,110 --> 02:24:08,720

will learn more about some of the

3666

02:24:13,429 --> 02:24:11,120

exciting science on the horizon for crew

3667

02:24:15,270 --> 02:24:13,439

3. marie

3668

02:24:17,590 --> 02:24:15,280

all right thank you so much sandra i am

3669

02:24:20,230 --> 02:24:17,600

here with dr hector gutierrez you're a

3670

02:24:21,910 --> 02:24:20,240

professor of uh mechanical and aerospace

3671

02:24:24,150 --> 02:24:21,920

engineering at the florida institute of

3672

02:24:25,910 --> 02:24:24,160

technology down the road in orlando and

3673

02:24:28,309 --> 02:24:25,920

you actually have an experiment

3674

02:24:29,830 --> 02:24:28,319

launching aboard crew 3 tonight that's

3675

02:24:31,510 --> 02:24:29,840

right mary thanks again for the

3676

02:24:33,990 --> 02:24:31,520

opportunity of being here

3677

02:24:34,710 --> 02:24:34,000

very excited to be here to the launch of

3678

02:24:37,110 --> 02:24:34,720

our

3679

02:24:39,349 --> 02:24:37,120

flight units

3680

02:24:41,830 --> 02:24:39,359

our experiment is called this

3681

02:24:43,190 --> 02:24:41,840

smartphone video guidance system

3682

02:24:44,710 --> 02:24:43,200

the name is a little bit misleading

3683

02:24:46,070 --> 02:24:44,720

because we're actually not using any

3684

02:24:47,590 --> 02:24:46,080

smartphones

3685

02:24:50,389 --> 02:24:47,600

but this is technology that was

3686

02:24:52,550 --> 02:24:50,399

originally developed by nasa marshall

3687

02:24:55,270 --> 02:24:52,560

for guidance of the spacecraft

3688

02:24:57,429 --> 02:24:55,280

and proximity maneuvers and

3689

02:24:59,670 --> 02:24:57,439

we're finally going to after several

3690

02:25:02,790 --> 02:24:59,680

years of working on the deployment of

3691

02:25:05,030 --> 02:25:02,800

sbgs we are going to

3692

02:25:07,030 --> 02:25:05,040

have the opportunity to deploy it on the

3693

02:25:08,630 --> 02:25:07,040

robot on the space station which is

3694

02:25:11,270 --> 02:25:08,640

called asterisk

3695

02:25:13,349 --> 02:25:11,280

so the smartphone guided system is

3696

02:25:15,349 --> 02:25:13,359

essentially a software sensor

3697

02:25:18,150 --> 02:25:15,359

so it's an algorithm that can be

3698

02:25:22,710 --> 02:25:18,160

deployed using the hardware resources of

3699

02:25:24,950 --> 02:25:22,720

a robot a cpu camera and in this case uh

3700

02:25:27,910 --> 02:25:24,960

that will be the resources of astoria

3701

02:25:29,830 --> 02:25:27,920

okay and so there's the actual payload

3702

02:25:31,750 --> 02:25:29,840

is a small beacon it's about you told me

3703

02:25:33,670 --> 02:25:31,760

it's about the size of a flashlight um i

3704

02:25:35,990 --> 02:25:33,680

think we have a couple of photos of it

3705

02:25:38,550 --> 02:25:36,000

but this beacon there it is

3706

02:25:40,389 --> 02:25:38,560

it attaches to the wall of the

3707

02:25:42,630 --> 02:25:40,399

international space station and has some

3708

02:25:45,110 --> 02:25:42,640

led lights that light up and then that

3709

02:25:47,510 --> 02:25:45,120

gets used in combination with the sensor

3710

02:25:49,510 --> 02:25:47,520

to maneuver the astro b that you

3711

02:25:51,270 --> 02:25:49,520

mentioned that's the free-flying robot

3712

02:25:53,590 --> 02:25:51,280

on the international space station there

3713

02:25:55,830 --> 02:25:53,600

are actually three of them and you're

3714

02:25:58,710 --> 02:25:55,840

going to test five different maneuvers

3715

02:26:00,710 --> 02:25:58,720

with one two and even all three of the

3716

02:26:03,270 --> 02:26:00,720

astro b robots at the same time is that

3717

02:26:05,670 --> 02:26:03,280

right that's exactly right so these

3718

02:26:07,830 --> 02:26:05,680

beacons will be attached

3719

02:26:09,990 --> 02:26:07,840

some of them to the wall or some of them

3720

02:26:11,270 --> 02:26:10,000

to the payload compartment on astra on

3721

02:26:12,790 --> 02:26:11,280

the astrovis

3722

02:26:14,790 --> 02:26:12,800

and they essentially will be used as

3723

02:26:17,110 --> 02:26:14,800

navigation beacons to

3724

02:26:19,190 --> 02:26:17,120

execute a number of formation flight

3725

02:26:21,990 --> 02:26:19,200

maneuvers and to demonstrate

3726  
02:26:24,710 --> 02:26:22,000  
capabilities of spgas and its accuracy

3727  
02:26:26,550 --> 02:26:24,720  
so how can you use this technology if if

3728  
02:26:28,710 --> 02:26:26,560  
these maneuvers are

3729  
02:26:30,070 --> 02:26:28,720  
successful if they if they do what you

3730  
02:26:31,750 --> 02:26:30,080  
expect them to do what you hope they

3731  
02:26:34,469 --> 02:26:31,760  
will do how can you apply this

3732  
02:26:37,510 --> 02:26:34,479  
technology in space and to help improve

3733  
02:26:40,630 --> 02:26:37,520  
our lives here on earth

3734  
02:26:43,910 --> 02:26:40,640  
so the expectation is we have many

3735  
02:26:45,990 --> 02:26:43,920  
potential applications for sbgs

3736  
02:26:48,550 --> 02:26:46,000  
in the space context

3737  
02:26:51,270 --> 02:26:48,560  
right now we're working with marshall on

3738  
02:26:54,469 --> 02:26:51,280

a landing mission in which uh one of the

3739

02:26:56,790 --> 02:26:54,479

possible applications of sbgs in space

3740

02:26:59,190 --> 02:26:56,800

is to serve as bcom for planetary

3741

02:27:01,750 --> 02:26:59,200

landings as you probably realize every

3742

02:27:02,950 --> 02:27:01,760

time that a probe or a robot is dropped

3743

02:27:05,110 --> 02:27:02,960

in a planet

3744

02:27:07,270 --> 02:27:05,120

one of the biggest issues is how to know

3745

02:27:10,150 --> 02:27:07,280

accurately what it lands sure

3746

02:27:12,389 --> 02:27:10,160

so planetary landing is a big challenge

3747

02:27:15,510 --> 02:27:12,399

and sbgs is one of the potential

3748

02:27:18,389 --> 02:27:15,520

technologies that could be used for that

3749

02:27:21,990 --> 02:27:18,399

but besides that spgs can be used for a

3750

02:27:24,550 --> 02:27:22,000

formation flight of a small spacecraft

3751  
02:27:26,950 --> 02:27:24,560  
one of the trends in the future of space

3752  
02:27:29,830 --> 02:27:26,960  
exploration also includes that instead

3753  
02:27:33,190 --> 02:27:29,840  
of launching large spacecraft is much

3754  
02:27:35,590 --> 02:27:33,200  
more cost effective and robust to launch

3755  
02:27:38,230 --> 02:27:35,600  
a cluster of items that they need to be

3756  
02:27:41,030 --> 02:27:38,240  
oriented relative to each other at a

3757  
02:27:42,070 --> 02:27:41,040  
relatively short distance so sbgs

3758  
02:27:44,630 --> 02:27:42,080  
is a

3759  
02:27:48,070 --> 02:27:44,640  
strong candidate to fulfill that role

3760  
02:27:51,110 --> 02:27:48,080  
but so within space applications uh the

3761  
02:27:53,830 --> 02:27:51,120  
potential uses of sbgs are for proximity

3762  
02:27:55,349 --> 02:27:53,840  
maneuvers formation flight

3763  
02:27:57,910 --> 02:27:55,359

landing

3764

02:28:01,270 --> 02:27:57,920

but besides that we're very excited that

3765

02:28:04,550 --> 02:28:01,280

svgs can also be used in on earth

3766

02:28:06,870 --> 02:28:04,560

for similar applications where you need

3767

02:28:08,230 --> 02:28:06,880

robots to cooperate between each other

3768

02:28:09,830 --> 02:28:08,240

to

3769

02:28:11,910 --> 02:28:09,840

dock or

3770

02:28:13,349 --> 02:28:11,920

land if it's a drone for example a

3771

02:28:15,349 --> 02:28:13,359

picture

3772

02:28:17,270 --> 02:28:15,359

in the not too far future

3773

02:28:19,510 --> 02:28:17,280

you can put your vehicle at your

3774

02:28:21,349 --> 02:28:19,520

doorstep and a deliberate drone will

3775

02:28:24,150 --> 02:28:21,359

drop the package right where the beacon

3776

02:28:26,150 --> 02:28:24,160

is you know and it can save significant

3777

02:28:28,550 --> 02:28:26,160

effort to a delivery person who has to

3778

02:28:30,070 --> 02:28:28,560

walk just three flights of stairs sure

3779

02:28:33,030 --> 02:28:30,080

something like that just have the drone

3780

02:28:35,270 --> 02:28:33,040

drop it off picture it in new york so um

3781

02:28:38,150 --> 02:28:35,280

there are a number of applications we

3782

02:28:42,550 --> 02:28:38,160

want to go into a commercial explore the

3783

02:28:47,349 --> 02:28:45,110

developing a commercial version of svgs

3784

02:28:49,830 --> 02:28:47,359

that can be integrated with robotic

3785

02:28:51,830 --> 02:28:49,840

platforms and drones all right dr hector

3786

02:28:53,830 --> 02:28:51,840

gutierrez thank you so much best of luck

3787

02:28:56,630 --> 02:28:53,840

with the smartphone video guidance

3788

02:28:58,469 --> 02:28:56,640

sensor experiment on crew 3 and we'll be

3789

02:28:59,990 --> 02:28:58,479

watching and following along and enjoy

3790

02:29:02,150 --> 02:29:00,000

the launch thank you very much a

3791

02:29:03,590 --> 02:29:02,160

pleasure to meet you thank you you too

3792

02:29:05,190 --> 02:29:03,600

daryl we'll send it back to you all

3793

02:29:07,270 --> 02:29:05,200

right marie thank you here's a closer

3794

02:29:09,110 --> 02:29:07,280

look now at some of the life-changing

3795

02:29:11,030 --> 02:29:09,120

science astronaut astronauts are

3796

02:29:14,309 --> 02:29:11,040

performing aboard the international

3797

02:29:18,550 --> 02:29:16,230

the international space station is a

3798

02:29:20,389 --> 02:29:18,560

state-of-the-art microgravity laboratory

3799

02:29:22,630 --> 02:29:20,399

that is unlocking discoveries not

3800

02:29:24,790 --> 02:29:22,640

possible on earth and helping us push

3801

02:29:27,030 --> 02:29:24,800

farther into deep space

3802

02:29:29,429 --> 02:29:27,040

every single day we are answering big

3803

02:29:31,030 --> 02:29:29,439

questions about earth and about space

3804

02:29:32,790 --> 02:29:31,040

about where we came from and about where

3805

02:29:34,150 --> 02:29:32,800

we're going but the other thing that

3806

02:29:35,820 --> 02:29:34,160

we're doing is we're learning more

3807

02:29:39,429 --> 02:29:35,830

questions to ask

3808

02:29:41,510 --> 02:29:39,439

[Music]

3809

02:29:43,670 --> 02:29:41,520

microgravity turns almost everything we

3810

02:29:46,309 --> 02:29:43,680

know upside down

3811

02:29:49,110 --> 02:29:46,319

liquids behave completely differently

3812

02:29:52,070 --> 02:29:49,120

fire burns in new ways

3813

02:29:53,590 --> 02:29:52,080

biological systems reveal surprises

3814

02:29:55,670 --> 02:29:53,600

there's a few things that have made me

3815

02:29:57,510 --> 02:29:55,680

gasp out loud up on board space station

3816

02:29:59,510 --> 02:29:57,520

watching heart cells actually beat has

3817

02:30:01,429 --> 02:29:59,520

been a pretty big one

3818

02:30:02,950 --> 02:30:01,439

we're studying ways to grow food in

3819

02:30:05,910 --> 02:30:02,960

microgravity

3820

02:30:08,150 --> 02:30:05,920

i gotta tell you these uh

3821

02:30:11,270 --> 02:30:08,160

these are pretty amazing we're learning

3822

02:30:13,030 --> 02:30:11,280

how human bodies react to life in space

3823

02:30:15,349 --> 02:30:13,040

and how to keep crew members safe and

3824

02:30:16,389 --> 02:30:15,359

strong on long duration exploration

3825

02:30:18,230 --> 02:30:16,399

missions

3826  
02:30:21,190 --> 02:30:18,240  
deadlifts are awesome on earth they're

3827  
02:30:23,110 --> 02:30:21,200  
also awesome in zero gravity

3828  
02:30:25,110 --> 02:30:23,120  
we're testing technologies that will be

3829  
02:30:28,309 --> 02:30:25,120  
critical to our return to the moon and

3830  
02:30:32,950 --> 02:30:30,550  
our research has contributed to medical

3831  
02:30:35,110 --> 02:30:32,960  
and social benefits on our home planet

3832  
02:30:37,510 --> 02:30:35,120  
allowing us to find new ways to combat

3833  
02:30:39,590 --> 02:30:37,520  
disease back on earth and develop

3834  
02:30:43,670 --> 02:30:39,600  
technologies to deliver clean water to

3835  
02:30:48,469 --> 02:30:45,670  
the spectacular vantage point of more

3836  
02:30:50,469 --> 02:30:48,479  
than 200 miles above our planet supports

3837  
02:30:53,190 --> 02:30:50,479  
our monitoring of earth's climate

3838  
02:30:55,349 --> 02:30:53,200

natural disasters and plant life our

3839

02:30:56,790 --> 02:30:55,359

planet earth is absolutely stunning to

3840

02:30:58,830 --> 02:30:56,800

me it doesn't matter where we are in the

3841

02:31:00,389 --> 02:30:58,840

world i just see beauty in different

3842

02:31:03,030 --> 02:31:00,399

ways

3843

02:31:05,349 --> 02:31:03,040

the growing new space economy so vital

3844

02:31:09,190 --> 02:31:05,359

to our continued progress in space is

3845

02:31:13,990 --> 02:31:11,910

we're inspiring future generations from

3846

02:31:16,630 --> 02:31:14,000

a platform that is one of the largest

3847

02:31:18,150 --> 02:31:16,640

international collaborations of our time

3848

02:31:20,630 --> 02:31:18,160

[Music]

3849

02:31:22,710 --> 02:31:20,640

we're doing science at 17

3850

02:31:29,590 --> 02:31:22,720

500 miles per hour

3851

02:31:37,429 --> 02:31:34,790

[Music]

3852

02:31:40,550 --> 02:31:37,439

and shannon you were a part of that ride

3853

02:31:42,469 --> 02:31:40,560

doing that science at 17 500 miles an

3854

02:31:43,990 --> 02:31:42,479

hour yes i was

3855

02:31:46,150 --> 02:31:44,000

and it looks like

3856

02:31:48,070 --> 02:31:46,160

they're gonna have a busy time up there

3857

02:31:50,469 --> 02:31:48,080

i think so there's so much science to be

3858

02:31:52,550 --> 02:31:50,479

done uh the ground crews do a very good

3859

02:31:54,389 --> 02:31:52,560

job of keeping the crew

3860

02:31:56,469 --> 02:31:54,399

on board scheduled

3861

02:31:59,110 --> 02:31:56,479

the entire day doing that science

3862

02:32:01,030 --> 02:31:59,120

taking advantage of every moment

3863

02:32:03,990 --> 02:32:01,040

as we look live inside the dragon

3864

02:32:06,070 --> 02:32:04,000

capsule we are t minus one hour and 44

3865

02:32:08,710 --> 02:32:06,080

minutes until liftoff we are here with

3866

02:32:10,469 --> 02:32:08,720

shannon walker nasa astronaut who flew

3867

02:32:13,510 --> 02:32:10,479

on crew one

3868

02:32:15,190 --> 02:32:13,520

watching crew 3 prepare to get ready for

3869

02:32:17,750 --> 02:32:15,200

their flight and it

3870

02:32:19,349 --> 02:32:17,760

it appears they haven't been very chatty

3871

02:32:21,750 --> 02:32:19,359

no they haven't been very chatty i guess

3872

02:32:23,670 --> 02:32:21,760

it's a quiet crew it's a quiet crew

3873

02:32:25,830 --> 02:32:23,680

and that's just fine as they

3874

02:32:28,630 --> 02:32:25,840

prepare for their liftoff crew 3 is

3875

02:32:30,950 --> 02:32:28,640

scheduled to arrive to station just days

3876

02:32:34,150 --> 02:32:30,960

after astronauts from crew 2 returned

3877

02:32:37,510 --> 02:32:34,160

home from a record-setting space flight

3878

02:32:39,910 --> 02:32:37,520

take a look at this at 10 33 pm eastern

3879

02:32:41,910 --> 02:32:39,920

time the view looks a little similar

3880

02:32:44,230 --> 02:32:41,920

this is crew 2 though safely splashing

3881

02:32:46,469 --> 02:32:44,240

down in the gulf off the coast of

3882

02:32:48,550 --> 02:32:46,479

pensacola there's a view from the

3883

02:32:51,270 --> 02:32:48,560

infrared camera as the

3884

02:32:53,429 --> 02:32:51,280

parachutes opened up

3885

02:32:55,990 --> 02:32:53,439

the crew of uh

3886

02:32:58,150 --> 02:32:56,000

shane kimbrough megan macarthur jackson

3887

02:33:00,790 --> 02:32:58,160

astronaut aki hoshide and

3888

02:33:03,030 --> 02:33:00,800

east astronaut tomah pesquet they

3889

02:33:03,990 --> 02:33:03,040

landed safely splashing down there in

3890

02:33:06,070 --> 02:33:04,000

the gulf

3891

02:33:09,750 --> 02:33:06,080

as the parachutes came down around them

3892

02:33:12,550 --> 02:33:09,760

they spent 199 days in orbit shannon

3893

02:33:15,670 --> 02:33:12,560

surpassing the previous record of 168

3894

02:33:17,670 --> 02:33:15,680

days set by crew one astronauts of which

3895

02:33:20,870 --> 02:33:17,680

you were apart i was i would have loved

3896

02:33:22,550 --> 02:33:20,880

to have stayed up 199 days but 168's not

3897

02:33:24,469 --> 02:33:22,560

bad either

3898

02:33:26,150 --> 02:33:24,479

and before they returned to earth nasa

3899

02:33:28,150 --> 02:33:26,160

astronauts shane kimbrough and megan

3900

02:33:30,309 --> 02:33:28,160

macarthur well they were good tenants

3901

02:33:32,710 --> 02:33:30,319

because they made sure that station was

3902

02:33:36,870 --> 02:33:32,720

ready for crew 3 i had a chance to speak

3903

02:33:39,349 --> 02:33:36,880

with them in space before they came home

3904

02:33:40,550 --> 02:33:39,359

hey shane and megan great to be with you

3905

02:33:42,950 --> 02:33:40,560

today

3906

02:33:45,110 --> 02:33:42,960

this is fantastic you guys are currently

3907

02:33:47,750 --> 02:33:45,120

over the pacific ocean

3908

02:33:49,910 --> 02:33:47,760

cruising at 17 500 miles per hour

3909

02:33:52,070 --> 02:33:49,920

towards our general direction though it

3910

02:33:54,389 --> 02:33:52,080

doesn't look like you're going that fast

3911

02:33:56,950 --> 02:33:54,399

and megan your hair is looking luxurious

3912

02:34:00,950 --> 02:33:58,630

thank you very much

3913

02:34:03,670 --> 02:34:00,960

so tell me um you're getting ready for

3914

02:34:05,429 --> 02:34:03,680

crew 3 to arrive

3915

02:34:07,030 --> 02:34:05,439

yeah so we've been getting your their

3916

02:34:08,389 --> 02:34:07,040

sleep stations ready to go they're crew

3917

02:34:09,429 --> 02:34:08,399

quarters so we've been cleaning those

3918

02:34:11,270 --> 02:34:09,439

and getting them all ready so they're

3919

02:34:13,510 --> 02:34:11,280

going to be set we also have got their

3920

02:34:14,830 --> 02:34:13,520

suitcases up here and uh

3921

02:34:16,950 --> 02:34:14,840

we got one here's

3922

02:34:19,349 --> 02:34:16,960

raja's and we got

3923

02:34:21,510 --> 02:34:19,359

kayla's there and so we've got toms and

3924

02:34:23,429 --> 02:34:21,520

matthias's as well so all your clothes

3925

02:34:25,030 --> 02:34:23,439

are ready to go for the next six months

3926

02:34:27,110 --> 02:34:25,040

so that's going to be set all your

3927

02:34:29,110 --> 02:34:27,120

food's ready to go as well

3928

02:34:30,790 --> 02:34:29,120

and given though the size of those

3929

02:34:33,670 --> 02:34:30,800

suitcases it doesn't look like the

3930

02:34:35,349 --> 02:34:33,680

wardrobe is uh having a lot of variety

3931

02:34:36,230 --> 02:34:35,359

but you don't need a lot of that up in

3932

02:34:40,469 --> 02:34:36,240

space

3933

02:34:42,950 --> 02:34:40,479

you know for the for the folks that are

3934

02:34:44,230 --> 02:34:42,960

coming up three of the four astronauts

3935

02:34:47,030 --> 02:34:44,240

this is going to be their first space

3936

02:34:49,429 --> 02:34:47,040

flight for those three astronauts we

3937

02:34:51,510 --> 02:34:49,439

know they've trained extensively but

3938

02:34:54,230 --> 02:34:51,520

what is something as a first-timer they

3939

02:34:55,910 --> 02:34:54,240

will experience that you just can't

3940

02:34:57,270 --> 02:34:55,920

train for

3941

02:34:59,030 --> 02:34:57,280

well darryl that's a great question and

3942

02:35:00,710 --> 02:34:59,040

really it's the physical environment

3943

02:35:02,870 --> 02:35:00,720

that we live in that is really hard

3944

02:35:05,270 --> 02:35:02,880

obviously to train for when you live in

3945

02:35:07,590 --> 02:35:05,280

1g on earth and so it's how you move

3946

02:35:09,270 --> 02:35:07,600

around how you move efficiently how you

3947

02:35:10,469 --> 02:35:09,280

can you know go floating and flying

3948

02:35:12,230 --> 02:35:10,479

through the space station without

3949

02:35:13,990 --> 02:35:12,240

crashing into things without knocking

3950

02:35:15,270 --> 02:35:14,000

things off the walls but these are these

3951  
02:35:16,469 --> 02:35:15,280  
are all smart folks uh they're gonna

3952  
02:35:17,990 --> 02:35:16,479  
figure it out really quick and they're

3953  
02:35:19,270 --> 02:35:18,000  
gonna be doing great work up here before

3954  
02:35:21,190 --> 02:35:19,280  
we know it

3955  
02:35:24,070 --> 02:35:21,200  
hey shane uh one of the veteran

3956  
02:35:27,110 --> 02:35:24,080  
astronauts thomas marshburn you know him

3957  
02:35:29,030 --> 02:35:27,120  
pretty well um you got any stories about

3958  
02:35:31,270 --> 02:35:29,040  
him he's a veteran astronaut just like

3959  
02:35:32,710 --> 02:35:31,280  
you flew on shuttle been up to the

3960  
02:35:35,030 --> 02:35:32,720  
station before

3961  
02:35:37,750 --> 02:35:35,040  
and both of you the astronaut class of

3962  
02:35:40,550 --> 02:35:37,760  
2004 so you got any good stories about

3963  
02:35:44,309 --> 02:35:40,560

tom

3964

02:35:46,630 --> 02:35:44,319

great guy um he was at nasa before we

3965

02:35:48,469 --> 02:35:46,640

were selected as astronauts um as a

3966

02:35:50,389 --> 02:35:48,479

flight surgeon so some folks may not

3967

02:35:51,910 --> 02:35:50,399

know that so he was kind of the go-to

3968

02:35:53,910 --> 02:35:51,920

person in our class of hey what's it

3969

02:35:55,830 --> 02:35:53,920

really like what i don't understand this

3970

02:35:57,349 --> 02:35:55,840

how nasa runs and since he'd been here a

3971

02:35:59,429 --> 02:35:57,359

little while he's he was definitely our

3972

02:36:00,870 --> 02:35:59,439

go-to person for that tom and i are also

3973

02:36:02,550 --> 02:36:00,880

both from atlanta so we have that in

3974

02:36:04,309 --> 02:36:02,560

common and we've enjoyed working

3975

02:36:05,590 --> 02:36:04,319

together and training together over

3976

02:36:07,670 --> 02:36:05,600

these many years

3977

02:36:10,469 --> 02:36:07,680

a couple of southern guys that's great i

3978

02:36:13,270 --> 02:36:10,479

want to ask you though um currently crew

3979

02:36:14,950 --> 02:36:13,280

3 as they're getting ready to go up i

3980

02:36:16,389 --> 02:36:14,960

was watching you guys play a game in

3981

02:36:17,750 --> 02:36:16,399

fact the entire world was watching you

3982

02:36:19,910 --> 02:36:17,760

guys play a game

3983

02:36:21,910 --> 02:36:19,920

with your thumbs and i'm just curious

3984

02:36:24,070 --> 02:36:21,920

what was that game and and why were you

3985

02:36:26,550 --> 02:36:24,080

playing it

3986

02:36:29,270 --> 02:36:26,560

so that is actually a french game that

3987

02:36:29,990 --> 02:36:29,280

our isa crewmate thomas pesquet taught

3988

02:36:31,670 --> 02:36:30,000

us

3989

02:36:34,070 --> 02:36:31,680

it's called the game of thumbs so very

3990

02:36:36,870 --> 02:36:34,080

original title and uh we're basically

3991

02:36:38,150 --> 02:36:36,880

playing it to pass the time so we were

3992

02:36:40,150 --> 02:36:38,160

you know you have a lot of time when

3993

02:36:41,670 --> 02:36:40,160

you're sitting in the vehicle um and we

3994

02:36:43,670 --> 02:36:41,680

had during that launch week you know you

3995

02:36:45,030 --> 02:36:43,680

have some some practice runs as well and

3996

02:36:46,550 --> 02:36:45,040

so you have a lot of time sitting in the

3997

02:36:48,389 --> 02:36:46,560

vehicle while the vehicle is getting

3998

02:36:50,469 --> 02:36:48,399

fueled and of course you know we talked

3999

02:36:52,309 --> 02:36:50,479

to each other about what um you know to

4000

02:36:53,750 --> 02:36:52,319

be prepared for any emergency scenario

4001  
02:36:55,750 --> 02:36:53,760  
that might happen we talk through all of

4002  
02:36:56,950 --> 02:36:55,760  
our nominal tasks and monitoring that

4003  
02:36:59,190 --> 02:36:56,960  
we're going to do and then we still have

4004  
02:37:01,110 --> 02:36:59,200  
some extra time and so tama had this

4005  
02:37:03,030 --> 02:37:01,120  
game at the ready for us to play and

4006  
02:37:05,190 --> 02:37:03,040  
that kept us entertained for the time

4007  
02:37:07,030 --> 02:37:05,200  
between the activities that we had to do

4008  
02:37:08,870 --> 02:37:07,040  
shane kimbrough and megan mcarthur

4009  
02:37:10,870 --> 02:37:08,880  
aboard the international space station

4010  
02:37:12,710 --> 02:37:10,880  
thank you so much and by the way fun

4011  
02:37:15,429 --> 02:37:12,720  
fact during this interview you just

4012  
02:37:17,429 --> 02:37:15,439  
traveled 3 000 miles incredible thanks

4013  
02:37:19,510 --> 02:37:17,439

daryl really great talking to you and uh

4014

02:37:21,510 --> 02:37:19,520

get crew 3 up here safely we're looking

4015

02:37:26,630 --> 02:37:21,520

forward to having them on board

4016

02:37:30,389 --> 02:37:28,230

but there's the floating flip you get

4017

02:37:32,790 --> 02:37:30,399

you can't yeah shots without having to

4018

02:37:35,190 --> 02:37:32,800

flip always got to do it shane and megan

4019

02:37:37,030 --> 02:37:35,200

they were great and you know it was uh

4020

02:37:39,110 --> 02:37:37,040

it was great to find out about that game

4021

02:37:41,349 --> 02:37:39,120

they they enjoyed games uh this crew

4022

02:37:43,190 --> 02:37:41,359

apparently is enjoying some solitude i

4023

02:37:44,790 --> 02:37:43,200

think so they're all i but they are

4024

02:37:46,469 --> 02:37:44,800

doing what megan just said they are

4025

02:37:47,750 --> 02:37:46,479

going through the nominal procedures

4026

02:37:49,910 --> 02:37:47,760

they're talking through the emergency

4027

02:37:51,510 --> 02:37:49,920

procedures uh to make sure that they are

4028

02:37:53,190 --> 02:37:51,520

prepared when launch actually happens

4029

02:37:55,110 --> 02:37:53,200

shane and megan back on the ground chen

4030

02:37:56,790 --> 02:37:55,120

and you were out there when they came

4031

02:37:59,110 --> 02:37:56,800

down and you were one of the first

4032

02:38:01,030 --> 02:37:59,120

people they saw i was it's just it's

4033

02:38:02,550 --> 02:38:01,040

hard to believe it was just monday night

4034

02:38:04,150 --> 02:38:02,560

when they splashed down but it was

4035

02:38:06,309 --> 02:38:04,160

pretty special for me to be out on the

4036

02:38:07,830 --> 02:38:06,319

ship that gathered up the capsule and i

4037

02:38:09,670 --> 02:38:07,840

got to see the crew and it was extra

4038

02:38:11,830 --> 02:38:09,680

special because i was on station when

4039

02:38:13,349 --> 02:38:11,840

they uh came on board and then i got to

4040

02:38:14,469 --> 02:38:13,359

be there when they splashed down how

4041

02:38:16,230 --> 02:38:14,479

about that

4042

02:38:18,070 --> 02:38:16,240

that must have brought a smile to their

4043

02:38:20,469 --> 02:38:18,080

faces even after you know coming back

4044

02:38:22,309 --> 02:38:20,479

from space yes yes they all told me that

4045

02:38:24,870 --> 02:38:22,319

it was great to see the

4046

02:38:26,630 --> 02:38:24,880

my friendly face great story shannon

4047

02:38:28,550 --> 02:38:26,640

thank you so much and now let's check

4048

02:38:30,870 --> 02:38:28,560

back in on launch operations in

4049

02:38:34,550 --> 02:38:30,880

hawthorne john i what is the team at

4050

02:38:39,429 --> 02:38:37,030

thanks daryl we're coming up on just

4051  
02:38:40,550 --> 02:38:39,439  
under one hour and 38 minutes before

4052  
02:38:42,950 --> 02:38:40,560  
launch

4053  
02:38:45,190 --> 02:38:42,960  
now the crew of four are in the capsule

4054  
02:38:47,190 --> 02:38:45,200  
hatches close and we have heard a

4055  
02:38:47,990 --> 02:38:47,200  
successful completion of the hatch leak

4056  
02:38:49,590 --> 02:38:48,000  
check

4057  
02:38:50,950 --> 02:38:49,600  
so pretty much everything is finished

4058  
02:38:53,349 --> 02:38:50,960  
with the capsule

4059  
02:38:55,429 --> 02:38:53,359  
the ground team will be securing the

4060  
02:38:57,429 --> 02:38:55,439  
white room the access arm and they'll be

4061  
02:38:59,190 --> 02:38:57,439  
off of the pad in just about a little

4062  
02:39:01,349 --> 02:38:59,200  
more than 30 minutes

4063  
02:39:03,429 --> 02:39:01,359

now the launch engineers for falcon 9 in

4064

02:39:05,670 --> 02:39:03,439

their firing room 4 in the nasa launch

4065

02:39:07,270 --> 02:39:05,680

control center that's just outside the

4066

02:39:09,190 --> 02:39:07,280

vehicle assembly building at kennedy

4067

02:39:10,469 --> 02:39:09,200

space center you can see the view

4068

02:39:13,349 --> 02:39:10,479

they're going to have through those

4069

02:39:15,750 --> 02:39:13,359

large windows of pad 39a it's five

4070

02:39:17,990 --> 02:39:15,760

kilometers just east of them we get

4071

02:39:19,190 --> 02:39:18,000

liftoff it's going to light up the sky

4072

02:39:20,950 --> 02:39:19,200

and i think everybody's going to be

4073

02:39:22,870 --> 02:39:20,960

looking out those windows

4074

02:39:24,950 --> 02:39:22,880

now the falcon 9 team has loaded the

4075

02:39:27,349 --> 02:39:24,960

helium and nitrogen gas into the storage

4076  
02:39:29,590 --> 02:39:27,359  
bottles on the launch vehicle we've done

4077  
02:39:31,670 --> 02:39:29,600  
some rf checkouts a little bit earlier

4078  
02:39:33,270 --> 02:39:31,680  
this evening and we're doing a final

4079  
02:39:35,349 --> 02:39:33,280  
review of vehicle tests that were

4080  
02:39:37,270 --> 02:39:35,359  
performed earlier today

4081  
02:39:39,510 --> 02:39:37,280  
now the spacex chief engineer will be

4082  
02:39:41,429 --> 02:39:39,520  
checking with the team at t minus 80

4083  
02:39:43,510 --> 02:39:41,439  
minutes to verify that we are good to

4084  
02:39:45,990 --> 02:39:43,520  
continue the countdown

4085  
02:39:47,670 --> 02:39:46,000  
now the next major activity is flowing a

4086  
02:39:50,389 --> 02:39:47,680  
small amount of fuel into the first

4087  
02:39:51,510 --> 02:39:50,399  
stage to prime the merlin 1d engines for

4088  
02:39:53,590 --> 02:39:51,520

ignition

4089

02:39:56,150 --> 02:39:53,600

now the team's also monitoring fuel and

4090

02:39:57,670 --> 02:39:56,160

liquid oxygen loading preparations we're

4091

02:39:59,510 --> 02:39:57,680

ensuring that the propellants that are

4092

02:40:01,429 --> 02:39:59,520

in the ground storage tanks are

4093

02:40:03,990 --> 02:40:01,439

correctly chilled before we load those

4094

02:40:07,190 --> 02:40:04,000

into the falcon 9 beginning at t minus

4095

02:40:09,190 --> 02:40:07,200

35 minutes now for the range in the

4096

02:40:11,590 --> 02:40:09,200

weather the range continues to be go we

4097

02:40:13,190 --> 02:40:11,600

are continuing to release balloons we

4098

02:40:14,870 --> 02:40:13,200

have been getting balloon data back from

4099

02:40:17,349 --> 02:40:14,880

the upper altitudes everything looks

4100

02:40:19,190 --> 02:40:17,359

good and more importantly the weather

4101  
02:40:21,269 --> 02:40:19,200  
has gone green again they said it would

4102  
02:40:23,510 --> 02:40:21,279  
be just a short period we were red for

4103  
02:40:25,670 --> 02:40:23,520  
precipitation that has cleared up and

4104  
02:40:27,830 --> 02:40:25,680  
weather says that we should be clear the

4105  
02:40:30,309 --> 02:40:27,840  
rest of the way through the countdown so

4106  
02:40:34,150 --> 02:40:30,319  
with that everything is a go we'll turn

4107  
02:40:36,550 --> 02:40:34,160  
it over to courtney here at hawthorne

4108  
02:40:38,870 --> 02:40:36,560  
john the draco spacecraft you see on

4109  
02:40:41,510 --> 02:40:38,880  
your screen is capable of carrying up to

4110  
02:40:43,670 --> 02:40:41,520  
seven passengers to and from earth's

4111  
02:40:45,830 --> 02:40:43,680  
orbit and beyond and what we have

4112  
02:40:48,070 --> 02:40:45,840  
sitting right here in front of us is a

4113  
02:40:49,990 --> 02:40:48,080

draco engine which helps get dragon from

4114

02:40:52,150 --> 02:40:50,000

one place to the next and we're really

4115

02:40:53,910 --> 02:40:52,160

excited to share some details about this

4116

02:40:55,990 --> 02:40:53,920

engine but first let's take a closer

4117

02:40:58,070 --> 02:40:56,000

look at the overall dragon vehicle

4118

02:41:01,670 --> 02:40:58,080

yeah courtney just to get an idea for

4119

02:41:03,429 --> 02:41:01,680

size this is our dragon vehicle and from

4120

02:41:06,870 --> 02:41:03,439

the bottom to the top of the vehicle is

4121

02:41:09,590 --> 02:41:06,880

about eight meters or about 27 feet tall

4122

02:41:12,070 --> 02:41:09,600

and about four meters in diameter or 13

4123

02:41:14,150 --> 02:41:12,080

13 feet in diameter the bottom portion

4124

02:41:16,150 --> 02:41:14,160

of it is called the trunk and this is

4125

02:41:18,150 --> 02:41:16,160

the unpressurized portion of the vehicle

4126  
02:41:19,269 --> 02:41:18,160  
whereas the top portion here is the

4127  
02:41:21,670 --> 02:41:19,279  
dragon capsule and this is the

4128  
02:41:23,190 --> 02:41:21,680  
pressurized section this black portion

4129  
02:41:24,710 --> 02:41:23,200  
on the trunk here is actually a bunch of

4130  
02:41:26,070 --> 02:41:24,720  
solar panels and that helps power the

4131  
02:41:29,269 --> 02:41:26,080  
vehicle

4132  
02:41:31,110 --> 02:41:29,279  
while it's on the pad and while it's in

4133  
02:41:33,190 --> 02:41:31,120  
in flight as well as while it's attached

4134  
02:41:36,309 --> 02:41:33,200  
to the international space station and

4135  
02:41:38,550 --> 02:41:36,319  
we also have 16 draco thrusters on the

4136  
02:41:40,550 --> 02:41:38,560  
vehicle that help maneuver it around and

4137  
02:41:43,269 --> 02:41:40,560  
eight super draco thrusters

4138  
02:41:44,950 --> 02:41:43,279

to help in case of emergency for a

4139

02:41:47,510 --> 02:41:44,960

launch escape system

4140

02:41:49,269 --> 02:41:47,520

it is the only spacecraft currently

4141

02:41:51,830 --> 02:41:49,279

flying that is capable of returning

4142

02:41:53,590 --> 02:41:51,840

significant amounts of cargo to earth

4143

02:41:55,510 --> 02:41:53,600

from the international space station and

4144

02:41:57,590 --> 02:41:55,520

it's the first private spacecraft to

4145

02:41:59,590 --> 02:41:57,600

take humans to the space station in

4146

02:42:02,070 --> 02:41:59,600

order to make this journey dragon is

4147

02:42:03,990 --> 02:42:02,080

equipped with 16 draco thrusters which

4148

02:42:06,150 --> 02:42:04,000

are used to maneuver the spacecraft

4149

02:42:08,389 --> 02:42:06,160

during the mission and today we actually

4150

02:42:10,950 --> 02:42:08,399

have some flight proven thrusters to

4151  
02:42:12,950 --> 02:42:10,960  
show viewers each were flown on the

4152  
02:42:14,950 --> 02:42:12,960  
first version of our dragon vehicle and

4153  
02:42:16,710 --> 02:42:14,960  
we have one right here yeah courtney i

4154  
02:42:18,950 --> 02:42:16,720  
think this is so cool that we have this

4155  
02:42:20,790 --> 02:42:18,960  
in front of us this specific draco

4156  
02:42:24,870 --> 02:42:20,800  
engine has actually flown twice and

4157  
02:42:27,910 --> 02:42:24,880  
that's been on crs-9 in 2016 and crs-15

4158  
02:42:30,230 --> 02:42:27,920  
back in 2018 on the first version of our

4159  
02:42:31,990 --> 02:42:30,240  
dragon vehicle and reusability is so

4160  
02:42:34,790 --> 02:42:32,000  
important to us so it's really great to

4161  
02:42:37,030 --> 02:42:34,800  
see a vehicle or a thruster right in

4162  
02:42:39,190 --> 02:42:37,040  
front of us that has proven that it can

4163  
02:42:40,950 --> 02:42:39,200

re-fly in this design

4164

02:42:43,429 --> 02:42:40,960

each thruster is capable of generating

4165

02:42:45,670 --> 02:42:43,439

90 pounds of force in the vacuum of

4166

02:42:48,790 --> 02:42:45,680

space and the earlier cargo version of

4167

02:42:51,030 --> 02:42:48,800

dragon fired its thrusters more than 450

4168

02:42:53,510 --> 02:42:51,040

000 times that's between missions and

4169

02:42:55,510 --> 02:42:53,520

testing an interesting fact about the

4170

02:42:56,950 --> 02:42:55,520

draco engines is that they can serve

4171

02:42:58,630 --> 02:42:56,960

different functions based on their

4172

02:43:01,590 --> 02:42:58,640

positions on the spacecraft so if you

4173

02:43:03,830 --> 02:43:01,600

can see um on the vehicle you know

4174

02:43:05,590 --> 02:43:03,840

depending on what orientation um we need

4175

02:43:07,590 --> 02:43:05,600

to maneuver the vehicle there are

4176

02:43:08,870 --> 02:43:07,600

thrusters that are oriented um

4177

02:43:11,670 --> 02:43:08,880

differently so that we can make those

4178

02:43:14,870 --> 02:43:12,630

yeah well thank you for your

4179

02:43:16,389 --> 02:43:14,880

demonstration that was great and i just

4180

02:43:18,710 --> 02:43:16,399

want to be sure everyone knows not to be

4181

02:43:20,950 --> 02:43:18,720

confused with the super draco thrusters

4182

02:43:22,950 --> 02:43:20,960

we're coming up on the launch escape

4183

02:43:25,269 --> 02:43:22,960

system health checks the launch escape

4184

02:43:27,110 --> 02:43:25,279

system is the automated system in place

4185

02:43:29,349 --> 02:43:27,120

that can fire the eight super draco

4186

02:43:31,269 --> 02:43:29,359

thrusters on dragon to quickly separate

4187

02:43:33,750 --> 02:43:31,279

the crew from the rocket either on the

4188

02:43:35,429 --> 02:43:33,760

pad or during the ride uphill while we

4189

02:43:37,269 --> 02:43:35,439

wait on those launch escape system

4190

02:43:39,590 --> 02:43:37,279

health checks let's check back in with

4191

02:43:41,510 --> 02:43:39,600

our team at kennedy space center daryl

4192

02:43:44,389 --> 02:43:41,520

all right thank you courtney and a great

4193

02:43:46,070 --> 02:43:44,399

uh show and tell there with uh that's i

4194

02:43:48,630 --> 02:43:46,080

i enjoyed that

4195

02:43:51,190 --> 02:43:48,640

yeah we're currently t minus one hour

4196

02:43:53,990 --> 02:43:51,200

and 32 minutes and counting until

4197

02:43:55,590 --> 02:43:54,000

liftoff and until crew dragon flies its

4198

02:43:57,830 --> 02:43:55,600

next four-person crew to the

4199

02:44:00,070 --> 02:43:57,840

international space station

4200

02:44:01,990 --> 02:44:00,080

they'll of course have the astronauts uh

4201

02:44:04,870 --> 02:44:02,000

inside the spacecraft you're looking

4202

02:44:07,269 --> 02:44:04,880

live down the crew access arm at uh the

4203

02:44:08,070 --> 02:44:07,279

capsule on top of that falcon 9 rocket

4204

02:44:10,389 --> 02:44:08,080

there

4205

02:44:13,510 --> 02:44:10,399

inside the spacecraft commander raj

4206

02:44:15,670 --> 02:44:13,520

atari pilot tom marshburn and mission

4207

02:44:19,030 --> 02:44:15,680

specialist kayla barron and matthias

4208

02:44:25,030 --> 02:44:21,110

we've had some progress uh since we had

4209

02:44:28,710 --> 02:44:27,110

some of that progress we've seen so far

4210

02:44:31,110 --> 02:44:28,720

shannon would you outline some of that

4211

02:44:32,469 --> 02:44:31,120

for us well so what we've done you can

4212

02:44:34,389 --> 02:44:32,479

see there that the

4213

02:44:36,070 --> 02:44:34,399

closeout crew is still working on

4214

02:44:37,670 --> 02:44:36,080

closing out the hatch

4215

02:44:39,429 --> 02:44:37,680

that does take a while longer than one

4216

02:44:41,429 --> 02:44:39,439

might expect but again you'll want to

4217

02:44:44,230 --> 02:44:41,439

make sure that everything is done just

4218

02:44:46,309 --> 02:44:44,240

so so that hatch will

4219

02:44:48,309 --> 02:44:46,319

hold its pressure uh before the hatch

4220

02:44:50,389 --> 02:44:48,319

closure we had the suit leak check so we

4221

02:44:52,950 --> 02:44:50,399

want those spacesuits to work properly

4222

02:44:54,389 --> 02:44:52,960

should we need them in an emergency and

4223

02:44:56,790 --> 02:44:54,399

they've done some other systems checks

4224

02:44:59,110 --> 02:44:56,800

to get ready for the all-important

4225

02:45:01,110 --> 02:44:59,120

arming of the launch escape system

4226

02:45:03,110 --> 02:45:01,120

absolutely we saw a shot there of the

4227

02:45:06,630 --> 02:45:03,120

crew or the closeout crew they were

4228

02:45:08,309 --> 02:45:06,640

tethered as you can see there both uh

4229

02:45:10,950 --> 02:45:08,319

the the crew member on the left and the

4230

02:45:13,670 --> 02:45:10,960

right you can see those tethers because

4231

02:45:16,150 --> 02:45:13,680

they're literally 255 feet up they are

4232

02:45:18,230 --> 02:45:16,160

they are and there's there's a little uh

4233

02:45:20,150 --> 02:45:18,240

space there that we do not want them to

4234

02:45:21,750 --> 02:45:20,160

fall through so absolutely that's why we

4235

02:45:24,230 --> 02:45:21,760

keep them tethered and it looks like a

4236

02:45:26,870 --> 02:45:24,240

step ladder there in case they they need

4237

02:45:28,230 --> 02:45:26,880

to get up a little higher right exactly

4238

02:45:30,790 --> 02:45:28,240

it's good to have the right tools on

4239

02:45:32,950 --> 02:45:30,800

hand here in just a few seconds um

4240

02:45:35,590 --> 02:45:32,960

around an hour and 30 minutes before

4241

02:45:37,590 --> 02:45:35,600

liftoff in our launch timeline

4242

02:45:40,230 --> 02:45:37,600

we should have that launch escape system

4243

02:45:42,870 --> 02:45:40,240

and communication checks uh conducted by

4244

02:45:44,710 --> 02:45:42,880

the falcon launch team

4245

02:45:46,070 --> 02:45:44,720

these checkouts as shannon mentioned

4246

02:45:47,190 --> 02:45:46,080

their standard part of the launch

4247

02:45:48,790 --> 02:45:47,200

countdown

4248

02:45:50,950 --> 02:45:48,800

of course it's critical to make sure

4249

02:45:53,030 --> 02:45:50,960

everything is working

4250

02:46:01,110 --> 02:45:53,040

in order before arming this launch

4251  
02:46:05,830 --> 02:46:03,349  
we'll get this call out in just a few

4252  
02:46:10,309 --> 02:46:07,830  
yeah it looks like the closeout crew is

4253  
02:46:12,790 --> 02:46:10,319  
finishing up

4254  
02:46:14,710 --> 02:46:12,800  
hopefully all is good checking out with

4255  
02:46:17,030 --> 02:46:14,720  
that hatch there

4256  
02:46:18,550 --> 02:46:17,040  
and as soon as they probably back away

4257  
02:46:20,150 --> 02:46:18,560  
and leave

4258  
02:46:25,750 --> 02:46:20,160  
we will hear the arming of the launch

4259  
02:46:29,510 --> 02:46:27,110  
but i tell you if there's still work to

4260  
02:46:32,550 --> 02:46:29,520  
do they will sit there and keep working

4261  
02:46:35,030 --> 02:46:32,560  
until that hatch is adequately closed

4262  
02:46:36,309 --> 02:46:35,040  
and we know that it will hold pressure

4263  
02:46:37,750 --> 02:46:36,319

what does it sound like as you're

4264

02:46:39,110 --> 02:46:37,760

sitting there in the seat and they're

4265

02:46:40,630 --> 02:46:39,120

working on it from the outside yeah you

4266

02:46:43,590 --> 02:46:40,640

kind of hear some thumping and bumping

4267

02:46:45,510 --> 02:46:43,600

uh going on and um you do have those two

4268

02:46:47,429 --> 02:46:45,520

windows in front so you can kind of see

4269

02:46:49,429 --> 02:46:47,439

a little bit what's what's happening but

4270

02:46:50,710 --> 02:46:49,439

mostly you really don't know exactly

4271

02:46:52,630 --> 02:46:50,720

what they're doing you just know that

4272

02:46:57,670 --> 02:46:52,640

they are working on it and

4273

02:47:01,830 --> 02:46:59,590

looks like we're going to need to

4274

02:47:03,670 --> 02:47:01,840

check something out a little bit taller

4275

02:47:05,349 --> 02:47:03,680

higher up on the capsule there now that

4276  
02:47:22,870 --> 02:47:05,359  
stepladder came in handy yeah it sure

4277  
02:47:26,070 --> 02:47:24,550  
not sure what that was i'm not sure what

4278  
02:47:30,230 --> 02:47:26,080  
that was either but it

4279  
02:47:32,550 --> 02:47:30,240  
it looked like it was a duck to uh flow

4280  
02:47:34,230 --> 02:47:32,560  
air or something to the spacecraft

4281  
02:47:36,230 --> 02:47:34,240  
clearly it did not need to be there for

4282  
02:47:38,469 --> 02:47:36,240  
the launch and so they spent the time

4283  
02:47:41,750 --> 02:47:38,479  
needed to remove it it did look like

4284  
02:47:41,760 --> 02:47:50,710  
as they continue to work here

4285  
02:47:54,710 --> 02:47:52,710  
as you mentioned they will take the time

4286  
02:47:56,790 --> 02:47:54,720  
necessary

4287  
02:47:58,710 --> 02:47:56,800  
to make sure everything is secure

4288  
02:48:00,950 --> 02:47:58,720

absolutely right and

4289

02:48:03,590 --> 02:48:00,960

everybody knows what the

4290

02:48:05,910 --> 02:48:03,600

timeline milestones are so they have a

4291

02:48:07,670 --> 02:48:05,920

very good idea of when they need to

4292

02:48:09,429 --> 02:48:07,680

finish up this activity they're not

4293

02:48:10,630 --> 02:48:09,439

going to rush through it by any stretch

4294

02:48:12,870 --> 02:48:10,640

of the imagination they're going to do

4295

02:48:14,790 --> 02:48:12,880

it very methodically very carefully but

4296

02:48:16,389 --> 02:48:14,800

we do have a timeline because that was

4297

02:48:17,990 --> 02:48:16,399

mentioned previously it is an

4298

02:48:21,590 --> 02:48:18,000

instantaneous launch

4299

02:48:24,070 --> 02:48:21,600

window we need to launch exactly on time

4300

02:48:25,269 --> 02:48:24,080

that instantaneous window

4301  
02:48:27,349 --> 02:48:25,279  
needed to

4302  
02:48:31,990 --> 02:48:27,359  
rendezvous with the international space

4303  
02:48:36,230 --> 02:48:33,910  
but in this schedule

4304  
02:48:39,190 --> 02:48:36,240  
they're aware as you said of where they

4305  
02:48:41,269 --> 02:48:39,200  
have some flexibility right so nothing

4306  
02:48:43,990 --> 02:48:41,279  
is is timeline so

4307  
02:48:45,349 --> 02:48:44,000  
um so tightly that we don't have a

4308  
02:48:46,790 --> 02:48:45,359  
little bit of padding to take care of

4309  
02:48:47,990 --> 02:48:46,800  
problems now i don't know if they've got

4310  
02:48:49,990 --> 02:48:48,000  
a problem they're addressing or if

4311  
02:48:51,510 --> 02:48:50,000  
they're just doing the normal work

4312  
02:48:53,349 --> 02:48:51,520  
because i was not a member of the

4313  
02:48:55,830 --> 02:48:53,359

closeout team so i don't know

4314

02:48:57,750 --> 02:48:55,840

all of what they are doing but they do

4315

02:48:59,590 --> 02:48:57,760

have a good sense of when that work

4316

02:49:02,230 --> 02:48:59,600

needs to be finished you were on the

4317

02:49:04,710 --> 02:49:02,240

other side inside the capsule for crew

4318

02:49:07,429 --> 02:49:04,720

one it does appear that uh the closeout

4319

02:49:10,230 --> 02:49:07,439

crew member is now documenting with the

4320

02:49:12,070 --> 02:49:10,240

camera phone right again all of the area

4321

02:49:15,750 --> 02:49:12,080

around that capsule you can see some of

4322

02:49:17,349 --> 02:49:15,760

the closeout crew making their way out

4323

02:49:19,830 --> 02:49:17,359

of the white room and down the crew

4324

02:49:21,510 --> 02:49:19,840

access on oh that's a very good sign so

4325

02:49:22,710 --> 02:49:21,520

looks like they are definitely finishing

4326

02:49:24,389 --> 02:49:22,720

up their work

4327

02:49:26,070 --> 02:49:24,399

and soon

4328

02:49:28,469 --> 02:49:26,080

hopefully we will hear that the largest

4329

02:49:30,389 --> 02:49:28,479

launch escape system is armed

4330

02:49:31,750 --> 02:49:30,399

we're expecting that in just a few

4331

02:49:33,590 --> 02:49:31,760

seconds

4332

02:49:35,030 --> 02:49:33,600

really any moment now

4333

02:49:37,349 --> 02:49:35,040

but he's got the light in the camera

4334

02:49:39,190 --> 02:49:37,359

still working that yep they're

4335

02:49:40,790 --> 02:49:39,200

taking one last look to make sure that

4336

02:49:43,269 --> 02:49:40,800

there is nothing

4337

02:49:45,030 --> 02:49:43,279

trapped in that hatchway and this that

4338

02:49:54,230 --> 02:49:45,040

would inhibit the seals from working

4339

02:49:58,309 --> 02:49:55,510

it's interesting watching them work

4340

02:50:01,030 --> 02:49:58,319

don't you think yes it is

4341

02:50:02,790 --> 02:50:01,040

it's very thorough i appreciate that yes

4342

02:50:04,309 --> 02:50:02,800

very thorough

4343

02:50:06,550 --> 02:50:04,319

they'll have a set of procedures i don't

4344

02:50:08,389 --> 02:50:06,560

know if we've uh seen it but the

4345

02:50:09,349 --> 02:50:08,399

closeout crew will have tablets with

4346

02:50:11,349 --> 02:50:09,359

them and uh

4347

02:50:12,790 --> 02:50:11,359

they will have on the tablets every step

4348

02:50:14,389 --> 02:50:12,800

that they need to do

4349

02:50:15,830 --> 02:50:14,399

and they'll also have those pictures

4350

02:50:17,910 --> 02:50:15,840

that accompany

4351  
02:50:20,469 --> 02:50:17,920  
each and every step that they took so if

4352  
02:50:22,389 --> 02:50:20,479  
they need to for any reason go back and

4353  
02:50:25,429 --> 02:50:22,399  
look at it yep exactly so

4354  
02:50:27,510 --> 02:50:25,439  
this is we should note a brand new

4355  
02:50:29,110 --> 02:50:27,520  
dragon capsule it is they get to ride in

4356  
02:50:44,309 --> 02:50:29,120  
a new dragon

4357  
02:50:50,790 --> 02:50:45,590  
the booster

4358  
02:50:54,070 --> 02:50:50,800  
so it is not making its first flight

4359  
02:50:56,309 --> 02:50:54,080  
flew on crs 22

4360  
02:50:58,469 --> 02:50:56,319  
landed back

4361  
02:51:03,110 --> 02:50:58,479  
was refurbished and

4362  
02:51:07,910 --> 02:51:05,429  
and there you see a nice shot on the pad

4363  
02:51:09,429 --> 02:51:07,920

against the dark sky

4364

02:51:11,190 --> 02:51:09,439

and hopefully no more rain clouds in the

4365

02:51:13,429 --> 02:51:11,200

way sounds like we have a go with the

4366

02:51:15,590 --> 02:51:13,439

weather so that is very good news that's

4367

02:51:16,469 --> 02:51:15,600

what we heard our launch weather officer

4368

02:51:18,389 --> 02:51:16,479

here

4369

02:51:21,269 --> 02:51:18,399

at the kennedy space center brian sisik

4370

02:51:23,670 --> 02:51:21,279

telling us that uh that has cleared out

4371

02:51:24,710 --> 02:51:23,680

john i reporting earlier that uh the

4372

02:51:26,870 --> 02:51:24,720

range

4373

02:51:28,150 --> 02:51:26,880

went from red when we had the little

4374

02:51:30,630 --> 02:51:28,160

shower

4375

02:51:33,190 --> 02:51:30,640

got rained on yeah even a few drops on

4376  
02:51:34,790 --> 02:51:33,200  
the lens you can see have uh you know

4377  
02:51:36,630 --> 02:51:34,800  
still hanging around

4378  
02:51:37,990 --> 02:51:36,640  
evidence that we had a little rain out

4379  
02:51:39,830 --> 02:51:38,000  
there on the pad you can see the ground

4380  
02:51:42,309 --> 02:51:39,840  
is wet as well the reflection of the

4381  
02:51:45,750 --> 02:51:42,319  
lights off the ground the droplets on

4382  
02:51:48,309 --> 02:51:45,760  
the lens but that has since moved out

4383  
02:51:52,070 --> 02:51:48,319  
of the area which is great news and then

4384  
02:51:53,349 --> 02:51:52,080  
the range went green for weather

4385  
02:51:54,870 --> 02:51:53,359  
you can see from that view there it

4386  
02:51:56,150 --> 02:51:54,880  
looks like there's a lot of fog at the

4387  
02:51:59,349 --> 02:51:56,160  
launch pad

4388  
02:52:03,590 --> 02:52:01,190

but fog fog will not stop us from

4389

02:52:06,230 --> 02:52:03,600

launching no it won't neither will the

4390

02:52:07,190 --> 02:52:06,240

thin clouds that uh we've had in the

4391

02:52:09,030 --> 02:52:07,200

area

4392

02:52:11,190 --> 02:52:09,040

it was explained to me by our launch

4393

02:52:13,110 --> 02:52:11,200

weather officer that we've got some

4394

02:52:14,230 --> 02:52:13,120

onshore flow

4395

02:52:16,870 --> 02:52:14,240

that

4396

02:52:19,349 --> 02:52:16,880

basically a high pressure system uh

4397

02:52:20,950 --> 02:52:19,359

north of us that's spinning and throwing

4398

02:52:22,950 --> 02:52:20,960

that moisture

4399

02:52:24,309 --> 02:52:22,960

from off the ocean off the atlantic

4400

02:52:26,469 --> 02:52:24,319

ocean

4401  
02:52:29,349 --> 02:52:26,479  
over the kennedy space center but

4402  
02:52:31,670 --> 02:52:29,359  
there's a layer of dry air in the mid

4403  
02:52:33,910 --> 02:52:31,680  
levels of the atmosphere that has soaked

4404  
02:52:36,870 --> 02:52:33,920  
up a fair amount of that moisture

4405  
02:52:38,630 --> 02:52:36,880  
and it is essentially drying it out

4406  
02:52:41,030 --> 02:52:38,640  
serving as kind of a you know you know a

4407  
02:52:44,070 --> 02:52:41,040  
blow dryer effect a blow dryer a blow

4408  
02:52:48,150 --> 02:52:45,750  
well the four crew two astronauts not

4409  
02:52:50,469 --> 02:52:48,160  
only broke a record for the longest stay

4410  
02:52:53,110 --> 02:52:50,479  
for a commercial space flight at 199

4411  
02:52:57,900 --> 02:52:53,120  
days they also got a lot of science done

4412  
02:52:57,910 --> 02:53:01,590  
[Music]

4413  
02:53:05,910 --> 02:53:03,590

everything we're doing up in space

4414

02:53:08,320 --> 02:53:05,920

is to benefit humanity or benefit human

4415

02:53:09,990 --> 02:53:08,330

exploration

4416

02:53:11,830 --> 02:53:10,000

[Music]

4417

02:53:13,670 --> 02:53:11,840

we are natural explorers we want to

4418

02:53:15,510 --> 02:53:13,680

explore our environment whatever small

4419

02:53:18,230 --> 02:53:15,520

area we start in we always want to push

4420

02:53:20,790 --> 02:53:18,240

the boundaries

4421

02:53:22,150 --> 02:53:20,800

[Music]

4422

02:53:25,270 --> 02:53:22,160

the great thing about space travel is

4423

02:53:27,510 --> 02:53:25,280

the perspective that it gives you

4424

02:53:30,790 --> 02:53:27,520

[Music]

4425

02:53:33,190 --> 02:53:30,800

i feel a sense of pride getting up there

4426

02:53:40,790 --> 02:53:33,200

but at the same time i want a lot of

4427

02:53:44,950 --> 02:53:43,590

dragon spacex go for launch

4428

02:53:46,309 --> 02:53:44,960

three

4429

02:53:51,980 --> 02:53:46,319

two

4430

02:54:04,160 --> 02:54:02,309

[Music]

4431

02:54:16,870 --> 02:54:04,170

falcon 9 is supersonic

4432

02:54:28,790 --> 02:54:16,880

[Music]

4433

02:54:30,950 --> 02:54:28,800

you are part of this big team you are

4434

02:54:34,230 --> 02:54:30,960

part of an effort that is larger than

4435

02:54:38,870 --> 02:54:36,230

it is a cool perspective to see from up

4436

02:54:40,469 --> 02:54:38,880

there that wow this whole planet looks

4437

02:54:42,870 --> 02:54:40,479

pretty special

4438

02:54:45,349 --> 02:54:42,880

dragon separation visually can come

4439

02:54:48,389 --> 02:54:45,359

just flying a few hundred kilometers

4440

02:54:50,070 --> 02:54:48,399

away from the earth changes everything

4441

02:54:53,110 --> 02:54:50,080

endeavor on behalf of spacex welcome

4442

02:54:56,710 --> 02:54:55,269

welcome home to planet earth and welcome

4443

02:54:58,150 --> 02:54:56,720

to the kennedy space center if you're

4444

02:55:00,710 --> 02:54:58,160

just joining us for

4445

02:55:03,269 --> 02:55:00,720

the launch coverage of crew 3 as we

4446

02:55:05,830 --> 02:55:03,279

await liftoff just an hour and 21

4447

02:55:07,750 --> 02:55:05,840

minutes from now crew 2 that you just

4448

02:55:10,230 --> 02:55:07,760

saw splash down in the gulf off the

4449

02:55:13,510 --> 02:55:10,240

coast of pensacola on monday after a

4450

02:55:15,269 --> 02:55:13,520

very eventful yet productive stay six

4451  
02:55:17,910 --> 02:55:15,279  
months in space shannon it looked to me

4452  
02:55:20,070 --> 02:55:17,920  
from the infrared video that they had

4453  
02:55:22,550 --> 02:55:20,080  
pretty calm waters and you were out

4454  
02:55:24,150 --> 02:55:22,560  
there you experienced a similar yes you

4455  
02:55:26,309 --> 02:55:24,160  
definitely want calm waters when you

4456  
02:55:27,110 --> 02:55:26,319  
splash down in the water because you

4457  
02:55:29,030 --> 02:55:27,120  
really

4458  
02:55:30,710 --> 02:55:29,040  
don't want that capsule rocking too much

4459  
02:55:32,230 --> 02:55:30,720  
that's going to make the crew feel badly

4460  
02:55:34,070 --> 02:55:32,240  
if they uh

4461  
02:55:35,349 --> 02:55:34,080  
have too much motion

4462  
02:55:37,590 --> 02:55:35,359  
you don't want to be bouncing around in

4463  
02:55:40,309 --> 02:55:37,600

the seas whether it's in a boat or a

4464

02:55:42,790 --> 02:55:40,319

space capsule no same effect not good

4465

02:55:45,670 --> 02:55:42,800

it's not good well nasa leaders are

4466

02:55:47,269 --> 02:55:45,680

watching this launch from

4467

02:55:48,870 --> 02:55:47,279

right here at the kennedy space center

4468

02:55:50,630 --> 02:55:48,880

they're watching the astronauts inside

4469

02:55:53,590 --> 02:55:50,640

crew dragon endurance

4470

02:55:55,590 --> 02:55:53,600

with great anticipate anticipation

4471

02:55:59,670 --> 02:55:55,600

nasa's marie lewis is with a special

4472

02:56:01,830 --> 02:55:59,680

guest right now from esa issa osb2 marie

4473

02:56:04,710 --> 02:56:01,840

that's right daryl i'm here with uh issa

4474

02:56:06,790 --> 02:56:04,720

astronaut and geophysicist alex gerst

4475

02:56:09,030 --> 02:56:06,800

two-time flyer to space on the russian

4476

02:56:11,429 --> 02:56:09,040

soyuz alex thanks for being here hey

4477

02:56:13,269 --> 02:56:11,439

marie good to be here and it's finally

4478

02:56:15,110 --> 02:56:13,279

good to see the stars come out

4479

02:56:16,870 --> 02:56:15,120

yeah looking through between the clouds

4480

02:56:18,630 --> 02:56:16,880

yeah we had some sprinkles but yeah you

4481

02:56:19,830 --> 02:56:18,640

pointed out we actually see stars so

4482

02:56:21,349 --> 02:56:19,840

that's a good sign here around the

4483

02:56:23,830 --> 02:56:21,359

launch pad

4484

02:56:25,830 --> 02:56:23,840

we were talking earlier tell me about

4485

02:56:28,309 --> 02:56:25,840

the difference between you've flown to

4486

02:56:30,230 --> 02:56:28,319

space twice this is matias's first time

4487

02:56:33,269 --> 02:56:30,240

and it's totally different

4488

02:56:34,870 --> 02:56:33,279

flying a simulator versus the real thing

4489

02:56:37,190 --> 02:56:34,880

actually sitting on top of the rocket

4490

02:56:38,790 --> 02:56:37,200

where matthias is right now so explain

4491

02:56:40,870 --> 02:56:38,800

the difference and what matthias must be

4492

02:56:42,389 --> 02:56:40,880

feeling right now yeah actually the you

4493

02:56:44,150 --> 02:56:42,399

know the real capsule it looks the same

4494

02:56:46,230 --> 02:56:44,160

as the simulator and it works the same

4495

02:56:47,830 --> 02:56:46,240

but if you spend a lot of time in the

4496

02:56:50,070 --> 02:56:47,840

simulator and then sit on the real

4497

02:56:51,830 --> 02:56:50,080

rocket on the real day it's amazing the

4498

02:56:54,469 --> 02:56:51,840

difference is you know it's feeling like

4499

02:56:57,030 --> 02:56:54,479

you're sitting in on this alive being

4500

02:56:59,110 --> 02:56:57,040

there it shrieks and there's steam here

4501  
02:57:01,349 --> 02:56:59,120  
and it's powered up it's humming and you

4502  
02:57:04,230 --> 02:57:01,359  
know when you sit on top it's sometimes

4503  
02:57:06,230 --> 02:57:04,240  
a bit like like swaying in the wind just

4504  
02:57:07,670 --> 02:57:06,240  
ever so slightly but you notice it so

4505  
02:57:09,030 --> 02:57:07,680  
there is a difference you know you're

4506  
02:57:10,950 --> 02:57:09,040  
going somewhere

4507  
02:57:12,230 --> 02:57:10,960  
and then once you arrive at the

4508  
02:57:15,030 --> 02:57:12,240  
international space station they're

4509  
02:57:17,830 --> 02:57:15,040  
going to be docking tomorrow and you

4510  
02:57:19,349 --> 02:57:17,840  
train for living in microgravity but

4511  
02:57:21,190 --> 02:57:19,359  
there's only so much training you can do

4512  
02:57:23,110 --> 02:57:21,200  
to prepare yourself for what life is

4513  
02:57:24,469 --> 02:57:23,120

actually like on the international space

4514

02:57:26,150 --> 02:57:24,479

station so can you talk about what

4515

02:57:28,230 --> 02:57:26,160

that's going to be like yeah that's

4516

02:57:30,710 --> 02:57:28,240

absolutely right there's no way to

4517

02:57:32,150 --> 02:57:30,720

really simulate microgravity down here

4518

02:57:33,910 --> 02:57:32,160

on earth that's why we have to fly up

4519

02:57:35,670 --> 02:57:33,920

there to do all that science experiments

4520

02:57:37,269 --> 02:57:35,680

but it also includes training like how

4521

02:57:39,030 --> 02:57:37,279

to live on the space station right how

4522

02:57:42,070 --> 02:57:39,040

you get your bearings and you know how

4523

02:57:43,750 --> 02:57:42,080

to translate uh that's what we call like

4524

02:57:46,150 --> 02:57:43,760

floating from one end of the space

4525

02:57:47,990 --> 02:57:46,160

station to the other uh you know how to

4526

02:57:49,349 --> 02:57:48,000

sleep in space how to go to the toilet

4527

02:57:51,110 --> 02:57:49,359

all things that you need to figure out

4528

02:57:53,110 --> 02:57:51,120

in the first day right yeah and you

4529

02:57:54,870 --> 02:57:53,120

can't train them so that's really a

4530

02:57:57,269 --> 02:57:54,880

challenge and you just

4531

02:57:58,950 --> 02:57:57,279

i mean people say they drink from a fire

4532

02:58:00,389 --> 02:57:58,960

hose up there right the first the first

4533

02:58:02,070 --> 02:58:00,399

three days yeah

4534

02:58:03,269 --> 02:58:02,080

and you mentioned science i want to talk

4535

02:58:05,510 --> 02:58:03,279

a little bit about the science that

4536

02:58:08,150 --> 02:58:05,520

matthias is going to be working on 35

4537

02:58:09,910 --> 02:58:08,160

different experiments uh specific to

4538

02:58:11,110 --> 02:58:09,920

issa can you touch on some of the

4539

02:58:13,110 --> 02:58:11,120

experiments

4540

02:58:14,790 --> 02:58:13,120

matthias will be doing yeah a lot of

4541

02:58:16,230 --> 02:58:14,800

stuff that they do up there that's

4542

02:58:18,309 --> 02:58:16,240

actually a long continuation of

4543

02:58:20,550 --> 02:58:18,319

experiments that have been done in the

4544

02:58:21,990 --> 02:58:20,560

past actually some that i already did

4545

02:58:23,510 --> 02:58:22,000

he's continuing he's a material

4546

02:58:26,070 --> 02:58:23,520

scientist so he's really good at those

4547

02:58:28,070 --> 02:58:26,080

things looking at new materials down for

4548

02:58:29,910 --> 02:58:28,080

down here i mean they they

4549

02:58:31,349 --> 02:58:29,920

do the experiments up there but the

4550

02:58:32,389 --> 02:58:31,359

really the use of the experiments is

4551

02:58:33,190 --> 02:58:32,399

down here for

4552

02:58:36,150 --> 02:58:33,200

like

4553

02:58:37,510 --> 02:58:36,160

turbo engines that use less fuel or

4554

02:58:40,230 --> 02:58:37,520

you know lighter materials that's

4555

02:58:42,070 --> 02:58:40,240

important but also like cell experiments

4556

02:58:43,670 --> 02:58:42,080

on cell aging

4557

02:58:44,950 --> 02:58:43,680

also experiments that help people who

4558

02:58:47,670 --> 02:58:44,960

have

4559

02:58:49,349 --> 02:58:47,680

muscular diseases down here um a really

4560

02:58:51,269 --> 02:58:49,359

nice set of experiments they actually

4561

02:58:52,550 --> 02:58:51,279

have a bioprinter for skin cells up

4562

02:58:54,389 --> 02:58:52,560

there really interesting that they can

4563

02:58:56,710 --> 02:58:54,399

put over wounds if they happen that's

4564

02:58:58,389 --> 02:58:56,720

fantastic alex thank you so much we're

4565

02:58:59,750 --> 02:58:58,399

out of time so i'm going to send it back

4566

02:59:01,110 --> 02:58:59,760

over to jesse and hawthorne but thank

4567

02:59:06,469 --> 02:59:01,120

you so much for being here alex you're

4568

02:59:11,910 --> 02:59:07,910

thanks marie

4569

02:59:14,230 --> 02:59:11,920

it's t-minus one hour and about 17

4570

02:59:15,750 --> 02:59:14,240

minutes from launch and it always gets

4571

02:59:18,070 --> 02:59:15,760

more and more exciting as we continue to

4572

02:59:20,150 --> 02:59:18,080

get closer to that t-zero

4573

02:59:22,309 --> 02:59:20,160

now crew has already ingressed the

4574

02:59:23,910 --> 02:59:22,319

vehicle they have been helped out by our

4575

02:59:25,830 --> 02:59:23,920

closeout team

4576  
02:59:26,710 --> 02:59:25,840  
to get into their seats and get buckled

4577  
02:59:28,950 --> 02:59:26,720  
in

4578  
02:59:31,429 --> 02:59:28,960  
attach their umbilicals to the

4579  
02:59:33,670 --> 02:59:31,439  
spacecraft which provide breathing air

4580  
02:59:35,590 --> 02:59:33,680  
and calms to dragon and then they've

4581  
02:59:38,309 --> 02:59:35,600  
completed com checks and suit leak

4582  
02:59:48,790 --> 02:59:38,319  
checks um and those contracts are

4583  
02:59:52,950 --> 02:59:50,070  
all right and confirmation that the

4584  
02:59:55,110 --> 02:59:52,960  
closeout team is now departing so after

4585  
02:59:57,269 --> 02:59:55,120  
those suit leak checks the closeout team

4586  
02:59:59,830 --> 02:59:57,279  
was able to close and seal the hatch

4587  
03:00:01,590 --> 02:59:59,840  
which also gets its own leak check

4588  
03:00:03,510 --> 03:00:01,600

as we just heard the closeout team has

4589

03:00:05,110 --> 03:00:03,520

departed and those final weather checks

4590

03:00:07,190 --> 03:00:05,120

are coming up which will be necessary

4591

03:00:08,469 --> 03:00:07,200

before that final go no-go is given for

4592

03:00:10,469 --> 03:00:08,479

launch

4593

03:00:12,150 --> 03:00:10,479

now before we get that final go no go

4594

03:00:14,389 --> 03:00:12,160

the various teams at both nasa and

4595

03:00:16,070 --> 03:00:14,399

spacex will do an internal go pull

4596

03:00:19,030 --> 03:00:16,080

making sure conditions are right with

4597

03:00:20,950 --> 03:00:19,040

falcon 9 the dragon the crew the range

4598

03:00:23,670 --> 03:00:20,960

and the space station before the final

4599

03:00:25,269 --> 03:00:23,680

go is given now let's check back in on

4600

03:00:26,950 --> 03:00:25,279

houston for a status on the team

4601  
03:00:28,950 --> 03:00:26,960  
supporting the space station on their

4602  
03:00:34,550 --> 03:00:28,960  
readiness for launch sandra how's it

4603  
03:00:39,349 --> 03:00:36,710  
thanks jesse the team here in mission

4604  
03:00:41,349 --> 03:00:39,359  
control houston remains go for launch

4605  
03:00:43,269 --> 03:00:41,359  
all systems on board the station that

4606  
03:00:45,670 --> 03:00:43,279  
are required to be healthy for this

4607  
03:00:47,830 --> 03:00:45,680  
mission are continuing to look good

4608  
03:00:50,309 --> 03:00:47,840  
before the station team is go for launch

4609  
03:00:52,309 --> 03:00:50,319  
they must verify that key systems on

4610  
03:00:54,630 --> 03:00:52,319  
board the station are functioning as

4611  
03:00:57,190 --> 03:00:54,640  
expected this includes life support

4612  
03:00:59,750 --> 03:00:57,200  
systems like oxygen generation carbon

4613  
03:01:02,790 --> 03:00:59,760

dioxide removal and the water recycling

4614

03:01:05,510 --> 03:01:02,800

system that allows us to reuse about 90

4615

03:01:07,269 --> 03:01:05,520

of the water we send to station we're

4616

03:01:09,510 --> 03:01:07,279

also ensuring that the computers that

4617

03:01:11,910 --> 03:01:09,520

allow us to command station's major

4618

03:01:14,630 --> 03:01:11,920

subsystems essentially the station's

4619

03:01:15,990 --> 03:01:14,640

nervous system are functioning normally

4620

03:01:18,389 --> 03:01:16,000

we also work with our russian

4621

03:01:20,389 --> 03:01:18,399

counterparts to ensure both methods of

4622

03:01:22,950 --> 03:01:20,399

controlling the station's attitude are

4623

03:01:25,510 --> 03:01:22,960

fully functional this includes the large

4624

03:01:28,150 --> 03:01:25,520

u.s gyroscopes and the thrusters found

4625

03:01:32,309 --> 03:01:28,160

on the russian segment both systems play

4626  
03:01:36,230 --> 03:01:34,150  
mission control houston will closely

4627  
03:01:37,990 --> 03:01:36,240  
monitor the cruise flight and will

4628  
03:01:40,150 --> 03:01:38,000  
continue to check off milestones for

4629  
03:01:42,150 --> 03:01:40,160  
most of the journey so i'll send it back

4630  
03:01:44,230 --> 03:01:42,160  
to hawthorne the international space

4631  
03:01:47,190 --> 03:01:44,240  
station team is ready for launch

4632  
03:01:50,950 --> 03:01:48,790  
thanks sandra we're so happy to hear

4633  
03:01:52,790 --> 03:01:50,960  
that the space station team is ready for

4634  
03:01:54,950 --> 03:01:52,800  
launch as we mentioned the crew 3

4635  
03:01:57,990 --> 03:01:54,960  
astronauts will spend about six months

4636  
03:01:59,830 --> 03:01:58,000  
aboard the international space station

4637  
03:02:02,150 --> 03:01:59,840  
they're starting their journey after the

4638  
03:02:04,389 --> 03:02:02,160

departure of the crew ii astronauts from

4639

03:02:07,110 --> 03:02:04,399

the space station crew 2 splashed down

4640

03:02:09,590 --> 03:02:07,120

off the florida coast monday night where

4641

03:02:11,830 --> 03:02:09,600

they were picked up at sea by spacex's

4642

03:02:13,990 --> 03:02:11,840

go navigator recovery vessel

4643

03:02:17,429 --> 03:02:14,000

next spacex will launch commercial

4644

03:02:19,830 --> 03:02:17,439

resupply mission 24 or crs 24 2 space

4645

03:02:22,550 --> 03:02:19,840

station to deliver cargo and supplies to

4646

03:02:24,469 --> 03:02:22,560

crew 3 and the astronauts and cosmonauts

4647

03:02:26,469 --> 03:02:24,479

aboard it will automatically dock to the

4648

03:02:28,710 --> 03:02:26,479

international docking adapter 3 on the

4649

03:02:30,710 --> 03:02:28,720

space facing port of the station's

4650

03:02:32,790 --> 03:02:30,720

harmony module

4651  
03:02:34,230 --> 03:02:32,800  
before crew 3 returns home they will

4652  
03:02:36,070 --> 03:02:34,240  
hand the baton to the next crew to

4653  
03:02:38,870 --> 03:02:36,080  
arrive at the orbiting lab on crew

4654  
03:02:41,349 --> 03:02:38,880  
dragon the crew 4 crew that mission is

4655  
03:02:43,269 --> 03:02:41,359  
targeted to launch in april of next year

4656  
03:02:46,150 --> 03:02:43,279  
and it will carry crew dragon commander

4657  
03:02:48,710 --> 03:02:46,160  
and nasa astronaut shell lingard pilot

4658  
03:02:50,550 --> 03:02:48,720  
bob hines of nasa and mission specialist

4659  
03:02:53,429 --> 03:02:50,560  
samantha christopher of the european

4660  
03:02:55,910 --> 03:02:53,439  
space agency or esa and a fourth crew

4661  
03:02:57,750 --> 03:02:55,920  
member who has yet to be named the crew

4662  
03:02:59,590 --> 03:02:57,760  
4 astronauts will also complete a

4663  
03:03:01,830 --> 03:02:59,600

six-month mission as expedition crew

4664

03:03:03,349 --> 03:03:01,840

members aboard the space station now

4665

03:03:05,110 --> 03:03:03,359

they will be joined there by three

4666

03:03:07,349 --> 03:03:05,120

additional crewmates who will launch on

4667

03:03:09,190 --> 03:03:07,359

a russian soyuz spacecraft and this will

4668

03:03:11,670 --> 03:03:09,200

mean that seven people will be on the

4669

03:03:13,429 --> 03:03:11,680

space station at one time allowing nasa

4670

03:03:15,190 --> 03:03:13,439

to increase the amount of science

4671

03:03:16,630 --> 03:03:15,200

conducted in space

4672

03:03:18,710 --> 03:03:16,640

that's right and this will be chell

4673

03:03:21,429 --> 03:03:18,720

lingard's second trip into space

4674

03:03:24,550 --> 03:03:21,439

following a 141 day stay at the space

4675

03:03:27,590 --> 03:03:24,560

station in 2015 for expeditions 44 and

4676  
03:03:29,670 --> 03:03:27,600  
45 before being selected as an astronaut

4677  
03:03:31,990 --> 03:03:29,680  
in 2009 he was

4678  
03:03:34,070 --> 03:03:32,000  
he was a flight surgeon supporting space

4679  
03:03:36,389 --> 03:03:34,080  
shuttle and space station missions in

4680  
03:03:38,469 --> 03:03:36,399  
december 2020 nasa named him as one of

4681  
03:03:40,469 --> 03:03:38,479  
the artemis team of astronauts helping

4682  
03:03:42,309 --> 03:03:40,479  
to pave the way for nasa's upcoming

4683  
03:03:44,630 --> 03:03:42,319  
lunar missions

4684  
03:03:46,630 --> 03:03:44,640  
bob hines a lieutenant colonel in the

4685  
03:03:49,110 --> 03:03:46,640  
u.s air force was selected as an

4686  
03:03:51,830 --> 03:03:49,120  
astronaut in 2017 and will be making his

4687  
03:03:53,269 --> 03:03:51,840  
first trip into space on crew 4. before

4688  
03:03:55,349 --> 03:03:53,279

becoming an astronaut he supported

4689

03:03:57,910 --> 03:03:55,359

multiple military deployments in the

4690

03:03:59,590 --> 03:03:57,920

middle east africa and europe served as

4691

03:04:01,830 --> 03:03:59,600

a flight test pilot for the federal

4692

03:04:04,070 --> 03:04:01,840

aviation administration and flew as a

4693

03:04:05,590 --> 03:04:04,080

research pilot at nasa's johnson space

4694

03:04:07,590 --> 03:04:05,600

center in houston

4695

03:04:09,590 --> 03:04:07,600

and esa astronaut samantha christopher

4696

03:04:12,550 --> 03:04:09,600

reddy will be making her second trip to

4697

03:04:14,389 --> 03:04:12,560

space as a mission specialist on crew 4.

4698

03:04:16,790 --> 03:04:14,399

she was selected as an esa astronaut in

4699

03:04:19,590 --> 03:04:16,800

2009 and flew to the international space

4700

03:04:21,349 --> 03:04:19,600

station in 2014 aboard a russian soyuz

4701  
03:04:24,550 --> 03:04:21,359  
for a long duration mission as part of

4702  
03:04:26,150 --> 03:04:24,560  
expedition 42 and 43. christopher eddy

4703  
03:04:28,710 --> 03:04:26,160  
is planned to take over as station

4704  
03:04:31,670 --> 03:04:28,720  
commander for expedition 68 and will be

4705  
03:04:33,830 --> 03:04:31,680  
the first woman from issa to do so

4706  
03:04:35,670 --> 03:04:33,840  
now let's head over to daryl at kennedy

4707  
03:04:38,230 --> 03:04:35,680  
space center daryl how's it going over

4708  
03:04:40,950 --> 03:04:38,240  
there all right it's very good courtney

4709  
03:04:42,950 --> 03:04:40,960  
we are having clear skies at the moment

4710  
03:04:45,110 --> 03:04:42,960  
we can see some stars here at kennedy

4711  
03:04:47,750 --> 03:04:45,120  
and that's great news and if you're just

4712  
03:04:49,750 --> 03:04:47,760  
joining us welcome to coverage for the

4713  
03:04:52,309 --> 03:04:49,760

mission known as crew 3 nasa and

4714

03:04:54,469 --> 03:04:52,319

spacex's fourth flight of astronauts to

4715

03:04:58,070 --> 03:04:54,479

the international space station we are

4716

03:05:00,950 --> 03:04:58,080

at t minus 1 hour and 11 minutes until

4717

03:05:03,510 --> 03:05:00,960

launch liftoff time still holding for

4718

03:05:04,389 --> 03:05:03,520

903 pm eastern time and we're tracking

4719

03:05:06,710 --> 03:05:04,399

no issues

4720

03:05:08,870 --> 03:05:06,720

with falcon 9 or with dragon the range

4721

03:05:11,030 --> 03:05:08,880

is green and the weather it's

4722

03:05:14,070 --> 03:05:11,040

cooperating moving on out we had a light

4723

03:05:16,790 --> 03:05:14,080

shower earlier but it is gone the range

4724

03:05:19,510 --> 03:05:16,800

is now green and so over the last three

4725

03:05:21,590 --> 03:05:19,520

hours our crew of raj achary

4726  
03:05:23,990 --> 03:05:21,600  
tom marshburn kayla baron and matthias

4727  
03:05:26,230 --> 03:05:24,000  
maurer they donned their spacex suits in

4728  
03:05:27,910 --> 03:05:26,240  
the historic crew quarters suit-up room

4729  
03:05:30,150 --> 03:05:27,920  
they walked out of the crew quarters

4730  
03:05:32,950 --> 03:05:30,160  
building as every nasa astronaut has

4731  
03:05:34,469 --> 03:05:32,960  
done since apollo 7. and then they were

4732  
03:05:37,110 --> 03:05:34,479  
transported to the pad where they

4733  
03:05:39,349 --> 03:05:37,120  
climbed inside the spacex crew dragon

4734  
03:05:41,670 --> 03:05:39,359  
endurance and now we are seeing them

4735  
03:05:43,990 --> 03:05:41,680  
live while they await liftoff and

4736  
03:05:46,790 --> 03:05:44,000  
shannon what is the crew doing right now

4737  
03:05:48,630 --> 03:05:46,800  
in these moments as they wait yeah it's

4738  
03:05:49,910 --> 03:05:48,640

uh they are waiting but they know that

4739

03:05:51,429 --> 03:05:49,920

they're getting closer and closer to

4740

03:05:53,269 --> 03:05:51,439

launch the time really starts to feel

4741

03:05:55,030 --> 03:05:53,279

like it's speeding up especially when we

4742

03:05:56,230 --> 03:05:55,040

get that launch escape system armed but

4743

03:05:57,910 --> 03:05:56,240

what they're doing is they're thinking

4744

03:05:58,870 --> 03:05:57,920

about their tasks ahead they're thinking

4745

03:06:00,389 --> 03:05:58,880

about

4746

03:06:02,070 --> 03:06:00,399

running through the nominal procedures

4747

03:06:04,230 --> 03:06:02,080

as well as running through any emergency

4748

03:06:04,950 --> 03:06:04,240

procedures that that in case they need

4749

03:06:06,389 --> 03:06:04,960

them

4750

03:06:08,790 --> 03:06:06,399

if you remember back in april we've

4751  
03:06:10,950 --> 03:06:08,800  
talked a lot about this we launched nasa

4752  
03:06:13,670 --> 03:06:10,960  
astronauts shane kimbrough

4753  
03:06:15,910 --> 03:06:13,680  
megan macarthur jaxa astronaut and

4754  
03:06:18,070 --> 03:06:15,920  
aki hoshide and east astronaut tomorrow

4755  
03:06:20,070 --> 03:06:18,080  
pesquet to the space station and those

4756  
03:06:22,469 --> 03:06:20,080  
four returned from their six-month

4757  
03:06:24,710 --> 03:06:22,479  
mission um shane kimbrough saying after

4758  
03:06:26,550 --> 03:06:24,720  
he splashed down it's great to be back

4759  
03:06:29,429 --> 03:06:26,560  
on planet earth it's always nice to come

4760  
03:06:30,950 --> 03:06:29,439  
home it is and so not that i would know

4761  
03:06:32,710 --> 03:06:30,960  
i've just about you've told me a few

4762  
03:06:33,990 --> 03:06:32,720  
times it is great it is

4763  
03:06:35,910 --> 03:06:34,000

it's just you know it's a long journey

4764

03:06:36,870 --> 03:06:35,920

so it is nice to go home to somewhere

4765

03:06:38,710 --> 03:06:36,880

familiar

4766

03:06:40,950 --> 03:06:38,720

over the next hour we will conduct a

4767

03:06:43,590 --> 03:06:40,960

series of polls

4768

03:06:46,710 --> 03:06:43,600

the pad crew uh has departed and we

4769

03:06:47,590 --> 03:06:46,720

watch uh them leave the area as we zoom

4770

03:06:50,230 --> 03:06:47,600

out

4771

03:06:52,790 --> 03:06:50,240

we get ready for launch uh through these

4772

03:06:55,510 --> 03:06:52,800

series of poles the crew will also arm

4773

03:06:57,830 --> 03:06:55,520

the launch escape system and fueling of

4774

03:07:01,429 --> 03:06:57,840

the falcon 9 will then begin

4775

03:07:03,349 --> 03:07:01,439

launch of course set for 903 pm eastern

4776  
03:07:06,070 --> 03:07:03,359  
and this will include a 12-minute flight

4777  
03:07:07,830 --> 03:07:06,080  
to orbit and then a roughly 22-hour

4778  
03:07:11,510 --> 03:07:07,840  
flight to dock with the international

4779  
03:07:15,510 --> 03:07:11,520  
space station at 7 10 pm eastern on

4780  
03:07:18,230 --> 03:07:15,520  
thursday november 11th which is veterans

4781  
03:07:20,950 --> 03:07:18,240  
day and it's not lost on us that we have

4782  
03:07:24,550 --> 03:07:20,960  
two active military members on this

4783  
03:07:26,469 --> 03:07:24,560  
flight um and so it it seems fitting

4784  
03:07:29,110 --> 03:07:26,479  
a day that we remember all veterans who

4785  
03:07:31,830 --> 03:07:29,120  
have served right yes it's important to

4786  
03:07:33,429 --> 03:07:31,840  
recognize our veterans and um nasa

4787  
03:07:34,950 --> 03:07:33,439  
definitely has a long history of working

4788  
03:07:36,870 --> 03:07:34,960

with the military service we are a

4789

03:07:39,030 --> 03:07:36,880

civilian organization but they do

4790

03:07:40,790 --> 03:07:39,040

provide some expertise to us and as you

4791

03:07:42,630 --> 03:07:40,800

pointed out we've got two active duty

4792

03:07:45,349 --> 03:07:42,640

military on that flight

4793

03:07:46,070 --> 03:07:45,359

many test pilots from the military ranks

4794

03:07:48,070 --> 03:07:46,080

have

4795

03:07:50,230 --> 03:07:48,080

come through nasa of course that was

4796

03:07:52,790 --> 03:07:50,240

certainly true in the early days of the

4797

03:07:54,870 --> 03:07:52,800

space program and it's still true today

4798

03:07:56,630 --> 03:07:54,880

it's still true today but uh we also

4799

03:07:58,230 --> 03:07:56,640

have non-military people such as myself

4800

03:08:00,150 --> 03:07:58,240

so we take a lot of scientists and

4801  
03:08:01,429 --> 03:08:00,160  
engineers that are not affiliated with

4802  
03:08:04,469 --> 03:08:01,439  
the military

4803  
03:08:07,670 --> 03:08:04,479  
as we look outside at the launch pad at

4804  
03:08:09,830 --> 03:08:07,680  
39 a for those who don't know this is a

4805  
03:08:13,190 --> 03:08:09,840  
very vast place kennedy space center

4806  
03:08:15,910 --> 03:08:13,200  
shares land with the 140 000 acre

4807  
03:08:17,590 --> 03:08:15,920  
merritt island wildlife refuge so that's

4808  
03:08:20,550 --> 03:08:17,600  
why when you're looking there it's just

4809  
03:08:22,309 --> 03:08:20,560  
so dark in so much of the picture even

4810  
03:08:23,830 --> 03:08:22,319  
when we're a far distance from the

4811  
03:08:26,230 --> 03:08:23,840  
launch pad it's

4812  
03:08:29,030 --> 03:08:26,240  
an area that has been preserved for a

4813  
03:08:31,670 --> 03:08:29,040

very long time for decades going back

4814

03:08:33,510 --> 03:08:31,680

and since it is native american heritage

4815

03:08:35,990 --> 03:08:33,520

month here in the month of november we

4816

03:08:38,710 --> 03:08:36,000

should mention that this was land once

4817

03:08:40,389 --> 03:08:38,720

occupied by indigenous tribes

4818

03:08:42,630 --> 03:08:40,399

including the ies

4819

03:08:44,550 --> 03:08:42,640

and the tamuqua

4820

03:08:47,110 --> 03:08:44,560

a quick history of nasa's commercial

4821

03:08:49,510 --> 03:08:47,120

crew program it all began with the first

4822

03:08:52,790 --> 03:08:49,520

successful and historic test flight with

4823

03:08:55,110 --> 03:08:52,800

nasa astronauts called demo2 after that

4824

03:08:57,510 --> 03:08:55,120

nasa certified spacex to fly astronauts

4825

03:08:59,750 --> 03:08:57,520

regularly to and from the international

4826  
03:09:02,950 --> 03:08:59,760  
space station and the first rotational

4827  
03:09:04,070 --> 03:09:02,960  
mission was of course drum roll please

4828  
03:09:05,590 --> 03:09:04,080  
crew won

4829  
03:09:07,190 --> 03:09:05,600  
shannon that was a big deal because it

4830  
03:09:08,790 --> 03:09:07,200  
really it was the first time in more

4831  
03:09:11,590 --> 03:09:08,800  
than a decade since space shuttle

4832  
03:09:13,590 --> 03:09:11,600  
retired for longer duration space

4833  
03:09:16,230 --> 03:09:13,600  
flights this was the first one you were

4834  
03:09:18,230 --> 03:09:16,240  
on it and you flew up there and spent

4835  
03:09:20,070 --> 03:09:18,240  
almost six months in space that's right

4836  
03:09:21,590 --> 03:09:20,080  
we did spend almost six months in space

4837  
03:09:23,750 --> 03:09:21,600  
and we make a big deal about this being

4838  
03:09:25,190 --> 03:09:23,760

the first capsule because even though it

4839

03:09:27,910 --> 03:09:25,200

has made it to space there's still

4840

03:09:29,910 --> 03:09:27,920

things that we need to see how it ages

4841

03:09:31,910 --> 03:09:29,920

um during its time on orbit so we're

4842

03:09:33,590 --> 03:09:31,920

constantly looking at its systems and

4843

03:09:35,990 --> 03:09:33,600

making sure that everything is working

4844

03:09:37,590 --> 03:09:36,000

properly so we can keep crew up there um

4845

03:09:40,070 --> 03:09:37,600

as long as we need them and a lot of

4846

03:09:42,790 --> 03:09:40,080

what you experienced then fl uh you know

4847

03:09:44,469 --> 03:09:42,800

flowed back into improvements that were

4848

03:09:46,550 --> 03:09:44,479

made for this brand new spacecraft

4849

03:09:49,030 --> 03:09:46,560

absolutely each time a crew comes back

4850

03:09:50,550 --> 03:09:49,040

just as we did we give

4851  
03:09:52,150 --> 03:09:50,560  
comments and what we call lessons

4852  
03:09:55,429 --> 03:09:52,160  
learned and maybe some suggestions on

4853  
03:09:57,670 --> 03:09:55,439  
how to make things a little bit better

4854  
03:09:58,950 --> 03:09:57,680  
and so spacex is good and nasa is good

4855  
03:10:00,630 --> 03:09:58,960  
and they try and

4856  
03:10:02,389 --> 03:10:00,640  
flow those improvements in whenever they

4857  
03:10:04,389 --> 03:10:02,399  
can a lot of those improvements made on

4858  
03:10:06,550 --> 03:10:04,399  
this capsule we've been hearing a little

4859  
03:10:08,710 --> 03:10:06,560  
from the crew on board

4860  
03:10:11,030 --> 03:10:08,720  
dragon currently strapped into their

4861  
03:10:13,670 --> 03:10:11,040  
seats as you can see there helmets

4862  
03:10:15,670 --> 03:10:13,680  
mid-level so they can look below them

4863  
03:10:17,990 --> 03:10:15,680

they have completed their communications

4864

03:10:20,070 --> 03:10:18,000

and suit leap checks now they're able to

4865

03:10:21,590 --> 03:10:20,080

follow all the milestone shannon still

4866

03:10:23,830 --> 03:10:21,600

ahead on those displays as you've been

4867

03:10:25,910 --> 03:10:23,840

telling us just above them they are

4868

03:10:29,349 --> 03:10:25,920

getting insight into all of the dragon

4869

03:10:30,309 --> 03:10:29,359

and falcon 9 systems as we proceed and

4870

03:10:32,870 --> 03:10:30,319

march

4871

03:10:34,389 --> 03:10:32,880

ever so slowly towards launch

4872

03:10:37,670 --> 03:10:34,399

and then at

4873

03:10:39,750 --> 03:10:37,680

t minus one hour and five minutes let's

4874

03:10:42,389 --> 03:10:39,760

go ahead and check in for a status

4875

03:10:46,309 --> 03:10:42,399

update from john i at spacex

4876  
03:10:51,429 --> 03:10:48,469  
the good news is we've had a smooth

4877  
03:10:53,510 --> 03:10:51,439  
countdown and the spacex team is getting

4878  
03:10:54,790 --> 03:10:53,520  
ready to pick up the pace here in the

4879  
03:10:56,790 --> 03:10:54,800  
last hour

4880  
03:10:59,429 --> 03:10:56,800  
now our next major activity happens at t

4881  
03:11:01,110 --> 03:10:59,439  
minus one hour when the spacex closeout

4882  
03:11:03,269 --> 03:11:01,120  
team actually gets out of the blast

4883  
03:11:04,950 --> 03:11:03,279  
danger area they've already left the

4884  
03:11:07,510 --> 03:11:04,960  
crew access arm and are leaving the

4885  
03:11:11,590 --> 03:11:07,520  
launch complex that just leaves the crew

4886  
03:11:13,349 --> 03:11:11,600  
on board dragon inside of 39a complex

4887  
03:11:15,830 --> 03:11:13,359  
now falcon 9 as you can see on the

4888  
03:11:17,269 --> 03:11:15,840

screen the two-stage reusable rocket

4889

03:11:19,590 --> 03:11:17,279

we've done our final propulsion

4890

03:11:21,510 --> 03:11:19,600

checkouts of the first and second stages

4891

03:11:23,750 --> 03:11:21,520

and the engines began just a few minutes

4892

03:11:24,710 --> 03:11:23,760

ago in preparation for propellant

4893

03:11:26,950 --> 03:11:24,720

loading

4894

03:11:28,309 --> 03:11:26,960

so we're testing and cycling valves on

4895

03:11:30,229 --> 03:11:28,319

the engine we're checking the engine

4896

03:11:31,510 --> 03:11:30,239

pneumatics pressurization system right

4897

03:11:33,590 --> 03:11:31,520

now

4898

03:11:35,429 --> 03:11:33,600

at t-minus 45 minutes the team will

4899

03:11:37,910 --> 03:11:35,439

report their readiness for propellant

4900

03:11:39,269 --> 03:11:37,920

load with a final electronic go no go

4901

03:11:40,630 --> 03:11:39,279

pull

4902

03:11:42,469 --> 03:11:40,640

now before we can start loading

4903

03:11:44,389 --> 03:11:42,479

propellant on the falcon 9 we have a

4904

03:11:46,150 --> 03:11:44,399

couple of major tasks to perform with

4905

03:11:48,150 --> 03:11:46,160

respect to dragon

4906

03:11:50,150 --> 03:11:48,160

first after the pole is complete we're

4907

03:11:51,910 --> 03:11:50,160

going to retract that crew access arm

4908

03:11:53,750 --> 03:11:51,920

that you can see alongside dry again

4909

03:11:55,030 --> 03:11:53,760

from the fixed service structure we're

4910

03:11:57,269 --> 03:11:55,040

going to move that away to launch

4911

03:11:59,670 --> 03:11:57,279

position that'll happen approximately

4912

03:12:02,150 --> 03:11:59,680

between t minus 44 and t minus 42

4913

03:12:04,790 --> 03:12:02,160

minutes with the arm out of the way the

4914

03:12:06,389 --> 03:12:04,800

crew will arm the launch escape system

4915

03:12:08,150 --> 03:12:06,399

once these two events are complete

4916

03:12:09,750 --> 03:12:08,160

dragon is ready for falcon to begin

4917

03:12:11,349 --> 03:12:09,760

propellant loading

4918

03:12:12,790 --> 03:12:11,359

on the weather front we're also

4919

03:12:14,389 --> 03:12:12,800

verifying that we made all the

4920

03:12:16,630 --> 03:12:14,399

constraints and as we mentioned a little

4921

03:12:18,790 --> 03:12:16,640

bit earlier everything both at ground

4922

03:12:20,870 --> 03:12:18,800

level and at upper altitude looks good

4923

03:12:23,750 --> 03:12:20,880

and ready to support an on-time launch

4924

03:12:25,590 --> 03:12:23,760

in just over 64 minutes

4925

03:12:26,630 --> 03:12:25,600

so with everything looking good right

4926

03:12:28,710 --> 03:12:26,640

now

4927

03:12:31,910 --> 03:12:28,720

the range is also ready to support from

4928

03:12:33,590 --> 03:12:31,920

historic launch pad 39a the worldwide

4929

03:12:35,269 --> 03:12:33,600

network of ground stations and the

4930

03:12:37,030 --> 03:12:35,279

tracking and data relay satellites are

4931

03:12:37,990 --> 03:12:37,040

ready to support dragon as it heads into

4932

03:12:40,150 --> 03:12:38,000

orbit

4933

03:12:44,469 --> 03:12:40,160

everything is looking good for that

4934

03:12:47,429 --> 03:12:44,479

instantaneous launch window at 903 31 pm

4935

03:12:49,990 --> 03:12:47,439

eastern standard time which is 2 hours 3

4936

03:12:51,750 --> 03:12:50,000

minutes 31 seconds universal time

4937

03:12:53,590 --> 03:12:51,760

as a reminder once we begin loading

4938

03:12:55,910 --> 03:12:53,600

propellant there's no opportunity to

4939

03:12:57,670 --> 03:12:55,920

change the t0 timing for drag and

4940

03:12:59,349 --> 03:12:57,680

rendezvous with the international space

4941

03:13:01,190 --> 03:12:59,359

station is very precise down to the

4942

03:13:03,750 --> 03:13:01,200

second so we're going to get one chance

4943

03:13:06,870 --> 03:13:03,760

at it today but the good news coming up

4944

03:13:10,469 --> 03:13:06,880

just over 63 minutes and counting we are

4945

03:13:15,190 --> 03:13:12,870

great thank you john i it's always great

4946

03:13:17,910 --> 03:13:15,200

to hear that we have everything going

4947

03:13:19,990 --> 03:13:17,920

for our team zero orbit tank isolation

4948

03:13:21,510 --> 03:13:20,000

valves to equalize low flow pressure at

4949

03:13:24,070 --> 03:13:21,520

this time

4950

03:13:29,510 --> 03:13:24,080

additionally you are go for section six

4951

03:13:32,870 --> 03:13:31,349

endurance copies will be cycling some

4952

03:13:38,469 --> 03:13:32,880

preservation files and we are go for

4953

03:13:43,349 --> 03:13:40,830

awesome just hearing some comms from the

4954

03:13:45,910 --> 03:13:43,359

teams today's launch marks the third

4955

03:13:47,830 --> 03:13:45,920

time a rotational crew will fly on a

4956

03:13:49,670 --> 03:13:47,840

commercial spacecraft and each of our

4957

03:13:52,309 --> 03:13:49,680

crew members brings a diverse set of

4958

03:13:54,790 --> 03:13:52,319

experiences to today's flight

4959

03:13:57,670 --> 03:13:54,800

rajatari is the commander of the crew

4960

03:13:59,429 --> 03:13:57,680

dragon spacecraft and the crew 3 mission

4961

03:14:01,510 --> 03:13:59,439

shari is responsible for all phases of

4962

03:14:03,750 --> 03:14:01,520

flight from launch to re-entry

4963

03:14:06,389 --> 03:14:03,760

once onboard station he'll serve as an

4964

03:14:08,229 --> 03:14:06,399

expedition 66 flight engineer he was

4965

03:14:11,110 --> 03:14:08,239

born in milwaukee but consider cedar

4966

03:14:13,670 --> 03:14:11,120

falls iowa his hometown he is a colonel

4967

03:14:14,710 --> 03:14:13,680

in the u.s air force and joins the

4968

03:14:18,630 --> 03:14:14,720

mission

4969

03:14:21,750 --> 03:14:18,640

experience as a test pilot over his

4970

03:14:23,670 --> 03:14:21,760

career he has accumulated more than 2500

4971

03:14:26,150 --> 03:14:23,680

hours of flight time this will be the

4972

03:14:29,510 --> 03:14:26,160

first space flight for chary who became

4973

03:14:31,510 --> 03:14:29,520

a nasa astronaut in 2017. he's also a

4974

03:14:33,349 --> 03:14:31,520

member of the artemis team so he is

4975

03:14:34,790 --> 03:14:33,359

eligible for assignment to a future

4976

03:14:36,950 --> 03:14:34,800

lunar mission

4977

03:14:39,030 --> 03:14:36,960

and tom marshburn is the pilot of the

4978

03:14:41,190 --> 03:14:39,040

crew dragon spacecraft and second in

4979

03:14:44,070 --> 03:14:41,200

command for the mission responsible for

4980

03:14:45,590 --> 03:14:44,080

spacecraft systems and performance once

4981

03:14:47,590 --> 03:14:45,600

aboard station he will serve as an

4982

03:14:49,190 --> 03:14:47,600

expedition 66 flight engineer and is

4983

03:15:00,070 --> 03:14:49,200

scheduled to assume command of the

4984

03:15:05,510 --> 03:15:01,990

all right and that call endurance is a

4985

03:15:07,910 --> 03:15:05,520

go for launch exciting news

4986

03:15:09,990 --> 03:15:07,920

again tom marshburn is a statesville

4987

03:15:13,030 --> 03:15:10,000

north carolina native who began who

4988

03:15:14,309 --> 03:15:13,040

became an astronaut in 2004. prior to

4989

03:15:15,910 --> 03:15:14,319

servicing in the astronaut core the

4990

03:15:18,150 --> 03:15:15,920

medical doctor served as a flight

4991

03:15:20,070 --> 03:15:18,160

surgeon at nasa's johnson space center

4992

03:15:21,670 --> 03:15:20,080

in houston and later became medical

4993

03:15:23,750 --> 03:15:21,680

operations lead for the international

4994

03:15:25,590 --> 03:15:23,760

space station the crew 3 mission will be

4995

03:15:27,910 --> 03:15:25,600

his third visit to the space station and

4996

03:15:29,830 --> 03:15:27,920

his second long duration mission and the

4997

03:15:31,750 --> 03:15:29,840

crew dragon will be the third spacecraft

4998

03:15:33,910 --> 03:15:31,760

for marshburn to fly in after the space

4999

03:15:36,110 --> 03:15:33,920

shuttle and the russian soyuz he

5000

03:15:40,309 --> 03:15:36,120

previously served as a crew member of

5001  
03:15:45,269 --> 03:15:40,319  
sts-127 in 2009 and expedition 34 and 35

5002  
03:15:48,870 --> 03:15:47,670  
kayla baron is a mission specialist for

5003  
03:15:50,469 --> 03:15:48,880  
crew 3.

5004  
03:15:52,070 --> 03:15:50,479  
as a mission specialist she will work

5005  
03:15:53,750 --> 03:15:52,080  
closely with the commander and pilot to

5006  
03:15:55,670 --> 03:15:53,760  
monitor the spacecraft during the

5007  
03:15:57,990 --> 03:15:55,680  
dynamic launch and re-entry phases of

5008  
03:16:00,070 --> 03:15:58,000  
flight once aboard the station she will

5009  
03:16:03,269 --> 03:16:00,080  
become a flight engineer for expedition

5010  
03:16:04,950 --> 03:16:03,279  
66 baron was born in pocatello idaho but

5011  
03:16:06,229 --> 03:16:04,960  
considers richland washington her

5012  
03:16:07,830 --> 03:16:06,239  
hometown

5013  
03:16:09,670 --> 03:16:07,840

she earned a bachelor's degree in

5014

03:16:12,550 --> 03:16:09,680

systems engineering from the u.s naval

5015

03:16:14,630 --> 03:16:12,560

academy in annapolis maryland in 2010

5016

03:16:16,070 --> 03:16:14,640

and a master's degree in nuclear

5017

03:16:19,510 --> 03:16:16,080

engineering from the university of

5018

03:16:21,750 --> 03:16:19,520

cambridge in england in 2011 as a gates

5019

03:16:23,990 --> 03:16:21,760

cambridge scholar lieutenant commander

5020

03:16:24,950 --> 03:16:24,000

barron earned her submarine warfare

5021

03:16:27,030 --> 03:16:24,960

officer

5022

03:16:30,070 --> 03:16:27,040

qualification and deployed three times

5023

03:16:31,590 --> 03:16:30,080

while serving aboard the uss maine at

5024

03:16:34,469 --> 03:16:31,600

the time of her selection as an

5025

03:16:36,309 --> 03:16:34,479

astronaut candidate in 2017 she was

5026

03:16:39,510 --> 03:16:36,319

serving as the flag aid to the

5027

03:16:41,269 --> 03:16:39,520

superintendent of the u.s naval academy

5028

03:16:43,190 --> 03:16:41,279

and matthias maurer will also be a

5029

03:16:44,950 --> 03:16:43,200

mission specialist for crew 3 working

5030

03:16:46,950 --> 03:16:44,960

with the commander and pilot to monitor

5031

03:16:49,269 --> 03:16:46,960

the spacecraft during the dynamic launch

5032

03:16:50,950 --> 03:16:49,279

and re-entry phases of flight he will

5033

03:16:53,190 --> 03:16:50,960

also become a long duration crew member

5034

03:16:55,429 --> 03:16:53,200

aboard the space station maurer comes

5035

03:16:58,229 --> 03:16:55,439

from zonked vendel in the german state

5036

03:17:00,070 --> 03:16:58,239

of zarland before becoming an astronaut

5037

03:17:01,910 --> 03:17:00,080

maurer held a number of engineering and

5038

03:17:04,710 --> 03:17:01,920

research roles both in a university

5039

03:17:07,670 --> 03:17:04,720

setting and at esa in 2016 mauer spent

5040

03:17:09,990 --> 03:17:07,680

16 days on an undersea mission as part

5041

03:17:12,870 --> 03:17:10,000

of nasa's extreme environment mission

5042

03:17:14,469 --> 03:17:12,880

operations or nemo space analog

5043

03:17:16,389 --> 03:17:14,479

like chari and baron mauer will be

5044

03:17:18,309 --> 03:17:16,399

making his first trip to space with the

5045

03:17:20,229 --> 03:17:18,319

crew 3 mission

5046

03:17:23,030 --> 03:17:20,239

each of these four crew members will

5047

03:17:24,870 --> 03:17:23,040

join expedition 66 once they arrive at

5048

03:17:27,429 --> 03:17:24,880

the international space station with

5049

03:17:29,670 --> 03:17:27,439

russian cosmonaut anton shkaplerov as

5050

03:17:32,389 --> 03:17:29,680

commander

5051  
03:17:37,990 --> 03:17:32,399  
yep and it looks like we are just under

5052  
03:17:44,710 --> 03:17:42,229  
and this day is a continuation

5053  
03:17:47,510 --> 03:17:44,720  
of regular crew flights to the space

5054  
03:17:49,269 --> 03:17:47,520  
station from u.s soil this will be the

5055  
03:17:51,269 --> 03:17:49,279  
fourth flight dragon

5056  
03:17:52,870 --> 03:17:51,279  
this will be the fourth flight of dragon

5057  
03:17:55,190 --> 03:17:52,880  
with nasa crew and its third long

5058  
03:17:56,870 --> 03:17:55,200  
duration mission to the international

5059  
03:17:59,349 --> 03:17:56,880  
space station

5060  
03:18:01,429 --> 03:17:59,359  
and today our crew is flying the newest

5061  
03:18:03,190 --> 03:18:01,439  
dragon in our fleet and will be taking a

5062  
03:18:05,670 --> 03:18:03,200  
ride on board the falcon 9 that

5063  
03:18:07,590 --> 03:18:05,680

supported the crs-22 mission back in

5064

03:18:10,150 --> 03:18:07,600

june of this year now it's been a great

5065

03:18:11,990 --> 03:18:10,160

countdown so far weather is still

5066

03:18:13,990 --> 03:18:12,000

looking good so the excitement is

5067

03:18:15,830 --> 03:18:14,000

continuing to pick up here as we get

5068

03:18:17,349 --> 03:18:15,840

closer to that t-zero

5069

03:18:19,750 --> 03:18:17,359

that's right we started our coverage

5070

03:18:21,670 --> 03:18:19,760

with suit up just over three hours ago

5071

03:18:23,190 --> 03:18:21,680

the spacex team helped the crew put on

5072

03:18:27,750 --> 03:18:23,200

their suits and conduct initial

5073

03:18:32,150 --> 03:18:30,229

crew walkout was where raja chari tom

5074

03:18:34,229 --> 03:18:32,160

marshburn kayla baron and matthias

5075

03:18:34,950 --> 03:18:34,239

maurer gave final goodbyes with friends

5076

03:18:37,349 --> 03:18:34,960

and

5077

03:18:39,190 --> 03:18:37,359

family gathered outside of the

5078

03:18:41,429 --> 03:18:39,200

operations and checkout building before

5079

03:18:43,750 --> 03:18:41,439

they began that roughly 20 minute ride

5080

03:18:46,309 --> 03:18:43,760

to pad 39a

5081

03:18:48,389 --> 03:18:46,319

and though it was just after sunset and

5082

03:18:50,630 --> 03:18:48,399

already dark outside we did still get

5083

03:18:52,309 --> 03:18:50,640

some awesome views of those teslas

5084

03:18:54,790 --> 03:18:52,319

heading down the nasa causeway before

5085

03:18:56,950 --> 03:18:54,800

the crew arrived at the pad

5086

03:18:58,870 --> 03:18:56,960

and once they arrived they all took a

5087

03:19:00,630 --> 03:18:58,880

brief moment to enjoy the view of the

5088

03:19:02,309 --> 03:19:00,640

vehicle that they will be taking flight

5089

03:19:04,630 --> 03:19:02,319

on and then headed up the fixed service

5090

03:19:06,389 --> 03:19:04,640

structure to begin a process known as

5091

03:19:08,389 --> 03:19:06,399

crew ingress where the astronauts

5092

03:19:10,469 --> 03:19:08,399

entered the vehicle and the spacex team

5093

03:19:12,710 --> 03:19:10,479

performed a series of checks to ensure

5094

03:19:14,550 --> 03:19:12,720

that the suits seats and vehicle

5095

03:19:16,070 --> 03:19:14,560

interactions were all functioning

5096

03:19:17,750 --> 03:19:16,080

properly

5097

03:19:19,750 --> 03:19:17,760

then about 30 minutes ago the team

5098

03:19:21,670 --> 03:19:19,760

closed dragon's hatch with the crew

5099

03:19:24,309 --> 03:19:21,680

safely inside

5100

03:19:26,790 --> 03:19:24,319

so again we're just under one hour to go

5101  
03:19:28,550 --> 03:19:26,800  
until dragon starts breathing fire

5102  
03:19:30,469 --> 03:19:28,560  
things will pick up as we get close to

5103  
03:19:32,389 --> 03:19:30,479  
the go no-go pole to arm the launch

5104  
03:19:33,590 --> 03:19:32,399  
escape system and begin propellant

5105  
03:19:35,590 --> 03:19:33,600  
loading

5106  
03:19:37,910 --> 03:19:35,600  
now the crew pull for readiness was

5107  
03:19:40,309 --> 03:19:37,920  
completed at t minus 60 minutes and the

5108  
03:19:42,630 --> 03:19:40,319  
dragon pole for prop load

5109  
03:19:46,070 --> 03:19:42,640  
is coming up here in about a minute at t

5110  
03:19:48,150 --> 03:19:46,080  
minus 55 minutes now next up at t minus

5111  
03:19:50,150 --> 03:19:48,160  
45 minutes after that will be an

5112  
03:19:52,070 --> 03:19:50,160  
internal mission control hawthorne pole

5113  
03:19:54,309 --> 03:19:52,080

and then the launch director's pull for

5114

03:19:56,229 --> 03:19:54,319

propellant loading

5115

03:19:58,229 --> 03:19:56,239

when we get to about t-minus 40 minutes

5116

03:20:00,469 --> 03:19:58,239

the crew access arm will retract and the

5117

03:20:01,990 --> 03:20:00,479

crew will get to will get the call to

5118

03:20:04,070 --> 03:20:02,000

close their visors and arm the launch

5119

03:20:05,910 --> 03:20:04,080

escape system now this is the automated

5120

03:20:07,830 --> 03:20:05,920

system in place that can fire the eight

5121

03:20:09,429 --> 03:20:07,840

super draco thrusters on dragon to

5122

03:20:11,670 --> 03:20:09,439

quickly separate the crew from the

5123

03:20:13,510 --> 03:20:11,680

rocket either on the pad or during the

5124

03:20:15,670 --> 03:20:13,520

flight on the ride uphill and then once

5125

03:20:18,070 --> 03:20:15,680

we reach about t minus 35 minutes

5126  
03:20:19,750 --> 03:20:18,080  
propellant loading for the falcon 9

5127  
03:20:20,870 --> 03:20:19,760  
we'll begin throughout the countdown

5128  
03:20:22,710 --> 03:20:20,880  
we've been getting some pretty

5129  
03:20:25,030 --> 03:20:22,720  
incredible views of the astronauts

5130  
03:20:27,269 --> 03:20:25,040  
inside dragon making their final

5131  
03:20:29,590 --> 03:20:27,279  
preparations as well as some close-up

5132  
03:20:31,349 --> 03:20:29,600  
views of those suits the teams have

5133  
03:20:33,750 --> 03:20:31,359  
often described the suits as an

5134  
03:20:35,830 --> 03:20:33,760  
extension of the dragon spacecraft

5135  
03:20:38,229 --> 03:20:35,840  
almost a mini spacecraft inside of a

5136  
03:20:40,469 --> 03:20:38,239  
spacecraft

5137  
03:20:44,070 --> 03:20:40,479  
we're standing by now for that call for

5138  
03:20:49,269 --> 03:20:45,910

again that should be coming up here at

5139

03:20:53,190 --> 03:20:49,279

about t minus 55 minutes so we're just

5140

03:20:56,870 --> 03:20:53,200

about roughly 40 seconds away from that

5141

03:20:59,190 --> 03:20:56,880

the crew in position ready to go

5142

03:21:17,910 --> 03:20:59,200

taking a look at those monitors above

5143

03:21:21,910 --> 03:21:19,590

and from the view that you can see on

5144

03:21:24,950 --> 03:21:21,920

your screen we have raja chari the

5145

03:21:26,950 --> 03:21:24,960

commander of crew 3 closest to the

5146

03:21:36,530 --> 03:21:26,960

screen with tom marshburn in the pilot

5147

03:21:36,540 --> 03:21:46,710

[Applause]

5148

03:21:50,389 --> 03:21:48,870

with everything still proceeding well

5149

03:21:52,309 --> 03:21:50,399

let's send it back to the team in

5150

03:21:54,710 --> 03:21:52,319

florida daryl how's it going there it's

5151  
03:21:56,630 --> 03:21:54,720  
going great out here ladies and uh we're

5152  
03:21:58,790 --> 03:21:56,640  
here with nasa astronaut shannon walker

5153  
03:21:59,750 --> 03:21:58,800  
if you want to get a question in

5154  
03:22:02,550 --> 03:21:59,760  
ask

5155  
03:22:04,229 --> 03:22:02,560  
nasa on twitter and she will do her best

5156  
03:22:06,389 --> 03:22:04,239  
to answer your question and by the way

5157  
03:22:09,510 --> 03:22:06,399  
speaking of social kennedy is hosting a

5158  
03:22:11,429 --> 03:22:09,520  
virtual nasa social on our facebook page

5159  
03:22:14,389 --> 03:22:11,439  
people who have joined are posting

5160  
03:22:16,550 --> 03:22:14,399  
messages pictures and videos with

5161  
03:22:18,790 --> 03:22:16,560  
their fellow space fans and we want to

5162  
03:22:21,910 --> 03:22:18,800  
share now four video messages that came

5163  
03:22:23,750 --> 03:22:21,920

into our virtual social for crew 3 that

5164

03:22:26,389 --> 03:22:23,760

were posted by the last four crew

5165

03:22:28,870 --> 03:22:26,399

members to fly on dragon that is the

5166

03:22:31,349 --> 03:22:28,880

crew of inspiration 4.

5167

03:22:33,030 --> 03:22:31,359

i want to wish the astronauts of crew 3

5168

03:22:35,510 --> 03:22:33,040

all the best on their journey to the

5169

03:22:37,910 --> 03:22:35,520

space station it's going to be one heck

5170

03:22:40,790 --> 03:22:37,920

of a ride falcon 9 and dragon as you

5171

03:22:42,870 --> 03:22:40,800

guys know is an incredible vehicle hi

5172

03:22:44,870 --> 03:22:42,880

everyone at virtual nasa social i'm dr

5173

03:22:47,030 --> 03:22:44,880

cyan proctor i am the mission pilot from

5174

03:22:49,830 --> 03:22:47,040

inspiration 4 and i just want to wish

5175

03:22:51,990 --> 03:22:49,840

crew 3 an awesome lift off as they head

5176  
03:22:54,309 --> 03:22:52,000  
to the international space station hi

5177  
03:22:55,830 --> 03:22:54,319  
raja tom matias kayla

5178  
03:22:58,229 --> 03:22:55,840  
hank's here just to wish you well on

5179  
03:23:00,150 --> 03:22:58,239  
your mission into space i couldn't be

5180  
03:23:01,750 --> 03:23:00,160  
more excited for you for the journey

5181  
03:23:03,830 --> 03:23:01,760  
you're about to go through

5182  
03:23:05,910 --> 03:23:03,840  
getting into that falcon rocket

5183  
03:23:08,630 --> 03:23:05,920  
with your suits on to have your name on

5184  
03:23:10,550 --> 03:23:08,640  
it is a feeling like no other crew free

5185  
03:23:12,630 --> 03:23:10,560  
i just want to say i'm so excited for

5186  
03:23:13,830 --> 03:23:12,640  
all of you i know that rush of emotion

5187  
03:23:16,229 --> 03:23:13,840  
that you're gonna feel with your

5188  
03:23:17,910 --> 03:23:16,239

spacesuit on strapped into the capsule

5189

03:23:20,150 --> 03:23:17,920

and you're about to have the best ride

5190

03:23:21,670 --> 03:23:20,160

of your life just laugh the whole way up

5191

03:23:23,830 --> 03:23:21,680

there like we did

5192

03:23:25,830 --> 03:23:23,840

i just want to wish you all the best and

5193

03:23:28,389 --> 03:23:25,840

i look forward to exchanging uh some

5194

03:23:31,750 --> 03:23:28,399

stories a little bit down the road take

5195

03:23:33,750 --> 03:23:31,760

care godspeed crew 3.

5196

03:23:35,590 --> 03:23:33,760

i love haley arsenau saying that she

5197

03:23:37,349 --> 03:23:35,600

laughed the whole way up i can

5198

03:23:38,309 --> 03:23:37,359

definitely relate to that can you really

5199

03:23:40,229 --> 03:23:38,319

yes

5200

03:23:42,309 --> 03:23:40,239

that was so funny exciting ride you're

5201  
03:23:44,870 --> 03:23:42,319  
just happy you're just so thrilled yeah

5202  
03:23:46,790 --> 03:23:44,880  
that's that's fantastic and whenever she

5203  
03:23:49,510 --> 03:23:46,800  
says anything it always brings a smile

5204  
03:23:50,950 --> 03:23:49,520  
to my face she has such great energy

5205  
03:23:53,269 --> 03:23:50,960  
well throughout the program we've been

5206  
03:23:55,750 --> 03:23:53,279  
answering your ass nasa questions from

5207  
03:23:57,910 --> 03:23:55,760  
social media we have time now for a few

5208  
03:23:59,990 --> 03:23:57,920  
more before falcon 9 fueling begins and

5209  
03:24:01,910 --> 03:24:00,000  
so we'll pop it up on the screen and

5210  
03:24:04,150 --> 03:24:01,920  
shannon you've been answering them all

5211  
03:24:06,469 --> 03:24:04,160  
so long we appreciate that so the

5212  
03:24:09,110 --> 03:24:06,479  
question we have up now is what are your

5213  
03:24:11,510 --> 03:24:09,120

tips for me to go to space i'm a high

5214

03:24:13,110 --> 03:24:11,520

school freshman from poland dreaming of

5215

03:24:14,950 --> 03:24:13,120

going to space

5216

03:24:17,830 --> 03:24:14,960

yes so the first thing the most

5217

03:24:21,110 --> 03:24:17,840

important thing is to do well in school

5218

03:24:22,630 --> 03:24:21,120

we need people who are very accomplished

5219

03:24:24,950 --> 03:24:22,640

and have lots of different skills and it

5220

03:24:26,309 --> 03:24:24,960

all starts with a good education now

5221

03:24:29,190 --> 03:24:26,319

being from poland you're going to have

5222

03:24:30,870 --> 03:24:29,200

to apply to the european space agency to

5223

03:24:31,990 --> 03:24:30,880

be part of their astronaut program and

5224

03:24:35,110 --> 03:24:32,000

hopefully they will have another

5225

03:24:37,030 --> 03:24:35,120

selection one of these days but really

5226

03:24:39,750 --> 03:24:37,040

do well in school and then go pursue a

5227

03:24:41,910 --> 03:24:39,760

field of work that really interests you

5228

03:24:44,950 --> 03:24:41,920

what you want to do is do something

5229

03:24:46,630 --> 03:24:44,960

you're very passionate about and um

5230

03:24:47,670 --> 03:24:46,640

that really when you're passionate about

5231

03:24:49,030 --> 03:24:47,680

something

5232

03:24:50,150 --> 03:24:49,040

you're going to do well at it and it's

5233

03:24:52,710 --> 03:24:50,160

going to stand out and people are going

5234

03:24:54,630 --> 03:24:52,720

to take notice and so yeah it doesn't

5235

03:24:56,870 --> 03:24:54,640

necessarily have to be a specific you

5236

03:24:58,710 --> 03:24:56,880

know you stem is good right right but

5237

03:25:01,830 --> 03:24:58,720

there have been people who have not gone

5238

03:25:03,910 --> 03:25:01,840

into stem and become astronauts uh every

5239

03:25:06,150 --> 03:25:03,920

astronaut that we have taken at on the

5240

03:25:07,750 --> 03:25:06,160

nasa side it's got a stem background oh

5241

03:25:09,910 --> 03:25:07,760

they do and so that is a requirement

5242

03:25:11,349 --> 03:25:09,920

that is a requirement right now now of

5243

03:25:12,790 --> 03:25:11,359

course we're starting to fly more people

5244

03:25:14,309 --> 03:25:12,800

and they're more opportunities to get to

5245

03:25:16,070 --> 03:25:14,319

space so it may not be a requirement in

5246

03:25:18,389 --> 03:25:16,080

the future but right now at least on the

5247

03:25:20,309 --> 03:25:18,399

nasa side uh you need a stem background

5248

03:25:22,870 --> 03:25:20,319

a stem background and study hard and get

5249

03:25:24,950 --> 03:25:22,880

some good grades our next question does

5250

03:25:27,670 --> 03:25:24,960

it get very hot wearing the spacesuits

5251

03:25:29,990 --> 03:25:27,680

or is the material breathable ah

5252

03:25:31,429 --> 03:25:30,000

yes no the material is absolutely not

5253

03:25:33,110 --> 03:25:31,439

breathable because you need those

5254

03:25:35,590 --> 03:25:33,120

spacesuits to hold pressure should

5255

03:25:37,670 --> 03:25:35,600

something go wrong in the capsule so you

5256

03:25:39,670 --> 03:25:37,680

need it to completely contain that

5257

03:25:41,750 --> 03:25:39,680

atmosphere around you so they can get a

5258

03:25:44,070 --> 03:25:41,760

little hot but the entire time you're in

5259

03:25:45,990 --> 03:25:44,080

the suit uh they're flowing air through

5260

03:25:48,389 --> 03:25:46,000

it to keep you cool you've got an air

5261

03:25:50,389 --> 03:25:48,399

conditioning system for the suit yes

5262

03:25:51,750 --> 03:25:50,399

blowing that air around yes exactly you

5263

03:25:53,349 --> 03:25:51,760

need the air to be blown around because

5264

03:25:54,950 --> 03:25:53,359

you really don't want to end up with a

5265

03:25:56,630 --> 03:25:54,960

carbon dioxide bubble right in front of

5266

03:25:58,229 --> 03:25:56,640

your face all right thank you so much

5267

03:25:59,830 --> 03:25:58,239

shannon for answering those questions

5268

03:26:02,710 --> 03:25:59,840

and keep the questions coming we

5269

03:26:05,110 --> 03:26:02,720

appreciate them appreciate them at

5270

03:26:07,110 --> 03:26:05,120

ask nasa now we'll send it over to marie

5271

03:26:08,950 --> 03:26:07,120

who is standing by with the deputy

5272

03:26:20,150 --> 03:26:08,960

director of the kennedy space center

5273

03:26:23,990 --> 03:26:21,750

oh it's a pleasure to be here with you

5274

03:26:25,910 --> 03:26:24,000

marie and i wanted to ask you about a

5275

03:26:28,550 --> 03:26:25,920

special connection that you have to

5276

03:26:31,349 --> 03:26:28,560

kayla and raja uh part of the turtle

5277

03:26:33,110 --> 03:26:31,359

class of astronauts in 2017. you were

5278

03:26:35,590 --> 03:26:33,120

actually on their selection board tell

5279

03:26:38,550 --> 03:26:35,600

me about that oh i sure was in the class

5280

03:26:42,150 --> 03:26:38,560

of 2017 we had the most applicants ever

5281

03:26:43,750 --> 03:26:42,160

in the history of nasa 18 353

5282

03:26:45,990 --> 03:26:43,760

and when it was all said and done we

5283

03:26:47,349 --> 03:26:46,000

picked 12. of course raja and kayla were

5284

03:26:49,750 --> 03:26:47,359

part of that class

5285

03:26:51,990 --> 03:26:49,760

so to see them when they first walked in

5286

03:26:54,229 --> 03:26:52,000

for their very first nasa interview and

5287

03:26:56,550 --> 03:26:54,239

to know now they're on board the dragon

5288

03:26:57,590 --> 03:26:56,560

on top of the falcon 9 rocket it's just

5289

03:26:59,830 --> 03:26:57,600

amazing

5290

03:27:02,229 --> 03:26:59,840

very exciting and so much has happened

5291

03:27:04,070 --> 03:27:02,239

in in such a short period of time you

5292

03:27:05,910 --> 03:27:04,080

became the deputy director just earlier

5293

03:27:07,910 --> 03:27:05,920

this year in the middle of a very busy

5294

03:27:09,670 --> 03:27:07,920

launch campaign we've seen private

5295

03:27:12,309 --> 03:27:09,680

citizens launch from here at kennedy

5296

03:27:13,910 --> 03:27:12,319

this year more of that is coming

5297

03:27:16,389 --> 03:27:13,920

we've got a regular cadence of these

5298

03:27:17,910 --> 03:27:16,399

commercial crew missions to station um

5299

03:27:20,630 --> 03:27:17,920

and we're coming up on the 60th

5300

03:27:22,389 --> 03:27:20,640

anniversary of kennedy so uh you know so

5301

03:27:24,150 --> 03:27:22,399

much has happened like we said in such a

5302

03:27:25,990 --> 03:27:24,160

short period of time what do you see

5303

03:27:27,190 --> 03:27:26,000

ahead for the next 60 years of kennedy

5304

03:27:29,830 --> 03:27:27,200

space center

5305

03:27:32,309 --> 03:27:29,840

well i see it's just getting started now

5306

03:27:34,870 --> 03:27:32,319

so this started with a vision ten years

5307

03:27:36,950 --> 03:27:34,880

ago we flew out the space shuttle and we

5308

03:27:38,870 --> 03:27:36,960

had a vision to create the world's

5309

03:27:41,429 --> 03:27:38,880

premier multi-user spaceport for both

5310

03:27:43,670 --> 03:27:41,439

commercial and government users and now

5311

03:27:45,990 --> 03:27:43,680

you've seen it coming to fruition

5312

03:27:48,070 --> 03:27:46,000

so it's just going to be we have 24

5313

03:27:50,309 --> 03:27:48,080

launches now more launches than any

5314

03:27:52,229 --> 03:27:50,319

place else in the world when we finish

5315

03:27:53,990 --> 03:27:52,239

this year we should have close to 50

5316

03:27:55,110 --> 03:27:54,000

launches and it's just going to increase

5317

03:27:57,590 --> 03:27:55,120

more and more

5318

03:27:59,190 --> 03:27:57,600

i want to also ask you about um what is

5319

03:28:01,910 --> 03:27:59,200

in the building right behind us of

5320

03:28:03,590 --> 03:28:01,920

course the goliath vehicle assembly

5321

03:28:05,750 --> 03:28:03,600

building the artemis

5322

03:28:07,990 --> 03:28:05,760

rocket the sls space launch system

5323

03:28:11,190 --> 03:28:08,000

rocket is fully stacked we want to show

5324

03:28:14,070 --> 03:28:11,200

you a peek inside our gigantic moon

5325

03:28:16,790 --> 03:28:14,080

rocket there it is that is the space

5326  
03:28:19,590 --> 03:28:16,800  
launch system and the orion capsule

5327  
03:28:21,830 --> 03:28:19,600  
being stacked on top this is video from

5328  
03:28:24,550 --> 03:28:21,840  
late october inside the vehicle assembly

5329  
03:28:27,389 --> 03:28:24,560  
building and now that the rocket and

5330  
03:28:31,670 --> 03:28:27,399  
capsule are fully stacked it stands at

5331  
03:28:34,389 --> 03:28:31,680  
322 feet tall and that is taller in fact

5332  
03:28:35,830 --> 03:28:34,399  
than the statue of liberty um quite a

5333  
03:28:37,910 --> 03:28:35,840  
sight in there kelvin i don't know if

5334  
03:28:40,550 --> 03:28:37,920  
you've had a chance to actually go

5335  
03:28:43,110 --> 03:28:40,560  
inside since that stack in october

5336  
03:28:44,790 --> 03:28:43,120  
but it's just astounding and and

5337  
03:28:46,870 --> 03:28:44,800  
what what do you have to say about that

5338  
03:28:48,309 --> 03:28:46,880

if you've seen it inside and what do we

5339

03:28:50,950 --> 03:28:48,319

have to get through before that first

5340

03:28:52,950 --> 03:28:50,960

launch of artemis one okay i saw today

5341

03:28:56,150 --> 03:28:52,960

and i see it about uh

5342

03:28:58,550 --> 03:28:56,160

every week you know and it is it is just

5343

03:28:59,910 --> 03:28:58,560

humongous to see that rocketed to know

5344

03:29:02,309 --> 03:28:59,920

that that rocket will carry our

5345

03:29:04,229 --> 03:29:02,319

astronauts to the moon and beyond

5346

03:29:06,309 --> 03:29:04,239

hopefully to mars so right now we're

5347

03:29:08,469 --> 03:29:06,319

undergoing something we call ivt

5348

03:29:10,710 --> 03:29:08,479

interface verification test we'll do

5349

03:29:12,870 --> 03:29:10,720

that for a couple more days and then

5350

03:29:15,269 --> 03:29:12,880

we're getting prepared to roll it out

5351  
03:29:17,670 --> 03:29:15,279  
for a wet dress rehearsal so hopefully

5352  
03:29:19,910 --> 03:29:17,680  
that'll happen the end of this year

5353  
03:29:22,070 --> 03:29:19,920  
early next year we'll roll it out to the

5354  
03:29:25,510 --> 03:29:22,080  
pad fully fuel it test all the

5355  
03:29:27,349 --> 03:29:25,520  
interfaces pad vehicle and

5356  
03:29:29,910 --> 03:29:27,359  
roll it back for a launch hopefully in

5357  
03:29:31,830 --> 03:29:29,920  
february fantastic calvin manning thank

5358  
03:29:33,830 --> 03:29:31,840  
you so much and by the way happy

5359  
03:29:35,910 --> 03:29:33,840  
veterans day a little early i know you

5360  
03:29:37,429 --> 03:29:35,920  
served so thank you for your service hey

5361  
03:29:39,190 --> 03:29:37,439  
thank you murray all right we're going

5362  
03:29:40,950 --> 03:29:39,200  
to go over to john inspector now in

5363  
03:29:44,389 --> 03:29:40,960

hawthorne as the action begins to pick

5364

03:29:48,070 --> 03:29:46,790

we're just inside t minus 47 minutes

5365

03:29:50,150 --> 03:29:48,080

we're listening right now to the

5366

03:29:51,590 --> 03:29:50,160

countdown net waiting for the spacex

5367

03:29:53,590 --> 03:29:51,600

launch director

5368

03:29:55,750 --> 03:29:53,600

to discuss the propellant load and

5369

03:29:58,309 --> 03:29:55,760

launch poll results and give final

5370

03:30:00,469 --> 03:29:58,319

instructions to the launch team

5371

03:30:02,389 --> 03:30:00,479

at this time we have completed all

5372

03:30:04,469 --> 03:30:02,399

checks on the falcon 9 and the dragon

5373

03:30:06,070 --> 03:30:04,479

spacecraft we're also checking with the

5374

03:30:11,190 --> 03:30:06,080

dragon mission director to make sure

5375

03:30:16,710 --> 03:30:12,950

and right now we're waiting to listen

5376

03:30:18,550 --> 03:30:16,720

for that launch director to come up

5377

03:30:20,550 --> 03:30:18,560

now we have been checking as i said with

5378

03:30:22,150 --> 03:30:20,560

the dragon mission director also nasa

5379

03:30:24,790 --> 03:30:22,160

launch manager to make sure they're

5380

03:30:27,750 --> 03:30:24,800

ready now you can see on this screen

5381

03:30:30,790 --> 03:30:27,760

right now falcon 9 on the pad true

5382

03:30:32,950 --> 03:30:30,800

access arm alongside the dragon capsule

5383

03:30:36,150 --> 03:30:32,960

earlier you saw the vehicle assembly

5384

03:30:38,630 --> 03:30:36,160

building during that previous interview

5385

03:30:41,590 --> 03:30:38,640

the falcon and dragon launch team as

5386

03:30:43,670 --> 03:30:41,600

well as key members of nasa are in the

5387

03:30:45,590 --> 03:30:43,680

launch control center which is just

5388

03:30:47,590 --> 03:30:45,600

adjacent to the vehicle assembly

5389

03:30:48,950 --> 03:30:47,600

building as you saw earlier if you're

5390

03:30:51,349 --> 03:30:48,960

with us they've got a view straight

5391

03:30:54,309 --> 03:30:51,359

towards pad 39a through the large

5392

03:30:56,469 --> 03:30:54,319

windows of firing room four

5393

03:30:59,349 --> 03:30:56,479

now going back to the current screen

5394

03:31:01,670 --> 03:30:59,359

view you can see the crew access arm

5395

03:31:03,990 --> 03:31:01,680

that arm once we finish the readiness

5396

03:31:05,670 --> 03:31:04,000

poll and instructions to the crew or

5397

03:31:07,830 --> 03:31:05,680

instructions to the attention on

5398

03:31:09,750 --> 03:31:07,840

countdown that inheritance is complete

5399

03:31:25,830 --> 03:31:09,760

and teams have pulled go for propellant

5400

03:31:28,550 --> 03:31:27,269

and they will approve aborting the

5401  
03:31:29,990 --> 03:31:28,560  
countdown

5402  
03:31:32,070 --> 03:31:30,000  
for urgent issues

5403  
03:31:34,309 --> 03:31:32,080  
affecting the safety of the operation

5404  
03:31:36,309 --> 03:31:34,319  
operators shall call hold hold hold on

5405  
03:31:37,590 --> 03:31:36,319  
the countdown net launch control will

5406  
03:31:39,510 --> 03:31:37,600  
abort the launch audit sequence

5407  
03:31:41,429 --> 03:31:39,520  
immediately and proceed to the launch

5408  
03:31:43,349 --> 03:31:41,439  
abort auto sequence

5409  
03:31:45,030 --> 03:31:43,359  
at t minus 10 seconds launch control

5410  
03:31:46,389 --> 03:31:45,040  
will be hands off relying solely on

5411  
03:31:47,990 --> 03:31:46,399  
automated work criteria for the

5412  
03:31:49,349 --> 03:31:48,000  
remainder of the account

5413  
03:31:51,190 --> 03:31:49,359

operators advise the launch director

5414

03:31:52,870 --> 03:31:51,200

whether structural breakup or fire is

5415

03:31:55,269 --> 03:31:52,880

imminent or recurring per dragon manual

5416

03:31:56,870 --> 03:31:55,279

escape flight rules

5417

03:31:58,870 --> 03:31:56,880

for those in

5418

03:32:01,190 --> 03:31:58,880

firing room 4 here at ksc in the event

5419

03:32:03,590 --> 03:32:01,200

of a fire alarm operators noted below

5420

03:32:05,590 --> 03:32:03,600

56.80 or made their post while the alarm

5421

03:32:07,670 --> 03:32:05,600

is evacuated the event that personnel

5422

03:32:09,429 --> 03:32:07,680

safety is threatened evacuate to south

5423

03:32:11,590 --> 03:32:09,439

facing emergency exit leads directly

5424

03:32:12,950 --> 03:32:11,600

outside

5425

03:32:14,790 --> 03:32:12,960

launch control at this time you may

5426  
03:32:18,309 --> 03:32:14,800  
proceed with arming the crew arm for

5427  
03:32:22,550 --> 03:32:20,630  
just over t minus 44 minutes we're going

5428  
03:32:24,309 --> 03:32:22,560  
to send it back to daryl and the team at

5429  
03:32:26,469 --> 03:32:24,319  
kennedy space center as we get ready to

5430  
03:32:28,070 --> 03:32:26,479  
move the crew access arm

5431  
03:32:29,910 --> 03:32:28,080  
that's right john we are awaiting that

5432  
03:32:32,790 --> 03:32:29,920  
big moment here at the kennedy space

5433  
03:32:39,110 --> 03:32:32,800  
center in florida as we do

5434  
03:32:44,150 --> 03:32:41,110  
and there is the retraction

5435  
03:32:46,309 --> 03:32:44,160  
great shot of the dragon moving it it's

5436  
03:32:47,750 --> 03:32:46,319  
not moving the crew access arm is moving

5437  
03:32:51,750 --> 03:32:47,760  
away from it yep and you can see that

5438  
03:32:57,830 --> 03:32:51,760

from inside the dragon as well

5439

03:33:02,469 --> 03:32:59,590

when you're in the capsule can you see

5440

03:33:04,309 --> 03:33:02,479

that you can you have windows that are

5441

03:33:05,990 --> 03:33:04,319

at pretty much your foot level and you

5442

03:33:08,070 --> 03:33:06,000

can you can see a little bit out so you

5443

03:33:09,429 --> 03:33:08,080

do see that moving away and once it's

5444

03:33:11,510 --> 03:33:09,439

gone you know it's just you and the

5445

03:33:13,670 --> 03:33:11,520

rocket

5446

03:33:14,870 --> 03:33:13,680

there's the camera pointed directly at

5447

03:33:16,790 --> 03:33:14,880

dragon

5448

03:33:19,590 --> 03:33:16,800

great view there you can see the strong

5449

03:33:35,349 --> 03:33:19,600

back at the top

5450

03:33:39,830 --> 03:33:37,510

and this crew access arm

5451  
03:33:41,670 --> 03:33:39,840  
can move faster than it's doing right

5452  
03:33:45,030 --> 03:33:41,680  
now under certain circumstances right

5453  
03:33:46,710 --> 03:33:45,040  
absolutely if it needs to go back to uh

5454  
03:33:55,510 --> 03:33:46,720  
being up against the capsule it can move

5455  
03:33:59,190 --> 03:33:57,590  
it was just not too long ago about an

5456  
03:34:01,990 --> 03:33:59,200  
hour ago that we saw the astronauts

5457  
03:34:06,870 --> 03:34:02,000  
walking down that very crew access arm

5458  
03:34:11,269 --> 03:34:09,349  
just one more step closer to launch an

5459  
03:34:15,269 --> 03:34:11,279  
important milestone

5460  
03:34:19,590 --> 03:34:17,670  
i'm enjoying uh just watching the the

5461  
03:34:21,190 --> 03:34:19,600  
various parts of the launch pad go by

5462  
03:34:23,349 --> 03:34:21,200  
yeah as we look out there yeah you don't

5463  
03:34:25,030 --> 03:34:23,359

often get that view so this might as

5464

03:34:27,190 --> 03:34:25,040

well soak it in while we've got it

5465

03:34:30,389 --> 03:34:27,200

there's nobody inside that arm there's

5466

03:34:31,670 --> 03:34:30,399

nobody on the pad the only people who

5467

03:34:34,150 --> 03:34:31,680

are there

5468

03:34:40,550 --> 03:34:34,160

are the four astronauts inside

5469

03:34:45,990 --> 03:34:43,910

you can see the water deluge system

5470

03:34:47,750 --> 03:34:46,000

to the left out the uh

5471

03:34:51,670 --> 03:34:47,760

opening there to the white room through

5472

03:34:56,630 --> 03:34:54,389

and we just heard the call out that the

5473

03:34:58,389 --> 03:34:56,640

crew access arm has completed its

5474

03:35:02,870 --> 03:34:58,399

retraction away from

5475

03:35:08,229 --> 03:35:05,590

dragon spacex you are go for section 7

5476  
03:35:13,590 --> 03:35:08,239  
of 4.100 close visors and arm the launch

5477  
03:35:13,600 --> 03:35:16,870  
that's what's up

5478  
03:35:20,710 --> 03:35:18,870  
arming the launch escape system and

5479  
03:35:22,469 --> 03:35:20,720  
while we await that

5480  
03:35:25,670 --> 03:35:22,479  
let's take a social question oh that

5481  
03:35:28,790 --> 03:35:25,680  
sounds like a great idea

5482  
03:35:31,429 --> 03:35:28,800  
michelle stone asks as an astronaut what

5483  
03:35:33,990 --> 03:35:31,439  
moment does it become real that you are

5484  
03:35:36,389 --> 03:35:34,000  
about to launch the space

5485  
03:35:38,790 --> 03:35:36,399  
you know michelle it is right about now

5486  
03:35:41,269 --> 03:35:38,800  
so you know everything else has happened

5487  
03:35:43,590 --> 03:35:41,279  
according to plan and this is really the

5488  
03:35:45,750 --> 03:35:43,600

final final bit before you launch into

5489

03:35:47,429 --> 03:35:45,760

space so anything had gone wrong

5490

03:35:49,590 --> 03:35:47,439

previously the access arm was there and

5491

03:35:53,830 --> 03:35:49,600

you could just exit the capsule now it's

5492

03:35:57,910 --> 03:35:55,510

and arming the launch escape system as

5493

03:35:59,590 --> 03:35:57,920

we just heard that call is is a major

5494

03:36:01,030 --> 03:35:59,600

major milestone

5495

03:36:02,950 --> 03:36:01,040

because you know if

5496

03:36:04,710 --> 03:36:02,960

for some reason something were to happen

5497

03:36:06,550 --> 03:36:04,720

that's how you're getting off the top of

5498

03:36:08,550 --> 03:36:06,560

that rocket that is correct if something

5499

03:36:10,630 --> 03:36:08,560

happens if it's detected on the ground

5500

03:36:14,389 --> 03:36:10,640

or by the systems on the

5501

03:36:16,150 --> 03:36:14,399

dragon or that falcon 9 um it will

5502

03:36:17,510 --> 03:36:16,160

engage that launch escape system and

5503

03:36:21,190 --> 03:36:17,520

that crew will go shooting off that

5504

03:36:25,030 --> 03:36:23,429

let's take another question now

5505

03:36:26,790 --> 03:36:25,040

shannon been doing so well with these

5506

03:36:28,950 --> 03:36:26,800

questions i love answering questions oh

5507

03:36:30,870 --> 03:36:28,960

excellent here's another one are there

5508

03:36:33,510 --> 03:36:30,880

pre-launch rituals and activities that

5509

03:36:35,990 --> 03:36:33,520

the crew go through before launch

5510

03:36:37,990 --> 03:36:36,000

you know we do have some um

5511

03:36:39,269 --> 03:36:38,000

i would say traditions and it's kind of

5512

03:36:41,190 --> 03:36:39,279

interesting now that we're in the

5513

03:36:43,030 --> 03:36:41,200

commercial escape system is verified

5514

03:36:47,429 --> 03:36:43,040

armed

5515

03:36:49,349 --> 03:36:47,439

there are copies we see the same

5516

03:36:51,670 --> 03:36:49,359

um so we have

5517

03:36:53,910 --> 03:36:51,680

uh traditions that come from the apollo

5518

03:36:56,150 --> 03:36:53,920

days we've got traditions that we

5519

03:36:58,309 --> 03:36:56,160

actually experienced over in russia when

5520

03:36:59,670 --> 03:36:58,319

we're flying on soyuz and so we sort of

5521

03:37:01,110 --> 03:36:59,680

combined a few

5522

03:37:02,550 --> 03:37:01,120

a lot of them as you've seen earlier

5523

03:37:06,150 --> 03:37:02,560

involves the crew sticking their

5524

03:37:08,469 --> 03:37:06,160

stickers on various places yes

5525

03:37:11,910 --> 03:37:08,479

everywhere you can everywhere we can

5526  
03:37:17,349 --> 03:37:14,150  
and one more question for you shannon

5527  
03:37:20,309 --> 03:37:17,359  
as we await the loading of propellant

5528  
03:37:22,710 --> 03:37:20,319  
into the falcon 9 rocket

5529  
03:37:24,790 --> 03:37:22,720  
hey nasa while watching the launch of

5530  
03:37:27,030 --> 03:37:24,800  
crew 3 i noticed the astronauts have a

5531  
03:37:30,389 --> 03:37:27,040  
little mirror on their suits on their

5532  
03:37:33,110 --> 03:37:30,399  
left arm what are they for yes

5533  
03:37:35,830 --> 03:37:33,120  
good eye to notice that good eye good

5534  
03:37:39,349 --> 03:37:35,840  
eye yes that mirror is actually uh will

5535  
03:37:40,950 --> 03:37:39,359  
let you um inspect your spacesuit to

5536  
03:37:42,630 --> 03:37:40,960  
make sure everything is fine so once

5537  
03:37:44,309 --> 03:37:42,640  
you're in the spacecraft by yourself if

5538  
03:37:47,030 --> 03:37:44,319

you open your visor and you need to shut

5539

03:37:49,110 --> 03:37:47,040

it you want to make sure in my case that

5540

03:37:51,429 --> 03:37:49,120

your hair is not crossing the boundary

5541

03:37:52,950 --> 03:37:51,439

and would interrupt the seal that is is

5542

03:37:55,510 --> 03:37:52,960

necessary to keep that pressure on the

5543

03:37:58,150 --> 03:37:55,520

inside so they use that to make sure

5544

03:38:00,710 --> 03:37:58,160

their space suit is in perfect condition

5545

03:38:01,429 --> 03:38:00,720

how about that i i hadn't even noticed

5546

03:38:05,910 --> 03:38:01,439

it

5547

03:38:07,510 --> 03:38:05,920

questions um from the viewers and the

5548

03:38:09,429 --> 03:38:07,520

people who are watching because they're

5549

03:38:11,190 --> 03:38:09,439

looking so closely they are looking

5550

03:38:12,950 --> 03:38:11,200

closely and it's great that uh people

5551

03:38:14,630 --> 03:38:12,960

are picking up those details

5552

03:38:16,950 --> 03:38:14,640

well let's take another one then since

5553

03:38:18,710 --> 03:38:16,960

uh we've got some great questions coming

5554

03:38:20,630 --> 03:38:18,720

in

5555

03:38:22,389 --> 03:38:20,640

can you keep your spacesuit after the

5556

03:38:23,990 --> 03:38:22,399

mission oh man i wish i could keep my

5557

03:38:26,150 --> 03:38:24,000

spacesuit i don't know where i would put

5558

03:38:27,510 --> 03:38:26,160

it but no um unfortunately we are not

5559

03:38:28,790 --> 03:38:27,520

allowed to keep our spacesuits you

5560

03:38:30,550 --> 03:38:28,800

couldn't stuff it and put it in the

5561

03:38:32,070 --> 03:38:30,560

foyer i suppose i could that would be a

5562

03:38:33,349 --> 03:38:32,080

bit pretentious don't you think but you

5563

03:38:35,990 --> 03:38:33,359

know what's interesting is if you don't

5564

03:38:38,309 --> 03:38:36,000

keep it it is made exactly to your

5565

03:38:41,429 --> 03:38:38,319

specification so what do we do with it

5566

03:38:43,990 --> 03:38:41,439

so um yeah actually after a flight the

5567

03:38:46,229 --> 03:38:44,000

spacesuits go into rotation for training

5568

03:38:47,990 --> 03:38:46,239

and so at this moment uh samantha

5569

03:38:50,630 --> 03:38:48,000

christopher reddy who is about my size

5570

03:38:53,030 --> 03:38:50,640

is using my spacesuit for her training

5571

03:38:55,590 --> 03:38:53,040

while her spacesuit is being built ah

5572

03:38:57,830 --> 03:38:55,600

okay so they really are used yes again

5573

03:38:59,750 --> 03:38:57,840

but not for space flight they go into a

5574

03:39:01,910 --> 03:38:59,760

life of training that's correct

5575

03:39:03,510 --> 03:39:01,920

great questions folks we really

5576

03:39:05,510 --> 03:39:03,520

appreciate these these are

5577

03:39:07,750 --> 03:39:05,520

these are some good ones

5578

03:39:10,950 --> 03:39:07,760

in approximately 25 seconds expect loud

5579

03:39:16,550 --> 03:39:12,309

so we're getting a call out as we

5580

03:39:20,950 --> 03:39:19,110

and you see the crew there crew 3 and

5581

03:39:22,630 --> 03:39:20,960

they have their visors closed so they

5582

03:39:25,349 --> 03:39:22,640

are ready they have them closed before

5583

03:39:26,150 --> 03:39:25,359

the launch system is activated in case

5584

03:39:27,750 --> 03:39:26,160

or

5585

03:39:29,269 --> 03:39:27,760

activated in case it needs to be put

5586

03:39:31,670 --> 03:39:29,279

into action they will be safe in their

5587

03:39:33,590 --> 03:39:31,680

suits another safety measure as we are

5588

03:39:35,830 --> 03:39:33,600

here at the kennedy space center taking

5589

03:39:37,910 --> 03:39:35,840

another question from social media

5590

03:39:40,550 --> 03:39:37,920

shannon what was it like to feel the

5591

03:39:42,550 --> 03:39:40,560

weightlessness of space for the first

5592

03:39:44,389 --> 03:39:42,560

time oh that is such an interesting

5593

03:39:46,469 --> 03:39:44,399

feeling when that happens of course i

5594

03:39:47,910 --> 03:39:46,479

felt it for the first time on the soyuz

5595

03:39:50,550 --> 03:39:47,920

spacecraft

5596

03:39:52,469 --> 03:39:50,560

when we got into space and the engines

5597

03:39:54,790 --> 03:39:52,479

cut off to me it felt like we were sort

5598

03:39:57,510 --> 03:39:54,800

of tipping forward i felt like i was

5599

03:39:59,750 --> 03:39:57,520

floating forward in my uh and my harness

5600

03:40:01,030 --> 03:39:59,760

that was holding me down huh i don't

5601  
03:40:02,630 --> 03:40:01,040  
know why i don't think we were but

5602  
03:40:04,710 --> 03:40:02,640  
that's what it felt like

5603  
03:40:07,510 --> 03:40:04,720  
and not too long after you get up into

5604  
03:40:09,269 --> 03:40:07,520  
space um don't you get ready to sleep in

5605  
03:40:11,110 --> 03:40:09,279  
anticipation for getting to the space

5606  
03:40:13,429 --> 03:40:11,120  
station it it really depends on your

5607  
03:40:16,309 --> 03:40:13,439  
profile so what uh the crew dragon will

5608  
03:40:19,030 --> 03:40:16,319  
do is what we did on our flight up was

5609  
03:40:20,710 --> 03:40:19,040  
also had a 22-hour ish rendezvous they

5610  
03:40:22,469 --> 03:40:20,720  
will go through systems checks make sure

5611  
03:40:24,150 --> 03:40:22,479  
everything is working on the dragon and

5612  
03:40:26,070 --> 03:40:24,160  
then they will have a sleep period

5613  
03:40:27,590 --> 03:40:26,080

before they do the final rendezvous and

5614

03:40:30,229 --> 03:40:27,600

i want to ask a follow-up on this

5615

03:40:32,550 --> 03:40:30,239

question okay what's it like to sleep in

5616

03:40:34,389 --> 03:40:32,560

space like what happens is does your

5617

03:40:36,309 --> 03:40:34,399

head kind of what does your head do and

5618

03:40:38,550 --> 03:40:36,319

how do you get comfortable with

5619

03:40:40,550 --> 03:40:38,560

not being against anything it is it is

5620

03:40:41,990 --> 03:40:40,560

interesting to sleep in space uh it is

5621

03:40:43,670 --> 03:40:42,000

actually pretty comfortable to sleep in

5622

03:40:45,750 --> 03:40:43,680

space but it does take a little bit

5623

03:40:47,670 --> 03:40:45,760

getting used to i will tell you the

5624

03:40:49,510 --> 03:40:47,680

first time i was up there for about the

5625

03:40:50,630 --> 03:40:49,520

first month i would wake up in the

5626

03:40:53,030 --> 03:40:50,640

middle of the night and feel like i

5627

03:40:54,630 --> 03:40:53,040

needed to turn over but of course that's

5628

03:40:56,469 --> 03:40:54,640

not going to do you any good in space so

5629

03:40:57,910 --> 03:40:56,479

you that's just part of adjusting to

5630

03:40:59,269 --> 03:40:57,920

learning how to sleep in space there's

5631

03:41:01,030 --> 03:40:59,279

certainly no pressure points are there

5632

03:41:03,510 --> 03:41:01,040

there are no pressure points

5633

03:41:05,910 --> 03:41:03,520

you just tucked into your sleeping bag

5634

03:41:07,189 --> 03:41:05,920

are you restrained you have a sleeping

5635

03:41:08,870 --> 03:41:07,199

bag on the space station you have a

5636

03:41:10,630 --> 03:41:08,880

sleeping bag that's inside your crew

5637

03:41:12,070 --> 03:41:10,640

quarters and that sleeping bag is

5638

03:41:13,670 --> 03:41:12,080

attached to the wall so you sort of

5639

03:41:16,150 --> 03:41:13,680

float inside your sleeping bag which is

5640

03:41:18,070 --> 03:41:16,160

attached to a wall all right great job

5641

03:41:20,070 --> 03:41:18,080

shannon thank you for all

5642

03:41:22,710 --> 03:41:20,080

the answers to the questions there and

5643

03:41:24,790 --> 03:41:22,720

thank you folks for sending them in they

5644

03:41:26,150 --> 03:41:24,800

were wonderful we enjoyed them and

5645

03:41:28,150 --> 03:41:26,160

shannon did a great job of answering

5646

03:41:31,349 --> 03:41:28,160

them just a few seconds away from prop

5647

03:41:31,359 --> 03:41:36,469

propellant load has started

5648

03:41:41,189 --> 03:41:38,790

and there we heard the call out yes this

5649

03:41:43,590 --> 03:41:41,199

rocket is being loaded with propeller

5650

03:41:44,950 --> 03:41:43,600

yes obviously another major milestone

5651  
03:41:47,910 --> 03:41:44,960  
and that is something that is very

5652  
03:41:50,309 --> 03:41:47,920  
obvious to the crew they can feel it um

5653  
03:41:52,150 --> 03:41:50,319  
loading into the tanks it starts

5654  
03:41:55,750 --> 03:41:52,160  
low down at the bottom of the rocket but

5655  
03:42:00,070 --> 03:41:57,830  
the propellant gets it the tanks get

5656  
03:42:02,469 --> 03:42:00,080  
more full you it gets more vibrations

5657  
03:42:04,070 --> 03:42:02,479  
and and uh louder as it gets uh closer

5658  
03:42:05,910 --> 03:42:04,080  
to the crew yeah you can you can hear

5659  
03:42:07,910 --> 03:42:05,920  
that inside the capsule definitely hear

5660  
03:42:09,189 --> 03:42:07,920  
it

5661  
03:42:11,510 --> 03:42:09,199  
you know something big is getting ready

5662  
03:42:13,830 --> 03:42:11,520  
to happen absolutely well we are t minus

5663  
03:42:16,389 --> 03:42:13,840

34 minutes and counting

5664

03:42:17,349 --> 03:42:16,399

away from the launch of crew dragon's

5665

03:42:20,070 --> 03:42:17,359

third

5666

03:42:22,950 --> 03:42:20,080

flight with astronauts and the second

5667

03:42:25,110 --> 03:42:22,960

for 2021. today begins the next

5668

03:42:27,269 --> 03:42:25,120

six-month rotation mission to the

5669

03:42:29,990 --> 03:42:27,279

international space station the launch

5670

03:42:32,389 --> 03:42:30,000

escape system is armed as we just heard

5671

03:42:35,510 --> 03:42:32,399

which happens just before we have

5672

03:42:37,670 --> 03:42:35,520

started loading propellant onto falcon 9

5673

03:42:39,990 --> 03:42:37,680

that propellant is now flowing into

5674

03:42:42,150 --> 03:42:40,000

dragon the dragon capsule was loaded

5675

03:42:44,469 --> 03:42:42,160

with its propellants about a week and a

5676

03:42:46,630 --> 03:42:44,479

half ago just a few miles down the road

5677

03:42:48,950 --> 03:42:46,640

at what we call dragon land and in order

5678

03:42:51,630 --> 03:42:48,960

to fly dragon needs a fuel and an

5679

03:42:54,550 --> 03:42:51,640

oxidizer so for the fuel we use

5680

03:42:57,349 --> 03:42:54,560

monomethylhydrazine or mmh and nitrogen

5681

03:42:59,510 --> 03:42:57,359

tetroxide or nto for the oxidizer

5682

03:43:02,229 --> 03:42:59,520

together these propellants feed the

5683

03:43:04,389 --> 03:43:02,239

draco engines that must maneuver dragon

5684

03:43:05,990 --> 03:43:04,399

on orbit as well as the eight super

5685

03:43:07,990 --> 03:43:06,000

draco engines that would power the

5686

03:43:09,349 --> 03:43:08,000

launch escape system in an abort

5687

03:43:13,750 --> 03:43:09,359

scenario

5688

03:43:18,389 --> 03:43:15,590

and that means the eight super draco

5689

03:43:19,349 --> 03:43:18,399

engines inside crew dragon are ready if

5690

03:43:21,110 --> 03:43:19,359

needed

5691

03:43:23,830 --> 03:43:21,120

they can launch the capsule away from

5692

03:43:25,670 --> 03:43:23,840

the falcon 9 rocket in an instant

5693

03:43:28,790 --> 03:43:25,680

should there be any kind of emergency

5694

03:43:30,950 --> 03:43:28,800

associated with the rocket or the pad

5695

03:43:33,590 --> 03:43:30,960

and the nasa and spacex teams have

5696

03:43:36,710 --> 03:43:33,600

trained extensively for exactly that

5697

03:43:39,189 --> 03:43:36,720

type of contingency

5698

03:43:40,950 --> 03:43:39,199

so we'll send it over for now to spacex

5699

03:43:46,229 --> 03:43:40,960

headquarters in hawthorne for an

5700

03:43:49,510 --> 03:43:48,150

we're counting down those final minutes

5701  
03:43:51,429 --> 03:43:49,520  
everything's still looking good for

5702  
03:43:52,389 --> 03:43:51,439  
falcon 9 and dragon for an on-time

5703  
03:43:54,950 --> 03:43:52,399  
launch

5704  
03:43:56,950 --> 03:43:54,960  
just over 32 minutes from now

5705  
03:43:59,590 --> 03:43:56,960  
falcon 9 did begin propellant load on

5706  
03:44:01,750 --> 03:43:59,600  
time at t minus 35 minutes you can see

5707  
03:44:03,910 --> 03:44:01,760  
falcon 9 on the pad the first and second

5708  
03:44:06,630 --> 03:44:03,920  
stages they're being loaded with two

5709  
03:44:09,030 --> 03:44:06,640  
liquid propellants one is a field loaded

5710  
03:44:11,030 --> 03:44:09,040  
into a tank at the bottom of the stage

5711  
03:44:13,590 --> 03:44:11,040  
the other is an oxidizer that loads into

5712  
03:44:15,030 --> 03:44:13,600  
the tank at the top of each stage

5713  
03:44:17,269 --> 03:44:15,040

fuel that we're using to power the

5714

03:44:19,349 --> 03:44:17,279

merlin engines is a refined kerosene

5715

03:44:21,750 --> 03:44:19,359

referred to as rp1

5716

03:44:25,189 --> 03:44:21,760

and the oxidizer loaded on each stage is

5717

03:44:27,670 --> 03:44:25,199

densified liquid oxygen or lox

5718

03:44:29,590 --> 03:44:27,680

now densified is the term that we use to

5719

03:44:31,910 --> 03:44:29,600

describe that we keep it much colder

5720

03:44:34,150 --> 03:44:31,920

than typical for launch vehicles now

5721

03:44:36,309 --> 03:44:34,160

allows it to take up less volume and

5722

03:44:39,189 --> 03:44:36,319

therefore we can put more liquid oxygen

5723

03:44:41,269 --> 03:44:39,199

onto the first and second stages

5724

03:44:43,510 --> 03:44:41,279

now to ignite the fuel and oxidizer in

5725

03:44:46,309 --> 03:44:43,520

the merlin rocket engine we use that

5726

03:44:48,630 --> 03:44:46,319

favorite ignition fluid called detail

5727

03:44:50,950 --> 03:44:48,640

now when t-tub comes into contact with

5728

03:44:52,710 --> 03:44:50,960

oxygen it'll burn and that gives off a

5729

03:44:54,790 --> 03:44:52,720

green colored flame

5730

03:44:57,030 --> 03:44:54,800

once we've got the flame going we add

5731

03:44:59,349 --> 03:44:57,040

the kerosene fuel into the merlin engine

5732

03:45:00,389 --> 03:44:59,359

chambers and the engine ramps up to full

5733

03:45:01,750 --> 03:45:00,399

power

5734

03:45:03,429 --> 03:45:01,760

you probably won't be able to see the

5735

03:45:05,110 --> 03:45:03,439

green flash of ignition of the nine

5736

03:45:06,710 --> 03:45:05,120

merlin engines on the first stage but

5737

03:45:08,950 --> 03:45:06,720

you may see it on the second stage

5738

03:45:11,110 --> 03:45:08,960

engine when it ignites following stage

5739

03:45:13,110 --> 03:45:11,120

separation about two minutes and 48

5740

03:45:15,269 --> 03:45:13,120

seconds into flight

5741

03:45:17,830 --> 03:45:15,279

we're now beginning to top off helium

5742

03:45:19,349 --> 03:45:17,840

into pressure vessels on both stages

5743

03:45:20,790 --> 03:45:19,359

we've been quiet for most of the

5744

03:45:22,550 --> 03:45:20,800

countdown but now we're going to squeeze

5745

03:45:24,389 --> 03:45:22,560

that last little bit and make sure that

5746

03:45:25,429 --> 03:45:24,399

the tanks are fully up on the pressure

5747

03:45:27,910 --> 03:45:25,439

vessels

5748

03:45:30,309 --> 03:45:27,920

we'll use that gas to pressurize the

5749

03:45:32,070 --> 03:45:30,319

propellant tanks in flight the merlin

5750

03:45:34,229 --> 03:45:32,080

turbo pumps will be pulling propellant

5751  
03:45:36,630 --> 03:45:34,239  
out of the stage and we need to take up

5752  
03:45:38,550 --> 03:45:36,640  
or make up that empty space with hot

5753  
03:45:40,229 --> 03:45:38,560  
helium

5754  
03:45:42,469 --> 03:45:40,239  
now at the very top of the stack is the

5755  
03:45:43,830 --> 03:45:42,479  
dragon spacecraft the astronauts are

5756  
03:45:46,309 --> 03:45:43,840  
monitoring their systems while

5757  
03:45:47,990 --> 03:45:46,319  
propellant is loaded into the falcon 9.

5758  
03:45:50,790 --> 03:45:48,000  
we heard them talking about uh the

5759  
03:45:52,550 --> 03:45:50,800  
noises of propellant loading stage

5760  
03:45:54,790 --> 03:45:52,560  
and in this case the crew training in

5761  
03:45:56,229 --> 03:45:54,800  
the simulator also includes playback of

5762  
03:45:59,910 --> 03:45:56,239  
sounds that have been recorded in the

5763  
03:46:01,990 --> 03:45:59,920

dragon capsule during recent flights

5764

03:46:03,590 --> 03:46:02,000

good news on the range they are ready to

5765

03:46:05,349 --> 03:46:03,600

support they've been doing the balloon

5766

03:46:07,189 --> 03:46:05,359

launches they've been making sure that

5767

03:46:09,189 --> 03:46:07,199

the air and sea space is clear and they

5768

03:46:10,790 --> 03:46:09,199

are go to support launch

5769

03:46:12,389 --> 03:46:10,800

and the good news on the weather front a

5770

03:46:14,469 --> 03:46:12,399

little while back the launch weather

5771

03:46:17,429 --> 03:46:14,479

officer came and reduced the probability

5772

03:46:18,790 --> 03:46:17,439

of violation from 30 to 20 percent

5773

03:46:21,590 --> 03:46:18,800

the biggest thing that we're going to be

5774

03:46:23,990 --> 03:46:21,600

looking for is precipitation and that's

5775

03:46:26,309 --> 03:46:24,000

less than 10 percent the wind speeds are

5776  
03:46:28,550 --> 03:46:26,319  
low probably about about five miles per

5777  
03:46:29,910 --> 03:46:28,560  
hour or less so everything is actually

5778  
03:46:31,670 --> 03:46:29,920  
looking good

5779  
03:46:33,750 --> 03:46:31,680  
now as a reminder we do have an

5780  
03:46:34,790 --> 03:46:33,760  
instantaneous launch time for tonight's

5781  
03:46:37,030 --> 03:46:34,800  
countdown

5782  
03:46:39,189 --> 03:46:37,040  
so from this point on if we hear hold

5783  
03:46:41,269 --> 03:46:39,199  
hold hold for any reason we'll have to

5784  
03:46:43,510 --> 03:46:41,279  
stand down and target our backup launch

5785  
03:46:46,309 --> 03:46:43,520  
opportunity tomorrow night which is

5786  
03:46:47,750 --> 03:46:46,319  
about just under 24 hours from tonight's

5787  
03:46:49,910 --> 03:46:47,760  
planned launch

5788  
03:46:51,429 --> 03:46:49,920

but with that everything's looking good

5789

03:46:52,950 --> 03:46:51,439

and we're going to turn it over to jesse

5790

03:46:56,870 --> 03:46:52,960

and courtney for an overview of what

5791

03:47:02,309 --> 03:47:00,070

great thank you john i we love good news

5792

03:47:05,349 --> 03:47:02,319

for crew 3 the astronauts flight to

5793

03:47:08,630 --> 03:47:05,359

station will take about 22 hours

5794

03:47:11,269 --> 03:47:08,640

as we await t minus zero in just about

5795

03:47:13,349 --> 03:47:11,279

28 minutes the ground operations teams

5796

03:47:15,590 --> 03:47:13,359

are doing a series of systems checks to

5797

03:47:17,189 --> 03:47:15,600

make sure both dragon and falcon 9 are

5798

03:47:19,110 --> 03:47:17,199

ready for launch you're looking at a

5799

03:47:22,630 --> 03:47:19,120

live view of our teams at the cape as

5800

03:47:24,710 --> 03:47:22,640

they prepare for liftoff as we wait for

5801  
03:47:26,389 --> 03:47:24,720  
the launch clock to hit zero we wanted

5802  
03:47:28,150 --> 03:47:26,399  
to give you an overview of what the

5803  
03:47:29,269 --> 03:47:28,160  
ascent portion of the mission will look

5804  
03:47:31,990 --> 03:47:29,279  
like

5805  
03:47:34,550 --> 03:47:32,000  
once we hit t0 in a successful launch

5806  
03:47:36,389 --> 03:47:34,560  
occurs we will watch falcon 9 and dragon

5807  
03:47:38,280 --> 03:47:36,399  
lift off from the historic launch pad

5808  
03:47:39,590 --> 03:47:38,290  
39a and make their ascent

5809  
03:47:41,590 --> 03:47:39,600  
[Music]

5810  
03:47:44,070 --> 03:47:41,600  
at about 50 seconds into flight falcon

5811  
03:47:46,070 --> 03:47:44,080  
9's engines will throttle down to help

5812  
03:47:49,030 --> 03:47:46,080  
pass through the period of maximum

5813  
03:47:51,510 --> 03:47:49,040

dynamic pressure on the rocket

5814

03:47:54,070 --> 03:47:51,520

or what we typically refer to as max-q

5815

03:47:56,630 --> 03:47:54,080

it's worth noting that once we hit max-q

5816

03:47:58,309 --> 03:47:56,640

the vehicle will be going supersonic

5817

03:48:00,389 --> 03:47:58,319

now once we are through the period of

5818

03:48:02,550 --> 03:48:00,399

maximum dynamic pressure we can throttle

5819

03:48:04,070 --> 03:48:02,560

up our nine merlin engines again now

5820

03:48:06,070 --> 03:48:04,080

from there at about two and a half

5821

03:48:07,510 --> 03:48:06,080

minutes into flight we have a series of

5822

03:48:08,870 --> 03:48:07,520

three events that will happen in rapid

5823

03:48:11,670 --> 03:48:08,880

succession

5824

03:48:14,389 --> 03:48:11,680

first is mika or main engine cutoff this

5825

03:48:16,950 --> 03:48:14,399

is where all nine merlin 1d engines shut

5826  
03:48:19,030 --> 03:48:16,960  
off in preparation for stage separation

5827  
03:48:21,429 --> 03:48:19,040  
which is our second event this is where

5828  
03:48:23,189 --> 03:48:21,439  
the first stage detaches from the second

5829  
03:48:25,670 --> 03:48:23,199  
stage with the first stage making its

5830  
03:48:27,670 --> 03:48:25,680  
way back to the earth for landing as the

5831  
03:48:29,830 --> 03:48:27,680  
second stage continues on its journey

5832  
03:48:32,550 --> 03:48:29,840  
with the third event

5833  
03:48:34,469 --> 03:48:32,560  
scs-1 or second stage engine start

5834  
03:48:37,030 --> 03:48:34,479  
number one is where the mvac engine

5835  
03:48:39,510 --> 03:48:37,040  
lights up and propels the second stage

5836  
03:48:40,710 --> 03:48:39,520  
along with our crew 3 astronauts into

5837  
03:48:42,950 --> 03:48:40,720  
orbit

5838  
03:48:44,950 --> 03:48:42,960

as stage two heads towards its targeted

5839

03:48:46,790 --> 03:48:44,960

drop off orbit stage one will execute

5840

03:48:49,030 --> 03:48:46,800

two burns in order to make its way back

5841

03:48:51,269 --> 03:48:49,040

to earth the first is the entry burn

5842

03:48:53,269 --> 03:48:51,279

where three of the nine m1d engines will

5843

03:48:54,870 --> 03:48:53,279

reignite and then shut down now this

5844

03:48:56,790 --> 03:48:54,880

helps to slow the stage down in

5845

03:48:58,550 --> 03:48:56,800

preparation for entry back into the

5846

03:48:59,990 --> 03:48:58,560

earth's atmosphere

5847

03:49:02,229 --> 03:49:00,000

while the first stage is heading back to

5848

03:49:04,229 --> 03:49:02,239

earth the second stage will cut off its

5849

03:49:07,269 --> 03:49:04,239

one merlin engine that was ignited right

5850

03:49:09,349 --> 03:49:07,279

after stage separation once that happens

5851  
03:49:10,950 --> 03:49:09,359  
we will wait for confirmation of a good

5852  
03:49:13,349 --> 03:49:10,960  
orbital insertion

5853  
03:49:16,150 --> 03:49:13,359  
about 90 seconds after dragon gets into

5854  
03:49:18,070 --> 03:49:16,160  
orbit falcon 9 will land back on earth

5855  
03:49:19,750 --> 03:49:18,080  
the landing burn is just a single engine

5856  
03:49:22,150 --> 03:49:19,760  
burn but it's powerful enough to bring

5857  
03:49:24,070 --> 03:49:22,160  
the vehicle speed down rapidly in order

5858  
03:49:26,710 --> 03:49:24,080  
to land on the drone ship at about nine

5859  
03:49:28,630 --> 03:49:26,720  
and a half minutes into the mission

5860  
03:49:30,630 --> 03:49:28,640  
and while falcon 9 first stage is

5861  
03:49:33,349 --> 03:49:30,640  
landing dragon is preparing to separate

5862  
03:49:35,349 --> 03:49:33,359  
from the second stage at about three

5863  
03:49:37,429 --> 03:49:35,359

minutes after the second stage gets into

5864

03:49:38,870 --> 03:49:37,439

orbit we should have a great view of

5865

03:49:41,269 --> 03:49:38,880

dragon with its four-person crew

5866

03:49:43,030 --> 03:49:41,279

drifting away from the second stage once

5867

03:49:45,110 --> 03:49:43,040

dragon is a short distance away it will

5868

03:49:47,429 --> 03:49:45,120

begin checking out its draco maneuvering

5869

03:49:49,670 --> 03:49:47,439

thrusters to make sure dragon continues

5870

03:49:51,670 --> 03:49:49,680

to increase separation distance from the

5871

03:49:53,830 --> 03:49:51,680

second stage it's worth noting that

5872

03:49:55,269 --> 03:49:53,840

these are not the super draco engines

5873

03:49:56,630 --> 03:49:55,279

that would be used during an abort

5874

03:49:58,790 --> 03:49:56,640

scenario

5875

03:50:00,870 --> 03:49:58,800

about 40 seconds after separation

5876  
03:50:03,110 --> 03:50:00,880  
dragon's nose cone deploy sequence will

5877  
03:50:04,950 --> 03:50:03,120  
begin it will take roughly four minutes

5878  
03:50:07,750 --> 03:50:04,960  
for the nose cone hooks to unlatch and

5879  
03:50:10,229 --> 03:50:07,760  
open exposing its guidance navigation

5880  
03:50:12,870 --> 03:50:10,239  
controls or what we call gnc that will

5881  
03:50:15,429 --> 03:50:12,880  
help the dragon autonomously fly to the

5882  
03:50:17,429 --> 03:50:15,439  
space station and lastly once the nose

5883  
03:50:19,670 --> 03:50:17,439  
cone is deployed the remaining draco

5884  
03:50:21,110 --> 03:50:19,680  
thrusters on the forward bulkhead will

5885  
03:50:23,269 --> 03:50:21,120  
be checked

5886  
03:50:25,590 --> 03:50:23,279  
from there over the next 22 hours dragon

5887  
03:50:28,790 --> 03:50:25,600  
will be in its rendezvous and approach

5888  
03:50:30,469 --> 03:50:28,800

phases undergoing a number of phasing

5889

03:50:32,790 --> 03:50:30,479

burns as it makes its way to the

5890

03:50:34,550 --> 03:50:32,800

international space station all that

5891

03:50:36,150 --> 03:50:34,560

will be coming up soon but for now let's

5892

03:50:42,550 --> 03:50:36,160

check back in with sandra in mission

5893

03:50:46,790 --> 03:50:44,630

thanks courtney the space station team

5894

03:50:49,110 --> 03:50:46,800

here in houston is focused and the

5895

03:50:51,349 --> 03:50:49,120

critical systems on the station continue

5896

03:50:52,950 --> 03:50:51,359

to function normally the teams have

5897

03:50:55,189 --> 03:50:52,960

verified the command path from the

5898

03:50:57,429 --> 03:50:55,199

ground up through our constellation of

5899

03:50:59,670 --> 03:50:57,439

communication satellites to the space

5900

03:51:07,750 --> 03:50:59,680

station everything is nominal and the

5901  
03:51:12,870 --> 03:51:09,670  
once the crew arrives at station they'll

5902  
03:51:14,630 --> 03:51:12,880  
join expedition 66 while on board their

5903  
03:51:17,189 --> 03:51:14,640  
official designation will be flight

5904  
03:51:18,790 --> 03:51:17,199  
engineers for most of their expedition

5905  
03:51:20,710 --> 03:51:18,800  
at the back end of their journey tom

5906  
03:51:22,630 --> 03:51:20,720  
marshburn will assume command of the

5907  
03:51:25,349 --> 03:51:22,640  
station from current space station

5908  
03:51:27,429 --> 03:51:25,359  
commander anton shkaplerov flight

5909  
03:51:29,110 --> 03:51:27,439  
director rebecca wingfield is on console

5910  
03:51:31,510 --> 03:51:29,120  
now leading flight controllers in

5911  
03:51:34,070 --> 03:51:31,520  
houston for launch and will also lead

5912  
03:51:36,229 --> 03:51:34,080  
teams for docking tomorrow a reminder

5913  
03:51:38,389 --> 03:51:36,239

that a launch today will take about 22

5914

03:51:40,710 --> 03:51:38,399

hours to get to station with the docking

5915

03:51:43,510 --> 03:51:40,720

to the node 2 forward port scheduled

5916

03:51:45,830 --> 03:51:43,520

tomorrow november 11th at 6 pm central

5917

03:51:47,750 --> 03:51:45,840

time once dragon is fully docked to the

5918

03:51:49,910 --> 03:51:47,760

station the team here in houston will

5919

03:51:51,990 --> 03:51:49,920

assist the dragon and space station

5920

03:51:54,389 --> 03:51:52,000

astronauts with leak checks as they work

5921

03:51:56,309 --> 03:51:54,399

to open hatches on both dragon and

5922

03:51:57,349 --> 03:51:56,319

inside the station's pressurized mating

5923

03:51:59,429 --> 03:51:57,359

adapter

5924

03:52:02,309 --> 03:51:59,439

we expect hatch open to take place

5925

03:52:04,389 --> 03:52:02,319

approximately two hours after docking

5926  
03:52:06,550 --> 03:52:04,399  
that's it for us here in mission control

5927  
03:52:09,429 --> 03:52:06,560  
houston i'll send it back over to the

5928  
03:52:11,590 --> 03:52:09,439  
team in florida daryl

5929  
03:52:13,510 --> 03:52:11,600  
all right thanks sandra we are back here

5930  
03:52:15,910 --> 03:52:13,520  
at the kennedy space center

5931  
03:52:17,189 --> 03:52:15,920  
circling about that mock dragon behind

5932  
03:52:19,189 --> 03:52:17,199  
us yes

5933  
03:52:21,590 --> 03:52:19,199  
pretty it's a pretty capsule

5934  
03:52:22,710 --> 03:52:21,600  
this lady right here flew on one crew

5935  
03:52:25,030 --> 03:52:22,720  
won

5936  
03:52:26,389 --> 03:52:25,040  
not too long ago and had an incredible

5937  
03:52:28,150 --> 03:52:26,399  
experience six months

5938  
03:52:28,950 --> 03:52:28,160

up on the international space station

5939

03:52:30,309 --> 03:52:28,960

yes

5940

03:52:33,990 --> 03:52:30,319

six months it's hard to believe that

5941

03:52:35,910 --> 03:52:34,000

i've been home uh six months already but

5942

03:52:39,030 --> 03:52:35,920

here you are ready to watch a launch

5943

03:52:40,950 --> 03:52:39,040

watching the next one go t minus 23

5944

03:52:42,469 --> 03:52:40,960

minutes and counting and if you're just

5945

03:52:45,590 --> 03:52:42,479

joining us

5946

03:52:47,110 --> 03:52:45,600

we are ready for the third astronaut

5947

03:52:48,870 --> 03:52:47,120

rotational flight

5948

03:52:51,189 --> 03:52:48,880

and mission to the international space

5949

03:52:52,229 --> 03:52:51,199

station under nasa's commercial crew

5950

03:52:55,110 --> 03:52:52,239

program

5951  
03:52:57,189 --> 03:52:55,120  
commander raja chari pilot tom marshburn

5952  
03:52:59,269 --> 03:52:57,199  
and mission specialist kayla barron

5953  
03:53:01,910 --> 03:52:59,279  
there you see them they are

5954  
03:53:04,550 --> 03:53:01,920  
strapped in along with matthias maurer

5955  
03:53:07,510 --> 03:53:04,560  
ready to fly inside crew dragon

5956  
03:53:10,469 --> 03:53:07,520  
endurance we can see them live as well

5957  
03:53:13,030 --> 03:53:10,479  
as outside the falcon 9 rocket fueling

5958  
03:53:15,670 --> 03:53:13,040  
operation is well underway the launch

5959  
03:53:18,389 --> 03:53:15,680  
escape system is armed and that means

5960  
03:53:20,550 --> 03:53:18,399  
crew dragon is prepared to launch itself

5961  
03:53:23,510 --> 03:53:20,560  
away from the falcon 9 rocket in the

5962  
03:53:24,710 --> 03:53:23,520  
case of an emergency on the pad or after

5963  
03:53:27,590 --> 03:53:24,720

liftoff

5964

03:53:29,830 --> 03:53:27,600

so far operations look and sound as

5965

03:53:35,990 --> 03:53:29,840

expected and we are just counting down

5966

03:53:38,550 --> 03:53:36,000

to that liftoff at 903 pm eastern time

5967

03:53:40,710 --> 03:53:38,560

can see the the steam as it comes off

5968

03:53:42,389 --> 03:53:40,720

the condensation as it comes off the

5969

03:53:44,870 --> 03:53:42,399

rocket

5970

03:53:48,870 --> 03:53:44,880

i've noted in past launches that as it

5971

03:53:50,630 --> 03:53:48,880

fills with fuel the entire first stage

5972

03:53:52,309 --> 03:53:50,640

begins to let off and it kind of gives

5973

03:53:53,429 --> 03:53:52,319

you a marker of exactly where in the

5974

03:53:54,870 --> 03:53:53,439

rocket

5975

03:53:58,229 --> 03:53:54,880

they are it's almost like a little fuel

5976

03:54:00,790 --> 03:53:58,239

gauge exactly yep because the

5977

03:54:02,790 --> 03:54:00,800

fuel and oxidizer are cryogenic they are

5978

03:54:04,550 --> 03:54:02,800

extremely cold and so

5979

03:54:06,389 --> 03:54:04,560

you just see them condensing the air

5980

03:54:07,990 --> 03:54:06,399

around it and of course in florida we've

5981

03:54:10,630 --> 03:54:08,000

got lots of moisture in our air to

5982

03:54:13,510 --> 03:54:10,640

condense we sure do there's some onshore

5983

03:54:16,469 --> 03:54:13,520

flow a weather pattern that is bringing

5984

03:54:18,710 --> 03:54:16,479

moist air off the atlantic ocean and so

5985

03:54:20,309 --> 03:54:18,720

with this lit up we should see a lot of

5986

03:54:21,830 --> 03:54:20,319

this condensation coming off this

5987

03:54:24,229 --> 03:54:21,840

particular rocket

5988

03:54:26,070 --> 03:54:24,239

the mission is the continuation of

5989

03:54:28,150 --> 03:54:26,080

rotational crew flights to the

5990

03:54:31,189 --> 03:54:28,160

international space station from u.s

5991

03:54:32,870 --> 03:54:31,199

soil on private rockets and spacecraft

5992

03:54:35,910 --> 03:54:32,880

this would not be possible without the

5993

03:54:38,630 --> 03:54:35,920

success of nasa spacex demo 2 test

5994

03:54:40,870 --> 03:54:38,640

flight last year and the safe delivery

5995

03:54:43,030 --> 03:54:40,880

of crew one astronauts including

5996

03:54:45,189 --> 03:54:43,040

including my co-host shannon walker to

5997

03:54:47,830 --> 03:54:45,199

the space station last fall for a long

5998

03:54:49,030 --> 03:54:47,840

duration mission crew one is back home

5999

03:54:50,229 --> 03:54:49,040

of course

6000

03:54:53,189 --> 03:54:50,239

and we have one of the mission

6001  
03:54:55,189 --> 03:54:53,199  
specialists with us right here today

6002  
03:54:58,550 --> 03:54:55,199  
as you're counting down we're only 20

6003  
03:55:00,150 --> 03:54:58,560  
min 21 minutes out from launch shannon

6004  
03:55:04,630 --> 03:55:00,160  
what is going through your head in this

6005  
03:55:07,030 --> 03:55:04,640  
moment boy this is uh this is really um

6006  
03:55:09,269 --> 03:55:07,040  
you know things get even more intense

6007  
03:55:11,429 --> 03:55:09,279  
and more exciting you're you can feel

6008  
03:55:14,630 --> 03:55:11,439  
the rocket being fueled you know you

6009  
03:55:16,870 --> 03:55:14,640  
don't have too much longer so

6010  
03:55:18,469 --> 03:55:16,880  
you're really thinking about the what

6011  
03:55:21,269 --> 03:55:18,479  
you're going to need to do as soon as

6012  
03:55:24,309 --> 03:55:21,279  
those engines light

6013  
03:55:26,389 --> 03:55:24,319

t-minus 21 minutes and counting

6014

03:55:28,309 --> 03:55:26,399

the excitement levels rising for the

6015

03:55:30,790 --> 03:55:28,319

crew inside

6016

03:55:33,510 --> 03:55:30,800

crew dragon commander raja chari he'll

6017

03:55:35,670 --> 03:55:33,520

be making his first trip to space

6018

03:55:38,229 --> 03:55:35,680

and as commander he is responsible for

6019

03:55:39,510 --> 03:55:38,239

all phases of flight from launch to

6020

03:55:41,590 --> 03:55:39,520

re-entry

6021

03:55:43,429 --> 03:55:41,600

chari is a colonel in the u.s air force

6022

03:55:45,990 --> 03:55:43,439

he holds degrees in aeronautical

6023

03:55:49,750 --> 03:55:46,000

engineering and aeronautics charities

6024

03:55:52,630 --> 03:55:49,760

also a combat veteran having flown f-15e

6025

03:55:55,030 --> 03:55:52,640

aircraft during operation iraqi freedom

6026  
03:55:57,110 --> 03:55:55,040  
and deployments in the korean peninsula

6027  
03:56:00,309 --> 03:55:57,120  
as a test pilot he has accumulated more

6028  
03:56:02,550 --> 03:56:00,319  
than 2500 hours of flight time and

6029  
03:56:05,349 --> 03:56:02,560  
various military aircraft

6030  
03:56:07,429 --> 03:56:05,359  
his pilot is tom marshburn sitting right

6031  
03:56:08,550 --> 03:56:07,439  
to his right you see charlie there on

6032  
03:56:10,550 --> 03:56:08,560  
the left

6033  
03:56:12,790 --> 03:56:10,560  
marshburn is suiting up for his third

6034  
03:56:15,750 --> 03:56:12,800  
space flight as pilot he is responsible

6035  
03:56:17,750 --> 03:56:15,760  
for spacecraft systems and performance

6036  
03:56:20,150 --> 03:56:17,760  
he previously flew on the space shuttle

6037  
03:56:24,389 --> 03:56:20,160  
endeavour and sts-127

6038  
03:56:28,389 --> 03:56:26,950

in expedition 3435

6039

03:56:32,469 --> 03:56:28,399

while helping to assemble the

6040

03:56:34,710 --> 03:56:32,479

international space station on sts-127

6041

03:56:37,349 --> 03:56:34,720

in that flight marshburn performed three

6042

03:56:39,189 --> 03:56:37,359

spacewalks totaling almost 19 hours it

6043

03:56:41,429 --> 03:56:39,199

was just go go go

6044

03:56:42,469 --> 03:56:41,439

a north carolina native holds degrees in

6045

03:56:43,349 --> 03:56:42,479

physics

6046

03:56:44,550 --> 03:56:43,359

and

6047

03:56:49,269 --> 03:56:44,560

medicine

6048

03:56:51,030 --> 03:56:49,279

doctor yes he was

6049

03:56:53,429 --> 03:56:51,040

mission specialist kayla barron she's

6050

03:56:55,590 --> 03:56:53,439

about to make her first trip to space in

6051  
03:56:57,510 --> 03:56:55,600  
this role she will work closely with the

6052  
03:56:59,910 --> 03:56:57,520  
commander and pilot to monitor the

6053  
03:57:02,309 --> 03:56:59,920  
spacecraft during the dynamic phases of

6054  
03:57:04,630 --> 03:57:02,319  
flight the washington state native has

6055  
03:57:06,550 --> 03:57:04,640  
degrees in nuclear engineering and

6056  
03:57:08,790 --> 03:57:06,560  
systems engineering

6057  
03:57:10,950 --> 03:57:08,800  
as a submarine warfare officer she was a

6058  
03:57:12,550 --> 03:57:10,960  
member of the first class of women

6059  
03:57:15,030 --> 03:57:12,560  
commissioned into the submarine

6060  
03:57:19,429 --> 03:57:15,040  
community and she deployed three times

6061  
03:57:22,950 --> 03:57:19,439  
while serving aboard the uss maine

6062  
03:57:25,670 --> 03:57:22,960  
and lastly on the end there in this shot

6063  
03:57:28,389 --> 03:57:25,680

is mission specialist matthias maurer he

6064

03:57:30,229 --> 03:57:28,399

will be making his debut space flight he

6065

03:57:32,150 --> 03:57:30,239

will be the second european astronaut to

6066

03:57:35,590 --> 03:57:32,160

fly on crew dragon

6067

03:57:37,510 --> 03:57:35,600

maurer is from zant vendel germany

6068

03:57:39,830 --> 03:57:37,520

and is a doctor of material science and

6069

03:57:42,150 --> 03:57:39,840

engineering he is the inventor of more

6070

03:57:43,830 --> 03:57:42,160

than 10 patent applications

6071

03:57:46,229 --> 03:57:43,840

and he joined the european astronaut

6072

03:57:48,950 --> 03:57:46,239

corps in 2015.

6073

03:57:51,030 --> 03:57:48,960

bauer has spent 16 days in underwater

6074

03:57:53,750 --> 03:57:51,040

training during a nasa extreme

6075

03:57:55,429 --> 03:57:53,760

environment mission operations challenge

6076  
03:57:57,030 --> 03:57:55,439  
and he's trained in sea survival

6077  
03:57:58,309 --> 03:57:57,040  
training off the coast

6078  
03:58:00,950 --> 03:57:58,319  
of china

6079  
03:58:03,030 --> 03:58:00,960  
and an interesting note about mauer

6080  
03:58:04,309 --> 03:58:03,040  
he will become the 600

6081  
03:58:05,510 --> 03:58:04,319  
person

6082  
03:58:08,710 --> 03:58:05,520  
in space

6083  
03:58:10,389 --> 03:58:08,720  
six zero zero yes even though uh all

6084  
03:58:12,469 --> 03:58:10,399  
four crew members will be traveling to

6085  
03:58:14,630 --> 03:58:12,479  
space at the same time we have to assign

6086  
03:58:16,389 --> 03:58:14,640  
numbers and he is number 600. he's

6087  
03:58:20,550 --> 03:58:16,399  
landed on that big milestone

6088  
03:58:22,870 --> 03:58:20,560

chary gets 5.99 baron is 601.

6089

03:58:24,469 --> 03:58:22,880

what was shannon walker you know i

6090

03:58:27,349 --> 03:58:24,479

believe i was

6091

03:58:29,830 --> 03:58:27,359

number 518 but don't quote me i could be

6092

03:58:31,429 --> 03:58:29,840

wrong but it's in the early 500s we'll

6093

03:58:33,590 --> 03:58:31,439

take a look at the nasa history books

6094

03:58:35,110 --> 03:58:33,600

and yes we'll figure it out

6095

03:58:38,070 --> 03:58:35,120

each of these four crew members will

6096

03:58:39,510 --> 03:58:38,080

join expedition 66 once they arrive at

6097

03:58:42,469 --> 03:58:39,520

the international

6098

03:58:46,550 --> 03:58:42,479

space station where anton shkaplerov is

6099

03:58:48,389 --> 03:58:46,560

currently commander of the space station

6100

03:58:50,550 --> 03:58:48,399

you spent some time

6101  
03:58:52,229 --> 03:58:50,560  
as the commander i spent a very brief

6102  
03:58:55,110 --> 03:58:52,239  
amount of time as commander right at the

6103  
03:58:57,590 --> 03:58:55,120  
end of uh our cruise time up there for

6104  
03:59:00,309 --> 03:58:57,600  
about two weeks i was commander after

6105  
03:59:02,950 --> 03:59:00,319  
the soyuz uh crew left

6106  
03:59:05,269 --> 03:59:02,960  
all right it was short sweet but you

6107  
03:59:06,950 --> 03:59:05,279  
were in charge i was in charge sweet all

6108  
03:59:08,870 --> 03:59:06,960  
right let's go over to osb2 and check in

6109  
03:59:10,870 --> 03:59:08,880  
with marie lewis marie

6110  
03:59:13,110 --> 03:59:10,880  
all right thank you daryl i am here with

6111  
03:59:15,189 --> 03:59:13,120  
nasa administrator bill nelson thank you

6112  
03:59:17,830 --> 03:59:15,199  
so much for being here tonight

6113  
03:59:20,710 --> 03:59:17,840

what a pleasure what a great evening

6114

03:59:22,309 --> 03:59:20,720

looks like the rain has given us a break

6115

03:59:24,150 --> 03:59:22,319

yeah it's clearing up we've got a great

6116

03:59:25,830 --> 03:59:24,160

view of the pad and

6117

03:59:27,750 --> 03:59:25,840

this must bring back quite a few

6118

03:59:30,550 --> 03:59:27,760

memories from you you launched from pad

6119

03:59:33,110 --> 03:59:30,560

39a some years ago and this is your

6120

03:59:35,110 --> 03:59:33,120

first uh crew launch here as the nasa

6121

03:59:36,950 --> 03:59:35,120

administrator what has this experience

6122

03:59:37,750 --> 03:59:36,960

been like for you so far

6123

03:59:38,630 --> 03:59:37,760

well

6124

03:59:41,990 --> 03:59:38,640

just

6125

03:59:44,630 --> 03:59:42,000

to have an opportunity to try to offer

6126  
03:59:46,550 --> 03:59:44,640  
some leadership to this fantastic

6127  
03:59:49,590 --> 03:59:46,560  
organization

6128  
03:59:51,429 --> 03:59:49,600  
that where the impossible

6129  
03:59:52,710 --> 03:59:51,439  
is routine

6130  
03:59:56,070 --> 03:59:52,720  
and

6131  
03:59:57,670 --> 03:59:56,080  
it's it's just such a a tremendous

6132  
04:00:00,150 --> 03:59:57,680  
organization

6133  
04:00:01,830 --> 04:00:00,160  
you know it's been voted the best place

6134  
04:00:04,790 --> 04:00:01,840  
to work in the federal government for

6135  
04:00:06,950 --> 04:00:04,800  
the last nine years straight stage two

6136  
04:00:09,750 --> 04:00:06,960  
is it any wonder that

6137  
04:00:11,910 --> 04:00:09,760  
everybody's excited all the time and

6138  
04:00:14,469 --> 04:00:11,920

here's another reason what we're going

6139

04:00:16,750 --> 04:00:14,479

to do tonight absolutely and you

6140

04:00:18,389 --> 04:00:16,760

launched on the space shuttle uh

6141

04:00:19,590 --> 04:00:18,399

61c

6142

04:00:22,070 --> 04:00:19,600

uh

6143

04:00:23,349 --> 04:00:22,080

years ago how did that experience change

6144

04:00:24,950 --> 04:00:23,359

you and how do you think it's going to

6145

04:00:27,189 --> 04:00:24,960

change the astronauts that are going to

6146

04:00:31,510 --> 04:00:27,199

space for the first time tonight

6147

04:00:34,389 --> 04:00:31,520

it happens to every space flier when you

6148

04:00:38,070 --> 04:00:34,399

look back at earth from the position of

6149

04:00:39,510 --> 04:00:38,080

earth orbit and you see this beautiful

6150

04:00:42,229 --> 04:00:39,520

creation

6151  
04:00:45,269 --> 04:00:42,239  
our home the planet suspended in the

6152  
04:00:49,670 --> 04:00:47,189  
it's

6153  
04:00:51,590 --> 04:00:49,680  
it makes you want to be a better steward

6154  
04:00:53,750 --> 04:00:51,600  
of our planet

6155  
04:00:58,389 --> 04:00:53,760  
it's extraordinary

6156  
04:01:01,030 --> 04:00:58,399  
as you orbit the earth every 90 minutes

6157  
04:01:05,030 --> 04:01:01,040  
and then of course the properties of

6158  
04:01:09,110 --> 04:01:05,040  
microgravity in space we're learning how

6159  
04:01:11,429 --> 04:01:09,120  
to make new materials new drugs

6160  
04:01:14,229 --> 04:01:11,439  
all of these things are going to come in

6161  
04:01:16,950 --> 04:01:14,239  
a commercial operation that we're taking

6162  
04:01:19,590 --> 04:01:16,960  
off the surface of the earth and we're

6163  
04:01:22,469 --> 04:01:19,600

taking the space and now we'll take it

6164

04:01:25,110 --> 04:01:22,479

to the moon and then who knows we're

6165

04:01:27,510 --> 04:01:25,120

going to take it on out into the cosmos

6166

04:01:29,590 --> 04:01:27,520

and speaking of the success of this

6167

04:01:31,670 --> 04:01:29,600

program years ago

6168

04:01:33,670 --> 04:01:31,680

over 10 years ago this program started

6169

04:01:35,910 --> 04:01:33,680

you're a part of that there were a lot

6170

04:01:38,070 --> 04:01:35,920

of skeptics at the time in the aerospace

6171

04:01:40,469 --> 04:01:38,080

industry about

6172

04:01:42,550 --> 04:01:40,479

shifting this low earth orbit to

6173

04:01:45,429 --> 04:01:42,560

commercial industry and this partnership

6174

04:01:47,590 --> 04:01:45,439

with spacex and here we are now what is

6175

04:01:50,070 --> 04:01:47,600

the success of this say about what we

6176

04:01:51,429 --> 04:01:50,080

can do when we do it together

6177

04:01:54,710 --> 04:01:51,439

and still

6178

04:01:56,309 --> 04:01:54,720

today people have difficulty making that

6179

04:01:59,110 --> 04:01:56,319

transition but the proof's in the

6180

04:02:03,670 --> 04:01:59,120

pudding and the pudding is out there

6181

04:02:06,070 --> 04:02:03,680

on launch pad 39a right now

6182

04:02:07,030 --> 04:02:06,080

a commercial operation

6183

04:02:09,349 --> 04:02:07,040

with

6184

04:02:11,830 --> 04:02:09,359

considerable nasa help

6185

04:02:14,469 --> 04:02:11,840

and oversight because when it comes to

6186

04:02:17,269 --> 04:02:14,479

the safety of our astronauts nasa is

6187

04:02:18,950 --> 04:02:17,279

going to be all over it

6188

04:02:22,790 --> 04:02:18,960

there's the proof

6189

04:02:24,630 --> 04:02:22,800

a very successful commercial operation

6190

04:02:26,309 --> 04:02:24,640

nasa administrator bill nelson thank you

6191

04:02:28,950 --> 04:02:26,319

so much for your time daryl we'll send

6192

04:02:31,429 --> 04:02:28,960

it back to you all right thank you marie

6193

04:02:34,229 --> 04:02:31,439

and administrator nelson some good words

6194

04:02:36,229 --> 04:02:34,239

there about our future exploration plans

6195

04:02:39,910 --> 04:02:36,239

want to remind you if you listen on

6196

04:02:41,990 --> 04:02:39,920

radio you can catch the frequencies for

6197

04:02:44,150 --> 04:02:42,000

our local radio if you're in the area

6198

04:02:47,030 --> 04:02:44,160

watching out at one of the locations you

6199

04:02:50,389 --> 04:02:47,040

can check it out on uh local amateur vhf

6200

04:02:53,389 --> 04:02:50,399

radio frequency 146.940

6201

04:02:55,510 --> 04:02:53,399

and uhf radio frequency

6202

04:02:57,510 --> 04:02:55,520

444.925 you can see it on your screen

6203

04:02:58,950 --> 04:02:57,520

there so if you need to step away from

6204

04:03:01,189 --> 04:02:58,960

whatever you're viewing it on be it your

6205

04:03:02,550 --> 04:03:01,199

laptop your tablet you turn on your

6206

04:03:03,830 --> 04:03:02,560

portable radio and you'll be able to

6207

04:03:05,110 --> 04:03:03,840

listen in

6208

04:03:06,469 --> 04:03:05,120

now as we get ready to launch in the

6209

04:03:07,990 --> 04:03:06,479

final few minutes we want to take a look

6210

04:03:09,429 --> 04:03:08,000

at some pictures that have some

6211

04:03:11,429 --> 04:03:09,439

particularly

6212

04:03:14,710 --> 04:03:11,439

significant meaning to the crew here

6213

04:03:17,429 --> 04:03:14,720

they are crew 3 with their booster a

6214

04:03:19,750 --> 04:03:17,439

pre-flown booster crew 3 will fly aboard

6215

04:03:22,229 --> 04:03:19,760

a new dragon capsule but that booster is

6216

04:03:24,630 --> 04:03:22,239

pre-flown this one launched crs-22 to

6217

04:03:26,150 --> 04:03:24,640

the international space station five

6218

04:03:27,990 --> 04:03:26,160

months ago and looks like they're giving

6219

04:03:30,070 --> 04:03:28,000

it some love yeah it's always a good

6220

04:03:32,389 --> 04:03:30,080

idea to hug your booster it's pretty

6221

04:03:33,510 --> 04:03:32,399

special to get to actually go touch the

6222

04:03:35,189 --> 04:03:33,520

rocket that's going to take you into

6223

04:03:37,510 --> 04:03:35,199

space well it's about to pin them back

6224

04:03:38,630 --> 04:03:37,520

in into their seats here in just a few

6225

04:03:41,189 --> 04:03:38,640

minutes

6226  
04:03:42,910 --> 04:03:41,199  
at the time of launch 903 pm eastern the

6227  
04:03:46,229 --> 04:03:42,920  
space station will be flying

6228  
04:03:48,550 --> 04:03:46,239  
258 miles over the north atlantic about

6229  
04:03:50,309 --> 04:03:48,560  
east of newfoundland you can see here

6230  
04:03:52,950 --> 04:03:50,319  
the track of the international space

6231  
04:03:54,710 --> 04:03:52,960  
station and then from that moment it

6232  
04:03:56,870 --> 04:03:54,720  
will be catching up

6233  
04:03:59,429 --> 04:03:56,880  
to the international space station once

6234  
04:04:01,670 --> 04:03:59,439  
it leaves the coast of florida

6235  
04:04:03,670 --> 04:04:01,680  
and with t minus 12 minutes and 30

6236  
04:04:05,750 --> 04:04:03,680  
seconds on until liftoff we want to

6237  
04:04:07,110 --> 04:04:05,760  
focus now on the pad as we proceed

6238  
04:04:08,710 --> 04:04:07,120

through the final stretch of the

6239

04:04:11,110 --> 04:04:08,720

countdown we'll turn it over to

6240

04:04:14,790 --> 04:04:11,120

hawthorne to take us through the launch

6241

04:04:19,830 --> 04:04:17,750

thanks daryl it's just over 12 minutes

6242

04:04:22,229 --> 04:04:19,840

and everything is still looking good for

6243

04:04:24,229 --> 04:04:22,239

launch of falcon 9 and dragon

6244

04:04:27,590 --> 04:04:24,239

falcon 9 did begin propellant loading on

6245

04:04:29,590 --> 04:04:27,600

time at t minus 35 minutes the rp1 fuel

6246

04:04:31,110 --> 04:04:29,600

loading on the second stage you can see

6247

04:04:33,030 --> 04:04:31,120

up at the top the white cylinder at the

6248

04:04:35,750 --> 04:04:33,040

very top of the stack fuel loading on

6249

04:04:38,070 --> 04:04:35,760

that stage is complete fuel loading is

6250

04:04:40,630 --> 04:04:38,080

continuing on the first stage we're

6251  
04:04:42,790 --> 04:04:40,640  
about uh eighty percent of the way full

6252  
04:04:43,830 --> 04:04:42,800  
and it will finish up at t minus six

6253  
04:04:46,229 --> 04:04:43,840  
minutes

6254  
04:04:48,150 --> 04:04:46,239  
the densified liquid oxygen loading is

6255  
04:04:50,229 --> 04:04:48,160  
also underway on the first stage we're

6256  
04:04:52,389 --> 04:04:50,239  
about three-fourths of the way full

6257  
04:04:55,269 --> 04:04:52,399  
and we began loading liquid oxygen on

6258  
04:04:57,269 --> 04:04:55,279  
the second stage about five minutes ago

6259  
04:04:59,189 --> 04:04:57,279  
now liquid oxygen loading is the last

6260  
04:05:01,030 --> 04:04:59,199  
thing to finish we'll wrap up first

6261  
04:05:03,510 --> 04:05:01,040  
stage at t minus three minutes second

6262  
04:05:05,269 --> 04:05:03,520  
stage of t minus two minutes

6263  
04:05:07,429 --> 04:05:05,279

coming up we're going to do final checks

6264

04:05:09,670 --> 04:05:07,439

of various engine systems our thrust

6265

04:05:12,150 --> 04:05:09,680

vector controllers are going to be moved

6266

04:05:14,229 --> 04:05:12,160

we call them tvc wiggles where we move

6267

04:05:16,870 --> 04:05:14,239

the engines back and forth slightly

6268

04:05:18,469 --> 04:05:16,880

we'll also be moving throttle valves on

6269

04:05:20,229 --> 04:05:18,479

the engines to make sure that they are

6270

04:05:22,229 --> 04:05:20,239

responding to commands from the ground

6271

04:05:24,309 --> 04:05:22,239

in preparation for flight

6272

04:05:25,990 --> 04:05:24,319

the dragon mission director has reported

6273

04:05:27,349 --> 04:05:26,000

their team is working no issues we're

6274

04:05:29,510 --> 04:05:27,359

going to hear from dragon in about a

6275

04:05:31,110 --> 04:05:29,520

minute here on the countdown their comp

6276  
04:05:32,870 --> 04:05:31,120  
checks are complete you can see the

6277  
04:05:35,269 --> 04:05:32,880  
access arm is retracted the launch

6278  
04:05:37,110 --> 04:05:35,279  
escape system is armed crew is strapped

6279  
04:05:39,269 --> 04:05:37,120  
in and they're ready to go they'll get

6280  
04:05:40,150 --> 04:05:39,279  
their final instructions at t minus 10

6281  
04:05:41,990 --> 04:05:40,160  
minutes

6282  
04:05:44,070 --> 04:05:42,000  
they'll be told to configure their

6283  
04:05:45,670 --> 04:05:44,080  
displays for launch and that setup will

6284  
04:05:47,670 --> 04:05:45,680  
give the crew insight into how the

6285  
04:05:50,229 --> 04:05:47,680  
launch is proceeding and provide them

6286  
04:05:52,070 --> 04:05:50,239  
constant updates on vehicle health the

6287  
04:05:53,750 --> 04:05:52,080  
t-minus five minutes will be in terminal

6288  
04:05:55,990 --> 04:05:53,760

count and dragon will go to internal

6289

04:05:57,910 --> 04:05:56,000

power and we'll hear continued call outs

6290

04:05:58,950 --> 04:05:57,920

on the countdown net as we get closer to

6291

04:06:00,229 --> 04:05:58,960

liftoff

6292

04:06:03,670 --> 04:06:00,239

and finally

6293

04:06:05,510 --> 04:06:03,680

easy to say rain just go weather is go

6294

04:06:07,510 --> 04:06:05,520

so right now courtney we're coming up on

6295

04:06:09,269 --> 04:06:07,520

team millionaires ten minutes one of the

6296

04:06:11,189 --> 04:06:09,279

things that we'll hear on dragonflights

6297

04:06:13,590 --> 04:06:11,199

that we don't hear on other ones

6298

04:06:15,269 --> 04:06:13,600

is the abort uh call outs during the

6299

04:06:17,510 --> 04:06:15,279

countdown can you enlighten us a little

6300

04:06:19,189 --> 04:06:17,520

bit on what goes on with that

6301  
04:06:21,110 --> 04:06:19,199  
yeah john great to hear that everything

6302  
04:06:23,269 --> 04:06:21,120  
is going well we're continuing to to

6303  
04:06:25,030 --> 04:06:23,279  
track that dragon and falcon 9 are ready

6304  
04:06:27,030 --> 04:06:25,040  
for launch but just in case anything

6305  
04:06:29,830 --> 04:06:27,040  
were to happen dragon is fully prepared

6306  
04:06:31,110 --> 04:06:29,840  
to initiate an abort upon liftoff you'll

6307  
04:06:34,070 --> 04:06:31,120  
be hearing number and letter

6308  
04:06:35,670 --> 04:06:34,080  
combinations on dragon's trip uphill

6309  
04:06:37,030 --> 04:06:35,680  
which will mark different abort zones

6310  
04:06:38,790 --> 04:06:37,040  
throughout the flight the numbers

6311  
04:06:40,870 --> 04:06:38,800  
signifying the stage of flight and the

6312  
04:06:46,950 --> 04:06:40,880  
letter as the abortion spacex the first

6313  
04:06:46,960 --> 04:06:52,150

copy endurance displays are complete

6314

04:06:56,150 --> 04:06:54,550

and copy that crew 3 we are honored to

6315

04:06:57,910 --> 04:06:56,160

have you at the controls today as the

6316

04:06:59,030 --> 04:06:57,920

first crew to fly aboard dragon

6317

04:07:01,429 --> 04:06:59,040

endurance

6318

04:07:06,870 --> 04:07:01,439

we wish you a great mission field look

6319

04:07:10,229 --> 04:07:08,469

thanks sarah and uh sometimes when you

6320

04:07:12,630 --> 04:07:10,239

try to fly on halloween you get a trick

6321

04:07:14,469 --> 04:07:12,640

instead of a treat but uh how honored

6322

04:07:16,870 --> 04:07:14,479

and appropriate to get to fly endurance

6323

04:07:19,269 --> 04:07:16,880

on veterans day we're proud and honored

6324

04:07:21,510 --> 04:07:19,279

to represent the spacex and nasa teams

6325

04:07:23,030 --> 04:07:21,520

as we head to the iss to live and work

6326  
04:07:27,910 --> 04:07:23,040  
on groundbreaking science next six

6327  
04:07:32,950 --> 04:07:30,630  
and there we have it some final words

6328  
04:07:35,269 --> 04:07:32,960  
from the crew aboard

6329  
04:07:38,070 --> 04:07:35,279  
dragon and a good luck from the core

6330  
04:07:40,149 --> 04:07:38,080  
here on the ground to the crew john with

6331  
04:07:42,550 --> 04:07:40,159  
everything still looking good that next

6332  
04:07:44,229 --> 04:07:42,560  
milestone of engine chill is coming up

6333  
04:07:45,349 --> 04:07:44,239  
next

6334  
04:07:48,469 --> 04:07:45,359  
that's right

6335  
04:07:50,710 --> 04:07:48,479  
the next major event that we have is t

6336  
04:07:52,630 --> 04:07:50,720  
minus seven minutes it's what we call

6337  
04:07:54,389 --> 04:07:52,640  
the engine chill event

6338  
04:07:57,030 --> 04:07:54,399

the big thing that happens there is we

6339

04:07:58,070 --> 04:07:57,040

open the prevals that feed the merlin 1d

6340

04:08:01,349 --> 04:07:58,080

engines

6341

04:08:03,110 --> 04:08:01,359

so super chilled liquid oxygen will be

6342

04:08:05,429 --> 04:08:03,120

trickling through the inlet to the

6343

04:08:07,670 --> 04:08:05,439

merlin turbo pumps and that'll help

6344

04:08:09,349 --> 04:08:07,680

chill those turbo pumps down before we

6345

04:08:11,750 --> 04:08:09,359

hit them with the full flow of liquid

6346

04:08:14,550 --> 04:08:11,760

oxygen during the ignition sequence in

6347

04:08:16,710 --> 04:08:14,560

the last three seconds before t0

6348

04:08:18,630 --> 04:08:16,720

so well here's a call out so stage one

6349

04:08:20,870 --> 04:08:18,640

engine chill has started we'll be

6350

04:08:23,910 --> 04:08:20,880

monitoring all nine engines to make sure

6351  
04:08:25,830 --> 04:08:23,920  
the aux fuel three valves are all open

6352  
04:08:27,830 --> 04:08:25,840  
we're also chilling down second stage

6353  
04:08:29,510 --> 04:08:27,840  
engine as we get ready for launch and

6354  
04:08:32,070 --> 04:08:29,520  
you'll hear an additional chill down of

6355  
04:08:33,910 --> 04:08:32,080  
the second stage called out once we get

6356  
04:08:35,590 --> 04:08:33,920  
into flight a little bit before two

6357  
04:08:37,590 --> 04:08:35,600  
minutes into flight then we'll do a

6358  
04:08:39,110 --> 04:08:37,600  
final chill of the upper stage engine

6359  
04:08:40,550 --> 04:08:39,120  
turbo pumps

6360  
04:08:44,070 --> 04:08:40,560  
if you might be able to hear behind me

6361  
04:08:45,590 --> 04:08:44,080  
here in hawthorne a lot of energy folks

6362  
04:08:46,389 --> 04:08:45,600  
are gathered around mission control

6363  
04:08:48,950 --> 04:08:46,399

center

6364

04:08:51,189 --> 04:08:48,960

uh watching on the big monitors as we

6365

04:08:55,429 --> 04:08:51,199

get ready for launch in just over seven

6366

04:08:59,349 --> 04:08:57,349

now in addition as i mentioned before as

6367

04:09:00,870 --> 04:08:59,359

we get ready at seven minutes to open

6368

04:09:03,269 --> 04:09:00,880

the pre-valves and begin the engine

6369

04:09:06,469 --> 04:09:03,279

chill sequence we're also getting ready

6370

04:09:07,510 --> 04:09:06,479

then to move into uh chest checkout

6371

04:09:09,670 --> 04:09:07,520

reviews

6372

04:09:11,910 --> 04:09:09,680

the fuel trim valves are being cycled

6373

04:09:13,590 --> 04:09:11,920

make sure that those are working we use

6374

04:09:15,429 --> 04:09:13,600

that to throttle the amount of

6375

04:09:17,590 --> 04:09:15,439

propellant going through the first stage

6376  
04:09:20,309 --> 04:09:17,600  
down to the engines as we go through

6377  
04:09:32,550 --> 04:09:22,309  
coming up on t minus seven minutes we'll

6378  
04:09:32,560 --> 04:09:39,429  
stage one engine chill has begun

6379  
04:09:43,349 --> 04:09:41,030  
well you've heard it

6380  
04:09:46,229 --> 04:09:43,359  
we're through another milestone next one

6381  
04:09:48,149 --> 04:09:46,239  
coming up here at six minutes

6382  
04:09:49,269 --> 04:09:48,159  
yep that's right john

6383  
04:09:52,389 --> 04:09:49,279  
and

6384  
04:09:54,469 --> 04:09:52,399  
that rp-1

6385  
04:09:56,149 --> 04:09:54,479  
kerosene is filling that second stage

6386  
04:09:57,990 --> 04:09:56,159  
we're anticipating a little longer for

6387  
04:10:00,870 --> 04:09:58,000  
that first stage to be completely filled

6388  
04:10:02,469 --> 04:10:00,880

with that rp1 refined kerosene liquid

6389

04:10:04,550 --> 04:10:02,479

oxygen will continue to flow through the

6390

04:10:10,950 --> 04:10:04,560

first and second stages up until the

6391

04:10:15,670 --> 04:10:12,870

that next call will be that the stage

6392

04:10:19,510 --> 04:10:15,680

one rp load is complete

6393

04:10:21,269 --> 04:10:19,520

coming up now in about 15 seconds

6394

04:10:24,710 --> 04:10:21,279

stage one we'll stand by for that call

6395

04:10:29,590 --> 04:10:26,870

and confirmation we have a complete fill

6396

04:10:31,910 --> 04:10:29,600

of rp-1 on the first stage now the first

6397

04:10:34,309 --> 04:10:31,920

and second stage are completely filled

6398

04:10:37,110 --> 04:10:34,319

with that rp1 kerosene

6399

04:10:39,349 --> 04:10:37,120

now just under six minutes to launch

6400

04:10:41,510 --> 04:10:39,359

until that instantaneous launch window

6401  
04:10:43,510 --> 04:10:41,520  
today the next milestone will be for

6402  
04:10:45,510 --> 04:10:43,520  
dragon to transition to configure for

6403  
04:10:47,590 --> 04:10:45,520  
terminal count and that's when dragons

6404  
04:10:49,590 --> 04:10:47,600  
on board computers will take control of

6405  
04:10:51,750 --> 04:10:49,600  
the vehicle and dragon will be on

6406  
04:10:57,110 --> 04:10:51,760  
internal power no longer relying on

6407  
04:11:00,950 --> 04:10:58,630  
from there falcon 9 tanks will

6408  
04:11:02,790 --> 04:11:00,960  
pressurize for strong back retract

6409  
04:11:04,630 --> 04:11:02,800  
that'll be another visual milestones the

6410  
04:11:06,950 --> 04:11:04,640  
clamps just below dragon's trunk will

6411  
04:11:08,870 --> 04:11:06,960  
open and the strong back will tilt back

6412  
04:11:12,630 --> 04:11:08,880  
just two degrees then right after

6413  
04:11:14,710 --> 04:11:12,640

liftoff back to 45 degrees

6414

04:11:16,950 --> 04:11:14,720

again rp1 kerosene filled on both the

6415

04:11:18,790 --> 04:11:16,960

first and second stages liquid oxygen

6416

04:11:20,389 --> 04:11:18,800

continues to flow through on the first

6417

04:11:21,990 --> 04:11:20,399

and second stages

6418

04:11:24,469 --> 04:11:22,000

standing by now for that call that

6419

04:11:32,149 --> 04:11:24,479

dragon has transitioned into terminal

6420

04:11:35,030 --> 04:11:33,590

dragon isn't configured for terminal

6421

04:11:36,469 --> 04:11:35,040

count

6422

04:11:40,950 --> 04:11:36,479

how can nine propellant tanks are

6423

04:11:44,950 --> 04:11:42,790

all right john some good calls dragon is

6424

04:11:47,349 --> 04:11:44,960

now on internal power and falcon 9

6425

04:11:51,110 --> 04:11:47,359

propellant tanks are pressurizing for

6426

04:11:54,469 --> 04:11:52,950

yes thanks courtney

6427

04:11:58,790 --> 04:11:54,479

what we're waiting to hear now is the

6428

04:12:02,790 --> 04:12:01,349

this will be a two-step process

6429

04:12:04,710 --> 04:12:02,800

first we'll spend about half a minute

6430

04:12:07,110 --> 04:12:04,720

opening up the first clamp around the

6431

04:12:10,070 --> 04:12:07,120

second stage

6432

04:12:11,830 --> 04:12:10,080

there's the call out sequence has begun

6433

04:12:13,510 --> 04:12:11,840

so we'll slowly open up the arms around

6434

04:12:15,830 --> 04:12:13,520

the second stage we might get a view if

6435

04:12:17,990 --> 04:12:15,840

we've got a close-up of the camera

6436

04:12:20,229 --> 04:12:18,000

then once the arms are open the strong

6437

04:12:23,110 --> 04:12:20,239

back alongside falcon 9 will retract

6438

04:12:24,469 --> 04:12:23,120

about two degrees away from the rocket

6439

04:12:26,309 --> 04:12:24,479

it'll stay there all the way through

6440

04:12:28,389 --> 04:12:26,319

liftoff and then as courtney mentioned

6441

04:12:31,510 --> 04:12:28,399

at liftoff hydraulics will then pull it

6442

04:12:33,429 --> 04:12:31,520

down to about a 45 degree position above

6443

04:12:35,510 --> 04:12:33,439

ground and that will give us the final

6444

04:12:37,590 --> 04:12:35,520

clearance it's that strong back right

6445

04:12:39,110 --> 04:12:37,600

now that is providing the liquids the

6446

04:12:41,349 --> 04:12:39,120

gas connections the electrical

6447

04:12:49,189 --> 04:12:41,359

connections to the launch vehicle

6448

04:12:54,229 --> 04:12:51,910

we're hearing some of the

6449

04:12:56,309 --> 04:12:54,239

venting of the vehicle is we are

6450

04:12:57,670 --> 04:12:56,319

pressurizing and depressurizing at

6451  
04:13:00,229 --> 04:12:57,680  
various steps

6452  
04:13:01,830 --> 04:13:00,239  
as we get ready you'll see a burst of

6453  
04:13:10,870 --> 04:13:01,840  
depressurization there on the second

6454  
04:13:15,030 --> 04:13:12,469  
that's right john we're also anxiously

6455  
04:13:17,269 --> 04:13:15,040  
awaiting the stage one liquid oxygen is

6456  
04:13:24,229 --> 04:13:17,279  
complete on the first stage you should

6457  
04:13:24,239 --> 04:13:36,950  
stage one locks load complete

6458  
04:13:44,370 --> 04:13:38,710  
and confirmation that the stage one

6459  
04:13:47,910 --> 04:13:46,149  
[Music]

6460  
04:13:54,229 --> 04:13:47,920  
right now locks is going to continue

6461  
04:13:54,239 --> 04:13:59,830  
gone internal power

6462  
04:14:04,149 --> 04:14:01,590  
again at t last two minutes we'll finish

6463  
04:14:06,469 --> 04:14:04,159

liquid oxygen loading and then a typical

6464

04:14:08,550 --> 04:14:06,479

event we will drain the propellant lines

6465

04:14:10,149 --> 04:14:08,560

that go along the strong back and we

6466

04:14:11,750 --> 04:14:10,159

typically get a large cloud of

6467

04:14:13,990 --> 04:14:11,760

conversation

6468

04:14:15,910 --> 04:14:14,000

at about 90 seconds before launch as we

6469

04:14:17,269 --> 04:14:15,920

see the propellants come back down off

6470

04:14:27,990 --> 04:14:17,279

of the strongback

6471

04:14:28,000 --> 04:14:42,950

so

6472

04:14:42,960 --> 04:14:46,950

stage two locks load complete

6473

04:14:51,429 --> 04:14:48,790

dragon is an auto idle all right falcon

6474

04:14:53,510 --> 04:14:51,439

9.

6475

04:14:55,269 --> 04:14:53,520

with that falcon 9 is fully fueled we

6476  
04:14:56,309 --> 04:14:55,279  
have fuel on both the first and second

6477  
04:15:01,269 --> 04:14:56,319  
stages

6478  
04:15:01,279 --> 04:15:04,950  
filled with liquid oxygen

6479  
04:15:09,510 --> 04:15:07,269  
dragon is also an auto idol the flight

6480  
04:15:11,590 --> 04:15:09,520  
computer is on board dragon maintaining

6481  
04:15:15,990 --> 04:15:11,600  
their calculations standing by for the

6482  
04:15:19,830 --> 04:15:17,510  
that next call out will be that dragon

6483  
04:15:31,590 --> 04:15:19,840  
is in countdown standing by now for that

6484  
04:15:36,710 --> 04:15:33,990  
fts is armed man isn't startup

6485  
04:15:40,309 --> 04:15:36,720  
as all control

6486  
04:15:46,149 --> 04:15:43,910  
all right the final minute before launch

6487  
04:15:47,830 --> 04:15:46,159  
just 47 seconds to go everything is

6488  
04:15:52,550 --> 04:15:47,840

ready for an on-time launch today go for

6489

04:15:52,560 --> 04:15:56,149

endurance happening

6490

04:16:00,070 --> 04:15:58,149

ground teams are ready and crew 3 is

6491

04:16:01,590 --> 04:16:00,080

ready for liftoff heading for that

6492

04:16:10,389 --> 04:16:01,600

instantaneous

6493

04:16:10,399 --> 04:16:15,349

20 seconds to lift off

6494

04:16:15,359 --> 04:16:20,389

you minus 15 seconds

6495

04:16:22,309 --> 04:16:21,349

10

6496

04:16:23,189 --> 04:16:22,319

9

6497

04:16:24,149 --> 04:16:23,199

8

6498

04:16:25,110 --> 04:16:24,159

7

6499

04:16:26,070 --> 04:16:25,120

6

6500

04:16:27,110 --> 04:16:26,080

5

6501  
04:16:28,149 --> 04:16:27,120  
4

6502  
04:16:29,110 --> 04:16:28,159  
three

6503  
04:16:29,910 --> 04:16:29,120  
two

6504  
04:16:33,030 --> 04:16:29,920  
one

6505  
04:16:36,149 --> 04:16:33,040  
zero ignition

6506  
04:16:54,389 --> 04:16:36,159  
and liftoff got

6507  
04:17:01,590 --> 04:16:56,389  
and that's the call we want to hear good

6508  
04:17:06,710 --> 04:17:03,750  
team plus 30 seconds

6509  
04:17:08,870 --> 04:17:06,720  
powered by nine merlin one g's

6510  
04:17:10,469 --> 04:17:08,880  
pushing dragon into low earth orbit on

6511  
04:17:11,590 --> 04:17:10,479  
the way to the international space

6512  
04:17:15,429 --> 04:17:11,600  
station

6513  
04:17:15,439 --> 04:17:31,670

okay anyone call them

6514

04:17:31,680 --> 04:17:42,309

getting ready

6515

04:17:49,590 --> 04:17:44,149

stage one throw up

6516

04:18:06,630 --> 04:17:55,030

stage

6517

04:18:17,349 --> 04:18:08,229

that next milestone coming up shortly

6518

04:18:22,070 --> 04:18:20,790

i'm back chill underway

6519

04:18:24,070 --> 04:18:22,080

there's a call out we're getting the

6520

04:18:26,389 --> 04:18:24,080

second stage engine turbo pumps ready

6521

04:18:28,710 --> 04:18:26,399

for their ignition coming up in just a

6522

04:18:30,309 --> 04:18:28,720

little more than 40 seconds

6523

04:18:31,910 --> 04:18:30,319

we've got the major events coming up

6524

04:18:33,110 --> 04:18:31,920

here shortly we're going to get main

6525

04:18:35,750 --> 04:18:33,120

engine cut off

6526  
04:18:37,670 --> 04:18:35,760  
two minutes 36 seconds the stages will

6527  
04:18:39,750 --> 04:18:37,680  
separate then the second stage will

6528  
04:18:42,790 --> 04:18:39,760  
ignite carrying dragon on its way into

6529  
04:18:42,800 --> 04:18:47,189  
everything continues to look good

6530  
04:18:51,830 --> 04:18:50,149  
stage one throw down

6531  
04:18:57,830 --> 04:18:51,840  
stage one throttling down at three and a

6532  
04:18:57,840 --> 04:19:13,590  
getting ready for mikko

6533  
04:19:22,140 --> 04:19:15,910  
stage separation

6534  
04:19:26,600 --> 04:19:26,590  
[Applause]

6535  
04:19:28,790 --> 04:19:27,310  
[Music]

6536  
04:19:31,110 --> 04:19:28,800  
[Applause]

6537  
04:19:32,890 --> 04:19:31,120  
and crew 3 is now on their way to the

6538  
04:19:36,710 --> 04:19:32,900

international space station

6539

04:19:39,590 --> 04:19:36,720

[Applause]

6540

04:19:42,149 --> 04:19:39,600

on the left side first stage you can see

6541

04:19:43,349 --> 04:19:42,159

the titanium drip fence coming out the

6542

04:19:45,269 --> 04:19:43,359

streaks

6543

04:19:47,269 --> 04:19:45,279

of the exhaust of the second stage

6544

04:19:48,790 --> 04:19:47,279

engine going by and the lights of

6545

04:19:50,229 --> 04:19:48,800

florida down in the background

6546

04:19:56,710 --> 04:19:50,239

acquisition signal that's right and on

6547

04:20:12,389 --> 04:19:58,149

with that red color we like to see

6548

04:20:18,950 --> 04:20:14,229

now three minutes and 40 seconds into

6549

04:20:18,960 --> 04:20:23,349

acquisition of signal bermuda

6550

04:20:23,359 --> 04:20:27,910

dragon spacex

6551  
04:20:31,590 --> 04:20:29,670  
that call out of acquisition of signal

6552  
04:20:33,189 --> 04:20:31,600  
bermuda that just means

6553  
04:20:35,030 --> 04:20:33,199  
the bermuda ground station has the

6554  
04:20:39,510 --> 04:20:35,040  
signals from the second stage of dragon

6555  
04:20:45,510 --> 04:20:42,149  
uh currently on the first stage we are

6556  
04:20:48,149 --> 04:20:45,520  
coasting to apogee beginning a slow 180

6557  
04:20:49,269 --> 04:20:48,159  
degree pitch so that when the

6558  
04:20:50,950 --> 04:20:49,279  
vehicle comes back through the

6559  
04:20:52,950 --> 04:20:50,960  
atmosphere the engines are pointed down

6560  
04:20:55,510 --> 04:20:52,960  
towards the drone ship when we do the

6561  
04:20:58,469 --> 04:20:55,520  
relight relight for the entry burn will

6562  
04:21:00,389 --> 04:20:58,479  
come at t plus 7 minutes and 30 seconds

6563  
04:21:02,790 --> 04:21:00,399

three minutes from now

6564

04:21:05,189 --> 04:21:02,800  
currently the first stage about 166

6565

04:21:12,309 --> 04:21:05,199  
kilometers up continuing to coast to

6566

04:21:15,429 --> 04:21:13,670  
meanwhile that second stage still

6567

04:21:17,110 --> 04:21:15,439  
propelling the crew three astronauts up

6568

04:21:18,630 --> 04:21:17,120  
the eastern seaboard and it will

6569

04:21:19,830 --> 04:21:18,640  
continue to fire that's about a

6570

04:21:22,710 --> 04:21:19,840  
six-minute burn to deliver the

6571

04:21:27,269 --> 04:21:22,720  
astronauts into orbit dragon spacex

6572

04:21:30,790 --> 04:21:29,030  
endurance and a good call out from the

6573

04:21:32,389 --> 04:21:30,800  
ground teams

6574

04:21:34,790 --> 04:21:32,399  
i always love to hear

6575

04:21:36,389 --> 04:21:34,800  
trajectory nominal and the crew gets to

6576

04:21:40,229 --> 04:21:36,399

hear it too on the call acquisition will

6577

04:22:05,349 --> 04:21:41,990

in the new hampshire tracking station

6578

04:22:08,870 --> 04:22:07,110

five minutes and 30 seconds into flight

6579

04:22:13,110 --> 04:22:08,880

today everything is still proceeding

6580

04:22:16,389 --> 04:22:14,950

and courtney right now on the second

6581

04:22:18,630 --> 04:22:16,399

stage

6582

04:22:20,469 --> 04:22:18,640

it's such a large amount of propellant

6583

04:22:22,710 --> 04:22:20,479

it takes a while for second stage to

6584

04:22:26,870 --> 04:22:22,720

really accelerate the crew right now it

6585

04:22:31,189 --> 04:22:28,309

looks like we're pulling about one and a

6586

04:22:34,870 --> 04:22:33,110

yeah right on cue those check-ins on the

6587

04:22:37,510 --> 04:22:34,880

second stage performance everything is

6588

04:22:39,349 --> 04:22:37,520

still looking good on that second stage

6589

04:22:41,590 --> 04:22:39,359

the next milestone on the second stage

6590

04:22:45,030 --> 04:22:41,600

will be ceco and we're getting our views

6591

04:22:47,349 --> 04:22:45,040

now from inside of endurance our first

6592

04:23:00,550 --> 04:22:47,359

views of the crew on their way to the

6593

04:23:05,590 --> 04:23:03,429

we're one minute away from entry burn of

6594

04:23:07,590 --> 04:23:05,600

the first stage hopefully we'll get a

6595

04:23:10,070 --> 04:23:07,600

camera view back on the first stage as

6596

04:23:22,070 --> 04:23:10,080

we like the three engines to come back

6597

04:23:22,080 --> 04:23:30,870

dragon spacex introductory nominal

6598

04:23:34,229 --> 04:23:32,870

another good check in with the crew

6599

04:23:42,469 --> 04:23:34,239

confirming everything is still looking

6600

04:23:45,990 --> 04:23:44,149

that next milestone coming at seven

6601  
04:23:49,750 --> 04:23:46,000  
minutes and 30 seconds will be entry

6602  
04:23:53,750 --> 04:23:51,590  
currently waiting for the call out from

6603  
04:23:56,229 --> 04:23:53,760  
the spacex propulsion responsible

6604  
04:23:58,550 --> 04:23:56,239  
engineer with the three merlin 1d

6605  
04:24:00,790 --> 04:23:58,560  
engines have lit to begin the slope to

6606  
04:24:02,950 --> 04:24:00,800  
begin slowing down the first stage

6607  
04:24:03,910 --> 04:24:02,960  
prior to entering the earth stage 2 fts

6608  
04:24:10,550 --> 04:24:03,920  
is safe

6609  
04:24:14,469 --> 04:24:12,149  
we've heard stage one entry burn to

6610  
04:24:16,070 --> 04:24:14,479  
start up we've lit the center engine

6611  
04:24:20,870 --> 04:24:16,080  
we've got the two side engines three

6612  
04:24:24,469 --> 04:24:22,469  
this will slow the first stage down

6613  
04:24:26,550 --> 04:24:24,479

we'll then enter the atmosphere

6614

04:24:28,229 --> 04:24:26,560

where the grid fins begin to work and

6615

04:24:29,030 --> 04:24:28,239

then we will fire the single center

6616

04:24:31,030 --> 04:24:29,040

engine

6617

04:24:35,030 --> 04:24:31,040

as we approach the drone ship stage one

6618

04:24:39,030 --> 04:24:37,110

confirmation entry burn shutdown and

6619

04:24:55,830 --> 04:24:39,040

meanwhile that second stage is less than

6620

04:24:55,840 --> 04:25:10,950

stage two and terminal guidance

6621

04:25:20,630 --> 04:25:12,950

copy shannon there's that call for

6622

04:25:24,070 --> 04:25:22,790

stage one decelerating as we prepare for

6623

04:25:25,990 --> 04:25:24,080

entry burn

6624

04:25:30,110 --> 04:25:26,000

but our tension is right now looking at

6625

04:25:34,239 --> 04:25:34,229

[Applause]

6626  
04:25:34,239 --> 04:25:38,340  
h1 vinegar

6627  
04:25:46,229 --> 04:25:40,389  
[Applause]

6628  
04:25:49,990 --> 04:25:48,229  
and the second stage has done its job

6629  
04:25:54,149 --> 04:25:50,000  
our crew three astronauts have been

6630  
04:26:00,309 --> 04:25:57,349  
stage one landing like deploy

6631  
04:26:00,950 --> 04:26:00,319  
landing lane deployments you can feel

6632  
04:26:03,110 --> 04:26:00,960  
and

6633  
04:26:04,870 --> 04:26:03,120  
confirms we are in space

6634  
04:26:05,270 --> 04:26:04,880  
dragon spacex launch escape system is

6635  
04:26:14,710 --> 04:26:05,280  
designed

6636  
04:26:20,309 --> 04:26:14,720  
[Applause]

6637  
04:26:24,389 --> 04:26:22,149  
and we've heard the call out stage one

6638  
04:26:30,309 --> 04:26:24,399

landing is confirmed

6639

04:26:35,269 --> 04:26:32,870

some great call outs that next milestone

6640

04:26:44,550 --> 04:26:35,279

is spacecraft separation around 12

6641

04:26:48,870 --> 04:26:45,990

getting a view now of the crew 3

6642

04:26:51,830 --> 04:26:48,880

astronauts from a camera aboard dragon

6643

04:26:57,670 --> 04:26:51,840

the crew now coasting in low earth orbit

6644

04:27:00,790 --> 04:26:59,349

again that next milestone coming in

6645

04:27:03,110 --> 04:27:00,800

about two minutes

6646

04:27:06,469 --> 04:27:03,120

that second stage will separate and crew

6647

04:27:08,309 --> 04:27:06,479

dragon will be flying free

6648

04:27:10,149 --> 04:27:08,319

and courtney right now the falcon 9's

6649

04:27:13,189 --> 04:27:10,159

second stage is still attached to the

6650

04:27:14,950 --> 04:27:13,199

dragon capsule when it's time dragon

6651  
04:27:16,550 --> 04:27:14,960  
will command separation from the falcon

6652  
04:27:18,070 --> 04:27:16,560  
9 second stage

6653  
04:27:20,070 --> 04:27:18,080  
right now that second stage under

6654  
04:27:21,990 --> 04:27:20,080  
control of its flight computer is

6655  
04:27:24,229 --> 04:27:22,000  
essentially going through a sequence to

6656  
04:27:26,229 --> 04:27:24,239  
idle the second stage make sure we're

6657  
04:27:28,710 --> 04:27:26,239  
not pulsing any of the cold gas

6658  
04:27:30,630 --> 04:27:28,720  
thrusters the engine has been purged out

6659  
04:27:32,389 --> 04:27:30,640  
essentially anything that might cause

6660  
04:27:34,550 --> 04:27:32,399  
motion of the second stage we're making

6661  
04:27:36,550 --> 04:27:34,560  
sure that all of that is eliminated so

6662  
04:27:46,520 --> 04:27:36,560  
that when dragon separates it's got a

6663  
04:27:46,530 --> 04:27:55,189

[Applause]

6664

04:27:59,590 --> 04:27:56,950

i believe the cheering in the background

6665

04:28:01,830 --> 04:27:59,600

uh they're getting video back of

6666

04:28:04,149 --> 04:28:01,840

falcon 9 first stage on

6667

04:28:09,830 --> 04:28:04,159

drone ship as we get ready for dragon

6668

04:28:14,309 --> 04:28:12,309

that's right john separation coming just

6669

04:28:27,269 --> 04:28:14,319

10 seconds from now standing by for that

6670

04:28:27,279 --> 04:28:35,590

expected loss of signal wallops

6671

04:28:35,600 --> 04:28:42,070

and again we are standing by

6672

04:28:42,080 --> 04:28:51,269

there we go dragon separation confirmed

6673

04:28:55,189 --> 04:28:53,110

dragon ce

6674

04:28:57,349 --> 04:28:55,199

welcome to orbit hope you enjoyed the

6675

04:28:59,990 --> 04:28:57,359

ride from f9 dragon will take you from

6676  
04:29:02,070 --> 04:29:00,000  
here save travels stand by for words

6677  
04:29:04,389 --> 04:29:02,080  
from ld

6678  
04:29:05,990 --> 04:29:04,399  
and endurance ld here on behalf of the

6679  
04:29:07,269 --> 04:29:06,000  
spacex launch and recovery teams it was

6680  
04:29:08,149 --> 04:29:07,279  
a pleasure to be part of this mission

6681  
04:29:09,910 --> 04:29:08,159  
with you

6682  
04:29:15,910 --> 04:29:09,920  
enjoy your holidays amongst the stars

6683  
04:29:18,870 --> 04:29:17,110  
wow

6684  
04:29:20,870 --> 04:29:18,880  
incredible views

6685  
04:29:22,550 --> 04:29:20,880  
of the crew now

6686  
04:29:24,389 --> 04:29:22,560  
in orbit on their way to the

6687  
04:29:32,550 --> 04:29:24,399  
international space station

6688  
04:29:37,429 --> 04:29:34,229

and some final words from the crew as

6689

04:29:42,870 --> 04:29:41,110

there they are our crew 3 astronauts

6690

04:29:44,469 --> 04:29:42,880

now in orbit

6691

04:29:49,670 --> 04:29:44,479

that next milestone will be the

6692

04:29:55,590 --> 04:29:53,990

that will be about a five minute process

6693

04:29:57,030 --> 04:29:55,600

it'll expose those forward bulkhead

6694

04:29:58,630 --> 04:29:57,040

dracos

6695

04:30:03,670 --> 04:29:58,640

and we'll prepare

6696

04:30:07,830 --> 04:30:05,670

nick courtney watching them and zero g

6697

04:30:08,630 --> 04:30:07,840

right now working their displays it

6698

04:30:10,070 --> 04:30:08,640

looks

6699

04:30:12,229 --> 04:30:10,080

so easy

6700

04:30:14,550 --> 04:30:12,239

but we had the benefit of watching the

6701  
04:30:16,950 --> 04:30:14,560  
the launch team the spacecraft team the

6702  
04:30:18,309 --> 04:30:16,960  
nasa team everybody working here for the

6703  
04:30:19,830 --> 04:30:18,319  
last weeks

6704  
04:30:21,990 --> 04:30:19,840  
working through this

6705  
04:30:24,229 --> 04:30:22,000  
and it's good to see

6706  
04:30:25,189 --> 04:30:24,239  
it come out looking just so easy right

6707  
04:30:26,469 --> 04:30:25,199  
now

6708  
04:30:32,070 --> 04:30:26,479  
yep it's been a long time coming and

6709  
04:30:36,309 --> 04:30:34,389  
dragon spacex nominal domino

6710  
04:30:47,910 --> 04:30:36,319  
dehumidifier activation and service

6711  
04:30:52,389 --> 04:30:50,790  
well it was a beautiful launch from here

6712  
04:30:54,710 --> 04:30:52,399  
at hawthorne

6713  
04:30:57,670 --> 04:30:54,720

headquarters at spacex headquarters here

6714

04:30:59,670 --> 04:30:57,680

in hawthorne i can't imagine how the

6715

04:31:02,229 --> 04:30:59,680

launch looked from over at kennedy space

6716

04:31:04,630 --> 04:31:02,239

center yeah pretty incredible launch we

6717

04:31:06,389 --> 04:31:04,640

also got to see their zero g indicator

6718

04:31:07,830 --> 04:31:06,399

on the screen it looked like a little

6719

04:31:10,469 --> 04:31:07,840

turtle so i'd love to hear the story

6720

04:31:12,309 --> 04:31:10,479

behind that but uh an amazing launch an

6721

04:31:13,750 --> 04:31:12,319

amazing day so far

6722

04:31:15,750 --> 04:31:13,760

yeah that's right and with that we'll go

6723

04:31:17,349 --> 04:31:15,760

ahead and send it back to kennedy space

6724

04:31:20,630 --> 04:31:17,359

center daryl how was the launch from

6725

04:31:21,990 --> 04:31:20,640

your end well it was simply stunning

6726  
04:31:23,590 --> 04:31:22,000  
thanks we're back here at the kennedy

6727  
04:31:25,830 --> 04:31:23,600  
space center with shannon walker crew

6728  
04:31:27,670 --> 04:31:25,840  
one astronaut michelin specialist from

6729  
04:31:30,550 --> 04:31:27,680  
that from that mission

6730  
04:31:32,790 --> 04:31:30,560  
wow wow is right i mean it was amazing

6731  
04:31:35,110 --> 04:31:32,800  
it's always so impressive to see a

6732  
04:31:37,670 --> 04:31:35,120  
launch live and and what always strikes

6733  
04:31:39,830 --> 04:31:37,680  
me is you get to see it and then you

6734  
04:31:42,309 --> 04:31:39,840  
hear the sound after it's gone for a few

6735  
04:31:44,070 --> 04:31:42,319  
seconds it's truly amazing the delay and

6736  
04:31:46,070 --> 04:31:44,080  
the sound coming to us but we're seeing

6737  
04:31:48,070 --> 04:31:46,080  
the sights and when it lifted off there

6738  
04:31:49,830 --> 04:31:48,080

was that low cloud deck yes it was like

6739

04:31:52,229 --> 04:31:49,840

lit up the clouds that lit up the ground

6740

04:31:54,630 --> 04:31:52,239

it was it was one of the most impressive

6741

04:31:56,790 --> 04:31:54,640

launches i have seen and that rumble was

6742

04:31:58,229 --> 04:31:56,800

probably one of the loudest i've heard i

6743

04:31:59,750 --> 04:31:58,239

don't know you know i don't know how to

6744

04:32:01,510 --> 04:31:59,760

explain that i don't either i mean it

6745

04:32:03,990 --> 04:32:01,520

seemed louder to me than most launches

6746

04:32:06,389 --> 04:32:04,000

and it was really rattling this whole uh

6747

04:32:08,630 --> 04:32:06,399

setup where we are here just a boom and

6748

04:32:10,149 --> 04:32:08,640

then we saw the zero g indicator

6749

04:32:11,990 --> 04:32:10,159

a turtle a turtle of course because

6750

04:32:13,910 --> 04:32:12,000

there's turtles on board

6751  
04:32:16,710 --> 04:32:13,920  
two turtles on board and of course he

6752  
04:32:17,750 --> 04:32:16,720  
had to convince the other two astronauts

6753  
04:32:19,429 --> 04:32:17,760  
right right

6754  
04:32:21,110 --> 04:32:19,439  
i don't know i don't know who won that

6755  
04:32:23,189 --> 04:32:21,120  
arm wrestle but i guess it was the term

6756  
04:32:25,830 --> 04:32:23,199  
turtles all right we're joined now by

6757  
04:32:27,670 --> 04:32:25,840  
frank davina is program manager for the

6758  
04:32:29,189 --> 04:32:27,680  
international space station thank you

6759  
04:32:31,910 --> 04:32:29,199  
very much for joining us and

6760  
04:32:34,630 --> 04:32:31,920  
congratulations yeah good evening yes

6761  
04:32:37,269 --> 04:32:34,640  
indeed beautiful launch we have

6762  
04:32:40,229 --> 04:32:37,279  
our second astronaut flying on crew

6763  
04:32:42,469 --> 04:32:40,239

dragon after tomah that just returned

6764

04:32:44,710 --> 04:32:42,479

last night that was in cologne welcoming

6765

04:32:46,710 --> 04:32:44,720

in him in cologne

6766

04:32:49,750 --> 04:32:46,720

after his space mission and now i'm here

6767

04:32:51,429 --> 04:32:49,760

to see of matthias it's a great time for

6768

04:32:53,189 --> 04:32:51,439

the european space agency what a

6769

04:32:56,229 --> 04:32:53,199

turnaround that must have been to be in

6770

04:32:58,710 --> 04:32:56,239

cologne there with tomah coming back and

6771

04:33:01,110 --> 04:32:58,720

literally just days later seeing off one

6772

04:33:03,110 --> 04:33:01,120

of your east astronauts matthias maurer

6773

04:33:05,429 --> 04:33:03,120

yeah it's a it's a great time for us

6774

04:33:07,109 --> 04:33:05,439

because we have two back to

6775

04:33:10,230 --> 04:33:07,119

back and we will also have samantha

6776

04:33:12,310 --> 04:33:10,240

christopher that will fly uh in april uh

6777

04:33:14,470 --> 04:33:12,320

next year so for the first time we will

6778

04:33:16,551 --> 04:33:14,480

have for one and a half years

6779

04:33:18,789 --> 04:33:16,561

permanently is astronauts on board of

6780

04:33:21,510 --> 04:33:18,799

the space station so it also shows uh

6781

04:33:23,670 --> 04:33:21,520

that is really stepping up to the game

6782

04:33:26,390 --> 04:33:23,680

we are more and more engaged in the iss

6783

04:33:28,390 --> 04:33:26,400

but also in the mundo program with our

6784

04:33:29,910 --> 04:33:28,400

nasa colleagues in the gateway we will

6785

04:33:32,470 --> 04:33:29,920

have three astronauts flying to the

6786

04:33:34,230 --> 04:33:32,480

gateway before the end of this decade uh

6787

04:33:36,310 --> 04:33:34,240

we are doing a new astronaut selection

6788

04:33:38,310 --> 04:33:36,320

so exploration is really also taking off

6789

04:33:40,390 --> 04:33:38,320

in europe and how did you enjoy the

6790

04:33:42,310 --> 04:33:40,400

launch uh were you watching from the

6791

04:33:45,429 --> 04:33:42,320

fifth floor of the operations support

6792

04:33:48,869 --> 04:33:45,439

building no i was actually in the lcc

6793

04:33:51,750 --> 04:33:48,879

so i was able to go outside and uh go on

6794

04:33:54,470 --> 04:33:51,760

the on the staircase on the outside uh

6795

04:33:57,029 --> 04:33:54,480

on the fifth uh fifth floor there uh or

6796

04:33:59,590 --> 04:33:57,039

something like that it's really amazing

6797

04:34:01,269 --> 04:33:59,600

like you said uh you see the the light

6798

04:34:03,029 --> 04:34:01,279

and then the sound and you're really on

6799

04:34:05,830 --> 04:34:03,039

the stairs there you feel everything

6800

04:34:07,830 --> 04:34:05,840

rambling so it's a really amazing uh

6801  
04:34:09,429 --> 04:34:07,840  
launch now you two are familiar with

6802  
04:34:12,551 --> 04:34:09,439  
each other shannon walker yes frank

6803  
04:34:14,789 --> 04:34:12,561  
davina explain that well we're uh we

6804  
04:34:16,230 --> 04:34:14,799  
have common job and so

6805  
04:34:17,590 --> 04:34:16,240  
american astronauts work with these

6806  
04:34:19,750 --> 04:34:17,600  
astronauts and so we actually go way

6807  
04:34:22,230 --> 04:34:19,760  
back yeah we go way back because uh we

6808  
04:34:25,349 --> 04:34:22,240  
were together in training actually uh uh

6809  
04:34:28,390 --> 04:34:25,359  
when i was doing my mission in 2009

6810  
04:34:30,390 --> 04:34:28,400  
shannon was also in training on soyuz so

6811  
04:34:31,910 --> 04:34:30,400  
indeed we go way back and uh we have

6812  
04:34:33,510 --> 04:34:31,920  
worked a lot together

6813  
04:34:36,070 --> 04:34:33,520

so tell me did you get a chance to talk

6814

04:34:38,390 --> 04:34:36,080

with matthias before um you know in the

6815

04:34:40,551 --> 04:34:38,400

in the days leading up to launch uh yes

6816

04:34:42,869 --> 04:34:40,561

i talked a couple of times uh with him

6817

04:34:44,310 --> 04:34:42,879

uh not as much as i would have wanted

6818

04:34:45,990 --> 04:34:44,320

because again the launch was a little

6819

04:34:48,949 --> 04:34:46,000

bit delayed and i had to be back in

6820

04:34:50,709 --> 04:34:48,959

europe uh welcoming uh tomah but uh i

6821

04:34:52,470 --> 04:34:50,719

think he's very motivated of course it's

6822

04:34:53,590 --> 04:34:52,480

his first flight uh it's always like

6823

04:34:55,029 --> 04:34:53,600

this uh

6824

04:34:57,109 --> 04:34:55,039

of course also a little bit curious

6825

04:34:58,629 --> 04:34:57,119

what's going to happen now because uh

6826

04:35:00,230 --> 04:34:58,639

it's different the second flight and the

6827

04:35:02,150 --> 04:35:00,240

first flight is totally different at

6828

04:35:03,990 --> 04:35:02,160

least for me it was because

6829

04:35:05,990 --> 04:35:04,000

you go into the unknown yeah and it's

6830

04:35:07,109 --> 04:35:06,000

always a little bit scary to go in into

6831

04:35:09,189 --> 04:35:07,119

the unknown

6832

04:35:11,429 --> 04:35:09,199

you know that the people expect a lot of

6833

04:35:13,670 --> 04:35:11,439

you and matthias has a whole science

6834

04:35:15,750 --> 04:35:13,680

program not only an isa science program

6835

04:35:17,670 --> 04:35:15,760

but also for the benefit of nasa jax and

6836

04:35:20,150 --> 04:35:17,680

of course every astronaut wants to

6837

04:35:22,551 --> 04:35:20,160

perform to the best of his abilities and

6838

04:35:24,390 --> 04:35:22,561

of course that also brings

6839

04:35:26,230 --> 04:35:24,400

this this thoughts with him but i'm told

6840

04:35:27,590 --> 04:35:26,240

him that he was excellent in training

6841

04:35:29,990 --> 04:35:27,600

and i'm sure that he will do a great

6842

04:35:31,349 --> 04:35:30,000

mission as well isa program manager for

6843

04:35:33,269 --> 04:35:31,359

the international space station frank

6844

04:35:34,789 --> 04:35:33,279

davina thanks for joining us in the post

6845

04:35:36,869 --> 04:35:34,799

launch interview we really appreciate it

6846

04:35:38,150 --> 04:35:36,879

and congratulations thank you very much

6847

04:35:40,310 --> 04:35:38,160

all right let's send it over to marie

6848

04:35:42,470 --> 04:35:40,320

lewis at the operations and support

6849

04:35:44,150 --> 04:35:42,480

building with another guest

6850

04:35:46,869 --> 04:35:44,160

thank you daryl i am here with nasa

6851  
04:35:48,629 --> 04:35:46,879  
associate administrator bob cabana uh

6852  
04:35:50,709 --> 04:35:48,639  
this is your first crew launch

6853  
04:35:52,470 --> 04:35:50,719  
officially as associate administrator

6854  
04:35:55,109 --> 04:35:52,480  
how was that was the launch tonight for

6855  
04:35:56,789 --> 04:35:55,119  
you oh it was fantastic marie

6856  
04:35:58,470 --> 04:35:56,799  
what a beautiful evening for a launch

6857  
04:36:01,109 --> 04:35:58,480  
you know it's like i tell folks don't

6858  
04:36:03,029 --> 04:36:01,119  
take pictures experience it and it was

6859  
04:36:05,830 --> 04:36:03,039  
another great experience seeing those

6860  
04:36:09,349 --> 04:36:05,840  
four guys take off into space on top of

6861  
04:36:10,709 --> 04:36:09,359  
that falcon 9 on that dragon how amazing

6862  
04:36:13,670 --> 04:36:10,719  
what a great partnership we have with

6863  
04:36:15,670 --> 04:36:13,680

spacex to enable that i just i couldn't

6864

04:36:16,869 --> 04:36:15,680

be more proud of our team in what we've

6865

04:36:20,230 --> 04:36:16,879

accomplished

6866

04:36:22,709 --> 04:36:20,240

and we now officially have had have more

6867

04:36:25,109 --> 04:36:22,719

than 600 people who have been to space

6868

04:36:27,750 --> 04:36:25,119

matthias was number 600 kayla kayla

6869

04:36:29,750 --> 04:36:27,760

baron is number 601 uh what do you think

6870

04:36:31,670 --> 04:36:29,760

about the trajectory that we're on for

6871

04:36:33,029 --> 04:36:31,680

human space flight going forward well

6872

04:36:34,310 --> 04:36:33,039

it's absolutely outstanding you know

6873

04:36:36,150 --> 04:36:34,320

what we want to do is enable a

6874

04:36:38,629 --> 04:36:36,160

commercial economy in low-earth orbit so

6875

04:36:40,629 --> 04:36:38,639

we can focus on that really hard job of

6876  
04:36:42,470 --> 04:36:40,639  
exploring beyond our home planet going

6877  
04:36:44,789 --> 04:36:42,480  
to the moon to learn what we need going

6878  
04:36:46,470 --> 04:36:44,799  
to the moon in a sustainable way so that

6879  
04:36:48,230 --> 04:36:46,480  
we can learn what we need to go on to

6880  
04:36:50,629 --> 04:36:48,240  
mars eventually establishing that

6881  
04:36:52,709 --> 04:36:50,639  
presence in our solar system beyond our

6882  
04:36:54,789 --> 04:36:52,719  
home planet and to do that we want to

6883  
04:36:56,869 --> 04:36:54,799  
commercialize low earth orbit and and

6884  
04:36:58,310 --> 04:36:56,879  
get as many folks as we can

6885  
04:36:59,990 --> 04:36:58,320  
go into space and

6886  
04:37:02,310 --> 04:37:00,000  
that's that's what we're enabling right

6887  
04:37:04,789 --> 04:37:02,320  
now it's i think it's an amazing time

6888  
04:37:06,949 --> 04:37:04,799

for america's space program uh we are

6889

04:37:09,029 --> 04:37:06,959

definitely at an inflection point on how

6890

04:37:10,789 --> 04:37:09,039

we are commercializing space and how

6891

04:37:12,949 --> 04:37:10,799

about the future of the international

6892

04:37:14,390 --> 04:37:12,959

space station in particular i know

6893

04:37:16,390 --> 04:37:14,400

that's near and dear to you because you

6894

04:37:17,670 --> 04:37:16,400

helped build it i mean on four different

6895

04:37:19,830 --> 04:37:17,680

space shuttle flights you're one of the

6896

04:37:21,990 --> 04:37:19,840

first people to cross the threshold into

6897

04:37:23,990 --> 04:37:22,000

the space station you know i can't

6898

04:37:25,269 --> 04:37:24,000

believe it's been you know almost 23

6899

04:37:28,230 --> 04:37:25,279

years since that first mission that

6900

04:37:31,269 --> 04:37:28,240

we've had crews on orbit since 2000 i

6901  
04:37:33,189 --> 04:37:31,279  
mean anybody that is 21 years old or

6902  
04:37:34,629 --> 04:37:33,199  
younger in the world has never known a

6903  
04:37:36,390 --> 04:37:34,639  
time that there weren't humans living in

6904  
04:37:38,709 --> 04:37:36,400  
space so

6905  
04:37:41,670 --> 04:37:38,719  
you know i i think it's it's just it's

6906  
04:37:43,830 --> 04:37:41,680  
so darn outstanding

6907  
04:37:46,390 --> 04:37:43,840  
and what do you want to say finally to

6908  
04:37:48,230 --> 04:37:46,400  
the nasa and spacex teams that have

6909  
04:37:50,070 --> 04:37:48,240  
gotten us here today we're in this

6910  
04:37:52,070 --> 04:37:50,080  
regular cadence of missions and also to

6911  
04:37:53,830 --> 04:37:52,080  
our international partners well first

6912  
04:37:56,150 --> 04:37:53,840  
off i want to say thank you thank you

6913  
04:37:58,949 --> 04:37:56,160

for all your dedication and hard work

6914

04:38:01,269 --> 04:37:58,959

you know this is not an easy job it is a

6915

04:38:03,590 --> 04:38:01,279

huge challenge to safely get humans to

6916

04:38:05,429 --> 04:38:03,600

and from low earth orbit and the

6917

04:38:07,750 --> 04:38:05,439

partnership that we have with our

6918

04:38:10,070 --> 04:38:07,760

international partners with our

6919

04:38:12,310 --> 04:38:10,080

commercial crew partners you know it has

6920

04:38:15,670 --> 04:38:12,320

enabled this space economy that we have

6921

04:38:18,070 --> 04:38:15,680

right now i can't wait until we

6922

04:38:20,070 --> 04:38:18,080

we get gateway around the moon again an

6923

04:38:22,310 --> 04:38:20,080

international partnership as we go back

6924

04:38:24,869 --> 04:38:22,320

to the moon in a sustainable way it's

6925

04:38:27,349 --> 04:38:24,879

absolutely outstanding so i think the

6926

04:38:30,070 --> 04:38:27,359

future that we have in space

6927

04:38:31,750 --> 04:38:30,080

is amazing absolutely amazing what a

6928

04:38:33,510 --> 04:38:31,760

great time to be part of america's space

6929

04:38:35,189 --> 04:38:33,520

program absolutely associated

6930

04:38:37,830 --> 04:38:35,199

administrator bob cabana thank you so

6931

04:38:40,070 --> 04:38:37,840

much for joining us happy veterans day a

6932

04:38:42,070 --> 04:38:40,080

little early and happy marine corps more

6933

04:38:44,709 --> 04:38:42,080

importantly that's right 246 years

6934

04:38:46,869 --> 04:38:44,719

around happy birthday to all the marines

6935

04:38:48,869 --> 04:38:46,879

and uh you know

6936

04:38:51,189 --> 04:38:48,879

thank you for everybody's hard work that

6937

04:38:53,429 --> 04:38:51,199

makes nasa such an awesome place to work

6938

04:38:55,269 --> 04:38:53,439

number one in the federal government

6939

04:38:56,789 --> 04:38:55,279

this is an amazing team and i couldn't

6940

04:38:57,910 --> 04:38:56,799

be more proud of them all right thank

6941

04:38:59,990 --> 04:38:57,920

you so much

6942

04:39:01,830 --> 04:39:00,000

daryl we'll send it back to you and bob

6943

04:39:04,629 --> 04:39:01,840

thank you so much and now you're looking

6944

04:39:07,750 --> 04:39:04,639

at a view of the first stage of the

6945

04:39:09,830 --> 04:39:07,760

falcon 9 rocket which has landed back on

6946

04:39:12,789 --> 04:39:09,840

a drone ship out in the middle of the

6947

04:39:15,109 --> 04:39:12,799

atlantic ocean uh the view cut out

6948

04:39:17,910 --> 04:39:15,119

during our live coverage but now you see

6949

04:39:20,949 --> 04:39:17,920

it there it landed and it was a beauty

6950

04:39:24,949 --> 04:39:20,959

it was and it's so amazing that they do

6951  
04:39:28,230 --> 04:39:24,959  
that time and time again it flew crs 22

6952  
04:39:29,429 --> 04:39:28,240  
it flew crew 3 and it'll fly again yes

6953  
04:39:31,590 --> 04:39:29,439  
it will

6954  
04:39:34,310 --> 04:39:31,600  
now just a quick update on the launch

6955  
04:39:37,510 --> 04:39:34,320  
operations the nosecone the nose cone

6956  
04:39:39,430 --> 04:39:37,520  
from the dragon has deployed off of it

6957  
04:39:41,670 --> 04:39:39,440  
and so that allows it to

6958  
04:39:43,590 --> 04:39:41,680  
dock so absolutely that's one of the key

6959  
04:39:45,430 --> 04:39:43,600  
milestones uh getting that nose cone

6960  
04:39:46,948 --> 04:39:45,440  
open you've got some engines underneath

6961  
04:39:48,628 --> 04:39:46,958  
the nose cone and of course the docking

6962  
04:39:51,110 --> 04:39:48,638  
apparatus that allow it to dock to space

6963  
04:39:53,750 --> 04:39:51,120

station that's ready to go and now the

6964

04:39:55,910 --> 04:39:53,760

astronauts will prepare for their

6965

04:39:57,830 --> 04:39:55,920

22-hour roughly journey to the

6966

04:39:59,750 --> 04:39:57,840

international space station they'll

6967

04:40:01,190 --> 04:39:59,760

probably have a snack and then get some

6968

04:40:03,350 --> 04:40:01,200

sleep all right

6969

04:40:05,350 --> 04:40:03,360

in the meantime how about we do a social

6970

04:40:07,430 --> 04:40:05,360

question great one last one for shannon

6971

04:40:09,510 --> 04:40:07,440

walker here at the crew 3 launch

6972

04:40:10,788 --> 04:40:09,520

broadcast let's take a look and here we

6973

04:40:13,590 --> 04:40:10,798

go

6974

04:40:15,590 --> 04:40:13,600

hi nasa i'm talking here from brazil and

6975

04:40:17,590 --> 04:40:15,600

would you like to know

6976  
04:40:19,910 --> 04:40:17,600  
they would like to know how it feels to

6977  
04:40:21,750 --> 04:40:19,920  
observe all the beauty of the planet

6978  
04:40:23,510 --> 04:40:21,760  
from above your view when you were

6979  
04:40:26,070 --> 04:40:23,520  
looking back at earth you know it's

6980  
04:40:28,708 --> 04:40:26,080  
really really hard to put into words but

6981  
04:40:30,390 --> 04:40:28,718  
when you first get into space and you

6982  
04:40:32,150 --> 04:40:30,400  
can look out and you see the curvature

6983  
04:40:33,030 --> 04:40:32,160  
of the earth and you see

6984  
04:40:35,110 --> 04:40:33,040  
um

6985  
04:40:38,708 --> 04:40:35,120  
the land masses and the oceans and the

6986  
04:40:40,628 --> 04:40:38,718  
clouds it's it's a lot to take in but um

6987  
04:40:42,868 --> 04:40:40,638  
it's it's truly amazing what you can see

6988  
04:40:44,550 --> 04:40:42,878

from up there and as the

6989

04:40:46,470 --> 04:40:44,560

nasa administrator bill nelson said

6990

04:40:48,708 --> 04:40:46,480

before it really makes you feel like you

6991

04:40:50,150 --> 04:40:48,718

want to be a good steward of the earth

6992

04:40:51,990 --> 04:40:50,160

because from above you can see how

6993

04:40:55,510 --> 04:40:52,000

fragile everything is

6994

04:40:57,350 --> 04:40:55,520

absolutely and now raja tom kayla and

6995

04:40:59,590 --> 04:40:57,360

matthias are going to see that view

6996

04:41:01,510 --> 04:40:59,600

three rookies on board as they go on

6997

04:41:04,310 --> 04:41:01,520

their way to arrive at the international

6998

04:41:06,390 --> 04:41:04,320

space station around 7pm eastern time

6999

04:41:09,110 --> 04:41:06,400

tomorrow and we are going to stay on the

7000

04:41:11,830 --> 04:41:09,120

air for continuous live coverage along

7001  
04:41:13,830 --> 04:41:11,840  
their entire ride to station through our

7002  
04:41:15,830 --> 04:41:13,840  
coverage here at kennedy space center

7003  
04:41:17,990 --> 04:41:15,840  
it's going to conclude we'll turn it

7004  
04:41:20,070 --> 04:41:18,000  
over to teams in hawthorne and houston

7005  
04:41:22,070 --> 04:41:20,080  
to take us through the next phases of

7006  
04:41:24,310 --> 04:41:22,080  
the crew 3 mission all the way through

7007  
04:41:26,788 --> 04:41:24,320  
hatch opening and then of course the

7008  
04:41:28,788 --> 04:41:26,798  
welcome ceremony for the crew uh shannon

7009  
04:41:30,868 --> 04:41:28,798  
i've watched those ceremonies on tv but

7010  
04:41:32,948 --> 04:41:30,878  
uh you've actually done it there's a lot

7011  
04:41:34,868 --> 04:41:32,958  
of like air hugs and a lot of hugs in

7012  
04:41:37,030 --> 04:41:34,878  
space it's really nice to greet a new

7013  
04:41:38,948 --> 04:41:37,040

crew coming on board and and seeing your

7014

04:41:41,030 --> 04:41:38,958

friends coming across the hatch it's

7015

04:41:42,948 --> 04:41:41,040

special and for those of you watching

7016

04:41:45,750 --> 04:41:42,958

online on youtube take a look at the

7017

04:41:48,230 --> 04:41:45,760

description below you will find a new

7018

04:41:50,470 --> 04:41:48,240

link for the crew 3 coast phase that

7019

04:41:52,470 --> 04:41:50,480

live coverage will continue at that

7020

04:41:54,868 --> 04:41:52,480

location in just a bit if you're

7021

04:41:57,430 --> 04:41:54,878

watching on nasa tv you won't notice a

7022

04:41:59,030 --> 04:41:57,440

thing coverage will continue and also we

7023

04:42:01,670 --> 04:41:59,040

want to let you know that there is a

7024

04:42:04,550 --> 04:42:01,680

post-launch news conference conference

7025

04:42:06,788 --> 04:42:04,560

it is scheduled for 10 pm eastern time

7026

04:42:09,270 --> 04:42:06,798

right here on nasa tv again a post

7027

04:42:11,910 --> 04:42:09,280

post-launch news conference

7028

04:42:14,310 --> 04:42:11,920

scheduled for 10 pm it will be on a

7029

04:42:16,708 --> 04:42:14,320

teleconference i'm hearing not on nasa

7030

04:42:18,708 --> 04:42:16,718

tv but you can go to nasa go live you'll

7031

04:42:21,830 --> 04:42:18,718

find it there and you can find mission

7032

04:42:25,990 --> 04:42:21,840

updates on twitter along the way at nasa

7033

04:42:27,990 --> 04:42:26,000

at spacex and on the web at nasa.gov and

7034

04:42:29,030 --> 04:42:28,000

before we sign up sign off of course i

7035

04:42:31,110 --> 04:42:29,040

want to thank

7036

04:42:33,110 --> 04:42:31,120

astronaut shannon walker for being here

7037

04:42:35,430 --> 04:42:33,120

thank you so much it was such a joy to

7038

04:42:37,110 --> 04:42:35,440

have you here answering questions giving

7039

04:42:39,190 --> 04:42:37,120

your insight and watching the launch

7040

04:42:40,788 --> 04:42:39,200

with you thank you very much it was my

7041

04:42:42,150 --> 04:42:40,798

treat and my pleasure to be here make

7042

04:42:44,230 --> 04:42:42,160

sure you come back soon and watch

7043

04:42:46,390 --> 04:42:44,240

another one i will do it all right

7044

04:42:48,708 --> 04:42:46,400

here's thanks also to all of our guests

7045

04:42:50,550 --> 04:42:48,718

for joining us today and thank you all

7046

04:42:52,868 --> 04:42:50,560

for watching we're going to leave you

7047

04:42:56,070 --> 04:42:52,878

now with highlights from the journey to

7048

04:42:57,990 --> 04:42:56,080

orbit off earth for the earth i'm daryl

7049

04:43:00,550 --> 04:42:58,000

nail for shannon walker good night

7050

04:43:02,310 --> 04:43:00,560

everyone and keep looking up

7051  
04:43:04,708 --> 04:43:02,320  
and there's a wide shot of the room with

7052  
04:43:07,030 --> 04:43:04,718  
the four crew three astronauts we have

7053  
04:43:09,190 --> 04:43:07,040  
commander raja chari

7054  
04:43:11,430 --> 04:43:09,200  
pilot thomas marshburn

7055  
04:43:14,550 --> 04:43:11,440  
mission specialist kayla barrett

7056  
04:43:19,190 --> 04:43:17,030  
and here they are the four crew three

7057  
04:43:20,628 --> 04:43:19,200  
astronauts as they walk down

7058  
04:43:22,310 --> 04:43:20,638  
the hallway

7059  
04:43:24,110 --> 04:43:22,320  
on their way out of astronaut crew

7060  
04:43:28,150 --> 04:43:24,120  
quarters

7061  
04:43:29,910 --> 04:43:28,160  
[Music]

7062  
04:43:32,310 --> 04:43:29,920  
and here they are

7063  
04:43:34,708 --> 04:43:32,320

indeed the crew 3 astronauts taking

7064

04:43:46,950 --> 04:43:34,718

their first steps outside before their

7065

04:43:46,960 --> 04:43:51,990

[Music]

7066

04:43:55,910 --> 04:43:53,990

there's a view inside the crew access

7067

04:44:00,788 --> 04:43:55,920

arms they make their way looking out the

7068

04:44:05,990 --> 04:44:02,550

we'll watch tom

7069

04:44:07,830 --> 04:44:06,000

ingress to the dragon capsule carefully

7070

04:44:10,470 --> 04:44:07,840

watch your head yep watch your head

7071

04:44:13,750 --> 04:44:10,480

watch the seals

7072

04:44:16,708 --> 04:44:13,760

four crew members of crew 3 now inside

7073

04:44:21,990 --> 04:44:16,718

dragon and you can see the suit techs

7074

04:44:27,010 --> 04:44:24,150

official contracts are now complete next

7075

04:44:30,470 --> 04:44:27,020

up will be seat rotation

7076  
04:44:32,860 --> 04:44:32,230  
as you can see the hatch being closed

7077  
04:44:38,390 --> 04:44:32,870  
right there

7078  
04:44:41,710 --> 04:44:38,400  
[Music]

7079  
04:44:43,270 --> 04:44:41,720  
and there is the retraction

7080  
04:44:44,310 --> 04:44:43,280  
[Music]

7081  
04:44:45,270 --> 04:44:44,320  
three

7082  
04:44:46,070 --> 04:44:45,280  
two

7083  
04:44:46,948 --> 04:44:46,080  
one

7084  
04:44:48,470 --> 04:44:46,958  
zero

7085  
04:44:50,500 --> 04:44:48,480  
ignition

7086  
04:44:52,920 --> 04:44:50,510  
[Music]

7087  
04:45:09,110 --> 04:44:52,930  
[Applause]

7088  
04:45:11,270 --> 04:45:09,120

[Music]

7089

04:45:15,590 --> 04:45:11,280

to hear good performance on that first