



1
00:00:03,000 --> 00:00:28,830

[Music]

2
00:00:40,310 --> 00:00:30,250

my

3
00:00:40,320 --> 00:00:47,960

t-minus one minute

4
00:01:29,429 --> 00:00:56,120

[Music]

5
00:01:37,190 --> 00:01:33,350

t-minus 10 9 8

6
00:01:40,230 --> 00:01:37,200

7 6 5 4

7
00:01:41,670 --> 00:01:40,240

3 2 one

8
00:02:15,920 --> 00:01:41,680
next up for nasa social we're going

9
00:02:15,930 --> 00:02:25,750

[Music]

10
00:02:30,150 --> 00:02:27,830
hello and welcome to nasa's virtual

11
00:02:32,630 --> 00:02:30,160
social my name is phillip hargrove and

12
00:02:34,470 --> 00:02:32,640
i'm coming from you coming to you live

13
00:02:36,630 --> 00:02:34,480

at the kennedy space center visitor

14

00:02:37,350 --> 00:02:36,640

center right in front of the beautiful

15

00:02:39,750 --> 00:02:37,360

atlantis

16

00:02:41,430 --> 00:02:39,760

space shuttle it's been a few days but

17

00:02:42,550 --> 00:02:41,440

this just never gets old does it i'm

18

00:02:44,710 --> 00:02:42,560

joined

19

00:02:45,990 --> 00:02:44,720

by stephanie how you doing today i'm

20

00:02:48,070 --> 00:02:46,000

doing well phillip how are you

21

00:02:49,830 --> 00:02:48,080

doing great doing awesome awesome hey

22

00:02:51,430 --> 00:02:49,840

everyone i'm stephanie plusinski with

23

00:02:53,750 --> 00:02:51,440

nasa communications

24

00:02:55,350 --> 00:02:53,760

and did you know that the worm is back

25

00:02:57,750 --> 00:02:55,360

in fact we're going to take you into the

26
00:02:59,509 --> 00:02:57,760
hangar over at launch complex 39a

27
00:03:01,350 --> 00:02:59,519
to check out the rocket that'll send

28
00:03:04,710 --> 00:03:01,360
americans from u.s soil

29
00:03:06,710 --> 00:03:04,720
to space for the first time since 2011.

30
00:03:08,229 --> 00:03:06,720
as always if you have any questions feel

31
00:03:08,710 --> 00:03:08,239
free to leave it in the comments section

32
00:03:11,910 --> 00:03:08,720
below

33
00:03:14,070 --> 00:03:11,920
and we may just answer it live

34
00:03:15,750 --> 00:03:14,080
all right so as stephanie said we really

35
00:03:17,509 --> 00:03:15,760
want you all to you know engage

36
00:03:19,430 --> 00:03:17,519
in this discussion we're going to start

37
00:03:20,630 --> 00:03:19,440
off with a really interesting video of a

38
00:03:23,589 --> 00:03:20,640

tour that we took

39

00:03:24,789 --> 00:03:23,599

onto pad 39a and into the hangars so

40

00:03:26,070 --> 00:03:24,799

basically the place where everything

41

00:03:27,750 --> 00:03:26,080

happens before

42

00:03:29,589 --> 00:03:27,760

the vehicle and the spacecraft are ready

43

00:03:31,830 --> 00:03:29,599

to to get up there into space

44

00:03:33,110 --> 00:03:31,840

so one thing is that hey this is kennedy

45

00:03:34,949 --> 00:03:33,120

space center where you know

46

00:03:36,869 --> 00:03:34,959

everything happens we launch from here

47

00:03:39,910 --> 00:03:36,879

it's a very dynamic place

48

00:03:41,670 --> 00:03:39,920

so what that means is that um

49

00:03:43,509 --> 00:03:41,680

it can be pretty loud sometimes so the

50

00:03:45,190 --> 00:03:43,519

audio is a little rough so we do have

51
00:03:47,110 --> 00:03:45,200
captions on the video so just

52
00:03:48,229 --> 00:03:47,120
be aware of that when you're watching

53
00:03:50,070 --> 00:03:48,239
the video so we

54
00:03:53,270 --> 00:03:50,080
hope you enjoy it and we will be back in

55
00:03:54,869 --> 00:03:53,280
just a few minutes to talk about it

56
00:03:57,589 --> 00:03:54,879
we're here at the historic launch

57
00:03:59,670 --> 00:03:57,599
complex 39a at the kennedy space center

58
00:04:00,869 --> 00:03:59,680
to learn more from kiko with spacex

59
00:04:04,309 --> 00:04:00,879
about launching humans

60
00:04:06,630 --> 00:04:04,319
in the space so i know last time we met

61
00:04:08,229 --> 00:04:06,640
here you were focused on the dragon

62
00:04:10,070 --> 00:04:08,239
specifically is that still the case

63
00:04:11,670 --> 00:04:10,080

yeah so i'm the director here of the

64

00:04:14,390 --> 00:04:11,680

dragon ground operations group

65

00:04:15,110 --> 00:04:14,400

my team is and accountable for all of

66

00:04:18,550 --> 00:04:15,120

the

67

00:04:19,590 --> 00:04:18,560

spacecraft as we get ready for launch

68

00:04:21,590 --> 00:04:19,600

and also

69

00:04:23,430 --> 00:04:21,600

maintaining it refurbishing it after it

70

00:04:25,830 --> 00:04:23,440

comes home from a successful

71

00:04:26,629 --> 00:04:25,840

launch we also handle all of the crew

72

00:04:29,670 --> 00:04:26,639

operations

73

00:04:30,550 --> 00:04:29,680

that we do at the cape uh and also

74

00:04:32,469 --> 00:04:30,560

actually do the

75

00:04:35,430 --> 00:04:32,479

launching of the spacecraft itself we

76
00:04:37,430 --> 00:04:35,440
work very closely with the booster team

77
00:04:39,110 --> 00:04:37,440
to really form this integrated spacex

78
00:04:40,629 --> 00:04:39,120
team and then obviously

79
00:04:42,629 --> 00:04:40,639
every day we're working side by side

80
00:04:43,830 --> 00:04:42,639
with nasa to ensure a successful

81
00:04:45,510 --> 00:04:43,840
reliable flight

82
00:04:47,350 --> 00:04:45,520
we're really excited to do something

83
00:04:49,670 --> 00:04:47,360
that is going to

84
00:04:51,270 --> 00:04:49,680
not only accomplish this goal for both

85
00:04:53,350 --> 00:04:51,280
nasa and spacex but

86
00:04:54,469 --> 00:04:53,360
inspire the public and get people

87
00:04:56,310 --> 00:04:54,479
excited about

88
00:04:58,230 --> 00:04:56,320

about the international space station

89

00:04:58,950 --> 00:04:58,240

and really hopefully get that next

90

00:05:01,590 --> 00:04:58,960

generation

91

00:05:02,469 --> 00:05:01,600

pretty pretty inspired to do their own

92

00:05:04,950 --> 00:05:02,479

great thing

93

00:05:06,230 --> 00:05:04,960

yeah yeah and obviously space hardware

94

00:05:10,469 --> 00:05:06,240

is a big part of that

95

00:05:12,070 --> 00:05:10,479

let's take a closer look if you go from

96

00:05:13,110 --> 00:05:12,080

the outside this facility looks pretty

97

00:05:14,710 --> 00:05:13,120

unassuming

98

00:05:16,550 --> 00:05:14,720

walk in and obviously this is not a

99

00:05:18,870 --> 00:05:16,560

whole home space here

100

00:05:20,150 --> 00:05:18,880

so what are we looking at here what's

101
00:05:21,510 --> 00:05:20,160
this facility for

102
00:05:23,670 --> 00:05:21,520
how does it get used in the process of

103
00:05:25,749 --> 00:05:23,680
launching into space yeah so welcome to

104
00:05:28,870 --> 00:05:25,759
the hangar at 39a

105
00:05:29,909 --> 00:05:28,880
it's roughly 54 000 square feet the size

106
00:05:33,029 --> 00:05:29,919
of the football field

107
00:05:33,990 --> 00:05:33,039
with the end zones on the inside it's

108
00:05:36,550 --> 00:05:34,000
mainly used for

109
00:05:37,029 --> 00:05:36,560
processing falcon 9 in preparation for

110
00:05:39,110 --> 00:05:37,039
flight

111
00:05:41,270 --> 00:05:39,120
and also doing maintenance of certain

112
00:05:43,830 --> 00:05:41,280
boosters that i've already fought

113
00:05:44,469 --> 00:05:43,840

so this hanger can actually fit five

114

00:05:48,390 --> 00:05:44,479

boosters

115

00:05:50,629 --> 00:05:48,400

five falcon 9 first stages side by side

116

00:05:52,070 --> 00:05:50,639

and it's effectively the place where we

117

00:05:52,950 --> 00:05:52,080

go through all the last little bit of

118

00:05:54,550 --> 00:05:52,960

processing

119

00:05:56,230 --> 00:05:54,560

uh before we take a rocket and

120

00:05:58,710 --> 00:05:56,240

spacecraft

121

00:05:59,510 --> 00:05:58,720

so for example dragon will actually

122

00:06:01,990 --> 00:05:59,520

arrive

123

00:06:03,110 --> 00:06:02,000

on the doors over basically at the front

124

00:06:05,909 --> 00:06:03,120

end of the rocket

125

00:06:07,670 --> 00:06:05,919

we'll use both cranes to flip it or

126

00:06:10,150 --> 00:06:07,680

break it over horizontally

127

00:06:10,790 --> 00:06:10,160

we made it on to falcon 9 and then using

128

00:06:12,390 --> 00:06:10,800

the big white

129

00:06:14,469 --> 00:06:12,400

transport erector that you see out on

130

00:06:16,150 --> 00:06:14,479

the pad we actually just

131

00:06:17,749 --> 00:06:16,160

open these big doors up with a hanger

132

00:06:20,629 --> 00:06:17,759

and hold the rocket up the hill

133

00:06:22,390 --> 00:06:20,639

up to the actual tapping nasa has helped

134

00:06:23,830 --> 00:06:22,400

set the framework for what needs to be

135

00:06:26,390 --> 00:06:23,840

done and kind of

136

00:06:27,670 --> 00:06:26,400

build off of all of the lessons we've

137

00:06:29,830 --> 00:06:27,680

learned over the

138

00:06:32,150 --> 00:06:29,840

50 years of space flight you know 60

139

00:06:33,990 --> 00:06:32,160

clusters of space like that we've had

140

00:06:35,990 --> 00:06:34,000

but sort of given private industry the

141

00:06:39,189 --> 00:06:36,000

keys to figuring out how to build it

142

00:06:40,710 --> 00:06:39,199

and um it's been amazing uh to work with

143

00:06:42,230 --> 00:06:40,720

my partners at nasa

144

00:06:43,510 --> 00:06:42,240

uh some of the people i've personally

145

00:06:44,710 --> 00:06:43,520

been working on the program for eight

146

00:06:46,870 --> 00:06:44,720

plus years and

147

00:06:48,629 --> 00:06:46,880

what's interesting is this is really

148

00:06:51,110 --> 00:06:48,639

kind of the start right

149

00:06:53,110 --> 00:06:51,120

exactly it's finishing once it's the

150

00:06:55,990 --> 00:06:53,120

start yeah it's finishing one phase

151
00:06:56,950 --> 00:06:56,000
it's really ushering in a whole new era

152
00:06:59,589 --> 00:06:56,960
where

153
00:07:00,309 --> 00:06:59,599
america has um able to actually get

154
00:07:03,749 --> 00:07:00,319
astronauts

155
00:07:05,990 --> 00:07:03,759
based on

156
00:07:06,870 --> 00:07:06,000
and it hopefully brings on a whole new

157
00:07:08,469 --> 00:07:06,880
era

158
00:07:10,070 --> 00:07:08,479
for the international space station

159
00:07:13,110 --> 00:07:10,080
whether it be our

160
00:07:16,870 --> 00:07:13,120
standard rotation astronauts or possible

161
00:07:18,950 --> 00:07:16,880
commercial ventures

162
00:07:21,029 --> 00:07:18,960
can you tell me about dragon one versus

163
00:07:23,430 --> 00:07:21,039

dragon two and crew dragon

164

00:07:25,350 --> 00:07:23,440

so dragon one uh was the vehicle we just

165

00:07:27,909 --> 00:07:25,360

retired that just had his last mission

166

00:07:30,070 --> 00:07:27,919

um first flew in 2010 first went to the

167

00:07:33,350 --> 00:07:30,080

space station in 2012 and we've got this

168

00:07:36,070 --> 00:07:33,360

just finished this last mission here in

169

00:07:37,270 --> 00:07:36,080

april of 2020 i always knew we were

170

00:07:39,430 --> 00:07:37,280

going to go build a vehicle

171

00:07:41,589 --> 00:07:39,440

to find events sure but there were a

172

00:07:44,070 --> 00:07:41,599

couple key upgrades we had

173

00:07:44,950 --> 00:07:44,080

first one was the addition of the launch

174

00:07:47,589 --> 00:07:44,960

escape

175

00:07:48,309 --> 00:07:47,599

so we needed a way to protect the

176
00:07:49,589 --> 00:07:48,319
astronauts

177
00:07:51,350 --> 00:07:49,599
because something happened to the

178
00:07:53,589 --> 00:07:51,360
booster on a set

179
00:07:55,350 --> 00:07:53,599
so we basically needed to add what's

180
00:07:57,510 --> 00:07:55,360
called the super jiggle engine

181
00:07:59,510 --> 00:07:57,520
to the exterior the vehicle such that at

182
00:08:01,830 --> 00:07:59,520
any given point from on the path

183
00:08:02,950 --> 00:08:01,840
all the way to orbit we can successfully

184
00:08:05,270 --> 00:08:02,960
effectively eject

185
00:08:06,309 --> 00:08:05,280
the astronauts off those off that

186
00:08:07,670 --> 00:08:06,319
booster engine

187
00:08:09,749 --> 00:08:07,680
um so that's that was sort of key

188
00:08:10,950 --> 00:08:09,759

upgrade number one key upgrade number

189

00:08:14,070 --> 00:08:10,960

two is the addition

190

00:08:15,350 --> 00:08:14,080

of the life support system and

191

00:08:16,710 --> 00:08:15,360

i was going to say it's going to be the

192

00:08:17,350 --> 00:08:16,720

body like what you're going to do is

193

00:08:20,390 --> 00:08:17,360

like you've got to have

194

00:08:23,189 --> 00:08:20,400

fun it's all of the things that you need

195

00:08:25,110 --> 00:08:23,199

to make people comfortable and sort of

196

00:08:29,270 --> 00:08:25,120

provide that confidence

197

00:08:32,469 --> 00:08:29,280

the seats the suits uh the various uh

198

00:08:34,790 --> 00:08:32,479

displays you know the potty the the

199

00:08:36,149 --> 00:08:34,800

bins keep the stuff right you know all

200

00:08:38,389 --> 00:08:36,159

the stuff that's required to actually

201

00:08:41,350 --> 00:08:38,399

put pilot in the loop

202

00:08:43,269 --> 00:08:41,360

the last part isn't a big upgrade but we

203

00:08:44,230 --> 00:08:43,279

learned a lot on dragon one and we made

204

00:08:47,350 --> 00:08:44,240

sure to roll

205

00:08:50,070 --> 00:08:47,360

all of those sort of lessons

206

00:08:51,430 --> 00:08:50,080

as far as the falcons go themselves is

207

00:08:54,550 --> 00:08:51,440

there something special

208

00:08:55,509 --> 00:08:54,560

other than just that that cognitive

209

00:08:56,630 --> 00:08:55,519

understanding of like this was going to

210

00:08:59,750 --> 00:08:56,640

fly through

211

00:09:00,470 --> 00:08:59,760

is this the same as the other dragon

212

00:09:03,829 --> 00:09:00,480

quarters that are

213

00:09:08,550 --> 00:09:06,630

yes whatever i said forgive me nope yeah

214

00:09:11,829 --> 00:09:08,560

fundamentally that that is also

215

00:09:15,110 --> 00:09:11,839

one of the things we highlighted because

216

00:09:18,150 --> 00:09:15,120

we didn't want to make this booster

217

00:09:19,030 --> 00:09:18,160

different than the you know 74 other

218

00:09:22,389 --> 00:09:19,040

ones

219

00:09:24,630 --> 00:09:22,399

right we wanted it to be consistent we

220

00:09:28,550 --> 00:09:24,640

wanted to prove out that very reliable

221

00:09:31,990 --> 00:09:28,560

launch operation and the way that we

222

00:09:34,949 --> 00:09:32,000

load the rocket the way we buy it so

223

00:09:36,470 --> 00:09:34,959

it's not inherently different than the

224

00:09:39,110 --> 00:09:36,480

other company

225

00:09:40,470 --> 00:09:39,120

this is a new falcon 9 in front of us

226

00:09:42,630 --> 00:09:40,480

specifically the

227

00:09:44,470 --> 00:09:42,640

first falcon 9 that we'll ever put a

228

00:09:44,870 --> 00:09:44,480

person on top of so in a lot of ways

229

00:09:47,829 --> 00:09:44,880

that's

230

00:09:48,870 --> 00:09:47,839

what makes it special and so while the

231

00:09:51,190 --> 00:09:48,880

hardware itself

232

00:09:52,310 --> 00:09:51,200

is new and shiny and has beautiful logos

233

00:09:54,710 --> 00:09:52,320

that

234

00:09:55,350 --> 00:09:54,720

help signify you know this partnership

235

00:09:57,670 --> 00:09:55,360

between

236

00:09:59,110 --> 00:09:57,680

spacex and nasa and make us proud as

237

00:10:02,069 --> 00:09:59,120

americans i think

238

00:10:03,990 --> 00:10:02,079

when i look at it i actually think of

239

00:10:06,550 --> 00:10:04,000

all of the hours and years

240

00:10:07,829 --> 00:10:06,560

that have gone into an incredible amount

241

00:10:10,790 --> 00:10:07,839

of hard work

242

00:10:12,150 --> 00:10:10,800

and engineering between spacex and nasa

243

00:10:15,509 --> 00:10:12,160

to certify

244

00:10:21,190 --> 00:10:15,519

a rocket competency there is zero doubt

245

00:10:25,269 --> 00:10:23,430

we would not be here today we would not

246

00:10:27,990 --> 00:10:25,279

be standing where we are today

247

00:10:29,430 --> 00:10:28,000

if it wasn't for that partnership is

248

00:10:30,550 --> 00:10:29,440

there a moment for whether it be the

249

00:10:32,150 --> 00:10:30,560

topic of the

250

00:10:33,750 --> 00:10:32,160

crew dragging where you like pause for a

251
00:10:35,829 --> 00:10:33,760
second you're like wait a second like

252
00:10:37,190 --> 00:10:35,839
this one's gonna have people like is

253
00:10:38,870 --> 00:10:37,200
there is there is there a moment is

254
00:10:39,430 --> 00:10:38,880
there extra attention to detail or is it

255
00:10:40,790 --> 00:10:39,440
just like

256
00:10:43,190 --> 00:10:40,800
hey we're gonna do great work like we

257
00:10:45,350 --> 00:10:43,200
always do let's go yeah i mean it it is

258
00:10:48,550 --> 00:10:45,360
absolutely critical for us that every

259
00:10:49,590 --> 00:10:48,560
mission that we fly has the utmost

260
00:10:52,550 --> 00:10:49,600
reliability

261
00:10:52,870 --> 00:10:52,560
but um i don't think it would be fair

262
00:10:57,110 --> 00:10:52,880
for

263
00:11:01,350 --> 00:10:57,120

me to pretend like we do not all realize

264

00:11:07,110 --> 00:11:04,550

appreciate you it's been phenomenal um

265

00:11:08,389 --> 00:11:07,120

obviously we're all excited i'm ready to

266

00:11:11,269 --> 00:11:08,399

see him supply again

267

00:11:12,069 --> 00:11:11,279

from america and that's happening very

268

00:11:13,910 --> 00:11:12,079

very soon

269

00:11:15,350 --> 00:11:13,920

for you guys and for us in fall of

270

00:11:17,590 --> 00:11:15,360

america um so

271

00:11:18,550 --> 00:11:17,600

we're uh we're ready to go so where are

272

00:11:20,530 --> 00:11:18,560

we thank you

273

00:11:26,069 --> 00:11:20,540

let's do it

274

00:11:29,910 --> 00:11:28,310

all right so we are joined here with mr

275

00:11:31,190 --> 00:11:29,920

joshua santora himself

276

00:11:32,870 --> 00:11:31,200

joshua you know the people who are

277

00:11:34,710 --> 00:11:32,880

watching the the social they know you

278

00:11:36,790 --> 00:11:34,720

they know you as the nasa guy but

279

00:11:38,470 --> 00:11:36,800

can you um tell us a little bit about

280

00:11:40,069 --> 00:11:38,480

your role with spacex and the commercial

281

00:11:41,110 --> 00:11:40,079

crew program and what it's been like for

282

00:11:43,269 --> 00:11:41,120

you to be a part of this

283

00:11:45,030 --> 00:11:43,279

sure yeah i want to just be clear up

284

00:11:46,949 --> 00:11:45,040

front and say i'm not a spacex employee

285

00:11:49,030 --> 00:11:46,959

i'm not going to speak for spacex

286

00:11:50,389 --> 00:11:49,040

that's not the role of those that work

287

00:11:52,470 --> 00:11:50,399

in nasa communication

288

00:11:54,949 --> 00:11:52,480

but ultimately we work right alongside

289

00:11:56,790 --> 00:11:54,959

them and that's been a big part of this

290

00:11:57,829 --> 00:11:56,800

process of working besides the team at

291

00:11:59,910 --> 00:11:57,839

spacex

292

00:12:01,590 --> 00:11:59,920

partnership is the right word with

293

00:12:02,389 --> 00:12:01,600

historical programs like the space

294

00:12:04,230 --> 00:12:02,399

shuttle

295

00:12:05,829 --> 00:12:04,240

nasa controlled that information we

296

00:12:06,470 --> 00:12:05,839

controlled the process we controlled the

297

00:12:08,389 --> 00:12:06,480

vehicle

298

00:12:10,230 --> 00:12:08,399

it was nasa's and we owned it and that's

299

00:12:10,550 --> 00:12:10,240

not the case with this and so um it's

300

00:12:13,430 --> 00:12:10,560

been

301
00:12:14,389 --> 00:12:13,440
involved um and we'll talk i'm sure some

302
00:12:16,710 --> 00:12:14,399
more about that today

303
00:12:18,470 --> 00:12:16,720
uh but just excited to be here um and

304
00:12:20,230 --> 00:12:18,480
answer questions that people might have

305
00:12:21,910 --> 00:12:20,240
ultimately again i i don't have the

306
00:12:23,350 --> 00:12:21,920
insight of a spacex employee

307
00:12:25,110 --> 00:12:23,360
um but have had the chance to work with

308
00:12:26,949 --> 00:12:25,120
them on a lot of projects as we saw

309
00:12:27,990 --> 00:12:26,959
earlier today with some of the 360 video

310
00:12:29,750 --> 00:12:28,000
stuff we'll see you guys

311
00:12:31,269 --> 00:12:29,760
see that again tomorrow morning um this

312
00:12:32,550 --> 00:12:31,279
video and i've been over that way a few

313
00:12:33,190 --> 00:12:32,560

times and worked on different projects

314

00:12:35,110 --> 00:12:33,200

with them

315

00:12:36,310 --> 00:12:35,120

over the years so excited to be a part

316

00:12:37,990 --> 00:12:36,320

of this picture

317

00:12:39,509 --> 00:12:38,000

a part of this mission a part of what's

318

00:12:42,710 --> 00:12:39,519

happening and

319

00:12:44,870 --> 00:12:42,720

ultimately just working with them

320

00:12:46,230 --> 00:12:44,880

through this process for sure so let's

321

00:12:48,230 --> 00:12:46,240

let's hop right in stephanie do we have

322

00:12:50,310 --> 00:12:48,240

any questions from online yes we have a

323

00:12:51,030 --> 00:12:50,320

few great questions for you joshua so

324

00:12:53,030 --> 00:12:51,040

here's one for

325

00:12:55,910 --> 00:12:53,040

yuri he wants to know why was the falcon

326

00:12:58,150 --> 00:12:55,920

9 and crew dragon erected at lc-39a

327

00:12:59,910 --> 00:12:58,160

versus stacking it up right at the vab

328

00:13:02,069 --> 00:12:59,920

and transporting it out to the pad

329

00:13:03,829 --> 00:13:02,079

yeah so this is fun and we heard regina

330

00:13:04,550 --> 00:13:03,839

spellman talk about this when it comes

331

00:13:07,350 --> 00:13:04,560

to

332

00:13:08,470 --> 00:13:07,360

the the fashionability of architecture

333

00:13:10,389 --> 00:13:08,480

with rocketry

334

00:13:11,990 --> 00:13:10,399

and this may not be quite the same thing

335

00:13:12,949 --> 00:13:12,000

because she was referring to things like

336

00:13:15,829 --> 00:13:12,959

clean pad

337

00:13:16,150 --> 00:13:15,839

and then fixed pad structures but this

338

00:13:18,310 --> 00:13:16,160

is

339

00:13:19,269 --> 00:13:18,320

similar where companies decide to do

340

00:13:20,470 --> 00:13:19,279

things different ways

341

00:13:21,430 --> 00:13:20,480

and so we have lots of companies and

342

00:13:22,389 --> 00:13:21,440

actually philip you can probably speak

343

00:13:24,150 --> 00:13:22,399

to this some too

344

00:13:25,430 --> 00:13:24,160

because the launch services program they

345

00:13:27,030 --> 00:13:25,440

experience this with different partners

346

00:13:29,110 --> 00:13:27,040

of how they operate and process

347

00:13:30,790 --> 00:13:29,120

and so i'm sure there are some technical

348

00:13:32,790 --> 00:13:30,800

reasons but i think that there are

349

00:13:35,190 --> 00:13:32,800

probably pros and cons to both of those

350

00:13:36,069 --> 00:13:35,200

and so spacex they decided that they

351

00:13:37,670 --> 00:13:36,079

wanted to put

352

00:13:39,269 --> 00:13:37,680

their vehicles right there near the pad

353

00:13:40,550 --> 00:13:39,279

so that they could go out and come back

354

00:13:42,230 --> 00:13:40,560

quickly

355

00:13:43,910 --> 00:13:42,240

obviously if you watch rollout this past

356

00:13:44,389 --> 00:13:43,920

week if you watch kind of that vertical

357

00:13:46,790 --> 00:13:44,399

tip

358

00:13:48,870 --> 00:13:46,800

you know that they they can do this in a

359

00:13:49,670 --> 00:13:48,880

matter of a few hours it's a very speedy

360

00:13:51,829 --> 00:13:49,680

process

361

00:13:53,430 --> 00:13:51,839

whereas nasa with us working in the

362

00:13:55,990 --> 00:13:53,440

vehicle assembly building

363

00:13:56,710 --> 00:13:56,000

we have to take at least a full day to

364

00:13:58,550 --> 00:13:56,720

make that trip

365

00:14:00,310 --> 00:13:58,560

out to the launch pad and now there's

366

00:14:01,910 --> 00:14:00,320

again pros and cons to both

367

00:14:03,350 --> 00:14:01,920

with the vehicle assembly building all

368

00:14:04,069 --> 00:14:03,360

of our hardware is very far from the

369

00:14:05,430 --> 00:14:04,079

launch pad

370

00:14:07,189 --> 00:14:05,440

um where your fueling is happening and

371

00:14:09,110 --> 00:14:07,199

so we're distant from that um

372

00:14:10,710 --> 00:14:09,120

with the spacex concept with the hangar

373

00:14:11,910 --> 00:14:10,720

being there like they're closer to

374

00:14:13,670 --> 00:14:11,920

their their fueling and they're closer

375

00:14:15,269 --> 00:14:13,680

to the rocket when it's armed um and so

376

00:14:16,310 --> 00:14:15,279

ultimately again pros and cons and

377

00:14:17,670 --> 00:14:16,320

that's just the way they decided to do

378

00:14:18,710 --> 00:14:17,680

it that's their architecture

379

00:14:20,310 --> 00:14:18,720

so phil i don't know if you want to add

380

00:14:21,509 --> 00:14:20,320

any more um again just curious to know

381

00:14:23,030 --> 00:14:21,519

your perspective on this

382

00:14:25,030 --> 00:14:23,040

right that's a really good connection

383

00:14:26,710 --> 00:14:25,040

that you drew um between you know the

384

00:14:28,710 --> 00:14:26,720

different decisions that space

385

00:14:30,150 --> 00:14:28,720

that the launch vehicles make for human

386

00:14:32,230 --> 00:14:30,160

space flight the same thing happens for

387

00:14:33,910 --> 00:14:32,240

robotic scientific missions as well

388

00:14:35,750 --> 00:14:33,920

so for the launch services program we

389

00:14:38,550 --> 00:14:35,760

only work with the robotic missions

390

00:14:40,150 --> 00:14:38,560

so but it's the same thing there's a lot

391

00:14:41,110 --> 00:14:40,160

of overlap between the companies and the

392

00:14:42,710 --> 00:14:41,120

programs

393

00:14:44,230 --> 00:14:42,720

so we have to make sure that our

394

00:14:45,509 --> 00:14:44,240

spacecraft customers and nasa's people

395

00:14:48,870 --> 00:14:45,519

who build the spacecraft

396

00:14:50,470 --> 00:14:48,880

that they are able to adapt to those

397

00:14:52,629 --> 00:14:50,480

different environments because

398

00:14:53,750 --> 00:14:52,639

you know when when they say hey lsp can

399

00:14:55,189 --> 00:14:53,760

you get us a rocket

400

00:14:56,710 --> 00:14:55,199

we need to make sure that the rocket is

401
00:14:58,069 --> 00:14:56,720
able to meet the needs of the spacecraft

402
00:15:00,790 --> 00:14:58,079
so if the spacecraft

403
00:15:02,069 --> 00:15:00,800
can go horizontal before launch great if

404
00:15:03,829 --> 00:15:02,079
it needs to be vertical we need to work

405
00:15:04,389 --> 00:15:03,839
that problem so it's really interesting

406
00:15:06,069 --> 00:15:04,399
um

407
00:15:07,750 --> 00:15:06,079
with such an evolving launch vehicle

408
00:15:08,069 --> 00:15:07,760
market you know new companies coming up

409
00:15:12,389 --> 00:15:08,079
and

410
00:15:14,230 --> 00:15:12,399
introduces a lot of new challenges

411
00:15:16,069 --> 00:15:14,240
yeah um but it's it's really exciting

412
00:15:17,350 --> 00:15:16,079
and obviously it drives the market to a

413
00:15:18,790 --> 00:15:17,360

better place where we you know have

414

00:15:20,310 --> 00:15:18,800

better options and things are cheaper

415

00:15:22,230 --> 00:15:20,320

and much more affordable so

416

00:15:24,230 --> 00:15:22,240

yeah and also just kind of sampling some

417

00:15:27,509 --> 00:15:24,240

other of the companies around we have

418

00:15:30,310 --> 00:15:27,519

the launch pad here um launch complex

419

00:15:31,430 --> 00:15:30,320

41 is where the atlas 5 launches from

420

00:15:33,110 --> 00:15:31,440

and they actually

421

00:15:34,389 --> 00:15:33,120

um they bring theirs in horizontally and

422

00:15:35,110 --> 00:15:34,399

then stack it in a vertical integration

423

00:15:36,790 --> 00:15:35,120

facility

424

00:15:39,030 --> 00:15:36,800

and then roll it out to their pad it's

425

00:15:40,710 --> 00:15:39,040

not quite as far as a vab trip to pad

426
00:15:43,030 --> 00:15:40,720
um and then we have the delta four pad

427
00:15:44,470 --> 00:15:43,040
37 they actually

428
00:15:45,990 --> 00:15:44,480
stack they do the same thing they they

429
00:15:46,470 --> 00:15:46,000
build it they stack it vertically in the

430
00:15:49,350 --> 00:15:46,480
building

431
00:15:51,269 --> 00:15:49,360
so just different options and then we

432
00:15:52,310 --> 00:15:51,279
have newcomers northrop grumman

433
00:15:54,069 --> 00:15:52,320
they're operating out of the vehicle

434
00:15:55,509 --> 00:15:54,079
assembly building and then blue origin

435
00:15:56,230 --> 00:15:55,519
i'm not quite sure what blue origin is

436
00:15:58,069 --> 00:15:56,240
doing yet

437
00:15:59,910 --> 00:15:58,079
um i haven't seen much publicly from

438
00:16:01,430 --> 00:15:59,920

them um but they're building a lot

439

00:16:01,990 --> 00:16:01,440

around here right now so i'm anxious to

440

00:16:03,509 --> 00:16:02,000

see them

441

00:16:05,030 --> 00:16:03,519

really begin flights from the space

442

00:16:06,150 --> 00:16:05,040

coast right i'm glad you brought up the

443

00:16:07,670 --> 00:16:06,160

delta iv heavy because

444

00:16:10,470 --> 00:16:07,680

before the parker solar probe launched a

445

00:16:12,069 --> 00:16:10,480

couple of years ago um i actually i

446

00:16:13,670 --> 00:16:12,079

sat in a parking lot where i could see

447

00:16:15,430 --> 00:16:13,680

the building and i did a little time

448

00:16:16,069 --> 00:16:15,440

lapse of seeing the building just crawl

449

00:16:17,670 --> 00:16:16,079

back so

450

00:16:19,430 --> 00:16:17,680

that was a very cool thing to see pretty

451

00:16:20,949 --> 00:16:19,440

unique here on center so

452

00:16:22,790 --> 00:16:20,959

yeah all right so we have another

453

00:16:24,710 --> 00:16:22,800

question from our facebook community

454

00:16:26,470 --> 00:16:24,720

and they want to know was this falcon 9

455

00:16:28,150 --> 00:16:26,480

booster used on any other previous

456

00:16:29,670 --> 00:16:28,160

missions or is this its first

457

00:16:31,189 --> 00:16:29,680

mission yeah good question and this one

458

00:16:32,150 --> 00:16:31,199

is a brand new booster so obviously

459

00:16:33,590 --> 00:16:32,160

there we saw and

460

00:16:35,189 --> 00:16:33,600

kiko kind of alluded to that this being

461

00:16:37,030 --> 00:16:35,199

a shiny new booster and

462

00:16:38,629 --> 00:16:37,040

i if i'm not mistaken i believe that in

463

00:16:41,590 --> 00:16:38,639

the the contract that

464

00:16:42,870 --> 00:16:41,600

um spacex had with with nasa for this is

465

00:16:44,629 --> 00:16:42,880

that they had committed they'd be using

466

00:16:46,790 --> 00:16:44,639

brand new boosters for their flights

467

00:16:48,470 --> 00:16:46,800

and so um we've seen spacex time and

468

00:16:50,069 --> 00:16:48,480

time again use

469

00:16:51,269 --> 00:16:50,079

flight proven boosters is the term that

470

00:16:51,749 --> 00:16:51,279

they love to use and that makes a lot of

471

00:16:53,509 --> 00:16:51,759

sense

472

00:16:55,350 --> 00:16:53,519

um we've seen that happen a lot and that

473

00:16:56,790 --> 00:16:55,360

may happen at some point um but for this

474

00:16:57,430 --> 00:16:56,800

point in time they're using brand new

475

00:16:59,030 --> 00:16:57,440

boosters

476
00:17:00,550 --> 00:16:59,040
and so excited to have a brand new crew

477
00:17:01,829 --> 00:17:00,560
dragon a brand new falcon

478
00:17:03,749 --> 00:17:01,839
to take bob and doug to the space

479
00:17:05,189 --> 00:17:03,759
station tomorrow

480
00:17:06,549 --> 00:17:05,199
so joshua i'm going to ask you a

481
00:17:06,949 --> 00:17:06,559
question that we've asked a lot of our

482
00:17:09,029 --> 00:17:06,959
guests

483
00:17:10,230 --> 00:17:09,039
obviously tomorrow is a big day for

484
00:17:12,150 --> 00:17:10,240
america as a whole

485
00:17:13,909 --> 00:17:12,160
as well as nasa and spacex so where are

486
00:17:15,990 --> 00:17:13,919
you going to be watching the launch from

487
00:17:17,590 --> 00:17:16,000
yeah so i will actually be out at the

488
00:17:18,710 --> 00:17:17,600

press site um so if you're familiar with

489

00:17:20,150 --> 00:17:18,720

the countdown clock we featured that

490

00:17:22,069 --> 00:17:20,160

yesterday one of our shows

491

00:17:23,270 --> 00:17:22,079

i'll be out there i'll helping support

492

00:17:24,549 --> 00:17:23,280

media activities

493

00:17:26,470 --> 00:17:24,559

there's a lot going on we do have some

494

00:17:27,909 --> 00:17:26,480

media out because they're a huge part of

495

00:17:28,630 --> 00:17:27,919

our story as well they're a part of what

496

00:17:31,110 --> 00:17:28,640

we do in

497

00:17:32,390 --> 00:17:31,120

and how we do it nasa is charged as part

498

00:17:35,430 --> 00:17:32,400

of its mission as part of its

499

00:17:37,190 --> 00:17:35,440

its goals is to disseminate as widely as

500

00:17:38,870 --> 00:17:37,200

practicable what we do

501
00:17:41,029 --> 00:17:38,880
um that includes everything from science

502
00:17:41,909 --> 00:17:41,039
research to launches to space station

503
00:17:45,350 --> 00:17:41,919
activities

504
00:17:46,789 --> 00:17:45,360
and so uh the media are a major part of

505
00:17:47,669 --> 00:17:46,799
that where they actually help carry the

506
00:17:49,430 --> 00:17:47,679
story for us

507
00:17:50,870 --> 00:17:49,440
so we are excited to have them we are

508
00:17:53,029 --> 00:17:50,880
glad to have them um

509
00:17:54,070 --> 00:17:53,039
we welcome them um certainly this

510
00:17:56,150 --> 00:17:54,080
current environment we're

511
00:17:57,669 --> 00:17:56,160
we're limiting the the specific numbers

512
00:18:00,549 --> 00:17:57,679
just for the sake of health and safety

513
00:18:02,150 --> 00:18:00,559

um but that aside we love to just have

514

00:18:02,630 --> 00:18:02,160

as many people as we can really helping

515

00:18:08,950 --> 00:18:02,640

to

516

00:18:10,310 --> 00:18:08,960

i'm i'm from texas originally i've only

517

00:18:11,029 --> 00:18:10,320

lived in florida for about three and a

518

00:18:12,390 --> 00:18:11,039

half years

519

00:18:14,710 --> 00:18:12,400

so i was never here when the space

520

00:18:16,070 --> 00:18:14,720

shuttle flew so i've been here on an

521

00:18:17,990 --> 00:18:16,080

exciting launch day

522

00:18:19,750 --> 00:18:18,000

but never for a human launch day so can

523

00:18:21,350 --> 00:18:19,760

you describe you know for me and for

524

00:18:22,310 --> 00:18:21,360

anybody else who's never been you know

525

00:18:23,990 --> 00:18:22,320

in florida

526

00:18:25,590 --> 00:18:24,000

you know at the space coast for a human

527

00:18:27,669 --> 00:18:25,600

launch what the energy feels like

528

00:18:29,110 --> 00:18:27,679

yeah yeah what it's like to anticipate

529

00:18:32,230 --> 00:18:29,120

and i have it in mind i have some

530

00:18:34,390 --> 00:18:32,240

i have a couple photos from sts-135

531

00:18:36,390 --> 00:18:34,400

uh the final flight of atlantis final

532

00:18:38,470 --> 00:18:36,400

shuttle flight um atlantis what a beauty

533

00:18:39,990 --> 00:18:38,480

um and they're really fun photos because

534

00:18:42,230 --> 00:18:40,000

we i was in the process

535

00:18:43,430 --> 00:18:42,240

of putting on a show similar to this for

536

00:18:44,470 --> 00:18:43,440

educational purposes

537

00:18:46,230 --> 00:18:44,480

where we were actually out on the

538

00:18:47,270 --> 00:18:46,240

preside lawn and so i actually have a

539

00:18:47,990 --> 00:18:47,280

photo from there i got to see that one

540

00:18:49,990 --> 00:18:48,000

from there

541

00:18:51,110 --> 00:18:50,000

that one was really that one that one

542

00:18:52,630 --> 00:18:51,120

was on another level

543

00:18:54,470 --> 00:18:52,640

um there's exciting launches and then

544

00:18:56,950 --> 00:18:54,480

there's sts-135

545

00:18:58,470 --> 00:18:56,960

and it's tough to kind of explain that

546

00:18:59,990 --> 00:18:58,480

to people and most of the

547

00:19:01,510 --> 00:19:00,000

the terminology in the way i describe

548

00:19:03,110 --> 00:19:01,520

this feels very cliché

549

00:19:04,950 --> 00:19:03,120

and and i own that i own that it sounds

550

00:19:06,549 --> 00:19:04,960

cliché but i still say it explain it

551
00:19:07,909 --> 00:19:06,559
this way because it's only way now how

552
00:19:09,510 --> 00:19:07,919
is that working here in the shuttle

553
00:19:11,110 --> 00:19:09,520
program i was here for the last two and

554
00:19:13,590 --> 00:19:11,120
a half years of the shuttle program

555
00:19:14,710 --> 00:19:13,600
and it's amazing how connected you feel

556
00:19:15,909 --> 00:19:14,720
very fast

557
00:19:17,590 --> 00:19:15,919
i was working in our education

558
00:19:19,110 --> 00:19:17,600
department at the time certainly i

559
00:19:19,750 --> 00:19:19,120
wasn't the one turning wrenches i wasn't

560
00:19:22,390 --> 00:19:19,760
the one

561
00:19:24,230 --> 00:19:22,400
pushing the button so to speak but felt

562
00:19:25,669 --> 00:19:24,240
a part of that and it and that

563
00:19:27,350 --> 00:19:25,679

i felt like a part of that team and a

564

00:19:28,150 --> 00:19:27,360

part of that family and so there was

565

00:19:30,390 --> 00:19:28,160

like this

566

00:19:32,150 --> 00:19:30,400

it is an indescribable energy of like

567

00:19:34,070 --> 00:19:32,160

like we're doing this together

568

00:19:35,270 --> 00:19:34,080

and so to know there's crew on board

569

00:19:37,669 --> 00:19:35,280

like

570

00:19:38,470 --> 00:19:37,679

i think whenever you see the crew drive

571

00:19:40,070 --> 00:19:38,480

by

572

00:19:42,310 --> 00:19:40,080

that's like the moment when you're like

573

00:19:44,390 --> 00:19:42,320

whoa because

574

00:19:45,909 --> 00:19:44,400

tomorrow afternoon we're going to see

575

00:19:48,070 --> 00:19:45,919

bob and doug roll by

576

00:19:49,830 --> 00:19:48,080

in a in a tesla that's got some

577

00:19:51,669 --> 00:19:49,840

beautiful nasa emblems on it

578

00:19:53,669 --> 00:19:51,679

and they're on their way to the pad and

579

00:19:55,430 --> 00:19:53,679

so that's a moment when you're like man

580

00:19:56,310 --> 00:19:55,440

like they're going to strap in on top of

581

00:19:58,710 --> 00:19:56,320

that thing

582

00:19:59,830 --> 00:19:58,720

um so it's it's it is it is exciting to

583

00:20:02,149 --> 00:19:59,840

see a rocket launch

584

00:20:04,230 --> 00:20:02,159

it is unbelievable to know that there's

585

00:20:06,070 --> 00:20:04,240

people that are strapping themselves in

586

00:20:08,390 --> 00:20:06,080

and making that trip into space right

587

00:20:09,590 --> 00:20:08,400

it's fun awesome thank you joshua

588

00:20:11,190 --> 00:20:09,600

we have another question from our

589

00:20:13,029 --> 00:20:11,200

facebook community they want to know

590

00:20:15,110 --> 00:20:13,039

will the falcon 9 booster land

591

00:20:16,070 --> 00:20:15,120

back once it puts crew dragon into orbit

592

00:20:18,310 --> 00:20:16,080

yeah so this one

593

00:20:19,750 --> 00:20:18,320

um and so the the question there becomes

594

00:20:21,029 --> 00:20:19,760

for the falcon 9 in general their

595

00:20:22,630 --> 00:20:21,039

performance capability

596

00:20:24,549 --> 00:20:22,640

and so we know that we've seen them land

597

00:20:26,149 --> 00:20:24,559

here at landing zone 1 um which is

598

00:20:28,070 --> 00:20:26,159

at the cape canaveral air force station

599

00:20:30,710 --> 00:20:28,080

we've also seen them land on their barge

600

00:20:31,590 --> 00:20:30,720

out in the atlantic ocean roughly kind

601
00:20:33,029 --> 00:20:31,600
of directly off the coast of

602
00:20:35,029 --> 00:20:33,039
jacksonville always

603
00:20:36,149 --> 00:20:35,039
and so a lot of that decision comes down

604
00:20:37,909 --> 00:20:36,159
to how much

605
00:20:39,590 --> 00:20:37,919
fuel do they need to get their payload

606
00:20:39,909 --> 00:20:39,600
where it needs to go that's always job

607
00:20:42,390 --> 00:20:39,919
one

608
00:20:43,270 --> 00:20:42,400
is get the payload to its intended orbit

609
00:20:45,350 --> 00:20:43,280
and so once

610
00:20:46,549 --> 00:20:45,360
the first stage is done that's the

611
00:20:49,110 --> 00:20:46,559
decision point and they make this

612
00:20:50,549 --> 00:20:49,120
decision way before that moment in time

613
00:20:52,549 --> 00:20:50,559

but that's where the booster has to have

614

00:20:54,710 --> 00:20:52,559

enough fuel to return and fly back

615

00:20:56,710 --> 00:20:54,720

or it has to just continue going towards

616

00:20:58,149 --> 00:20:56,720

the barge and so essentially if you kind

617

00:20:59,909 --> 00:20:58,159

of and this is obviously

618

00:21:01,750 --> 00:20:59,919

very simplified but essentially it

619

00:21:02,950 --> 00:21:01,760

launches more on an arc trajectory

620

00:21:04,230 --> 00:21:02,960

because it doesn't fly straight up it

621

00:21:04,950 --> 00:21:04,240

flies to go rendezvous with space

622

00:21:06,950 --> 00:21:04,960

station

623

00:21:09,350 --> 00:21:06,960

and so once it flies this direction

624

00:21:10,549 --> 00:21:09,360

essentially in order to come back to ksc

625

00:21:11,990 --> 00:21:10,559

or to the cape canaveral air force

626

00:21:12,549 --> 00:21:12,000

station it has to have enough fuel to

627

00:21:14,950 --> 00:21:12,559

actually

628

00:21:16,230 --> 00:21:14,960

stop its momentum turn around and then

629

00:21:18,390 --> 00:21:16,240

fly back and land safely

630

00:21:19,590 --> 00:21:18,400

that's not a tiny amount of fuel you

631

00:21:21,270 --> 00:21:19,600

need a good bit left there

632

00:21:22,630 --> 00:21:21,280

so if they don't have that then what

633

00:21:23,190 --> 00:21:22,640

they do is they simply just kind of go

634

00:21:25,350 --> 00:21:23,200

into

635

00:21:26,390 --> 00:21:25,360

and it's not a free fall it's it's very

636

00:21:27,750 --> 00:21:26,400

precise they have the

637

00:21:29,590 --> 00:21:27,760

their hypersonic grid fins and their

638

00:21:30,630 --> 00:21:29,600

landing legs so they're doing a lot of

639

00:21:32,070 --> 00:21:30,640

maneuvering here

640

00:21:34,789 --> 00:21:32,080

but they're going to more fall back

641

00:21:36,710 --> 00:21:34,799

towards where the barge would be located

642

00:21:38,310 --> 00:21:36,720

so the barge is is kind of a catcher's

643

00:21:39,430 --> 00:21:38,320

men of swords um they position it or

644

00:21:39,909 --> 00:21:39,440

they know that that booster will come

645

00:21:41,190 --> 00:21:39,919

down

646

00:21:43,110 --> 00:21:41,200

um where they where they have enough

647

00:21:44,070 --> 00:21:43,120

fuel to land safely but ultimately

648

00:21:46,470 --> 00:21:44,080

that's they don't have enough

649

00:21:47,590 --> 00:21:46,480

to return to their launch site well

650

00:21:49,029 --> 00:21:47,600

joshua we can probably

651
00:21:50,310 --> 00:21:49,039
update your tagline from nasa

652
00:21:52,070 --> 00:21:50,320
communications to launch vehicle

653
00:21:55,510 --> 00:21:52,080
trajectory analyst because

654
00:21:57,350 --> 00:21:55,520
clearly you get it am i ready

655
00:21:59,270 --> 00:21:57,360
that's exactly what i do i use my hands

656
00:22:01,430 --> 00:21:59,280
and i say perfect exactly so that was a

657
00:22:02,789 --> 00:22:01,440
great description yes i love it i'm in

658
00:22:04,390 --> 00:22:02,799
all right joshua i think we have time

659
00:22:06,390 --> 00:22:04,400
for one more question and we want to

660
00:22:08,149 --> 00:22:06,400
know what does it mean to you personally

661
00:22:09,190 --> 00:22:08,159
to have human space flight return to the

662
00:22:11,669 --> 00:22:09,200
united states

663
00:22:12,870 --> 00:22:11,679

yeah such a such a good question uh and

664

00:22:16,470 --> 00:22:12,880

i think that

665

00:22:17,830 --> 00:22:16,480

there's there's a sense to where

666

00:22:19,510 --> 00:22:17,840

i've heard it answered a couple

667

00:22:20,710 --> 00:22:19,520

different ways and i think all of them

668

00:22:22,390 --> 00:22:20,720

are really valid

669

00:22:24,230 --> 00:22:22,400

uh the first is that there's this

670

00:22:25,510 --> 00:22:24,240

there's this inerrant drive in humanity

671

00:22:28,630 --> 00:22:25,520

to explore

672

00:22:29,909 --> 00:22:28,640

and i think that that is something that

673

00:22:32,549 --> 00:22:29,919

this moment connects with a lot of

674

00:22:33,830 --> 00:22:32,559

people that you don't have to be the one

675

00:22:34,950 --> 00:22:33,840

hopping on that boat to cross the

676

00:22:35,909 --> 00:22:34,960

atlantic for the first time you don't

677

00:22:37,350 --> 00:22:35,919

have to be the one hopping on that

678

00:22:38,630 --> 00:22:37,360

rocket to fly into space

679

00:22:40,870 --> 00:22:38,640

you don't have to be the one trekking

680

00:22:44,310 --> 00:22:40,880

across america and over

681

00:22:45,270 --> 00:22:44,320

the um and over the plains and over the

682

00:22:46,470 --> 00:22:45,280

rocky mountains

683

00:22:49,350 --> 00:22:46,480

there's something about that that's

684

00:22:51,830 --> 00:22:49,360

really just captivating

685

00:22:53,350 --> 00:22:51,840

we saw this with the moon landings of

686

00:22:54,630 --> 00:22:53,360

people stopped and took notice around

687

00:22:55,750 --> 00:22:54,640

the world everybody did and everybody

688

00:22:58,149 --> 00:22:55,760

kind of owned a piece of that

689

00:22:59,990 --> 00:22:58,159

like we did it we we've accomplished

690

00:23:00,710 --> 00:23:00,000

this and so there's that that's really

691

00:23:03,270 --> 00:23:00,720

important

692

00:23:04,470 --> 00:23:03,280

um i think that there's there's a sense

693

00:23:06,310 --> 00:23:04,480

to where it's just

694

00:23:07,590 --> 00:23:06,320

it's just achievement it's just hey like

695

00:23:09,430 --> 00:23:07,600

we are

696

00:23:11,190 --> 00:23:09,440

we have this ability um we're ready to

697

00:23:12,789 --> 00:23:11,200

move forward um there's

698

00:23:14,390 --> 00:23:12,799

there's the desire to kind of expand

699

00:23:16,950 --> 00:23:14,400

beyond of like we know this is

700

00:23:18,470 --> 00:23:16,960

this is a stepping stone with which we

701
00:23:19,909 --> 00:23:18,480
will go farther than we have before and

702
00:23:21,270 --> 00:23:19,919
i think that's really powerful

703
00:23:22,390 --> 00:23:21,280
um and then there's other things for

704
00:23:23,510 --> 00:23:22,400
people who don't connect with those

705
00:23:25,510 --> 00:23:23,520
ideas there's things that i would

706
00:23:28,710 --> 00:23:25,520
encourage them to think through of like

707
00:23:29,750 --> 00:23:28,720
when we do anything nasa one of the

708
00:23:32,390 --> 00:23:29,760
things that happens

709
00:23:33,029 --> 00:23:32,400
is called spinoff technology where we

710
00:23:35,909 --> 00:23:33,039
actually

711
00:23:36,789 --> 00:23:35,919
create things we we create brand new

712
00:23:39,029 --> 00:23:36,799
things

713
00:23:40,710 --> 00:23:39,039

to help us achieve our goals um we heard

714

00:23:41,430 --> 00:23:40,720

jim moreheart earlier today here sitting

715

00:23:42,870 --> 00:23:41,440

in this seat

716

00:23:44,390 --> 00:23:42,880

talking about in-situ resource

717

00:23:45,909 --> 00:23:44,400

utilization which is living off of the

718

00:23:48,630 --> 00:23:45,919

moon's resources

719

00:23:50,549 --> 00:23:48,640

and so we will invent technology to live

720

00:23:52,070 --> 00:23:50,559

off the resources of the moon

721

00:23:53,830 --> 00:23:52,080

and that technology will not be used

722

00:23:55,590 --> 00:23:53,840

just for that we will export that

723

00:23:56,149 --> 00:23:55,600

technology to commercial companies on

724

00:23:58,310 --> 00:23:56,159

earth

725

00:23:59,350 --> 00:23:58,320

now obviously they may or may not go to

726

00:24:01,110 --> 00:23:59,360

the moon but there are other

727

00:24:04,149 --> 00:24:01,120

applications for that technology

728

00:24:05,350 --> 00:24:04,159

um people often times will cite some

729

00:24:08,630 --> 00:24:05,360

popular examples

730

00:24:10,070 --> 00:24:08,640

um velcro is a is a common one that's

731

00:24:11,510 --> 00:24:10,080

not actually invented by us

732

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

but that's kind of the idea there of

733

00:24:15,430 --> 00:24:13,600

like when we use it we develop it and

734

00:24:16,950 --> 00:24:15,440

and export the technology for others to

735

00:24:18,549 --> 00:24:16,960

to benefit and that's what we mean when

736

00:24:19,350 --> 00:24:18,559

we say the benefit of all mankind that's

737

00:24:20,950 --> 00:24:19,360

a part of that

738

00:24:23,590 --> 00:24:20,960

um so the cell phone that you keep in

739

00:24:24,950 --> 00:24:23,600

your pocket uh that cell phone would not

740

00:24:27,190 --> 00:24:24,960

be anywhere near

741

00:24:28,470 --> 00:24:27,200

as amazing as it is today without nasa

742

00:24:29,350 --> 00:24:28,480

we have helped drive forward

743

00:24:30,950 --> 00:24:29,360

communication

744

00:24:32,470 --> 00:24:30,960

we've helped drive forward battery

745

00:24:34,870 --> 00:24:32,480

technology we've helped

746

00:24:36,710 --> 00:24:34,880

drive forward gps and satellite systems

747

00:24:37,190 --> 00:24:36,720

and so all of those things kind of come

748

00:24:38,310 --> 00:24:37,200

together

749

00:24:39,430 --> 00:24:38,320

that's just one example there's

750

00:24:40,310 --> 00:24:39,440

everything from your sneakers to your

751
00:24:42,870 --> 00:24:40,320
tennis rackets

752
00:24:44,149 --> 00:24:42,880
to infrared technology i mean even in

753
00:24:45,190 --> 00:24:44,159
your house there's dozens of things

754
00:24:47,029 --> 00:24:45,200
today

755
00:24:48,950 --> 00:24:47,039
so just encourage you all to think

756
00:24:51,430 --> 00:24:48,960
through those um for me personally

757
00:24:52,070 --> 00:24:51,440
it i think that i get i get captivated

758
00:24:55,350 --> 00:24:52,080
in

759
00:24:57,029 --> 00:24:55,360
than myself of just

760
00:25:00,390 --> 00:24:57,039
this is something that we can achieve

761
00:25:02,390 --> 00:25:00,400
together and

762
00:25:03,669 --> 00:25:02,400
despite the challenges despite setbacks

763
00:25:06,310 --> 00:25:03,679

that happen despite

764

00:25:07,830 --> 00:25:06,320

um the things that keep us from getting

765

00:25:09,029 --> 00:25:07,840

there today immediately now

766

00:25:10,950 --> 00:25:09,039

uh those are the things that make it

767

00:25:12,630 --> 00:25:10,960

worth it right uh we get to

768

00:25:13,830 --> 00:25:12,640

to overcome and triumph so those are the

769

00:25:14,870 --> 00:25:13,840

those are the things that come to mind

770

00:25:16,310 --> 00:25:14,880

but i think that last one is really

771

00:25:18,470 --> 00:25:16,320

where i'm at i'm just like

772

00:25:19,350 --> 00:25:18,480

being a part of something big is is a

773

00:25:20,789 --> 00:25:19,360

pleasure and a joy

774

00:25:23,190 --> 00:25:20,799

and i hope that all of america will feel

775

00:25:23,909 --> 00:25:23,200

that tomorrow um as we achieve this for

776

00:25:26,070 --> 00:25:23,919

america

777

00:25:27,269 --> 00:25:26,080

and for all humankind that's really

778

00:25:27,909 --> 00:25:27,279

great that's awesome and i'm glad you

779

00:25:29,909 --> 00:25:27,919

mentioned you know

780

00:25:31,909 --> 00:25:29,919

the technology and the applicability of

781

00:25:32,230 --> 00:25:31,919

all these things i think nasa spinoffs

782

00:25:34,630 --> 00:25:32,240

is

783

00:25:35,350 --> 00:25:34,640

a way that people can learn about um

784

00:25:37,029 --> 00:25:35,360

yeah

785

00:25:39,190 --> 00:25:37,039

the ways that the things that nasa are

786

00:25:41,110 --> 00:25:39,200

is doing it doesn't stop

787

00:25:42,230 --> 00:25:41,120

at where we are going so and i think

788

00:25:43,909 --> 00:25:42,240

just personally for me

789

00:25:45,430 --> 00:25:43,919

i'm so excited for the launch because as

790

00:25:46,789 --> 00:25:45,440

i said i've been here for three years

791

00:25:49,029 --> 00:25:46,799

and i've actually been telling i've seen

792

00:25:50,630 --> 00:25:49,039

40 launches which is unbelievable like

793

00:25:52,070 --> 00:25:50,640

three years ago i had seen zero and now

794

00:25:53,510 --> 00:25:52,080

i've seen 40 launches and

795

00:25:54,870 --> 00:25:53,520

everyone has been just a little

796

00:25:55,990 --> 00:25:54,880

different there's you know just

797

00:25:58,310 --> 00:25:56,000

something unique about each

798

00:25:59,750 --> 00:25:58,320

launch and tomorrow it'll be like wow

799

00:26:01,269 --> 00:25:59,760

there's people on there you know

800

00:26:02,870 --> 00:26:01,279

i model this rocket all the time but

801
00:26:04,710 --> 00:26:02,880
there's people on that one so that i'm

802
00:26:06,710 --> 00:26:04,720
really excited to see that so

803
00:26:08,630 --> 00:26:06,720
um joshua thank you for your your your

804
00:26:09,990 --> 00:26:08,640
comments all the information and

805
00:26:11,750 --> 00:26:10,000
for being here with us hope you had a

806
00:26:12,710 --> 00:26:11,760
good time yeah last thing just want to

807
00:26:14,630 --> 00:26:12,720
give a huge shout out to the

808
00:26:15,669 --> 00:26:14,640
communications teams for both nasa and

809
00:26:17,909 --> 00:26:15,679
spacex

810
00:26:19,029 --> 00:26:17,919
they have been laboring for years uh

811
00:26:20,870 --> 00:26:19,039
working through challenges

812
00:26:22,230 --> 00:26:20,880
learning how to work together um and

813
00:26:23,750 --> 00:26:22,240

achieving a ton

814

00:26:25,110 --> 00:26:23,760

and tomorrow is going to be another big

815

00:26:26,549 --> 00:26:25,120

accomplishment as we do the launch

816

00:26:28,390 --> 00:26:26,559

broadcast side by side

817

00:26:29,750 --> 00:26:28,400

i'm telling this story together awesome

818

00:26:31,269 --> 00:26:29,760

yeah definitely congratulations to

819

00:26:33,350 --> 00:26:31,279

everyone who's been working on this

820

00:26:34,310 --> 00:26:33,360

um yeah stephanie thank you for being a

821

00:26:36,310 --> 00:26:34,320

part of this as well

822

00:26:38,470 --> 00:26:36,320

thanks for having me and thank you all

823

00:26:40,789 --> 00:26:38,480

for joining us we hope you continue to

824

00:26:42,950 --> 00:26:40,799

be a part of these nasa socials

825

00:26:45,350 --> 00:26:42,960

next up at four o'clock eastern we will

826

00:26:48,310 --> 00:26:45,360

be having a couple more pop-in speakers

827

00:26:49,909 --> 00:26:48,320

so please join us for that and until