

NASA LIVE

ARTEMIS I

LAUNCH



1
00:00:19,980 --> 00:00:50,190
foreign

2
00:00:50,200 --> 00:00:54,490
[Music]

3
00:00:59,510 --> 00:00:56,750
you are looking at the world's most

4
00:01:03,110 --> 00:00:59,520
rocket and Orion spacecraft live on

5
00:01:05,530 --> 00:01:03,120
Launchpad 39b Artemis 1 embodies the

6
00:01:08,270 --> 00:01:05,540
hard work of thousands across the world

7
00:01:09,469 --> 00:01:08,280
determined to explore for the benefit of

8
00:01:11,210 --> 00:01:09,479
all

9
00:01:13,490 --> 00:01:11,220
welcome and thank you for joining us

10
00:01:16,370 --> 00:01:13,500
live at Kennedy Space Center where the

11
00:01:18,649 --> 00:01:16,380
energy here is palpable as we attempt to

12
00:01:20,810 --> 00:01:18,659
make history today I'm Megan Cruz and

13
00:01:22,609 --> 00:01:20,820

this is NASA astronaut Kayla veran Kayla

14

00:01:24,950 --> 00:01:22,619

great to have you here again so awesome

15

00:01:26,749 --> 00:01:24,960

to be here tonight well uh some of you

16

00:01:28,609 --> 00:01:26,759

may know this Michaela served as a

17

00:01:30,530 --> 00:01:28,619

mission specialist for NASA's SpaceX

18

00:01:32,330 --> 00:01:30,540

crew 3 mission it launched to the

19

00:01:34,249 --> 00:01:32,340

International Space Station in November

20

00:01:36,590 --> 00:01:34,259

of last year and she lived and worked

21

00:01:37,910 --> 00:01:36,600

there for about six months today I am

22

00:01:39,710 --> 00:01:37,920

thrilled to have her here with me to

23

00:01:41,510 --> 00:01:39,720

talk about this rocket behind us

24

00:01:43,850 --> 00:01:41,520

Illuminating beautifully the night sky

25

00:01:45,289 --> 00:01:43,860

here in Florida yeah it's so awesome to

26

00:01:47,330 --> 00:01:45,299

be here tonight when I first walked up

27

00:01:50,030 --> 00:01:47,340

and saw the view from the desk here I

28

00:01:51,770 --> 00:01:50,040

was just blown away by how close it is

29

00:01:53,450 --> 00:01:51,780

and what an awesome view it's going to

30

00:01:55,429 --> 00:01:53,460

be when we get to launch time yeah it's

31

00:01:57,289 --> 00:01:55,439

a magnificent View and I know you're

32

00:01:58,969 --> 00:01:57,299

especially excited about this because if

33

00:02:01,550 --> 00:01:58,979

we launched today this will be the first

34

00:02:04,190 --> 00:02:01,560

launch that you actually see from the

35

00:02:06,530 --> 00:02:04,200

ground exactly I I've never been able to

36

00:02:07,910 --> 00:02:06,540

come see a launch in person except for

37

00:02:09,350 --> 00:02:07,920

my own of course but that's a little bit

38

00:02:11,990 --> 00:02:09,360

different perspective very different

39

00:02:13,850 --> 00:02:12,000

yeah but to be here for the world's most

40

00:02:16,670 --> 00:02:13,860

powerful rocket and the first test

41

00:02:19,070 --> 00:02:16,680

flight of Orion and SLS is just amazing

42

00:02:22,010 --> 00:02:19,080

yeah so our two hour launch window opens

43

00:02:23,630 --> 00:02:22,020

at 104 a.m eastern time so Kayla tell

44

00:02:24,589 --> 00:02:23,640

everyone why are we returning to the

45

00:02:31,070 --> 00:02:24,599

Moon

46

00:02:33,110 --> 00:02:31,080

place to learn more about our solar

47

00:02:34,430 --> 00:02:33,120

system how the moon formed but also how

48

00:02:36,470 --> 00:02:34,440

the Earth and the rest of our solar

49

00:02:38,510 --> 00:02:36,480

system formed and we know so little

50

00:02:40,070 --> 00:02:38,520

about it there's a lot to learn by

51
00:02:42,290 --> 00:02:40,080
returning there and doing some awesome

52
00:02:44,770 --> 00:02:42,300
geology work but it's also the perfect

53
00:02:47,089 --> 00:02:44,780
Proving Ground for our continuation

54
00:02:48,949 --> 00:02:47,099
exploring further into our solar system

55
00:02:50,690 --> 00:02:48,959
and eventually going to Mars right we

56
00:02:53,630 --> 00:02:50,700
need to test all the operations Concepts

57
00:02:55,729 --> 00:02:53,640
all the equipment habitats Rovers suits

58
00:02:57,350 --> 00:02:55,739
all of these things and so it's the

59
00:02:58,729 --> 00:02:57,360
perfect place to test all those things

60
00:03:00,350 --> 00:02:58,739
out and learn the things we need to do

61
00:03:01,610 --> 00:03:00,360
to do something that's almost hard to

62
00:03:03,229 --> 00:03:01,620
wrap your head around going all the way

63
00:03:05,270 --> 00:03:03,239

to another planet absolutely really

64

00:03:07,910 --> 00:03:05,280

ambitious goals and it all starts here

65

00:03:11,270 --> 00:03:07,920

with Artemis one so Artemis one is the

66

00:03:14,210 --> 00:03:11,280

is the first flight test of NASA's brand

67

00:03:16,369 --> 00:03:14,220

new space launch system or SLS rocket

68

00:03:18,229 --> 00:03:16,379

it's the world's most powerful rocket

69

00:03:20,690 --> 00:03:18,239

and will send an uncrewed Orion

70

00:03:22,490 --> 00:03:20,700

spacecraft farther around the Moon than

71

00:03:24,470 --> 00:03:22,500

any of the Apollo missions before it

72

00:03:26,930 --> 00:03:24,480

Artemis 2 will be the first crude

73

00:03:30,229 --> 00:03:26,940

Mission around the moon and then Artemis

74

00:03:32,570 --> 00:03:30,239

3 will use a brand new human Landing

75

00:03:33,949 --> 00:03:32,580

system to bring astronauts to the

76

00:03:35,869 --> 00:03:33,959

surface of the Moon

77

00:03:38,089 --> 00:03:35,879

future Artemis missions will dock to

78

00:03:41,210 --> 00:03:38,099

Gateway NASA's lunar orbiting space

79

00:03:43,369 --> 00:03:41,220

station before descending to the Moon

80

00:03:46,430 --> 00:03:43,379

so Kayla what must we demonstrate with

81

00:03:47,990 --> 00:03:46,440

Artemis one before we put astronauts on

82

00:03:50,750 --> 00:03:48,000

board for those future crude missions

83

00:03:52,490 --> 00:03:50,760

this is our first integrated Test Flight

84

00:03:54,830 --> 00:03:52,500

of the rocket the space launch system

85

00:03:57,110 --> 00:03:54,840

rocket and Orion the capsule that crew

86

00:03:58,970 --> 00:03:57,120

will fly in on Artemis 2. and so it's

87

00:04:01,009 --> 00:03:58,980

really important for us to put all of

88

00:04:03,649 --> 00:04:01,019

those systems together and actually send

89

00:04:05,809 --> 00:04:03,659

them to do a mission test all those

90

00:04:07,910 --> 00:04:05,819

systems in real time in concert together

91

00:04:09,589 --> 00:04:07,920

we do a lot of testing before we get to

92

00:04:11,390 --> 00:04:09,599

this moment before we get to launch day

93

00:04:13,429 --> 00:04:11,400

but it's not integrated and we're not

94

00:04:14,929 --> 00:04:13,439

actually putting the systems under all

95

00:04:16,670 --> 00:04:14,939

of the real world stresses they're going

96

00:04:18,650 --> 00:04:16,680

to see so we want to see the rocket

97

00:04:21,349 --> 00:04:18,660

perform we want to see Orion make it

98

00:04:23,150 --> 00:04:21,359

around the moon go super deep into space

99

00:04:26,330 --> 00:04:23,160

and then come home and successfully

100

00:04:28,610 --> 00:04:26,340

re-entry re-enter so the the heat shield

101
00:04:30,590 --> 00:04:28,620
that actually has to withstand the

102
00:04:32,930 --> 00:04:30,600
fastest and hottest re-entry we've ever

103
00:04:35,030 --> 00:04:32,940
seen in human space flight so that's a

104
00:04:36,650 --> 00:04:35,040
big thing we want to see the heat shield

105
00:04:38,870 --> 00:04:36,660
perform successfully and then of course

106
00:04:41,810 --> 00:04:38,880
recover the vehicle or test all of that

107
00:04:43,490 --> 00:04:41,820
so it's a lot but it's the important

108
00:04:44,870 --> 00:04:43,500
First Step before we put crew on the

109
00:04:47,270 --> 00:04:44,880
vehicle yeah lots of eyes on this one

110
00:04:49,850 --> 00:04:47,280
for sure so tanking of the rocket began

111
00:04:51,409 --> 00:04:49,860
at 4 30 this afternoon NASA's Daryl nail

112
00:04:53,689 --> 00:04:51,419
is inside with the launch Team and has

113
00:04:56,629 --> 00:04:53,699

some information about an issue they're

114

00:04:59,270 --> 00:04:56,639

currently working right Megan uh the

115

00:05:02,330 --> 00:04:59,280

launch director gave the go for tanking

116

00:05:05,210 --> 00:05:02,340

shortly after 3 P.M this afternoon but

117

00:05:07,730 --> 00:05:05,220

as of right now there is a red crew as

118

00:05:10,490 --> 00:05:07,740

they are named specifically specially

119

00:05:14,689 --> 00:05:10,500

trained team of individuals out at the

120

00:05:17,450 --> 00:05:14,699

pad making an unplanned change to a

121

00:05:20,810 --> 00:05:17,460

replenish valve on the liquid hydrogen

122

00:05:23,590 --> 00:05:20,820

side there are two technicians and a

123

00:05:27,710 --> 00:05:23,600

safety representative that are right now

124

00:05:32,029 --> 00:05:27,720

working inside the mobile launcher it's

125

00:05:34,249 --> 00:05:32,039

in an open air area that has a replenish

126

00:05:37,189 --> 00:05:34,259

valve that goes to the liquid hydrogen

127

00:05:39,950 --> 00:05:37,199

side of the core stage now this happened

128

00:05:43,370 --> 00:05:39,960

roughly uh early earlier this evening

129

00:05:46,010 --> 00:05:43,380

probably about an hour ago go when a

130

00:05:48,409 --> 00:05:46,020

leak was detected detected at the core

131

00:05:50,870 --> 00:05:48,419

stage liquid hydrogen valve by the

132

00:05:53,469 --> 00:05:50,880

launch Team here inside firing room one

133

00:05:55,850 --> 00:05:53,479

at the launch control center

134

00:06:00,290 --> 00:05:55,860

unfortunately the team here was unable

135

00:06:02,870 --> 00:06:00,300

to remedy the leak remotely and so it

136

00:06:05,450 --> 00:06:02,880

became necessary to send a crew of

137

00:06:09,469 --> 00:06:05,460

individuals called the red crew out to

138

00:06:11,870 --> 00:06:09,479

the launch pad to make a Hands-On fix so

139

00:06:14,510 --> 00:06:11,880

to speak to that valve what they're

140

00:06:17,930 --> 00:06:14,520

doing is they're torquing down bolts

141

00:06:20,930 --> 00:06:17,940

that are on the valve they believe that

142

00:06:23,629 --> 00:06:20,940

by torquing these bolts down they'll get

143

00:06:26,990 --> 00:06:23,639

a better seal on that replenish valve

144

00:06:29,990 --> 00:06:27,000

and that should remedy the leak the leak

145

00:06:32,809 --> 00:06:30,000

was detected by the Hazardous operations

146

00:06:35,210 --> 00:06:32,819

team here inside the launch control when

147

00:06:38,210 --> 00:06:35,220

the percentage of hydrogen went above

148

00:06:40,309 --> 00:06:38,220

one percent now that's significant for

149

00:06:44,390 --> 00:06:40,319

this particular area because it is an

150

00:06:48,730 --> 00:06:44,400

open air location uh the skid valve that

151

00:06:53,029 --> 00:06:48,740

runs uh the uh liquid hydrogen

152

00:06:56,450 --> 00:06:53,039

into the core stage and we had reached

153

00:06:58,670 --> 00:06:56,460

replenish when this leak was detected

154

00:07:00,290 --> 00:06:58,680

over on the liquid hydrogen side of

155

00:07:03,909 --> 00:07:00,300

course there's two tanks on the core

156

00:07:06,830 --> 00:07:03,919

stage liquid oxygen and liquid hydrogen

157

00:07:10,309 --> 00:07:06,840

both had been uh

158

00:07:13,070 --> 00:07:10,319

topped and gotten into replenish when

159

00:07:16,670 --> 00:07:13,080

this leak was detected currently liquid

160

00:07:20,330 --> 00:07:16,680

oxygen is topped off and stable in

161

00:07:22,850 --> 00:07:20,340

replenish but the liquid hydrogen is in

162

00:07:24,830 --> 00:07:22,860

stop flow at the moment which will

163

00:07:26,409 --> 00:07:24,840

prevent them from proceeding forward

164

00:07:31,129 --> 00:07:26,419

with a launch

165

00:07:33,890 --> 00:07:31,139

until that leak is remedied again this

166

00:07:36,170 --> 00:07:33,900

red crew is inside the area inside the

167

00:07:39,490 --> 00:07:36,180

blast danger area working inside the

168

00:07:42,409 --> 00:07:39,500

mobile launcher torquing down those nuts

169

00:07:44,689 --> 00:07:42,419

that are associated with the replenish

170

00:07:46,790 --> 00:07:44,699

valve for the liquid hydrogen side of

171

00:07:50,029 --> 00:07:46,800

the core stage of course we'll keep you

172

00:07:52,610 --> 00:07:50,039

updated on uh the operation in the

173

00:07:54,230 --> 00:07:52,620

meantime I'll send it back to Megan

174

00:07:56,570 --> 00:07:54,240

thank you for that update Daryl and yes

175

00:07:58,550 --> 00:07:56,580

we are looking forward to your next uh

176
00:07:59,990 --> 00:07:58,560
update as to what happened with the red

177
00:08:01,670 --> 00:08:00,000
team out there on the pad

178
00:08:03,710 --> 00:08:01,680
now today will be our third opportunity

179
00:08:05,990 --> 00:08:03,720
to launch Artemis one the launch team

180
00:08:07,610 --> 00:08:06,000
called off the first two attempts due to

181
00:08:09,290 --> 00:08:07,620
issues while loading propellants into

182
00:08:10,969 --> 00:08:09,300
the Rockets the team addressed those

183
00:08:13,490 --> 00:08:10,979
issues and plans to try again in

184
00:08:15,890 --> 00:08:13,500
September but then hurricane Ian made

185
00:08:18,589 --> 00:08:15,900
landfall here on Florida as a strong

186
00:08:20,749 --> 00:08:18,599
category four storm satellite imagery

187
00:08:24,050 --> 00:08:20,759
there shows us the storm went right by

188
00:08:25,670 --> 00:08:24,060

launch pad 39b thankfully the rocket was

189

00:08:27,770 --> 00:08:25,680

safe inside the Vehicle Assembly

190

00:08:30,170 --> 00:08:27,780

Building at the time the team rolled the

191

00:08:32,329 --> 00:08:30,180

rocket back to the pad two weeks ago and

192

00:08:34,790 --> 00:08:32,339

it stayed there through hurricane Nicole

193

00:08:37,010 --> 00:08:34,800

which made landfall last week as a

194

00:08:39,350 --> 00:08:37,020

category one just south of Kennedy Space

195

00:08:41,389 --> 00:08:39,360

Center teams inspected everything after

196

00:08:43,670 --> 00:08:41,399

the storm and confirmed they were ready

197

00:08:45,410 --> 00:08:43,680

to try and launch today

198

00:08:47,449 --> 00:08:45,420

now Daryl is one of a team of people

199

00:08:49,190 --> 00:08:47,459

helping to bring you today's uncrewed

200

00:08:51,230 --> 00:08:49,200

flight test we have Jasmine Hopkins

201
00:08:53,630 --> 00:08:51,240
nearby also inside with the launch Team

202
00:08:55,790 --> 00:08:53,640
who will interview some key players in

203
00:08:57,590 --> 00:08:55,800
our Return To The Moon we also have Leah

204
00:09:00,290 --> 00:08:57,600
Cheshire inside Mission Control at

205
00:09:02,570 --> 00:09:00,300
Johnson Space Center Dan Hewitt with a

206
00:09:04,070 --> 00:09:02,580
new tool we're excited to show you Leah

207
00:09:06,590 --> 00:09:04,080
Martin at the Kennedy Space Center

208
00:09:08,269 --> 00:09:06,600
Visitor complex and finally Brian sizek

209
00:09:10,910 --> 00:09:08,279
with the U.S space force monitoring

210
00:09:13,310 --> 00:09:10,920
weather with one hour 54 minutes until

211
00:09:15,170 --> 00:09:13,320
liftoff how are we looking Brian

212
00:09:16,970 --> 00:09:15,180
and you showed we had certainly had some

213
00:09:19,070 --> 00:09:16,980

interesting weather here in East Central

214

00:09:20,990 --> 00:09:19,080

Florida over the last several months but

215

00:09:23,150 --> 00:09:21,000

I'm happy to report we're not looking at

216

00:09:24,889 --> 00:09:23,160

any type of satellite imagery like the

217

00:09:27,050 --> 00:09:24,899

ones you just showed overall weather is

218

00:09:28,910 --> 00:09:27,060

looking quite favorable as we head

219

00:09:30,170 --> 00:09:28,920

throughout the countdown and into the

220

00:09:31,910 --> 00:09:30,180

launch window so here's what we're

221

00:09:34,250 --> 00:09:31,920

looking at right now really just one

222

00:09:36,110 --> 00:09:34,260

area of concern that's these upper level

223

00:09:38,269 --> 00:09:36,120

clouds that are moving in so there's a

224

00:09:40,190 --> 00:09:38,279

cold front in the Gulf of Mexico right

225

00:09:42,290 --> 00:09:40,200

now that's producing some showers in the

226

00:09:44,930 --> 00:09:42,300

Gulf but those are not expected to get

227

00:09:46,790 --> 00:09:44,940

to us by the launch window but they are

228

00:09:48,829 --> 00:09:46,800

the upper level winds are bringing in

229

00:09:50,509 --> 00:09:48,839

some cirrus clouds that are moving in

230

00:09:51,949 --> 00:09:50,519

now they're high enough and thin enough

231

00:09:53,750 --> 00:09:51,959

where they're really not going to be a

232

00:09:55,790 --> 00:09:53,760

concern for it to be a thick Cloud

233

00:09:58,009 --> 00:09:55,800

layers rule violation they'd have to be

234

00:10:00,230 --> 00:09:58,019

a lot thicker and a little bit lower in

235

00:10:02,269 --> 00:10:00,240

the atmosphere in order to hold a charge

236

00:10:03,889 --> 00:10:02,279

so that's what we're looking for in

237

00:10:06,230 --> 00:10:03,899

these lightning launch commit criteria

238

00:10:08,210 --> 00:10:06,240

not just natural lighting but rocket

239

00:10:10,070 --> 00:10:08,220

triggered lightning potential as some of

240

00:10:11,930 --> 00:10:10,080

these clouds can hold a charge a rocket

241

00:10:14,449 --> 00:10:11,940

can actually induce a lightning strike

242

00:10:16,430 --> 00:10:14,459

in a ATM atmosphere that's not strong

243

00:10:17,389 --> 00:10:16,440

enough to produce a natural lightning

244

00:10:19,310 --> 00:10:17,399

strike so that's really what we're

245

00:10:20,930 --> 00:10:19,320

watching but right now weather is go

246

00:10:23,090 --> 00:10:20,940

these clouds as I said are high enough

247

00:10:24,949 --> 00:10:23,100

and thin enough where they're really not

248

00:10:26,449 --> 00:10:24,959

going to be much of concern but we are

249

00:10:28,430 --> 00:10:26,459

going to be watching it my colleagues

250

00:10:29,990 --> 00:10:28,440

Melody Lovin Mark Berger and the rest of

251
00:10:32,269 --> 00:10:30,000
the launch weather team will be watching

252
00:10:33,889 --> 00:10:32,279
this very closely as we head closer to

253
00:10:36,769 --> 00:10:33,899
t0 so let's take a look at the graphic

254
00:10:38,690 --> 00:10:36,779
uh the latest briefing 90 percent go

255
00:10:40,790 --> 00:10:38,700
really the only concern being the thick

256
00:10:42,889 --> 00:10:40,800
Cloud layers Rule and a very small

257
00:10:45,050 --> 00:10:42,899
concern for the cumulus cloud rule but

258
00:10:47,870 --> 00:10:45,060
overall the weather is looking favorable

259
00:10:49,670 --> 00:10:47,880
as I said right now weather is go those

260
00:10:52,130 --> 00:10:49,680
clouds are high enough and thin enough

261
00:10:53,870 --> 00:10:52,140
where we do not expect them to be a

262
00:10:56,090 --> 00:10:53,880
concern so I'm happy to report a very

263
00:10:58,910 --> 00:10:56,100

favorable launch forecast as we head

264

00:11:01,610 --> 00:10:58,920

closer to P0 Megan back to you

265

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

don't you just love hearing 90 you know

266

00:11:04,790 --> 00:11:03,120

that's wonderful especially here in

267

00:11:06,710 --> 00:11:04,800

Florida you know what I mean weather can

268

00:11:10,430 --> 00:11:06,720

really be uh

269

00:11:12,829 --> 00:11:10,440

uh tricky here in Florida so 90 is

270

00:11:15,290 --> 00:11:12,839

perfect now Florida Space Coast has been

271

00:11:17,930 --> 00:11:15,300

the primary launch site for NASA's crude

272

00:11:20,449 --> 00:11:17,940

missions for the last six decades first

273

00:11:22,670 --> 00:11:20,459

Apollo then shuttle the commercial crew

274

00:11:25,850 --> 00:11:22,680

program which Kayla flew up as a part of

275

00:11:27,470 --> 00:11:25,860

and soon Artemis let's go now to NASA's

276

00:11:29,509 --> 00:11:27,480

Jasmine Hopkins

277

00:11:31,370 --> 00:11:29,519

thank you so much Megan we're here in

278

00:11:33,590 --> 00:11:31,380

the launch control center amid all the

279

00:11:35,030 --> 00:11:33,600

excitement in firing room two and I'm so

280

00:11:37,009 --> 00:11:35,040

glad right now to be joined by our

281

00:11:38,810 --> 00:11:37,019

Kennedy Space Center Director Janet

282

00:11:40,370 --> 00:11:38,820

petro and our deputy director as well

283

00:11:42,949 --> 00:11:40,380

Kelvin Manning thank you both for being

284

00:11:44,810 --> 00:11:42,959

here thank you Jasmine we are so glad to

285

00:11:47,090 --> 00:11:44,820

have you this team has overcome a lot to

286

00:11:48,829 --> 00:11:47,100

get to today we are no stranger to

287

00:11:51,050 --> 00:11:48,839

storms on the Space Coast we overcame

288

00:11:53,449 --> 00:11:51,060

Ian and then Nicole Janet how did we

289

00:11:56,449 --> 00:11:53,459

embrace the challenge that's my Line

290

00:11:58,610 --> 00:11:56,459

Jazz man I gotta say I couldn't be more

291

00:12:00,350 --> 00:11:58,620

proud of the team out here everything we

292

00:12:03,410 --> 00:12:00,360

did to get to this point and then to

293

00:12:05,569 --> 00:12:03,420

have those two storms thrown at us at

294

00:12:08,389 --> 00:12:05,579

the last minute Nicole all the

295

00:12:11,030 --> 00:12:08,399

evacuations as you know one time we

296

00:12:13,009 --> 00:12:11,040

remained at the pad and the other time

297

00:12:14,690 --> 00:12:13,019

we had to roll back to the VAB but I got

298

00:12:17,449 --> 00:12:14,700

to tell you across the workforce whether

299

00:12:19,009 --> 00:12:17,459

it was our program people across the

300

00:12:21,050 --> 00:12:19,019

agency our institutional support

301
00:12:22,610 --> 00:12:21,060
organizations they all came together and

302
00:12:24,410 --> 00:12:22,620
worked as a team and so here we are

303
00:12:26,210 --> 00:12:24,420
tonight looking forward to a great

304
00:12:28,310 --> 00:12:26,220
launch right we're a very strong team

305
00:12:30,050 --> 00:12:28,320
and we have been at the this for for

306
00:12:32,210 --> 00:12:30,060
years for decades we started off during

307
00:12:34,190 --> 00:12:32,220
the Apollo program but now we've evolved

308
00:12:36,889 --> 00:12:34,200
into what we're calling a multi-user

309
00:12:38,870 --> 00:12:36,899
Spaceport Kelvin what does that mean

310
00:12:40,310 --> 00:12:38,880
so when we were getting ready to retire

311
00:12:41,449 --> 00:12:40,320
the Space Shuttle A lot of people

312
00:12:43,790 --> 00:12:41,459
thought we were going out of business

313
00:12:45,590 --> 00:12:43,800

literally shutting down but our

314

00:12:46,970 --> 00:12:45,600

leadership team we had a vision to

315

00:12:49,009 --> 00:12:46,980

create what we call a multi-user

316

00:12:51,889 --> 00:12:49,019

Spaceport to become the world's Premier

317

00:12:53,870 --> 00:12:51,899

government and Commercial Spaceport and

318

00:12:57,050 --> 00:12:53,880

so that's happened over the last 10 or

319

00:12:59,990 --> 00:12:57,060

so years probably a lot faster than

320

00:13:01,910 --> 00:13:00,000

um we thought it would but right if you

321

00:13:03,170 --> 00:13:01,920

would say uh you ask us well what's the

322

00:13:05,030 --> 00:13:03,180

future look like I'll tell you we're

323

00:13:07,009 --> 00:13:05,040

just getting started right the future is

324

00:13:09,230 --> 00:13:07,019

very bright for us and this is a really

325

00:13:11,389 --> 00:13:09,240

big day for NASA I mean Artemis launched

326

00:13:13,490 --> 00:13:11,399

but an even bigger year for Kennedy

327

00:13:15,769 --> 00:13:13,500

Space Center the diamond anniversary our

328

00:13:18,110 --> 00:13:15,779

60th anniversary Janet how have we

329

00:13:19,730 --> 00:13:18,120

commemorated that big milestone oh we've

330

00:13:21,590 --> 00:13:19,740

had a whole bunch of celebrations all

331

00:13:24,350 --> 00:13:21,600

along this year as you know Kennedy

332

00:13:26,509 --> 00:13:24,360

became a center back in 1962 as you said

333

00:13:27,769 --> 00:13:26,519

we've been celebrating all year long and

334

00:13:30,590 --> 00:13:27,779

I can't think of a better way of

335

00:13:32,569 --> 00:13:30,600

culminating our diamond anniversary with

336

00:13:35,150 --> 00:13:32,579

a launch of the Artemis for the Artemis

337

00:13:36,650 --> 00:13:35,160

generation later this evening right that

338

00:13:38,810 --> 00:13:36,660

is so exciting and what does it mean for

339

00:13:40,610 --> 00:13:38,820

both of you to be leading the center at

340

00:13:42,769 --> 00:13:40,620

one of our busiest cadences we've ever

341

00:13:44,389 --> 00:13:42,779

seen we've had over 40 launches this

342

00:13:46,069 --> 00:13:44,399

year alone what has that been like yeah

343

00:13:49,550 --> 00:13:46,079

we're gonna we're gonna get past 50

344

00:13:51,650 --> 00:13:49,560

tonight I think but for me it's I'm

345

00:13:53,990 --> 00:13:51,660

incredible incredibly honored to be

346

00:13:56,030 --> 00:13:54,000

leading this team it really is all about

347

00:13:58,910 --> 00:13:56,040

the team and the workforce we have such

348

00:14:00,710 --> 00:13:58,920

a highly skilled a highly dedicated a

349

00:14:02,509 --> 00:14:00,720

highly motivated Workforce we have an

350

00:14:04,069 --> 00:14:02,519

incredible Mission and we all come

351
00:14:06,769 --> 00:14:04,079
together and embrace the challenge and

352
00:14:08,269 --> 00:14:06,779
make things happen right yeah it is a

353
00:14:10,370 --> 00:14:08,279
privilege to work here and it's not

354
00:14:11,990 --> 00:14:10,380
about us like Janet said it's about the

355
00:14:14,030 --> 00:14:12,000
people it really is it's about this

356
00:14:15,350 --> 00:14:14,040
great team Janet Kelvin thank you both

357
00:14:16,850 --> 00:14:15,360
so much for being here tonight we really

358
00:14:20,030 --> 00:14:16,860
appreciate it thank you Jasmine go

359
00:14:22,610 --> 00:14:20,040
Artemis yes go Artemis absolutely Megan

360
00:14:25,250 --> 00:14:22,620
back to you great to hear from them so

361
00:14:27,650 --> 00:14:25,260
one hour and 48 minutes and Counting

362
00:14:30,170 --> 00:14:27,660
until our two hour launch window opens

363
00:14:31,910 --> 00:14:30,180

we heard Dale report out that there is a

364

00:14:33,290 --> 00:14:31,920

team at the pad working an issue so why

365

00:14:35,150 --> 00:14:33,300

don't we go back to him now to see if he

366

00:14:38,090 --> 00:14:35,160

has an update for us yeah Megan now

367

00:14:40,310 --> 00:14:38,100

continuing to track their red crew Crews

368

00:14:41,930 --> 00:14:40,320

work at the launch pad this is a

369

00:14:44,689 --> 00:14:41,940

specially trained team of three

370

00:14:46,610 --> 00:14:44,699

individuals two technicians one safety

371

00:14:49,610 --> 00:14:46,620

representative who are currently right

372

00:14:51,650 --> 00:14:49,620

now inside the mobile launcher at the

373

00:14:53,930 --> 00:14:51,660

base of the launch pad they are doing

374

00:14:56,990 --> 00:14:53,940

work on a replenish valve currently

375

00:15:00,350 --> 00:14:57,000

torquing down the bolts in order to

376

00:15:02,750 --> 00:15:00,360

remedy a leak in that replenish valve

377

00:15:05,230 --> 00:15:02,760

that was detected a little over an hour

378

00:15:08,569 --> 00:15:05,240

ago now this is significant because

379

00:15:11,389 --> 00:15:08,579

currently with a leak they have had to

380

00:15:14,569 --> 00:15:11,399

go into what's called stop flow on the

381

00:15:17,449 --> 00:15:14,579

liquid hydrogen tank of the core stage

382

00:15:20,569 --> 00:15:17,459

normally under replenish they continue

383

00:15:22,730 --> 00:15:20,579

to flow liquid hydrogen into the tank as

384

00:15:25,610 --> 00:15:22,740

it boils off in order to maintain a

385

00:15:29,150 --> 00:15:25,620

level of around 100 percent but that has

386

00:15:32,449 --> 00:15:29,160

been in stop flow and so at this moment

387

00:15:35,509 --> 00:15:32,459

we are slowly losing liquid hydrogen in

388

00:15:37,550 --> 00:15:35,519

the core stage hydrogen tank the red

389

00:15:40,370 --> 00:15:37,560

crew went in and is currently working a

390

00:15:42,590 --> 00:15:40,380

little longer than expected on the issue

391

00:15:45,170 --> 00:15:42,600

it was estimated that it would take 15

392

00:15:48,050 --> 00:15:45,180

minutes to do the work but as we're now

393

00:15:50,629 --> 00:15:48,060

finding out the red crew is torquing

394

00:15:52,970 --> 00:15:50,639

down the bolts and then backing out of

395

00:15:55,910 --> 00:15:52,980

the area and allowing the launch Team to

396

00:15:58,250 --> 00:15:55,920

cycle the valves to test to see if

397

00:16:00,710 --> 00:15:58,260

they've got that leak fixed

398

00:16:04,790 --> 00:16:00,720

so as they do this it will we understand

399

00:16:07,189 --> 00:16:04,800

they will cycle this work go in cycle

400

00:16:09,350 --> 00:16:07,199

the valves torque them down again if

401
00:16:11,870 --> 00:16:09,360
they continues to leak and then back out

402
00:16:14,629 --> 00:16:11,880
and test the work and this may continue

403
00:16:17,269 --> 00:16:14,639
until they have it fixed the red crew

404
00:16:20,269 --> 00:16:17,279
going on onto the launch pad isn't uh

405
00:16:23,509 --> 00:16:20,279
totally uncommon uh occurrence certainly

406
00:16:26,150 --> 00:16:23,519
new with the Artemis program but uh work

407
00:16:28,370 --> 00:16:26,160
like this was done in previous space

408
00:16:30,590 --> 00:16:28,380
programs the red crew is specially

409
00:16:33,410 --> 00:16:30,600
trained for this work they are

410
00:16:36,949 --> 00:16:33,420
accustomed to working around in

411
00:16:39,290 --> 00:16:36,959
hazardous operation uh especially a

412
00:16:41,509 --> 00:16:39,300
fully tanked rocket

413
00:16:44,329 --> 00:16:41,519

again we are tracking red crew's

414

00:16:46,009 --> 00:16:44,339

operation out at the pad it's expected

415

00:16:48,050 --> 00:16:46,019

that this will eat into the launch

416

00:16:52,129 --> 00:16:48,060

window which currently we have liftoff

417

00:16:55,970 --> 00:16:52,139

at 104 a.m eastern time but the window

418

00:16:58,310 --> 00:16:55,980

runs two hours to 304 a.m eastern time

419

00:17:00,530 --> 00:16:58,320

again monitoring the red Crews work

420

00:17:03,230 --> 00:17:00,540

we'll have more updates for you a little

421

00:17:05,569 --> 00:17:03,240

later on for now back to you Megan

422

00:17:07,370 --> 00:17:05,579

thank you Daryl some quick programming

423

00:17:09,590 --> 00:17:07,380

notes for the first time ever we are

424

00:17:11,390 --> 00:17:09,600

broadcasting a launch in 4k you can

425

00:17:13,429 --> 00:17:11,400

watch it on NASA's YouTube channel or

426

00:17:16,610 --> 00:17:13,439

check your local provider to see if you

427

00:17:18,590 --> 00:17:16,620

have NASA's UHD channel the audio of our

428

00:17:22,730 --> 00:17:18,600

broadcast is also available on the local

429

00:17:24,650 --> 00:17:22,740

amateur VHF and UHF radio frequencies

430

00:17:26,030 --> 00:17:24,660

you see at the bottom of your screen so

431

00:17:27,590 --> 00:17:26,040

if you're here along the space coast and

432

00:17:29,330 --> 00:17:27,600

interested in that make note of those

433

00:17:31,730 --> 00:17:29,340

frequencies now

434

00:17:33,770 --> 00:17:31,740

or you can watch today's launch with

435

00:17:35,870 --> 00:17:33,780

live commentary in Spanish that

436

00:17:38,210 --> 00:17:35,880

broadcast starts at midnight on NASA s

437

00:17:39,830 --> 00:17:38,220

in espanol's YouTube page which we're

438

00:17:41,450 --> 00:17:39,840

showing you now at the bottom of your

439

00:17:43,490 --> 00:17:41,460

screen

440

00:17:45,470 --> 00:17:43,500

now Kayla why did NASA choose the name

441

00:17:47,690 --> 00:17:45,480

Artemis for our return to the Moon

442

00:17:50,029 --> 00:17:47,700

well in Greek mythology Artemis is the

443

00:17:52,070 --> 00:17:50,039

twin sister of Apollo so it's really a

444

00:17:53,570 --> 00:17:52,080

connection back to the Apollo era the

445

00:17:56,390 --> 00:17:53,580

amazing things we did as part of the

446

00:17:58,430 --> 00:17:56,400

Apollo program but we wanted to give a

447

00:18:00,529 --> 00:17:58,440

nod to the future you know it's a it's a

448

00:18:03,110 --> 00:18:00,539

new set of missions we're with new

449

00:18:05,210 --> 00:18:03,120

objectives so it's a Connection to the

450

00:18:07,130 --> 00:18:05,220

Past with an eye towards what we might

451
00:18:08,870 --> 00:18:07,140
do as part of the Artemis generation

452
00:18:10,909 --> 00:18:08,880
yeah let's talk about what those future

453
00:18:12,830 --> 00:18:10,919
Ambitions might be I mean Landing the

454
00:18:14,750 --> 00:18:12,840
first woman and first person of color on

455
00:18:17,390 --> 00:18:14,760
the lunar surface that is a worthwhile

456
00:18:19,730 --> 00:18:17,400
ambition oh yeah absolutely I think

457
00:18:21,409 --> 00:18:19,740
we've come a long way since Apollo in so

458
00:18:23,990 --> 00:18:21,419
many ways in the space program but one

459
00:18:26,150 --> 00:18:24,000
of the ways we've evolved is our

460
00:18:28,130 --> 00:18:26,160
astronaut core more closely reflects the

461
00:18:30,529 --> 00:18:28,140
nation it represents now so those Crews

462
00:18:32,210 --> 00:18:30,539
will be more diverse and we think those

463
00:18:33,890 --> 00:18:32,220

diverse perspectives not only in our

464

00:18:36,049 --> 00:18:33,900

astronaut core but our larger team only

465

00:18:40,250 --> 00:18:36,059

make us a stronger one yeah all right

466

00:18:42,950 --> 00:18:40,260

well coming up we are going to hear from

467

00:18:45,049 --> 00:18:42,960

some of the Apollo Astronauts and learn

468

00:18:47,630 --> 00:18:45,059

more about what we will accomplish for

469

00:18:49,430 --> 00:18:47,640

Humanity by going back to the Moon we'll

470

00:18:51,350 --> 00:18:49,440

meet some of the women shattering glass

471

00:18:54,470 --> 00:18:51,360

ceilings to bring Artemis to life

472

00:18:55,490 --> 00:18:54,480

including NASA's first female launch

473

00:18:57,350 --> 00:18:55,500

director

474

00:18:59,630 --> 00:18:57,360

we'll also show you the space launch

475

00:19:02,510 --> 00:18:59,640

system up close and what happens when

476

00:19:04,430 --> 00:19:02,520

the cutest group of visitors gets the

477

00:19:06,230 --> 00:19:04,440

surprise of a lifetime

478

00:19:08,630 --> 00:19:06,240

plus we'll take you around the world to

479

00:19:09,950 --> 00:19:08,640

show you how people are marking this

480

00:19:11,630 --> 00:19:09,960

historic mission

481

00:19:13,010 --> 00:19:11,640

and Kayla and I will also take your

482

00:19:15,350 --> 00:19:13,020

questions live you can send those our

483

00:19:17,210 --> 00:19:15,360

way by using the hashtag Artemis we

484

00:19:18,710 --> 00:19:17,220

already have some questions from some

485

00:19:20,990 --> 00:19:18,720

celebrities I know you're gonna love

486

00:19:22,490 --> 00:19:21,000

Facebook questions so you're gonna have

487

00:19:24,710 --> 00:19:22,500

to keep watching to find out who sent

488

00:19:26,930 --> 00:19:24,720

those in and we also invite you to share

489

00:19:29,750 --> 00:19:26,940

your moon inspired content using the

490

00:19:31,370 --> 00:19:29,760

hashtag NASA Moon snap here's a sample

491

00:19:32,930 --> 00:19:31,380

of some that's already been sent in this

492

00:19:34,250 --> 00:19:32,940

one's beautiful the flower and the

493

00:19:36,289 --> 00:19:34,260

foreground there

494

00:19:39,890 --> 00:19:36,299

um the the moon and the background

495

00:19:43,370 --> 00:19:41,630

here's an awesome one it looks like we

496

00:19:45,650 --> 00:19:43,380

have an eagle here flying over the moon

497

00:19:48,289 --> 00:19:45,660

oh just beautiful it's been really cool

498

00:19:49,730 --> 00:19:48,299

to see all these artistic submissions oh

499

00:19:51,650 --> 00:19:49,740

yeah really creative and we're going to

500

00:19:54,310 --> 00:19:51,660

compile as many as we can and and show

501
00:19:56,930 --> 00:19:54,320
them later on the broadcast

502
00:19:58,250 --> 00:19:56,940
now let's check back in with Daryl we do

503
00:19:59,630 --> 00:19:58,260
like to check in with him as much as

504
00:20:00,890 --> 00:19:59,640
possible to see if we can get any

505
00:20:03,110 --> 00:20:00,900
updates from the launch Team go ahead

506
00:20:07,130 --> 00:20:03,120
Daryl yeah Megan we just saw the red

507
00:20:08,930 --> 00:20:07,140
team give a thumbs up to the camera

508
00:20:10,970 --> 00:20:08,940
um as they are doing their work out at

509
00:20:13,250 --> 00:20:10,980
the launch pad currently they're

510
00:20:16,130 --> 00:20:13,260
torquing down some bolts to the

511
00:20:18,409 --> 00:20:16,140
specification required in order to try

512
00:20:20,810 --> 00:20:18,419
and stop uh what has been described as

513
00:20:22,970 --> 00:20:20,820

an intermittent hydrogen leak in the

514

00:20:27,049 --> 00:20:22,980

area it went above the one percent

515

00:20:30,110 --> 00:20:27,059

threshold and so that is a violation uh

516

00:20:32,510 --> 00:20:30,120

of the Haz gas limit in that area the

517

00:20:34,850 --> 00:20:32,520

team continuing to work as you look at

518

00:20:37,250 --> 00:20:34,860

the rocket on the pad

519

00:20:38,630 --> 00:20:37,260

they were called out to the pad about a

520

00:20:41,150 --> 00:20:38,640

half hour ago

521

00:20:42,049 --> 00:20:41,160

and uh they appeared to be making their

522

00:20:44,750 --> 00:20:42,059

way

523

00:20:46,190 --> 00:20:44,760

at least have stepped back back from the

524

00:20:48,529 --> 00:20:46,200

area of work

525

00:20:50,870 --> 00:20:48,539

uh the way that the workflow has been

526
00:20:52,970 --> 00:20:50,880
going is they uh torque down the bolts

527
00:20:55,310 --> 00:20:52,980
step back a little bit

528
00:20:57,350 --> 00:20:55,320
the launch Team then Cycles the valves

529
00:21:00,169 --> 00:20:57,360
to check to see if the leak is still

530
00:21:01,669 --> 00:21:00,179
there and then they come back in

531
00:21:05,510 --> 00:21:01,679
and this has happened a couple of times

532
00:21:08,510 --> 00:21:05,520
and start torquing the bolts again

533
00:21:11,150 --> 00:21:08,520
the rocket was nearly fully tanked the

534
00:21:14,750 --> 00:21:11,160
core stage was in replenish for both

535
00:21:16,970 --> 00:21:14,760
hydrogen and oxygen

536
00:21:19,610 --> 00:21:16,980
the upper stage had nearly been finished

537
00:21:22,490 --> 00:21:19,620
when the leak was detected

538
00:21:25,250 --> 00:21:22,500

and the countdown

539

00:21:28,370 --> 00:21:25,260

though it is continuing the rocket uh

540

00:21:32,990 --> 00:21:28,380

the leak had to be addressed in order

541

00:21:35,870 --> 00:21:33,000

for the launch to proceed

542

00:21:39,110 --> 00:21:35,880

the replenish puts the

543

00:21:41,930 --> 00:21:39,120

hydrogen back into the tank after it

544

00:21:44,930 --> 00:21:41,940

boils off and So currently we're in a

545

00:21:47,630 --> 00:21:44,940

stop flow which no longer longer allows

546

00:21:50,750 --> 00:21:47,640

a replenishment of the hydrogen tank and

547

00:21:53,450 --> 00:21:50,760

that would not allow us to have a launch

548

00:21:55,730 --> 00:21:53,460

without those tanks being in total

549

00:21:59,510 --> 00:21:55,740

replenish and also in a vented

550

00:22:01,010 --> 00:21:59,520

configuration which has also been put on

551

00:22:03,430 --> 00:22:01,020

hold I'm sorry not a vented

552

00:22:06,350 --> 00:22:03,440

configuration but rather an engine bleed

553

00:22:08,450 --> 00:22:06,360

has been stopped and so that would need

554

00:22:11,510 --> 00:22:08,460

to continue as well in order to get the

555

00:22:14,090 --> 00:22:11,520

engines conditioned for launch that's

556

00:22:15,830 --> 00:22:14,100

the latest here from firing room one at

557

00:22:18,230 --> 00:22:15,840

the launch control center Megan we'll

558

00:22:21,289 --> 00:22:18,240

send it back to you thank you Daryl one

559

00:22:24,110 --> 00:22:21,299

hour 41 minutes until again the uh

560

00:22:26,570 --> 00:22:24,120

planned the start of the two hour launch

561

00:22:28,730 --> 00:22:26,580

window uh right now let's head over to

562

00:22:30,529 --> 00:22:28,740

the Apollo Saturn V Center at Kennedy

563

00:22:33,590 --> 00:22:30,539

Space Center's visitor complex where

564

00:22:35,390 --> 00:22:33,600

NASA's Dan Hewitt is just inside in

565

00:22:37,130 --> 00:22:35,400

front of a Saturn V rocket which is the

566

00:22:39,110 --> 00:22:37,140

only vehicle to date to carry humans

567

00:22:41,450 --> 00:22:39,120

Beyond low earth orbit he's going to

568

00:22:44,330 --> 00:22:41,460

show us what uh he has behind us there

569

00:22:46,130 --> 00:22:44,340

the moon board it's an interactive tool

570

00:22:48,230 --> 00:22:46,140

yeah thanks Megan and welcome everybody

571

00:22:49,970 --> 00:22:48,240

we're in the Saturn 5 Center fitting

572

00:22:51,529 --> 00:22:49,980

that the rocket that carried astronauts

573

00:22:53,330 --> 00:22:51,539

the moon of Apollos just over our

574

00:22:54,710 --> 00:22:53,340

shoulder as we meet the rocket that's

575

00:22:57,470 --> 00:22:54,720

going to do it with the Next Generation

576
00:22:59,090 --> 00:22:57,480
under Artemis so SLS the space launch

577
00:23:01,010 --> 00:22:59,100
system is out on the pad right now it's

578
00:23:02,690 --> 00:23:01,020
on the mobile launcher before we jump

579
00:23:04,610 --> 00:23:02,700
into that just to give you some

580
00:23:06,169 --> 00:23:04,620
perspective so that valve that Daryl's

581
00:23:08,090 --> 00:23:06,179
been talking about is in the base

582
00:23:10,610 --> 00:23:08,100
section of this mobile launcher down

583
00:23:12,830 --> 00:23:10,620
here that's different from the areas we

584
00:23:16,250 --> 00:23:12,840
were focused on in August and September

585
00:23:18,110 --> 00:23:16,260
in these 33 foot tall tale service Mast

586
00:23:21,289 --> 00:23:18,120
umbilicals that are delivering the

587
00:23:23,750 --> 00:23:21,299
hydrogen and oxygen to the core stage of

588
00:23:26,510 --> 00:23:23,760

SLS but let's Jump Right In

589

00:23:27,830 --> 00:23:26,520

a couple of key components to SLS we're

590

00:23:29,510 --> 00:23:27,840

going to start here on the sides with

591

00:23:31,490 --> 00:23:29,520

the solid rocket boosters if they look

592

00:23:33,470 --> 00:23:31,500

familiar they're derived from those that

593

00:23:34,909 --> 00:23:33,480

flew the space shuttle in fact some of

594

00:23:37,070 --> 00:23:34,919

the segments of these boosters today

595

00:23:39,289 --> 00:23:37,080

were flown on previous space shuttle

596

00:23:41,090 --> 00:23:39,299

missions we call them solids because of

597

00:23:42,950 --> 00:23:41,100

the type of propellant inside if you

598

00:23:45,169 --> 00:23:42,960

were able to look in you would see a mix

599

00:23:47,750 --> 00:23:45,179

of ammonium perchlorate aluminum powder

600

00:23:49,250 --> 00:23:47,760

and a binding agent called polybutadine

601
00:23:52,010 --> 00:23:49,260
acrylonitrile that your expert

602
00:23:53,690 --> 00:23:52,020
vocabulary word for the day now as these

603
00:23:56,090 --> 00:23:53,700
are firing they're providing more than

604
00:23:58,610 --> 00:23:56,100
90 percent of the steering and 75

605
00:24:01,730 --> 00:23:58,620
percent of the thrust as SLS makes its

606
00:24:04,549 --> 00:24:01,740
way uphill and those are attached to the

607
00:24:05,930 --> 00:24:04,559
core stage 212 feet tall five major

608
00:24:08,990 --> 00:24:05,940
sections we're going to start the fun

609
00:24:11,210 --> 00:24:09,000
part down here on the bottom four rs-25

610
00:24:13,250 --> 00:24:11,220
engines again derived from those that

611
00:24:15,289 --> 00:24:13,260
flew the space shuttle in addition we

612
00:24:17,090 --> 00:24:15,299
have this core engine section here where

613
00:24:19,190 --> 00:24:17,100

we have all of their necessary Plumbing

614

00:24:21,590 --> 00:24:19,200

also the connection points where we're

615

00:24:23,690 --> 00:24:21,600

feeding the propellants into the core

616

00:24:26,390 --> 00:24:23,700

stage itself and as these are firing

617

00:24:28,070 --> 00:24:26,400

each one providing up to half a million

618

00:24:30,890 --> 00:24:28,080

pounds of thrust during operation

619

00:24:34,549 --> 00:24:30,900

consuming 1500 gallons of propellant

620

00:24:37,190 --> 00:24:34,559

every second as they go uphill now these

621

00:24:39,529 --> 00:24:37,200

are liquid rocket engines which means

622

00:24:41,630 --> 00:24:39,539

you need a fuel about half a million

623

00:24:44,390 --> 00:24:41,640

gallons of liquid hydrogen and an

624

00:24:46,370 --> 00:24:44,400

oxidizer about 200 000 of liquid oxygen

625

00:24:47,930 --> 00:24:46,380

up here that hydrogen gets fed through

626

00:24:50,510 --> 00:24:47,940

feed lines down at the bottom of the

627

00:24:52,909 --> 00:24:50,520

tank here the oxygen coming from these

628

00:24:55,310 --> 00:24:52,919

two feed lines you see running down out

629

00:24:56,870 --> 00:24:55,320

of this the intertank section the inner

630

00:24:58,730 --> 00:24:56,880

tank also has the upper attachment

631

00:25:01,130 --> 00:24:58,740

points for the solid rocket boosters the

632

00:25:03,230 --> 00:25:01,140

bottom attacks attaches down here at the

633

00:25:04,909 --> 00:25:03,240

engine block now all the way up top we

634

00:25:07,130 --> 00:25:04,919

have the forward skirt it's where you

635

00:25:09,470 --> 00:25:07,140

have your core avionics your brains for

636

00:25:11,870 --> 00:25:09,480

flying SLS as well as connections to the

637

00:25:14,810 --> 00:25:11,880

mobile launcher and some antennas and if

638

00:25:17,029 --> 00:25:14,820

we zoom in why does it look all bumpy we

639

00:25:20,090 --> 00:25:17,039

have a spray-on insulation on the core

640

00:25:22,130 --> 00:25:20,100

stage these propellants are stored at

641

00:25:24,710 --> 00:25:22,140

cryogenic temperatures hundreds of

642

00:25:26,149 --> 00:25:24,720

degrees below zero fahrenheit and so we

643

00:25:28,730 --> 00:25:26,159

have to try and keep them as cold as

644

00:25:31,310 --> 00:25:28,740

possible now underneath this upper skirt

645

00:25:34,850 --> 00:25:31,320

we have the second stage the interim

646

00:25:36,649 --> 00:25:34,860

cryogenic propulsion stage or icps this

647

00:25:38,930 --> 00:25:36,659

is a modified upper stage from the Delta

648

00:25:40,130 --> 00:25:38,940

IV family of rockets from United launch

649

00:25:43,610 --> 00:25:40,140

Alliance

650

00:25:45,649 --> 00:25:43,620

single rl-10b-2 engine also propelled by

651
00:25:47,450 --> 00:25:45,659
liquid hydrogen liquid oxygen this is

652
00:25:49,730 --> 00:25:47,460
used for our in-space propulsion

653
00:25:51,289 --> 00:25:49,740
Maneuvers critically that translunar

654
00:25:53,510 --> 00:25:51,299
injection which is going to give us the

655
00:25:56,090 --> 00:25:53,520
energy to go beyond low earth orbit and

656
00:25:57,769 --> 00:25:56,100
head out to the Moon all together that's

657
00:25:59,570 --> 00:25:57,779
the space launch system it's going to be

658
00:26:02,029 --> 00:25:59,580
making its first flight hopefully today

659
00:26:03,529 --> 00:26:02,039
it's going to be a heck of a show let's

660
00:26:04,789 --> 00:26:03,539
get back to the countdown I'll send it

661
00:26:07,610 --> 00:26:04,799
over to you Megan

662
00:26:09,110 --> 00:26:07,620
thanks Dan one hour 37 minutes and

663
00:26:11,149 --> 00:26:09,120

Counting until our two hour launch

664

00:26:12,710 --> 00:26:11,159

window opens tonight the space launch

665

00:26:14,870 --> 00:26:12,720

system rocket and Orion spacecraft

666

00:26:17,810 --> 00:26:14,880

together standing just taller than the

667

00:26:19,490 --> 00:26:17,820

Statue of Liberty at launch pad 39b it's

668

00:26:21,950 --> 00:26:19,500

the culmination of years of development

669

00:26:24,289 --> 00:26:21,960

and thousands of tests here's a look at

670

00:26:26,450 --> 00:26:24,299

its path to the pad

671

00:26:28,130 --> 00:26:26,460

the space launch system is really the

672

00:26:31,310 --> 00:26:28,140

backbone of the Artemis missions it's

673

00:26:35,210 --> 00:26:31,320

the truck it's the big carry vehicle

674

00:26:37,430 --> 00:26:35,220

it allows us to carry both crew as well

675

00:26:40,070 --> 00:26:37,440

as the equipment that we need to live

676
00:26:42,769 --> 00:26:40,080
and work on the moon

677
00:26:45,289 --> 00:26:42,779
60 years ago NASA was in a race to get

678
00:26:47,090 --> 00:26:45,299
to the moon this time is more than just

679
00:26:48,789 --> 00:26:47,100
a race it's about establishing a

680
00:26:51,470 --> 00:26:48,799
long-term presence can you imagine

681
00:26:54,190 --> 00:26:51,480
rolling the Statue of Liberty out to put

682
00:26:57,230 --> 00:26:54,200
at the pad that's what we're doing

683
00:26:59,149 --> 00:26:57,240
it will lift up from Earth with more

684
00:27:00,970 --> 00:26:59,159
power than the Saturn Vibe which was the

685
00:27:05,050 --> 00:27:00,980
first vehicle to take us

686
00:27:11,570 --> 00:27:05,060
Artemis is our next giant League

687
00:27:16,070 --> 00:27:13,549
the difference between the Apollo

688
00:27:18,169 --> 00:27:16,080

program and the Artemis program is

689

00:27:20,510 --> 00:27:18,179

really the focus on sustainability and

690

00:27:21,970 --> 00:27:20,520

using the moon as an outpost for further

691

00:27:25,250 --> 00:27:21,980

exploration

692

00:27:29,470 --> 00:27:25,260

this time we're going back to learn how

693

00:27:33,890 --> 00:27:31,789

the space launch system really is the

694

00:27:36,490 --> 00:27:33,900

culmination of our knowledge for 60

695

00:27:40,130 --> 00:27:36,500

years of building Rockets

696

00:27:43,130 --> 00:27:40,140

we started by looking at over 1700

697

00:27:46,370 --> 00:27:43,140

different potential components that

698

00:27:48,590 --> 00:27:46,380

would go into the rocket and by looking

699

00:27:50,630 --> 00:27:48,600

at the way we could reuse some of the

700

00:27:52,850 --> 00:27:50,640

most reliable equipment that was flown

701
00:27:56,210 --> 00:27:52,860
on the shuttle we took those and we put

702
00:27:59,210 --> 00:27:56,220
them together into a system that had

703
00:28:00,590 --> 00:27:59,220
enough energy to make sense to do the

704
00:28:04,370 --> 00:28:00,600
mission that we've been asked to do

705
00:28:06,230 --> 00:28:04,380
we're moving from low earth orbit like

706
00:28:09,049 --> 00:28:06,240
you see in the International Space

707
00:28:11,130 --> 00:28:09,059
Station today to moving beyond that to

708
00:28:12,350 --> 00:28:11,140
taking the next step in Exploration

709
00:28:14,930 --> 00:28:12,360
[Music]

710
00:28:18,230 --> 00:28:14,940
it's 322 feet tall

711
00:28:20,810 --> 00:28:18,240
it's got 700 000 gallons of cryogenic

712
00:28:24,110 --> 00:28:20,820
propellant in the core stage alone

713
00:28:26,990 --> 00:28:24,120

it can produce 8.8 million pounds of

714

00:28:29,269 --> 00:28:27,000

vacuum thrust the space launch system is

715

00:28:31,549 --> 00:28:29,279

really a national rocket a National

716

00:28:34,010 --> 00:28:31,559

Asset too we have worked with

717

00:28:36,110 --> 00:28:34,020

contractors as well as with our NASA

718

00:28:37,909 --> 00:28:36,120

experts our science and engineering

719

00:28:40,250 --> 00:28:37,919

department our safety and Mission

720

00:28:43,010 --> 00:28:40,260

Assurance team to get the space launch

721

00:28:45,110 --> 00:28:43,020

system designed developed and produced

722

00:28:48,830 --> 00:28:45,120

it has taken thousands of companies

723

00:28:51,470 --> 00:28:48,840

across the country it comes together by

724

00:28:53,330 --> 00:28:51,480

train it comes together by plane comes

725

00:28:55,250 --> 00:28:53,340

together by barges so all of that

726

00:28:57,350 --> 00:28:55,260

culminates at the Kennedy Space Center

727

00:28:59,750 --> 00:28:57,360

for the launch of the first Artemis

728

00:29:01,669 --> 00:28:59,760

Mission everybody has worked together to

729

00:29:02,990 --> 00:29:01,679

ensure that we have a safe and reliable

730

00:29:06,830 --> 00:29:03,000

rocket

731

00:29:09,230 --> 00:29:06,840

at Nasa safety and testing is extremely

732

00:29:11,149 --> 00:29:09,240

important because ultimately this rocket

733

00:29:13,549 --> 00:29:11,159

isn't meant just to carry cargo it's

734

00:29:16,130 --> 00:29:13,559

meant to carry people

735

00:29:18,830 --> 00:29:16,140

all types of Education all types of

736

00:29:21,049 --> 00:29:18,840

backgrounds all types of diversity to do

737

00:29:23,990 --> 00:29:21,059

the things we do and it'll be great to

738

00:29:25,850 --> 00:29:24,000

see a diverse crew land on the moon

739

00:29:27,710 --> 00:29:25,860

where the space launch system comes in

740

00:29:30,289 --> 00:29:27,720

is providing that reliable

741

00:29:32,210 --> 00:29:30,299

transportation so that we can start

742

00:29:35,570 --> 00:29:32,220

flying these rockets on a routine basis

743

00:29:38,029 --> 00:29:35,580

to take people and to take payload to

744

00:29:40,610 --> 00:29:38,039

that Outpost the moon and also the

745

00:29:43,010 --> 00:29:40,620

Gateway system you have a generation

746

00:29:44,510 --> 00:29:43,020

who've never seen deep space exploration

747

00:29:46,310 --> 00:29:44,520

and this will give them an opportunity

748

00:29:48,830 --> 00:29:46,320

to see that this is something that they

749

00:29:50,750 --> 00:29:48,840

can potentially do themselves it's going

750

00:29:52,490 --> 00:29:50,760

to be a paradigm shift for NASA we're

751
00:29:59,630 --> 00:29:52,500
going to be back to looking at things

752
00:30:03,590 --> 00:30:01,610
a lot to look forward to and it all

753
00:30:05,389 --> 00:30:03,600
begins with lunch afterwards our friends

754
00:30:07,250 --> 00:30:05,399
at Johnson Space Center in Houston will

755
00:30:08,690 --> 00:30:07,260
control Orion once it's on its way to

756
00:30:10,310 --> 00:30:08,700
the Moon let's get an update of

757
00:30:13,630 --> 00:30:10,320
operations there with NASA's Leah

758
00:30:17,930 --> 00:30:16,010
thanks Megan and welcome to Mission

759
00:30:19,970 --> 00:30:17,940
Control Houston home of the Red White

760
00:30:21,470 --> 00:30:19,980
and Blue flight control rooms but today

761
00:30:23,149 --> 00:30:21,480
we're in the white flight control room

762
00:30:24,649 --> 00:30:23,159
which is just across the hall from where

763
00:30:27,230 --> 00:30:24,659

you usually see us in the International

764

00:30:28,970 --> 00:30:27,240

Space Station flight control room like

765

00:30:31,310 --> 00:30:28,980

this morning when we conducted a

766

00:30:32,990 --> 00:30:31,320

spacewalk outside the space station now

767

00:30:34,789 --> 00:30:33,000

this white flight control room has been

768

00:30:36,769 --> 00:30:34,799

used before during some space station

769

00:30:39,049 --> 00:30:36,779

missions plus commanding Boeing

770

00:30:40,549 --> 00:30:39,059

Starliner previously this room was used

771

00:30:43,370 --> 00:30:40,559

for space shuttle missions and was

772

00:30:45,289 --> 00:30:43,380

renovated in 2014 to support our use

773

00:30:47,630 --> 00:30:45,299

with the Artemis program

774

00:30:50,149 --> 00:30:47,640

today's flight director is Judd frieling

775

00:30:52,010 --> 00:30:50,159

of flight director of 11 years who will

776

00:30:54,409 --> 00:30:52,020

lead the team through the ascent portion

777

00:30:56,330 --> 00:30:54,419

of the mission after feeling shift today

778

00:30:57,590 --> 00:30:56,340

flight director Rick Le broad will lead

779

00:30:59,990 --> 00:30:57,600

the team through the rest of the mission

780

00:31:01,909 --> 00:31:00,000

all the way to entry and Splashdown when

781

00:31:03,769 --> 00:31:01,919

freeling will step in again

782

00:31:05,510 --> 00:31:03,779

other console members will be monitoring

783

00:31:07,909 --> 00:31:05,520

the various systems on Orion like

784

00:31:10,190 --> 00:31:07,919

propulsion solar arrays and trajectory

785

00:31:12,529 --> 00:31:10,200

and they arrived on Console about five

786

00:31:14,269 --> 00:31:12,539

hours ago and you might also be

787

00:31:16,610 --> 00:31:14,279

surprised to learn that there is indeed

788

00:31:18,830 --> 00:31:16,620

a Capcom or capsule communicator on

789

00:31:20,630 --> 00:31:18,840

Console today as well while there are no

790

00:31:23,210 --> 00:31:20,640

crew on board J marshky and other

791

00:31:25,190 --> 00:31:23,220

capsule caps capsule communicators will

792

00:31:27,830 --> 00:31:25,200

be training throughout the mission in

793

00:31:29,690 --> 00:31:27,840

preparation for Artemis 2 and Beyond the

794

00:31:31,549 --> 00:31:29,700

Capcom is the single person in the room

795

00:31:33,350 --> 00:31:31,559

who speaks with the crew Gathering info

796

00:31:34,850 --> 00:31:33,360

from Mission Control team and keeping

797

00:31:37,250 --> 00:31:34,860

streamlined communication with the

798

00:31:39,049 --> 00:31:37,260

astronauts in space we're counting down

799

00:31:40,789 --> 00:31:39,059

to lift off when teams here will really

800

00:31:43,070 --> 00:31:40,799

jump into action and monitor the first

801
00:31:45,169 --> 00:31:43,080
Artemis flight sending Orion further

802
00:31:47,630 --> 00:31:45,179
than any crew-rated spacecraft has gone

803
00:31:49,130 --> 00:31:47,640
before but for now Megan and Kayla will

804
00:31:50,570 --> 00:31:49,140
send it back to you at Kennedy Space

805
00:31:52,549 --> 00:31:50,580
Center to keep walking us through the

806
00:31:54,110 --> 00:31:52,559
events of the day well you just heard

807
00:31:56,570 --> 00:31:54,120
Leah remind us that no one is inside

808
00:31:58,909 --> 00:31:56,580
Orion today again it's because Artemis

809
00:32:01,370 --> 00:31:58,919
one is a flight test to prove we can

810
00:32:03,830 --> 00:32:01,380
safely return crew from lunar orbit on

811
00:32:05,630 --> 00:32:03,840
Artemis 2 and when we launched the first

812
00:32:07,250 --> 00:32:05,640
crude mission NASA has a very diverse

813
00:32:09,409 --> 00:32:07,260

and talented core to choose from

814

00:32:11,090 --> 00:32:09,419

including Kayla here uh we're looking at

815

00:32:13,310 --> 00:32:11,100

video now some of your friends who got

816

00:32:15,590 --> 00:32:13,320

to go to the pad

817

00:32:17,149 --> 00:32:15,600

that looks fun yeah it's always so

818

00:32:18,649 --> 00:32:17,159

exciting to see the rocket on the pad

819

00:32:21,649 --> 00:32:18,659

because you know you're getting close to

820

00:32:23,690 --> 00:32:21,659

launch so we're all just really excited

821

00:32:24,830 --> 00:32:23,700

to see how this test goes today I wish I

822

00:32:25,909 --> 00:32:24,840

could have gone out there with them you

823

00:32:29,090 --> 00:32:25,919

and me what happened we didn't get our

824

00:32:30,529 --> 00:32:29,100

invite and I thought this was fun too as

825

00:32:33,350 --> 00:32:30,539

some of your friends also got to fly

826

00:32:35,389 --> 00:32:33,360

over the pad in t-38s here's video of

827

00:32:37,190 --> 00:32:35,399

that now Incredible video so these

828

00:32:39,529 --> 00:32:37,200

flyovers were common during shuttle

829

00:32:41,870 --> 00:32:39,539

right yeah and we still try to do them

830

00:32:44,450 --> 00:32:41,880

whenever we can we actually use the t-38

831

00:32:46,190 --> 00:32:44,460

jet as a training platform it's a chance

832

00:32:47,990 --> 00:32:46,200

for us to practice making real world

833

00:32:50,630 --> 00:32:48,000

decisions in a high-risk environment

834

00:32:52,970 --> 00:32:50,640

practice working as a team in a good

835

00:32:54,950 --> 00:32:52,980

analog for space flight okay but we also

836

00:32:56,570 --> 00:32:54,960

like to fly by the pad when we can when

837

00:32:58,370 --> 00:32:56,580

we have a rocket out there it's a way of

838

00:32:59,810 --> 00:32:58,380

saluting and thanking the team for all

839

00:33:02,029 --> 00:32:59,820

the work it took to get to this moment

840

00:33:03,409 --> 00:33:02,039

that's great yeah a worthwhile thing to

841

00:33:04,970 --> 00:33:03,419

do because yes the team has worked so

842

00:33:06,769 --> 00:33:04,980

hard to get to this moment and you spoke

843

00:33:09,710 --> 00:33:06,779

about training has training already

844

00:33:11,750 --> 00:33:09,720

started for Artemis 2 for you guys we're

845

00:33:13,789 --> 00:33:11,760

we've been developing the training but

846

00:33:15,830 --> 00:33:13,799

the crews aren't assigned yet so they're

847

00:33:17,630 --> 00:33:15,840

not in dedicated training flows yet but

848

00:33:19,430 --> 00:33:17,640

our team at Johnson Space Center where

849

00:33:21,049 --> 00:33:19,440

we train for human space flight are

850

00:33:22,430 --> 00:33:21,059

working on all of the things that we're

851
00:33:24,649 --> 00:33:22,440
going to need to teach the crew and the

852
00:33:26,149 --> 00:33:24,659
best ways to go about that once we get

853
00:33:28,009 --> 00:33:26,159
that crew assigned they'll be straight

854
00:33:30,049 --> 00:33:28,019
into training right up until launch day

855
00:33:32,090 --> 00:33:30,059
awesome cool cool all right I can't wait

856
00:33:33,889 --> 00:33:32,100
to hear who gets assigned and the

857
00:33:35,570 --> 00:33:33,899
absence of crew today doesn't mean Orion

858
00:33:37,730 --> 00:33:35,580
is empty there are plenty of other

859
00:33:39,470 --> 00:33:37,740
interesting things flying on Artemis one

860
00:33:41,090 --> 00:33:39,480
including several technology

861
00:33:42,409 --> 00:33:41,100
demonstrations and science

862
00:33:44,269 --> 00:33:42,419
investigations we're going to show you

863
00:33:46,909 --> 00:33:44,279

throughout the broadcast there are also

864

00:33:48,830 --> 00:33:46,919

some mementos like these seeds that we

865

00:33:50,630 --> 00:33:48,840

have right here right Kayla yeah we have

866

00:33:52,130 --> 00:33:50,640

an example of the Moon seeds that will

867

00:33:53,630 --> 00:33:52,140

be flying as part of this Mission today

868

00:33:56,389 --> 00:33:53,640

and the idea actually comes from an

869

00:33:58,009 --> 00:33:56,399

Apollo 14 astronaut Stuart Russa who

870

00:33:59,269 --> 00:33:58,019

flew seeds with him to the Moon hundreds

871

00:34:00,950 --> 00:33:59,279

of them and then brought them back to

872

00:34:02,330 --> 00:34:00,960

Earth and then they were planted all

873

00:34:04,130 --> 00:34:02,340

over the country in the world and

874

00:34:06,769 --> 00:34:04,140

they're called Moon trees and so we're

875

00:34:08,869 --> 00:34:06,779

kind of carrying on with that idea on

876

00:34:10,550 --> 00:34:08,879

Orion for this launch yeah I love that

877

00:34:11,869 --> 00:34:10,560

and the the seeds that are flying on

878

00:34:14,270 --> 00:34:11,879

Artemis one is going to come back and

879

00:34:15,770 --> 00:34:14,280

they're going to distribute it uh to a

880

00:34:17,869 --> 00:34:15,780

number of organizations through NASA

881

00:34:20,629 --> 00:34:17,879

stem program so it's really a neat idea

882

00:34:22,430 --> 00:34:20,639

and so these Moon seeds are part of

883

00:34:25,669 --> 00:34:22,440

what's inside Artemis one's official

884

00:34:28,430 --> 00:34:25,679

flight kit along with more than 10 000

885

00:34:30,589 --> 00:34:28,440

other mementos like this Artemis this

886

00:34:33,770 --> 00:34:30,599

Apollo 8 commemorative metal you see

887

00:34:36,589 --> 00:34:33,780

here a nod to 1968 when humans first

888

00:34:39,889 --> 00:34:36,599

orbited the moon and a bolt from Apollo

889

00:34:42,109 --> 00:34:39,899

11 1969 when humans first landed on the

890

00:34:44,089 --> 00:34:42,119

moon those items are on loan to us from

891

00:34:45,950 --> 00:34:44,099

the National Air and Space Museum and

892

00:34:47,450 --> 00:34:45,960

once back on Earth will be exhibited

893

00:34:49,790 --> 00:34:47,460

there so you can check them out

894

00:34:51,649 --> 00:34:49,800

there are also a variety of flags pins

895

00:34:53,750 --> 00:34:51,659

and patches like these Artemis one

896

00:34:56,270 --> 00:34:53,760

patches that will be distributed to

897

00:34:58,250 --> 00:34:56,280

people who contributed to this flight

898

00:34:59,810 --> 00:34:58,260

now NASA spacecraft both crude and

899

00:35:02,570 --> 00:34:59,820

uncrewed have carried mementos like

900

00:35:04,370 --> 00:35:02,580

these since the 1960s astronauts are

901
00:35:06,050 --> 00:35:04,380
also allowed their own personal flight

902
00:35:08,870 --> 00:35:06,060
kit so I was wondering what did you

903
00:35:09,770 --> 00:35:08,880
bring with you for your crew 3 mission

904
00:35:11,630 --> 00:35:09,780
um I actually brought a couple of

905
00:35:12,950 --> 00:35:11,640
examples to show you the moon suits

906
00:35:14,930 --> 00:35:12,960
inspired me to share that I actually

907
00:35:15,890 --> 00:35:14,940
brought some vegetables oh that's

908
00:35:17,930 --> 00:35:15,900
awesome

909
00:35:19,970 --> 00:35:17,940
um so these are kind of fun they're

910
00:35:22,250 --> 00:35:19,980
Dragon themed so I got dragon carrots

911
00:35:24,770 --> 00:35:22,260
and dragon Bean oh that's I went up on a

912
00:35:25,910 --> 00:35:24,780
SpaceX crew Dragon vehicle sure um and

913
00:35:27,710 --> 00:35:25,920

then of course I think the most

914

00:35:29,450 --> 00:35:27,720

important meeting thing full thing to

915

00:35:31,430 --> 00:35:29,460

all of us is usually pictures of our

916

00:35:34,190 --> 00:35:31,440

family and friends so

917

00:35:36,589 --> 00:35:34,200

um Family yeah me and my family at my

918

00:35:40,930 --> 00:35:36,599

sister's wedding

919

00:35:45,010 --> 00:35:40,940

um friends backpacking in Alberta Canada

920

00:35:47,870 --> 00:35:45,020

and then my my in-laws

921

00:35:49,910 --> 00:35:47,880

together on a family vacation and I also

922

00:35:51,890 --> 00:35:49,920

brought some Flags some American flags

923

00:35:53,990 --> 00:35:51,900

and then United States Navy Flags since

924

00:35:55,970 --> 00:35:54,000

I'm a naval officer so things like that

925

00:35:58,490 --> 00:35:55,980

I think it's just so human to want to

926
00:36:00,890 --> 00:35:58,500
bring stuff with you right souvenirs who

927
00:36:02,690 --> 00:36:00,900
just love that yeah but I think for most

928
00:36:04,370 --> 00:36:02,700
of us yeah pictures of our family and

929
00:36:06,230 --> 00:36:04,380
friends things that connect us back home

930
00:36:07,910 --> 00:36:06,240
are the most important yeah you know six

931
00:36:10,010 --> 00:36:07,920
months might not sound like a long time

932
00:36:12,050 --> 00:36:10,020
for people but it is right wouldn't you

933
00:36:13,550 --> 00:36:12,060
saying you're also so far it's nice to

934
00:36:15,890 --> 00:36:13,560
have those tangible things that remind

935
00:36:17,870 --> 00:36:15,900
you of Home absolutely yeah really

936
00:36:19,069 --> 00:36:17,880
important for us cool cool thank you for

937
00:36:21,230 --> 00:36:19,079
bringing those those are really fun to

938
00:36:23,930 --> 00:36:21,240

look at all right one hour 27 minutes

939

00:36:26,089 --> 00:36:23,940

and Counting until uh launch and we have

940

00:36:28,250 --> 00:36:26,099

our first questions from social media so

941

00:36:30,170 --> 00:36:28,260

let's take a look at the clip here Kayla

942

00:36:32,930 --> 00:36:30,180

you're going to notice a familiar um

943

00:36:34,790 --> 00:36:32,940

handsome face

944

00:36:36,589 --> 00:36:34,800

hey there I'm Chris Evans and I play

945

00:36:38,870 --> 00:36:36,599

Buzz Lightyear and Pixar's light year

946

00:36:40,910 --> 00:36:38,880

movie I was wondering when we fly future

947

00:36:42,710 --> 00:36:40,920

Artemis missions with astronauts how

948

00:36:44,450 --> 00:36:42,720

many people can fly on board the Orion

949

00:36:46,550 --> 00:36:44,460

capsule at once

950

00:36:48,650 --> 00:36:46,560

my nephew's probably asleep but he's a

951
00:36:50,450 --> 00:36:48,660
big mudslayer fan so he's probably gonna

952
00:36:52,970 --> 00:36:50,460
enjoy watching that question tomorrow

953
00:36:56,150 --> 00:36:52,980
but we can get four astronauts in the

954
00:36:57,290 --> 00:36:56,160
Orion Space Capsule it's about it's a

955
00:36:59,210 --> 00:36:57,300
little bit bigger than the Apollo Castle

956
00:37:01,490 --> 00:36:59,220
about 30 percent more habitable volume

957
00:37:03,050 --> 00:37:01,500
and so instead of supporting three crew

958
00:37:05,450 --> 00:37:03,060
for about two weeks Orion can support

959
00:37:07,550 --> 00:37:05,460
four crew for about 21 days okay good

960
00:37:09,710 --> 00:37:07,560
good first question let's take a second

961
00:37:13,210 --> 00:37:09,720
question now

962
00:37:15,470 --> 00:37:13,220
can a microbiologist be an astronaut

963
00:37:17,990 --> 00:37:15,480

absolutely I already have

964

00:37:20,569 --> 00:37:18,000

microbiologists who are astronauts like

965

00:37:23,089 --> 00:37:20,579

my training classmate Xena Cardman

966

00:37:24,829 --> 00:37:23,099

um so yeah we we hire people from all

967

00:37:27,109 --> 00:37:24,839

sorts of different backgrounds all you

968

00:37:29,510 --> 00:37:27,119

have to do is have a stem degree beyond

969

00:37:31,310 --> 00:37:29,520

that you you can come from any pathway

970

00:37:32,990 --> 00:37:31,320

so some of us are military astronauts

971

00:37:34,849 --> 00:37:33,000

like me either Aviation or I'm a

972

00:37:36,170 --> 00:37:34,859

Submariner but we have a ton of people

973

00:37:37,550 --> 00:37:36,180

from different scientific and

974

00:37:40,010 --> 00:37:37,560

Engineering communities including

975

00:37:42,170 --> 00:37:40,020

microbiologists yeah I love that it's so

976

00:37:45,410 --> 00:37:42,180

diverse because I think diversity really

977

00:37:47,329 --> 00:37:45,420

adds to to what you guys can do yeah and

978

00:37:48,950 --> 00:37:47,339

those unique perspectives I think make

979

00:37:50,750 --> 00:37:48,960

us stronger as a team whenever we're

980

00:37:52,730 --> 00:37:50,760

tackling a new problem having people

981

00:37:54,589 --> 00:37:52,740

with different not only academic

982

00:37:56,089 --> 00:37:54,599

backgrounds but the all of these

983

00:37:58,310 --> 00:37:56,099

scientists A lot of them have different

984

00:37:59,690 --> 00:37:58,320

field experience so like Xena worked in

985

00:38:02,089 --> 00:37:59,700

some really extreme environments in

986

00:38:04,190 --> 00:38:02,099

Antarctica in caves doing a lot of her

987

00:38:05,690 --> 00:38:04,200

research so it's not that different than

988

00:38:07,849 --> 00:38:05,700

what we're hoping to do at the South

989

00:38:10,069 --> 00:38:07,859

Pole of the moon so these perspectives

990

00:38:12,349 --> 00:38:10,079

are really important for us to

991

00:38:14,030 --> 00:38:12,359

form the best team that we can yeah

992

00:38:15,710 --> 00:38:14,040

that's interesting all right I think we

993

00:38:18,530 --> 00:38:15,720

have time for one more question so why

994

00:38:21,230 --> 00:38:18,540

don't we pull one up what is the coolest

995

00:38:23,390 --> 00:38:21,240

part about Artemis to you

996

00:38:26,450 --> 00:38:23,400

I mean I think I can't even quite get my

997

00:38:28,730 --> 00:38:26,460

head around how it might feel for the

998

00:38:30,290 --> 00:38:28,740

crew to orbit the Moon on Artemis 2 and

999

00:38:32,210 --> 00:38:30,300

see it up close and then of course on

1000

00:38:34,550 --> 00:38:32,220

Artemis 3 to actually land on the moon

1001
00:38:36,829 --> 00:38:34,560
and conduct a moonwalk it's just going

1002
00:38:38,810 --> 00:38:36,839
to be incredible to have that view back

1003
00:38:40,490 --> 00:38:38,820
of our home planet and so just the

1004
00:38:42,530 --> 00:38:40,500
thought of human sending human beings

1005
00:38:44,150 --> 00:38:42,540
back to the moon it's just super

1006
00:38:45,109 --> 00:38:44,160
exciting for all of us I honestly didn't

1007
00:38:46,790 --> 00:38:45,119
know how you're going to answer that

1008
00:38:48,710 --> 00:38:46,800
because there is so many things to look

1009
00:38:50,450 --> 00:38:48,720
forward to to pinpoint you know the

1010
00:38:51,349 --> 00:38:50,460
thing that you're most excited about I

1011
00:38:54,170 --> 00:38:51,359
thought that was going to be a hard

1012
00:38:56,030 --> 00:38:54,180
question actually all right so great

1013
00:38:57,589 --> 00:38:56,040

questions keep them coming using hashtag

1014

00:38:59,690 --> 00:38:57,599

Artemis wherever you're watching this

1015

00:39:01,849 --> 00:38:59,700

broadcast and keep sending those Moon

1016

00:39:03,829 --> 00:39:01,859

inspired content too again that's

1017

00:39:04,970 --> 00:39:03,839

hashtag NASA Moon snap and we're going

1018

00:39:05,930 --> 00:39:04,980

to show some of them later on the

1019

00:39:08,210 --> 00:39:05,940

broadcast

1020

00:39:10,370 --> 00:39:08,220

okay one hour 24 minutes and Counting

1021

00:39:11,870 --> 00:39:10,380

until hopefully liftoff of Artemis one

1022

00:39:13,490 --> 00:39:11,880

and a time for another update with

1023

00:39:15,650 --> 00:39:13,500

NASA's Daryl nail who's with the launch

1024

00:39:17,750 --> 00:39:15,660

team as they were monitoring a leak

1025

00:39:20,030 --> 00:39:17,760

yeah that's right Megan we're inside uh

1026

00:39:21,770 --> 00:39:20,040

the firing room number one here at the

1027

00:39:24,050 --> 00:39:21,780

launch control center at the Kennedy

1028

00:39:26,150 --> 00:39:24,060

Space Center and uh currently we have an

1029

00:39:29,030 --> 00:39:26,160

update on that red crew which went out

1030

00:39:31,609 --> 00:39:29,040

to the pad to torque down some bolts on

1031

00:39:34,130 --> 00:39:31,619

a leaky hydrogen replenish valve for the

1032

00:39:36,530 --> 00:39:34,140

core stage and that update is that the

1033

00:39:39,829 --> 00:39:36,540

red crew has Departed the blast danger

1034

00:39:42,950 --> 00:39:39,839

area they have completed their work they

1035

00:39:46,849 --> 00:39:42,960

got the go at 10 pm this evening 10 p.m

1036

00:39:50,270 --> 00:39:46,859

eastern time to go out and conduct work

1037

00:39:52,490 --> 00:39:50,280

that took roughly uh an hour from the

1038

00:39:56,150 --> 00:39:52,500

time they were given the go till the

1039

00:39:59,210 --> 00:39:56,160

time they left the blast danger area

1040

00:40:01,730 --> 00:39:59,220

the technicians to technicians and one

1041

00:40:05,210 --> 00:40:01,740

safety representative uh did the work

1042

00:40:07,510 --> 00:40:05,220

out at the pad on the replenish valve

1043

00:40:10,970 --> 00:40:07,520

and now that they are on their way back

1044

00:40:14,089 --> 00:40:10,980

uh the team is now examining uh the work

1045

00:40:17,329 --> 00:40:14,099

and whether or not that uh leak is uh

1046

00:40:20,210 --> 00:40:17,339

still there what we do know is uh you

1047

00:40:23,030 --> 00:40:20,220

may have heard me mention that uh this

1048

00:40:24,170 --> 00:40:23,040

put the liquid hydrogen tank into stop

1049

00:40:27,530 --> 00:40:24,180

flow

1050

00:40:31,069 --> 00:40:27,540

and as a result also stopped a required

1051
00:40:33,710 --> 00:40:31,079
90-minute engine bleed for the liquid

1052
00:40:36,890 --> 00:40:33,720
hydrogen side

1053
00:40:41,150 --> 00:40:36,900
teams have come to the conclusion that

1054
00:40:44,210 --> 00:40:41,160
only a 45-minute bleed is required at

1055
00:40:46,310 --> 00:40:44,220
this point they can resume the bleed at

1056
00:40:48,050 --> 00:40:46,320
the point that they left off

1057
00:40:51,950 --> 00:40:48,060
and it'll be

1058
00:40:53,630 --> 00:40:51,960
um enough to meet that requirement

1059
00:40:55,310 --> 00:40:53,640
for launch

1060
00:40:58,490 --> 00:40:55,320
you're looking now at a graphic where

1061
00:41:01,490 --> 00:40:58,500
we're tracking the core stage fill rate

1062
00:41:04,190 --> 00:41:01,500
we did this earlier this evening took

1063
00:41:06,050 --> 00:41:04,200

about four hours and 20 minutes to fill

1064

00:41:08,690 --> 00:41:06,060

the core stage you can see on the left

1065

00:41:11,510 --> 00:41:08,700

that the core stage liquid oxygen is at

1066

00:41:13,550 --> 00:41:11,520

100 percent that's the same for the

1067

00:41:15,890 --> 00:41:13,560

upper stage and both are in stable

1068

00:41:18,230 --> 00:41:15,900

replenish as you can look to the right

1069

00:41:21,650 --> 00:41:18,240

though you can see that we're at 97

1070

00:41:24,349 --> 00:41:21,660

percent for liquid hydrogen a reason for

1071

00:41:25,430 --> 00:41:24,359

that is because when we went into stop

1072

00:41:28,069 --> 00:41:25,440

flow

1073

00:41:31,069 --> 00:41:28,079

that means that the replenish was no

1074

00:41:34,190 --> 00:41:31,079

longer refilling the tank and that

1075

00:41:37,250 --> 00:41:34,200

liquid hydrogen was boiling off

1076

00:41:39,589 --> 00:41:37,260

and uh draining some of the capacity out

1077

00:41:41,930 --> 00:41:39,599

of uh that particular tank so we've lost

1078

00:41:44,210 --> 00:41:41,940

some liquid hydrogen the plan is to

1079

00:41:47,030 --> 00:41:44,220

resume of course uh the filling of

1080

00:41:49,010 --> 00:41:47,040

liquid hydrogen which goes into that uh

1081

00:41:51,230 --> 00:41:49,020

into the liquid hydrogen tank on the

1082

00:41:53,450 --> 00:41:51,240

core stage and then vents out on that

1083

00:41:56,630 --> 00:41:53,460

flare stack that you see the right where

1084

00:41:58,370 --> 00:41:56,640

uh excess hydrogen is burned off that's

1085

00:42:00,770 --> 00:41:58,380

the latest here from firing room one

1086

00:42:02,329 --> 00:42:00,780

Megan we'll send it back to you thank

1087

00:42:04,310 --> 00:42:02,339

you Daryl all right let's go back inside

1088

00:42:06,890 --> 00:42:04,320

our Apollo Saturn 5 center now with

1089

00:42:09,050 --> 00:42:06,900

NASA's Dan Hewitt we last sent humans to

1090

00:42:10,849 --> 00:42:09,060

the Moon using the rocket behind you can

1091

00:42:13,910 --> 00:42:10,859

you show us how we're going back now

1092

00:42:15,829 --> 00:42:13,920

with Artemis absolutely thanks Megan so

1093

00:42:17,930 --> 00:42:15,839

Artemis one is going to take us from

1094

00:42:19,670 --> 00:42:17,940

planet Earth around the moon and all the

1095

00:42:22,310 --> 00:42:19,680

way back and I'm going to show you every

1096

00:42:24,410 --> 00:42:22,320

step of the way like every great space

1097

00:42:26,990 --> 00:42:24,420

mission it starts with the launch in

1098

00:42:29,270 --> 00:42:27,000

this case four rs-25 engines two solid

1099

00:42:31,430 --> 00:42:29,280

rocket boosters ignite sending SLS and

1100

00:42:33,050 --> 00:42:31,440

Orion into the sky on the way uphill

1101

00:42:35,089 --> 00:42:33,060

we'll have a number of jettison events

1102

00:42:37,370 --> 00:42:35,099

things coming off the rocket one of the

1103

00:42:38,810 --> 00:42:37,380

most visible these two large solid

1104

00:42:40,670 --> 00:42:38,820

rocket boosters a little over two

1105

00:42:42,770 --> 00:42:40,680

minutes into the flight will break away

1106

00:42:44,690 --> 00:42:42,780

we'll also have the launch abort system

1107

00:42:46,430 --> 00:42:44,700

come off once we're high enough and then

1108

00:42:48,290 --> 00:42:46,440

three fairings which are protecting

1109

00:42:49,730 --> 00:42:48,300

Orion's capsule and service module

1110

00:42:51,710 --> 00:42:49,740

during the flight through the thicker

1111

00:42:53,390 --> 00:42:51,720

parts of the atmosphere now after the

1112

00:42:55,130 --> 00:42:53,400

core stages consumed its propellants

1113

00:42:57,470 --> 00:42:55,140

we'll hear Mikko main engine cut off

1114

00:42:59,390 --> 00:42:57,480

those four engines will cut off the core

1115

00:43:01,430 --> 00:42:59,400

stage will drop away handing over

1116

00:43:03,950 --> 00:43:01,440

propulsion duties to this the interim

1117

00:43:06,410 --> 00:43:03,960

cryogenic propulsion stage

1118

00:43:08,210 --> 00:43:06,420

its first job is a perigee raised

1119

00:43:10,250 --> 00:43:08,220

maneuver perigee just means the lowest

1120

00:43:12,230 --> 00:43:10,260

point of your orbit this will give us a

1121

00:43:14,450 --> 00:43:12,240

nice circular path for Orion around our

1122

00:43:16,190 --> 00:43:14,460

planet while it's there we can really

1123

00:43:17,870 --> 00:43:16,200

check the spacecraft out make sure

1124

00:43:19,430 --> 00:43:17,880

everything from electrical systems

1125

00:43:21,470 --> 00:43:19,440

guidance navigation and control

1126

00:43:23,870 --> 00:43:21,480

Communications are all functioning

1127

00:43:26,390 --> 00:43:23,880

before we commit it to heading to the

1128

00:43:28,790 --> 00:43:26,400

moon and we do that with this the trans

1129

00:43:31,370 --> 00:43:28,800

lunar injection this will be about an 18

1130

00:43:34,370 --> 00:43:31,380

minute firing on today's timeline and

1131

00:43:36,650 --> 00:43:34,380

this is done to give us enough energy to

1132

00:43:39,230 --> 00:43:36,660

get out of low earth orbit and make our

1133

00:43:41,569 --> 00:43:39,240

way to the Moon shortly after that the

1134

00:43:43,370 --> 00:43:41,579

icps will separate it'll do a disposal

1135

00:43:45,349 --> 00:43:43,380

burn sending it around the moon and into

1136

00:43:47,150 --> 00:43:45,359

an orbit around the Sun but from there

1137

00:43:49,309 --> 00:43:47,160

on out propulsion duties get handed over

1138

00:43:50,750 --> 00:43:49,319

to the European service module it's

1139

00:43:52,910 --> 00:43:50,760

going to make a couple of outbound

1140

00:43:54,829 --> 00:43:52,920

trajectory correction Burns in the way

1141

00:43:56,630 --> 00:43:54,839

out critically testing that orbital

1142

00:43:58,309 --> 00:43:56,640

maneuvering system engine that large one

1143

00:43:59,690 --> 00:43:58,319

on the very bottom that's going to be

1144

00:44:01,670 --> 00:43:59,700

needed when we start making our

1145

00:44:03,770 --> 00:44:01,680

Maneuvers around the Moon to get into

1146

00:44:05,630 --> 00:44:03,780

what's known as distant retrograde orbit

1147

00:44:06,829 --> 00:44:05,640

or for dro

1148

00:44:08,750 --> 00:44:06,839

to do that we're going to do the

1149

00:44:11,030 --> 00:44:08,760

outbound powered flyby dipping in about

1150

00:44:12,890 --> 00:44:11,040

70 or 80 miles off the lunar surface

1151

00:44:14,390 --> 00:44:12,900

really pushing with that large engine

1152

00:44:16,130 --> 00:44:14,400

that's going to slingshot us around

1153

00:44:18,230 --> 00:44:16,140

we're going to do a final orbit

1154

00:44:20,510 --> 00:44:18,240

insertion maneuver and then we will be

1155

00:44:22,609 --> 00:44:20,520

in Dro distant retrograde orbit this

1156

00:44:25,250 --> 00:44:22,619

dotted line right here distant we're

1157

00:44:28,250 --> 00:44:25,260

about 40 000 miles off the lunar surface

1158

00:44:30,230 --> 00:44:28,260

and retrograde because the moon orbits

1159

00:44:31,930 --> 00:44:30,240

the earth in a counterclockwise fashion

1160

00:44:34,849 --> 00:44:31,940

we're going to be going clockwise

1161

00:44:37,430 --> 00:44:34,859

opposite retrograde it's a very stable

1162

00:44:39,589 --> 00:44:37,440

orbit doesn't require a lot of energy to

1163

00:44:41,630 --> 00:44:39,599

maintain your space there really lets us

1164

00:44:44,390 --> 00:44:41,640

put Orion through the paces learn about

1165

00:44:46,550 --> 00:44:44,400

using the spacecraft in in deep space

1166

00:44:48,650 --> 00:44:46,560

but eventually it'll be time to come

1167

00:44:51,170 --> 00:44:48,660

home we'll fire up the engines once more

1168

00:44:53,450 --> 00:44:51,180

do a departure burn this is what commits

1169

00:44:55,670 --> 00:44:53,460

us from departing the moon and heading

1170

00:44:57,530 --> 00:44:55,680

back home we'll dip in close to the

1171

00:45:00,109 --> 00:44:57,540

surface once more for the return powered

1172

00:45:02,150 --> 00:45:00,119

flyby and execute correction burns on

1173

00:45:04,790 --> 00:45:02,160

the return Transit as we target a

1174

00:45:06,710 --> 00:45:04,800

Splashdown in the Pacific Ocean

1175

00:45:08,630 --> 00:45:06,720

before that happens the spacecraft

1176

00:45:10,790 --> 00:45:08,640

separate the European service module's

1177

00:45:14,450 --> 00:45:10,800

job is done it drops a way to burn up

1178

00:45:16,910 --> 00:45:14,460

revealing the heat shield this is goal

1179

00:45:18,770 --> 00:45:16,920

number one for this flight is testing

1180

00:45:20,930 --> 00:45:18,780

that heat shield at lunar return

1181

00:45:22,670 --> 00:45:20,940

velocities because when we hit the upper

1182

00:45:25,309 --> 00:45:22,680

atmosphere we're going to be moving more

1183

00:45:27,410 --> 00:45:25,319

than 20 000 miles an hour and heating

1184

00:45:29,630 --> 00:45:27,420

that up to more than 5 000 degrees

1185

00:45:31,430 --> 00:45:29,640

Fahrenheit so really need to make sure

1186

00:45:33,470 --> 00:45:31,440

that that can withstand that heat of

1187

00:45:36,170 --> 00:45:33,480

re-entry after it makes it through

1188

00:45:37,970 --> 00:45:36,180

parachutes deploy Orion splashes down in

1189

00:45:40,490 --> 00:45:37,980

the Pacific a Navy ship and other

1190

00:45:42,530 --> 00:45:40,500

recovery assets are standing by to pick

1191

00:45:44,930 --> 00:45:42,540

it up out of the water and bring it in

1192

00:45:46,970 --> 00:45:44,940

to the first mission in the Artemis

1193

00:45:49,250 --> 00:45:46,980

program so that's all still going to

1194

00:45:50,450 --> 00:45:49,260

unfold it all starts with launch today

1195

00:45:52,670 --> 00:45:50,460

though so let's get back to the

1196

00:45:54,349 --> 00:45:52,680

countdown over to you Megan

1197

00:45:56,150 --> 00:45:54,359

our Return To The Moon would not be

1198

00:45:58,130 --> 00:45:56,160

possible without our partners across the

1199

00:46:01,250 --> 00:45:58,140

country and the world so joining us now

1200

00:46:03,170 --> 00:46:01,260

is Frank Divina head of esa's European

1201

00:46:05,809 --> 00:46:03,180

astronaut Center good evening to you

1202

00:46:08,329 --> 00:46:05,819

good evening well so I want to ask you

1203

00:46:10,790 --> 00:46:08,339

talk to me about Airbus and how that

1204

00:46:12,410 --> 00:46:10,800

company and Esa contributed to the Orion

1205

00:46:15,370 --> 00:46:12,420

spacecraft

1206

00:46:17,990 --> 00:46:15,380

well uh ambers is of course the the lead

1207

00:46:21,410 --> 00:46:18,000

manufacturer and integrator of the

1208

00:46:24,109 --> 00:46:21,420

service module of our Orion capsule and

1209

00:46:25,550 --> 00:46:24,119

that will fly to to the moon so this is

1210

00:46:27,230 --> 00:46:25,560

a very important part of course because

1211

00:46:30,349 --> 00:46:27,240

without the service module it's clear

1212

00:46:32,569 --> 00:46:30,359

that we would not get to the moon or not

1213

00:46:34,670 --> 00:46:32,579

be able to return from it so it's a very

1214

00:46:36,710 --> 00:46:34,680

important partner for for Isa better of

1215

00:46:38,630 --> 00:46:36,720

course there are Industries across

1216

00:46:40,790 --> 00:46:38,640

Europe not only Airbus but across Europe

1217

00:46:44,390 --> 00:46:40,800

that are contributing to the service

1218

00:46:46,550 --> 00:46:44,400

module in Italy in France Belgium really

1219

00:46:49,370 --> 00:46:46,560

it's a really European project

1220

00:46:51,829 --> 00:46:49,380

yeah Frank we've been close Partners

1221

00:46:53,569 --> 00:46:51,839

NASA and the European Space Agency for

1222

00:46:55,069 --> 00:46:53,579

decades now and partnering on things

1223

00:46:56,569 --> 00:46:55,079

like the space station scientific

1224

00:46:58,910 --> 00:46:56,579

exploration and of course commercial

1225

00:47:00,710 --> 00:46:58,920

crew missions Matthias Maurer Issa

1226

00:47:02,630 --> 00:47:00,720

astronaut extraordinaire was on my crew

1227

00:47:04,910 --> 00:47:02,640

crew three can you tell us a little bit

1228

00:47:06,410 --> 00:47:04,920

more about what makes these Partnerships

1229

00:47:08,569 --> 00:47:06,420

so important

1230

00:47:10,730 --> 00:47:08,579

well it's important these Partnerships

1231

00:47:12,410 --> 00:47:10,740

because we want to do sustainable

1232

00:47:15,050 --> 00:47:12,420

exploration of the Moon we want to

1233

00:47:17,150 --> 00:47:15,060

explore space on a sustainable way and I

1234

00:47:20,329 --> 00:47:17,160

think Partnerships in in that sense are

1235

00:47:22,250 --> 00:47:20,339

essential One Nation alone could they do

1236

00:47:24,230 --> 00:47:22,260

it the U.S maybe yes Europe certainly

1237

00:47:25,910 --> 00:47:24,240

could not participate to a lunar program

1238

00:47:28,370 --> 00:47:25,920

by themselves or could not do it by

1239

00:47:30,650 --> 00:47:28,380

themselves but I think if we do it as a

1240

00:47:32,210 --> 00:47:30,660

partnership we can go a lot further we

1241

00:47:35,450 --> 00:47:32,220

can do a lot more we can leverage

1242

00:47:38,030 --> 00:47:35,460

Technologies we can level talent in all

1243

00:47:39,470 --> 00:47:38,040

these countries across the globe that

1244

00:47:41,930 --> 00:47:39,480

can really push the the partnership

1245

00:47:43,430 --> 00:47:41,940

forward so looking ahead to Future

1246

00:47:46,309 --> 00:47:43,440

Artemis missions we're going to have

1247

00:47:48,230 --> 00:47:46,319

Issa astronauts on board those have you

1248

00:47:50,089 --> 00:47:48,240

guys begun preparing for that training

1249

00:47:52,550 --> 00:47:50,099

anything like that we have actually

1250

00:47:54,770 --> 00:47:52,560

started preparing already for uh lunar

1251
00:47:58,190 --> 00:47:54,780
missions surface missions we have a

1252
00:48:00,410 --> 00:47:58,200
program called Pangea in Iza which is

1253
00:48:02,510 --> 00:48:00,420
basically there are NASA astronauts

1254
00:48:05,569 --> 00:48:02,520
participating in in those trainings

1255
00:48:09,349 --> 00:48:05,579
Stephanie was just over with us just one

1256
00:48:11,150 --> 00:48:09,359
week ago doing field trips and we are

1257
00:48:12,950 --> 00:48:11,160
actually starting to prepare to see also

1258
00:48:15,710 --> 00:48:12,960
which Technologies do we need to use

1259
00:48:17,329 --> 00:48:15,720
that we can at the best possible way do

1260
00:48:19,790 --> 00:48:17,339
science on the moon because of course we

1261
00:48:22,309 --> 00:48:19,800
just do not go there to walk around or

1262
00:48:24,829 --> 00:48:22,319
do things we want to do uh real science

1263
00:48:26,390 --> 00:48:24,839

we want to do discoveries we want to

1264

00:48:28,490 --> 00:48:26,400

live there for a sustainable way so

1265

00:48:31,130 --> 00:48:28,500

which these Technologies do we need and

1266

00:48:32,870 --> 00:48:31,140

that we are actually starting already in

1267

00:48:34,430 --> 00:48:32,880

the European astronaut Center the we

1268

00:48:37,069 --> 00:48:34,440

actually started already more than five

1269

00:48:39,410 --> 00:48:37,079

years ago developing this this training

1270

00:48:41,150 --> 00:48:39,420

program so so yes we are involved again

1271

00:48:42,650 --> 00:48:41,160

together with our NASA colleagues and

1272

00:48:45,290 --> 00:48:42,660

colleagues from the the international

1273

00:48:47,510 --> 00:48:45,300

Partners to start preparing crew to

1274

00:48:50,030 --> 00:48:47,520

really do a sustainable surface

1275

00:48:51,530 --> 00:48:50,040

exploration of the Moon yeah and you

1276

00:48:52,910 --> 00:48:51,540

guys are doing more than just crew right

1277

00:48:55,069 --> 00:48:52,920

you guys were contributing to the

1278

00:48:57,109 --> 00:48:55,079

Artemis programs in other ways and we

1279

00:48:58,730 --> 00:48:57,119

are contributing to the Artemis program

1280

00:49:01,250 --> 00:48:58,740

in many ways of course the service

1281

00:49:03,470 --> 00:49:01,260

module uh that we will see launching

1282

00:49:05,450 --> 00:49:03,480

here hopefully uh today is is the

1283

00:49:07,790 --> 00:49:05,460

biggest part today but we are looking

1284

00:49:10,010 --> 00:49:07,800

into a lot of uh other uh capabilities

1285

00:49:12,650 --> 00:49:10,020

first of all there is the Gateway uh

1286

00:49:14,390 --> 00:49:12,660

that will be a real element to enable

1287

00:49:16,970 --> 00:49:14,400

the sustainable exploration of the Moon

1288

00:49:19,730 --> 00:49:16,980

we have the communication system on the

1289

00:49:21,710 --> 00:49:19,740

Gateway we have the ihap the habitation

1290

00:49:24,530 --> 00:49:21,720

module we have spree which is a

1291

00:49:26,390 --> 00:49:24,540

refueling module which is essential if

1292

00:49:28,370 --> 00:49:26,400

you want to sustain the Gateway there

1293

00:49:30,770 --> 00:49:28,380

for a longer period of time of course

1294

00:49:32,690 --> 00:49:30,780

you need to be able to to refuel the the

1295

00:49:35,510 --> 00:49:32,700

system so these are essential elements

1296

00:49:38,270 --> 00:49:35,520

again that is providing we're also

1297

00:49:40,609 --> 00:49:38,280

providing a small technology uh

1298

00:49:43,430 --> 00:49:40,619

experiments radiation for example will

1299

00:49:45,650 --> 00:49:43,440

be very important we are looking in crew

1300

00:49:47,930 --> 00:49:45,660

exercise device for the great way we are

1301
00:49:50,150 --> 00:49:47,940
looking into to Medical Systems so these

1302
00:49:51,890 --> 00:49:50,160
are also small components but for the

1303
00:49:53,450 --> 00:49:51,900
crew that are very important because we

1304
00:49:55,430 --> 00:49:53,460
need to creep the crew healthy there of

1305
00:49:56,630 --> 00:49:55,440
course your partner you have so much

1306
00:49:58,730 --> 00:49:56,640
that you're contributing we really

1307
00:50:00,650 --> 00:49:58,740
appreciate it we have a lot that we can

1308
00:50:02,510 --> 00:50:00,660
contribute and thank you and of course

1309
00:50:04,309 --> 00:50:02,520
in this ministerial because we have now

1310
00:50:06,470 --> 00:50:04,319
our ministerial conference coming up

1311
00:50:09,170 --> 00:50:06,480
next week where the big decisions are

1312
00:50:12,650 --> 00:50:09,180
going to be made for the next uh decade

1313
00:50:15,770 --> 00:50:12,660

and there we will propose a European

1314

00:50:18,470 --> 00:50:15,780

Lander that will bring Logistics to the

1315

00:50:20,390 --> 00:50:18,480

moon and this Logistics capability that

1316

00:50:22,609 --> 00:50:20,400

will be a big part of the integrated

1317

00:50:25,130 --> 00:50:22,619

Artemis program will allow us to have

1318

00:50:27,650 --> 00:50:25,140

European astronauts actually walking on

1319

00:50:29,329 --> 00:50:27,660

the moon so that is a really interesting

1320

00:50:31,790 --> 00:50:29,339

for us wow Frank thank you so much and

1321

00:50:32,990 --> 00:50:31,800

we continue to look forward to the

1322

00:50:34,490 --> 00:50:33,000

contributions that we can make together

1323

00:50:36,770 --> 00:50:34,500

with this partnership thank you so much

1324

00:50:39,170 --> 00:50:36,780

thank you for having me and good morning

1325

00:50:41,210 --> 00:50:39,180

to the viewers in Europe thank you so

1326
00:50:43,069 --> 00:50:41,220
much all right and speaking of viewers

1327
00:50:44,510 --> 00:50:43,079
we have a ton of people out here on

1328
00:50:46,250 --> 00:50:44,520
along the Space Coast of Florida

1329
00:50:48,470 --> 00:50:46,260
watching today's launch so let's head on

1330
00:50:50,150 --> 00:50:48,480
over to NASA's Liam Martin she's over at

1331
00:50:53,270 --> 00:50:50,160
the visitor center with whole bunch of

1332
00:50:54,589 --> 00:50:53,280
excited people oh my goodness Megan you

1333
00:50:55,970 --> 00:50:54,599
know this normally is a time of night

1334
00:50:58,309 --> 00:50:55,980
that people are winding down and getting

1335
00:50:59,930 --> 00:50:58,319
ready for bed but there is not a single

1336
00:51:02,270 --> 00:50:59,940
person here who has sleep on their mind

1337
00:51:04,309 --> 00:51:02,280
it is everybody is so excited on the

1338
00:51:05,809 --> 00:51:04,319

edge of their seat trading stories

1339

00:51:07,670 --> 00:51:05,819

talking about previous launches and

1340

00:51:09,710 --> 00:51:07,680

being excited for this one and I'm

1341

00:51:11,809 --> 00:51:09,720

actually joined here by three women who

1342

00:51:13,849 --> 00:51:11,819

are thrilled to come out and watch

1343

00:51:15,170 --> 00:51:13,859

tonight's launch what does it mean to be

1344

00:51:17,630 --> 00:51:15,180

out here and see this historic launch

1345

00:51:19,790 --> 00:51:17,640

tonight it's an amazing moment I grew up

1346

00:51:21,230 --> 00:51:19,800

on the space coast watching launches and

1347

00:51:23,089 --> 00:51:21,240

so to be out here tonight it's

1348

00:51:24,530 --> 00:51:23,099

incredible it's an amazing feeling to be

1349

00:51:26,630 --> 00:51:24,540

out with all of these people celebrating

1350

00:51:28,130 --> 00:51:26,640

and we're super excited to be here and

1351

00:51:30,230 --> 00:51:28,140

Isabel I know that you said that you

1352

00:51:31,549 --> 00:51:30,240

have been having your eyes on this

1353

00:51:32,870 --> 00:51:31,559

launch you've been watching on the

1354

00:51:35,150 --> 00:51:32,880

previous attempts what does it mean for

1355

00:51:37,190 --> 00:51:35,160

you to be here tonight well yeah this is

1356

00:51:38,630 --> 00:51:37,200

our third attempt here we were here for

1357

00:51:40,490 --> 00:51:38,640

the first and second here at Banana

1358

00:51:42,410 --> 00:51:40,500

Creek so we're really excited the energy

1359

00:51:44,270 --> 00:51:42,420

out here is electrifying and we can't

1360

00:51:47,030 --> 00:51:44,280

wait to see this thing go off

1361

00:51:48,530 --> 00:51:47,040

now this is the first of a series of

1362

00:51:50,990 --> 00:51:48,540

missions that are becoming increasingly

1363

00:51:53,390 --> 00:51:51,000

more complex what are you most excited

1364

00:51:55,910 --> 00:51:53,400

about for the Artemis missions Leah I am

1365

00:51:57,770 --> 00:51:55,920

so excited to be here I just feel so

1366

00:52:00,589 --> 00:51:57,780

honored because as you know this isn't

1367

00:52:03,290 --> 00:52:00,599

just a momentous launch for Humanity as

1368

00:52:05,150 --> 00:52:03,300

a whole it's so important for gender and

1369

00:52:07,430 --> 00:52:05,160

cultural minorities across the globe

1370

00:52:09,770 --> 00:52:07,440

because Artemis is landing the first

1371

00:52:11,390 --> 00:52:09,780

woman and the first person of color on

1372

00:52:14,030 --> 00:52:11,400

the surface of the Moon this is this

1373

00:52:15,770 --> 00:52:14,040

generation's Apollo and so all of the

1374

00:52:18,109 --> 00:52:15,780

people who didn't have the opportunity

1375

00:52:20,390 --> 00:52:18,119

to live through Apollo and be inspired

1376

00:52:22,730 --> 00:52:20,400

by that have the opportunity today to

1377

00:52:24,650 --> 00:52:22,740

witness it and I'm just so grateful to

1378

00:52:27,230 --> 00:52:24,660

be here I can't wait to see the positive

1379

00:52:28,430 --> 00:52:27,240

impact one more question uh this is

1380

00:52:30,410 --> 00:52:28,440

going to be something that you guys I'm

1381

00:52:32,750 --> 00:52:30,420

sure will remember for your entire lives

1382

00:52:34,490 --> 00:52:32,760

are how are you uh marking this and you

1383

00:52:35,569 --> 00:52:34,500

have any special plans of capturing

1384

00:52:38,030 --> 00:52:35,579

these memories and being able to pass

1385

00:52:39,770 --> 00:52:38,040

them on to you know people in your life

1386

00:52:41,329 --> 00:52:39,780

um well my son is growing up here I

1387

00:52:42,710 --> 00:52:41,339

didn't grow up here and so he's going to

1388

00:52:44,030 --> 00:52:42,720

grow up here on the space coast and I

1389

00:52:46,130 --> 00:52:44,040

just can't wait for him to just grow up

1390

00:52:47,750 --> 00:52:46,140

with the Artemis missions well Megan

1391

00:52:49,549 --> 00:52:47,760

we're out here we have our eye to the

1392

00:52:51,049 --> 00:52:49,559

sky and we can't wait to see it go back

1393

00:52:52,970 --> 00:52:51,059

to you

1394

00:52:55,010 --> 00:52:52,980

really great interviews and wow I saw

1395

00:52:56,930 --> 00:52:55,020

that drone shot that we had showing all

1396

00:52:58,250 --> 00:52:56,940

of the bleachers filled with people

1397

00:52:59,990 --> 00:52:58,260

there to watch the launch that was

1398

00:53:01,910 --> 00:53:00,000

incredible if you're just joining us

1399

00:53:04,609 --> 00:53:01,920

welcome to NASA's live launch coverage

1400

00:53:06,829 --> 00:53:04,619

of Artemis one our return to the Moon in

1401

00:53:08,750 --> 00:53:06,839

almost 50 years I'm NASA's Megan Cruz

1402

00:53:11,510 --> 00:53:08,760

and this is NASA astronaut Kayla veran

1403

00:53:13,430 --> 00:53:11,520

who flew on NASA's SpaceX crew 3 mission

1404

00:53:15,049 --> 00:53:13,440

and returned home earlier this year

1405

00:53:16,490 --> 00:53:15,059

after living and working on the

1406

00:53:19,010 --> 00:53:16,500

International Space Station for about

1407

00:53:20,150 --> 00:53:19,020

six months I gotta ask you how was that

1408

00:53:24,049 --> 00:53:20,160

experience

1409

00:53:27,230 --> 00:53:24,059

it was incredible we had such an amazing

1410

00:53:28,970 --> 00:53:27,240

time up there the Expedition 66 crew was

1411

00:53:30,530 --> 00:53:28,980

awesome I've been saying since I got

1412

00:53:32,510 --> 00:53:30,540

back that we're the happiest crew in the

1413

00:53:34,069 --> 00:53:32,520

history of the space station and

1414

00:53:36,109 --> 00:53:34,079

nobody's been able to really challenge

1415

00:53:38,690 --> 00:53:36,119

me on that yet you guys look very happy

1416

00:53:41,210 --> 00:53:38,700

in them oh man we were just like a

1417

00:53:43,549 --> 00:53:41,220

family up there executing an incredible

1418

00:53:46,490 --> 00:53:43,559

Mission some amazing science experiments

1419

00:53:48,410 --> 00:53:46,500

we got to do three space walks uh it was

1420

00:53:50,750 --> 00:53:48,420

just you couldn't have planned a perfect

1421

00:53:52,910 --> 00:53:50,760

first mission for me Matthias and Raja

1422

00:53:56,089 --> 00:53:52,920

and of course our veterans up there mark

1423

00:53:58,190 --> 00:53:56,099

and Tom we just it was it was amazing we

1424

00:53:59,809 --> 00:53:58,200

had an incredible time yeah wow look at

1425

00:54:00,770 --> 00:53:59,819

that photo of you in the cupola that is

1426

00:54:03,470 --> 00:54:00,780

amazing

1427

00:54:04,970 --> 00:54:03,480

yeah the views are beautiful it's just

1428

00:54:06,890 --> 00:54:04,980

like every time you look out the window

1429

00:54:08,390 --> 00:54:06,900

it takes your breath away wow and now

1430

00:54:10,730 --> 00:54:08,400

here you are adding some valuable

1431

00:54:12,890 --> 00:54:10,740

insight into Artemis one this is our

1432

00:54:14,630 --> 00:54:12,900

third opportunity to launch NASA's a

1433

00:54:16,730 --> 00:54:14,640

brand new space launch system rocket and

1434

00:54:18,650 --> 00:54:16,740

Orion spacecraft this is an uncrewed

1435

00:54:20,809 --> 00:54:18,660

flight test to pave the way for future

1436

00:54:23,630 --> 00:54:20,819

crude missions starting with Artemis 2

1437

00:54:24,950 --> 00:54:23,640

and Kayla you could be chosen to fly on

1438

00:54:27,349 --> 00:54:24,960

some of those future missions how does

1439

00:54:29,930 --> 00:54:27,359

that make you feel uh honestly it's a

1440

00:54:31,670 --> 00:54:29,940

little unbelievable to me I like could

1441

00:54:34,130 --> 00:54:31,680

barely imagine what it'd be like to go

1442

00:54:35,510 --> 00:54:34,140

to the space station until I did it and

1443

00:54:37,549 --> 00:54:35,520

just thinking about what it would be

1444

00:54:39,650 --> 00:54:37,559

like to look back at the Earth from

1445

00:54:42,589 --> 00:54:39,660

orbit around the moon or even standing

1446

00:54:45,230 --> 00:54:42,599

on the moon kind of blows my mind wow so

1447

00:54:46,970 --> 00:54:45,240

yeah it's hard hard to even imagine that

1448

00:54:49,970 --> 00:54:46,980

that's true but it's a really special

1449

00:54:51,410 --> 00:54:49,980

time to be at Nasa and an even more

1450

00:54:53,569 --> 00:54:51,420

special time to be in the astronaut

1451
00:54:57,049 --> 00:54:53,579
office yeah that's a beautiful picture

1452
00:54:59,089 --> 00:54:57,059
of you seeing the moon right yeah that's

1453
00:55:01,490 --> 00:54:59,099
a sort of a Moon spotting Adventure

1454
00:55:03,650 --> 00:55:01,500
there I've got binoculars one thing

1455
00:55:04,910 --> 00:55:03,660
that's really cool about seeing stars in

1456
00:55:06,109 --> 00:55:04,920
the Moon from orbit is you're not

1457
00:55:08,750 --> 00:55:06,119
looking at them through the atmosphere

1458
00:55:10,790 --> 00:55:08,760
so you get these very clear views and

1459
00:55:12,829 --> 00:55:10,800
the Moon is always super spherical you

1460
00:55:14,990 --> 00:55:12,839
never get these like sort of slices that

1461
00:55:18,589 --> 00:55:15,000
look kind of flat from Earth up there

1462
00:55:20,510 --> 00:55:18,599
you see it in 3D it feels like wow um so

1463
00:55:22,609 --> 00:55:20,520

yeah we I think we all sort of fall in

1464

00:55:25,190 --> 00:55:22,619

love with the Moon from space in a whole

1465

00:55:27,530 --> 00:55:25,200

new way yeah well today's launch attempt

1466

00:55:29,990 --> 00:55:27,540

comes amid a very busy year for us at

1467

00:55:32,089 --> 00:55:30,000

Nasa some of the highlights include two

1468

00:55:34,190 --> 00:55:32,099

more commercial crew launches with

1469

00:55:37,309 --> 00:55:34,200

SpaceX crew 4 in April you're seeing

1470

00:55:40,250 --> 00:55:37,319

there and crew 5 last month in May NASA

1471

00:55:42,589 --> 00:55:40,260

and Boeing flew off2 the second uncrewed

1472

00:55:44,329 --> 00:55:42,599

flight test of the Starliner capsule the

1473

00:55:45,530 --> 00:55:44,339

goal is to certify the capsule for

1474

00:55:48,170 --> 00:55:45,540

regular flights to the International

1475

00:55:50,990 --> 00:55:48,180

Space Station after a crude flight test

1476

00:55:54,049 --> 00:55:51,000

next year in July we released the first

1477

00:55:56,510 --> 00:55:54,059

images captured by our James Webb Space

1478

00:55:58,549 --> 00:55:56,520

Telescope and wow they are magnificent

1479

00:56:00,650 --> 00:55:58,559

pictures like these could help us answer

1480

00:56:03,230 --> 00:56:00,660

some of astronomy's biggest questions

1481

00:56:05,450 --> 00:56:03,240

about how our universe began

1482

00:56:07,790 --> 00:56:05,460

and then in September we intentionally

1483

00:56:10,430 --> 00:56:07,800

slammed the dart spacecraft into

1484

00:56:12,589 --> 00:56:10,440

asteroid dimorphous and successfully

1485

00:56:14,270 --> 00:56:12,599

changed its course the asteroid wasn't

1486

00:56:16,609 --> 00:56:14,280

headed for Earth that's important to say

1487

00:56:18,710 --> 00:56:16,619

but the test was to show that we could

1488

00:56:20,510 --> 00:56:18,720

defend our planet if needed

1489

00:56:22,790 --> 00:56:20,520

and recently two other missions that

1490

00:56:25,130 --> 00:56:22,800

benefit the Artemis program last week we

1491

00:56:27,349 --> 00:56:25,140

tested a new inflatable heat shield that

1492

00:56:29,690 --> 00:56:27,359

could help us eventually land humans on

1493

00:56:32,329 --> 00:56:29,700

Mars and just two days ago Capstone

1494

00:56:34,250 --> 00:56:32,339

arrived at its intended orbit around the

1495

00:56:36,230 --> 00:56:34,260

moon the small satellite launched from

1496

00:56:38,930 --> 00:56:36,240

New Zealand in June and will now test

1497

00:56:40,609 --> 00:56:38,940

the unique lunar orbit for a future

1498

00:56:41,809 --> 00:56:40,619

space station there you heard us talk

1499

00:56:43,910 --> 00:56:41,819

about a gateway

1500

00:56:45,890 --> 00:56:43,920

now Kayla what do you think about all

1501

00:56:47,990 --> 00:56:45,900

that NASA is accomplishing

1502

00:56:50,569 --> 00:56:48,000

I mean those are all just amazing

1503

00:56:53,089 --> 00:56:50,579

examples of why it's such a cool time to

1504

00:56:55,190 --> 00:56:53,099

be part of human space flight and the

1505

00:56:57,349 --> 00:56:55,200

larger Space Program we're learning so

1506

00:56:59,450 --> 00:56:57,359

much not only about our home planet but

1507

00:57:01,490 --> 00:56:59,460

our galaxy and the universe like those

1508

00:57:03,710 --> 00:57:01,500

James Webb images just capture my

1509

00:57:05,990 --> 00:57:03,720

imagination every time they release a

1510

00:57:07,670 --> 00:57:06,000

new set and so it's yeah we have a lot

1511

00:57:09,049 --> 00:57:07,680

going on and a lot to be excited about

1512

00:57:10,670 --> 00:57:09,059

right now I hope people are following

1513

00:57:12,829 --> 00:57:10,680

along for it because it is truly great

1514

00:57:15,049 --> 00:57:12,839

and we want people to to share along

1515

00:57:16,609 --> 00:57:15,059

with that so all right one hour six

1516

00:57:18,589 --> 00:57:16,619

minutes and Counting from liftoff of

1517

00:57:20,510 --> 00:57:18,599

Artemis one let's head back to the

1518

00:57:22,730 --> 00:57:20,520

launch control center with Daryl nail

1519

00:57:25,609 --> 00:57:22,740

yeah thanks Megan and uh so we get an

1520

00:57:27,710 --> 00:57:25,619

update for you now the red crew of

1521

00:57:30,109 --> 00:57:27,720

course completed its work on torquing

1522

00:57:33,290 --> 00:57:30,119

down the bolts for that replenish valve

1523

00:57:36,530 --> 00:57:33,300

on the core stage hydrogen side and now

1524

00:57:39,829 --> 00:57:36,540

we are back in replenish for core stage

1525

00:57:42,290 --> 00:57:39,839

hydrogen which is good news the team now

1526
00:57:45,109 --> 00:57:42,300
looking to work on that upper stage and

1527
00:57:48,349 --> 00:57:45,119
we understand for the update to the NASA

1528
00:57:52,309 --> 00:57:48,359
test director they just informed uh the

1529
00:57:55,250 --> 00:57:52,319
NTD that they can start getting back the

1530
00:57:58,370 --> 00:57:55,260
flow on the upper stage as well it went

1531
00:58:01,190 --> 00:57:58,380
into a stop flow roughly around 10 pm

1532
00:58:03,910 --> 00:58:01,200
eastern time after a leak was detected

1533
00:58:06,530 --> 00:58:03,920
you can see the core stage status there

1534
00:58:08,630 --> 00:58:06,540
liquid oxygen side is in stable

1535
00:58:10,730 --> 00:58:08,640
replenish both for the core stage and

1536
00:58:12,049 --> 00:58:10,740
the upper stage of the rocket over on

1537
00:58:14,870 --> 00:58:12,059
the right side you can see we've lost

1538
00:58:18,349 --> 00:58:14,880

some hydrogen since going into a stop

1539

00:58:21,890 --> 00:58:18,359

flow that allowed some liquid hydrogen

1540

00:58:25,250 --> 00:58:21,900

to boil off during about an hour or so

1541

00:58:28,010 --> 00:58:25,260

while a red crew was sent out to the

1542

00:58:31,010 --> 00:58:28,020

launch pad to make repairs

1543

00:58:34,250 --> 00:58:31,020

now the hydrogen bleed for the engines

1544

00:58:37,190 --> 00:58:34,260

was re-established and it looks like the

1545

00:58:40,789 --> 00:58:37,200

team is back on track to recover that

1546

00:58:43,010 --> 00:58:40,799

after a stop flow halted the bleed they

1547

00:58:45,950 --> 00:58:43,020

are required to bleed that liquid

1548

00:58:48,410 --> 00:58:45,960

hydrogen through the rs-25 engines for

1549

00:58:51,530 --> 00:58:48,420

90 minutes but they're picking up where

1550

00:58:52,609 --> 00:58:51,540

they left off and that appears to be on

1551
00:58:54,770 --> 00:58:52,619
track

1552
00:58:57,650 --> 00:58:54,780
in the meantime we've had an update from

1553
00:59:00,589 --> 00:58:57,660
the range and the range has informed the

1554
00:59:03,170 --> 00:59:00,599
NASA text director that currently at the

1555
00:59:06,890 --> 00:59:03,180
moment if we were to launch now they are

1556
00:59:09,890 --> 00:59:06,900
no go due to the loss of signal on a

1557
00:59:12,530 --> 00:59:09,900
Radar Site that's currently being worked

1558
00:59:14,510 --> 00:59:12,540
right now again the range advising the

1559
00:59:17,089 --> 00:59:14,520
NASA test director that they are no go

1560
00:59:20,210 --> 00:59:17,099
uh the range is not clear for launch

1561
00:59:22,970 --> 00:59:20,220
until they remedy that issue on their

1562
00:59:24,349 --> 00:59:22,980
Radar Site and so we're also tracking

1563
00:59:28,069 --> 00:59:24,359

that

1564

00:59:29,930 --> 00:59:28,079

in the meantime we started this at 3 23

1565

00:59:32,270 --> 00:59:29,940

p.m Eastern Time

1566

00:59:34,849 --> 00:59:32,280

got the core stage tanked in about four

1567

00:59:37,370 --> 00:59:34,859

hours and 23 minutes and now looking to

1568

00:59:40,250 --> 00:59:37,380

get everything back on track to try to

1569

00:59:43,190 --> 00:59:40,260

make that launch window at 104 a.m

1570

00:59:46,549 --> 00:59:43,200

eastern time which has a two hour window

1571

00:59:49,130 --> 00:59:46,559

associated with it all the way to 3 A.M

1572

00:59:51,829 --> 00:59:49,140

eastern time that's the latest from the

1573

00:59:53,930 --> 00:59:51,839

firing room Megan back to you thank you

1574

00:59:56,089 --> 00:59:53,940

Daryl now there may not be astronauts

1575

00:59:57,530 --> 00:59:56,099

aboard the Orion spacecraft for this

1576

00:59:59,569 --> 00:59:57,540

flight test but there are some

1577

01:00:02,170 --> 00:59:59,579

passengers there with very important

1578

01:00:06,890 --> 01:00:05,150

inside the Orion spacecraft as we fly

1579

01:00:08,510 --> 01:00:06,900

around the Moon we have some cool

1580

01:00:10,309 --> 01:00:08,520

experiments going on to help us

1581

01:00:11,990 --> 01:00:10,319

understand what the environment is like

1582

01:00:13,849 --> 01:00:12,000

although there's no humans aboard

1583

01:00:15,770 --> 01:00:13,859

Artemis one we do have a few special

1584

01:00:18,049 --> 01:00:15,780

passengers aboard that will help us pave

1585

01:00:19,910 --> 01:00:18,059

the way for future Artemis missions so

1586

01:00:21,109 --> 01:00:19,920

there's basically three occupants riding

1587

01:00:23,930 --> 01:00:21,119

kind of think about it like three

1588

01:00:26,990 --> 01:00:23,940

astronauts we have a moonikin we will

1589

01:00:28,670 --> 01:00:27,000

also have two torsos that are learning

1590

01:00:30,170 --> 01:00:28,680

about the moon and learning about the

1591

01:00:32,329 --> 01:00:30,180

environment for our astronauts before

1592

01:00:34,789 --> 01:00:32,339

they go we have a mannequin on Artemis

1593

01:00:36,349 --> 01:00:34,799

one we call them our moon again for

1594

01:00:39,589 --> 01:00:36,359

short that Moon again is called

1595

01:00:42,470 --> 01:00:39,599

Commander Moon again Campos the name is

1596

01:00:44,030 --> 01:00:42,480

actually in homage to Arturo Campos who

1597

01:00:46,549 --> 01:00:44,040

was an important person who helped bring

1598

01:00:48,890 --> 01:00:46,559

the Apollo 13 capsule home the moon

1599

01:00:51,829 --> 01:00:48,900

again will sit in the Commander's seat

1600

01:00:54,109 --> 01:00:51,839

and it will wear a suit just like our

1601
01:00:56,569 --> 01:00:54,119
astronauts will wear Moon compost is

1602
01:00:59,150 --> 01:00:56,579
actually weighted to simulate an actual

1603
01:01:00,650 --> 01:00:59,160
human aboard the Orion spacecraft so

1604
01:01:03,289 --> 01:01:00,660
will help us understand what our

1605
01:01:04,730 --> 01:01:03,299
astronauts will experience as they go to

1606
01:01:07,069 --> 01:01:04,740
the moon and home the Orion Cruise

1607
01:01:08,990 --> 01:01:07,079
survival system suit and the Orion sea

1608
01:01:11,270 --> 01:01:09,000
were designed simultaneously to fit

1609
01:01:14,630 --> 01:01:11,280
together as a seamless package the

1610
01:01:17,030 --> 01:01:14,640
actual design of the suit was built into

1611
01:01:19,549 --> 01:01:17,040
the Orion sea such that when they're in

1612
01:01:21,349 --> 01:01:19,559
the suit in the seat is a true Cocoon of

1613
01:01:23,030 --> 01:01:21,359

protection for them during this test

1614

01:01:25,309 --> 01:01:23,040

flight the seat will actually be

1615

01:01:26,870 --> 01:01:25,319

instrumented with accelerometers sensors

1616

01:01:29,030 --> 01:01:26,880

that tell us how much the chair is

1617

01:01:30,829 --> 01:01:29,040

shaking during launch and re-entry and

1618

01:01:32,809 --> 01:01:30,839

how many g-forces or gravitational

1619

01:01:34,789 --> 01:01:32,819

forces it experiences we expect

1620

01:01:36,650 --> 01:01:34,799

Commander Munich and compost to have a

1621

01:01:38,809 --> 01:01:36,660

very exciting ride on his way to orbit

1622

01:01:40,849 --> 01:01:38,819

the thrill of launch the experience of

1623

01:01:42,950 --> 01:01:40,859

weightlessness the excitement of Landing

1624

01:01:44,690 --> 01:01:42,960

what we learn on Artemis 1 with our

1625

01:01:46,370 --> 01:01:44,700

mannequins assistance will help us

1626

01:01:48,170 --> 01:01:46,380

better understand how a human will

1627

01:01:50,630 --> 01:01:48,180

actually behave in the sea both for

1628

01:01:52,849 --> 01:01:50,640

landing and for launch to allow us to

1629

01:01:55,309 --> 01:01:52,859

ensure their safety in addition to the

1630

01:01:57,650 --> 01:01:55,319

Moon again we'll have two seats that

1631

01:02:00,410 --> 01:01:57,660

have basically what's like a human dummy

1632

01:02:01,490 --> 01:02:00,420

an upper torso that are detecting how

1633

01:02:03,589 --> 01:02:01,500

much radiation their experience

1634

01:02:06,589 --> 01:02:03,599

experiencing it's called the matrushka

1635

01:02:08,390 --> 01:02:06,599

astrolog radiation experiment Mare Mare

1636

01:02:10,970 --> 01:02:08,400

is an international collaboration with

1637

01:02:14,089 --> 01:02:10,980

German Aerospace Center DLR and with

1638

01:02:16,970 --> 01:02:14,099

Israel space agency the mara experiment

1639

01:02:20,150 --> 01:02:16,980

consists of two anthropomorphic Phantoms

1640

01:02:23,210 --> 01:02:20,160

called Helga and Zohar that are

1641

01:02:25,670 --> 01:02:23,220

simulating a female body in a space

1642

01:02:28,069 --> 01:02:25,680

radiation environment one of those will

1643

01:02:30,650 --> 01:02:28,079

be wearing a safety vest the Astro

1644

01:02:32,569 --> 01:02:30,660

radiation vest that we hope will help

1645

01:02:34,910 --> 01:02:32,579

protect our astronauts from radiation

1646

01:02:38,150 --> 01:02:34,920

each one of the two Phantoms will be

1647

01:02:40,910 --> 01:02:38,160

equipped with about 20 battery operated

1648

01:02:43,430 --> 01:02:40,920

radiation instruments so between the two

1649

01:02:44,809 --> 01:02:43,440

we'll be able to determine how well we

1650

01:02:47,270 --> 01:02:44,819

can protect our astronauts from

1651

01:02:49,490 --> 01:02:47,280

radiation events space radiation is a

1652

01:02:52,370 --> 01:02:49,500

mix of high energy heavy charge

1653

01:02:54,890 --> 01:02:52,380

particles that originate from the Sun to

1654

01:02:57,530 --> 01:02:54,900

put things in perspective one year of

1655

01:02:59,690 --> 01:02:57,540

Earth exposure to cosmic rays is

1656

01:03:02,390 --> 01:02:59,700

equivalent with one day of space

1657

01:03:05,089 --> 01:03:02,400

radiation exposure in deep space the

1658

01:03:07,849 --> 01:03:05,099

purpose of the mara experiment is to

1659

01:03:11,390 --> 01:03:07,859

learn more about the radiation exposure

1660

01:03:13,430 --> 01:03:11,400

as well as the biological effects of

1661

01:03:16,370 --> 01:03:13,440

different organs so basically it's like

1662

01:03:18,470 --> 01:03:16,380

we have three occupants inside Orion

1663

01:03:19,970 --> 01:03:18,480

that are learning about the moon and

1664

01:03:22,190 --> 01:03:19,980

learning about the environment for our

1665

01:03:24,349 --> 01:03:22,200

astronauts before they go going back to

1666

01:03:26,630 --> 01:03:24,359

the Moon with new exploration goals and

1667

01:03:28,609 --> 01:03:26,640

new technologies will help us gain

1668

01:03:31,130 --> 01:03:28,619

better understanding of the challenges

1669

01:03:33,589 --> 01:03:31,140

we encounter with deep space exploration

1670

01:03:35,930 --> 01:03:33,599

we will have to develop new technology

1671

01:03:38,030 --> 01:03:35,940

and solutions to meet really difficult

1672

01:03:42,890 --> 01:03:38,040

challenges but that's what NASA does

1673

01:03:46,670 --> 01:03:44,809

and we have one more passenger to tell

1674

01:03:48,589 --> 01:03:46,680

you about it's everyone's favorite

1675

01:03:52,250 --> 01:03:48,599

beagle that's had a special connection

1676

01:03:55,849 --> 01:03:52,260

with NASA ever since Apollo

1677

01:03:59,030 --> 01:03:55,859

Artemis is NASA's plan to go back to the

1678

01:04:02,210 --> 01:03:59,040

moon and Snoopy is to be the zero

1679

01:04:04,609 --> 01:04:02,220

gravity indicator a zero D or a zero

1680

01:04:06,349 --> 01:04:04,619

gravity indicator demonstrates the

1681

01:04:09,710 --> 01:04:06,359

moment that the crew and the spacecraft

1682

01:04:12,410 --> 01:04:09,720

reach weightlessness Snoopy is about to

1683

01:04:15,109 --> 01:04:12,420

take his first trip around the moon the

1684

01:04:17,870 --> 01:04:15,119

relationship with NASA and Snoopy goes

1685

01:04:20,089 --> 01:04:17,880

back about 50 years since the Apollo

1686

01:04:23,809 --> 01:04:20,099

days he was the face of the safety

1687

01:04:26,450 --> 01:04:23,819

campaign the icon for NASA's culture of

1688

01:04:29,030 --> 01:04:26,460

safety and Mission success so NASA and

1689

01:04:32,750 --> 01:04:29,040

peanuts have a space act agreement and

1690

01:04:35,870 --> 01:04:32,760

we collaborate together on stem content

1691

01:04:38,030 --> 01:04:35,880

and we really were excited when it was

1692

01:04:40,609 --> 01:04:38,040

decided that Snoopy would be the zero

1693

01:04:43,069 --> 01:04:40,619

gravity indicator on Artemis one we

1694

01:04:45,650 --> 01:04:43,079

wanted to go all out so we created a

1695

01:04:47,870 --> 01:04:45,660

custom Snoopy and the spacesuit is

1696

01:04:50,930 --> 01:04:47,880

actually made out of material worn by

1697

01:04:53,750 --> 01:04:50,940

the NASA astronauts everything was done

1698

01:04:57,289 --> 01:04:53,760

with extreme detail tail they cut

1699

01:05:00,289 --> 01:04:57,299

patterns for his suit even how his

1700

01:05:04,250 --> 01:05:00,299

collar worked and how the NASA meatball

1701
01:05:09,650 --> 01:05:06,650
very excited I'm personally very excited

1702
01:05:12,289 --> 01:05:09,660
I can't contain the excitement I am

1703
01:05:14,690 --> 01:05:12,299
feeling about this day Snoopy is going

1704
01:05:16,970 --> 01:05:14,700
farther in space than he's ever been

1705
01:05:19,540 --> 01:05:16,980
before this is a day that we've all been

1706
01:05:22,190 --> 01:05:19,550
waiting for it's it's fantastic

1707
01:05:24,170 --> 01:05:22,200
[Music]

1708
01:05:26,930 --> 01:05:24,180
and we snapped this picture of Snoopy

1709
01:05:29,030 --> 01:05:26,940
and Orion he's comfortable and ready for

1710
01:05:31,730 --> 01:05:29,040
his journey to the Moon

1711
01:05:33,470 --> 01:05:31,740
lucky for us that Snoopy has this twin

1712
01:05:35,510 --> 01:05:33,480
that's staying here on Earth that way we

1713
01:05:37,609 --> 01:05:35,520

can take a closer look at how cute he is

1714

01:05:39,410 --> 01:05:37,619

and this Orange

1715

01:05:41,930 --> 01:05:39,420

um suit I mean it is amazing it's

1716

01:05:44,150 --> 01:05:41,940

actually uh the same material that would

1717

01:05:46,010 --> 01:05:44,160

be worn by Artemis astronauts right

1718

01:05:47,930 --> 01:05:46,020

yeah you know the suits will be wearing

1719

01:05:49,910 --> 01:05:47,940

an Artemis ultimately are an update of

1720

01:05:51,890 --> 01:05:49,920

the shoot suits that the shuttle Crews

1721

01:05:53,390 --> 01:05:51,900

wore that they're this iconic orange

1722

01:05:55,730 --> 01:05:53,400

color

1723

01:05:58,069 --> 01:05:55,740

um and we've updated them though for

1724

01:05:59,809 --> 01:05:58,079

with new technologies and also new crew

1725

01:06:01,609 --> 01:05:59,819

capabilities so that they can best

1726
01:06:03,109 --> 01:06:01,619
protect the crew and our Return To The

1727
01:06:05,329 --> 01:06:03,119
Moon I actually got to work with that

1728
01:06:06,710 --> 01:06:05,339
suit team before my assignment and so

1729
01:06:07,849 --> 01:06:06,720
the suit's kind of near and dear to my

1730
01:06:10,010 --> 01:06:07,859
heart yeah I think they have a picture

1731
01:06:12,289 --> 01:06:10,020
of you wearing the suit as part of when

1732
01:06:14,930 --> 01:06:12,299
you were helping to design it right

1733
01:06:16,670 --> 01:06:14,940
yeah so I was our representation from

1734
01:06:18,230 --> 01:06:16,680
the crew office from the astronaut

1735
01:06:19,670 --> 01:06:18,240
office to the engineering team that's

1736
01:06:21,410 --> 01:06:19,680
working on putting the suit together so

1737
01:06:24,529 --> 01:06:21,420
I got the chance to wear it for some of

1738
01:06:26,690 --> 01:06:24,539

the early testing and it is an amazing

1739

01:06:30,170 --> 01:06:26,700

suit and it'll protect us while we're in

1740

01:06:31,970 --> 01:06:30,180

the vehicle cool so what was your uh

1741

01:06:33,650 --> 01:06:31,980

zero g indicator

1742

01:06:35,690 --> 01:06:33,660

yeah like the video mentioned we always

1743

01:06:38,089 --> 01:06:35,700

choose stuffed animals so we actually

1744

01:06:39,910 --> 01:06:38,099

had a turtle we named her foul which is

1745

01:06:43,910 --> 01:06:39,920

German for peacock

1746

01:06:45,710 --> 01:06:43,920

and we chose that because Raj and I are

1747

01:06:47,029 --> 01:06:45,720

from the turtle training class so we

1748

01:06:49,370 --> 01:06:47,039

thought it would be fun to have a sea

1749

01:06:52,730 --> 01:06:49,380

turtle as our zero g indicator but we

1750

01:06:54,109 --> 01:06:52,740

wanted to have a nod to Matthias who is

1751

01:06:56,029 --> 01:06:54,119

a German astronaut so that's what gave

1752

01:06:58,130 --> 01:06:56,039

her a German name and Tom who's from the

1753

01:06:59,630 --> 01:06:58,140

peacock class so she's peacock colored

1754

01:07:01,490 --> 01:06:59,640

and it kind of worked for everybody I

1755

01:07:03,950 --> 01:07:01,500

was about to ask I was like wait why is

1756

01:07:06,349 --> 01:07:03,960

it German for peacock but it's a turtle

1757

01:07:09,109 --> 01:07:06,359

yeah exactly now I get it as a you know

1758

01:07:11,270 --> 01:07:09,119

diplomacy crew diplomacy now I get it so

1759

01:07:13,130 --> 01:07:11,280

we had Turtle we have snoopy here why is

1760

01:07:15,589 --> 01:07:13,140

it always toys

1761

01:07:17,150 --> 01:07:15,599

I think the tradition goes back to Crews

1762

01:07:19,130 --> 01:07:17,160

taking stuffed animals from their

1763

01:07:22,130 --> 01:07:19,140

children and sometimes flying the

1764

01:07:24,289 --> 01:07:22,140

stuffed animals of their kids that still

1765

01:07:26,150 --> 01:07:24,299

happens to this day when a cruise

1766

01:07:27,710 --> 01:07:26,160

selects a zero g indicator but they're

1767

01:07:29,390 --> 01:07:27,720

convenient because they're nice and soft

1768

01:07:30,890 --> 01:07:29,400

so if you're gonna allow something to

1769

01:07:32,750 --> 01:07:30,900

bounce around in the capsule you want to

1770

01:07:34,609 --> 01:07:32,760

make sure that it won't hurt the crew or

1771

01:07:36,109 --> 01:07:34,619

any of the equipment and they're cute I

1772

01:07:38,809 --> 01:07:36,119

mean come on who doesn't want to make

1773

01:07:40,789 --> 01:07:38,819

you smile yeah absolutely well NASA's

1774

01:07:43,250 --> 01:07:40,799

Workforce has changed over the last 50

1775

01:07:46,010 --> 01:07:43,260

years for Artemis one today women make

1776

01:07:47,329 --> 01:07:46,020

up 30 percent of the launch Team but

1777

01:07:50,270 --> 01:07:47,339

when we first stepped on the moon with

1778

01:07:52,010 --> 01:07:50,280

Apollo 11 in 1969 take a look at this

1779

01:07:55,069 --> 01:07:52,020

picture here

1780

01:07:58,549 --> 01:07:55,079

you see this woman highlighted near the

1781

01:08:02,990 --> 01:08:01,010

that's going to be Joanne Morgan and she

1782

01:08:04,910 --> 01:08:03,000

was the only woman in the firing room

1783

01:08:09,410 --> 01:08:04,920

she now has a special message for the

1784

01:08:14,809 --> 01:08:12,410

hello I'm Joanne Morgan and I am so

1785

01:08:16,789 --> 01:08:14,819

excited for Artemis Swan this flight

1786

01:08:18,950 --> 01:08:16,799

test will bring new knowledge to people

1787

01:08:22,070 --> 01:08:18,960

on Earth and I'm thrilled to see such a

1788

01:08:24,349 --> 01:08:22,080

diverse team at the LCC making it happen

1789

01:08:26,570 --> 01:08:24,359

firing room one is a different site

1790

01:08:29,450 --> 01:08:26,580

today than when I was on console for

1791

01:08:31,729 --> 01:08:29,460

Apollo 11. I was totally focused on

1792

01:08:34,430 --> 01:08:31,739

doing my job and never thought about

1793

01:08:37,849 --> 01:08:34,440

being the only woman in the room

1794

01:08:40,309 --> 01:08:37,859

today women at Nasa are Center directors

1795

01:08:42,650 --> 01:08:40,319

and launch and flight directors and have

1796

01:08:45,590 --> 01:08:42,660

substantial roles in engineering science

1797

01:08:47,390 --> 01:08:45,600

and technical areas this is so important

1798

01:08:49,910 --> 01:08:47,400

for a new generation the Artemis

1799

01:08:51,769 --> 01:08:49,920

generation to see how individuals are

1800

01:08:54,289 --> 01:08:51,779

leaders and contributors to the mission

1801

01:08:56,269 --> 01:08:54,299

and for youth Across America and the

1802

01:08:59,870 --> 01:08:56,279

planet to see this as well

1803

01:09:02,209 --> 01:08:59,880

after 50 years it is gratifying to see

1804

01:09:04,789 --> 01:09:02,219

this change and I can't wait to see what

1805

01:09:07,430 --> 01:09:04,799

you all accomplished together New

1806

01:09:10,370 --> 01:09:07,440

Century New Generation new mission to

1807

01:09:12,950 --> 01:09:10,380

the moon and Beyond godspeed Artemis

1808

01:09:14,689 --> 01:09:12,960

team and Artemis one

1809

01:09:16,490 --> 01:09:14,699

I think it's so great that we know she's

1810

01:09:19,309 --> 01:09:16,500

following along and interested in this

1811

01:09:21,050 --> 01:09:19,319

Mission too yeah it's so awesome to see

1812

01:09:23,450 --> 01:09:21,060

the women who have come before us at

1813

01:09:25,669 --> 01:09:23,460

Nasa and paved the way for a much more

1814

01:09:27,709 --> 01:09:25,679

diverse team to contribute to these

1815

01:09:29,630 --> 01:09:27,719

amazing missions yeah and speaking of

1816

01:09:31,550 --> 01:09:29,640

women breaking the mold before serving

1817

01:09:34,070 --> 01:09:31,560

as a NASA astronaut I know you were a

1818

01:09:36,050 --> 01:09:34,080

naval officer and a member of the first

1819

01:09:38,450 --> 01:09:36,060

class of women commissioned to the

1820

01:09:40,610 --> 01:09:38,460

submarine Community how amazing is that

1821

01:09:42,289 --> 01:09:40,620

I mean what would you say as you look at

1822

01:09:44,749 --> 01:09:42,299

these pictures what would you say to

1823

01:09:46,910 --> 01:09:44,759

women young girls who might be thinking

1824

01:09:48,289 --> 01:09:46,920

hey I might want to join a predominantly

1825

01:09:50,030 --> 01:09:48,299

male field

1826

01:09:51,349 --> 01:09:50,040

yeah you know I was just really lucky to

1827

01:09:53,450 --> 01:09:51,359

be in the right place at the right time

1828

01:09:54,590 --> 01:09:53,460

I was a senior at the Naval Academy when

1829

01:09:56,630 --> 01:09:54,600

they announced that they were going to

1830

01:09:59,209 --> 01:09:56,640

change the policy and allow us to serve

1831

01:10:00,890 --> 01:09:59,219

aboard submarines but even before that

1832

01:10:02,270 --> 01:10:00,900

change happened I knew that I was

1833

01:10:03,830 --> 01:10:02,280

passionate about serving in that role

1834

01:10:07,130 --> 01:10:03,840

and I was dreaming about it so I think

1835

01:10:09,650 --> 01:10:07,140

allowing yourself to really examine what

1836

01:10:10,970 --> 01:10:09,660

your passions are and be brave enough to

1837

01:10:12,950 --> 01:10:10,980

dream that you could actually do those

1838

01:10:15,290 --> 01:10:12,960

things I had awesome mentors who

1839

01:10:17,510 --> 01:10:15,300

encouraged me along the way and told me

1840

01:10:20,209 --> 01:10:17,520

never close a door on yourself you know

1841

01:10:21,530 --> 01:10:20,219

you always want to put yourself in the

1842

01:10:22,910 --> 01:10:21,540

roles you're most passionate about

1843

01:10:24,890 --> 01:10:22,920

especially if you're going to challenge

1844

01:10:26,630 --> 01:10:24,900

yourself doing something you love that's

1845

01:10:29,390 --> 01:10:26,640

hard is so much better than doing

1846

01:10:31,610 --> 01:10:29,400

something that you're not as well suited

1847

01:10:33,229 --> 01:10:31,620

to so I was just lucky I had some

1848

01:10:34,970 --> 01:10:33,239

awesome leaders in my life who

1849

01:10:36,470 --> 01:10:34,980

encouraged me to be brave enough to

1850

01:10:38,209 --> 01:10:36,480

dream so that when those opportunities

1851
01:10:39,950 --> 01:10:38,219
presented themselves I was ready to take

1852
01:10:41,810 --> 01:10:39,960
them on yeah no that's great having

1853
01:10:44,270 --> 01:10:41,820
mentors is always so important because

1854
01:10:45,890 --> 01:10:44,280
yes sometimes you don't know what path

1855
01:10:47,450 --> 01:10:45,900
to take especially if you're blazing

1856
01:10:49,490 --> 01:10:47,460
your own so it's always so nice to have

1857
01:10:50,930 --> 01:10:49,500
somebody to talk through some of that

1858
01:10:53,689 --> 01:10:50,940
absolutely

1859
01:10:56,030 --> 01:10:53,699
52 minutes until the opening of the two

1860
01:10:57,470 --> 01:10:56,040
hour window for Artemis one today once

1861
01:10:58,910 --> 01:10:57,480
it soars off the launch pad our

1862
01:11:00,470 --> 01:10:58,920
colleagues over in Houston will take

1863
01:11:17,169 --> 01:11:00,480

over Leah how are things looking in

1864

01:11:21,169 --> 01:11:19,610

hey Megan I'm here now and thanks for

1865

01:11:23,570 --> 01:11:21,179

joining us again here in the white

1866

01:11:25,130 --> 01:11:23,580

flight control room here at NASA's

1867

01:11:27,350 --> 01:11:25,140

Johnson Space Center so you might be

1868

01:11:28,970 --> 01:11:27,360

wondering why Johnson Space Center will

1869

01:11:30,770 --> 01:11:28,980

control the flight of Orion after

1870

01:11:32,510 --> 01:11:30,780

liftoff even though it's launching at

1871

01:11:34,490 --> 01:11:32,520

Kennedy Space Center and that's all

1872

01:11:36,649 --> 01:11:34,500

about how our flight control centers are

1873

01:11:39,050 --> 01:11:36,659

designed launch control is at Kennedy

1874

01:11:41,330 --> 01:11:39,060

while mission control is in Houston and

1875

01:11:43,189 --> 01:11:41,340

we also have the SLS engineering Support

1876

01:11:45,530 --> 01:11:43,199

Center at NASA's Marshall space flight

1877

01:11:48,110 --> 01:11:45,540

center ever since the Gemini 4 Mission

1878

01:11:50,510 --> 01:11:48,120

in 1965 all flights have been commanded

1879

01:11:52,310 --> 01:11:50,520

from Houston after launch so we have the

1880

01:11:54,290 --> 01:11:52,320

infrastructure and the experience here

1881

01:11:56,570 --> 01:11:54,300

at Johnson Space Center to work through

1882

01:11:59,510 --> 01:11:56,580

long duration missions with or in this

1883

01:12:01,550 --> 01:11:59,520

case without crew additionally launches

1884

01:12:04,010 --> 01:12:01,560

must be conducted over water rather than

1885

01:12:06,350 --> 01:12:04,020

overpopulated areas which makes Kennedy

1886

01:12:08,810 --> 01:12:06,360

Space Center a prime location again

1887

01:12:10,250 --> 01:12:08,820

we're ready to jump into action once SLS

1888

01:12:12,169 --> 01:12:10,260

takes flight and this room will be

1889

01:12:14,209 --> 01:12:12,179

staffed Around the Clock until Orion

1890

01:12:16,070 --> 01:12:14,219

splashes down at the end of the mission

1891

01:12:17,810 --> 01:12:16,080

we're excited to continue that work

1892

01:12:19,910 --> 01:12:17,820

today with Artemis 1 and throughout the

1893

01:12:23,090 --> 01:12:19,920

Artemis program but for now we'll turn

1894

01:12:25,130 --> 01:12:23,100

it back over to you Megan and Kayla

1895

01:12:26,810 --> 01:12:25,140

now the fully stacked SLS and Orion

1896

01:12:28,669 --> 01:12:26,820

system was rolled from the Vehicle

1897

01:12:31,310 --> 01:12:28,679

Assembly Building to the launch pad

1898

01:12:34,669 --> 01:12:31,320

about two weeks ago we captured this

1899

01:12:36,709 --> 01:12:34,679

video of the Four Mile nine hour Journey

1900

01:12:38,390 --> 01:12:36,719

it took a special transporter and a

1901

01:12:40,430 --> 01:12:38,400

special team of people to make it happen

1902

01:12:44,390 --> 01:12:40,440

hear from them what it's like to

1903

01:12:47,330 --> 01:12:44,400

shoulder the weight of this moment

1904

01:12:49,310 --> 01:12:47,340

the crawler transporter is a it's a

1905

01:12:50,630 --> 01:12:49,320

machine that goes and picks up the

1906

01:12:54,290 --> 01:12:50,640

mobile launcher

1907

01:12:55,850 --> 01:12:54,300

the SLS rocket with Orion it's basically

1908

01:12:58,130 --> 01:12:55,860

the Cornerstone of the mobile launch

1909

01:13:00,470 --> 01:12:58,140

concept without the crawler you couldn't

1910

01:13:02,570 --> 01:13:00,480

transport the mobile launcher and the

1911

01:13:04,970 --> 01:13:02,580

vehicle from the VAB to the pad or the

1912

01:13:06,830 --> 01:13:04,980

pad back to the VAB and it was designed

1913

01:13:09,530 --> 01:13:06,840

and built for the Apollo program to move

1914

01:13:11,570 --> 01:13:09,540

Saturn files to the launch pad since

1915

01:13:13,610 --> 01:13:11,580

then we've modified it and used it to

1916

01:13:14,930 --> 01:13:13,620

move the entire shuttle program and

1917

01:13:16,970 --> 01:13:14,940

after the shuttle program we did

1918

01:13:19,130 --> 01:13:16,980

extensive modifications and now it's to

1919

01:13:21,070 --> 01:13:19,140

be used to move Artemis to the launch

1920

01:13:25,669 --> 01:13:21,080

pad the crawler is

1921

01:13:28,250 --> 01:13:25,679

136 feet long from end to end it's 114

1922

01:13:30,169 --> 01:13:28,260

feet wide from the edge of the truck to

1923

01:13:33,530 --> 01:13:30,179

the other edge of the truck and it

1924

01:13:35,510 --> 01:13:33,540

weighs 6.6 million pounds it has the

1925

01:13:37,430 --> 01:13:35,520

power to do two miles an hour but you

1926

01:13:41,689 --> 01:13:37,440

never want to go that fast generally

1927

01:13:43,370 --> 01:13:41,699

we're around 0.83 for SLS Artemis will

1928

01:13:45,050 --> 01:13:43,380

be one of the heaviest loads we've ever

1929

01:13:46,970 --> 01:13:45,060

carried and one of the tallest loads

1930

01:13:48,530 --> 01:13:46,980

we've carried I am exceptionally proud

1931

01:13:50,990 --> 01:13:48,540

of our team they're very talented

1932

01:13:52,430 --> 01:13:51,000

they're very committed and they're

1933

01:13:54,770 --> 01:13:52,440

they're just all around good team I

1934

01:13:56,030 --> 01:13:54,780

think we'll any problem with crops up or

1935

01:13:58,189 --> 01:13:56,040

anything that comes up we'll fix it

1936

01:14:00,470 --> 01:13:58,199

we'll get moving again and again it

1937

01:14:01,970 --> 01:14:00,480

starts right here with the crawler so if

1938

01:14:03,290 --> 01:14:01,980

we do our job and everybody else does

1939

01:14:04,610 --> 01:14:03,300

theirs man we're going to have a

1940

01:14:06,290 --> 01:14:04,620

successful launch we're going back to

1941

01:14:09,830 --> 01:14:06,300

the moon this is going to be just

1942

01:14:13,490 --> 01:14:11,689

such an impressive team

1943

01:14:15,290 --> 01:14:13,500

crawler Kayla I mean this is a

1944

01:14:17,510 --> 01:14:15,300

certificate from the Guinness Book of

1945

01:14:20,270 --> 01:14:17,520

World Records yeah it's pretty cool

1946

01:14:23,229 --> 01:14:20,280

getting the recognized for the heaviest

1947

01:14:26,689 --> 01:14:23,239

self-powered vehicle in the world at

1948

01:14:28,189 --> 01:14:26,699

3106 tons that's amazing I know I know

1949

01:14:30,770 --> 01:14:28,199

we were just talking about how awesome

1950

01:14:32,930 --> 01:14:30,780

the crawler is I mean it was retrofit it

1951

01:14:36,290 --> 01:14:32,940

was it was created in the Apollo for the

1952

01:14:38,510 --> 01:14:36,300

Apollo uh missions and it was updated

1953

01:14:41,630 --> 01:14:38,520

modified for shuttle and now it's been

1954

01:14:44,649 --> 01:14:41,640

modified for Artemis it's just really an

1955

01:14:47,689 --> 01:14:44,659

amazing machine and the people who

1956

01:14:49,430 --> 01:14:47,699

keep it maintained and operate it like

1957

01:14:54,470 --> 01:14:49,440

I'm so glad that we could feature them

1958

01:14:56,209 --> 01:14:54,480

today absolutely all right so we are 48

1959

01:14:57,830 --> 01:14:56,219

minutes and Counting again from that

1960

01:14:59,930 --> 01:14:57,840

opening of the two-hour window we have

1961

01:15:01,970 --> 01:14:59,940

today Kayla if you thought you were

1962

01:15:05,209 --> 01:15:01,980

excited you have got to check out this

1963

01:15:11,149 --> 01:15:08,050

foreign

1964

01:15:12,830 --> 01:15:11,159

this is really cool we got some children

1965

01:15:14,630 --> 01:15:12,840

that are on a bus and they're going to

1966

01:15:16,490 --> 01:15:14,640

come here to the Vehicle Assembly

1967

01:15:18,410 --> 01:15:16,500

Building and the administrator and I are

1968

01:15:20,510 --> 01:15:18,420

going to jump on the bus and surprise

1969

01:15:23,689 --> 01:15:20,520

them we're going to give them the

1970

01:15:26,950 --> 01:15:23,699

opportunity to come in and go up the

1971

01:15:39,370 --> 01:15:26,960

elevator with the rocket

1972

01:15:42,490 --> 01:15:42,050

hey guys would you like to see a moon

1973

01:15:45,649 --> 01:15:42,500

rocket

1974

01:15:48,770 --> 01:15:45,659

[Applause]

1975

01:15:51,890 --> 01:15:48,780

because it is the future of our country

1976

01:15:55,209 --> 01:15:51,900

and indeed the future of the world uh

1977

01:15:57,950 --> 01:15:55,219

and we saw what our space program does

1978

01:16:00,169 --> 01:15:57,960

for Science and Technology and

1979

01:16:01,780 --> 01:16:00,179

Engineering and Mathematics we saw that

1980

01:16:04,209 --> 01:16:01,790

in the Apollo generation

1981

01:16:14,810 --> 01:16:04,219

[Music]

1982

01:16:17,750 --> 01:16:14,820

what I hope to achieve today is

1983

01:16:19,669 --> 01:16:17,760

inspiring a new generation I mean the

1984

01:16:22,490 --> 01:16:19,679

more people that we can get to see up

1985

01:16:25,550 --> 01:16:22,500

close and personal this rocket it just

1986

01:16:28,430 --> 01:16:25,560

it's awe-inspiring and I cannot wait

1987

01:16:29,570 --> 01:16:28,440

till the launch when America sees our

1988

01:16:32,330 --> 01:16:29,580

rocket

1989

01:16:34,610 --> 01:16:32,340

actually launch on a test flight to the

1990

01:16:36,830 --> 01:16:34,620

Moon you know it's just going to spark a

1991

01:16:40,010 --> 01:16:36,840

whole new push for what we are doing

1992

01:16:41,930 --> 01:16:40,020

best day of my whole life ever is going

1993

01:16:44,450 --> 01:16:41,940

to be incredible it was a dream come

1994

01:16:47,330 --> 01:16:44,460

true the song is definitely going to the

1995

01:16:48,530 --> 01:16:47,340

Moon I think it's really amazing I was

1996

01:16:50,350 --> 01:16:48,540

actually really excited because I've

1997

01:16:53,810 --> 01:16:50,360

never seen a rocket like this close-up

1998

01:16:56,390 --> 01:16:53,820

now we have the Artemis generation this

1999

01:16:59,570 --> 01:16:56,400

is a new generation of us going back to

2000

01:17:01,610 --> 01:16:59,580

the Moon to learn and live and then

2001

01:17:04,310 --> 01:17:01,620

we're going to Mars

2002

01:17:07,189 --> 01:17:04,320

yes

2003

01:17:10,370 --> 01:17:07,199

I told you they were so excited they're

2004

01:17:11,930 --> 01:17:10,380

so cute they're faces it was amazing I

2005

01:17:13,729 --> 01:17:11,940

think my face looked pretty similar the

2006

01:17:15,229 --> 01:17:13,739

first time I walked into the VAB and

2007

01:17:17,090 --> 01:17:15,239

looked up at that rocket I mean the

2008

01:17:18,830 --> 01:17:17,100

building is huge and standing at the

2009

01:17:21,709 --> 01:17:18,840

base of the rocket just takes your

2010

01:17:23,630 --> 01:17:21,719

breath away the scale of it you know 322

2011

01:17:26,570 --> 01:17:23,640

feet especially stacked on its end like

2012

01:17:28,250 --> 01:17:26,580

that is just amazing so I almost relived

2013

01:17:30,229 --> 01:17:28,260

my first time in the VAB through their

2014

01:17:31,850 --> 01:17:30,239

eyes and it was really cool there was

2015

01:17:33,470 --> 01:17:31,860

this opportunity where they got to just

2016

01:17:34,550 --> 01:17:33,480

ask any questions they wanted I was

2017

01:17:36,410 --> 01:17:34,560

there so they were asking me questions

2018

01:17:39,350 --> 01:17:36,420

they were asking the administrator

2019

01:17:41,630 --> 01:17:39,360

um uh Bob Cabana as well and they just

2020

01:17:43,550 --> 01:17:41,640

hands shot up they just had questions

2021

01:17:44,689 --> 01:17:43,560

and then sometimes I didn't really know

2022

01:17:45,950 --> 01:17:44,699

the answer and they're like well it's

2023

01:17:48,169 --> 01:17:45,960

this and I was like oh my God they know

2024

01:17:50,209 --> 01:17:48,179

so much and they're so interested in it

2025

01:17:51,950 --> 01:17:50,219

I mean again this is why we're doing

2026

01:17:54,350 --> 01:17:51,960

this this is this is part of the

2027

01:17:56,090 --> 01:17:54,360

inspiring the Next Generation absolutely

2028

01:17:58,490 --> 01:17:56,100

whenever I get a chance to interact with

2029

01:17:59,870 --> 01:17:58,500

with kids kind of of any age all the way

2030

01:18:00,890 --> 01:17:59,880

from elementary school up through

2031

01:18:02,750 --> 01:18:00,900

college

2032

01:18:04,430 --> 01:18:02,760

the human space flight program and

2033

01:18:06,530 --> 01:18:04,440

Artemis in particular I think really

2034

01:18:08,270 --> 01:18:06,540

captures people's imagination and gets

2035

01:18:10,310 --> 01:18:08,280

them interested in everything it takes

2036

01:18:12,530 --> 01:18:10,320

to do something so daring and so

2037

01:18:14,149 --> 01:18:12,540

complicated yeah and actually before we

2038

01:18:16,310 --> 01:18:14,159

move on an interesting note about the

2039

01:18:18,830 --> 01:18:16,320

opening music in that video it's an

2040

01:18:20,990 --> 01:18:18,840

original composition called the Artemis

2041

01:18:23,149 --> 01:18:21,000

generation performed by the Cooper

2042

01:18:24,709 --> 01:18:23,159

Middle School Band percussion section of

2043

01:18:27,110 --> 01:18:24,719

McLean Virginia

2044

01:18:29,209 --> 01:18:27,120

and to continue to inspire the Artemis

2045

01:18:30,950 --> 01:18:29,219

generation NASA invited students to take

2046

01:18:33,110 --> 01:18:30,960

part in a national essay contest

2047

01:18:35,510 --> 01:18:33,120

challenging them to imagine what it'd be

2048

01:18:37,250 --> 01:18:35,520

like to lead a week-long mission to the

2049

01:18:41,270 --> 01:18:37,260

moon's South Pole here's the first

2050

01:18:46,910 --> 01:18:43,970

I gazed out of our moonpod window just

2051
01:18:51,530 --> 01:18:46,920
before it was time to exit my crew 3 and

2052
01:18:56,630 --> 01:18:53,870
our crew consisted of a botanist an

2053
01:18:58,490 --> 01:18:56,640
engineer a doctor and me an

2054
01:19:00,169 --> 01:18:58,500
astrobiologist

2055
01:19:01,850 --> 01:19:00,179
we've been picked because of how well we

2056
01:19:03,649 --> 01:19:01,860
got along together with our

2057
01:19:07,490 --> 01:19:03,659
complementary stem backgrounds and our

2058
01:19:12,229 --> 01:19:09,590
Houston this is Artemis crew one

2059
01:19:14,320 --> 01:19:12,239
initiating airlock sequence I set a

2060
01:19:15,490 --> 01:19:14,330
Roman microphone

2061
01:19:18,229 --> 01:19:15,500
[Music]

2062
01:19:20,530 --> 01:19:18,239
I looked at my crewmates and as I

2063
01:19:24,710 --> 01:19:20,540

stepped over the Pod I felt so gratified

2064

01:19:28,930 --> 01:19:24,720

becoming the first woman on the moon

2065

01:19:33,290 --> 01:19:31,669

our purpose was to set up a moon habitat

2066

01:19:34,610 --> 01:19:33,300

containing the four things needed to

2067

01:19:37,490 --> 01:19:34,620

keep a crew safe

2068

01:19:40,310 --> 01:19:37,500

oxygen and clean water a Waste Disposal

2069

01:19:41,689 --> 01:19:40,320

system the veggie project for food and a

2070

01:19:44,390 --> 01:19:41,699

protective outside shell made of

2071

01:19:46,669 --> 01:19:44,400

regolith and mycelium

2072

01:19:48,649 --> 01:19:46,679

we will build it over the next week and

2073

01:19:53,290 --> 01:19:48,659

it will be used by other astronauts for

2074

01:19:58,010 --> 01:19:56,510

embarking on this incredible Adventure I

2075

01:20:00,410 --> 01:19:58,020

couldn't help but be grateful to be

2076

01:20:03,590 --> 01:20:00,420

given this opportunity to the most

2077

01:20:09,410 --> 01:20:03,600

remarkable crew and to know that I was a

2078

01:20:13,570 --> 01:20:11,450

so that was beautifully written by Taya

2079

01:20:16,490 --> 01:20:13,580

Sauer of Laguna California

2080

01:20:18,950 --> 01:20:16,500

and she was one of three essay winners

2081

01:20:21,890 --> 01:20:18,960

the two others were Austin pritz of

2082

01:20:23,870 --> 01:20:21,900

Walcott Indiana and Amanda Gutierrez of

2083

01:20:26,510 --> 01:20:23,880

Lincoln Nebraska if you want to check

2084

01:20:28,910 --> 01:20:26,520

out their essays you can scan the QR

2085

01:20:31,250 --> 01:20:28,920

code you see on the screen the three of

2086

01:20:33,110 --> 01:20:31,260

them beat out nearly 14

2087

01:20:34,430 --> 01:20:33,120

000 students who submitted Sac

2088

01:20:38,030 --> 01:20:34,440

definitely want to check out the other

2089

01:20:40,370 --> 01:20:38,040

two Again by scanning this QR code

2090

01:20:42,110 --> 01:20:40,380

so right now you're looking live at uh

2091

01:20:44,570 --> 01:20:42,120

right outside of Kennedy Space Center's

2092

01:20:47,030 --> 01:20:44,580

visitor complex we have uh plenty of

2093

01:20:48,890 --> 01:20:47,040

bleachers set out to accommodate as you

2094

01:20:50,810 --> 01:20:48,900

can see a lot of guests that are hoping

2095

01:20:52,490 --> 01:20:50,820

to see uh the launch today so why don't

2096

01:20:55,010 --> 01:20:52,500

we go in there and check back in with

2097

01:20:57,530 --> 01:20:55,020

NASA's Leo Martin

2098

01:21:01,250 --> 01:20:57,540

Hi Megan yeah this place is filling up

2099

01:21:06,229 --> 01:21:03,890

talking and you know we just heard about

2100

01:21:08,450 --> 01:21:06,239

those Artemis Moon pod essay winners who

2101
01:21:09,770 --> 01:21:08,460
are part of the Artemis generation also

2102
01:21:11,510 --> 01:21:09,780
joining me tonight from the Artemis

2103
01:21:13,790 --> 01:21:11,520
generation we have two students who were

2104
01:21:15,410 --> 01:21:13,800
actually able to come down and visit at

2105
01:21:17,689 --> 01:21:15,420
Kennedy Space Center to watch this

2106
01:21:20,510 --> 01:21:17,699
launch live tonight I'm joined here by

2107
01:21:22,490 --> 01:21:20,520
Denim and Allison how does it feel to be

2108
01:21:24,290 --> 01:21:22,500
here tonight

2109
01:21:25,910 --> 01:21:24,300
um really I was just when I first found

2110
01:21:28,370 --> 01:21:25,920
out I was really nervous I didn't really

2111
01:21:29,570 --> 01:21:28,380
know what to expect like we really just

2112
01:21:32,570 --> 01:21:29,580
looked at each other and we kind of

2113
01:21:35,330 --> 01:21:32,580

screamed just out of excitement how did

2114

01:21:37,130 --> 01:21:35,340

you feel honestly it was like amazing it

2115

01:21:39,050 --> 01:21:37,140

was surreal like that we have this

2116

01:21:41,450 --> 01:21:39,060

opportunity out of so many people who

2117

01:21:43,370 --> 01:21:41,460

applied for this it was like outstanding

2118

01:21:45,110 --> 01:21:43,380

and you guys actually got to take a tour

2119

01:21:46,669 --> 01:21:45,120

of Kennedy Space Center a little bit

2120

01:21:48,169 --> 01:21:46,679

earlier this week what was something

2121

01:21:51,290 --> 01:21:48,179

that you got to see that was just really

2122

01:21:54,169 --> 01:21:51,300

outstanding I think it was the shuttle

2123

01:21:56,510 --> 01:21:54,179

experience like how it is when the

2124

01:21:59,390 --> 01:21:56,520

rocket ship goes on up with people in it

2125

01:22:01,070 --> 01:21:59,400

it was honestly really fun doing it and

2126

01:22:03,350 --> 01:22:01,080

learning like how they feel at the

2127

01:22:04,970 --> 01:22:03,360

moment and denim what do you think it

2128

01:22:07,250 --> 01:22:04,980

will be like to watch the world's most

2129

01:22:09,470 --> 01:22:07,260

powerful rocket launch tonight from just

2130

01:22:10,910 --> 01:22:09,480

across the river well really I don't

2131

01:22:13,130 --> 01:22:10,920

really know what to expect because I

2132

01:22:14,390 --> 01:22:13,140

never really done this before but I I

2133

01:22:16,550 --> 01:22:14,400

feel like it would really be outstanding

2134

01:22:18,950 --> 01:22:16,560

I might shed a little tear but

2135

01:22:20,689 --> 01:22:18,960

um I don't really know like I was I'm

2136

01:22:23,930 --> 01:22:20,699

really excited to be here and I just

2137

01:22:25,070 --> 01:22:23,940

it's amazing like it is amazing and I

2138

01:22:27,350 --> 01:22:25,080

don't think you're going to be the only

2139

01:22:29,570 --> 01:22:27,360

one shedding tears tonight Megan we're

2140

01:22:31,550 --> 01:22:29,580

super excited eyes on the Artemis and

2141

01:22:33,470 --> 01:22:31,560

we're ready to see the launch

2142

01:22:34,729 --> 01:22:33,480

thanks so much guys

2143

01:22:36,229 --> 01:22:34,739

now Kayla are you ready for more

2144

01:22:38,390 --> 01:22:36,239

questions from social media we're

2145

01:22:39,590 --> 01:22:38,400

getting them in always all right let's

2146

01:22:43,550 --> 01:22:39,600

take a look at the screen now we have

2147

01:22:48,410 --> 01:22:46,070

hey I'm Kiki Palmer and I play Izzy

2148

01:22:51,890 --> 01:22:48,420

Hawthorne and Pixar's light year and I

2149

01:22:54,350 --> 01:22:51,900

can't wait to see Artemis 1 launch today

2150

01:22:56,090 --> 01:22:54,360

how we're going back to the Moon paved

2151
01:22:58,430 --> 01:22:56,100
the way to Mars

2152
01:23:00,709 --> 01:22:58,440
thank you Katie yeah what an awesome

2153
01:23:02,450 --> 01:23:00,719
question for tonight I mean the return

2154
01:23:04,610 --> 01:23:02,460
to the moon is going to give us a chance

2155
01:23:07,250 --> 01:23:04,620
to test all of the capabilities we need

2156
01:23:09,290 --> 01:23:07,260
to operate on Mars Mars is really far

2157
01:23:11,270 --> 01:23:09,300
from now it's going to take us six

2158
01:23:13,850 --> 01:23:11,280
months just to get there and that's with

2159
01:23:16,070 --> 01:23:13,860
ideal planetary alignment and expected

2160
01:23:17,689 --> 01:23:16,080
advances in propulsion technology then

2161
01:23:19,370 --> 01:23:17,699
we'll spend about a year plus on the

2162
01:23:21,169 --> 01:23:19,380
surface before it's in you know six

2163
01:23:22,790 --> 01:23:21,179

months home and so the Moon is a lot

2164

01:23:24,950 --> 01:23:22,800

closer we can get there in three days

2165

01:23:27,649 --> 01:23:24,960

the communications delay is a lot

2166

01:23:29,450 --> 01:23:27,659

shorter and so we can really test our

2167

01:23:31,910 --> 01:23:29,460

operational Concepts a lot closer to

2168

01:23:33,649 --> 01:23:31,920

home the moon's super far away it's 250

2169

01:23:35,330 --> 01:23:33,659

000 miles but that's way closer than

2170

01:23:37,970 --> 01:23:35,340

Mars so it's going to give us a chance

2171

01:23:40,310 --> 01:23:37,980

to test all of our Technologies so that

2172

01:23:42,830 --> 01:23:40,320

we know what we need to develop in order

2173

01:23:45,169 --> 01:23:42,840

to take that next step yeah it's a we

2174

01:23:47,750 --> 01:23:45,179

call it the next giant step for a reason

2175

01:23:49,610 --> 01:23:47,760

Mars is very very far like you said all

2176

01:23:52,669 --> 01:23:49,620

right let's take another question from

2177

01:23:54,470 --> 01:23:52,679

social media Kayla what inspired you to

2178

01:23:56,030 --> 01:23:54,480

be an astronaut

2179

01:23:57,470 --> 01:23:56,040

you know my journey was a little bit

2180

01:23:59,209 --> 01:23:57,480

different than some of my colleagues I

2181

01:24:00,830 --> 01:23:59,219

didn't grow up specifically dreaming of

2182

01:24:02,870 --> 01:24:00,840

becoming an astronaut I don't know what

2183

01:24:04,490 --> 01:24:02,880

the barrier was there I was aware of and

2184

01:24:06,110 --> 01:24:04,500

inspired by the space program but I

2185

01:24:08,450 --> 01:24:06,120

never allowed myself to dream of

2186

01:24:10,430 --> 01:24:08,460

becoming an astronaut until I had served

2187

01:24:12,530 --> 01:24:10,440

on a submarine actually

2188

01:24:14,450 --> 01:24:12,540

um I think that operational experience

2189

01:24:15,770 --> 01:24:14,460

that's so similar to what we do in the

2190

01:24:17,750 --> 01:24:15,780

space program if you think about it

2191

01:24:19,490 --> 01:24:17,760

we're sending humans to live work and do

2192

01:24:20,990 --> 01:24:19,500

something of importance in a place where

2193

01:24:23,149 --> 01:24:21,000

people aren't supposed to be the depths

2194

01:24:25,250 --> 01:24:23,159

of the ocean or the vacuum of space and

2195

01:24:26,810 --> 01:24:25,260

so I think those experiences gave me the

2196

01:24:29,390 --> 01:24:26,820

confidence to even dream that I could

2197

01:24:31,189 --> 01:24:29,400

become an astronaut and then inspired me

2198

01:24:33,229 --> 01:24:31,199

to apply in the first place and that

2199

01:24:34,669 --> 01:24:33,239

doesn't deter you again like being in a

2200

01:24:37,010 --> 01:24:34,679

place where yeah we're not supposed to

2201

01:24:39,950 --> 01:24:37,020

be a confined space at that

2202

01:24:41,330 --> 01:24:39,960

yeah I think those parallels the I I got

2203

01:24:43,430 --> 01:24:41,340

a chance to meet an astronaut after

2204

01:24:45,169 --> 01:24:43,440

serving on my submarine K hire who's

2205

01:24:47,990 --> 01:24:45,179

also a Naval Academy graduate class of

2206

01:24:50,990 --> 01:24:48,000

1981 and hearing about her experiences

2207

01:24:53,149 --> 01:24:51,000

working on the space station really made

2208

01:24:55,130 --> 01:24:53,159

me click all of a sudden I said this the

2209

01:24:57,229 --> 01:24:55,140

Space Station's a submarine in space yes

2210

01:24:59,090 --> 01:24:57,239

and it sounds silly but I never made

2211

01:25:00,770 --> 01:24:59,100

that connection before and once I did I

2212

01:25:02,390 --> 01:25:00,780

just couldn't stop dreaming about it oh

2213

01:25:05,510 --> 01:25:02,400

that's so cool I love that your story

2214

01:25:06,470 --> 01:25:05,520

isn't uh uh you know the typical one as

2215

01:25:08,030 --> 01:25:06,480

he said

2216

01:25:10,130 --> 01:25:08,040

okay I think we have time for one more

2217

01:25:14,570 --> 01:25:10,140

question

2218

01:25:16,610 --> 01:25:14,580

ah is Snoopy ready and excited of course

2219

01:25:18,890 --> 01:25:16,620

I think like any crew member Snoopy's

2220

01:25:20,510 --> 01:25:18,900

been training for this moment he knows

2221

01:25:22,010 --> 01:25:20,520

what to expect in a nominal and an

2222

01:25:24,110 --> 01:25:22,020

off-nominal launch and all the actions

2223

01:25:26,149 --> 01:25:24,120

expected of him so like any good crew

2224

01:25:28,130 --> 01:25:26,159

member he's ready to go and he has a

2225

01:25:30,050 --> 01:25:28,140

suit that's been tailored to him it's

2226

01:25:32,149 --> 01:25:30,060

especially made for him the way that the

2227

01:25:33,830 --> 01:25:32,159

astronaut suits are especially made for

2228

01:25:35,750 --> 01:25:33,840

them so yeah I think he's ready yeah

2229

01:25:38,149 --> 01:25:35,760

seeing the Moon up close he's ready to

2230

01:25:40,370 --> 01:25:38,159

go so keep those questions coming use

2231

01:25:41,570 --> 01:25:40,380

that hashtag Artemis and tweet or drop

2232

01:25:43,189 --> 01:25:41,580

them in the comments wherever you're

2233

01:25:46,790 --> 01:25:43,199

watching this broadcast and don't forget

2234

01:25:49,850 --> 01:25:46,800

those NASA Moon snaps hashtag NASA Moon

2235

01:25:52,310 --> 01:25:49,860

snap for your moon inspired content

2236

01:25:53,870 --> 01:25:52,320

okay we are now 37 minutes from the

2237

01:25:55,970 --> 01:25:53,880

opening of our two hour launch window

2238

01:25:58,189 --> 01:25:55,980

today let's check check back in with

2239

01:26:00,169 --> 01:25:58,199

Daryl uh with the launch Team

2240

01:26:02,689 --> 01:26:00,179

yeah we've had a couple of issues that

2241

01:26:05,570 --> 01:26:02,699

the launch team has been working and we

2242

01:26:08,510 --> 01:26:05,580

have an update on both of those first of

2243

01:26:11,090 --> 01:26:08,520

all uh is the leak the liquid hydrogen

2244

01:26:12,770 --> 01:26:11,100

leak and the replenish valve out at the

2245

01:26:14,870 --> 01:26:12,780

mobile launcher we understand from the

2246

01:26:17,629 --> 01:26:14,880

launch team that that leak has not

2247

01:26:20,810 --> 01:26:17,639

recurred the work that happened out at

2248

01:26:22,970 --> 01:26:20,820

the pad is that the red crew and the

2249

01:26:26,629 --> 01:26:22,980

work that they did out there remedied

2250

01:26:29,209 --> 01:26:26,639

the leak that's good news and now the

2251

01:26:33,890 --> 01:26:29,219

liquid hydrogen tank on the core stage

2252

01:26:37,129 --> 01:26:33,900

is back in replenish at this moment and

2253

01:26:41,209 --> 01:26:37,139

the upper stage of the rocket liquid

2254

01:26:43,129 --> 01:26:41,219

hydrogen side is in fast fill you can

2255

01:26:45,890 --> 01:26:43,139

see from the graphic there that we are

2256

01:26:48,050 --> 01:26:45,900

back up to 100 over on the liquid

2257

01:26:50,149 --> 01:26:48,060

hydrogen side on the right hand of the

2258

01:26:52,550 --> 01:26:50,159

screen on the left hand of the screen

2259

01:26:55,970 --> 01:26:52,560

you can see we have been in stable

2260

01:26:58,370 --> 01:26:55,980

replenish for liquid oxygen

2261

01:27:00,830 --> 01:26:58,380

now with regards to the range they

2262

01:27:04,030 --> 01:27:00,840

reported that they had an issue to the

2263

01:27:07,970 --> 01:27:04,040

NASA test director with their Radar Site

2264

01:27:11,450 --> 01:27:07,980

later found out that that was actually a

2265

01:27:14,030 --> 01:27:11,460

bad ethernet switch that was uh cutting

2266

01:27:16,010 --> 01:27:14,040

out and not providing them the data the

2267

01:27:17,990 --> 01:27:16,020

range reported that they will swap out

2268

01:27:20,510 --> 01:27:18,000

that bad switch

2269

01:27:23,810 --> 01:27:20,520

and they're currently working on that

2270

01:27:25,490 --> 01:27:23,820

they advised at the time about uh a half

2271

01:27:27,530 --> 01:27:25,500

hour ago that it would take them about

2272

01:27:30,709 --> 01:27:27,540

70 minutes

2273

01:27:33,290 --> 01:27:30,719

or about 25 minutes into that work they

2274

01:27:35,570 --> 01:27:33,300

did uh just recently update the NASA

2275

01:27:37,729 --> 01:27:35,580

test director to say that uh it's going

2276

01:27:39,950 --> 01:27:37,739

to take them a little bit longer because

2277

01:27:42,410 --> 01:27:39,960

they're going to need to re-verify this

2278

01:27:45,709 --> 01:27:42,420

ethernet equipment once they have it

2279

01:27:47,810 --> 01:27:45,719

installed again that work is ongoing but

2280

01:27:51,709 --> 01:27:47,820

at the moment if we were launching right

2281

01:27:53,930 --> 01:27:51,719

now the range is no go as a result of

2282

01:27:57,430 --> 01:27:53,940

that bad ethernet switch

2283

01:28:00,110 --> 01:27:57,440

the dolly Loop file which helps steer

2284

01:28:02,990 --> 01:28:00,120

the space launch system through the

2285

01:28:04,970 --> 01:28:03,000

upper atmosphere has been uploaded to

2286

01:28:07,550 --> 01:28:04,980

the rocket and so we're good to go there

2287

01:28:10,550 --> 01:28:07,560

in terms of other configurations that

2288

01:28:12,350 --> 01:28:10,560

are ongoing but we are continuing to

2289

01:28:14,510 --> 01:28:12,360

monitor Communications the launch Team

2290

01:28:18,530 --> 01:28:14,520

about holding to the top of the window

2291

01:28:21,709 --> 01:28:18,540

currently slated for 104 a.m eastern

2292

01:28:23,870 --> 01:28:21,719

time but we do have two hours and we

2293

01:28:26,330 --> 01:28:23,880

have yet to see whether or not the

2294

01:28:28,850 --> 01:28:26,340

launch team has is going to be able to

2295

01:28:31,729 --> 01:28:28,860

make enough adjustments in order to hit

2296

01:28:33,770 --> 01:28:31,739

the top of that window no slip yet but

2297

01:28:36,350 --> 01:28:33,780

we're monitoring their work and we'll

2298

01:28:37,610 --> 01:28:36,360

give you an update when we have it back

2299

01:28:39,530 --> 01:28:37,620

to you Megan

2300

01:28:41,750 --> 01:28:39,540

thank you Daryl really great news about

2301

01:28:43,850 --> 01:28:41,760

uh that leak Kayla and I actually said

2302

01:28:45,950 --> 01:28:43,860

wow that's really great news so we'll uh

2303

01:28:47,750 --> 01:28:45,960

wait on your next update let's go back

2304

01:28:50,270 --> 01:28:47,760

live now to Kennedy Space Center's

2305

01:28:51,890 --> 01:28:50,280

visitor complex where we have NASA's Dan

2306

01:28:54,890 --> 01:28:51,900

Hewitt inside there with our new moon

2307

01:28:57,410 --> 01:28:54,900

board Dan let's focus in on Orion now it

2308

01:28:59,689 --> 01:28:57,420

has three main elements right that's

2309

01:29:01,370 --> 01:28:59,699

right Megan and Orion is the spacecraft

2310

01:29:03,229 --> 01:29:01,380

that's going to be carrying our Artemis

2311

01:29:05,209 --> 01:29:03,239

astronauts off of planet Earth and then

2312

01:29:06,950 --> 01:29:05,219

returning them home as you said three

2313

01:29:08,750 --> 01:29:06,960

major components so we'll jump in here

2314

01:29:11,330 --> 01:29:08,760

at the top with the first one the launch

2315

01:29:13,430 --> 01:29:11,340

abort system this is a critical safety

2316

01:29:15,709 --> 01:29:13,440

feature on Orion designed to pull the

2317

01:29:17,689 --> 01:29:15,719

capsule away from the SLS stack in the

2318

01:29:20,390 --> 01:29:17,699

event of an emergency on the pad or the

2319

01:29:22,370 --> 01:29:20,400

way uphill and it does that using three

2320

01:29:24,649 --> 01:29:22,380

solid rocket Motors the first one the

2321

01:29:26,450 --> 01:29:24,659

abort motor can Fire Within milliseconds

2322

01:29:28,669 --> 01:29:26,460

of automatically detecting an issue

2323

01:29:30,890 --> 01:29:28,679

pulling the capsule away to a safe

2324

01:29:33,169 --> 01:29:30,900

distance after that the attitude

2325

01:29:35,390 --> 01:29:33,179

adjustment motor this one will fire we

2326

01:29:37,550 --> 01:29:35,400

can cancel out any rates put us into a

2327

01:29:40,250 --> 01:29:37,560

nice stable Glide before we get ready to

2328

01:29:42,229 --> 01:29:40,260

to fire the jettison motor this is the

2329

01:29:44,570 --> 01:29:42,239

one that will actually take the launcher

2330

01:29:46,490 --> 01:29:44,580

board system off of Orion allowing it to

2331

01:29:48,410 --> 01:29:46,500

then deploy parachutes and parachute

2332

01:29:50,390 --> 01:29:48,420

down to safety I will note that jettison

2333

01:29:52,550 --> 01:29:50,400

motor the only one that fires no matter

2334

01:29:54,110 --> 01:29:52,560

what on a normal Mission it's gonna fire

2335

01:29:56,090 --> 01:29:54,120

once we're high enough in the atmosphere

2336

01:29:58,129 --> 01:29:56,100

and for Artemis one that is the only

2337

01:30:00,590 --> 01:29:58,139

motor on this that is active the

2338

01:30:02,689 --> 01:30:00,600

attitude and abort Motors are inert for

2339

01:30:04,669 --> 01:30:02,699

Artemis one and that's all focused on

2340

01:30:06,590 --> 01:30:04,679

protecting this the Orion crew module

2341

01:30:09,530 --> 01:30:06,600

this is where you have your astronauts

2342

01:30:11,149 --> 01:30:09,540

physically inside in the capsule you

2343

01:30:13,790 --> 01:30:11,159

have everything you need to keep a crew

2344

01:30:16,189 --> 01:30:13,800

safe happy healthy thriving in deep

2345

01:30:18,649 --> 01:30:16,199

space you have a pressurized environment

2346

01:30:20,990 --> 01:30:18,659

seats crew displays toilet everything

2347

01:30:23,330 --> 01:30:21,000

that you need on the outside couple of

2348

01:30:25,010 --> 01:30:23,340

critical features on the bottom the heat

2349

01:30:26,870 --> 01:30:25,020

shield remember this is goal number one

2350

01:30:28,910 --> 01:30:26,880

for this mission is testing that heat

2351

01:30:31,010 --> 01:30:28,920

shield it's an ablative structure made

2352

01:30:32,870 --> 01:30:31,020

to survive that fiery re-entry at the

2353

01:30:35,270 --> 01:30:32,880

end of a mission along the outside you

2354

01:30:37,189 --> 01:30:35,280

still see these small gray circles those

2355

01:30:39,410 --> 01:30:37,199

are reaction control system thrusters

2356

01:30:41,330 --> 01:30:39,420

Orion can use that at the very end to

2357

01:30:43,370 --> 01:30:41,340

control the yaw pitch and roll as it's

2358

01:30:45,050 --> 01:30:43,380

hurtling through the atmosphere we have

2359

01:30:48,050 --> 01:30:45,060

Windows you need Windows to look outside

2360

01:30:50,030 --> 01:30:48,060

two on the front two on the sides one on

2361

01:30:51,709 --> 01:30:50,040

the side hatch one up top in the very

2362

01:30:53,870 --> 01:30:51,719

top docking hatch those are different

2363

01:30:55,669 --> 01:30:53,880

layers of glass and acrylics for

2364

01:30:57,310 --> 01:30:55,679

pressure and thermal control we have a

2365

01:31:00,169 --> 01:30:57,320

docking system an operating system

2366

01:31:02,570 --> 01:31:00,179

parachutes all for the very end of the

2367

01:31:04,129 --> 01:31:02,580

mission third and final piece down here

2368

01:31:06,410 --> 01:31:04,139

at the bottom the European service

2369

01:31:09,290 --> 01:31:06,420

module this has all of the propulsion

2370

01:31:11,930 --> 01:31:09,300

assets for after SLS has done its job

2371

01:31:13,550 --> 01:31:11,940

starting on the bottom the large orbital

2372

01:31:15,110 --> 01:31:13,560

maneuvering system engine this is the

2373

01:31:17,090 --> 01:31:15,120

one that's providing the most thrust for

2374

01:31:19,729 --> 01:31:17,100

all of those key maneuvers around the

2375

01:31:22,129 --> 01:31:19,739

Moon eight auxiliary thrusters also

2376
01:31:23,510 --> 01:31:22,139
around the after the bottom part of the

2377
01:31:26,330 --> 01:31:23,520
service module to provide some

2378
01:31:28,430 --> 01:31:26,340
additional push as well and then 24 of

2379
01:31:30,530 --> 01:31:28,440
these smaller reaction control system

2380
01:31:32,390 --> 01:31:30,540
thrusters they can be used for attitude

2381
01:31:34,189 --> 01:31:32,400
control which way you're pointing as

2382
01:31:36,350 --> 01:31:34,199
well as small translational Maneuvers

2383
01:31:38,629 --> 01:31:36,360
moving side to side we flip the vehicle

2384
01:31:41,330 --> 01:31:38,639
up we see four solar arrays each one 24

2385
01:31:43,550 --> 01:31:41,340
feet in length altogether generating 11

2386
01:31:46,070 --> 01:31:43,560
kilowatts of electrical power for Orion

2387
01:31:47,990 --> 01:31:46,080
systems inside the service module you

2388
01:31:50,149 --> 01:31:48,000

have tanks for things like the thermal

2389

01:31:52,490 --> 01:31:50,159

control system potable water when we

2390

01:31:54,350 --> 01:31:52,500

have a crew on board and also pressurize

2391

01:31:56,330 --> 01:31:54,360

oxygen and nitrogen for an atmosphere

2392

01:31:58,129 --> 01:31:56,340

which gets fed through this umbilical

2393

01:31:59,689 --> 01:31:58,139

here to the crew module along with

2394

01:32:01,550 --> 01:31:59,699

electrical lines that's also what's

2395

01:32:03,410 --> 01:32:01,560

going to separate us at the very end of

2396

01:32:05,450 --> 01:32:03,420

the mission so that's Orion it's going

2397

01:32:07,850 --> 01:32:05,460

to be making its first flight around the

2398

01:32:09,830 --> 01:32:07,860

Moon on Artemis one can't wait to see it

2399

01:32:12,169 --> 01:32:09,840

taking those selfies around our lunar

2400

01:32:14,990 --> 01:32:12,179

neighbor send it back over to you Megan

2401
01:32:16,910 --> 01:32:15,000
thanks Dan that last component Dan

2402
01:32:19,010 --> 01:32:16,920
talked about the European service module

2403
01:32:22,250 --> 01:32:19,020
provided by the European Space Agency

2404
01:32:24,950 --> 01:32:22,260
let's go to Jasmine for that

2405
01:32:26,750 --> 01:32:24,960
thank you Megan we are back in firing

2406
01:32:29,629 --> 01:32:26,760
room two the launch control center and

2407
01:32:31,790 --> 01:32:29,639
joining us now is Philippe de Lou esa's

2408
01:32:33,830 --> 01:32:31,800
program manager for the Orion European

2409
01:32:36,410 --> 01:32:33,840
service module you have quite the title

2410
01:32:38,330 --> 01:32:36,420
there big title for a big job I'm sure

2411
01:32:40,070 --> 01:32:38,340
we are very glad to have you here and we

2412
01:32:41,810 --> 01:32:40,080
understand that the European service

2413
01:32:43,850 --> 01:32:41,820

module is powering Orion that's going to

2414

01:32:46,129 --> 01:32:43,860

send Humanity farther than ever before

2415

01:32:48,590 --> 01:32:46,139

Philippe how is it getting us there yeah

2416

01:32:50,810 --> 01:32:48,600

thank you good evening everyone so yes

2417

01:32:54,649 --> 01:32:50,820

the service module accommodates the

2418

01:32:57,110 --> 01:32:54,659

propulsion system system that contains

2419

01:33:02,330 --> 01:32:57,120

among the tanks and the pressurization

2420

01:33:05,270 --> 01:33:02,340

of the system the engine all the engines

2421

01:33:07,610 --> 01:33:05,280

33 engines total among which the main

2422

01:33:12,229 --> 01:33:07,620

engine which which is going to perform

2423

01:33:16,250 --> 01:33:12,239

the burns to put Orion into the moon

2424

01:33:19,729 --> 01:33:16,260

orbit and then back on the trajectory to

2425

01:33:22,850 --> 01:33:19,739

return to Earth the other engines are

2426

01:33:25,729 --> 01:33:22,860

used for attitude correction during uh

2427

01:33:28,790 --> 01:33:25,739

sorry attitude control and trajectory

2428

01:33:32,030 --> 01:33:28,800

correction during the travel to the Boon

2429

01:33:34,250 --> 01:33:32,040

in addition to the propulsion system the

2430

01:33:37,910 --> 01:33:34,260

service module generates the power and

2431

01:33:40,729 --> 01:33:37,920

distributes the the electricity to the

2432

01:33:43,189 --> 01:33:40,739

crew module and the service module

2433

01:33:46,250 --> 01:33:43,199

equipment so that they can operate

2434

01:33:50,570 --> 01:33:46,260

and the third function is the thermal

2435

01:33:52,370 --> 01:33:50,580

control of the system the service module

2436

01:33:54,229 --> 01:33:52,380

accommodates the radiators to reject the

2437

01:33:56,149 --> 01:33:54,239

heat that is produced by all the

2438

01:34:00,110 --> 01:33:56,159

equipment and the crew that will

2439

01:34:00,669 --> 01:34:00,120

eventually be in the Orion

2440

01:34:04,729 --> 01:34:00,679

um

2441

01:34:09,310 --> 01:34:08,330

not an Artemis one but on future Artemis

2442

01:34:12,770 --> 01:34:09,320

Mission

2443

01:34:14,870 --> 01:34:12,780

it will have tanks to store the crew

2444

01:34:17,750 --> 01:34:14,880

consumable the water the oxygen and

2445

01:34:19,729 --> 01:34:17,760

nitrogen right so we understand too that

2446

01:34:22,070 --> 01:34:19,739

you are monitoring launch here in firing

2447

01:34:23,450 --> 01:34:22,080

Room 2 with us and you also have a team

2448

01:34:24,890 --> 01:34:23,460

we're going to bring up a picture of

2449

01:34:27,649 --> 01:34:24,900

that team right now or a live look

2450

01:34:29,510 --> 01:34:27,659

inside issa's control room uh in the in

2451
01:34:32,030 --> 01:34:29,520
the Netherlands so can you tell us what

2452
01:34:34,490 --> 01:34:32,040
is your team working on today yes well

2453
01:34:36,770 --> 01:34:34,500
the ISA team is not only back in the

2454
01:34:38,810 --> 01:34:36,780
Netherlands it's one aspect but we have

2455
01:34:41,030 --> 01:34:38,820
also a significant team in the control

2456
01:34:41,930 --> 01:34:41,040
room in Johnson in the mirror control

2457
01:34:45,070 --> 01:34:41,940
room

2458
01:34:47,870 --> 01:34:45,080
and their role is to monitor the

2459
01:34:50,709 --> 01:34:47,880
Telemetry from the service module to

2460
01:34:54,110 --> 01:34:50,719
make sure that all parameters are within

2461
01:34:58,189 --> 01:34:54,120
the nominal behavior that the operations

2462
01:35:01,610 --> 01:34:58,199
are performed also nominally and

2463
01:35:04,790 --> 01:35:01,620

for sure identify if something goes

2464

01:35:07,430 --> 01:35:04,800

wrong if something goes not nominal and

2465

01:35:09,830 --> 01:35:07,440

if something non-nominal is identified

2466

01:35:13,129 --> 01:35:09,840

then they will have the role to support

2467

01:35:15,890 --> 01:35:13,139

another team to troubleshoot the anomaly

2468

01:35:17,629 --> 01:35:15,900

and prepare the recommendation to be

2469

01:35:19,610 --> 01:35:17,639

brought to the mission management team

2470

01:35:21,410 --> 01:35:19,620

for a decision on how to operate the

2471

01:35:22,669 --> 01:35:21,420

vehicle forward you're great that's glad

2472

01:35:24,770 --> 01:35:22,679

we're really glad to hear that your

2473

01:35:27,050 --> 01:35:24,780

teams are monitoring here Johnson in the

2474

01:35:28,490 --> 01:35:27,060

Netherlands as well and this has been a

2475

01:35:30,229 --> 01:35:28,500

huge collaboration there were 10

2476

01:35:31,910 --> 01:35:30,239

countries that contributed to the

2477

01:35:34,910 --> 01:35:31,920

European service module can you tell me

2478

01:35:38,330 --> 01:35:34,920

about that teamwork indeed it was a real

2479

01:35:41,709 --> 01:35:38,340

teamwork but of about 60 companies

2480

01:35:44,209 --> 01:35:41,719

across 10 European countries

2481

01:35:47,750 --> 01:35:44,219

while together with a prime contractor

2482

01:35:50,689 --> 01:35:47,760

we have selected the finest companies

2483

01:35:52,370 --> 01:35:50,699

available in Europe to build a

2484

01:35:56,330 --> 01:35:52,380

state-of-the-art equipment which is

2485

01:35:58,790 --> 01:35:56,340

needed to go back to the Moon with

2486

01:36:00,410 --> 01:35:58,800

humans right we're going back to Saloon

2487

01:36:01,550 --> 01:36:00,420

and farther even Beyond thank you so

2488

01:36:03,530 --> 01:36:01,560

much Philly we really appreciate you

2489

01:36:05,990 --> 01:36:03,540

being here tonight welcome thank you

2490

01:36:06,890 --> 01:36:06,000

very much of course of course Megan back

2491

01:36:08,390 --> 01:36:06,900

to you

2492

01:36:10,490 --> 01:36:08,400

now it's time to check back in with

2493

01:36:13,629 --> 01:36:10,500

Mission Control in Houston Leah how are

2494

01:36:18,110 --> 01:36:15,709

things are good over here at Johnson

2495

01:36:20,450 --> 01:36:18,120

Space Center which is just one part of

2496

01:36:22,610 --> 01:36:20,460

an agency-wide effort with many NASA

2497

01:36:25,070 --> 01:36:22,620

programs doing their part to make future

2498

01:36:26,930 --> 01:36:25,080

missions a reality when the first woman

2499

01:36:28,189 --> 01:36:26,940

and first person of color travel to the

2500

01:36:29,930 --> 01:36:28,199

Moon they'll be wearing a

2501

01:36:32,629 --> 01:36:29,940

state-of-the-art launch and entry

2502

01:36:34,430 --> 01:36:32,639

spacesuit called the Orion crew survival

2503

01:36:36,590 --> 01:36:34,440

system when they set foot on the moon

2504

01:36:38,570 --> 01:36:36,600

they'll be in another all-new next gen

2505

01:36:40,070 --> 01:36:38,580

suit both being developed at the Johnson

2506

01:36:42,290 --> 01:36:40,080

Space Center and through Partnerships

2507

01:36:44,090 --> 01:36:42,300

with commercial providers during those

2508

01:36:46,010 --> 01:36:44,100

spacewalks astronauts will collect

2509

01:36:48,110 --> 01:36:46,020

samples for further study of the Moon

2510

01:36:50,450 --> 01:36:48,120

the astromaterials research and

2511

01:36:52,850 --> 01:36:50,460

exploration science division at JSC is

2512

01:36:54,470 --> 01:36:52,860

preparing to receive rocks soil and Ice

2513

01:36:56,270 --> 01:36:54,480

collected from the moon's South Pole

2514

01:36:58,250 --> 01:36:56,280

which has a unique crater impact history

2515

01:37:00,290 --> 01:36:58,260

and Ice deposits that have never been

2516

01:37:01,610 --> 01:37:00,300

sampled and leading the effort to

2517

01:37:03,410 --> 01:37:01,620

advance capabilities for science

2518

01:37:05,030 --> 01:37:03,420

exploration and Commercial development

2519

01:37:07,129 --> 01:37:05,040

of the moon is the commercial lunar

2520

01:37:09,470 --> 01:37:07,139

payload Services initiative or Clips

2521

01:37:11,270 --> 01:37:09,480

more than a dozen American companies are

2522

01:37:13,430 --> 01:37:11,280

developing science investigations and

2523

01:37:15,590 --> 01:37:13,440

Tech demos additionally we need a

2524

01:37:17,750 --> 01:37:15,600

sustainable presence as

2525

01:37:19,850 --> 01:37:17,760

a station in orbit to facilitate

2526

01:37:22,189 --> 01:37:19,860

continuous lunar access and serve as a

2527

01:37:24,470 --> 01:37:22,199

home base or a jumping off point for new

2528

01:37:26,270 --> 01:37:24,480

deep space exploration missions this is

2529

01:37:28,070 --> 01:37:26,280

where Gateway comes in it's a

2530

01:37:30,649 --> 01:37:28,080

multi-purpose lunar space station being

2531

01:37:33,470 --> 01:37:30,659

developed by a worldwide effort LED out

2532

01:37:35,390 --> 01:37:33,480

of Js NASA is again teaming up with

2533

01:37:37,910 --> 01:37:35,400

International and Commercial Partners to

2534

01:37:39,890 --> 01:37:37,920

create this essential component Artemis

2535

01:37:41,810 --> 01:37:39,900

and Gateway will enable NASA's human

2536

01:37:44,149 --> 01:37:41,820

research program to better understand

2537

01:37:46,490 --> 01:37:44,159

how the human body adapts Beyond low

2538

01:37:48,110 --> 01:37:46,500

earth orbit ensuring future astronauts

2539

01:37:50,330 --> 01:37:48,120

traveling to the moon and Mars have the

2540

01:37:52,430 --> 01:37:50,340

tools to keep healthy and thrive in new

2541

01:37:54,470 --> 01:37:52,440

environments and with that we're going

2542

01:37:57,470 --> 01:37:54,480

to turn it back over to Megan and Kayla

2543

01:37:59,209 --> 01:37:57,480

at Kennedy thank you so much so Artemis

2544

01:38:01,490 --> 01:37:59,219

will also facilitate new discoveries

2545

01:38:03,169 --> 01:38:01,500

about the moon so to tell us what we're

2546

01:38:05,570 --> 01:38:03,179

hoping to learn we have Sarah Noble here

2547

01:38:08,330 --> 01:38:05,580

she's the Artemis lunar science lead

2548

01:38:10,910 --> 01:38:08,340

great to have you here thanks so tell us

2549

01:38:12,530 --> 01:38:10,920

about what we know about the moon yeah

2550

01:38:14,689 --> 01:38:12,540

so we learned a ton about the moon

2551
01:38:16,310 --> 01:38:14,699
during Apollo right from the samples and

2552
01:38:17,930 --> 01:38:16,320
the data that we collected in fact we're

2553
01:38:20,750 --> 01:38:17,940
still learning from those samples and

2554
01:38:22,790 --> 01:38:20,760
data even today 50 years later but then

2555
01:38:24,649 --> 01:38:22,800
since Apollo you know we've actually

2556
01:38:27,290 --> 01:38:24,659
been studying the moon mostly from above

2557
01:38:28,910 --> 01:38:27,300
learning about getting more of a global

2558
01:38:30,830 --> 01:38:28,920
perspective on the moon that we really

2559
01:38:32,390 --> 01:38:30,840
didn't have during Apollo and so that's

2560
01:38:34,250 --> 01:38:32,400
allowed us to ask ask a lot better

2561
01:38:36,470 --> 01:38:34,260
questions and to understand where to go

2562
01:38:38,209 --> 01:38:36,480
to find the answers to them now that

2563
01:38:39,709 --> 01:38:38,219

we're headed back to the Moon sending

2564

01:38:41,149 --> 01:38:39,719

human beings as part of the Artemis

2565

01:38:42,410 --> 01:38:41,159

program what are we hoping to learn

2566

01:38:44,450 --> 01:38:42,420

that's new

2567

01:38:46,129 --> 01:38:44,460

yes so we're going to an entirely

2568

01:38:47,870 --> 01:38:46,139

different part of the moon for Artemis

2569

01:38:49,910 --> 01:38:47,880

right during Apollo we kind of landed

2570

01:38:51,470 --> 01:38:49,920

almost in the same place like six times

2571

01:38:53,090 --> 01:38:51,480

right in the sort of central near side

2572

01:38:54,890 --> 01:38:53,100

of the moon but for Artemis we're gonna

2573

01:38:57,110 --> 01:38:54,900

go explore a new part of the Moon we're

2574

01:38:59,270 --> 01:38:57,120

gonna go to the South Pole which is some

2575

01:39:01,189 --> 01:38:59,280

of the oldest rocks on the on the moon

2576

01:39:03,530 --> 01:39:01,199

it's the part of the original crest of

2577

01:39:06,229 --> 01:39:03,540

the Moon and there's places there that

2578

01:39:09,169 --> 01:39:06,239

are permanently shadowed where we think

2579

01:39:11,090 --> 01:39:09,179

that water and other molecules sort of

2580

01:39:12,830 --> 01:39:11,100

get trapped and we really want to

2581

01:39:14,689 --> 01:39:12,840

understand what those are and so that we

2582

01:39:16,310 --> 01:39:14,699

can use them for both science and and

2583

01:39:18,350 --> 01:39:16,320

for as a resource

2584

01:39:20,030 --> 01:39:18,360

Sarah we're also planning to land a

2585

01:39:21,830 --> 01:39:20,040

Rover at the South Pole of the Moon in

2586

01:39:23,930 --> 01:39:21,840

late 2024. can you tell us about that

2587

01:39:25,669 --> 01:39:23,940

yeah absolutely the Viper Rover the

2588

01:39:28,250 --> 01:39:25,679

volatiles investigating polar

2589

01:39:29,629 --> 01:39:28,260

exploration Rover is going to land near

2590

01:39:31,010 --> 01:39:29,639

the South Pole and it's actually going

2591

01:39:32,450 --> 01:39:31,020

to explore some of these permanently

2592

01:39:35,149 --> 01:39:32,460

shattered areas it's going to dip into

2593

01:39:36,950 --> 01:39:35,159

them drill down try to find out what

2594

01:39:38,870 --> 01:39:36,960

that what that water is what else is

2595

01:39:40,250 --> 01:39:38,880

there what form that water is how much

2596

01:39:41,510 --> 01:39:40,260

is there so that we can really

2597

01:39:43,490 --> 01:39:41,520

understand it both from a science

2598

01:39:45,590 --> 01:39:43,500

perspective and if we want to use it as

2599

01:39:47,450 --> 01:39:45,600

a resource we will understand how to how

2600

01:39:48,950 --> 01:39:47,460

to extract it so some people might say

2601
01:39:51,169 --> 01:39:48,960
you know we have all these Rovers we

2602
01:39:52,550 --> 01:39:51,179
have access to machines that can do a

2603
01:39:54,590 --> 01:39:52,560
lot of the work on the surface of the

2604
01:39:57,530 --> 01:39:54,600
Moon for us so why is it important to

2605
01:39:59,330 --> 01:39:57,540
return humans to the Moon yeah it's not

2606
01:40:01,070 --> 01:39:59,340
an either or proposition right there are

2607
01:40:02,510 --> 01:40:01,080
some things that robot ruts are better

2608
01:40:04,070 --> 01:40:02,520
at and some things that humans are

2609
01:40:06,229 --> 01:40:04,080
better at and it turns out that humans

2610
01:40:08,209 --> 01:40:06,239
are much better field geologists we're

2611
01:40:11,030 --> 01:40:08,219
really much more efficient and and

2612
01:40:13,850 --> 01:40:11,040
better at that plus we can we can do uh

2613
01:40:16,189 --> 01:40:13,860

better we can deploy more complicated

2614

01:40:17,870 --> 01:40:16,199

instruments and we can use tools in a

2615

01:40:19,490 --> 01:40:17,880

way ways that it's very difficult for

2616

01:40:21,830 --> 01:40:19,500

robots to do so we can collect better

2617

01:40:23,629 --> 01:40:21,840

samples and one of the great things is

2618

01:40:25,430 --> 01:40:23,639

that we can bring back a lot of samples

2619

01:40:27,050 --> 01:40:25,440

right when we do robotic sample return

2620

01:40:28,250 --> 01:40:27,060

it's usually a very small amount but if

2621

01:40:30,169 --> 01:40:28,260

you look at what we brought back from

2622

01:40:32,689 --> 01:40:30,179

Apollo it's a large amount of samples

2623

01:40:34,430 --> 01:40:32,699

that literally hundreds probably maybe

2624

01:40:35,810 --> 01:40:34,440

the thousands of scientists have been

2625

01:40:37,790 --> 01:40:35,820

able to study over the years and over

2626

01:40:39,830 --> 01:40:37,800

generations and that's a lot of brain

2627

01:40:41,629 --> 01:40:39,840

power to put behind those samples so

2628

01:40:43,850 --> 01:40:41,639

again that's how Artemis and Apollo are

2629

01:40:46,010 --> 01:40:43,860

different now we're utilizing machines

2630

01:40:47,570 --> 01:40:46,020

and people that's right so hopefully

2631

01:40:48,950 --> 01:40:47,580

Advance yeah that's right perfect Sarah

2632

01:40:50,629 --> 01:40:48,960

thank you so much for your time thanks

2633

01:40:52,669 --> 01:40:50,639

for having me so in honor of our

2634

01:40:54,709 --> 01:40:52,679

destination the moon we asked you all to

2635

01:40:56,750 --> 01:40:54,719

create Moon inspired content and share

2636

01:40:58,669 --> 01:40:56,760

them with us using the hashtag NASA Moon

2637

01:41:00,290 --> 01:40:58,679

snap we got so many wonderful

2638

01:41:02,000 --> 01:41:00,300

submissions so why don't we check them

2639

01:41:13,510 --> 01:41:02,010

out now

2640

01:41:15,360 --> 01:41:13,520

[Music]

2641

01:41:31,070 --> 01:41:15,370

thank you

2642

01:41:35,990 --> 01:41:33,590

foreign

2643

01:41:37,980 --> 01:41:36,000

[Music]

2644

01:41:45,590 --> 01:41:37,990

foreign

2645

01:41:53,750 --> 01:41:50,810

[Music]

2646

01:41:56,450 --> 01:41:53,760

that was a really cool look at all the

2647

01:41:59,149 --> 01:41:56,460

different kinds of Creations recipes and

2648

01:42:00,890 --> 01:41:59,159

also art and and it was great to see

2649

01:42:02,810 --> 01:42:00,900

what people submitted yeah it's awesome

2650

01:42:04,370 --> 01:42:02,820

to see the creativity out there and how

2651
01:42:06,950 --> 01:42:04,380
people are engaging with this mission in

2652
01:42:08,990 --> 01:42:06,960
so many different ways yeah so I know

2653
01:42:11,510 --> 01:42:09,000
that you you didn't submit it yet but

2654
01:42:12,709 --> 01:42:11,520
you did create a moon snap sort of so to

2655
01:42:14,510 --> 01:42:12,719
say so why don't we take a look at that

2656
01:42:16,070 --> 01:42:14,520
picture yeah this is one of my favorite

2657
01:42:19,070 --> 01:42:16,080
pictures of the Moon that I was able to

2658
01:42:21,410 --> 01:42:19,080
take from orbit I think for me it kind

2659
01:42:23,930 --> 01:42:21,420
of reminds me of that iconic picture of

2660
01:42:26,510 --> 01:42:23,940
moonrise or earthrise from the Moon from

2661
01:42:27,709 --> 01:42:26,520
Apollo and it's kind of that reverse I

2662
01:42:29,570 --> 01:42:27,719
think there's something about seeing the

2663
01:42:32,090 --> 01:42:29,580

Moon from orbit around the Earth that

2664

01:42:33,649 --> 01:42:32,100

makes it seem a little bit easier to

2665

01:42:34,970 --> 01:42:33,659

imagine what it'd be like to have that

2666

01:42:36,530 --> 01:42:34,980

view from the Moon looking back at our

2667

01:42:38,149 --> 01:42:36,540

home planet yeah you should definitely

2668

01:42:40,430 --> 01:42:38,159

submit that because that's an amazing

2669

01:42:42,350 --> 01:42:40,440

photo did you take that yourself yeah

2670

01:42:44,990 --> 01:42:42,360

out of the cupola window or the space

2671

01:42:46,490 --> 01:42:45,000

station wow the resolution's great the

2672

01:42:49,609 --> 01:42:46,500

cameras we have up there are incredible

2673

01:42:51,470 --> 01:42:49,619

yeah it's awesome so so I haven't taken

2674

01:42:53,209 --> 01:42:51,480

a moons now so I had nothing to submit

2675

01:42:54,890 --> 01:42:53,219

so how do you feel about creating

2676

01:42:56,930 --> 01:42:54,900

women's snap with me let's do it all

2677

01:42:59,149 --> 01:42:56,940

right well take that if you don't mind

2678

01:43:01,629 --> 01:42:59,159

lifting it up and we're just gonna snap

2679

01:43:04,850 --> 01:43:01,639

a photo here oh lighting

2680

01:43:06,709 --> 01:43:04,860

perfect so I just created a moon snap I

2681

01:43:08,149 --> 01:43:06,719

love it I'm gonna share it uh and again

2682

01:43:10,010 --> 01:43:08,159

this is just to encourage people to

2683

01:43:12,709 --> 01:43:10,020

really get involved in this Mission so

2684

01:43:14,689 --> 01:43:12,719

uh we will continue to collect and share

2685

01:43:17,209 --> 01:43:14,699

those photos so again if you have a NASA

2686

01:43:19,790 --> 01:43:17,219

Moon snap just use that hashtag okay

2687

01:43:22,370 --> 01:43:19,800

artemis1 comes amid a very busy a year

2688

01:43:24,109 --> 01:43:22,380

and exciting here at Nasa some of the

2689

01:43:26,689 --> 01:43:24,119

highlights include two more commercial

2690

01:43:30,350 --> 01:43:26,699

crew launches with SpaceX crew 4 in

2691

01:43:33,109 --> 01:43:30,360

April and then crew 5 last month in May

2692

01:43:35,330 --> 01:43:33,119

NASA and Boeing flew oft2 the second

2693

01:43:37,370 --> 01:43:35,340

uncrewed flight test of the Starliner

2694

01:43:39,169 --> 01:43:37,380

capsule the goal is to certify the

2695

01:43:41,209 --> 01:43:39,179

capsule for regular flights to the

2696

01:43:44,330 --> 01:43:41,219

International Space Station after a

2697

01:43:46,370 --> 01:43:44,340

crude flight test next year in July we

2698

01:43:49,250 --> 01:43:46,380

released the first images captured by

2699

01:43:51,890 --> 01:43:49,260

our James Webb Telescope and oh my my

2700

01:43:53,090 --> 01:43:51,900

those are really beautiful fascinating

2701

01:43:54,709 --> 01:43:53,100

photos and they're going to really help

2702

01:43:57,770 --> 01:43:54,719

us answer some of astronomy's biggest

2703

01:43:59,750 --> 01:43:57,780

questions about how our universe began

2704

01:44:02,390 --> 01:43:59,760

and then in September we intentionally

2705

01:44:04,550 --> 01:44:02,400

slammed the dart spacecraft into

2706

01:44:06,649 --> 01:44:04,560

asteroid dimorphous boom look at that

2707

01:44:08,930 --> 01:44:06,659

and we successfully changed its course

2708

01:44:10,910 --> 01:44:08,940

the asteroid wasn't headed for Earth but

2709

01:44:12,530 --> 01:44:10,920

the test was to show we could defend our

2710

01:44:14,390 --> 01:44:12,540

planet if needed

2711

01:44:16,790 --> 01:44:14,400

and recently two other missions that

2712

01:44:19,790 --> 01:44:16,800

benefit the Artemis program last week we

2713

01:44:21,890 --> 01:44:19,800

tested a new inflatable heat shield that

2714

01:44:24,229 --> 01:44:21,900

could help us eventually land humans on

2715

01:44:26,570 --> 01:44:24,239

Mars and just two days ago Capstone

2716

01:44:28,490 --> 01:44:26,580

arrived at its intended orbit around the

2717

01:44:31,250 --> 01:44:28,500

moon the small satellite launched from

2718

01:44:33,709 --> 01:44:31,260

New Zealand in June and will now test a

2719

01:44:38,290 --> 01:44:33,719

unique lunar orbit for a future space

2720

01:44:45,050 --> 01:44:41,930

Artemis won Heralds a new era in the

2721

01:44:47,270 --> 01:44:45,060

history of human space flight it marks a

2722

01:44:49,910 --> 01:44:47,280

pivotal next step in Humanity's return

2723

01:44:53,470 --> 01:44:49,920

to the Moon ushering in a new generation

2724

01:44:56,270 --> 01:44:53,480

of astronauts technology and research

2725

01:44:58,310 --> 01:44:56,280

this critical flight test sets the

2726

01:45:01,310 --> 01:44:58,320

course for a bright future at the Moon

2727

01:45:03,770 --> 01:45:01,320

it represents our ability to safely send

2728

01:45:06,770 --> 01:45:03,780

Artemis astronauts and critical Hardware

2729

01:45:09,169 --> 01:45:06,780

to lunar orbit Humanity will experience

2730

01:45:12,470 --> 01:45:09,179

Artemis in different ways than we did

2731

01:45:15,290 --> 01:45:12,480

Apollo we will explore new areas of the

2732

01:45:18,910 --> 01:45:15,300

Moon with 21st century materials

2733

01:45:21,890 --> 01:45:18,920

Technologies systems and operations

2734

01:45:24,470 --> 01:45:21,900

Gateway will be Humanity's first space

2735

01:45:27,410 --> 01:45:24,480

station to orbit the Moon built with

2736

01:45:29,629 --> 01:45:27,420

Next Generation technology Gateway will

2737

01:45:32,390 --> 01:45:29,639

not only provide a deep space Outpost

2738

01:45:34,810 --> 01:45:32,400

for future lunar Expeditions it will

2739

01:45:38,209 --> 01:45:34,820

also serve as a station for Landers

2740

01:45:40,609 --> 01:45:38,219

experiments and supplies starting with

2741

01:45:42,770 --> 01:45:40,619

the Core Power and habitation elements

2742

01:45:45,050 --> 01:45:42,780

Gateway will grow with increasing

2743

01:45:47,629 --> 01:45:45,060

capability as International Partners

2744

01:45:50,629 --> 01:45:47,639

contribute new habitat and refueling

2745

01:45:53,750 --> 01:45:50,639

modules observation Windows external

2746

01:45:56,149 --> 01:45:53,760

Robotics and more Gateway will enable

2747

01:45:58,729 --> 01:45:56,159

longer stays and more science to be

2748

01:46:02,149 --> 01:45:58,739

conducted on and around the Moon than

2749

01:46:05,390 --> 01:46:02,159

ever before and one day it will help set

2750

01:46:07,850 --> 01:46:05,400

the stage for Missions to Mars a highly

2751
01:46:09,590 --> 01:46:07,860
skilled diverse Corps of astronauts will

2752
01:46:12,050 --> 01:46:09,600
be selected for Artemis missions

2753
01:46:14,270 --> 01:46:12,060
including the first woman and first

2754
01:46:17,270 --> 01:46:14,280
person of color to step foot on the moon

2755
01:46:20,090 --> 01:46:17,280
a board Gateway the crew will conduct

2756
01:46:23,030 --> 01:46:20,100
exciting research from their unique deep

2757
01:46:25,129 --> 01:46:23,040
space vintage Point Gateway will also be

2758
01:46:27,290 --> 01:46:25,139
a transfer station for astronauts to

2759
01:46:29,330 --> 01:46:27,300
board Innovative human Landing systems

2760
01:46:31,609 --> 01:46:29,340
that will vary them to and from the

2761
01:46:34,850 --> 01:46:31,619
lunar surface for exciting scientific

2762
01:46:36,950 --> 01:46:34,860
Expeditions near the South Pole once on

2763
01:46:39,590 --> 01:46:36,960

the moon Artemis astronauts will use

2764

01:46:41,629 --> 01:46:39,600

expertise in fields like biology and

2765

01:46:44,510 --> 01:46:41,639

geology to conduct groundbreaking

2766

01:46:47,390 --> 01:46:44,520

research in modern spacesuits using

2767

01:46:49,729 --> 01:46:47,400

Advanced tools they will drive new

2768

01:46:51,530 --> 01:46:49,739

Rovers to investigate the lunar terrain

2769

01:46:54,830 --> 01:46:51,540

and unlock some of the greatest

2770

01:46:57,590 --> 01:46:54,840

mysteries of our solar system

2771

01:46:59,510 --> 01:46:57,600

Artemis won cement our capability to

2772

01:47:02,450 --> 01:46:59,520

send astronauts and cargo to the moon

2773

01:47:06,880 --> 01:47:02,460

for years to come

2774

01:47:10,010 --> 01:47:06,890

going back to the Moon we are Artemis

2775

01:47:14,090 --> 01:47:11,930

as we approach the opening of our

2776

01:47:17,090 --> 01:47:14,100

two-hour launch window we have a special

2777

01:47:19,490 --> 01:47:17,100

musical performance for you America the

2778

01:47:22,310 --> 01:47:19,500

Beautiful played in honor of the flight

2779

01:47:32,140 --> 01:47:22,320

test by the Philadelphia Orchestra and

2780

01:48:33,910 --> 01:47:50,870

[Music]

2781

01:48:47,629 --> 01:48:35,120

thank you

2782

01:49:07,710 --> 01:48:50,530

foreign

2783

01:49:27,800 --> 01:49:26,920

[Music]

2784

01:49:31,970 --> 01:49:27,810

[Applause]

2785

01:49:34,270 --> 01:49:31,980

[Music]

2786

01:49:51,669 --> 01:49:34,280

foreign

2787

01:49:56,689 --> 01:49:54,830

beautiful performance it really has me

2788

01:49:58,970 --> 01:49:56,699

feeling quite emotional right now yeah

2789

01:50:01,129 --> 01:49:58,980

perfect tribute for tonight's launch you

2790

01:50:03,770 --> 01:50:01,139

know it's just uh it gives me a sense of

2791

01:50:06,290 --> 01:50:03,780

Pride really to just remember that our

2792

01:50:09,109 --> 01:50:06,300

country continues to lead our nation in

2793

01:50:11,149 --> 01:50:09,119

space exploration so and as such the

2794

01:50:13,370 --> 01:50:11,159

White House is closely watching this

2795

01:50:15,229 --> 01:50:13,380

historic launch earlier this year vice

2796

01:50:17,930 --> 01:50:15,239

president Kamala Harris came down to

2797

01:50:20,390 --> 01:50:17,940

Kennedy Space Center and met with NASA

2798

01:50:22,790 --> 01:50:20,400

leadership as well as astronauts she

2799

01:50:24,590 --> 01:50:22,800

also toured our facilities where teams

2800

01:50:26,450 --> 01:50:24,600

are working on hardware for future

2801

01:50:28,910 --> 01:50:26,460

Artemis missions

2802

01:50:31,129 --> 01:50:28,920

before leaving she signs a piece of the

2803

01:50:32,750 --> 01:50:31,139

Orion spacecraft that will fly on

2804

01:50:35,030 --> 01:50:32,760

Artemis 3. she's doing it right there

2805

01:50:37,850 --> 01:50:35,040

which will return astronauts to the

2806

01:50:42,350 --> 01:50:40,250

okay Kayla time for more social

2807

01:50:43,850 --> 01:50:42,360

questions so let's take the first one

2808

01:50:47,629 --> 01:50:43,860

you know now the drill it's going to be

2809

01:50:53,149 --> 01:50:50,390

hey guys I'm Jack Black and I'm super

2810

01:50:54,770 --> 01:50:53,159

excited for the Artemis one launch today

2811

01:50:57,169 --> 01:50:54,780

I was part of a little movie called

2812

01:50:59,689 --> 01:50:57,179

Apollo 10 and a half a space age

2813

01:51:00,890 --> 01:50:59,699

childhood and I have a few burning

2814

01:51:04,010 --> 01:51:00,900

queries

2815

01:51:06,410 --> 01:51:04,020

question the first how is Artemis

2816

01:51:10,070 --> 01:51:06,420

different than Apollo

2817

01:51:12,050 --> 01:51:10,080

we're returning to the moon but this

2818

01:51:14,270 --> 01:51:12,060

time we're going to stay so rather than

2819

01:51:15,590 --> 01:51:14,280

a short visit where we can do some

2820

01:51:17,629 --> 01:51:15,600

amazing science but it was pretty

2821

01:51:18,890 --> 01:51:17,639

limited by these short visits kind of a

2822

01:51:20,450 --> 01:51:18,900

small area of the Moon we're going to

2823

01:51:22,370 --> 01:51:20,460

the South Pole and we're going to learn

2824

01:51:23,570 --> 01:51:22,380

how to live there long term so we're

2825

01:51:24,709 --> 01:51:23,580

going to be building habitats we're

2826
01:51:26,750 --> 01:51:24,719
going to have Rovers we're gonna have

2827
01:51:29,330 --> 01:51:26,760
all of this infrastructure on the moon

2828
01:51:31,850 --> 01:51:29,340
supporting scientific discovery but also

2829
01:51:33,649 --> 01:51:31,860
that next big step to Mars I love seeing

2830
01:51:35,270 --> 01:51:33,659
celebrities also take part and ask

2831
01:51:36,530 --> 01:51:35,280
questions because it really shows that

2832
01:51:38,750 --> 01:51:36,540
this is something that's that's

2833
01:51:40,850 --> 01:51:38,760
captivating a lot of people so that was

2834
01:51:43,669 --> 01:51:40,860
really fun to see Jack Black also query

2835
01:51:47,390 --> 01:51:43,679
the first that was that was funny all

2836
01:51:53,810 --> 01:51:50,629
how does it feel in space being in space

2837
01:51:55,129 --> 01:51:53,820
is amazing I mean for us launching to

2838
01:51:56,629 --> 01:51:55,139

orbit around the Earth and then go to

2839

01:51:58,370 --> 01:51:56,639

the space station where I just was for

2840

01:52:00,470 --> 01:51:58,380

six months we're in an apparent

2841

01:52:01,669 --> 01:52:00,480

microgravity environment so for us it

2842

01:52:03,950 --> 01:52:01,679

feels like we're weightless like we're

2843

01:52:05,570 --> 01:52:03,960

floating so you have to relearn how to

2844

01:52:07,430 --> 01:52:05,580

live and work in that space But once you

2845

01:52:08,930 --> 01:52:07,440

get used to it it's a lot of fun yeah we

2846

01:52:11,450 --> 01:52:08,940

were just talking Jessica Watkins

2847

01:52:12,649 --> 01:52:11,460

another NASA astronaut was just here and

2848

01:52:14,270 --> 01:52:12,659

she was saying that actually when you

2849

01:52:15,830 --> 01:52:14,280

came back on Earth that was an

2850

01:52:18,410 --> 01:52:15,840

adjustment as well because you got so

2851
01:52:21,050 --> 01:52:18,420
used to uh used to living on the space

2852
01:52:22,550 --> 01:52:21,060
station yeah the transition home was

2853
01:52:23,930 --> 01:52:22,560
actually a lot harder for me than the

2854
01:52:26,270 --> 01:52:23,940
transition up there because our

2855
01:52:27,950 --> 01:52:26,280
vestibular systems kind of remap we

2856
01:52:29,390 --> 01:52:27,960
start ignoring all the sensors in our

2857
01:52:31,129 --> 01:52:29,400
inner ear that tell us how our bodies

2858
01:52:33,050 --> 01:52:31,139
are moving because the space environment

2859
01:52:34,609 --> 01:52:33,060
is so strange but we really need that on

2860
01:52:36,590 --> 01:52:34,619
Earth to balance and control our bodies

2861
01:52:38,030 --> 01:52:36,600
so when we get back it takes a couple of

2862
01:52:39,649 --> 01:52:38,040
days before we feel comfortable again

2863
01:52:40,310 --> 01:52:39,659

really interesting thanks so much for

2864

01:52:43,729 --> 01:52:40,320

those

2865

01:52:45,350 --> 01:52:43,739

okay so we are 10 minutes until the

2866

01:52:46,850 --> 01:52:45,360

opening of our two hour launch window

2867

01:52:48,590 --> 01:52:46,860

today so why don't we head back over to

2868

01:52:50,750 --> 01:52:48,600

Daryl Daryl tell us what's happening now

2869

01:52:52,729 --> 01:52:50,760

yeah Megan we actually uh have about 10

2870

01:52:55,850 --> 01:52:52,739

minutes before we go into a half hour

2871

01:52:58,609 --> 01:52:55,860

hold uh that half hour hold is part of

2872

01:53:00,470 --> 01:52:58,619

the L clock and what you see on your

2873

01:53:03,169 --> 01:53:00,480

monitor right now I believe is the T

2874

01:53:05,930 --> 01:53:03,179

clock so uh in about 10 minutes we'll

2875

01:53:08,510 --> 01:53:05,940

hold for a half hour and currently the

2876
01:53:11,810 --> 01:53:08,520
launch team is trying to evaluate how

2877
01:53:14,270 --> 01:53:11,820
much of a delay may result from some

2878
01:53:17,570 --> 01:53:14,280
issues that we've been facing uh over

2879
01:53:21,050 --> 01:53:17,580
the past hour just to recap those we had

2880
01:53:23,990 --> 01:53:21,060
a uh a leak and a replenish valve on the

2881
01:53:27,530 --> 01:53:24,000
mobile launcher that feeds into liquid

2882
01:53:30,830 --> 01:53:27,540
hydrogen core stage tank that's been

2883
01:53:33,649 --> 01:53:30,840
resolved the leak uh has been fixed and

2884
01:53:36,890 --> 01:53:33,659
we're moving forward currently the upper

2885
01:53:39,530 --> 01:53:36,900
stage of the rocket for liquid hydrogen

2886
01:53:43,070 --> 01:53:39,540
uh is roughly 70

2887
01:53:46,129 --> 01:53:43,080
8 at the moment so that is tracking

2888
01:53:47,750 --> 01:53:46,139

progress continues there the core stage

2889

01:53:50,930 --> 01:53:47,760

has been topped off

2890

01:53:52,930 --> 01:53:50,940

and now both liquid oxygen and liquid

2891

01:53:57,050 --> 01:53:52,940

hydrogen are 100

2892

01:54:00,530 --> 01:53:57,060

along with the upper stage of the liquid

2893

01:54:04,070 --> 01:54:00,540

hydrogen side of the equation so we're

2894

01:54:07,070 --> 01:54:04,080

just waiting on uh the complete tanking

2895

01:54:09,470 --> 01:54:07,080

of the upper stage liquid hydrogen now

2896

01:54:12,050 --> 01:54:09,480

with regards to the range issue that we

2897

01:54:15,830 --> 01:54:12,060

had we just got an update from the range

2898

01:54:18,649 --> 01:54:15,840

the 45th space Wing officer reporting in

2899

01:54:22,370 --> 01:54:18,659

to the NASA test director that the

2900

01:54:26,030 --> 01:54:22,380

ethernet switch has been replaced this

2901

01:54:29,390 --> 01:54:26,040

problematic switch took down their

2902

01:54:32,810 --> 01:54:29,400

ability to see radar from one of their

2903

01:54:35,810 --> 01:54:32,820

assets which is key in getting

2904

01:54:38,510 --> 01:54:35,820

acquisition and signal for the flight

2905

01:54:40,430 --> 01:54:38,520

termination system if it were to be

2906

01:54:45,590 --> 01:54:40,440

needed of course this is a critical

2907

01:54:47,689 --> 01:54:45,600

system that has to be tested before we

2908

01:54:53,410 --> 01:54:47,699

can launch so at the moment we're

2909

01:54:56,270 --> 01:54:53,420

looking still at a 104 a.m Eastern Time

2910

01:54:58,490 --> 01:54:56,280

launch but it is pretty clear from the

2911

01:55:00,290 --> 01:54:58,500

work that is ahead that

2912

01:55:03,129 --> 01:55:00,300

it looks like we're going to slip into

2913

01:55:05,810 --> 01:55:03,139

that window how much exactly

2914

01:55:08,990 --> 01:55:05,820

we don't have an accurate calculation

2915

01:55:12,890 --> 01:55:09,000

from the launch team as of right now but

2916

01:55:15,410 --> 01:55:12,900

of course we're anticipating that so for

2917

01:55:19,310 --> 01:55:15,420

the moment you see on your clock now we

2918

01:55:20,990 --> 01:55:19,320

are in the T minus 10 minute hold we

2919

01:55:23,450 --> 01:55:21,000

just entered that

2920

01:55:24,370 --> 01:55:23,460

and now roughly we're looking at 28

2921

01:55:29,030 --> 01:55:24,380

minutes

2922

01:55:31,490 --> 01:55:29,040

to resume terminal count a launch team

2923

01:55:34,070 --> 01:55:31,500

will assess what work needs to be done

2924

01:55:36,890 --> 01:55:34,080

how that syncs up with the range getting

2925

01:55:38,930 --> 01:55:36,900

back online with their uh with their

2926

01:55:42,470 --> 01:55:38,940

equipment and then we should have a new

2927

01:55:44,330 --> 01:55:42,480

t0 for you soon that's latest from

2928

01:55:46,729 --> 01:55:44,340

firing room one here at the Kennedy

2929

01:55:48,350 --> 01:55:46,739

Space Center Megan back to you

2930

01:55:49,910 --> 01:55:48,360

so things are obviously still very

2931

01:55:52,669 --> 01:55:49,920

Dynamic we're going to come back to

2932

01:55:54,410 --> 01:55:52,679

Daryl as much as possible now to

2933

01:55:56,390 --> 01:55:54,420

understand where we are going we have to

2934

01:55:58,430 --> 01:55:56,400

know where we have been to do that we

2935

01:56:00,229 --> 01:55:58,440

spoke to some of the special few who

2936

01:56:01,729 --> 01:56:00,239

walked on the moon and those who sent

2937

01:56:04,550 --> 01:56:01,739

them

2938

01:56:06,950 --> 01:56:04,560

we choose to go to the moon in this

2939

01:56:09,410 --> 01:56:06,960

decade and do the other things not

2940

01:56:10,310 --> 01:56:09,420

because they are easy but because they

2941

01:56:14,030 --> 01:56:10,320

are hard

2942

01:56:16,850 --> 01:56:14,040

because that goal will serve to organize

2943

01:56:19,970 --> 01:56:16,860

and measure the best of our energies and

2944

01:56:22,250 --> 01:56:19,980

skills it's been 50 years since we've

2945

01:56:25,550 --> 01:56:22,260

been to the moon and we've got a great

2946

01:56:29,090 --> 01:56:25,560

program called Artemis we're going back

2947

01:56:31,550 --> 01:56:29,100

the Apollo program was a test for the

2948

01:56:34,850 --> 01:56:31,560

American people that you can do what you

2949

01:56:37,090 --> 01:56:34,860

set out to do all it took was turning to

2950

01:56:40,070 --> 01:56:37,100

it and making it happen

2951
01:56:41,290 --> 01:56:40,080
we are go for a mission to the moon at

2952
01:56:46,250 --> 01:56:41,300
this time

2953
01:56:48,850 --> 01:56:46,260
engines on five four three two

2954
01:56:52,970 --> 01:56:48,860
all engines running

2955
01:56:55,750 --> 01:56:52,980
commit liftoff we have liftoff 49

2956
01:56:57,649 --> 01:56:55,760
minutes past the hour

2957
01:57:00,410 --> 01:56:57,659
characteristic system that I remember

2958
01:57:02,090 --> 01:57:00,420
most of the satisfy was the noise the

2959
01:57:03,460 --> 01:57:02,100
noise was enormous and it was almost

2960
01:57:06,910 --> 01:57:03,470
impossible to communicate

2961
01:57:06,920 --> 01:57:10,510
we're going

2962
01:57:15,830 --> 01:57:13,430
bad quality base here the eagle has

2963
01:57:17,689 --> 01:57:15,840

landed The Landing to me was a great

2964

01:57:25,450 --> 01:57:17,699

celebration the nation was almost

2965

01:57:31,970 --> 01:57:28,790

there are so many things that we can

2966

01:57:34,050 --> 01:57:31,980

eventually learn about our universe and

2967

01:57:39,729 --> 01:57:34,060

the spacecraft that we use exploring

2968

01:57:43,250 --> 01:57:39,739

[Music]

2969

01:57:46,129 --> 01:57:43,260

we are a nation of explorers during the

2970

01:57:48,350 --> 01:57:46,139

pow-up we were on national TV literally

2971

01:57:51,589 --> 01:57:48,360

every day because we were doing

2972

01:57:53,870 --> 01:57:51,599

something visible that America could see

2973

01:57:56,450 --> 01:57:53,880

and they could feel and say look what we

2974

01:57:58,669 --> 01:57:56,460

are doing and I believe Artemis is going

2975

01:58:01,220 --> 01:57:58,679

to come up and say look what we are

2976

01:58:05,410 --> 01:58:01,230

capable of and what we are doing now

2977

01:58:07,910 --> 01:58:05,420

[Music]

2978

01:58:11,030 --> 01:58:07,920

thank you

2979

01:58:12,890 --> 01:58:11,040

Artemis will stand on the shoulders of

2980

01:58:14,930 --> 01:58:12,900

Apollo they're going to have the eyes of

2981

01:58:18,470 --> 01:58:14,940

the world on them when they start down

2982

01:58:24,530 --> 01:58:21,589

the science of a space flight is one

2983

01:58:27,169 --> 01:58:24,540

that will continue to inspire going to

2984

01:58:30,229 --> 01:58:27,179

the Moon generates technology more

2985

01:58:33,709 --> 01:58:30,239

Communications more computer technology

2986

01:58:37,930 --> 01:58:33,719

more sophistication in manufacturing

2987

01:58:42,890 --> 01:58:40,910

we have a generation that is ready a

2988

01:58:45,470 --> 01:58:42,900

generation with that technology a

2989

01:58:48,589 --> 01:58:45,480

generation with the education Artemis

2990

01:58:53,970 --> 01:58:48,599

represents the future in space it is our

2991

01:59:00,410 --> 01:58:58,910

[Music]

2992

01:59:02,930 --> 01:59:00,420

if you're just joining us welcome to

2993

01:59:04,609 --> 01:59:02,940

NASA's Kennedy Space Center where we are

2994

01:59:07,250 --> 01:59:04,619

showing you a live look of another

2995

01:59:09,589 --> 01:59:07,260

Visitor Center this is the U.S Space and

2996

01:59:11,570 --> 01:59:09,599

Rocket Center wow take a look at all of

2997

01:59:13,609 --> 01:59:11,580

those people who are there hoping to

2998

01:59:15,770 --> 01:59:13,619

watch the launch today you know this is

2999

01:59:18,169 --> 01:59:15,780

the visitor center for the Marshall

3000

01:59:20,330 --> 01:59:18,179

space flight center in Huntsville

3001

01:59:23,330 --> 01:59:20,340

Alabama they that Center played a

3002

01:59:26,570 --> 01:59:23,340

crucial role in contributing to the

3003

01:59:27,709 --> 01:59:26,580

Artemis program so I'm not I'm not a

3004

01:59:32,030 --> 01:59:27,719

surprised that there are a bunch of

3005

01:59:37,910 --> 01:59:34,070

all right so now we're going to take a

3006

01:59:39,649 --> 01:59:37,920

uh go back to Leah Martin over at Banana

3007

01:59:41,149 --> 01:59:39,659

Creek again that's right outside of our

3008

01:59:42,709 --> 01:59:41,159

Visitor Center and she's with some other

3009

01:59:43,790 --> 01:59:42,719

folks who came out to watch today's

3010

01:59:45,890 --> 01:59:43,800

lunch

3011

01:59:48,890 --> 01:59:45,900

yeah you know Megan we talked about this

3012

01:59:50,810 --> 01:59:48,900

being America's rocket right every state

3013

01:59:52,310 --> 01:59:50,820

in the United States has contributed to

3014

01:59:54,709 --> 01:59:52,320

this rocket so it should be no surprise

3015

01:59:56,629 --> 01:59:54,719

that we have people from all over the

3016

01:59:58,250 --> 01:59:56,639

country joining us here tonight I'm

3017

02:00:00,649 --> 01:59:58,260

actually joined by uh some friends of

3018

02:00:02,629 --> 02:00:00,659

ours who are joining us from Georgia and

3019

02:00:04,910 --> 02:00:02,639

Utah what does it mean to be here

3020

02:00:06,830 --> 02:00:04,920

tonight to see tonight's launch I think

3021

02:00:08,629 --> 02:00:06,840

it's amazing I know that tons of people

3022

02:00:10,850 --> 02:00:08,639

from all over the United States have

3023

02:00:12,050 --> 02:00:10,860

helped build the rockets and are here

3024

02:00:13,430 --> 02:00:12,060

tonight so it's awesome to know that we

3025

02:00:15,410 --> 02:00:13,440

all have a little bit of personal ties

3026

02:00:17,750 --> 02:00:15,420

to the rocket

3027

02:00:19,550 --> 02:00:17,760

and go ahead no I'm just excited to be

3028

02:00:21,770 --> 02:00:19,560

here because I've been a fan of space

3029

02:00:24,410 --> 02:00:21,780

travel and going to the moon and back

3030

02:00:27,109 --> 02:00:24,420

and I'm glad to see it's happening again

3031

02:00:28,669 --> 02:00:27,119

later in life and you were actually

3032

02:00:31,189 --> 02:00:28,679

telling me a little bit earlier that you

3033

02:00:33,290 --> 02:00:31,199

grew up in the Apollo era in those years

3034

02:00:35,149 --> 02:00:33,300

following those first launches and now

3035

02:00:36,830 --> 02:00:35,159

here how does it feel to be watching the

3036

02:00:38,810 --> 02:00:36,840

sister program launch and sing at the

3037

02:00:41,270 --> 02:00:38,820

beginning look at the Goosebumps that

3038

02:00:44,810 --> 02:00:41,280

tells it all right here I'm totally

3039

02:00:46,729 --> 02:00:44,820

thrilled to be here now and you were

3040

02:00:48,470 --> 02:00:46,739

connection to this rocket as well you

3041

02:00:50,450 --> 02:00:48,480

know some people have worked on it what

3042

02:00:52,189 --> 02:00:50,460

do you think it feels like being here

3043

02:00:54,109 --> 02:00:52,199

how does it feel for you to see

3044

02:00:55,970 --> 02:00:54,119

something that's the culmination of so

3045

02:00:57,589 --> 02:00:55,980

many years of hard work yeah I think

3046

02:00:59,629 --> 02:00:57,599

it's crazy when you think about how long

3047

02:01:02,030 --> 02:00:59,639

it takes to build it and stuff like I

3048

02:01:04,430 --> 02:01:02,040

wasn't even born last time people tried

3049

02:01:06,890 --> 02:01:04,440

to get to the moon so it's awesome I

3050

02:01:10,129 --> 02:01:06,900

think it's so exciting and I cannot wait

3051
02:01:11,990 --> 02:01:10,139
and uh we have a ton of people who are

3052
02:01:13,430 --> 02:01:12,000
working tonight still on Console we just

3053
02:01:15,890 --> 02:01:13,440
want to tell them words of encouragement

3054
02:01:17,270 --> 02:01:15,900
what more do you have to say oh I hope

3055
02:01:20,750 --> 02:01:17,280
this goes tonight

3056
02:01:24,830 --> 02:01:23,209
go Artemis yes I love that and again I

3057
02:01:26,870 --> 02:01:24,840
just love these drone shots that we're

3058
02:01:30,350 --> 02:01:26,880
showing of all the people who are here

3059
02:01:32,810 --> 02:01:30,360
ready hoping uh anticipating uh launch

3060
02:01:35,330 --> 02:01:32,820
today so now let's head back over to Dan

3061
02:01:37,669 --> 02:01:35,340
so Dan is in the Apollo Saturn V Center

3062
02:01:39,169 --> 02:01:37,679
which is right next to uh This Crowd

3063
02:01:40,970 --> 02:01:39,179

that you're seeing here he's inside

3064

02:01:43,370 --> 02:01:40,980

there and he's going to tell us more

3065

02:01:45,290 --> 02:01:43,380

about SLS using an interactive

3066

02:01:46,250 --> 02:01:45,300

state-of-the-art tool we're calling the

3067

02:01:47,689 --> 02:01:46,260

moon board

3068

02:01:50,209 --> 02:01:47,699

that's right Megan everybody Welcome

3069

02:01:52,609 --> 02:01:50,219

Back To The Moon board so just to recap

3070

02:01:54,229 --> 02:01:52,619

SLS out on the pad on the mobile

3071

02:01:56,149 --> 02:01:54,239

launcher Daryl's been walking you

3072

02:01:58,490 --> 02:01:56,159

through all of the tanking all the

3073

02:01:59,870 --> 02:01:58,500

preparation we had that hydrogen leak

3074

02:02:01,490 --> 02:01:59,880

that was in the base of the mobile

3075

02:02:03,470 --> 02:02:01,500

service structure here that's been

3076
02:02:05,750 --> 02:02:03,480
remedied uh we haven't had any issue

3077
02:02:08,330 --> 02:02:05,760
with those tail umbilicals that we were

3078
02:02:09,770 --> 02:02:08,340
tracking so closely back in August uh

3079
02:02:13,370 --> 02:02:09,780
and September so everything looking

3080
02:02:16,189 --> 02:02:13,380
really good with SLS just to recap

3081
02:02:18,649 --> 02:02:16,199
most powerful rocket we have ever built

3082
02:02:20,330 --> 02:02:18,659
it's propelled by two solid rocket

3083
02:02:22,490 --> 02:02:20,340
boosters and four engines on this core

3084
02:02:24,109 --> 02:02:22,500
stage now these solid rocket boosters

3085
02:02:25,910 --> 02:02:24,119
are going to be firing for the first

3086
02:02:27,530 --> 02:02:25,920
roughly two minutes of the flight a

3087
02:02:29,390 --> 02:02:27,540
little more than two minutes and we call

3088
02:02:31,310 --> 02:02:29,400

them solids because of the type of

3089

02:02:33,109 --> 02:02:31,320

propellant in there if you forgot it

3090

02:02:35,089 --> 02:02:33,119

already it's aluminum powder ammonium

3091

02:02:37,129 --> 02:02:35,099

perchlorate and polybutadine

3092

02:02:39,290 --> 02:02:37,139

acrylonitrile it's a binding agent

3093

02:02:41,750 --> 02:02:39,300

that's inside solid propellants are

3094

02:02:43,790 --> 02:02:41,760

extremely stable they're very reliable

3095

02:02:45,169 --> 02:02:43,800

but once you ignite them they're going

3096

02:02:47,390 --> 02:02:45,179

to keep burning you can't really

3097

02:02:49,370 --> 02:02:47,400

throttle them up and down like you can

3098

02:02:51,470 --> 02:02:49,380

with liquid-fueled engines you can

3099

02:02:53,750 --> 02:02:51,480

throttle just based off of the

3100

02:02:56,030 --> 02:02:53,760

distribution so you basically put more

3101

02:02:58,250 --> 02:02:56,040

propellant in some areas unless and

3102

02:03:00,410 --> 02:02:58,260

others as you're trying to really

3103

02:03:02,990 --> 02:03:00,420

throttle the rocket down which we do as

3104

02:03:05,209 --> 02:03:03,000

we go through things like Max Q maximum

3105

02:03:08,089 --> 02:03:05,219

Dynamic pressure and just a reminder is

3106

02:03:10,189 --> 02:03:08,099

these things are firing they can steer

3107

02:03:12,229 --> 02:03:10,199

they can gimbal the bottom part here

3108

02:03:14,810 --> 02:03:12,239

gimbal just means you can really direct

3109

02:03:16,729 --> 02:03:14,820

and they're providing 90 percent of the

3110

02:03:19,310 --> 02:03:16,739

steering as SLS is making the flight

3111

02:03:21,470 --> 02:03:19,320

uphill and more than 75 percent of the

3112

02:03:23,330 --> 02:03:21,480

thrust with those two firing at the same

3113

02:03:26,209 --> 02:03:23,340

time and again they're attached to this

3114

02:03:27,890 --> 02:03:26,219

this is the core stage 212 feet tall the

3115

02:03:29,689 --> 02:03:27,900

largest single stage we've ever

3116

02:03:32,870 --> 02:03:29,699

constructed it's been through the green

3117

02:03:35,870 --> 02:03:32,880

run test a lot of preparation for this

3118

02:03:38,510 --> 02:03:35,880

flight today and it is propelled by

3119

02:03:40,790 --> 02:03:38,520

these four rs-25 engines now these are

3120

02:03:42,709 --> 02:03:40,800

liquid-fueled rocket engines so you have

3121

02:03:44,209 --> 02:03:42,719

a fuel and an oxidizer and one of the

3122

02:03:45,950 --> 02:03:44,219

great things about liquid fuel is you

3123

02:03:47,570 --> 02:03:45,960

can throttle them in real time you could

3124

02:03:49,790 --> 02:03:47,580

kind of like the gas in your car you can

3125

02:03:51,470 --> 02:03:49,800

go faster a little bit slower so these

3126
02:03:53,209 --> 02:03:51,480
throttle up to a hundred and four

3127
02:03:55,790 --> 02:03:53,219
percent of their rated thrust at the

3128
02:03:58,070 --> 02:03:55,800
time of liftoff we throttle them down as

3129
02:04:00,770 --> 02:03:58,080
we go through Max use the maximum amount

3130
02:04:02,810 --> 02:04:00,780
of pressure on SLS on the way uphill and

3131
02:04:04,609 --> 02:04:02,820
then throttle them back up until they've

3132
02:04:06,350 --> 02:04:04,619
consumed all of their propellants and

3133
02:04:09,050 --> 02:04:06,360
they're consuming that propellant at

3134
02:04:11,209 --> 02:04:09,060
more than 50 500 gallons a second that

3135
02:04:13,250 --> 02:04:11,219
is just an astronomical amount of fuel

3136
02:04:15,229 --> 02:04:13,260
that's running through these engines to

3137
02:04:18,050 --> 02:04:15,239
produce that thrust each of these up to

3138
02:04:20,450 --> 02:04:18,060

half a million pounds each during their

3139

02:04:22,310 --> 02:04:20,460

operation and of all the different

3140

02:04:24,410 --> 02:04:22,320

components we've got this engine block

3141

02:04:26,750 --> 02:04:24,420

section down here you have all of the

3142

02:04:28,669 --> 02:04:26,760

Associated Plumbing everything to feed

3143

02:04:30,470 --> 02:04:28,679

those propellants down to these engines

3144

02:04:32,689 --> 02:04:30,480

you also have these two attachment

3145

02:04:35,570 --> 02:04:32,699

points here and that's where we actually

3146

02:04:37,430 --> 02:04:35,580

tank the SLS rocket so a lot of focus on

3147

02:04:39,770 --> 02:04:37,440

those in the previous attempts they've

3148

02:04:42,290 --> 02:04:39,780

cooperated spectacularly so far today

3149

02:04:45,229 --> 02:04:42,300

and we've been able to fully tank this

3150

02:04:47,750 --> 02:04:45,239

core stage and reminder you have a fuel

3151

02:04:50,629 --> 02:04:47,760

about half a million gallons right here

3152

02:04:52,729 --> 02:04:50,639

of liquid hydrogen and then an oxidizer

3153

02:04:54,410 --> 02:04:52,739

you need those two together and then an

3154

02:04:57,169 --> 02:04:54,420

ignition Source that's what gives you

3155

02:04:59,510 --> 02:04:57,179

your reaction your thrust your basically

3156

02:05:02,750 --> 02:04:59,520

controlled explosion that then comes out

3157

02:05:04,729 --> 02:05:02,760

of those rocket engines so fully tanked

3158

02:05:06,830 --> 02:05:04,739

these are cryogenic fuels hundreds of

3159

02:05:09,350 --> 02:05:06,840

degrees below zero so we've got a spray

3160

02:05:11,089 --> 02:05:09,360

on insulation across the entire vehicle

3161

02:05:13,430 --> 02:05:11,099

as it's sitting out there in the Florida

3162

02:05:14,990 --> 02:05:13,440

Air it's a little bit warm tonight but

3163

02:05:16,790 --> 02:05:15,000

we need to keep those hundreds of

3164

02:05:19,070 --> 02:05:16,800

degrees below zero it takes a lot of

3165

02:05:20,990 --> 02:05:19,080

energy to do that so the less you have

3166

02:05:23,390 --> 02:05:21,000

to use to keep them cold the better

3167

02:05:25,490 --> 02:05:23,400

which is why we have that insulation so

3168

02:05:27,830 --> 02:05:25,500

we're going to be seeing SLS take flight

3169

02:05:30,470 --> 02:05:27,840

for the first time tonight as we clear

3170

02:05:32,870 --> 02:05:30,480

all of those final issues again this is

3171

02:05:34,910 --> 02:05:32,880

going to be one heck of a show when this

3172

02:05:38,570 --> 02:05:34,920

thing launches into the night sky so

3173

02:05:40,189 --> 02:05:38,580

with that send it back over to you Megan

3174

02:05:42,350 --> 02:05:40,199

if you're just joining us welcome to

3175

02:05:44,629 --> 02:05:42,360

NASA's Kennedy Space Center for live

3176

02:05:46,310 --> 02:05:44,639

launch coverage of Artemis one I'm

3177

02:05:48,169 --> 02:05:46,320

NASA's Megan Cruz and this is NASA

3178

02:05:49,609 --> 02:05:48,179

astronaut Kayla Baron it's been great

3179

02:05:51,169 --> 02:05:49,619

having you these past two hours it's

3180

02:05:53,450 --> 02:05:51,179

been so awesome to be here for this

3181

02:05:56,209 --> 02:05:53,460

historic launch tonight so right now we

3182

02:05:58,250 --> 02:05:56,219

are awaiting a new t0 the launch team

3183

02:05:59,629 --> 02:05:58,260

had to work through some issues and

3184

02:06:01,370 --> 02:05:59,639

they're doing a great job at working

3185

02:06:04,250 --> 02:06:01,380

through those issues so now we're just

3186

02:06:06,050 --> 02:06:04,260

waiting to see a new t0 since we had

3187

02:06:09,229 --> 02:06:06,060

been aiming for the top of the launch

3188

02:06:11,990 --> 02:06:09,239

window which opened uh our wood uh does

3189

02:06:15,589 --> 02:06:12,000

open at 104 a.m eastern time now today

3190

02:06:17,209 --> 02:06:15,599

is a big deal Apollo 17 in 1972 was the

3191

02:06:19,490 --> 02:06:17,219

last time humans stepped foot on the

3192

02:06:21,050 --> 02:06:19,500

Moon that uh the rocket you see right

3193

02:06:23,089 --> 02:06:21,060

there behind us illuminated in the

3194

02:06:25,669 --> 02:06:23,099

darkness there is the first step back

3195

02:06:27,649 --> 02:06:25,679

towards getting us to the moon now

3196

02:06:29,930 --> 02:06:27,659

Artemis 1 is the first integrated flight

3197

02:06:32,149 --> 02:06:29,940

test of NASA's deep space exploration

3198

02:06:34,250 --> 02:06:32,159

systems that's the ground systems here

3199

02:06:36,770 --> 02:06:34,260

at Kennedy Space Center the space launch

3200

02:06:39,950 --> 02:06:36,780

system or SLS Rockets and the Orion

3201

02:06:42,770 --> 02:06:39,960

spacecraft we will send send an uncrewed

3202

02:06:44,510 --> 02:06:42,780

Orion spacecraft farther beyond the moon

3203

02:06:47,270 --> 02:06:44,520

than any of the Apollo missions before

3204

02:06:49,250 --> 02:06:47,280

it for Artemis 2 Orion will have

3205

02:06:51,530 --> 02:06:49,260

astronauts on board as it orbits the

3206

02:06:53,870 --> 02:06:51,540

moon then future Artemis missions will

3207

02:06:56,089 --> 02:06:53,880

land the first woman and first person of

3208

02:06:57,709 --> 02:06:56,099

color on the surface of the Moon

3209

02:06:58,550 --> 02:06:57,719

so Kayla why do we want to go back to

3210

02:07:00,649 --> 02:06:58,560

the Moon

3211

02:07:02,689 --> 02:07:00,659

the moon's a super interesting place to

3212

02:07:05,030 --> 02:07:02,699

study it can tell us a lot about the

3213

02:07:07,250 --> 02:07:05,040

Earth its own formation but also more

3214

02:07:09,229 --> 02:07:07,260

about our solar system and we also want

3215

02:07:11,930 --> 02:07:09,239

to return this time in an international

3216

02:07:13,370 --> 02:07:11,940

partnership for a permanent presence on

3217

02:07:14,750 --> 02:07:13,380

the lunar surface that'll teach us

3218

02:07:17,750 --> 02:07:14,760

everything we need to know to travel

3219

02:07:20,570 --> 02:07:17,760

onto Mars and what about for you I mean

3220

02:07:22,189 --> 02:07:20,580

you have the possibility of maybe being

3221

02:07:24,470 --> 02:07:22,199

selected for those future missions

3222

02:07:26,810 --> 02:07:24,480

because they the Artemis program can

3223

02:07:28,430 --> 02:07:26,820

choose from any of you guys any of the

3224

02:07:30,890 --> 02:07:28,440

NASA astronauts

3225

02:07:32,330 --> 02:07:30,900

it's a crazy time to be a NASA astronaut

3226

02:07:34,070 --> 02:07:32,340

and even imagine that that could be real

3227

02:07:35,870 --> 02:07:34,080

I think we're all just honored to be a

3228

02:07:38,450 --> 02:07:35,880

part of the team that's doing this we're

3229

02:07:39,890 --> 02:07:38,460

just a small representation of all of

3230

02:07:41,870 --> 02:07:39,900

the amazing human beings around the

3231

02:07:43,370 --> 02:07:41,880

world that it takes to do something as

3232

02:07:45,290 --> 02:07:43,380

audacious as returning to the Moon

3233

02:07:47,510 --> 02:07:45,300

learning what we need to go on to Mars

3234

02:07:49,609 --> 02:07:47,520

so we're just all excited to support the

3235

02:07:51,709 --> 02:07:49,619

program in any way we can but of course

3236

02:07:54,109 --> 02:07:51,719

a ride to the Moon would be incredible

3237

02:07:56,689 --> 02:07:54,119

so I think we're all just dreaming about

3238

02:07:58,729 --> 02:07:56,699

those Moonwalks now since Artemis one is

3239

02:08:00,290 --> 02:07:58,739

setting the stage for those future crude

3240

02:08:02,750 --> 02:08:00,300

missions is there anything in particular

3241

02:08:04,850 --> 02:08:02,760

about this 26-day mission that you will

3242

02:08:06,709 --> 02:08:04,860

be watching is it re-entry

3243

02:08:07,850 --> 02:08:06,719

yeah you know we've mentioned that a few

3244

02:08:10,010 --> 02:08:07,860

times throughout the broadcast tonight

3245

02:08:11,990 --> 02:08:10,020

the re-entry is a really important part

3246

02:08:13,850 --> 02:08:12,000

of the flight of course and the heat

3247

02:08:15,950 --> 02:08:13,860

shield we're interested in seeing how it

3248

02:08:17,750 --> 02:08:15,960

performs in real life we tested it on

3249

02:08:19,790 --> 02:08:17,760

the ground but Orion's going to be

3250

02:08:22,250 --> 02:08:19,800

coming in faster and hotter than any

3251

02:08:23,570 --> 02:08:22,260

human rated spacecraft in history and so

3252

02:08:25,250 --> 02:08:23,580

we really want to see how the heat

3253

02:08:27,290 --> 02:08:25,260

shield performs and make sure all the

3254

02:08:29,089 --> 02:08:27,300

systems can keep the crew safe for that

3255

02:08:30,350 --> 02:08:29,099

Dynamic event yeah we'll all be watching

3256

02:08:32,149 --> 02:08:30,360

for that too it's not just about the

3257

02:08:34,970 --> 02:08:32,159

launch the 26 day Mission as we said so

3258

02:08:37,430 --> 02:08:34,980

we'll be keeping a watch over the entire

3259

02:08:38,870 --> 02:08:37,440

Mission our Workforce Now is very

3260

02:08:41,330 --> 02:08:38,880

different from what it was during the

3261

02:08:43,669 --> 02:08:41,340

Apollo era when Apollo 11 launched there

3262

02:08:45,830 --> 02:08:43,679

was only one female engineer in the

3263

02:08:48,530 --> 02:08:45,840

firing room today's launch of Artemis

3264

02:08:50,510 --> 02:08:48,540

one is led by NASA's first ever female

3265

02:08:52,310 --> 02:08:50,520

launch director take a look at how she

3266

02:08:54,609 --> 02:08:52,320

and other women across NASA are

3267

02:08:57,649 --> 02:08:54,619

shattering glass ceilings

3268

02:09:00,229 --> 02:08:57,659

when I was a little girl I wanted to be

3269

02:09:02,270 --> 02:09:00,239

an astronaut a scientist a doctor a

3270

02:09:04,310 --> 02:09:02,280

fighter pilot when I was a little girl I

3271

02:09:06,169 --> 02:09:04,320

wanted to grow up to be strong and

3272

02:09:07,850 --> 02:09:06,179

independent when we were asked to draw a

3273

02:09:10,850 --> 02:09:07,860

picture of what we wanted to be when we

3274

02:09:12,649 --> 02:09:10,860

grew up I drew an astronaut standing on

3275

02:09:14,149 --> 02:09:12,659

the surface of the Moon all I thought

3276
02:09:14,650 --> 02:09:14,159
about was when I was going to get to

3277
02:09:19,189 --> 02:09:14,660
NASA

3278
02:09:22,010 --> 02:09:19,199
[Music]

3279
02:09:24,770 --> 02:09:22,020
honor to be NASA's first female watch

3280
02:09:25,930 --> 02:09:24,780
director to be the launch director for

3281
02:09:29,510 --> 02:09:25,940
Artemis

3282
02:09:32,330 --> 02:09:29,520
NASA has so many wonderful women

3283
02:09:34,669 --> 02:09:32,340
Pioneers so many Heroes to me some of

3284
02:09:36,950 --> 02:09:34,679
the most amazing women in my eyes are

3285
02:09:39,050 --> 02:09:36,960
people like Katherine Johnson and the

3286
02:09:40,770 --> 02:09:39,060
other women that you've seen in Hidden

3287
02:09:42,290 --> 02:09:40,780
figures

3288
02:09:44,149 --> 02:09:42,300

[Music]

3289

02:09:46,669 --> 02:09:44,159

sometimes it's difficult to believe that

3290

02:09:48,169 --> 02:09:46,679

I'm on this side now wearing this Blue

3291

02:09:50,689 --> 02:09:48,179

flight suit with all of the other

3292

02:09:53,089 --> 02:09:50,699

astronauts representing this iconic

3293

02:09:55,310 --> 02:09:53,099

image that had so inspired and excited

3294

02:09:58,070 --> 02:09:55,320

me my entire life

3295

02:10:00,530 --> 02:09:58,080

being of South Asian Heritage kalpa

3296

02:10:02,390 --> 02:10:00,540

nachala was just such a big thing for me

3297

02:10:04,850 --> 02:10:02,400

growing up I've always looked up to

3298

02:10:07,010 --> 02:10:04,860

Sally Ride and Mae Jemison who really

3299

02:10:08,990 --> 02:10:07,020

laid the foundation to allow people like

3300

02:10:11,750 --> 02:10:09,000

me to be in the position that I am now

3301
02:10:13,550 --> 02:10:11,760
all of these women were pushing those

3302
02:10:16,129 --> 02:10:13,560
boundaries and breaking those glass

3303
02:10:18,290 --> 02:10:16,139
ceilings now of course there are some

3304
02:10:24,070 --> 02:10:18,300
fantastic women in leadership positions

3305
02:10:28,910 --> 02:10:26,689
so much has changed since the Apollo

3306
02:10:32,089 --> 02:10:28,920
program during the Apollo 11 launched we

3307
02:10:34,490 --> 02:10:32,099
had one woman one out of 400 engineers

3308
02:10:36,830 --> 02:10:34,500
in the room and I look at our team today

3309
02:10:39,410 --> 02:10:36,840
it's much more reflection of the world

3310
02:10:42,109 --> 02:10:39,420
that we live in a big piece of why it's

3311
02:10:43,850 --> 02:10:42,119
so important to have women and diverse

3312
02:10:45,530 --> 02:10:43,860
backgrounds because it allows us to

3313
02:10:47,450 --> 02:10:45,540

bring everybody along with us on this

3314

02:10:49,430 --> 02:10:47,460

journey it doesn't really matter what

3315

02:10:51,410 --> 02:10:49,440

you look like if you've got the brains

3316

02:10:53,089 --> 02:10:51,420

and you have the knowledge we need you

3317

02:10:55,910 --> 02:10:53,099

at the table

3318

02:10:57,649 --> 02:10:55,920

we are at such an exciting time in human

3319

02:10:59,689 --> 02:10:57,659

space flight right now and Artemis is

3320

02:11:02,089 --> 02:10:59,699

such a huge part of that we haven't been

3321

02:11:04,129 --> 02:11:02,099

to the Moon in many many years we have a

3322

02:11:06,410 --> 02:11:04,139

lot of younger generation folks that

3323

02:11:08,390 --> 02:11:06,420

have never seen that happen we will

3324

02:11:10,189 --> 02:11:08,400

understand so much more about the moon

3325

02:11:13,669 --> 02:11:10,199

about the Earth about our solar system

3326

02:11:15,649 --> 02:11:13,679

we're going to stay and to me that's an

3327

02:11:20,149 --> 02:11:15,659

amazing idea the moon is going to be the

3328

02:11:22,430 --> 02:11:20,159

blueprint for how we go to Mars and out

3329

02:11:25,850 --> 02:11:22,440

into the solar system and maybe Beyond

3330

02:11:28,310 --> 02:11:25,860

it is incredibly exciting to be part of

3331

02:11:30,649 --> 02:11:28,320

this Artemis team it still feels pretty

3332

02:11:33,169 --> 02:11:30,659

surreal to think that I might one day

3333

02:11:35,570 --> 02:11:33,179

walk on the moon to see a woman in a

3334

02:11:38,149 --> 02:11:35,580

person of color on the surface of the

3335

02:11:41,089 --> 02:11:38,159

Moon to be able to say that space is for

3336

02:11:44,629 --> 02:11:41,099

everyone and that we go to space to make

3337

02:11:47,780 --> 02:11:44,639

life better here on Earth for everyone I

3338

02:11:51,950 --> 02:11:47,790

know that tears will be in my eyes

3339

02:11:57,709 --> 02:11:54,290

my message to women and girls out there

3340

02:11:59,990 --> 02:11:57,719

is to find your passion whatever that is

3341

02:12:03,410 --> 02:12:00,000

don't let anyone tell you what you can

3342

02:12:07,010 --> 02:12:03,420

do or can't do only you can realize your

3343

02:12:09,350 --> 02:12:07,020

dreams faith for everyone and if me

3344

02:12:11,330 --> 02:12:09,360

being in this role helps to send that

3345

02:12:12,830 --> 02:12:11,340

message I think that's a great thing I

3346

02:12:15,229 --> 02:12:12,840

just actually love that I don't feel

3347

02:12:18,290 --> 02:12:15,239

like a woman at Nasa I just feel like a

3348

02:12:21,050 --> 02:12:18,300

person at Nasa the women of NASA are

3349

02:12:22,669 --> 02:12:21,060

autumnus and we make a difference every

3350

02:12:25,189 --> 02:12:22,679

day

3351
02:12:27,530 --> 02:12:25,199
I am NASA's spacewalk office Hardware

3352
02:12:30,109 --> 02:12:27,540
manager I'm the program scientist for

3353
02:12:33,589 --> 02:12:30,119
space biology I'm the director of NASA's

3354
02:12:41,890 --> 02:12:33,599
Johnson Space Center I am Artemis I am

3355
02:12:47,330 --> 02:12:45,229
I am Artemis

3356
02:12:48,890 --> 02:12:47,340
I just love the way that that video ends

3357
02:12:51,530 --> 02:12:48,900
with you and all these other women

3358
02:12:54,589 --> 02:12:51,540
saying I am Artemis what do you think

3359
02:12:56,390 --> 02:12:54,599
why is it so powerful to just hear those

3360
02:12:58,069 --> 02:12:56,400
three words I am Artemis why does that

3361
02:13:00,169 --> 02:12:58,079
resonate so much

3362
02:13:02,689 --> 02:13:00,179
I think it just represents how far we've

3363
02:13:04,970 --> 02:13:02,699

come since the Apollo area era and how

3364

02:13:06,770 --> 02:13:04,980

we take advantage of the incredible

3365

02:13:08,930 --> 02:13:06,780

diversity our country has to offer

3366

02:13:10,669 --> 02:13:08,940

having seats at the table for everyone

3367

02:13:12,050 --> 02:13:10,679

you know spaces for everyone you heard

3368

02:13:13,490 --> 02:13:12,060

that a few times in the video and I

3369

02:13:15,649 --> 02:13:13,500

think we're proving that out every

3370

02:13:17,629 --> 02:13:15,659

single day in our work not just at Nasa

3371

02:13:19,370 --> 02:13:17,639

but with our International Partners I

3372

02:13:21,109 --> 02:13:19,380

think it's so important to our ability

3373

02:13:22,910 --> 02:13:21,119

to succeed on these really complex

3374

02:13:25,609 --> 02:13:22,920

missions yeah I thought that was a very

3375

02:13:27,589 --> 02:13:25,619

powerful video and and I'm glad that

3376

02:13:28,550 --> 02:13:27,599

people got that message young girls in

3377

02:13:30,410 --> 02:13:28,560

particular

3378

02:13:32,870 --> 02:13:30,420

another person who you saw in that video

3379

02:13:35,089 --> 02:13:32,880

is uh Pam melroy she's a former

3380

02:13:36,589 --> 02:13:35,099

astronaut and NASA's Deputy

3381

02:13:38,209 --> 02:13:36,599

Administrator so why don't we head over

3382

02:13:40,550 --> 02:13:38,219

to Jasmine Hopkins because Pam is there

3383

02:13:42,290 --> 02:13:40,560

with her now thank you so much Megan yes

3384

02:13:45,470 --> 02:13:42,300

I am honored now to be joined by Pam

3385

02:13:47,450 --> 02:13:45,480

Milroy NASA Deputy Administrator this is

3386

02:13:49,850 --> 02:13:47,460

just a fantastic night we just saw that

3387

02:13:52,790 --> 02:13:49,860

powerful video with you among so many of

3388

02:13:54,830 --> 02:13:52,800

the Great women here at Nasa what is so

3389

02:13:56,870 --> 02:13:54,840

important about us now being ready to

3390

02:13:59,569 --> 02:13:56,880

send you know the first woman the first

3391

02:14:02,569 --> 02:13:59,579

person of color to the Moon Yeah I loved

3392

02:14:04,550 --> 02:14:02,579

watching that video just inspires me so

3393

02:14:06,550 --> 02:14:04,560

many of those women are my friends but

3394

02:14:09,229 --> 02:14:06,560

also they're just such fantastic

3395

02:14:11,330 --> 02:14:09,239

engineers and scientists and just so

3396

02:14:13,609 --> 02:14:11,340

many roles at the agency I've always

3397

02:14:16,370 --> 02:14:13,619

thought one of the strongest teams that

3398

02:14:18,709 --> 02:14:16,380

you could ever find is a family and

3399

02:14:21,109 --> 02:14:18,719

families have men and women and so our

3400

02:14:23,870 --> 02:14:21,119

teams are stronger I think when we have

3401

02:14:26,450 --> 02:14:23,880

that balance and that diversity so that

3402

02:14:28,490 --> 02:14:26,460

was exciting but for me I was a part of

3403

02:14:31,550 --> 02:14:28,500

the Apollo generation and I was very

3404

02:14:34,550 --> 02:14:31,560

inspired by you know Neil Armstrong and

3405

02:14:36,950 --> 02:14:34,560

Buzz Aldrin and Mike Collins on Apollo

3406

02:14:39,649 --> 02:14:36,960

11 and all the Apollo Astronauts

3407

02:14:41,390 --> 02:14:39,659

I just cannot even imagine the

3408

02:14:42,709 --> 02:14:41,400

inspiration though for a little girl I

3409

02:14:44,689 --> 02:14:42,719

mean it never

3410

02:14:46,609 --> 02:14:44,699

occurred to me that there I mean I

3411

02:14:49,069 --> 02:14:46,619

wanted to be an astronaut but of course

3412

02:14:50,330 --> 02:14:49,079

there were no women astronauts then I

3413

02:14:52,550 --> 02:14:50,340

think what's going to happen now with

3414

02:14:54,229 --> 02:14:52,560

the Artemis generation is that that

3415

02:14:57,649 --> 02:14:54,239

first woman and the first person of

3416

02:14:59,870 --> 02:14:57,659

color is just going to have a huge

3417

02:15:01,790 --> 02:14:59,880

impact on the Next Generation right we

3418

02:15:02,930 --> 02:15:01,800

are just watching with baited breath and

3419

02:15:05,209 --> 02:15:02,940

I know that it's going to mean so much

3420

02:15:07,069 --> 02:15:05,219

to little kids to look up to them and

3421

02:15:08,629 --> 02:15:07,079

and we understand too this is a huge I

3422

02:15:10,729 --> 02:15:08,639

mean when we launch Artemis it's going

3423

02:15:12,470 --> 02:15:10,739

to be a global accomplishment we have

3424

02:15:14,510 --> 02:15:12,480

the Artemis Accords which are helping us

3425

02:15:16,430 --> 02:15:14,520

make sure we explore peacefully can you

3426

02:15:18,890 --> 02:15:16,440

tell us more about those yeah it's

3427

02:15:22,010 --> 02:15:18,900

really important actually especially

3428

02:15:23,569 --> 02:15:22,020

because you know unlike in Apollo where

3429

02:15:25,250 --> 02:15:23,579

it was actually just a few countries

3430

02:15:27,890 --> 02:15:25,260

that had the capability to go to space

3431

02:15:31,010 --> 02:15:27,900

now those capabilities are proliferating

3432

02:15:32,930 --> 02:15:31,020

throughout the world and so what we do

3433

02:15:36,470 --> 02:15:32,940

with the rocket is really important and

3434

02:15:39,830 --> 02:15:36,480

how we go is is just as important and

3435

02:15:42,290 --> 02:15:39,840

how we go is as teams and with our

3436

02:15:44,810 --> 02:15:42,300

partners and with a sense of the

3437

02:15:46,609 --> 02:15:44,820

response ability that we have as we go

3438

02:15:50,089 --> 02:15:46,619

out into the solar system to do it

3439

02:15:52,189 --> 02:15:50,099

peacefully for scientific purposes and

3440

02:15:54,350 --> 02:15:52,199

responsibly right Pam you have a great

3441

02:15:56,270 --> 02:15:54,360

sense of teamwork and this is definitely

3442

02:15:58,430 --> 02:15:56,280

not our first time you know there's a

3443

02:16:00,109 --> 02:15:58,440

lot of things that go into testing out a

3444

02:16:02,209 --> 02:16:00,119

first-time vehicle there's actually

3445

02:16:04,669 --> 02:16:02,219

Dynamic activity going on right now so

3446

02:16:06,350 --> 02:16:04,679

how does this first flight test of SLS

3447

02:16:08,089 --> 02:16:06,360

compare to other first times you know

3448

02:16:10,850 --> 02:16:08,099

with shuttle or with Saturn V before

3449

02:16:13,850 --> 02:16:10,860

that well I can I can do even better as

3450

02:16:14,990 --> 02:16:13,860

a test pilot right so there's a history

3451

02:16:17,030 --> 02:16:15,000

there

3452

02:16:19,129 --> 02:16:17,040

um in fact the you know the amazing

3453

02:16:21,649 --> 02:16:19,139

thing about this is it so first flight

3454

02:16:23,270 --> 02:16:21,659

of a first aircraft you actually taxi it

3455

02:16:25,490 --> 02:16:23,280

out to the end of the runway and then

3456

02:16:27,470 --> 02:16:25,500

run down the runway and come back and

3457

02:16:29,149 --> 02:16:27,480

check all the data then you might take

3458

02:16:31,490 --> 02:16:29,159

off once and go around the pattern and

3459

02:16:33,889 --> 02:16:31,500

come back and land this is a little bit

3460

02:16:35,870 --> 02:16:33,899

like taking off and going to fly a full

3461

02:16:38,810 --> 02:16:35,880

mission on your very first flight of an

3462

02:16:41,509 --> 02:16:38,820

aircraft and so everything has to be

3463

02:16:43,790 --> 02:16:41,519

right so this Compares very you know

3464

02:16:46,030 --> 02:16:43,800

it's very similar to the experiences

3465

02:16:48,589 --> 02:16:46,040

that all new rocket developments have

3466

02:16:50,690 --> 02:16:48,599

where you know it's not just about

3467

02:16:52,669 --> 02:16:50,700

learning the hardware that's a big piece

3468

02:16:54,950 --> 02:16:52,679

of it but it's also about gelling that

3469

02:16:56,330 --> 02:16:54,960

team together and your procedures and

3470

02:16:58,009 --> 02:16:56,340

how you're going to deal with issues

3471

02:16:59,990 --> 02:16:58,019

that come up because they will come up

3472

02:17:02,209 --> 02:17:00,000

they always come up exactly and you have

3473

02:17:04,070 --> 02:17:02,219

that experience as a test pilot but also

3474

02:17:06,410 --> 02:17:04,080

as a former astronaut in that video we

3475

02:17:08,270 --> 02:17:06,420

saw you getting your induction into the

3476

02:17:10,250 --> 02:17:08,280

Astronaut Hall of Fame which is pretty

3477

02:17:11,929 --> 02:17:10,260

cool so what is your perspective or what

3478

02:17:13,549 --> 02:17:11,939

advice do you have for the Artemis

3479

02:17:15,770 --> 02:17:13,559

astronauts those ones that are are going

3480

02:17:18,530 --> 02:17:15,780

to maybe set foot on the moon oh well

3481

02:17:21,250 --> 02:17:18,540

they don't need my advice I'd love to

3482

02:17:24,530 --> 02:17:21,260

Elbow them out of the way and go to them

3483

02:17:27,469 --> 02:17:24,540

they are fantastic I mean we are I'm so

3484

02:17:29,450 --> 02:17:27,479

proud of all of our astronauts I was

3485

02:17:33,110 --> 02:17:29,460

just talking to Jessica Watkins who just

3486

02:17:35,690 --> 02:17:33,120

came back on crew for this generation is

3487

02:17:37,490 --> 02:17:35,700

prepared ready and excited and I think

3488

02:17:39,589 --> 02:17:37,500

they're really excited that we're

3489

02:17:41,690 --> 02:17:39,599

putting science front and center in the

3490

02:17:43,969 --> 02:17:41,700

Artemis program too we're going to learn

3491

02:17:46,490 --> 02:17:43,979

so much about the cell solar system from

3492

02:17:48,349 --> 02:17:46,500

the Moon and even about the Earth and so

3493

02:17:49,969 --> 02:17:48,359

that I think the astronauts are really

3494

02:17:52,070 --> 02:17:49,979

excited about doing that Hands-On

3495

02:17:53,929 --> 02:17:52,080

science and they're they're they are

3496

02:17:55,969 --> 02:17:53,939

ready to go right I know they're ready

3497

02:17:57,889 --> 02:17:55,979

to go and maybe you are as well but

3498

02:17:59,389 --> 02:17:57,899

Artemis one is just the beginning then

3499

02:18:01,429 --> 02:17:59,399

we have Artemis two and on we're

3500

02:18:03,290 --> 02:18:01,439

learning so much what do you think about

3501
02:18:04,969 --> 02:18:03,300
this just forward movement that we're

3502
02:18:07,129 --> 02:18:04,979
making right now well it's really

3503
02:18:10,610 --> 02:18:07,139
important this is uh the Artemis

3504
02:18:13,129 --> 02:18:10,620
campaign is actually a part of

3505
02:18:16,429 --> 02:18:13,139
um multi-decade effort that we're doing

3506
02:18:19,790 --> 02:18:16,439
right now which is really with the goal

3507
02:18:22,849 --> 02:18:19,800
of creating a blueprint for how we're

3508
02:18:25,250 --> 02:18:22,859
going to explore with humans and do

3509
02:18:27,110 --> 02:18:25,260
science throughout the solar system so

3510
02:18:28,910 --> 02:18:27,120
we're going to learn through the Artemis

3511
02:18:32,270 --> 02:18:28,920
campaign on the moon and then we're

3512
02:18:34,310 --> 02:18:32,280
going to go demonstrate it on Mars and

3513
02:18:35,990 --> 02:18:34,320

then the next destination who knows

3514

02:18:37,849 --> 02:18:36,000

where right I mean we're going so much

3515

02:18:39,110 --> 02:18:37,859

further than we ever have before pamel

3516

02:18:41,270 --> 02:18:39,120

Ray thank you so much for joining us

3517

02:18:43,730 --> 02:18:41,280

thank you go Artemis of course go

3518

02:18:45,770 --> 02:18:43,740

Artemis Megan to you

3519

02:18:48,110 --> 02:18:45,780

thank you both for That interview now

3520

02:18:50,330 --> 02:18:48,120

teams over at NASA's Johnson Space

3521

02:18:51,530 --> 02:18:50,340

Center also monitoring today's launched

3522

02:18:53,929 --> 02:18:51,540

attempt so why don't we go back over

3523

02:18:57,349 --> 02:18:53,939

there with Leah to tell us what's going

3524

02:19:01,310 --> 02:18:59,509

thanks Megan and you're right teams here

3525

02:19:03,709 --> 02:19:01,320

in Mission Control Houston continue to

3526

02:19:05,389 --> 02:19:03,719

monitor today's events again they will

3527

02:19:07,129 --> 02:19:05,399

really kick into action once we have

3528

02:19:09,169 --> 02:19:07,139

liftoff and they'll remain on Console

3529

02:19:10,849 --> 02:19:09,179

all the way through Splashdown but

3530

02:19:12,230 --> 02:19:10,859

quickly I have to show you something a

3531

02:19:14,690 --> 02:19:12,240

little show and tell makes me feel like

3532

02:19:17,030 --> 02:19:14,700

the coolest kid in school I've got a

3533

02:19:21,290 --> 02:19:17,040

moon rock here I hope you can get a good

3534

02:19:23,450 --> 02:19:21,300

shot of it it is from Apollo 15 1971 and

3535

02:19:26,509 --> 02:19:23,460

when it was brought back to Earth it was

3536

02:19:28,910 --> 02:19:26,519

part of a larger Rock in total it was 21

3537

02:19:30,830 --> 02:19:28,920

pounds this is of course a smaller

3538

02:19:32,750 --> 02:19:30,840

section of that but we're looking

3539

02:19:34,969 --> 02:19:32,760

forward to the Artemis program and being

3540

02:19:36,830 --> 02:19:34,979

able to go back to the moon so that we

3541

02:19:39,290 --> 02:19:36,840

can continue to gather these kinds of

3542

02:19:41,509 --> 02:19:39,300

samples but this time at the lunar South

3543

02:19:43,370 --> 02:19:41,519

Pole we've never been there and we've

3544

02:19:46,250 --> 02:19:43,380

never brought samples back from that

3545

02:19:47,929 --> 02:19:46,260

area so we're really excited to see what

3546

02:19:49,610 --> 02:19:47,939

might differ in those samples and the

3547

02:19:51,770 --> 02:19:49,620

ones that we have here now of course

3548

02:19:53,929 --> 02:19:51,780

we've got a whole laboratory of

3549

02:19:56,570 --> 02:19:53,939

scientists that are able to study all of

3550

02:19:59,330 --> 02:19:56,580

those samples we just opened some up for

3551

02:20:01,190 --> 02:19:59,340

the first time earlier this year so that

3552

02:20:03,530 --> 02:20:01,200

we're able to test with new technology

3553

02:20:05,510 --> 02:20:03,540

everything that we can learn about these

3554

02:20:07,730 --> 02:20:05,520

samples that we brought back now 50

3555

02:20:09,410 --> 02:20:07,740

years ago so hopefully within the next

3556

02:20:12,110 --> 02:20:09,420

few years we're bringing some new ones

3557

02:20:14,630 --> 02:20:12,120

back uh to to use that same experimental

3558

02:20:16,969 --> 02:20:14,640

process on and tell us a little bit more

3559

02:20:19,730 --> 02:20:16,979

about the moon but just had to show this

3560

02:20:21,650 --> 02:20:19,740

off Apollo 15 Moon Rock we're looking

3561

02:20:24,170 --> 02:20:21,660

forward to having some Artist Artemis

3562

02:20:26,330 --> 02:20:24,180

ones here at Johnson Space Center with

3563

02:20:28,130 --> 02:20:26,340

that I will send it back to you at KSC

3564

02:20:30,950 --> 02:20:28,140

you are a cool kid before you even had

3565

02:20:33,650 --> 02:20:30,960

the moon rock so but now you're even a

3566

02:20:35,630 --> 02:20:33,660

cooler kid now the name Artemis was

3567

02:20:38,510 --> 02:20:35,640

chosen because in Greek mythology she's

3568

02:20:40,309 --> 02:20:38,520

the twin sister of Apollo NASA's Leo

3569

02:20:41,990 --> 02:20:40,319

Martin is over at the nearby Kennedy

3570

02:20:44,030 --> 02:20:42,000

Space Center Visitor complex where

3571

02:20:47,150 --> 02:20:44,040

thousands have gathered to watch today's

3572

02:20:52,190 --> 02:20:49,309

Hi Megan I'm actually joined here

3573

02:20:54,950 --> 02:20:52,200

tonight by a very special group of

3574

02:20:57,590 --> 02:20:54,960

guests uh here from stennis visiting

3575

02:21:00,170 --> 02:20:57,600

Kennedy Space Center why don't you tell

3576

02:21:01,550 --> 02:21:00,180

me Ryan what it is that ties you to

3577

02:21:03,950 --> 02:21:01,560

tonight's launch

3578

02:21:07,429 --> 02:21:03,960

so we were lucky and privileged enough

3579

02:21:11,150 --> 02:21:07,439

to be able to test the core stage of the

3580

02:21:14,950 --> 02:21:13,130

we got to Green Run which is a full

3581

02:21:18,050 --> 02:21:14,960

duration Hot Fire

3582

02:21:19,730 --> 02:21:18,060

it's a very historic time for us at

3583

02:21:22,429 --> 02:21:19,740

stennis it was so exciting to be a part

3584

02:21:25,490 --> 02:21:22,439

of it was seven years of hard work by a

3585

02:21:28,370 --> 02:21:25,500

lot of really great people and Jack oh

3586

02:21:29,809 --> 02:21:28,380

just so excited to be here to see it and

3587

02:21:32,030 --> 02:21:29,819

Jack you were actually telling me that

3588

02:21:34,070 --> 02:21:32,040

you know firsthand you know how much

3589

02:21:35,929 --> 02:21:34,080

work has gone into tonight's launch what

3590

02:21:38,570 --> 02:21:35,939

does it feel

3591

02:21:41,030 --> 02:21:38,580

the rocket fully in a on the pad ready

3592

02:21:43,370 --> 02:21:41,040

to go man I'm just incredibly grateful

3593

02:21:45,770 --> 02:21:43,380

to be a part of this history and just

3594

02:21:49,250 --> 02:21:45,780

really excited to see this thing launch

3595

02:21:52,910 --> 02:21:51,230

firsthand you know the adversity that

3596

02:21:54,770 --> 02:21:52,920

these teams have overcome to be here

3597

02:21:56,150 --> 02:21:54,780

tonight do you have a word of

3598

02:21:58,010 --> 02:21:56,160

encouragement anything that you'd like

3599

02:21:59,750 --> 02:21:58,020

to say to the teams all across the

3600

02:22:02,330 --> 02:21:59,760

United States right now both at Kennedy

3601
02:22:04,070 --> 02:22:02,340
and at JSC who are just sitting in these

3602
02:22:07,309 --> 02:22:04,080
seats ready to get the rocket launched

3603
02:22:10,730 --> 02:22:07,319
tonight sure persevere I mean it's hard

3604
02:22:12,650 --> 02:22:10,740
work but it's so well worth it we spent

3605
02:22:14,750 --> 02:22:12,660
many hours doing the testing and trying

3606
02:22:16,969 --> 02:22:14,760
to get ready for this moment and I think

3607
02:22:18,710 --> 02:22:16,979
we've forwarded that information to

3608
02:22:20,150 --> 02:22:18,720
those guys and we also give them the

3609
02:22:22,429 --> 02:22:20,160
encouragement to continue on so we know

3610
02:22:23,750 --> 02:22:22,439
they can do it thanks so much Barry and

3611
02:22:24,950 --> 02:22:23,760
I think it would be great if just on the

3612
02:22:29,210 --> 02:22:24,960
count of three we can give them a great

3613
02:22:33,050 --> 02:22:29,220

big go Artemis one two three

3614

02:22:35,330 --> 02:22:33,060

back to you Megan that was amazing uh

3615

02:22:37,190 --> 02:22:35,340

and that's just uh uh you know people

3616

02:22:39,530 --> 02:22:37,200

who were actually able to come here to

3617

02:22:41,090 --> 02:22:39,540

Florida there's many uh people who are

3618

02:22:42,469 --> 02:22:41,100

joining us from around the world who

3619

02:22:44,690 --> 02:22:42,479

couldn't obviously make the trip out

3620

02:22:46,190 --> 02:22:44,700

here uh so let's take a look at some of

3621

02:22:48,170 --> 02:22:46,200

those watch parties there here's Space

3622

02:22:50,870 --> 02:22:48,180

Center Houston it's the visitor center

3623

02:22:52,790 --> 02:22:50,880

over uh for Johnson Space Center in

3624

02:22:55,429 --> 02:22:52,800

Houston and you can see a lot of people

3625

02:22:57,170 --> 02:22:55,439

there after hours because you know that

3626

02:22:59,570 --> 02:22:57,180

visitor center is closed right now

3627

02:23:02,690 --> 02:22:59,580

people are waving I love it wow look at

3628

02:23:04,190 --> 02:23:02,700

that whatever that is it's amazing I

3629

02:23:05,690 --> 02:23:04,200

don't think I've ever noticed that when

3630

02:23:08,150 --> 02:23:05,700

I'm at Space Center Houston maybe it's

3631

02:23:10,190 --> 02:23:08,160

new I know but yeah just look at that

3632

02:23:11,809 --> 02:23:10,200

crowd it's really fun to see again all

3633

02:23:14,450 --> 02:23:11,819

all these people who are captivated

3634

02:23:16,070 --> 02:23:14,460

young and old by today's launch attempt

3635

02:23:18,950 --> 02:23:16,080

and the beginning of the Artemis program

3636

02:23:22,010 --> 02:23:18,960

I know that they're uh probably looking

3637

02:23:24,950 --> 02:23:22,020

at the clock and and wondering when we

3638

02:23:30,610 --> 02:23:24,960

might see the launch today so lovely to

3639

02:23:36,670 --> 02:23:34,130

and there's the Space and Rocket Center

3640

02:23:39,290 --> 02:23:36,680

uh where we have a ton of people

3641

02:23:42,290 --> 02:23:39,300

cheerleaders next cheering us on tonight

3642

02:23:43,969 --> 02:23:42,300

for this incredible launch this evening

3643

02:23:45,770 --> 02:23:43,979

I love that they totally look like

3644

02:23:48,110 --> 02:23:45,780

cheerleaders and I they're embracing it

3645

02:23:49,790 --> 02:23:48,120

I love it uh and yeah this is the U.S

3646

02:23:51,590 --> 02:23:49,800

Basin Rocket Center this is the visitor

3647

02:23:55,730 --> 02:23:51,600

center over in Huntsville Alabama as

3648

02:23:58,010 --> 02:23:55,740

I've said before uh this uh that uh

3649

02:24:01,849 --> 02:23:58,020

um Marshall space flight center there is

3650

02:24:04,250 --> 02:24:01,859

super instrumental uh in uh What uh what

3651

02:24:06,590 --> 02:24:04,260

the Artemis program is doing that they

3652

02:24:08,270 --> 02:24:06,600

uh contributed a lot to the mission so

3653

02:24:10,550 --> 02:24:08,280

it's nice to see everyone there and then

3654

02:24:13,010 --> 02:24:10,560

here is Airbus and Bremen Germany so

3655

02:24:15,469 --> 02:24:13,020

Airbus is the main contractor for the

3656

02:24:17,389 --> 02:24:15,479

European space agency and together the

3657

02:24:20,450 --> 02:24:17,399

company and Esa they provided the

3658

02:24:22,429 --> 02:24:20,460

European service module which is uh an

3659

02:24:25,010 --> 02:24:22,439

important part of the Orion spacecraft

3660

02:24:27,110 --> 02:24:25,020

so we have quite a bit of people there a

3661

02:24:31,070 --> 02:24:27,120

more reasonable time over there in

3662

02:24:34,630 --> 02:24:31,080

Germany it is 7 00 a.m so I'm gonna say

3663

02:24:37,670 --> 02:24:34,640

Guten Morgen to them did I say it right

3664

02:24:40,610 --> 02:24:37,680

Guten Morgen to them over there uh in

3665

02:24:43,250 --> 02:24:40,620

Bremen Germany again the Airbus company

3666

02:24:44,690 --> 02:24:43,260

all right so let's get another check on

3667

02:24:46,490 --> 02:24:44,700

the launch team with our Daryl nail

3668

02:24:47,510 --> 02:24:46,500

who's inside there and has an update for

3669

02:24:49,309 --> 02:24:47,520

us

3670

02:24:51,710 --> 02:24:49,319

yeah that's right Megan so we are

3671

02:24:53,690 --> 02:24:51,720

clearly in a delay now the NASA test

3672

02:24:56,210 --> 02:24:53,700

director who's basically flying the ship

3673

02:24:59,270 --> 02:24:56,220

for the launch countdown tonight has

3674

02:25:02,750 --> 02:24:59,280

said that we are extending the hold that

3675

02:25:05,630 --> 02:25:02,760

we were currently in at T minus 10

3676
02:25:09,050 --> 02:25:05,640
minutes and Counting and so that puts us

3677
02:25:11,690 --> 02:25:09,060
off the 104 a.m Eastern Time launch

3678
02:25:14,750 --> 02:25:11,700
we're now slipping indefinitely into the

3679
02:25:17,830 --> 02:25:14,760
hold and NASA test director Carlos mange

3680
02:25:21,170 --> 02:25:17,840
saying that we are currently

3681
02:25:22,250 --> 02:25:21,180
estimating how much work needs to be

3682
02:25:26,030 --> 02:25:22,260
done

3683
02:25:28,790 --> 02:25:26,040
before resuming uh the polling that uh

3684
02:25:32,510 --> 02:25:28,800
supposed to take place 15 minutes before

3685
02:25:35,090 --> 02:25:32,520
launch it then goes to terminal count at

3686
02:25:37,910 --> 02:25:35,100
T minus 10 minutes now we've got an

3687
02:25:41,510 --> 02:25:37,920
update on the tanking of the upper stage

3688
02:25:44,210 --> 02:25:41,520

liquid hydrogen tank currently 95

3689

02:25:47,690 --> 02:25:44,220

percent filled we're in topping on that

3690

02:25:50,030 --> 02:25:47,700

tank it is the last of four tanks in the

3691

02:25:53,450 --> 02:25:50,040

space launch system that needed to be

3692

02:25:55,370 --> 02:25:53,460

completely fueled up before we launch of

3693

02:25:57,889 --> 02:25:55,380

course cryogenic tanking a complex

3694

02:26:00,469 --> 02:25:57,899

operation that has seen some delays

3695

02:26:03,230 --> 02:26:00,479

tonight we had a roughly hour delay

3696

02:26:05,990 --> 02:26:03,240

after replenish valve on the core stage

3697

02:26:08,510 --> 02:26:06,000

liquid hydrogen side required Hands-On

3698

02:26:10,730 --> 02:26:08,520

work by a red crew team that went out to

3699

02:26:13,969 --> 02:26:10,740

the launch pad and tightened down some

3700

02:26:17,510 --> 02:26:13,979

bolts on the valve and got it fixed

3701
02:26:20,210 --> 02:26:17,520
before leaving the launch pad and then

3702
02:26:22,969 --> 02:26:20,220
launch Team verifying that that work was

3703
02:26:26,150 --> 02:26:22,979
complete now currently we're awaiting

3704
02:26:28,490 --> 02:26:26,160
some work with the range the 45th space

3705
02:26:33,650 --> 02:26:28,500
Wing which oversees the range here makes

3706
02:26:37,070 --> 02:26:33,660
sure that the air space and uh and the

3707
02:26:39,290 --> 02:26:37,080
ocean out over the flight path is clear

3708
02:26:41,929 --> 02:26:39,300
and also has the responsibility to

3709
02:26:44,870 --> 02:26:41,939
destruct the rocket should it go off

3710
02:26:46,969 --> 02:26:44,880
track they are been working on some

3711
02:26:48,530 --> 02:26:46,979
issues with their equipment and sending

3712
02:26:52,190 --> 02:26:48,540
a flight termination signal to the

3713
02:26:53,750 --> 02:26:52,200

rocket that that uh there is testing

3714

02:26:56,330 --> 02:26:53,760

that must happen with the flight

3715

02:26:58,610 --> 02:26:56,340

termination system that was delayed by a

3716

02:27:01,429 --> 02:26:58,620

bad ethernet switch switch has been

3717

02:27:04,550 --> 02:27:01,439

changed out and now the range is looking

3718

02:27:07,670 --> 02:27:04,560

to start testing their connectivity to

3719

02:27:10,130 --> 02:27:07,680

the rocket in order to preserve that

3720

02:27:11,630 --> 02:27:10,140

safety function that they are

3721

02:27:13,190 --> 02:27:11,640

responsible for

3722

02:27:16,070 --> 02:27:13,200

so again we are slipping now

3723

02:27:18,889 --> 02:27:16,080

indefinitely into the launch window

3724

02:27:22,010 --> 02:27:18,899

um we're awaiting uh the launch Team to

3725

02:27:25,670 --> 02:27:22,020

evaluate just how much time is required

3726
02:27:28,010 --> 02:27:25,680
to complete the work to get this rocket

3727
02:27:30,530 --> 02:27:28,020
ready to launch and of course when we

3728
02:27:34,070 --> 02:27:30,540
have a new t0 for you we'll report that

3729
02:27:36,710 --> 02:27:34,080
out right away Megan back to you

3730
02:27:38,809 --> 02:27:36,720
Daryl thank you so much as NASA prepares

3731
02:27:40,790 --> 02:27:38,819
to explore the moon here's a look at the

3732
02:27:48,250 --> 02:27:40,800
spacesuits and tools that will help us

3733
02:27:52,910 --> 02:27:51,110
watching Apollo footage of astronauts

3734
02:27:55,010 --> 02:27:52,920
doing geology on the surface of the Moon

3735
02:27:57,530 --> 02:27:55,020
is a really great way to think about

3736
02:28:00,710 --> 02:27:57,540
preparing for Artemis for putting people

3737
02:28:03,230 --> 02:28:00,720
on the lunar surface once again

3738
02:28:04,910 --> 02:28:03,240

we learn a lot in how they did science

3739

02:28:06,530 --> 02:28:04,920

operations on the Moon and what it's

3740

02:28:08,750 --> 02:28:06,540

like to work on the moon you see them

3741

02:28:10,969 --> 02:28:08,760

doing geology you see them taking Rock

3742

02:28:13,190 --> 02:28:10,979

samples putting in a drive tube to take

3743

02:28:14,809 --> 02:28:13,200

a core sample you see them bouncing

3744

02:28:17,030 --> 02:28:14,819

along the surface of the Moon on the

3745

02:28:19,730 --> 02:28:17,040

lunar rover that they used in Apollo 15

3746

02:28:21,770 --> 02:28:19,740

through 17. so it's a great way to help

3747

02:28:23,450 --> 02:28:21,780

Drive technology development for the

3748

02:28:25,670 --> 02:28:23,460

next generation of spacesuits and

3749

02:28:28,670 --> 02:28:25,680

geology sampling tools there's these

3750

02:28:31,450 --> 02:28:28,680

facilities that help us train like we

3751

02:28:35,389 --> 02:28:31,460

are on the lunar surface you know these

3752

02:28:37,309 --> 02:28:35,399

16g offload systems or putting people in

3753

02:28:39,710 --> 02:28:37,319

the Aquatic environment are great ways

3754

02:28:41,690 --> 02:28:39,720

to train the mobility part right like

3755

02:28:44,570 --> 02:28:41,700

what can you do and how different does

3756

02:28:46,610 --> 02:28:44,580

it feel to be in 16g and do these tasks

3757

02:28:48,950 --> 02:28:46,620

we've been training astronauts in

3758

02:28:51,410 --> 02:28:48,960

geology and geoscience for decades now

3759

02:28:53,750 --> 02:28:51,420

the Apollo Astronauts had literally

3760

02:28:55,670 --> 02:28:53,760

hundreds of hours of training in geology

3761

02:28:57,469 --> 02:28:55,680

before they flew to the moon it's often

3762

02:28:59,150 --> 02:28:57,479

said that the Apollo Astronauts had the

3763

02:29:01,370 --> 02:28:59,160

equivalent of a master's degree in

3764

02:29:03,650 --> 02:29:01,380

geology by the time they flew to the

3765

02:29:05,630 --> 02:29:03,660

in the intervening decades since Apollo

3766

02:29:06,889 --> 02:29:05,640

we've been training astronauts who fly

3767

02:29:09,170 --> 02:29:06,899

to the International Space Station

3768

02:29:11,150 --> 02:29:09,180

because when they're on the ISS they

3769

02:29:13,190 --> 02:29:11,160

spend time observing the Earth looking

3770

02:29:15,050 --> 02:29:13,200

out the window taking pictures of what

3771

02:29:16,849 --> 02:29:15,060

they see on the Earth's surface now that

3772

02:29:18,889 --> 02:29:16,859

we're looking at putting astronauts on

3773

02:29:20,809 --> 02:29:18,899

the surface of the Moon we also take

3774

02:29:23,150 --> 02:29:20,819

them into the field we take them to

3775

02:29:25,130 --> 02:29:23,160

field sites here on Earth that resemble

3776

02:29:27,050 --> 02:29:25,140

field sites that we expect them to see

3777

02:29:28,849 --> 02:29:27,060

on the moon that's the reason why we

3778

02:29:32,450 --> 02:29:28,859

take them out into places that are

3779

02:29:34,790 --> 02:29:32,460

unique like volcanic Landscapes or

3780

02:29:36,830 --> 02:29:34,800

places that are analogous to the lunar

3781

02:29:38,870 --> 02:29:36,840

surface to train them on the scale and

3782

02:29:41,330 --> 02:29:38,880

Fidelity of science that you just can't

3783

02:29:43,190 --> 02:29:41,340

recreate in these facilities and so by

3784

02:29:45,170 --> 02:29:43,200

combining this classroom and field

3785

02:29:47,150 --> 02:29:45,180

training we're able to prep them for

3786

02:29:49,070 --> 02:29:47,160

fundamentals of geology the major

3787

02:29:50,750 --> 02:29:49,080

driving lunar science questions that we

3788

02:29:52,910 --> 02:29:50,760

have that we hope to address with the

3789

02:29:54,650 --> 02:29:52,920

Artemis program and teaching them how to

3790

02:29:57,710 --> 02:29:54,660

do field work in relevant analog

3791

02:30:00,110 --> 02:29:57,720

environments for just science aspects of

3792

02:30:02,630 --> 02:30:00,120

developing new spacesuits can it get you

3793

02:30:04,969 --> 02:30:02,640

to where you need to go and then once

3794

02:30:07,309 --> 02:30:04,979

you get there can you do the cool

3795

02:30:09,710 --> 02:30:07,319

science that you need to do and so

3796

02:30:11,389 --> 02:30:09,720

that's can you move effectively and

3797

02:30:14,270 --> 02:30:11,399

efficiently in the suit to be able to

3798

02:30:16,370 --> 02:30:14,280

collect the samples or use the tools or

3799

02:30:17,809 --> 02:30:16,380

the instruments for the visibility it's

3800

02:30:20,570 --> 02:30:17,819

like can you make the necessary

3801
02:30:22,610 --> 02:30:20,580
observations that you need to or does

3802
02:30:24,650 --> 02:30:22,620
the suit have the lights on it that it

3803
02:30:28,190 --> 02:30:24,660
needs to to illuminate the surface and

3804
02:30:31,010 --> 02:30:28,200
make the observations you need to

3805
02:30:33,050 --> 02:30:31,020
the lunar South Pole holds tremendous

3806
02:30:35,389 --> 02:30:33,060
resources that are going to allow us to

3807
02:30:36,710 --> 02:30:35,399
continue to explore this is this is a

3808
02:30:38,990 --> 02:30:36,720
place that we've never been before

3809
02:30:40,670 --> 02:30:39,000
there's so much to be learned from

3810
02:30:43,130 --> 02:30:40,680
getting boots on the ground and

3811
02:30:45,770 --> 02:30:43,140
exploring a unique place that challenges

3812
02:30:48,110 --> 02:30:45,780
us so that humans and also helps us

3813
02:30:50,570 --> 02:30:48,120

develop technologies that make our

3814

02:30:52,550 --> 02:30:50,580

everyday life that much better we think

3815

02:30:54,590 --> 02:30:52,560

there might be volatiles present at the

3816

02:30:56,150 --> 02:30:54,600

South Pole by using these volatiles

3817

02:30:58,429 --> 02:30:56,160

we'll be able to do things like create

3818

02:31:00,349 --> 02:30:58,439

drinking water create rocket fueled

3819

02:31:01,969 --> 02:31:00,359

launch astronauts back to Earth and so

3820

02:31:03,710 --> 02:31:01,979

by harnessing the power of the land

3821

02:31:05,389 --> 02:31:03,720

we'll be able to help astronauts

3822

02:31:06,250 --> 02:31:05,399

establish that long-term sustainable

3823

02:31:14,990 --> 02:31:06,260

presence

3824

02:31:20,570 --> 02:31:17,870

it's human nature to explore pushing our

3825

02:31:22,070 --> 02:31:20,580

boundaries and exploring our universes I

3826

02:31:24,349 --> 02:31:22,080

think just one of those things that's

3827

02:31:25,849 --> 02:31:24,359

just stuck in our human nature and that

3828

02:31:28,550 --> 02:31:25,859

we need to do it in order to understand

3829

02:31:30,460 --> 02:31:28,560

the world around us including our Earth

3830

02:31:36,170 --> 02:31:30,470

and our solar system

3831

02:31:42,530 --> 02:31:39,170

we just heard there how curiosity is

3832

02:31:43,969 --> 02:31:42,540

just a part of us so with that in mind

3833

02:31:46,429 --> 02:31:43,979

why don't we do some social questions

3834

02:31:47,750 --> 02:31:46,439

because some people are very curious to

3835

02:31:49,070 --> 02:31:47,760

hear what you have to say about their

3836

02:31:52,730 --> 02:31:49,080

questions so why don't we pull up the

3837

02:31:57,290 --> 02:31:54,889

what are your thoughts on the

3838

02:31:59,750 --> 02:31:57,300

responsibilities that come with going to

3839

02:32:02,090 --> 02:31:59,760

space obviously a question for you I am

3840

02:32:04,969 --> 02:32:02,100

not going to space

3841

02:32:07,250 --> 02:32:04,979

yeah the opportunity to travel to space

3842

02:32:09,469 --> 02:32:07,260

is it comes with a lot of responsibility

3843

02:32:11,510 --> 02:32:09,479

I think for all of us it's a huge honor

3844

02:32:13,790 --> 02:32:11,520

to be a part of these teams and the work

3845

02:32:15,950 --> 02:32:13,800

we're doing is so critical in supporting

3846

02:32:17,389 --> 02:32:15,960

scientific discovery on the ground so on

3847

02:32:20,150 --> 02:32:17,399

the International Space Station we're a

3848

02:32:22,490 --> 02:32:20,160

National Laboratory our crew executed

3849

02:32:24,290 --> 02:32:22,500

over 350 different scientific

3850

02:32:26,990 --> 02:32:24,300

experiments during our six-month Mission

3851
02:32:28,730 --> 02:32:27,000
and so when you think about that it's

3852
02:32:30,469 --> 02:32:28,740
years of work to get one of these

3853
02:32:32,809 --> 02:32:30,479
payloads or an experiment on the space

3854
02:32:34,550 --> 02:32:32,819
station and sometimes that someone's

3855
02:32:37,070 --> 02:32:34,560
life's work you're holding in your hands

3856
02:32:39,110 --> 02:32:37,080
and executing and so being prepared for

3857
02:32:40,730 --> 02:32:39,120
those moments is really important and

3858
02:32:43,070 --> 02:32:40,740
understanding how to bring the team from

3859
02:32:45,830 --> 02:32:43,080
the ground into solving complex problems

3860
02:32:47,389 --> 02:32:45,840
we take that really really seriously and

3861
02:32:49,250 --> 02:32:47,399
of course we want to share what that

3862
02:32:51,770 --> 02:32:49,260
experience is like only a few people

3863
02:32:53,990 --> 02:32:51,780

have been able to go to space and as we

3864

02:32:55,670 --> 02:32:54,000

commercialize space as low earth orbit

3865

02:32:57,889 --> 02:32:55,680

becomes more accessible that'll change

3866

02:32:59,389 --> 02:32:57,899

but still it's only available to some of

3867

02:33:01,670 --> 02:32:59,399

us so we really want to share what

3868

02:33:03,650 --> 02:33:01,680

that's like and the perspective we gain

3869

02:33:05,450 --> 02:33:03,660

from our I'm up there it's really great

3870

02:33:07,250 --> 02:33:05,460

to see and hear that you guys

3871

02:33:09,050 --> 02:33:07,260

acknowledge that right like that this

3872

02:33:10,610 --> 02:33:09,060

experiment that you're holding that

3873

02:33:12,469 --> 02:33:10,620

you're working on for six months

3874

02:33:14,030 --> 02:33:12,479

somebody has been working on literally

3875

02:33:15,410 --> 02:33:14,040

for years I mean I've talked to some

3876

02:33:17,630 --> 02:33:15,420

scientists and they're saying oh this

3877

02:33:19,610 --> 02:33:17,640

has been my life's work 20 years of my

3878

02:33:21,830 --> 02:33:19,620

life's work so so yeah that was a really

3879

02:33:23,929 --> 02:33:21,840

good question I like that question a lot

3880

02:33:26,630 --> 02:33:23,939

okay we have another one from social

3881

02:33:29,150 --> 02:33:26,640

media here Astro Kayla have you

3882

02:33:31,429 --> 02:33:29,160

considered what you might say if you had

3883

02:33:35,630 --> 02:33:31,439

the opportunity to be the first female

3884

02:33:39,050 --> 02:33:35,640

to set foot on the moon's surface

3885

02:33:43,070 --> 02:33:40,910

um if I was in that role it's something

3886

02:33:45,590 --> 02:33:43,080

I would take really seriously I think

3887

02:33:47,570 --> 02:33:45,600

the iconic words of Neil Armstrong you

3888

02:33:50,450 --> 02:33:47,580

know one small step for man one giant

3889

02:33:52,250 --> 02:33:50,460

leap for mankind are something that we

3890

02:33:53,870 --> 02:33:52,260

all know whether you witness that moment

3891

02:33:56,210 --> 02:33:53,880

or not or it happened before you were

3892

02:33:58,010 --> 02:33:56,220

born for like for me I think we all have

3893

02:33:59,870 --> 02:33:58,020

that embedded in our psyche that's

3894

02:34:02,330 --> 02:33:59,880

important word so I think it's something

3895

02:34:03,950 --> 02:34:02,340

I would have to think a lot about ahead

3896

02:34:05,270 --> 02:34:03,960

of that mission yeah that would be in

3897

02:34:07,309 --> 02:34:05,280

the history books that'll be something

3898

02:34:09,530 --> 02:34:07,319

you're remembered for oh my gosh I'd be

3899

02:34:11,210 --> 02:34:09,540

so anxious delivering it even after I've

3900

02:34:13,010 --> 02:34:11,220

thought of what I want to say like to

3901
02:34:15,710 --> 02:34:13,020
actually open my mouth and say it from

3902
02:34:17,830 --> 02:34:15,720
the surface of the Moon wow yeah that

3903
02:34:20,929 --> 02:34:17,840
we'll have to think about that yeah

3904
02:34:24,110 --> 02:34:20,939
okay let's see another question here oh

3905
02:34:26,030 --> 02:34:24,120
why is the space too orange in color

3906
02:34:27,530 --> 02:34:26,040
that's an awesome question that I wish I

3907
02:34:28,790 --> 02:34:27,540
knew the answer to Megan and I were

3908
02:34:30,950 --> 02:34:28,800
actually talking about that earlier when

3909
02:34:32,750 --> 02:34:30,960
we had Snoopy up here it's a

3910
02:34:34,910 --> 02:34:32,760
continuation of the same suit that we

3911
02:34:37,309 --> 02:34:34,920
used during the shuttle era and I was

3912
02:34:39,710 --> 02:34:37,319
kind of hypothesizing that maybe it's to

3913
02:34:41,929 --> 02:34:39,720

help forces if for some reason when we

3914

02:34:43,550 --> 02:34:41,939

landed in the water we had to get out of

3915

02:34:45,469 --> 02:34:43,560

the capsule for some reason it would be

3916

02:34:47,389 --> 02:34:45,479

easy to see us

3917

02:34:48,830 --> 02:34:47,399

um but that I'm gonna have to take a

3918

02:34:50,389 --> 02:34:48,840

phone a friend on that one I think to

3919

02:34:52,490 --> 02:34:50,399

know the real answer I'm sure somebody

3920

02:34:54,050 --> 02:34:52,500

will be commenting on social media right

3921

02:34:55,790 --> 02:34:54,060

now with the what the real history was

3922

02:34:57,349 --> 02:34:55,800

I'm trying to think about it too I'm

3923

02:35:02,150 --> 02:34:57,359

thinking does it have anything to do

3924

02:35:05,090 --> 02:35:02,160

with SLS being orange because yeah

3925

02:35:06,290 --> 02:35:05,100

I don't know I don't know we got stumped

3926

02:35:07,849 --> 02:35:06,300

that was our first one that we got

3927

02:35:10,370 --> 02:35:07,859

stuffed on

3928

02:35:12,830 --> 02:35:10,380

do we have another question

3929

02:35:15,710 --> 02:35:12,840

all right if you could name one of the

3930

02:35:17,750 --> 02:35:15,720

moon's craters what would you name it oh

3931

02:35:19,790 --> 02:35:17,760

man what would you name it Megan I don't

3932

02:35:22,809 --> 02:35:19,800

know that's a big decision I thought you

3933

02:35:26,450 --> 02:35:22,819

might say the name of your zero g grass

3934

02:35:28,250 --> 02:35:26,460

yeah maybe I don't know that's a like

3935

02:35:30,889 --> 02:35:28,260

pretty big responsibility I think to

3936

02:35:32,630 --> 02:35:30,899

name these geological features and a lot

3937

02:35:34,910 --> 02:35:32,640

of the craters on the moon already have

3938

02:35:36,410 --> 02:35:34,920

names so I'm sure there's some that

3939

02:35:37,849 --> 02:35:36,420

maybe they haven't named they're too

3940

02:35:40,370 --> 02:35:37,859

small or we haven't explored them yet

3941

02:35:42,590 --> 02:35:40,380

but a lot of them already do have names

3942

02:35:44,570 --> 02:35:42,600

like we're going to be exploring the

3943

02:35:46,190 --> 02:35:44,580

edge of Shackleton crater as part of

3944

02:35:48,469 --> 02:35:46,200

Artemis Mission so a lot of them are

3945

02:35:49,849 --> 02:35:48,479

already named and mapped yeah thanks for

3946

02:35:52,429 --> 02:35:49,859

throwing it back on me I was like I

3947

02:35:55,429 --> 02:35:52,439

don't know do you think like our parents

3948

02:35:58,610 --> 02:35:55,439

or or husband or fiance are now upset

3949

02:36:00,849 --> 02:35:58,620

that we didn't say them I know I mean I

3950

02:36:03,349 --> 02:36:00,859

don't think so I think they understand

3951

02:36:05,929 --> 02:36:03,359

all right these are big decisions this

3952

02:36:08,570 --> 02:36:05,939

is all right last question here for this

3953

02:36:11,150 --> 02:36:08,580

segment at least what will Orion do when

3954

02:36:14,030 --> 02:36:11,160

it gets to the Moon

3955

02:36:16,309 --> 02:36:14,040

um so for this Mission Artemis one it's

3956

02:36:18,530 --> 02:36:16,319

actually going to orbit the Moon and

3957

02:36:20,389 --> 02:36:18,540

then go into a distant retrograde orbit

3958

02:36:23,510 --> 02:36:20,399

and so it'll get really close as close

3959

02:36:24,650 --> 02:36:23,520

as 62 miles and then go way past the

3960

02:36:26,270 --> 02:36:24,660

moon

3961

02:36:28,910 --> 02:36:26,280

um and way deeper into space than we've

3962

02:36:30,770 --> 02:36:28,920

ever been before so yeah the Orion

3963

02:36:32,150 --> 02:36:30,780

vehicle will be checking out all of its

3964

02:36:33,410 --> 02:36:32,160

systems we're going to be analyzing that

3965

02:36:34,849 --> 02:36:33,420

data from the ground and then we're

3966

02:36:36,950 --> 02:36:34,859

going to see that it can survive

3967

02:36:38,750 --> 02:36:36,960

re-entry and a successful splash down

3968

02:36:40,969 --> 02:36:38,760

off the coast of San Diego yeah yeah

3969

02:36:42,469 --> 02:36:40,979

that was a good question too okay well

3970

02:36:44,330 --> 02:36:42,479

again just keep those questions coming

3971

02:36:46,790 --> 02:36:44,340

you know we do we're entering into this

3972

02:36:48,349 --> 02:36:46,800

launch window and we do have time so

3973

02:36:51,889 --> 02:36:48,359

we'd love to hear from you and we'd love

3974

02:36:53,929 --> 02:36:51,899

to try at least to answer most of your

3975

02:36:55,130 --> 02:36:53,939

questions so you've been hearing

3976

02:36:57,230 --> 02:36:55,140

throughout the broadcast all the

3977

02:36:59,210 --> 02:36:57,240

different science that returning to the

3978

02:37:00,830 --> 02:36:59,220

moon will enable us to do so there's

3979

02:37:03,590 --> 02:37:00,840

actually something called the prime one

3980

02:37:05,690 --> 02:37:03,600

mining experiment and that's going to

3981

02:37:10,990 --> 02:37:05,700

robotically look for ice and other

3982

02:37:17,270 --> 02:37:13,849

NASA's first polar resources ice mining

3983

02:37:19,130 --> 02:37:17,280

experiment also known as prime one will

3984

02:37:23,510 --> 02:37:19,140

robotically look for ice and other

3985

02:37:28,250 --> 02:37:25,910

thanks to data from spacecraft orbiting

3986

02:37:30,530 --> 02:37:28,260

the moon scientists believe that the

3987

02:37:33,889 --> 02:37:30,540

polar regions contain Water Ice in the

3988

02:37:36,290 --> 02:37:33,899

form of ice just below the surface

3989

02:37:38,270 --> 02:37:36,300

with the right technologies that ice is

3990

02:37:40,610 --> 02:37:38,280

a game-changing resource that can be

3991

02:37:44,809 --> 02:37:40,620

mined and used to produce propellant and

3992

02:37:47,270 --> 02:37:44,819

breathable oxygen for future explorers

3993

02:37:49,730 --> 02:37:47,280

under NASA's commercial lunar payload

3994

02:37:52,490 --> 02:37:49,740

Services initiative the agency selected

3995

02:37:55,070 --> 02:37:52,500

intuitive machines to fly and land prime

3996

02:37:57,110 --> 02:37:55,080

one on the moon's South Pole

3997

02:37:59,570 --> 02:37:57,120

prime one will land near the Shackleton

3998

02:38:02,690 --> 02:37:59,580

crater to drill into the lunar soil in

3999

02:38:04,910 --> 02:38:02,700

an area that could contain Water Ice

4000

02:38:07,790 --> 02:38:04,920

prime one is made up of two instruments

4001
02:38:10,969 --> 02:38:07,800
Trident the regolith and Ice drill for

4002
02:38:12,710 --> 02:38:10,979
exploring new terrain and M solo the

4003
02:38:15,170 --> 02:38:12,720
mass spectrometer observing lunar

4004
02:38:17,690 --> 02:38:15,180
operations

4005
02:38:21,290 --> 02:38:17,700
Trident will drill up to three feet into

4006
02:38:23,270 --> 02:38:21,300
the lunar surface extract lunar soil and

4007
02:38:25,969 --> 02:38:23,280
bring it up to the surface

4008
02:38:27,950 --> 02:38:25,979
Trident drills to its maximum depth in

4009
02:38:29,389 --> 02:38:27,960
multiple phases stopping at different

4010
02:38:32,030 --> 02:38:29,399
increments

4011
02:38:34,370 --> 02:38:32,040
as it reaches each desired depth it will

4012
02:38:36,590 --> 02:38:34,380
pause and retract the drill string to

4013
02:38:39,110 --> 02:38:36,600

deposit lunar soil on the surface for

4014

02:38:41,750 --> 02:38:39,120

analysis

4015

02:38:44,450 --> 02:38:41,760

this is where M solo comes in

4016

02:38:46,849 --> 02:38:44,460

M solo is a commercial off-the-shelf

4017

02:38:48,950 --> 02:38:46,859

Mass spectrometer modified for space

4018

02:38:51,050 --> 02:38:48,960

flight it will evaluate the chemical

4019

02:38:53,450 --> 02:38:51,060

elements and compounds released from the

4020

02:38:54,889 --> 02:38:53,460

lunar soil for water and other chemical

4021

02:38:57,110 --> 02:38:54,899

compounds

4022

02:38:59,270 --> 02:38:57,120

Trident will then proceed to the next

4023

02:39:01,730 --> 02:38:59,280

specified depth and repeat the process

4024

02:39:03,469 --> 02:39:01,740

until samples at all desired depths have

4025

02:39:06,290 --> 02:39:03,479

been analyzed for water

4026
02:39:08,389 --> 02:39:06,300
if no ice is found where prime one lands

4027
02:39:10,250 --> 02:39:08,399
NASA will still collect valuable

4028
02:39:13,190 --> 02:39:10,260
information about drilling into the

4029
02:39:15,889 --> 02:39:13,200
lunar soil for a future Mission NASA's

4030
02:39:18,110 --> 02:39:15,899
Viper the volatiles investigating polar

4031
02:39:20,630 --> 02:39:18,120
exploration Rover will use prime one

4032
02:39:23,150 --> 02:39:20,640
technology on a mobile robot that will

4033
02:39:25,429 --> 02:39:23,160
navigate the moon's South Pole searching

4034
02:39:27,830 --> 02:39:25,439
for additional resources

4035
02:39:30,710 --> 02:39:27,840
prime one data will help NASA assess

4036
02:39:33,650 --> 02:39:30,720
lunar resources to inform future Artemis

4037
02:39:40,330 --> 02:39:33,660
missions and a robust human presence on

4038
02:39:46,010 --> 02:39:43,130

so we are away we are still awaiting a

4039

02:39:48,889 --> 02:39:46,020

new t0 for today's launch attempt but

4040

02:39:51,530 --> 02:39:48,899

for more on what to expect when we

4041

02:39:53,870 --> 02:39:51,540

launch for this first day let's go to

4042

02:39:55,730 --> 02:39:53,880

NASA's Dan Hewitt he's inside our Apollo

4043

02:39:57,530 --> 02:39:55,740

Saturn 5 Center at the KSC visitor

4044

02:39:59,389 --> 02:39:57,540

complex hey thanks Megan everybody

4045

02:40:01,490 --> 02:39:59,399

Welcome Back To The Moon board there's a

4046

02:40:03,710 --> 02:40:01,500

lot of people here in the complex I just

4047

02:40:05,570 --> 02:40:03,720

heard a woohoo people are getting in and

4048

02:40:06,889 --> 02:40:05,580

out because we have a great view of

4049

02:40:09,170 --> 02:40:06,899

launch when it's going to happen and

4050

02:40:11,090 --> 02:40:09,180

it's going to happen today but that

4051
02:40:12,950 --> 02:40:11,100
launch is just the first step in the

4052
02:40:15,349 --> 02:40:12,960
Artemis One mission so let's look at

4053
02:40:17,750 --> 02:40:15,359
what's ahead for this historic First

4054
02:40:20,210 --> 02:40:17,760
Flight as we just said launch is Step

4055
02:40:22,370 --> 02:40:20,220
number one those four rs-25 engines

4056
02:40:24,410 --> 02:40:22,380
throttle up followed shortly after by

4057
02:40:27,590 --> 02:40:24,420
the two solid rocket boosters igniting

4058
02:40:29,389 --> 02:40:27,600
sending SLS and Orion Skyward now on our

4059
02:40:30,590 --> 02:40:29,399
way uphill we'll have a number of Jedis

4060
02:40:34,190 --> 02:40:30,600
events you'll be able to see things

4061
02:40:36,770 --> 02:40:34,200
coming off of the SLS rocket one of the

4062
02:40:39,050 --> 02:40:36,780
most visual ones will be these two solid

4063
02:40:40,969 --> 02:40:39,060

rocket boosters now they'll expend their

4064

02:40:43,010 --> 02:40:40,979

propel a little over two minutes into

4065

02:40:45,830 --> 02:40:43,020

the flight they will separate we'll see

4066

02:40:48,170 --> 02:40:45,840

them flare off onto either side and then

4067

02:40:50,030 --> 02:40:48,180

the core stage continues to fire we're

4068

02:40:51,710 --> 02:40:50,040

also going to see the launch abort

4069

02:40:53,690 --> 02:40:51,720

system come off the top once you get

4070

02:40:55,429 --> 02:40:53,700

high enough in the atmosphere it's no

4071

02:40:58,309 --> 02:40:55,439

longer required you could actually do

4072

02:41:01,010 --> 02:40:58,319

aborts using engines on Orion and its

4073

02:41:02,690 --> 02:41:01,020

service module I will also note that on

4074

02:41:04,849 --> 02:41:02,700

the launch abort system it's got those

4075

02:41:07,490 --> 02:41:04,859

three solid rocket Motors the jettison

4076

02:41:09,530 --> 02:41:07,500

motor is active the abort and the

4077

02:41:11,750 --> 02:41:09,540

attitude ones are not for this flight we

4078

02:41:14,210 --> 02:41:11,760

don't have people so we're not flying a

4079

02:41:16,790 --> 02:41:14,220

fully active abort system we also have

4080

02:41:19,070 --> 02:41:16,800

three fairings that are there to protect

4081

02:41:20,690 --> 02:41:19,080

Orion the service module and the crew

4082

02:41:22,730 --> 02:41:20,700

module as we're flying up through the

4083

02:41:26,090 --> 02:41:22,740

really dense parts of the Earth's

4084

02:41:28,670 --> 02:41:26,100

atmosphere next up we'll hit core stage

4085

02:41:31,190 --> 02:41:28,680

separation so we've got four main

4086

02:41:33,170 --> 02:41:31,200

engines we'll hear Mikko main engine cut

4087

02:41:35,690 --> 02:41:33,180

off those engines will shut down the

4088

02:41:37,490 --> 02:41:35,700

core stage will separate drop away it's

4089

02:41:40,190 --> 02:41:37,500

eventually going to splash down in the

4090

02:41:42,590 --> 02:41:40,200

ocean and that hands over the propulsion

4091

02:41:45,170 --> 02:41:42,600

duties to this our upper stage the

4092

02:41:46,790 --> 02:41:45,180

interim cryogenic propulsion stage or

4093

02:41:49,429 --> 02:41:46,800

icps

4094

02:41:51,349 --> 02:41:49,439

its first job is to execute what's known

4095

02:41:54,050 --> 02:41:51,359

as a perigee raised maneuver so the

4096

02:41:55,730 --> 02:41:54,060

perigee is the lowest part of your orbit

4097

02:41:57,889 --> 02:41:55,740

you have a perigee that's your low part

4098

02:41:59,690 --> 02:41:57,899

an apogee that's your highest point

4099

02:42:01,070 --> 02:41:59,700

we're going to raise up the perigee and

4100

02:42:04,010 --> 02:42:01,080

that's going to actually put us in a

4101
02:42:06,050 --> 02:42:04,020
nice circular path around the planet and

4102
02:42:08,510 --> 02:42:06,060
while we're there that gives us time to

4103
02:42:10,910 --> 02:42:08,520
check out Orion we're flying it in space

4104
02:42:13,130 --> 02:42:10,920
for the second time the first time in

4105
02:42:15,410 --> 02:42:13,140
this fully integrated stack with SLS

4106
02:42:17,809 --> 02:42:15,420
we'll be able to look at all of Orion's

4107
02:42:19,790 --> 02:42:17,819
systems make sure those solar arrays are

4108
02:42:22,010 --> 02:42:19,800
capturing the sun's energy and turning

4109
02:42:24,230 --> 02:42:22,020
it into electrical power for Orion

4110
02:42:25,969 --> 02:42:24,240
systems make sure the communications are

4111
02:42:28,370 --> 02:42:25,979
working all of our guidance navigation

4112
02:42:29,929 --> 02:42:28,380
within control that is your time to make

4113
02:42:32,450 --> 02:42:29,939

sure you have a healthy spacecraft

4114

02:42:34,670 --> 02:42:32,460

before you do something that is going to

4115

02:42:37,130 --> 02:42:34,680

send it to the moon and that's next up

4116

02:42:39,469 --> 02:42:37,140

on our list that's the trans lunar

4117

02:42:41,750 --> 02:42:39,479

injection for today's launch profile

4118

02:42:44,090 --> 02:42:41,760

that's going to be a firing of about 18

4119

02:42:46,490 --> 02:42:44,100

minutes of that single engine on the

4120

02:42:49,309 --> 02:42:46,500

upper stage now that engine optimized

4121

02:42:51,110 --> 02:42:49,319

for about vacuum it's producing about 24

4122

02:42:53,150 --> 02:42:51,120

000 pounds of thrust so it's a pretty

4123

02:42:55,550 --> 02:42:53,160

big engine and it's doing that because

4124

02:42:58,070 --> 02:42:55,560

we need enough energy

4125

02:43:01,190 --> 02:42:58,080

to be able to send our payload Orion

4126
02:43:03,530 --> 02:43:01,200
Beyond low earth orbit and send it on a

4127
02:43:05,990 --> 02:43:03,540
path to head out to the Moon

4128
02:43:08,389 --> 02:43:06,000
now after that burn is complete icps

4129
02:43:10,969 --> 02:43:08,399
separates it's going to do what's called

4130
02:43:15,110 --> 02:43:10,979
a disposal burn so it's going to send

4131
02:43:17,510 --> 02:43:15,120
itself on a path from Earth around the

4132
02:43:19,910 --> 02:43:17,520
moon and slingshot out into what's known

4133
02:43:22,309 --> 02:43:19,920
as a heliocentric orbit so it's going to

4134
02:43:25,550 --> 02:43:22,319
completely leave the Earth Moon system

4135
02:43:28,010 --> 02:43:25,560
and go into orbit around our sun

4136
02:43:29,809 --> 02:43:28,020
but after it separates propulsion duties

4137
02:43:32,330 --> 02:43:29,819
get handed over to this the European

4138
02:43:33,770 --> 02:43:32,340

service module and it's got a couple of

4139

02:43:35,330 --> 02:43:33,780

different engines that it's going to be

4140

02:43:37,429 --> 02:43:35,340

using and we're going to be testing

4141

02:43:39,650 --> 02:43:37,439

those out just on day one we're going to

4142

02:43:42,410 --> 02:43:39,660

do what's called the outbound trajectory

4143

02:43:44,150 --> 02:43:42,420

correction burn one and we'll do a

4144

02:43:45,889 --> 02:43:44,160

couple of these trajectory corrections

4145

02:43:48,349 --> 02:43:45,899

as we're flying out to the moon but that

4146

02:43:49,849 --> 02:43:48,359

first one is that first critical test of

4147

02:43:51,950 --> 02:43:49,859

this large engine the orbital

4148

02:43:53,570 --> 02:43:51,960

maneuvering system engine that's the one

4149

02:43:56,150 --> 02:43:53,580

that has the most thrust generating

4150

02:43:57,410 --> 02:43:56,160

about six thousand pounds of force in a

4151
02:44:00,110 --> 02:43:57,420
vacuum and that's what's going to be

4152
02:44:01,730 --> 02:44:00,120
doing a lot of our Maneuvers are giving

4153
02:44:03,710 --> 02:44:01,740
us that pushing power as we do these

4154
02:44:05,990 --> 02:44:03,720
Maneuvers around the Moon to enter into

4155
02:44:09,410 --> 02:44:06,000
what's known as distant retrograde orbit

4156
02:44:11,690 --> 02:44:09,420
or Dro and that's this dotted line that

4157
02:44:14,030 --> 02:44:11,700
you see around here now we call it

4158
02:44:15,469 --> 02:44:14,040
distant basically because of the

4159
02:44:18,410 --> 02:44:15,479
distance we're away from the Moon we're

4160
02:44:20,389 --> 02:44:18,420
about 40 000 miles a little bit less off

4161
02:44:22,550 --> 02:44:20,399
the lunar surface and then we call it

4162
02:44:24,889 --> 02:44:22,560
retrograde because the moon orbiting

4163
02:44:26,870 --> 02:44:24,899

planet Earth in this direction going in

4164

02:44:28,610 --> 02:44:26,880

a counter clockwise wise fashion we're

4165

02:44:31,010 --> 02:44:28,620

going to be entering into a clockwise

4166

02:44:33,830 --> 02:44:31,020

orbit around the Moon opposite

4167

02:44:36,410 --> 02:44:33,840

retrograde now to do that we're going to

4168

02:44:37,910 --> 02:44:36,420

get in close we're going to dip in off

4169

02:44:41,270 --> 02:44:37,920

the lunar surface we're going to be

4170

02:44:43,070 --> 02:44:41,280

about 80 miles 80 statute miles off the

4171

02:44:45,530 --> 02:44:43,080

lunar surface as we do this outbound

4172

02:44:47,150 --> 02:44:45,540

powered flyby again the major thrust

4173

02:44:50,090 --> 02:44:47,160

coming from that orbital maneuvering

4174

02:44:52,309 --> 02:44:50,100

system engine after we do that we'll do

4175

02:44:54,770 --> 02:44:52,319

a final maneuver to actually go into

4176
02:44:57,710 --> 02:44:54,780
that distant retrograde orbit that Dro

4177
02:44:59,690 --> 02:44:57,720
now why Dro why are we not just going

4178
02:45:01,730 --> 02:44:59,700
around the moon and coming back on like

4179
02:45:04,490 --> 02:45:01,740
a free return trajectory which he did on

4180
02:45:06,469 --> 02:45:04,500
some of the Apollo missions well in Dro

4181
02:45:09,349 --> 02:45:06,479
it's a very stable orbit it doesn't

4182
02:45:11,270 --> 02:45:09,359
require a lot of fuel to maintain that

4183
02:45:13,250 --> 02:45:11,280
area around the moon so it gives you a

4184
02:45:15,650 --> 02:45:13,260
lot of time to really test the

4185
02:45:17,750 --> 02:45:15,660
spacecraft if you followed with any

4186
02:45:19,670 --> 02:45:17,760
launch of a new spacecraft you know

4187
02:45:21,950 --> 02:45:19,680
there's only so much testing you can do

4188
02:45:24,590 --> 02:45:21,960

on the ground once you actually put all

4189

02:45:25,910 --> 02:45:24,600

of that Hardware in space in the

4190

02:45:28,550 --> 02:45:25,920

environment that it's going to be be

4191

02:45:30,410 --> 02:45:28,560

operating hundreds of thousands of vials

4192

02:45:32,450 --> 02:45:30,420

away from Earth you're going to learn

4193

02:45:34,969 --> 02:45:32,460

things you didn't even realize about

4194

02:45:36,410 --> 02:45:34,979

everything from Communications the life

4195

02:45:38,809 --> 02:45:36,420

support systems the thermal control

4196

02:45:40,550 --> 02:45:38,819

everything on a spacecraft needs to get

4197

02:45:42,889 --> 02:45:40,560

put through its Paces in this

4198

02:45:44,270 --> 02:45:42,899

environment before we put people on

4199

02:45:45,650 --> 02:45:44,280

board and that's why we're heading out

4200

02:45:47,630 --> 02:45:45,660

to Dro

4201
02:45:49,790 --> 02:45:47,640
eventually though it's going to be time

4202
02:45:52,490 --> 02:45:49,800
to come home and we will do a Dro

4203
02:45:53,990 --> 02:45:52,500
departure maneuver this again firing up

4204
02:45:56,210 --> 02:45:54,000
that orbital maneuvering system engine

4205
02:45:58,250 --> 02:45:56,220
and others on the service module and

4206
02:46:00,469 --> 02:45:58,260
this is what's going to commit us from

4207
02:46:02,990 --> 02:46:00,479
leaving the moon and heading on back

4208
02:46:05,150 --> 02:46:03,000
towards Earth we'll dip in Once More

4209
02:46:07,550 --> 02:46:05,160
close off the lunar surface and

4210
02:46:10,250 --> 02:46:07,560
slingshot and use the lunar gravity to

4211
02:46:12,110 --> 02:46:10,260
do this return powered flyby and then

4212
02:46:14,150 --> 02:46:12,120
similar to the way out we can make

4213
02:46:17,570 --> 02:46:14,160

correction Burns as we kind of fine tune

4214

02:46:19,969 --> 02:46:17,580

our path back towards the Earth and then

4215

02:46:21,530 --> 02:46:19,979

it's time for re-entry a couple of

4216

02:46:22,969 --> 02:46:21,540

things happen before that one of the

4217

02:46:25,429 --> 02:46:22,979

really critical ones spacecraft

4218

02:46:27,349 --> 02:46:25,439

separation we're going to detach the

4219

02:46:30,410 --> 02:46:27,359

European service module shortly before

4220

02:46:32,570 --> 02:46:30,420

re-entry its job largely done that burns

4221

02:46:35,270 --> 02:46:32,580

up in the Earth's atmosphere and reveals

4222

02:46:38,090 --> 02:46:35,280

on the crew module the heat shield I

4223

02:46:40,969 --> 02:46:38,100

circled it earlier this is goal number

4224

02:46:43,790 --> 02:46:40,979

one of the Artemis Mission Artemis One

4225

02:46:46,190 --> 02:46:43,800

mission is testing this heat shield at

4226
02:46:47,809 --> 02:46:46,200
lunar return velocities because when we

4227
02:46:50,030 --> 02:46:47,819
make that trip around the moon and we

4228
02:46:53,030 --> 02:46:50,040
come back we are going in speeds of

4229
02:46:55,130 --> 02:46:53,040
excess of 20 000 miles an hour so when

4230
02:46:56,630 --> 02:46:55,140
we slam into the Earth's atmosphere it's

4231
02:46:59,110 --> 02:46:56,640
going to heat that thing up to more

4232
02:47:01,790 --> 02:46:59,120
excuse me more than 5 000 degrees

4233
02:47:03,230 --> 02:47:01,800
Fahrenheit uh for the Artemis one

4234
02:47:06,170 --> 02:47:03,240
profile we're going to do what's known

4235
02:47:08,330 --> 02:47:06,180
as the skip re-entry so basically you

4236
02:47:11,809 --> 02:47:08,340
can come into shallow and Skip off the

4237
02:47:13,429 --> 02:47:11,819
atmosphere to to narrow and you're going

4238
02:47:15,590 --> 02:47:13,439

to do what's known as a ballistic entry

4239

02:47:17,270 --> 02:47:15,600

which really Heats things up we're going

4240

02:47:19,610 --> 02:47:17,280

to do kind of a mix where we're going to

4241

02:47:21,050 --> 02:47:19,620

skip once off the atmosphere and that

4242

02:47:23,090 --> 02:47:21,060

we're still going to get the heat but

4243

02:47:25,969 --> 02:47:23,100

that helps to reduce some of the G loads

4244

02:47:28,190 --> 02:47:25,979

on the crew once you're through that you

4245

02:47:30,550 --> 02:47:28,200

get to parachute deploy there's 11

4246

02:47:33,710 --> 02:47:30,560

parachutes in total that are going to

4247

02:47:35,630 --> 02:47:33,720

slow Orion down before it splashes down

4248

02:47:37,790 --> 02:47:35,640

we're going to be going from 20 000

4249

02:47:40,429 --> 02:47:37,800

miles an hour to about 300 miles an hour

4250

02:47:42,889 --> 02:47:40,439

before those parachutes deploy and then

4251
02:47:44,510 --> 02:47:42,899
they do a final job of getting it in the

4252
02:47:46,849 --> 02:47:44,520
water in the South Pacific we've got

4253
02:47:48,710 --> 02:47:46,859
these big Orange balloons that's an

4254
02:47:50,809 --> 02:47:48,720
uprighting system so

4255
02:47:53,929 --> 02:47:50,819
even if Orion landed in the water upside

4256
02:47:55,490 --> 02:47:53,939
down those can those can inflate and

4257
02:47:57,050 --> 02:47:55,500
they put us back up right into what's

4258
02:47:58,490 --> 02:47:57,060
known as stable one that's where you

4259
02:48:00,530 --> 02:47:58,500
want your spacecraft to be nice and

4260
02:48:02,090 --> 02:48:00,540
upright in the water especially if

4261
02:48:05,510 --> 02:48:02,100
you're an astronaut and they're floating

4262
02:48:07,730 --> 02:48:05,520
now we also have a large U.S Navy ship

4263
02:48:10,130 --> 02:48:07,740

with a big Bay that's going to basically

4264

02:48:11,750 --> 02:48:10,140

come up and swallow Orion into its deck

4265

02:48:14,210 --> 02:48:11,760

and you've got a couple of other assets

4266

02:48:16,010 --> 02:48:14,220

in the area to help recover Hardware the

4267

02:48:18,230 --> 02:48:16,020

forward bait cover parachutes things

4268

02:48:21,950 --> 02:48:18,240

like that but that's scheduled to happen

4269

02:48:24,349 --> 02:48:21,960

26 days after a launch today so that's

4270

02:48:27,770 --> 02:48:24,359

26 days from liftoff here in Florida

4271

02:48:30,469 --> 02:48:27,780

around the Moon to a Splashdown in the

4272

02:48:32,870 --> 02:48:30,479

Pacific and that will be the first

4273

02:48:35,030 --> 02:48:32,880

mission in the Artemis program the

4274

02:48:38,270 --> 02:48:35,040

farthest we've ever sent a human rated

4275

02:48:40,370 --> 02:48:38,280

spacecraft in history and just the first

4276
02:48:42,349 --> 02:48:40,380
step before we put people on board so

4277
02:48:44,330 --> 02:48:42,359
that's a look at everything still to

4278
02:48:46,610 --> 02:48:44,340
come we're counting down to that launch

4279
02:48:49,070 --> 02:48:46,620
I'll send it back over to Megan and the

4280
02:48:50,630 --> 02:48:49,080
team at the host desk guys there very

4281
02:48:52,550 --> 02:48:50,640
comprehensive look at that thank you so

4282
02:48:54,590 --> 02:48:52,560
much Dan if you're just joining us

4283
02:48:57,410 --> 02:48:54,600
welcome to Kennedy Space Center and our

4284
02:48:59,090 --> 02:48:57,420
live coverage of Artemis one an uncrewed

4285
02:49:01,670 --> 02:48:59,100
flight tests that will return us to the

4286
02:49:04,849 --> 02:49:01,680
Moon in nearly 50 years but you know

4287
02:49:07,550 --> 02:49:04,859
some might ask why the moon well here's

4288
02:49:07,560 --> 02:49:11,570

we are going

4289

02:49:17,630 --> 02:49:14,750

the history of this agency is marked

4290

02:49:18,969 --> 02:49:17,640

with broken barriers once viewed as

4291

02:49:22,610 --> 02:49:18,979

impossible

4292

02:49:25,370 --> 02:49:22,620

with science fiction turned reality

4293

02:49:28,070 --> 02:49:25,380

with innovations that have spun

4294

02:49:32,750 --> 02:49:28,080

Industries all their own

4295

02:49:36,070 --> 02:49:32,760

and with demonstrations of Peace for all

4296

02:49:44,030 --> 02:49:40,270

soar in the skies of our home planet

4297

02:49:47,510 --> 02:49:44,040

we maintain a human presence just

4298

02:49:51,410 --> 02:49:47,520

outside of gravity and we touch points

4299

02:49:54,469 --> 02:49:51,420

all across the solar system and beyond

4300

02:49:56,110 --> 02:49:54,479

we're going back to the moon and this is

4301
02:49:58,790 --> 02:49:56,120
why

4302
02:50:01,610 --> 02:49:58,800
the Moon is a treasure Trove of science

4303
02:50:04,370 --> 02:50:01,620
it holds opportunities for us to make

4304
02:50:07,490 --> 02:50:04,380
discoveries about our home planet about

4305
02:50:08,929 --> 02:50:07,500
our sun and a better solar system the

4306
02:50:11,210 --> 02:50:08,939
wealth of knowledge to be gleaned from

4307
02:50:14,510 --> 02:50:11,220
the moon will inspire a new generation

4308
02:50:16,790 --> 02:50:14,520
of thought and action without fail every

4309
02:50:19,130 --> 02:50:16,800
major program and mission NASA has

4310
02:50:20,929 --> 02:50:19,140
invested in has led to Technologies and

4311
02:50:23,210 --> 02:50:20,939
capabilities that have shaped our

4312
02:50:26,090 --> 02:50:23,220
culture the breakthroughs of the Artemis

4313
02:50:27,710 --> 02:50:26,100

era will Define Our Generation and the

4314

02:50:30,170 --> 02:50:27,720

generations to follow

4315

02:50:32,570 --> 02:50:30,180

the tens of thousands of jobs associated

4316

02:50:34,610 --> 02:50:32,580

with propelling us to the Moon today are

4317

02:50:37,010 --> 02:50:34,620

just the beginning of a lunar economy

4318

02:50:39,770 --> 02:50:37,020

that will see hundreds of thousands of

4319

02:50:41,809 --> 02:50:39,780

new jobs developed around the world the

4320

02:50:44,030 --> 02:50:41,819

this is not an ambition of one entity or

4321

02:50:47,270 --> 02:50:44,040

one country the exploration of the moon

4322

02:50:49,910 --> 02:50:47,280

is a shared effort woven together by a

4323

02:50:52,730 --> 02:50:49,920

desire for the greater good why the moon

4324

02:50:55,070 --> 02:50:52,740

because the missions of Tomorrow Will Be

4325

02:50:57,830 --> 02:50:55,080

sparked by the accomplishments of the

4326

02:51:01,190 --> 02:50:57,840

Artemis generation today because the

4327

02:51:03,170 --> 02:51:01,200

ambition to go has already begun and

4328

02:51:04,610 --> 02:51:03,180

because Mars is calling we need to learn

4329

02:51:07,550 --> 02:51:04,620

what it takes to establish a community

4330

02:51:10,570 --> 02:51:07,560

upon another Cosmic Shore so let's Camp

4331

02:51:14,450 --> 02:51:10,580

close before pushing out

4332

02:51:17,710 --> 02:51:14,460

and so we go to the moon now not as a

4333

02:51:21,349 --> 02:51:17,720

series of isolated missions

4334

02:51:24,770 --> 02:51:21,359

but to build a community on and around

4335

02:51:27,110 --> 02:51:24,780

the Moon capable of proving how to live

4336

02:51:31,969 --> 02:51:27,120

on other worlds

4337

02:51:37,130 --> 02:51:33,889

we'll use the lessons for more than 50

4338

02:51:39,170 --> 02:51:37,140

years of peaceful exploration to send a

4339

02:51:41,570 --> 02:51:39,180

new generation to the lunar surface to

4340

02:51:43,370 --> 02:51:41,580

stay we will anchor our efforts on the

4341

02:51:45,590 --> 02:51:43,380

lunar South Pole to establish the

4342

02:51:48,349 --> 02:51:45,600

artemis-based camp positioning us for

4343

02:51:50,750 --> 02:51:48,359

long-term science and exploration of the

4344

02:51:53,570 --> 02:51:50,760

lunar surface we will prove what it

4345

02:51:56,349 --> 02:51:53,580

takes to assemble a complex ship in deep

4346

02:52:00,290 --> 02:51:56,359

space we will perfect

4347

02:52:02,630 --> 02:52:00,300

and returning from a distance service we

4348

02:52:04,190 --> 02:52:02,640

will learn how humans can survive and

4349

02:52:06,469 --> 02:52:04,200

thrive in the partial gravity

4350

02:52:08,630 --> 02:52:06,479

environment with improved spacesuit

4351
02:52:10,550 --> 02:52:08,640
designs mobile habitats and with

4352
02:52:12,530 --> 02:52:10,560
reconnaissance robots pre-positioning

4353
02:52:14,750 --> 02:52:12,540
and relocating supplies

4354
02:52:17,150 --> 02:52:14,760
to learn how to utilize the resources we

4355
02:52:18,769 --> 02:52:17,160
find other worlds starting with finding

4356
02:52:20,809 --> 02:52:18,779
water rights and purifying it to

4357
02:52:23,870 --> 02:52:20,819
drinkable water and then finding that

4358
02:52:26,630 --> 02:52:23,880
into hydrogen Supply and oxygen to leave

4359
02:52:29,090 --> 02:52:26,640
we will establish fission power plants

4360
02:52:30,950 --> 02:52:29,100
on the surface of the Moon capable of

4361
02:52:33,769 --> 02:52:30,960
supporting a growing community of

4362
02:52:35,990 --> 02:52:33,779
efforts and we will expand the logistics

4363
02:52:38,630 --> 02:52:36,000

supply chain to enable commercial and

4364

02:52:42,309 --> 02:52:38,640

international Partners to resupply and

4365

02:52:47,269 --> 02:52:42,319

refuel deep space outposts

4366

02:52:50,290 --> 02:52:47,279

none of this is simple or easy but

4367

02:52:52,790 --> 02:52:50,300

nothing in our history ever has been

4368

02:52:55,190 --> 02:52:52,800

you got a bunch of guys about to turn

4369

02:52:57,710 --> 02:52:55,200

blue we're breathing again thanks a lot

4370

02:53:00,530 --> 02:52:57,720

this kind of continuous lunar presence

4371

02:53:03,309 --> 02:53:00,540

is a natural extension of all that we've

4372

02:53:06,590 --> 02:53:03,319

learned in low earth orbit

4373

02:53:09,349 --> 02:53:06,600

and what we will accomplish there will

4374

02:53:11,889 --> 02:53:09,359

ensure the Monumental missions to Mars

4375

02:53:15,230 --> 02:53:11,899

are within reach

4376
02:53:17,210 --> 02:53:15,240
as we ready the launch of the first

4377
02:53:19,610 --> 02:53:17,220
Artemis mission

4378
02:53:22,250 --> 02:53:19,620
and as commercial companies ready their

4379
02:53:24,230 --> 02:53:22,260
lunar Landers for the first private

4380
02:53:29,210 --> 02:53:24,240
payload deliveries

4381
02:53:29,470 --> 02:53:29,220
we have already begun to take the next

4382
02:53:39,050 --> 02:53:29,480
step

4383
02:53:43,730 --> 02:53:41,389
throughout this launch broadcast our

4384
02:53:45,950 --> 02:53:43,740
NASA's Leah Martin has been introducing

4385
02:53:48,710 --> 02:53:45,960
us to people over at the Kennedy Space

4386
02:53:51,349 --> 02:53:48,720
Center Visitor complex who have come out

4387
02:53:54,050 --> 02:53:51,359
for hopefully the maiden voyage of

4388
02:53:57,349 --> 02:53:54,060

Artemis one people from near and far

4389

02:54:00,710 --> 02:53:57,359

young and old just really excited to

4390

02:54:02,630 --> 02:54:00,720

hopefully see this historic flight so

4391

02:54:04,730 --> 02:54:02,640

now she's joined by somebody else who

4392

02:54:07,130 --> 02:54:04,740

has a really interesting story Leah tell

4393

02:54:09,290 --> 02:54:07,140

us about it Megan I think one of the

4394

02:54:10,910 --> 02:54:09,300

most exciting things about being here

4395

02:54:13,790 --> 02:54:10,920

tonight is being with people who are

4396

02:54:15,290 --> 02:54:13,800

like-minded who have such a strong tie

4397

02:54:17,330 --> 02:54:15,300

to the history of our nation's space

4398

02:54:18,889 --> 02:54:17,340

program and their love of space flight

4399

02:54:20,570 --> 02:54:18,899

and I actually struck up an amazing

4400

02:54:22,429 --> 02:54:20,580

conversation with Scott here and you

4401
02:54:23,990 --> 02:54:22,439
were telling me about the special tie

4402
02:54:27,170 --> 02:54:24,000
that you have to tonight's launch as

4403
02:54:29,450 --> 02:54:27,180
well oh yeah I grew up literally grew up

4404
02:54:33,290 --> 02:54:29,460
with NASA my father went to work with

4405
02:54:34,969 --> 02:54:33,300
the NACA before NASA went to work for Dr

4406
02:54:37,309 --> 02:54:34,979
Von Braun followed him over to Marshall

4407
02:54:38,750 --> 02:54:37,319
space flight center and became you know

4408
02:54:40,790 --> 02:54:38,760
when it became NASA

4409
02:54:44,450 --> 02:54:40,800
he worked on the Jupiter C Redstone

4410
02:54:47,330 --> 02:54:44,460
Saturn one Saturn V and then because of

4411
02:54:48,530 --> 02:54:47,340
that he brought me here to see Apollo 11

4412
02:54:53,510 --> 02:54:48,540
launch

4413
02:54:57,889 --> 02:54:53,520

years old and loved it still remember

4414

02:55:00,710 --> 02:54:57,899

the sound that's about all but and then

4415

02:55:02,750 --> 02:55:00,720

years later through my flying career

4416

02:55:05,030 --> 02:55:02,760

I was able to bring my sons back with my

4417

02:55:07,429 --> 02:55:05,040

friends that flew the shuttle and they

4418

02:55:10,370 --> 02:55:07,439

saw five launches and

4419

02:55:12,349 --> 02:55:10,380

four Landings but basically I wanted to

4420

02:55:14,389 --> 02:55:12,359

be here I was here for the first moon

4421

02:55:19,190 --> 02:55:14,399

launch

4422

02:55:22,130 --> 02:55:19,200

Gene cernan our family friend went to

4423

02:55:24,050 --> 02:55:22,140

Apollo 17. so I wanted to be here for

4424

02:55:26,150 --> 02:55:24,060

this because it's it's kind of in our

4425

02:55:28,010 --> 02:55:26,160

family in our blood

4426

02:55:30,290 --> 02:55:28,020

and hopefully I'll be around for the

4427

02:55:37,610 --> 02:55:30,300

next one when we go and land again so

4428

02:55:41,570 --> 02:55:39,050

what I knew most of the German

4429

02:55:44,690 --> 02:55:41,580

scientists the kids sit in our lap Dr

4430

02:55:46,429 --> 02:55:44,700

Ernst sterlinger and my father fluid Von

4431

02:55:49,790 --> 02:55:46,439

Braun because he was a general aviation

4432

02:55:52,790 --> 02:55:49,800

pilot as well so they get off work and

4433

02:55:53,929 --> 02:55:52,800

fly and it was they were in Life

4434

02:55:55,969 --> 02:55:53,939

Magazine together

4435

02:55:57,650 --> 02:55:55,979

National Geographic so it was fun I

4436

02:56:01,309 --> 02:55:57,660

literally got to

4437

02:56:02,510 --> 02:56:01,319

knew Al Shepherd all the Mercury Gemini

4438

02:56:04,969 --> 02:56:02,520

Apollo guys

4439

02:56:06,830 --> 02:56:04,979

and it was an honor I I would have loved

4440

02:56:07,969 --> 02:56:06,840

to been an astronaut but I went a

4441

02:56:10,429 --> 02:56:07,979

different route

4442

02:56:13,010 --> 02:56:10,439

and but I can still come here and see

4443

02:56:14,870 --> 02:56:13,020

him the weekend and we're so so grateful

4444

02:56:16,670 --> 02:56:14,880

so thrilled to see you here tonight and

4445

02:56:18,530 --> 02:56:16,680

so excited that you will be able to

4446

02:56:19,670 --> 02:56:18,540

actually compare the last launch in the

4447

02:56:21,410 --> 02:56:19,680

sound of the last one with the one

4448

02:56:24,730 --> 02:56:21,420

tonight it's absolutely gonna rock this

4449

02:56:28,309 --> 02:56:26,690

well thanks so much for joining us

4450

02:56:31,250 --> 02:56:28,319

tonight it's been an honor to meet you

4451
02:56:32,750 --> 02:56:31,260
and Megan we're going back to you

4452
02:56:35,150 --> 02:56:32,760
So yeah thank you so much for sharing

4453
02:56:37,370 --> 02:56:35,160
that that was such a fun story here we

4454
02:56:39,830 --> 02:56:37,380
are now at Space Center Houston this is

4455
02:56:43,670 --> 02:56:39,840
a live look inside of the visitor center

4456
02:56:45,590 --> 02:56:43,680
there uh lots of people uh hoping to see

4457
02:56:47,750 --> 02:56:45,600
the launch today I love this guy in the

4458
02:56:50,630 --> 02:56:47,760
front with his NASA shirt representing

4459
02:56:53,389 --> 02:56:50,640
uh and again just seeing children and

4460
02:56:56,269 --> 02:56:53,399
young and old just all these people who

4461
02:56:59,690 --> 02:56:56,279
uh feel captivated and are excited about

4462
02:57:02,990 --> 02:56:59,700
our next giant leap into deep space so

4463
02:57:05,870 --> 02:57:03,000

glad to have them here oh my gosh I love

4464

02:57:07,730 --> 02:57:05,880

this yeah the team in Marshall in

4465

02:57:09,830 --> 02:57:07,740

Huntsville there is always ready for

4466

02:57:12,110 --> 02:57:09,840

their shot even their flags are super

4467

02:57:14,510 --> 02:57:12,120

pumped that's the home to the SLS

4468

02:57:15,550 --> 02:57:14,520

program office so they have a dog in the

4469

02:57:18,170 --> 02:57:15,560

fight tonight

4470

02:57:18,889 --> 02:57:18,180

Artemis launch for the first time is

4471

02:57:20,389 --> 02:57:18,899

that

4472

02:57:22,550 --> 02:57:20,399

inflatable

4473

02:57:24,550 --> 02:57:22,560

astronaut in the center Center do you

4474

02:57:27,710 --> 02:57:24,560

see that I think somebody is dressed up

4475

02:57:29,269 --> 02:57:27,720

yeah we're ready to go I love this yeah

4476

02:57:31,130 --> 02:57:29,279

I'm so glad that they're there again

4477

02:57:33,590 --> 02:57:31,140

these visitor centers are closed to the

4478

02:57:35,510 --> 02:57:33,600

public but uh you know the people there

4479

02:57:37,190 --> 02:57:35,520

decided to hold a watch party oh look

4480

02:57:39,490 --> 02:57:37,200

how excited because Germany are you

4481

02:57:41,990 --> 02:57:39,500

ready for us this time

4482

02:57:44,870 --> 02:57:42,000

anticipated the delay they look pumped

4483

02:57:47,870 --> 02:57:44,880

and ready to go so these are employees

4484

02:57:49,790 --> 02:57:47,880

of Airbus Airbus is the main contractor

4485

02:57:51,769 --> 02:57:49,800

for the European space agency and

4486

02:57:53,929 --> 02:57:51,779

together they provided the European

4487

02:57:55,910 --> 02:57:53,939

service module for the Orion spacecraft

4488

02:57:58,370 --> 02:57:55,920

so really we should be applauding them

4489

02:58:00,349 --> 02:57:58,380

they shouldn't be athletic thank you so

4490

02:58:03,050 --> 02:58:00,359

much guys for your contribution to the

4491

02:58:05,150 --> 02:58:03,060

program and and can't wait to see Orion

4492

02:58:06,950 --> 02:58:05,160

and SLS launch

4493

02:58:09,050 --> 02:58:06,960

okay so now let's head back over to

4494

02:58:11,570 --> 02:58:09,060

Daryl nail over with the launch Team so

4495

02:58:14,570 --> 02:58:11,580

we can hear any updates about a new t0

4496

02:58:17,210 --> 02:58:14,580

yeah Megan thank you and uh a clear

4497

02:58:19,250 --> 02:58:17,220

picture is starting to emerge as the

4498

02:58:22,010 --> 02:58:19,260

launch Team now reports out that they

4499

02:58:24,170 --> 02:58:22,020

only have a few minutes left of work to

4500

02:58:27,170 --> 02:58:24,180

do before they're ready to pick up

4501
02:58:28,910 --> 02:58:27,180
polling and uh we're also hearing that

4502
02:58:31,550 --> 02:58:28,920
some of that polling which kicks off

4503
02:58:33,650 --> 02:58:31,560
with the mission management team is also

4504
02:58:35,389 --> 02:58:33,660
now just about three and a half minutes

4505
02:58:39,710 --> 02:58:35,399
away

4506
02:58:43,670 --> 02:58:39,720
now we are currently still in that hold

4507
02:58:46,670 --> 02:58:43,680
but uh the launch Team NASA NASA's test

4508
02:58:48,349 --> 02:58:46,680
director is uh continuing to move the

4509
02:58:50,870 --> 02:58:48,359
team forward

4510
02:58:52,969 --> 02:58:50,880
we've wrapped up work

4511
02:58:54,830 --> 02:58:52,979
um on the upper stage

4512
02:58:58,910 --> 02:58:54,840
and the lower stage you're looking now

4513
02:59:01,010 --> 02:58:58,920

live inside firing room one

4514

02:59:02,570 --> 02:59:01,020

we're launch director Charlie Blackwell

4515

02:59:05,750 --> 02:59:02,580

Thompson is

4516

02:59:07,790 --> 02:59:05,760

overseeing her launch Team

4517

02:59:10,969 --> 02:59:07,800

we've had a number of delays that have

4518

02:59:13,849 --> 02:59:10,979

put us off the t0

4519

02:59:16,309 --> 02:59:13,859

but we are starting to track

4520

02:59:18,950 --> 02:59:16,319

to a t0

4521

02:59:23,030 --> 02:59:18,960

close to around

4522

02:59:28,370 --> 02:59:25,250

but we do

4523

02:59:30,889 --> 02:59:28,380

need to have some polling

4524

02:59:33,889 --> 02:59:30,899

that takes place I'm pausing now because

4525

02:59:41,269 --> 02:59:33,899

I'm listening in to the teams as they

4526
02:59:45,530 --> 02:59:44,150
in this launch window which we're

4527
02:59:48,110 --> 02:59:45,540
currently

4528
02:59:51,469 --> 02:59:48,120
26 minutes into and it's two hours long

4529
02:59:54,110 --> 02:59:51,479
it runs until 304 a.m Eastern Time

4530
02:59:56,750 --> 02:59:54,120
we have what's called 40 cutouts

4531
02:59:59,750 --> 02:59:56,760
and in those cutouts they range from

4532
03:00:02,090 --> 02:59:59,760
about a second to about a minute These

4533
03:00:05,150 --> 03:00:02,100
are times where they can't launch

4534
03:00:13,670 --> 03:00:05,160
these cutouts must be accounted for when

4535
03:00:18,710 --> 03:00:15,950
the upper stage of

4536
03:00:21,170 --> 03:00:18,720
the rocket which was the last to get

4537
03:00:24,349 --> 03:00:21,180
ready and configured

4538
03:00:28,790 --> 03:00:24,359

just recently the team cycled the liquid

4539

03:00:31,429 --> 03:00:28,800

hydrogen valves which is required

4540

03:00:33,710 --> 03:00:31,439

and they are currently working on the

4541

03:00:48,650 --> 03:00:33,720

lo2 valves liquid oxygen valves in the

4542

03:00:55,790 --> 03:00:51,710

we are now a minute and a half away from

4543

03:00:58,910 --> 03:00:55,800

the pole of the mission management team

4544

03:01:07,849 --> 03:00:58,920

which is several minutes before

4545

03:01:12,530 --> 03:01:10,370

when that poll starts we'll get a

4546

03:01:28,730 --> 03:01:12,540

clearer picture

4547

03:01:36,590 --> 03:01:32,210

NASA NASA's test director has informed

4548

03:01:38,690 --> 03:01:36,600

the launch Team to all switch to a

4549

03:01:40,849 --> 03:01:38,700

common Communication channel it's called

4550

03:01:44,269 --> 03:01:40,859

230

4551
03:01:50,870 --> 03:01:46,969
and what this means is

4552
03:01:54,410 --> 03:01:50,880
that the entire launch team is now on

4553
03:01:58,130 --> 03:01:57,050
and all future communication will happen

4554
03:02:02,330 --> 03:01:58,140
there

4555
03:02:11,929 --> 03:02:02,340
now they

4556
03:02:16,250 --> 03:02:14,269
just heard from NASA test director

4557
03:02:19,190 --> 03:02:16,260
Carlos monge

4558
03:02:22,309 --> 03:02:19,200
I'm sorry Jeff Spalding Jeff Spalding's

4559
03:02:26,150 --> 03:02:24,590
there are currently no constraints to

4560
03:02:28,610 --> 03:02:26,160
Launch

4561
03:02:31,550 --> 03:02:28,620
great news again

4562
03:02:34,250 --> 03:02:31,560
no constraints to Launch

4563
03:02:37,309 --> 03:02:34,260

and they're getting ready to pick up

4564

03:03:25,849 --> 03:02:39,110

to determine

4565

03:03:25,859 --> 03:03:36,309

foreign

4566

03:03:41,510 --> 03:03:38,150

test director

4567

03:03:44,210 --> 03:03:41,520

Jeff Spalding getting ready to conduct

4568

03:03:49,190 --> 03:03:44,220

the Readiness poll so we are getting

4569

03:03:49,200 --> 03:03:55,130

we're going to pull up the audio now

4570

03:03:55,140 --> 03:04:00,170

so that you can listen in

4571

03:04:06,769 --> 03:04:04,250

LPS go and rock rock let's go

4572

03:04:08,690 --> 03:04:06,779

all right copy all and launch director

4573

03:04:10,790 --> 03:04:08,700

NTD our launch team is ready to proceed

4574

03:04:17,690 --> 03:04:10,800

at this time

4575

03:04:22,309 --> 03:04:20,330

and attention on 232 this is the launch

4576
03:04:24,650 --> 03:04:22,319
director performing the final Poll for

4577
03:04:28,610 --> 03:04:24,660
launch verify no constraints and go for

4578
03:04:30,590 --> 03:04:28,620
launch EGS program chief engineer bgs

4579
03:04:32,929 --> 03:04:30,600
program chief engineer verifies that the

4580
03:04:34,550 --> 03:04:32,939
EGS SLS and Orion program Chief

4581
03:04:35,630 --> 03:04:34,560
Engineers have no constraints in our go

4582
03:04:38,330 --> 03:04:35,640
for launch

4583
03:04:39,710 --> 03:04:38,340
copy Greg thank you EGS Chief safety

4584
03:04:43,070 --> 03:04:39,720
officer

4585
03:04:44,870 --> 03:04:43,080
the EGS CSO verifies the SOS Orion and

4586
03:04:47,389 --> 03:04:44,880
egscsos

4587
03:04:49,309 --> 03:04:47,399
I have no constraints in our go for

4588
03:04:52,790 --> 03:04:49,319

launch

4589

03:04:55,670 --> 03:04:52,800

copy John thank you range weather

4590

03:04:57,050 --> 03:04:55,680

has no constraints and weather is go for

4591

03:05:05,750 --> 03:04:57,060

launch

4592

03:05:05,760 --> 03:05:10,750

foreign

4593

03:05:10,760 --> 03:05:15,349

manager launch director

4594

03:05:20,269 --> 03:05:18,650

launch director Mission manager on 232

4595

03:05:21,170 --> 03:05:20,279

the mission management team has been

4596

03:05:22,670 --> 03:05:21,180

pulled

4597

03:05:25,910 --> 03:05:22,680

you have a go to proceed with terminal

4598

03:05:28,730 --> 03:05:25,920

count and launch of Artemis one

4599

03:05:31,550 --> 03:05:28,740

hi copy all thank you

4600

03:05:34,969 --> 03:05:31,560

and into the launch director

4601
03:05:36,710 --> 03:05:34,979
go ahead one stricter yes sir

4602
03:05:38,870 --> 03:05:36,720
on behalf of all the men and women

4603
03:05:41,690 --> 03:05:38,880
across our great nation who have worked

4604
03:05:44,150 --> 03:05:41,700
to bring this Hardware together to make

4605
03:05:46,370 --> 03:05:44,160
this day possible and for the Artemis

4606
03:05:48,590 --> 03:05:46,380
generation this is for you

4607
03:05:52,969 --> 03:05:48,600
at this time I give you a go to resume

4608
03:05:55,429 --> 03:05:52,979
count and launch Artemis one

4609
03:05:57,170 --> 03:05:55,439
copy lunch director and thank you

4610
03:05:58,490 --> 03:05:57,180
all right we do have a couple of steps

4611
03:06:01,849 --> 03:05:58,500
to configure and then we will be ready

4612
03:06:03,889 --> 03:06:01,859
to resume the clock cvse NTD cvsc here

4613
03:06:06,170 --> 03:06:03,899

initiate recording of Orion cameras at

4614

03:06:09,889 --> 03:06:06,180

this time in work

4615

03:06:14,330 --> 03:06:09,899

our NTD rsr here perform the booster

4616

03:06:20,510 --> 03:06:17,510

NDT rsr booster ignition sna arm and

4617

03:06:23,330 --> 03:06:20,520

rotation enable is complete and I copy

4618

03:06:29,510 --> 03:06:25,849

okay so there you heard the poll from

4619

03:06:29,520 --> 03:06:35,269

early

4620

03:06:35,279 --> 03:06:46,190

getting ready to get that new t0 time

4621

03:06:50,870 --> 03:06:48,590

the poll that you heard was the NASA

4622

03:06:52,309 --> 03:06:50,880

test director's poll and all right and

4623

03:06:54,410 --> 03:06:52,319

we have verified no cutouts at this time

4624

03:06:56,510 --> 03:06:54,420

and all Personnel we are going to resume

4625

03:07:00,650 --> 03:06:56,520

the clock

4626
03:07:02,809 --> 03:07:00,660
mark TLS copies countdown clock will

4627
03:07:06,309 --> 03:07:02,819
resume on my mark

4628
03:07:08,809 --> 03:07:06,319
three two one

4629
03:07:10,730 --> 03:07:08,819
GLS main line has been initiated okay

4630
03:07:13,190 --> 03:07:10,740
minus 10 minutes and Counting we are T

4631
03:07:15,469 --> 03:07:13,200
minus 10 minutes away from liftoff of

4632
03:07:17,929 --> 03:07:15,479
Artemis one as you can see the clock is

4633
03:07:21,230 --> 03:07:17,939
now moving let's put that up

4634
03:07:22,690 --> 03:07:21,240
T minus 9 minutes and 47 seconds the L

4635
03:07:26,929 --> 03:07:22,700
minus

4636
03:07:33,730 --> 03:07:26,939
18.6 47 44 is a new lift up time affirm

4637
03:07:47,210 --> 03:07:39,349
oh 147 44 1 47 a.m eastern time and 44

4638
03:07:47,220 --> 03:07:53,510

we went straight into terminal count

4639

03:07:53,520 --> 03:08:01,730

foreign

4640

03:08:07,130 --> 03:08:04,490

so terminal count

4641

03:08:10,610 --> 03:08:07,140

control has been given over to

4642

03:08:12,710 --> 03:08:10,620

the GLS the ground launch sequencer a

4643

03:08:15,290 --> 03:08:12,720

computer and software that is doing all

4644

03:08:23,150 --> 03:08:15,300

of the commanding and monitoring

4645

03:08:27,110 --> 03:08:25,849

we'll hear call outs from the GLS

4646

03:08:34,130 --> 03:08:27,120

operator

4647

03:08:38,870 --> 03:08:36,349

as well as NASA test director Jeff

4648

03:08:41,269 --> 03:08:38,880

Spalding

4649

03:08:43,370 --> 03:08:41,279

GLS is pre-tensioning the umbilicals at

4650

03:08:45,290 --> 03:08:43,380

this very moment you can see them as

4651
03:08:49,490 --> 03:08:45,300
they run down the rocket that's getting

4652
03:08:54,230 --> 03:08:51,650
and lift off those arms will swing away

4653
03:09:02,920 --> 03:08:54,240
we'll let go of the rocket in a

4654
03:09:07,990 --> 03:09:05,570
[Music]

4655
03:09:10,090 --> 03:09:08,000
T-minus eight minutes and Counting

4656
03:09:12,830 --> 03:09:10,100
[Music]

4657
03:09:15,170 --> 03:09:12,840
the GLS is a

4658
03:09:18,490 --> 03:09:15,180
performing up to a hundred commands per

4659
03:09:27,290 --> 03:09:21,230
including configuring ground systems for

4660
03:09:31,790 --> 03:09:29,269
GLS is turning on cameras recording

4661
03:09:37,630 --> 03:09:31,800
video inside and outside the crew module

4662
03:09:42,410 --> 03:09:40,250
purging the outskirt booster with high

4663
03:09:45,110 --> 03:09:42,420

flow nitrogen

4664

03:09:56,210 --> 03:09:45,120

clear out any hydrogen gas that may be

4665

03:09:59,330 --> 03:09:57,889

you can see the crew access arm is

4666

03:10:02,570 --> 03:09:59,340

already retracted

4667

03:10:05,030 --> 03:10:02,580

when there is crew during Artemis 2

4668

03:10:06,950 --> 03:10:05,040

it would happen at T minus six minutes

4669

03:10:09,110 --> 03:10:06,960

but out of abundance of caution they

4670

03:10:15,110 --> 03:10:09,120

went ahead and retracted the arm well

4671

03:10:18,290 --> 03:10:16,610

want to point your attention to the base

4672

03:10:20,870 --> 03:10:18,300

of the mobile launcher if something

4673

03:10:22,969 --> 03:10:20,880

wasn't done to reduce the power from the

4674

03:10:25,250 --> 03:10:22,979

pressure caused by the Rocket's ignition

4675

03:10:27,530 --> 03:10:25,260

and thunderous sound it could damage the

4676
03:10:29,210 --> 03:10:27,540
rocket so the ignition over pressure and

4677
03:10:30,830 --> 03:10:29,220
sound suppression system will flood the

4678
03:10:33,110 --> 03:10:30,840
mobile launcher with water

4679
03:10:38,450 --> 03:10:33,120
you'll see that sequence start at T

4680
03:10:42,410 --> 03:10:40,250
now coming up in less than 30 seconds

4681
03:10:45,170 --> 03:10:42,420
the ground launch sequencer will start

4682
03:10:58,370 --> 03:10:45,180
bringing the high energy systems online

4683
03:11:02,809 --> 03:11:01,010
fire number one is

4684
03:11:06,469 --> 03:11:02,819
completely silent

4685
03:11:11,389 --> 03:11:08,630
gls's go for core stage tank

4686
03:11:13,990 --> 03:11:11,399
pressurization

4687
03:11:18,410 --> 03:11:14,000
the core stage tank is now pressuring

4688
03:11:25,849 --> 03:11:21,050

the replenish valve to the liquid

4689

03:11:30,410 --> 03:11:27,710

the liquid oxygen tank will come a

4690

03:11:41,950 --> 03:11:32,990

now we're arming your the Orion ascent

4691

03:11:46,910 --> 03:11:44,150

we'll launch a board system or Las

4692

03:11:48,710 --> 03:11:46,920

jettison motor is now armed on this

4693

03:11:50,809 --> 03:11:48,720

flight the abort motor is inactive

4694

03:11:53,809 --> 03:11:50,819

because there is no crew on board up

4695

03:11:56,990 --> 03:11:53,819

next is the flight termination system

4696

03:11:58,670 --> 03:11:57,000

or FTS which gives the space force the

4697

03:12:00,590 --> 03:11:58,680

ability to destruct the rocket if it

4698

03:12:06,349 --> 03:12:00,600

goes in the wrong direction let's listen

4699

03:12:11,570 --> 03:12:09,170

DLS go for FPS arm

4700

03:12:12,769 --> 03:12:11,580

the flight termination system is now

4701
03:12:15,050 --> 03:12:12,779
armed

4702
03:12:17,389 --> 03:12:15,060
coming up at four minutes and 40 seconds

4703
03:12:18,830 --> 03:12:17,399
a big moment this is where the rs-25

4704
03:12:20,750 --> 03:12:18,840
engines

4705
03:12:25,929 --> 03:12:20,760
and their bleed go to high flow it's

4706
03:12:25,939 --> 03:12:37,070
GLS go for lh2 high flow bleed check

4707
03:12:42,349 --> 03:12:39,650
good word we've passed that

4708
03:12:46,130 --> 03:12:42,359
the cryo team got the lh2 engine bleed

4709
03:12:50,450 --> 03:12:47,750
they are now at the right temperature

4710
03:12:53,870 --> 03:12:50,460
for launch countdown continues

4711
03:12:56,570 --> 03:12:53,880
T-minus four minutes 15 seconds

4712
03:12:58,370 --> 03:12:56,580
up next GLS fires up the capoos those

4713
03:13:00,290 --> 03:12:58,380

are high-speed turbines which provide

4714

03:13:02,929 --> 03:13:00,300

pressure to hydraulic pumps that steer

4715

03:13:04,610 --> 03:13:02,939

the rs-25s

4716

03:13:06,349 --> 03:13:04,620

stands for core stage auxiliary power

4717

03:13:09,769 --> 03:13:06,359

unit start

4718

03:13:12,710 --> 03:13:09,779

s go for Core State Apu Stark

4719

03:13:15,290 --> 03:13:12,720

that now leads to the thrust vector

4720

03:13:17,990 --> 03:13:15,300

control test at T minus two minutes and

4721

03:13:19,190 --> 03:13:18,000

30 seconds that can proceed now and we

4722

03:13:21,830 --> 03:13:19,200

will see

4723

03:13:35,870 --> 03:13:21,840

the engine's gimbal at the bottom of the

4724

03:13:39,769 --> 03:13:37,670

at T minus three minutes and 10 seconds

4725

03:13:42,710 --> 03:13:39,779

you will hear the go for Purge sequence

4726
03:13:44,870 --> 03:13:42,720
form that's a helium Purge of the four

4727
03:13:46,969 --> 03:13:44,880
core stage engines Downstream of the

4728
03:13:50,510 --> 03:13:46,979
propellant valve getting the air and

4729
03:13:50,520 --> 03:13:59,030
foreign

4730
03:14:04,849 --> 03:14:01,250
and in just a few seconds GLS will close

4731
03:14:06,769 --> 03:14:04,859
the core stage locks vent liquid oxygen

4732
03:14:08,929 --> 03:14:06,779
the white Vapor Cloud caused the super

4733
03:14:11,630 --> 03:14:08,939
cold gaseous oxygen condensing the water

4734
03:14:15,650 --> 03:14:11,640
in the atmosphere will disappear you see

4735
03:14:19,849 --> 03:14:18,050
and there it goes it's closed locks vent

4736
03:14:23,450 --> 03:14:19,859
closed pressure rising in the core stage

4737
03:14:25,969 --> 03:14:23,460
Lux tank to flight levels

4738
03:14:29,269 --> 03:14:25,979

coming up in 15 seconds look for that

4739

03:14:36,290 --> 03:14:29,279

thrust vector control actuator test

4740

03:14:43,670 --> 03:14:39,050

and there they go

4741

03:14:46,490 --> 03:14:43,680

before core stage rs25 engines gimbaling

4742

03:14:50,290 --> 03:14:46,500

around testing the ability to steer the

4743

03:14:57,349 --> 03:14:53,990

they will operate at 109 performance

4744

03:15:00,050 --> 03:14:57,359

each rs-25 thrown down a half million

4745

03:15:02,230 --> 03:15:00,060

pounds of thrust all four two million

4746

03:15:05,030 --> 03:15:02,240

pounds all together with the boosters

4747

03:15:07,130 --> 03:15:05,040

8.8 million pounds of thrust yeah let's

4748

03:15:08,750 --> 03:15:07,140

go for upper stage to internal power now

4749

03:15:09,830 --> 03:15:08,760

the upper stage has gone to internal

4750

03:15:14,570 --> 03:15:09,840

power

4751
03:15:16,670 --> 03:15:14,580
upper stage the icps and it's been

4752
03:15:19,070 --> 03:15:16,680
switched to battery power

4753
03:15:22,070 --> 03:15:19,080
the same Milestone is coming up for the

4754
03:15:36,230 --> 03:15:22,080
core stage at T minus one minute and 30

4755
03:15:39,710 --> 03:15:38,510
GLS scope or core stage to internal

4756
03:15:42,050 --> 03:15:39,720
power

4757
03:15:44,330 --> 03:15:42,060
the Rocket's core stage which houses the

4758
03:15:46,610 --> 03:15:44,340
three flight computers is now on battery

4759
03:15:48,830 --> 03:15:46,620
power so there is no more hold time

4760
03:15:51,830 --> 03:15:48,840
available because there's no more margin

4761
03:15:54,469 --> 03:15:51,840
on the battery so if we hold have a hold

4762
03:15:57,469 --> 03:15:54,479
we'd have to recycle back to T minus 10

4763
03:15:59,870 --> 03:15:57,479

minutes and recharge those batteries

4764

03:16:05,690 --> 03:15:59,880

the count continues

4765

03:16:10,010 --> 03:16:08,330

one minute shortly after liftoff Mission

4766

03:16:12,410 --> 03:16:10,020

Control Houston will take control of the

4767

03:16:14,929 --> 03:16:12,420

rocket and my colleague Leah Cheshire

4768

03:16:16,910 --> 03:16:14,939

will take over commentary T-minus 50

4769

03:16:19,429 --> 03:16:16,920

seconds and counting

4770

03:16:21,590 --> 03:16:19,439

coming up at T's minus 33 seconds the

4771

03:16:23,809 --> 03:16:21,600

GLS will hand off control to the ALS

4772

03:16:25,790 --> 03:16:23,819

this is the autonomous launch sequencer

4773

03:16:28,910 --> 03:16:25,800

on board the rocket it will take over

4774

03:16:30,889 --> 03:16:28,920

command and control of the rocket but

4775

03:16:33,050 --> 03:16:30,899

the ALS will check make sure there's no

4776
03:16:35,150 --> 03:16:33,060
holds coming from the ground up until T

4777
03:16:38,510 --> 03:16:35,160
minus two seconds go for Ayla and we are

4778
03:16:41,030 --> 03:16:38,520
go for ALS the space launch system is

4779
03:16:45,230 --> 03:16:41,040
now counting down to liftoff of Orion on

4780
03:16:49,429 --> 03:16:46,910
launch Team can no longer recycle the

4781
03:16:54,110 --> 03:16:51,769
ER pressure water now flowing under the

4782
03:16:58,269 --> 03:16:55,550
and here we go

4783
03:17:03,830 --> 03:16:58,279
10 hydrogen burnoff igniters initiate

4784
03:17:08,090 --> 03:17:03,840
seven six five four stage engine start

4785
03:17:11,150 --> 03:17:08,100
three two one booster's indications

4786
03:17:22,130 --> 03:17:11,160
and liftoff of Artemis one we rise

4787
03:17:26,150 --> 03:17:24,590
all four rs-25 engines on the core stage

4788
03:17:28,670 --> 03:17:26,160

and two solid rocket boosters now

4789

03:17:33,349 --> 03:17:28,680

propelling the vehicle at 128 miles per

4790

03:17:37,250 --> 03:17:35,929

good good control on the role from teams

4791

03:17:39,530 --> 03:17:37,260

in Mission Control Houston all good

4792

03:17:41,269 --> 03:17:39,540

calls so far now 30 seconds into the

4793

03:17:43,010 --> 03:17:41,279

flight Harvest one

4794

03:17:44,929 --> 03:17:43,020

first Milestone will be fourth the

4795

03:17:46,969 --> 03:17:44,939

vehicle's past the max Q in about one

4796

03:17:48,710 --> 03:17:46,979

minute and nine seconds into launch this

4797

03:17:56,570 --> 03:17:48,720

is the greatest period of atmospheric

4798

03:17:56,580 --> 03:18:05,929

SLS now traveling 607 miles per hour

4799

03:18:10,670 --> 03:18:07,969

you're looking at 8.8 million pounds of

4800

03:18:14,330 --> 03:18:10,680

Maximum thrust quiet here

4801
03:18:29,330 --> 03:18:16,490
course agents and throttling down ahead

4802
03:18:36,349 --> 03:18:31,550
tax now one minute 21 seconds into the

4803
03:18:38,150 --> 03:18:36,359
flight traveling at 1 420 miles per hour

4804
03:18:42,410 --> 03:18:38,160
before core stage engines are back at

4805
03:18:46,670 --> 03:18:44,750
the next major Milestone will be for the

4806
03:18:48,410 --> 03:18:46,680
solid rocket boosters to cut off in

4807
03:18:50,210 --> 03:18:48,420
jettison in about two minutes and 11

4808
03:18:52,370 --> 03:18:50,220
seconds into the flight so about 30

4809
03:18:54,170 --> 03:18:52,380
seconds from now

4810
03:18:56,450 --> 03:18:54,180
again quiet here in Mission Control

4811
03:18:58,849 --> 03:18:56,460
Houston as teams continue monitoring the

4812
03:19:00,889 --> 03:18:58,859
flight of Artemis one

4813
03:19:02,210 --> 03:19:00,899

we're now 16 miles downrange from the

4814

03:19:10,130 --> 03:19:02,220

launch pad at Kennedy Space Center

4815

03:19:23,469 --> 03:19:11,809

standing by for solid rocket booster

4816

03:19:28,429 --> 03:19:25,610

confirmation that the solid rocket

4817

03:19:30,710 --> 03:19:28,439

boosters have separated these 177-foot

4818

03:19:32,570 --> 03:19:30,720

boosters

4819

03:19:35,450 --> 03:19:32,580

now the core stage continues to power

4820

03:19:38,630 --> 03:19:35,460

the flight of Orion all Force rs-25

4821

03:19:43,809 --> 03:19:38,640

engines firing traveling over 3 400

4822

03:19:48,349 --> 03:19:46,550

two minutes and 36 seconds into the

4823

03:19:49,849 --> 03:19:48,359

flight

4824

03:19:51,830 --> 03:19:49,859

hearing nominal calls here in Mission

4825

03:19:53,630 --> 03:19:51,840

Control Houston

4826
03:19:55,610 --> 03:19:53,640
we've still got four good engines on the

4827
03:19:57,290 --> 03:19:55,620
core stage next up we'll be looking for

4828
03:19:59,570 --> 03:19:57,300
the service module fairing to separate

4829
03:20:01,370 --> 03:19:59,580
this is three 15 by 15 foot fairing

4830
03:20:03,469 --> 03:20:01,380
panels providing structural support

4831
03:20:05,269 --> 03:20:03,479
protecting the service module those will

4832
03:20:07,130 --> 03:20:05,279
separate about 3 minutes and 11 seconds

4833
03:20:09,050 --> 03:20:07,140
into flight and very shortly thereafter

4834
03:20:13,910 --> 03:20:09,060
will be followed by the launch abort

4835
03:20:18,650 --> 03:20:16,070
just over three minutes into the flight

4836
03:20:22,730 --> 03:20:18,660
of Artemis 1 now traveling over 4060

4837
03:20:24,349 --> 03:20:22,740
miles per hour 83 miles downrange

4838
03:20:32,210 --> 03:20:24,359

we just had confirmation that the

4839

03:20:36,530 --> 03:20:34,190

and that the launch abort system pyros

4840

03:20:37,790 --> 03:20:36,540

have fired separating those from Orion

4841

03:20:51,889 --> 03:20:37,800

as well

4842

03:20:55,730 --> 03:20:53,450

we just heard the call for three engine

4843

03:20:57,170 --> 03:20:55,740

press meaning if SLS were to lose an

4844

03:20:59,030 --> 03:20:57,180

engine at this point in the mission we

4845

03:21:00,530 --> 03:20:59,040

could still achieve a nominal Mission we

4846

03:21:02,630 --> 03:21:00,540

would just have an extended main engine

4847

03:21:04,969 --> 03:21:02,640

cut off time however we still have four

4848

03:21:07,370 --> 03:21:04,979

good engines all at maximum thrust right

4849

03:21:11,030 --> 03:21:07,380

now powering the first flight of Artemis

4850

03:21:24,769 --> 03:21:11,040

at 5200 miles per hour 148 miles

4851
03:21:29,210 --> 03:21:26,990
we're four minutes and 16 seconds into

4852
03:21:32,630 --> 03:21:29,220
the flight of Artemis 1

4853
03:21:34,130 --> 03:21:32,640
. so far we've had a clean Ascent we saw

4854
03:21:35,870 --> 03:21:34,140
those solid rocket boosters jettison

4855
03:21:38,150 --> 03:21:35,880
about two minutes and 11 seconds after

4856
03:21:40,730 --> 03:21:38,160
liftoff shortly after we had the service

4857
03:21:43,010 --> 03:21:40,740
module parent panels fairings separate

4858
03:21:44,809 --> 03:21:43,020
as well as the launch abort system the

4859
03:21:51,650 --> 03:21:44,819
launch abort system was inert for this

4860
03:21:56,210 --> 03:21:53,809
those four core stage engines will

4861
03:21:59,510 --> 03:21:56,220
continue to Fire and power the flight of

4862
03:22:04,090 --> 03:21:59,520
Artemis one now traveling over 6 800

4863
03:22:06,650 --> 03:22:04,100

miles per hour 229 miles downrange

4864

03:22:15,110 --> 03:22:06,660

booster flight controller reports that

4865

03:22:18,590 --> 03:22:17,210

our core stage main engine cutoff time

4866

03:22:20,750 --> 03:22:18,600

is about eight minutes and three seconds

4867

03:22:24,950 --> 03:22:20,760

we are now at five minutes and 11

4868

03:22:28,490 --> 03:22:24,960

seconds into the flight 77 656 miles per

4869

03:22:36,349 --> 03:22:31,550

again four good core stage engines those

4870

03:22:39,889 --> 03:22:38,090

the last time those core stage engines

4871

03:22:41,510 --> 03:22:39,899

flew they were taking space shuttles to

4872

03:22:43,130 --> 03:22:41,520

orbit now with upgraded capabilities

4873

03:22:49,130 --> 03:22:43,140

they're launching the future of human

4874

03:22:54,469 --> 03:22:52,070

five minutes and 42 seconds into the

4875

03:22:57,410 --> 03:22:54,479

mission we are now traveling 8 800 miles

4876
03:23:03,769 --> 03:22:57,420
per hour 345 miles downrange from the

4877
03:23:08,030 --> 03:23:06,650
again we are anticipating core stage

4878
03:23:10,130 --> 03:23:08,040
main engine caught off at about eight

4879
03:23:11,809 --> 03:23:10,140
minutes and three seconds and about 10

4880
03:23:13,849 --> 03:23:11,819
seconds later we'll see core stage

4881
03:23:15,530 --> 03:23:13,859
separation at which point Orion and the

4882
03:23:19,849 --> 03:23:15,540
interim cryogenic propulsion stage will

4883
03:23:24,769 --> 03:23:22,429
now traveling over 10 000 miles per hour

4884
03:23:28,190 --> 03:23:24,779
6 minutes and 15 seconds into the flight

4885
03:23:29,809 --> 03:23:28,200
of Artemis 1 427 miles downrange quiet

4886
03:23:32,210 --> 03:23:29,819
here on the loops in Mission Control

4887
03:23:43,370 --> 03:23:32,220
Houston teams continue to monitor this

4888
03:23:48,050 --> 03:23:45,769

about a minute and a half now until that

4889

03:23:49,910 --> 03:23:48,060

core stage main engine cut off time our

4890

03:24:04,849 --> 03:23:49,920

four core stage engines continue to fire

4891

03:24:08,990 --> 03:24:06,650

coming up on seven minutes since launch

4892

03:24:12,830 --> 03:24:09,000

today now traveling over 12 800 miles

4893

03:24:22,429 --> 03:24:12,840

per hour 563 miles downrange again still

4894

03:24:27,769 --> 03:24:25,190

as we prepare for main engine cutoff the

4895

03:24:41,570 --> 03:24:27,779

four rs-25 engines are beginning to

4896

03:24:45,710 --> 03:24:43,670

30 seconds now until core stage main

4897

03:24:52,490 --> 03:24:45,720

engine cut off all four engines continue

4898

03:24:57,469 --> 03:24:55,250

now seven minutes 45 seconds into the

4899

03:25:00,769 --> 03:24:57,479

flight traveling over 16 000 miles per

4900

03:25:04,969 --> 03:25:02,870

continuing to hear good calls here in

4901
03:25:07,190 --> 03:25:04,979
Mission Control Houston

4902
03:25:17,690 --> 03:25:07,200
we're standing by for core stage main

4903
03:25:23,030 --> 03:25:20,090
and we have confirmation of course stage

4904
03:25:24,830 --> 03:25:23,040
main engine cutoff Orion and it's now in

4905
03:25:26,809 --> 03:25:24,840
Earth's orbit

4906
03:25:29,450 --> 03:25:26,819
the flight Dynamics officer reports that

4907
03:25:31,250 --> 03:25:29,460
we have a nominal main engine cutoff

4908
03:25:33,889 --> 03:25:31,260
and we just heard the call for core

4909
03:25:35,630 --> 03:25:33,899
stage separation that means Orion and

4910
03:25:37,550 --> 03:25:35,640
the interim cryogenic propulsion stage

4911
03:25:39,650 --> 03:25:37,560
are now flying free from the core stage

4912
03:25:41,690 --> 03:25:39,660
of the space launch system the next

4913
03:25:44,090 --> 03:25:41,700

Milestone will be solar array deploy

4914

03:25:46,130 --> 03:25:44,100

approximately 18 minutes after liftoff

4915

03:25:48,050 --> 03:25:46,140

but before Orion stretches its wings

4916

03:25:49,729 --> 03:25:48,060

let's check back in with our friends at

4917

03:25:52,309 --> 03:25:49,739

Kennedy Space Center and hear all about

4918

03:25:54,710 --> 03:25:52,319

what it was like to hear the rocket Roar

4919

03:25:57,050 --> 03:25:54,720

off the launch pad Megan and Kayla I've

4920

03:25:58,550 --> 03:25:57,060

got to hear all about it well if you're

4921

03:26:00,410 --> 03:25:58,560

just joining us welcome to NASA's

4922

03:26:03,229 --> 03:26:00,420

Kennedy Space Center where we just

4923

03:26:05,630 --> 03:26:03,239

watched Artemis 1 launch our first step

4924

03:26:07,849 --> 03:26:05,640

towards our next adventure into deep

4925

03:26:10,190 --> 03:26:07,859

space as Leah said I'm NASA's Megan Cruz

4926
03:26:12,769 --> 03:26:10,200
and this is NASA astronaut Kayla Varan

4927
03:26:14,690 --> 03:26:12,779
and I'm kind of still giddy and

4928
03:26:16,849 --> 03:26:14,700
speechless I don't even know how to

4929
03:26:18,950 --> 03:26:16,859
explain how I'm feeling right now I feel

4930
03:26:20,630 --> 03:26:18,960
the same way this is the first launch

4931
03:26:24,530 --> 03:26:20,640
that I've been able to watch in person

4932
03:26:26,570 --> 03:26:24,540
and I've got to say it was incredible I

4933
03:26:29,630 --> 03:26:26,580
was just took my breath away and I was

4934
03:26:31,849 --> 03:26:29,640
tearing up just what an amazing

4935
03:26:33,290 --> 03:26:31,859
accomplishment for this team this

4936
03:26:35,030 --> 03:26:33,300
international team people who have been

4937
03:26:36,830 --> 03:26:35,040
dedicating their careers to getting this

4938
03:26:38,330 --> 03:26:36,840

rocket off the ground and taking the

4939

03:26:40,130 --> 03:26:38,340

first step to getting a crew on that

4940

03:26:42,590 --> 03:26:40,140

vehicle back to the Moon it was just

4941

03:26:44,389 --> 03:26:42,600

incredible yeah this is a moment I think

4942

03:26:46,670 --> 03:26:44,399

that we're all going to remember where

4943

03:26:48,290 --> 03:26:46,680

we were when we saw this sort of thing

4944

03:26:50,389 --> 03:26:48,300

you know what I mean and it was great to

4945

03:26:52,670 --> 03:26:50,399

see again when we entered into terminal

4946

03:26:54,469 --> 03:26:52,680

count everybody here just started

4947

03:26:57,710 --> 03:26:54,479

cheering you know coming out to get a

4948

03:27:00,050 --> 03:26:57,720

really good view and boy I mean it lit

4949

03:27:01,490 --> 03:27:00,060

up the night sky and it just shook

4950

03:27:04,070 --> 03:27:01,500

everything around us did you feel that

4951
03:27:06,710 --> 03:27:04,080
like in my bones I felt that oh yeah the

4952
03:27:08,450 --> 03:27:06,720
I mean the cool thing is just kind of

4953
03:27:11,030 --> 03:27:08,460
the delay between what you see it yes

4954
03:27:13,130 --> 03:27:11,040
here because of course the sound travels

4955
03:27:15,469 --> 03:27:13,140
a little bit slower and it was just

4956
03:27:18,410 --> 03:27:15,479
amazing the the ground shook we could

4957
03:27:21,349 --> 03:27:18,420
hear the thrust pushing that rocket into

4958
03:27:23,450 --> 03:27:21,359
space 8.8 million pounds of thrust yes

4959
03:27:25,309 --> 03:27:23,460
it's incredible it was amazing to see

4960
03:27:27,349 --> 03:27:25,319
here live in person how does it compare

4961
03:27:28,670 --> 03:27:27,359
so this is your first launch on the

4962
03:27:30,290 --> 03:27:28,680
ground how does it compare to your

4963
03:27:33,110 --> 03:27:30,300

launch when you're in the capsule

4964

03:27:35,630 --> 03:27:33,120

soaring towards space I mean

4965

03:27:37,190 --> 03:27:35,640

equally emotional I think one that we

4966

03:27:38,929 --> 03:27:37,200

train for everything and so when we're

4967

03:27:40,490 --> 03:27:38,939

in that capsule waiting for launch we're

4968

03:27:42,530 --> 03:27:40,500

just running our procedures you could

4969

03:27:43,670 --> 03:27:42,540

almost you know trick us and say that

4970

03:27:46,429 --> 03:27:43,680

we're in the simulator and it wasn't

4971

03:27:48,050 --> 03:27:46,439

real but like in that moment of liftoff

4972

03:27:50,510 --> 03:27:48,060

when the thrust builds underneath you

4973

03:27:52,849 --> 03:27:50,520

like we saw it today it's just hard not

4974

03:27:55,010 --> 03:27:52,859

to be overwhelmed by the emotional

4975

03:27:57,229 --> 03:27:55,020

experience the excitement the joy of

4976

03:27:59,990 --> 03:27:57,239

that moment it's incredible yeah I I

4977

03:28:02,690 --> 03:28:00,000

think we can't say it enough this team

4978

03:28:05,630 --> 03:28:02,700

really deserved this moment they've been

4979

03:28:07,550 --> 03:28:05,640

working so hard for this moment when I

4980

03:28:10,370 --> 03:28:07,560

heard that we got into terminal count it

4981

03:28:12,830 --> 03:28:10,380

was I felt a sense of relief and

4982

03:28:14,630 --> 03:28:12,840

excitement for them that I think

4983

03:28:16,610 --> 03:28:14,640

everybody here did you know we really

4984

03:28:19,670 --> 03:28:16,620

wanted them to succeed we really wanted

4985

03:28:22,309 --> 03:28:19,680

to see the launch today and wow I I will

4986

03:28:24,290 --> 03:28:22,319

never forget this me neither it was an

4987

03:28:25,790 --> 03:28:24,300

incredible experience to be here and see

4988

03:28:27,650 --> 03:28:25,800

that happen yeah was there anything that

4989

03:28:29,210 --> 03:28:27,660

was particularly surprising to you again

4990

03:28:30,830 --> 03:28:29,220

this is your first launch you know what

4991

03:28:33,290 --> 03:28:30,840

were you expecting

4992

03:28:35,690 --> 03:28:33,300

you know I think we also had a nighttime

4993

03:28:38,150 --> 03:28:35,700

launch for our launch and so I I think

4994

03:28:40,070 --> 03:28:38,160

one thing you underestimate is how much

4995

03:28:41,990 --> 03:28:40,080

it lights up the nights yeah we were

4996

03:28:44,389 --> 03:28:42,000

able to watch it all the way through

4997

03:28:46,309 --> 03:28:44,399

that trajectory we were able to see the

4998

03:28:48,229 --> 03:28:46,319

boosters separate and everything so it

4999

03:28:50,150 --> 03:28:48,239

was just an incredible view it's amazing

5000

03:28:51,769 --> 03:28:50,160

how much you get to see of the flight

5001

03:28:53,090 --> 03:28:51,779

path when it's at night and sliding up

5002

03:28:55,729 --> 03:28:53,100

the sky yeah and I don't know if you

5003

03:28:58,130 --> 03:28:55,739

notice this but we see the moon here and

5004

03:29:00,410 --> 03:28:58,140

it and the trajectory of the rocket

5005

03:29:01,550 --> 03:29:00,420

looked like it was flying towards me you

5006

03:29:04,490 --> 03:29:01,560

know what I mean I was like oh my God

5007

03:29:06,769 --> 03:29:04,500

that's so poetic it's so beautiful I'm

5008

03:29:08,630 --> 03:29:06,779

so glad we launched today yeah wow

5009

03:29:10,250 --> 03:29:08,640

congratulations to the team it's

5010

03:29:12,170 --> 03:29:10,260

incredible we're gonna head over to

5011

03:29:14,750 --> 03:29:12,180

Daryl who was at the launch Team Daryl

5012

03:29:17,090 --> 03:29:14,760

you got to count us down through that uh

5013

03:29:20,090 --> 03:29:17,100

uh through liftoff I mean how was that

5014

03:29:22,610 --> 03:29:20,100

being in the launch launch uh control

5015

03:29:24,710 --> 03:29:22,620

center with them

5016

03:29:26,450 --> 03:29:24,720

well Megan it was uh it was something

5017

03:29:28,130 --> 03:29:26,460

else I got to tell you you're looking

5018

03:29:30,590 --> 03:29:28,140

live inside the firing room where

5019

03:29:33,469 --> 03:29:30,600

Charlie Blackwell Thompson is about to

5020

03:29:35,389 --> 03:29:33,479

address her team after a whole lot of

5021

03:29:37,610 --> 03:29:35,399

hard work and preparation to get to this

5022

03:29:41,750 --> 03:29:37,620

moment let's Stand By and listen to her

5023

03:29:41,760 --> 03:29:45,170

Comcheck

5024

03:29:45,180 --> 03:29:49,429

you can't hear it in the room

5025

03:29:53,870 --> 03:29:51,710

can you guys hear me

5026
03:29:53,880 --> 03:29:58,610
microphone

5027
03:30:02,929 --> 03:30:01,190
the Press site can hear me but the the

5028
03:30:04,729 --> 03:30:02,939
room came

5029
03:30:17,330 --> 03:30:04,739
you can hear me

5030
03:30:17,340 --> 03:30:32,510
I don't know what he's telling me to do

5031
03:30:32,520 --> 03:31:04,809
team can't hear me

5032
03:31:04,819 --> 03:31:11,630
is here

5033
03:31:11,640 --> 03:31:17,450
can you guys hear me oh there we go

5034
03:31:17,460 --> 03:31:26,150
is he ready for me

5035
03:31:26,160 --> 03:31:31,429
well for once I might be speechless

5036
03:31:36,110 --> 03:31:33,590
so you guys know I have talked a lot

5037
03:31:38,809 --> 03:31:36,120
about appreciating the moment that

5038
03:31:41,030 --> 03:31:38,819

you're in and we have worked hard as a

5039

03:31:51,349 --> 03:31:41,040

team you guys have worked hard as a team

5040

03:31:51,359 --> 03:31:55,309

foreign

5041

03:31:59,090 --> 03:31:58,130

it is not by chance that you are here

5042

03:32:01,309 --> 03:31:59,100

today

5043

03:32:02,809 --> 03:32:01,319

so I want you to look around look around

5044

03:32:05,750 --> 03:32:02,819

at this team

5045

03:32:07,330 --> 03:32:05,760

and know that you have earned it you

5046

03:32:10,490 --> 03:32:07,340

have earned your place in the room

5047

03:32:14,630 --> 03:32:10,500

you've earned this moment you have

5048

03:32:20,570 --> 03:32:17,809

you were part of a first doesn't come

5049

03:32:23,630 --> 03:32:20,580

along very often

5050

03:32:25,370 --> 03:32:23,640

once in a career Maybe

5051

03:32:28,849 --> 03:32:25,380

but we are all part of something

5052

03:32:37,849 --> 03:32:28,859

incredibly special the first launch of

5053

03:32:42,830 --> 03:32:40,429

the first step in returning our country

5054

03:32:49,690 --> 03:32:42,840

to the Moon

5055

03:32:55,969 --> 03:32:52,670

what you have done well what you have

5056

03:32:57,830 --> 03:32:55,979

done today will inspire generations to

5057

03:33:00,710 --> 03:32:57,840

come

5058

03:33:02,330 --> 03:33:00,720

so thank you thank you for your

5059

03:33:04,490 --> 03:33:02,340

resilience

5060

03:33:07,309 --> 03:33:04,500

you know I said at the pre-test briefing

5061

03:33:08,269 --> 03:33:07,319

the heart of the climb the better The

5062

03:33:10,550 --> 03:33:08,279

View

5063

03:33:13,070 --> 03:33:10,560

we showed the Space Coast tonight what a

5064

03:33:14,910 --> 03:33:13,080

beautiful view it is

5065

03:33:21,170 --> 03:33:14,920

so congratulations

5066

03:33:23,870 --> 03:33:21,180

[Applause]

5067

03:33:25,969 --> 03:33:23,880

so we got a couple of traditions here in

5068

03:33:28,790 --> 03:33:25,979

launch control

5069

03:33:31,010 --> 03:33:28,800

and the first one is

5070

03:33:32,450 --> 03:33:31,020

when you're in the position for the

5071

03:33:35,090 --> 03:33:32,460

first time

5072

03:33:38,750 --> 03:33:35,100

you get a tie cutting

5073

03:33:40,309 --> 03:33:38,760

and so I

5074

03:33:43,550 --> 03:33:40,319

I have my

5075

03:33:45,710 --> 03:33:43,560

launch director scissors

5076
03:33:48,410 --> 03:33:45,720
and I'm going to get my tie cut by a

5077
03:33:51,290 --> 03:33:48,420
couple of Legends that are here

5078
03:33:53,330 --> 03:33:51,300
and then anyone who wants their tie cut

5079
03:33:55,670 --> 03:33:53,340
will be making the rounds in the firing

5080
03:33:57,950 --> 03:33:55,680
room you got your console Chiefs if they

5081
03:33:59,750 --> 03:33:57,960
want to do it that's fine if you want me

5082
03:34:01,790 --> 03:33:59,760
to do it you might have to wait a little

5083
03:34:05,750 --> 03:34:01,800
while but I'll stay all night if I have

5084
03:34:08,090 --> 03:34:05,760
to it'll be my pleasure to cut ties

5085
03:34:09,969 --> 03:34:08,100
so I'm gonna get gonna take care of mine

5086
03:34:43,020 --> 03:34:09,979
and then I have one other presentation

5087
03:34:43,030 --> 03:34:49,250
[Applause]

5088
03:34:53,630 --> 03:34:51,349

eight

5089

03:34:55,429 --> 03:34:53,640

this is Charlie Blackwell Thompson

5090

03:34:59,030 --> 03:34:55,439

Artemis one launch director she just got

5091

03:35:00,469 --> 03:34:59,040

her tie cut that is a tradition here at

5092

03:35:03,229 --> 03:35:00,479

NASA

5093

03:35:04,610 --> 03:35:03,239

we just got to hear her talk to the team

5094

03:35:05,870 --> 03:35:04,620

and one thing that really stuck out to

5095

03:35:07,849 --> 03:35:05,880

me that she said is that they really

5096

03:35:09,650 --> 03:35:07,859

earned their place in history we're

5097

03:35:13,630 --> 03:35:09,660

coming up on solar array deploy let's go

5098

03:35:17,750 --> 03:35:15,950

thanks Megan and yes we're here in

5099

03:35:19,910 --> 03:35:17,760

Mission Control Houston still monitoring

5100

03:35:21,950 --> 03:35:19,920

the Artemis One mission and the first

5101
03:35:23,809 --> 03:35:21,960
flight of Orion atop the space launch

5102
03:35:27,469 --> 03:35:23,819
system so far we saw a successful

5103
03:35:29,269 --> 03:35:27,479
liftoff at 1 47 a.m eastern time all the

5104
03:35:31,550 --> 03:35:29,279
way through separation from the core

5105
03:35:33,910 --> 03:35:31,560
stage we now have Orion and the interim

5106
03:35:36,710 --> 03:35:33,920
cryogenic propulsion stage flying free

5107
03:35:39,290 --> 03:35:36,720
and we just heard that we have initiated

5108
03:35:41,990 --> 03:35:39,300
solar array deploy so we are turning our

5109
03:35:43,969 --> 03:35:42,000
Focus to that the spacecraft was running

5110
03:35:46,309 --> 03:35:43,979
on battery power but stretching These

5111
03:35:48,290 --> 03:35:46,319
Wings will allow it to stop relying on

5112
03:35:51,349 --> 03:35:48,300
those batteries and significantly extend

5113
03:35:53,690 --> 03:35:51,359

the time it can stay in space

5114

03:35:55,729 --> 03:35:53,700

so solar array deploy takes about 12

5115

03:35:57,830 --> 03:35:55,739

minutes we have four solar arrays that

5116

03:35:59,570 --> 03:35:57,840

we need to deploy and latch these will

5117

03:36:01,250 --> 03:35:59,580

provide power to the spacecraft on its

5118

03:36:03,590 --> 03:36:01,260

journey to distant retrograde orbit and

5119

03:36:05,690 --> 03:36:03,600

all the way back to earth once these are

5120

03:36:07,729 --> 03:36:05,700

properly configured again Orion will no

5121

03:36:08,870 --> 03:36:07,739

longer need to rely solely on battery

5122

03:36:11,150 --> 03:36:08,880

power

5123

03:36:13,670 --> 03:36:11,160

and we expect this to be done about 30

5124

03:36:16,969 --> 03:36:13,680

minutes after liftoff right now we're 19

5125

03:36:18,969 --> 03:36:16,979

minutes since liftoff today Orion is now

5126
03:36:24,229 --> 03:36:18,979
traveling 17

5127
03:36:27,710 --> 03:36:26,030
we're continuing to hear good calls here

5128
03:36:29,330 --> 03:36:27,720
in Mission Control Houston from the

5129
03:36:30,050 --> 03:36:29,340
flight controllers monitoring the

5130
03:36:32,030 --> 03:36:30,060
mission

5131
03:36:34,429 --> 03:36:32,040
a little bit about these solar arrays as

5132
03:36:36,530 --> 03:36:34,439
we wait again we heard the call that the

5133
03:36:39,290 --> 03:36:36,540
deploy has been initiated we'll hear a

5134
03:36:42,290 --> 03:36:39,300
little bit more about that once they

5135
03:36:44,330 --> 03:36:42,300
start to unfold these four solar arrays

5136
03:36:46,309 --> 03:36:44,340
generate 11 kilowatts of power which is

5137
03:36:48,349 --> 03:36:46,319
enough electricity to power two three

5138
03:36:51,469 --> 03:36:48,359

bedroom houses and they have a wingspan

5139

03:36:53,510 --> 03:36:51,479

of 63 feet just one of these six and a

5140

03:36:55,330 --> 03:36:53,520

half by six and a half foot panels has

5141

03:36:58,070 --> 03:36:55,340

uh

5142

03:36:59,510 --> 03:36:58,080

1250 solar cells so you're looking at a

5143

03:37:01,550 --> 03:36:59,520

total of 15

5144

03:37:03,830 --> 03:37:01,560

000 solar cells

5145

03:37:05,750 --> 03:37:03,840

now we just heard the call that all four

5146

03:37:07,729 --> 03:37:05,760

solar arrays have been released so we

5147

03:37:09,590 --> 03:37:07,739

initially heard the initiation call that

5148

03:37:11,570 --> 03:37:09,600

command had been sent now those four

5149

03:37:15,349 --> 03:37:11,580

solar arrays are released again this is

5150

03:37:19,010 --> 03:37:17,269

the solar arrays will deploy straight

5151
03:37:21,170 --> 03:37:19,020
and you're getting a live view right now

5152
03:37:22,969 --> 03:37:21,180
this is really exciting they'll

5153
03:37:25,490 --> 03:37:22,979
eventually be swept back against the

5154
03:37:28,010 --> 03:37:25,500
vehicle prior to translunar injection

5155
03:37:30,410 --> 03:37:28,020
burn to prevent any loads from breaking

5156
03:37:32,150 --> 03:37:30,420
or damaging the arrays and on the end of

5157
03:37:33,950 --> 03:37:32,160
each solar array is a camera that will

5158
03:37:35,870 --> 03:37:33,960
capture imagery for us throughout the

5159
03:37:37,670 --> 03:37:35,880
mission along with a few other cameras

5160
03:37:40,190 --> 03:37:37,680
placed outside and inside the spacecraft

5161
03:37:44,630 --> 03:37:40,200
to help us Monitor and perform various

5162
03:37:48,410 --> 03:37:46,729
of course if you recall the Apollo

5163
03:37:51,050 --> 03:37:48,420

capsule design there were no solar

5164

03:37:52,490 --> 03:37:51,060

arrays we had fuel cells instead so this

5165

03:37:54,410 --> 03:37:52,500

design with arrays gives us the

5166

03:37:56,870 --> 03:37:54,420

opportunity to stay in orbit longer

5167

03:37:58,670 --> 03:37:56,880

since we practically have no limit to

5168

03:38:03,110 --> 03:37:58,680

the energy available for use from the

5169

03:38:08,450 --> 03:38:06,710

coming up on 21 minutes since liftoff

5170

03:38:10,070 --> 03:38:08,460

Orion is attached to the interim

5171

03:38:12,950 --> 03:38:10,080

cryogenic propulsion stage you can see

5172

03:38:15,170 --> 03:38:12,960

those four solar arrays unfolding now

5173

03:38:17,030 --> 03:38:15,180

and again Artemis one is a flight test

5174

03:38:19,010 --> 03:38:17,040

it's Paving the way for a sustainable

5175

03:38:20,510 --> 03:38:19,020

Presence at the Moon looking forward to

5176

03:38:22,490 --> 03:38:20,520

the future Gateway will be our space

5177

03:38:24,229 --> 03:38:22,500

station and lunar orbit and we have some

5178

03:38:26,150 --> 03:38:24,239

similarities and differences in the

5179

03:38:28,370 --> 03:38:26,160

solar arrays unfolding right now on

5180

03:38:30,710 --> 03:38:28,380

Orion and those that will be on Gateway

5181

03:38:33,170 --> 03:38:30,720

so like we're seeing now these are

5182

03:38:35,929 --> 03:38:33,180

deploying autonomously the Gateway solar

5183

03:38:38,030 --> 03:38:35,939

arrays will as well

5184

03:38:40,250 --> 03:38:38,040

and while these generate those 11

5185

03:38:42,830 --> 03:38:40,260

kilowatts of power the two roll out

5186

03:38:46,070 --> 03:38:42,840

solar arrays or Rosas on Gateway will

5187

03:38:47,690 --> 03:38:46,080

generate 60 kilowatts of power that Rosa

5188

03:38:49,610 --> 03:38:47,700

design is currently being tested aboard

5189

03:38:51,469 --> 03:38:49,620

the space station we have two new ones

5190

03:39:02,630 --> 03:38:51,479

installed and a spacewalk conducted

5191

03:39:07,550 --> 03:39:05,450

coming up on 22 minutes since liftoff

5192

03:39:11,090 --> 03:39:07,560

today Orion and the interim cryogenic

5193

03:39:15,590 --> 03:39:11,100

propulsion stage traveling over 16 800

5194

03:39:19,969 --> 03:39:18,290

the solar arrays deploying now are part

5195

03:39:22,550 --> 03:39:19,979

of the European service module it's

5196

03:39:25,010 --> 03:39:22,560

comprised of 20 000 parts and components

5197

03:39:26,809 --> 03:39:25,020

the service module was developed as part

5198

03:39:30,950 --> 03:39:26,819

of an agreement between NASA and the

5199

03:39:35,269 --> 03:39:33,590

this is the first time NASA is using a

5200

03:41:01,729 --> 03:39:35,279

European-built system as a critical

5201
03:41:07,849 --> 03:41:05,330
coming up now in 24 minutes into the

5202
03:41:10,250 --> 03:41:07,859
flight of Artemis one spacecraft now

5203
03:41:13,309 --> 03:41:10,260
traveling at 16 500 miles per hour

5204
03:41:15,410 --> 03:41:13,319
around the earth we are in solar array

5205
03:41:33,830 --> 03:41:15,420
deploy and we have confirmation all four

5206
03:42:41,809 --> 03:41:35,570
coming up in a little less than 30

5207
03:42:48,050 --> 03:42:46,130
and with our launch at 141 eastern time

5208
03:42:50,870 --> 03:42:48,060
this morning we are looking for a

5209
03:42:55,070 --> 03:42:50,880
perigee raised maneuver about 53 minutes

5210
03:42:57,469 --> 03:42:55,080
into today's flight again we are now 25

5211
03:43:00,530 --> 03:42:57,479
minutes and 47 seconds into the flight

5212
03:43:03,110 --> 03:43:00,540
and we have a complete deployment of all

5213
03:43:05,510 --> 03:43:03,120

four solar arrays

5214

03:43:07,790 --> 03:43:05,520

Orion's Journey To The Moon continues as

5215

03:43:09,769 --> 03:43:07,800

planned again looking forward to that

5216

03:43:12,710 --> 03:43:09,779

perigee raised maneuver that'll be

5217

03:43:16,969 --> 03:43:12,720

coming up again at about 53 minutes into

5218

03:43:18,650 --> 03:43:16,979

the mission so about 27 minutes from now

5219

03:43:20,389 --> 03:43:18,660

during the perigee maneuver the

5220

03:43:22,729 --> 03:43:20,399

interim cryogenic propulsion stage will

5221

03:43:25,070 --> 03:43:22,739

use its rl-10 engine to lift the lowest

5222

03:43:26,870 --> 03:43:25,080

point of Orion in Earth's orbit the

5223

03:43:28,550 --> 03:43:26,880

current orbit is more of an oval shape

5224

03:43:30,229 --> 03:43:28,560

than a perfect circle and this burn will

5225

03:43:32,750 --> 03:43:30,239

raise that point closest to Earth and

5226

03:43:34,429 --> 03:43:32,760

make the orbit more circular this will

5227

03:43:36,590 --> 03:43:34,439

also include a checkout of Orion's

5228

03:43:38,929 --> 03:43:36,600

systems and any adjustments to the solar

5229

03:43:40,910 --> 03:43:38,939

arrays it'll be a short burn less than

5230

03:43:43,550 --> 03:43:40,920

30 seconds long but critical to keep us

5231

03:43:45,650 --> 03:43:43,560

on track and it also prepares us for the

5232

03:43:47,210 --> 03:43:45,660

next engine burn to send Orion to the

5233

03:43:49,190 --> 03:43:47,220

Moon that's the translunar injection

5234

03:43:52,010 --> 03:43:49,200

burn that'll come up a little later

5235

03:43:53,990 --> 03:43:52,020

which is a longer burn another firing of

5236

03:44:10,130 --> 03:43:54,000

the rl-10 engine on the interim

5237

03:44:14,570 --> 03:44:12,349

we caught a glimpse there of those solar

5238

03:44:16,729 --> 03:44:14,580

arrays and with all four solar arrays

5239

03:44:18,590 --> 03:44:16,739

properly deployed Orion's Journey To The

5240

03:44:20,330 --> 03:44:18,600

Moon continues and we've got more

5241

03:44:22,309 --> 03:44:20,340

operational updates coming up shortly

5242

03:44:24,650 --> 03:44:22,319

but for now I'm going to toss it back to

5243

03:44:26,870 --> 03:44:24,660

Megan and Kayla at Kennedy

5244

03:44:28,370 --> 03:44:26,880

Leah thank you so much our return to the

5245

03:44:30,590 --> 03:44:28,380

moon will be different than the last

5246

03:44:32,929 --> 03:44:30,600

time we plan to explore more of the

5247

03:44:34,729 --> 03:44:32,939

lunar surface and learn how to live and

5248

03:44:36,650 --> 03:44:34,739

work there with more on our destination

5249

03:44:38,030 --> 03:44:36,660

let's bring back NASA's Dan Hewitt with

5250

03:44:41,210 --> 03:44:38,040

our new moon board

5251
03:44:43,490 --> 03:44:41,220
hey thanks Megan I I gotta be honest we

5252
03:44:46,250 --> 03:44:43,500
ran outside to catch it I'm still

5253
03:44:47,809 --> 03:44:46,260
shaking a little bit that that never

5254
03:44:49,490 --> 03:44:47,819
gets old that is always one of the

5255
03:44:53,269 --> 03:44:49,500
coolest things you'll ever see in your

5256
03:44:55,010 --> 03:44:53,279
entire life and that rocket was massive

5257
03:44:57,830 --> 03:44:55,020
and loud and just

5258
03:45:00,349 --> 03:44:57,840
the so cool all right

5259
03:45:02,690 --> 03:45:00,359
the moon this is why we call it the moon

5260
03:45:05,269 --> 03:45:02,700
board but the moon you know since the

5261
03:45:07,429 --> 03:45:05,279
dawn of time humans have looked at the

5262
03:45:09,590 --> 03:45:07,439
sky and shouted at our neighbor I'm

5263
03:45:12,710 --> 03:45:09,600

gonna walk in your face

5264

03:45:15,290 --> 03:45:12,720

and in the 60s we actually did it uh six

5265

03:45:18,950 --> 03:45:15,300

times starting with Neil Armstrong Buzz

5266

03:45:21,530 --> 03:45:18,960

Aldrin Apollo 11 1969 followed by five

5267

03:45:23,630 --> 03:45:21,540

more successive Landings each time

5268

03:45:26,330 --> 03:45:23,640

delivering two human beings to the

5269

03:45:30,530 --> 03:45:26,340

surface of the Moon our last one was

5270

03:45:32,630 --> 03:45:30,540

Apollo 17 and that was in 1972 Gene

5271

03:45:35,030 --> 03:45:32,640

cernan and Harrison Smith stepping off

5272

03:45:37,250 --> 03:45:35,040

for the last time now we have not sent

5273

03:45:39,349 --> 03:45:37,260

humans back since then but they

5274

03:45:41,450 --> 03:45:39,359

accomplished a lot under Apollo lots of

5275

03:45:42,769 --> 03:45:41,460

technological advancements deployed

5276

03:45:45,410 --> 03:45:42,779

science instruments brought back

5277

03:45:47,990 --> 03:45:45,420

hundreds of pounds of lunar rocks and

5278

03:45:49,849 --> 03:45:48,000

regula teaching us about the moon and

5279

03:45:52,309 --> 03:45:49,859

also about our place in the solar system

5280

03:45:54,050 --> 03:45:52,319

the Moon is fascinating because it

5281

03:45:56,330 --> 03:45:54,060

doesn't have a lot of the geological

5282

03:45:58,130 --> 03:45:56,340

processes we have here on Earth you

5283

03:46:00,410 --> 03:45:58,140

don't have erosion you don't have wind

5284

03:46:02,870 --> 03:46:00,420

and water wearing Down rocks you don't

5285

03:46:05,450 --> 03:46:02,880

have plate tectonics that are constantly

5286

03:46:07,729 --> 03:46:05,460

recycling the crust and so everything

5287

03:46:10,070 --> 03:46:07,739

out there is really old in fact one of

5288

03:46:12,290 --> 03:46:10,080

the Rocks brought back on Apollo 50 teen

5289

03:46:14,630 --> 03:46:12,300

called The Genesis Rock was dated to be

5290

03:46:17,150 --> 03:46:14,640

4 billion years old so from the

5291

03:46:19,729 --> 03:46:17,160

primordial beginnings of our solar

5292

03:46:22,190 --> 03:46:19,739

system but as Kayla said a little bit

5293

03:46:25,370 --> 03:46:22,200

earlier those missions were measured in

5294

03:46:27,650 --> 03:46:25,380

days their spacewalks in just hours with

5295

03:46:29,690 --> 03:46:27,660

Artemis were looking to go and we're

5296

03:46:32,870 --> 03:46:29,700

looking to stay and we're not looking

5297

03:46:35,690 --> 03:46:32,880

around the equator like our under Apollo

5298

03:46:38,750 --> 03:46:35,700

we're looking at the lunar South Pole

5299

03:46:40,610 --> 03:46:38,760

now why so we haven't sent people since

5300

03:46:43,790 --> 03:46:40,620

the 70s to the moon but we haven't

5301
03:46:45,650 --> 03:46:43,800
stopped studying it we've had orbiters

5302
03:46:47,450 --> 03:46:45,660
like the lunar reconnaissance Orbiter

5303
03:46:49,670 --> 03:46:47,460
which has literally just been flying

5304
03:46:52,429 --> 03:46:49,680
loops around the Moon taking high

5305
03:46:54,349 --> 03:46:52,439
resolution images of the surface so high

5306
03:46:55,849 --> 03:46:54,359
resolution that you can look them up

5307
03:46:57,410 --> 03:46:55,859
they have images of all the different

5308
03:46:59,870 --> 03:46:57,420
Apollo Landing sites and you can

5309
03:47:01,910 --> 03:46:59,880
actually see the footprints the paths

5310
03:47:04,550 --> 03:47:01,920
they left in the lunar regolith of those

5311
03:47:07,910 --> 03:47:04,560
sites we had a mission called L cross

5312
03:47:10,190 --> 03:47:07,920
which slammed a probe into a crater on

5313
03:47:11,630 --> 03:47:10,200

the moon sending out material some of

5314

03:47:14,150 --> 03:47:11,640

which potentially hadn't seen direct

5315

03:47:16,309 --> 03:47:14,160

sunlight for billions of years and then

5316

03:47:18,110 --> 03:47:16,319

analyzing what shot out and through

5317

03:47:20,469 --> 03:47:18,120

missions like that and others we've been

5318

03:47:23,150 --> 03:47:20,479

able to find that there is water ice

5319

03:47:25,490 --> 03:47:23,160

trapped in those permanently shadowed

5320

03:47:27,830 --> 03:47:25,500

areas on the moon a lot of them center

5321

03:47:32,150 --> 03:47:27,840

around that South Pole we have already

5322

03:47:35,210 --> 03:47:32,160

identified 13 potential Landing sites

5323

03:47:37,610 --> 03:47:35,220

for the Artemis 3 mission and these are

5324

03:47:40,130 --> 03:47:37,620

where we're going to send our astronauts

5325

03:47:43,309 --> 03:47:40,140

around the lunar South Pole to access

5326

03:47:45,710 --> 03:47:43,319

that water ice now why water why are we

5327

03:47:47,809 --> 03:47:45,720

caring about water well it serves a lot

5328

03:47:49,729 --> 03:47:47,819

of purposes obviously for humans you

5329

03:47:52,309 --> 03:47:49,739

need that to breathe you can split water

5330

03:47:53,990 --> 03:47:52,319

apart get oxygen for breathing gas for

5331

03:47:56,090 --> 03:47:54,000

an atmosphere if you have a lunar base

5332

03:47:58,070 --> 03:47:56,100

you can split it into oxygen and

5333

03:48:00,170 --> 03:47:58,080

hydrogen that's Rocket Fuel we just

5334

03:48:02,870 --> 03:48:00,180

launched the most powerful rocket in

5335

03:48:05,389 --> 03:48:02,880

history using those constituent parts

5336

03:48:07,670 --> 03:48:05,399

and so you can start to live off the

5337

03:48:10,550 --> 03:48:07,680

land we can use that something called

5338

03:48:13,070 --> 03:48:10,560

in-situ resource utilization and and

5339

03:48:15,410 --> 03:48:13,080

really the whole point of that is to use

5340

03:48:17,389 --> 03:48:15,420

the moon as this Proving Ground we're

5341

03:48:19,190 --> 03:48:17,399

trying to get to Mars we're trying to

5342

03:48:21,170 --> 03:48:19,200

learn to live on other planets where

5343

03:48:23,690 --> 03:48:21,180

there is gravity where we're going to

5344

03:48:25,250 --> 03:48:23,700

have to use resources there on the

5345

03:48:27,410 --> 03:48:25,260

ground because we won't be able to bring

5346

03:48:29,389 --> 03:48:27,420

everything with us and by going to the

5347

03:48:30,950 --> 03:48:29,399

lunar South Pole by going to stay under

5348

03:48:32,750 --> 03:48:30,960

Artemis we're going to be able to start

5349

03:48:35,030 --> 03:48:32,760

practicing that we're going to perfect

5350

03:48:37,429 --> 03:48:35,040

those systems perfect those techniques

5351
03:48:39,110 --> 03:48:37,439
and operations we need to do that so we

5352
03:48:42,229 --> 03:48:39,120
can use the moon as that jumping off

5353
03:48:45,410 --> 03:48:42,239
point to Mars and Beyond so

5354
03:48:47,210 --> 03:48:45,420
that's why the moon we're going to see

5355
03:48:49,490 --> 03:48:47,220
Orion fly around it for the very first

5356
03:48:51,889 --> 03:48:49,500
time in just a couple of days that

5357
03:48:54,469 --> 03:48:51,899
launched is spectacular I'm still way

5358
03:48:55,910 --> 03:48:54,479
too excited uh but can't wait to see

5359
03:48:57,590 --> 03:48:55,920
some shots of the Moon from up close

5360
03:48:59,929 --> 03:48:57,600
from Orion so I'll send it back over to

5361
03:49:02,030 --> 03:48:59,939
you Megan

5362
03:49:04,250 --> 03:49:02,040
thanks so much Stan so right now we're

5363
03:49:06,290 --> 03:49:04,260

actually joined by members of the red

5364

03:49:07,969 --> 03:49:06,300

crew you'll remember from watching the

5365

03:49:09,530 --> 03:49:07,979

launch coverage that the red crew was

5366

03:49:12,650 --> 03:49:09,540

sent out by the launch Team when the

5367

03:49:14,510 --> 03:49:12,660

launch Team identified a small leak on a

5368

03:49:17,630 --> 03:49:14,520

hydrogen valve inside of the mobile

5369

03:49:19,309 --> 03:49:17,640

launcher well now here they are this is

5370

03:49:20,809 --> 03:49:19,319

Trent and it's Trent can you just uh

5371

03:49:23,030 --> 03:49:20,819

introduce everybody else here on your

5372

03:49:26,030 --> 03:49:23,040

team yeah so this is Chad he's our

5373

03:49:28,250 --> 03:49:26,040

safety guy and behind me is Billy and

5374

03:49:30,830 --> 03:49:28,260

he's the experienced hydrogen Tech out

5375

03:49:33,469 --> 03:49:30,840

here and the three of you guys really I

5376

03:49:34,969 --> 03:49:33,479

I would say save the day today I mean

5377

03:49:36,950 --> 03:49:34,979

really you guys had to go in there to

5378

03:49:38,990 --> 03:49:36,960

What's called the blast danger zone you

5379

03:49:42,469 --> 03:49:39,000

guys are specially trained uh to be able

5380

03:49:45,469 --> 03:49:42,479

to do operations on the pad while cryo

5381

03:49:47,450 --> 03:49:45,479

is loading talk to us about getting that

5382

03:49:48,769 --> 03:49:47,460

call being told hey you guys need to go

5383

03:49:50,389 --> 03:49:48,779

in there and it was the first time for

5384

03:49:52,070 --> 03:49:50,399

all three of you

5385

03:49:53,269 --> 03:49:52,080

yeah all I could say is we were very

5386

03:49:55,250 --> 03:49:53,279

excited

5387

03:49:58,309 --> 03:49:55,260

I was ready to get up there and go

5388

03:50:00,590 --> 03:49:58,319

really how are you guys feeling

5389

03:50:02,630 --> 03:50:00,600

very very comfortable very confident in

5390

03:50:04,849 --> 03:50:02,640

the test team and the procedures and our

5391

03:50:07,130 --> 03:50:04,859

training we we did a great job

5392

03:50:08,450 --> 03:50:07,140

walk us oh sorry go ahead how gratifying

5393

03:50:10,010 --> 03:50:08,460

it must be for you guys because you you

5394

03:50:11,929 --> 03:50:10,020

train for this eventuality but don't

5395

03:50:13,910 --> 03:50:11,939

always get to do it Billy was saying

5396

03:50:16,130 --> 03:50:13,920

that he's been a red crew team member

5397

03:50:17,450 --> 03:50:16,140

for 37 years and this is the first time

5398

03:50:19,429 --> 03:50:17,460

he's been called to go into the blast

5399

03:50:21,769 --> 03:50:19,439

danger zone so I know for us when we're

5400

03:50:23,510 --> 03:50:21,779

training for all of these eventualities

5401

03:50:24,710 --> 03:50:23,520

whether it's a spacewalk or robotics

5402

03:50:26,330 --> 03:50:24,720

operations you really want to put that

5403

03:50:28,790 --> 03:50:26,340

training into practice how do you guys

5404

03:50:30,110 --> 03:50:28,800

feel like it went today sure amazing I

5405

03:50:33,590 --> 03:50:30,120

still can't believe it

5406

03:50:35,030 --> 03:50:33,600

it's surreal to me it's just insane yeah

5407

03:50:37,190 --> 03:50:35,040

kind of walk us through what you were

5408

03:50:38,809 --> 03:50:37,200

thinking so you get there and and what

5409

03:50:41,389 --> 03:50:38,819

is it just like game time and you're

5410

03:50:42,590 --> 03:50:41,399

really focused or you know how are you

5411

03:50:44,990 --> 03:50:42,600

feeling

5412

03:50:47,150 --> 03:50:45,000

yeah I'd say we were we were very

5413

03:50:49,429 --> 03:50:47,160

focused on what was happening up there

5414

03:50:51,349 --> 03:50:49,439

just making sure

5415

03:50:53,330 --> 03:50:51,359

we knew what was happening

5416

03:50:56,030 --> 03:50:53,340

because the Rockets you know it's alive

5417

03:50:59,269 --> 03:50:56,040

it's creaking it's making venting noises

5418

03:51:01,610 --> 03:50:59,279

it's it's pretty scary so on zero deck

5419

03:51:03,590 --> 03:51:01,620

my heart was pumping my nerves were

5420

03:51:06,530 --> 03:51:03,600

going but

5421

03:51:07,790 --> 03:51:06,540

yeah we showed up today I think as soon

5422

03:51:09,950 --> 03:51:07,800

as we walked up the stairs we were ready

5423

03:51:11,150 --> 03:51:09,960

to rock and roll and they were telling

5424

03:51:12,469 --> 03:51:11,160

us a bit about it while you're working

5425

03:51:15,469 --> 03:51:12,479

on it you guys were actually just

5426
03:51:17,389 --> 03:51:15,479
torquing down at the valve to prevent or

5427
03:51:19,370 --> 03:51:17,399
reduce the leak rate or stop the leak is

5428
03:51:22,010 --> 03:51:19,380
that right that's right just the packing

5429
03:51:23,330 --> 03:51:22,020
gland is a little loose so went up there

5430
03:51:26,269 --> 03:51:23,340
and tightened her up

5431
03:51:28,790 --> 03:51:26,279
you're probably still like in this oh my

5432
03:51:31,070 --> 03:51:28,800
gosh moment like all of us are you know

5433
03:51:33,229 --> 03:51:31,080
has it actually hit you like the role

5434
03:51:34,790 --> 03:51:33,239
you played today in making Artemis one

5435
03:51:37,610 --> 03:51:34,800
launch

5436
03:51:40,309 --> 03:51:37,620
you know I still can't believe it like

5437
03:51:42,229 --> 03:51:40,319
it's like I said it's surreal and just

5438
03:51:44,650 --> 03:51:42,239

amazing

5439

03:51:47,510 --> 03:51:44,660

I don't know about you guys but

5440

03:51:49,610 --> 03:51:47,520

they're nodding along behind you for

5441

03:51:51,469 --> 03:51:49,620

sure anything you want to say to the

5442

03:51:54,469 --> 03:51:51,479

launch team again this is a big day for

5443

03:51:56,269 --> 03:51:54,479

the launch Team for you guys NASA but

5444

03:51:57,769 --> 03:51:56,279

really the whole world I mean this is a

5445

03:51:59,630 --> 03:51:57,779

historic launch that I think we'll all

5446

03:52:02,210 --> 03:51:59,640

remember uh

5447

03:52:04,429 --> 03:52:02,220

we'll all remember really

5448

03:52:06,769 --> 03:52:04,439

you know we had a lot of people here

5449

03:52:10,670 --> 03:52:06,779

helping us out a lot of teams firing

5450

03:52:12,469 --> 03:52:10,680

room I'm sure that was hectic and uh you

5451
03:52:14,269 --> 03:52:12,479
know NASA Boeing

5452
03:52:22,010 --> 03:52:14,279
all the other companies did a great job

5453
03:52:25,790 --> 03:52:23,990
right like none of us could accomplish

5454
03:52:28,670 --> 03:52:25,800
this on our own it takes a really

5455
03:52:30,050 --> 03:52:28,680
complex team nobody can be an expert in

5456
03:52:31,849 --> 03:52:30,060
all of the systems all the technology

5457
03:52:34,010 --> 03:52:31,859
all the workarounds we might have to do

5458
03:52:35,210 --> 03:52:34,020
to get a rocket off the pad so thank you

5459
03:52:37,130 --> 03:52:35,220
for the role you played in that team

5460
03:52:39,050 --> 03:52:37,140
today it's awesome thank you pleasure

5461
03:52:41,210 --> 03:52:39,060
yeah thank you so much guys I appreciate

5462
03:52:42,889 --> 03:52:41,220
you coming by to talk with us all right

5463
03:52:45,710 --> 03:52:42,899

it's now been about 35 minutes since

5464

03:52:47,510 --> 03:52:45,720

liftoff of Artemis one Orion and icps

5465

03:52:49,070 --> 03:52:47,520

are now free-flying so let's head back

5466

03:52:53,269 --> 03:52:49,080

to Leah again to talk about how the

5467

03:52:57,769 --> 03:52:55,010

thanks Megan and it has been a pretty

5468

03:52:59,870 --> 03:52:57,779

smooth ride so far and uh we are now

5469

03:53:02,389 --> 03:52:59,880

again like you mentioned coming up on 36

5470

03:53:04,849 --> 03:53:02,399

minutes since launch that puts us about

5471

03:53:06,830 --> 03:53:04,859

17 minutes into the perigee until the

5472

03:53:08,690 --> 03:53:06,840

perigee Rays maneuver that's going to be

5473

03:53:10,910 --> 03:53:08,700

the maneuver that lifts the lowest point

5474

03:53:13,010 --> 03:53:10,920

of Orion's orbit around the Earth and

5475

03:53:15,530 --> 03:53:13,020

puts us where we need to be ahead of the

5476
03:53:17,389 --> 03:53:15,540
translunar injection burn the translunar

5477
03:53:18,950 --> 03:53:17,399
injection burn is that really long burn

5478
03:53:21,650 --> 03:53:18,960
that we're going to need to send us on

5479
03:53:23,450 --> 03:53:21,660
to the moon so we've been treated to

5480
03:53:26,570 --> 03:53:23,460
some exciting views from the spacecraft

5481
03:53:29,389 --> 03:53:26,580
today including and we hope to see some

5482
03:53:30,950 --> 03:53:29,399
from inside the cabin but we expect to

5483
03:53:33,290 --> 03:53:30,960
continue receiving photo updates

5484
03:53:35,389 --> 03:53:33,300
throughout the mission it takes a team

5485
03:53:40,370 --> 03:53:35,399
though to bring the imagery of Orion

5486
03:53:44,510 --> 03:53:42,110
the imagery they were collecting on

5487
03:53:47,389 --> 03:53:44,520
Artemis 1 and the mission itself

5488
03:53:49,490 --> 03:53:47,399

is preparing to carry humans to the moon

5489

03:53:51,950 --> 03:53:49,500

the Orion imager team is going to be

5490

03:53:53,570 --> 03:53:51,960

monitoring every aspect of visual

5491

03:53:54,889 --> 03:53:53,580

spacecraft performance for the entire

5492

03:53:56,150 --> 03:53:54,899

duration of the mission

5493

03:53:58,070 --> 03:53:56,160

the first time that we're going to be

5494

03:53:59,929 --> 03:53:58,080

live streaming digital video from its

5495

03:54:01,130 --> 03:53:59,939

spacecraft back down to the Earth from

5496

03:54:03,170 --> 03:54:01,140

the vicinity of the Moon that's never

5497

03:54:05,090 --> 03:54:03,180

been done before what will be

5498

03:54:06,769 --> 03:54:05,100

transmitting live streaming will be

5499

03:54:08,870 --> 03:54:06,779

lower resolution

5500

03:54:12,110 --> 03:54:08,880

more compressed because we have to fit

5501
03:54:13,910 --> 03:54:12,120
it into a thinner pipe if you will

5502
03:54:15,290 --> 03:54:13,920
every one of these cameras is in this

5503
03:54:17,870 --> 03:54:15,300
position where it is and it's configured

5504
03:54:19,370 --> 03:54:17,880
the way it is for a very specific reason

5505
03:54:21,530 --> 03:54:19,380
we're going to be monitoring anything

5506
03:54:23,570 --> 03:54:21,540
that we can see with the cameras for

5507
03:54:25,490 --> 03:54:23,580
spacecraft performance

5508
03:54:28,729 --> 03:54:25,500
the imagery teams at Nasa are composed

5509
03:54:30,349 --> 03:54:28,739
of dozens and dozens of very highly

5510
03:54:33,830 --> 03:54:30,359
trained very specialized people

5511
03:54:35,269 --> 03:54:33,840
Engineers technicians analysts if we can

5512
03:54:37,550 --> 03:54:35,279
see it we're going to try and keep an

5513
03:54:39,769 --> 03:54:37,560

eye on it imagery has been invaluable

5514

03:54:42,349 --> 03:54:39,779

throughout the history of NASA we flew

5515

03:54:43,370 --> 03:54:42,359

cameras on Mercury Gemini Apollo all of

5516

03:54:45,410 --> 03:54:43,380

that stuff that we saw with the

5517

03:54:48,349 --> 03:54:45,420

astronauts around the Moon it helps us

5518

03:54:50,990 --> 03:54:48,359

detect the unknown unknowns

5519

03:54:53,090 --> 03:54:51,000

allows us to see things that we didn't

5520

03:54:55,429 --> 03:54:53,100

anticipate happening before so when we

5521

03:54:56,990 --> 03:54:55,439

do fly people on Artemis 2 we can have a

5522

03:54:58,440 --> 03:54:57,000

high confidence that everything's

5523

03:55:06,769 --> 03:54:58,450

working the way it should be

5524

03:55:10,729 --> 03:55:09,110

I love getting a look at those teams

5525

03:55:13,189 --> 03:55:10,739

that we don't normally see like the red

5526
03:55:15,110 --> 03:55:13,199
team that Megan and Kayla just got to

5527
03:55:17,090 --> 03:55:15,120
interview a really big thanks to them

5528
03:55:19,429 --> 03:55:17,100
and everyone that made this liftoff

5529
03:55:21,590 --> 03:55:19,439
happen tonight so we are going to toss

5530
03:55:23,510 --> 03:55:21,600
it back to Megan and Kayla now at KSC

5531
03:55:25,849 --> 03:55:23,520
again we're about 15 minutes away from

5532
03:55:27,950 --> 03:55:25,859
perigee race maneuver

5533
03:55:30,290 --> 03:55:27,960
thank you Leah yeah we wanted to take us

5534
03:55:31,849 --> 03:55:30,300
back into Orion and talk about some of

5535
03:55:34,670 --> 03:55:31,859
the science that's being enabled by

5536
03:55:37,429 --> 03:55:34,680
Artemis one today so inside of Orion are

5537
03:55:39,229 --> 03:55:37,439
10 of these so they're called cubesats

5538
03:55:40,550 --> 03:55:39,239

because they're tiny satellites

5539

03:55:42,469 --> 03:55:40,560

essentially they're the size of the

5540

03:55:43,849 --> 03:55:42,479

shoebox when they're folded down but

5541

03:55:45,469 --> 03:55:43,859

then once they're deployed they're

5542

03:55:46,670 --> 03:55:45,479

opened up they have solar arrays things

5543

03:55:49,250 --> 03:55:46,680

like that that's when it gets a lot

5544

03:55:51,170 --> 03:55:49,260

bigger now these are called secondary

5545

03:55:53,269 --> 03:55:51,180

payloads for this Mission Kayla can you

5546

03:55:55,189 --> 03:55:53,279

talk to us about what secondary payloads

5547

03:55:56,990 --> 03:55:55,199

are yeah it just really means that it's

5548

03:55:58,910 --> 03:55:57,000

not a primary objective of the mission

5549

03:56:01,010 --> 03:55:58,920

it's not we're not relying on the

5550

03:56:02,870 --> 03:56:01,020

success of these cubesats or overall

5551

03:56:05,450 --> 03:56:02,880

mission success it's kind of a bonus

5552

03:56:06,830 --> 03:56:05,460

payload right a chance to deploy these

5553

03:56:08,750 --> 03:56:06,840

satellites that have different sensors

5554

03:56:10,429 --> 03:56:08,760

on them and collect some awesome data to

5555

03:56:12,170 --> 03:56:10,439

support other research objectives yeah

5556

03:56:14,090 --> 03:56:12,180

and I know battery life was a concern

5557

03:56:15,710 --> 03:56:14,100

for some of them but all 10 were

5558

03:56:17,689 --> 03:56:15,720

deployed and scientists I'm sure are

5559

03:56:19,429 --> 03:56:17,699

eager to see what kind of information

5560

03:56:21,229 --> 03:56:19,439

that hopefully they'll be able to get

5561

03:56:22,849 --> 03:56:21,239

and they're just some of several

5562

03:56:24,889 --> 03:56:22,859

research projects on this flight that

5563

03:56:27,189 --> 03:56:24,899

will help gather data about the moon and

5564

03:56:33,170 --> 03:56:30,590

Artemis one is Paving the way for us to

5565

03:56:36,110 --> 03:56:33,180

explore deeper and deeper into space I

5566

03:56:39,290 --> 03:56:36,120

think Artemis 1 is significant on so

5567

03:56:41,510 --> 03:56:39,300

many levels it is a new frontier to do

5568

03:56:43,610 --> 03:56:41,520

science so the primary objective is to

5569

03:56:45,650 --> 03:56:43,620

test the Orion spacecraft integrated

5570

03:56:49,130 --> 03:56:45,660

with the space launch system and it is

5571

03:56:50,809 --> 03:56:49,140

designed to to carry out the the boldest

5572

03:56:52,429 --> 03:56:50,819

of the Bold missions but it's more than

5573

03:56:54,830 --> 03:56:52,439

just learning how to travel in space

5574

03:56:56,570 --> 03:56:54,840

we're taking a lot of cool science along

5575

03:56:59,389 --> 03:56:56,580

with us on this first mission to the

5576

03:57:01,429 --> 03:56:59,399

moon so as NASA plans to go back to the

5577

03:57:03,530 --> 03:57:01,439

surface of the Moon and then on to Mars

5578

03:57:05,689 --> 03:57:03,540

we want to spend more time there and

5579

03:57:07,610 --> 03:57:05,699

that's riskier business so the more we

5580

03:57:09,710 --> 03:57:07,620

learn about the moon itself and the

5581

03:57:11,750 --> 03:57:09,720

environment where we'll be operating the

5582

03:57:14,150 --> 03:57:11,760

better we can prepare we have 10

5583

03:57:16,429 --> 03:57:14,160

cubesats we call secondary payloads

5584

03:57:18,229 --> 03:57:16,439

which are small scientific spacecraft of

5585

03:57:20,269 --> 03:57:18,239

their own that will each be conducting

5586

03:57:22,610 --> 03:57:20,279

their own scientific Mission all of

5587

03:57:25,490 --> 03:57:22,620

these payloads in some form or fashion

5588

03:57:27,290 --> 03:57:25,500

will help us going forward they are

5589

03:57:28,670 --> 03:57:27,300

going to be studying the Moon soon and

5590

03:57:30,769 --> 03:57:28,680

they're going to help us understand what

5591

03:57:33,050 --> 03:57:30,779

is the moon made out of what types of

5592

03:57:35,269 --> 03:57:33,060

rocks what types of regolith what types

5593

03:57:37,010 --> 03:57:35,279

of ice what's mixed in with water that

5594

03:57:39,290 --> 03:57:37,020

might be present one of them actually is

5595

03:57:40,790 --> 03:57:39,300

going to attempt to land on the moon

5596

03:57:42,950 --> 03:57:40,800

they're going to be studying the sun

5597

03:57:45,170 --> 03:57:42,960

understanding and studying the space

5598

03:57:48,170 --> 03:57:45,180

environment or the space weather some

5599

03:57:50,809 --> 03:57:48,180

different propulsion systems these novel

5600

03:57:52,670 --> 03:57:50,819

ideas will ultimately turn into the

5601
03:57:55,010 --> 03:57:52,680
technology and the systems that we want

5602
03:57:56,630 --> 03:57:55,020
to use going forward there's a lot of

5603
03:57:58,189 --> 03:57:56,640
cool things going on between all these

5604
03:58:00,889 --> 03:57:58,199
cubesats that make up our secondary

5605
03:58:02,929 --> 03:58:00,899
payloads additionally inside the Orion

5606
03:58:07,189 --> 03:58:02,939
will be flying an experiment to study

5607
03:58:10,790 --> 03:58:07,199
space biology space biology is where we

5608
03:58:13,429 --> 03:58:10,800
study the underlying changes that

5609
03:58:15,769 --> 03:58:13,439
earth-based biological systems undergo

5610
03:58:17,330 --> 03:58:15,779
when they're in space or basically how

5611
03:58:19,610 --> 03:58:17,340
does life respond to the space

5612
03:58:21,530 --> 03:58:19,620
environment the level of ionizing

5613
03:58:24,110 --> 03:58:21,540

radiation that you experience when you

5614

03:58:26,630 --> 03:58:24,120

go beyond the Van Allen belt so you go

5615

03:58:29,269 --> 03:58:26,640

beyond the protective magnetic sphere

5616

03:58:31,790 --> 03:58:29,279

that we have around us you then get

5617

03:58:34,550 --> 03:58:31,800

exposed to higher levels of ionizing

5618

03:58:36,650 --> 03:58:34,560

radiation so we are flying several space

5619

03:58:39,650 --> 03:58:36,660

biology experiments it will take a

5620

03:58:42,830 --> 03:58:39,660

series of materials plant seeds fungi

5621

03:58:44,990 --> 03:58:42,840

the yeast cell algae and right along the

5622

03:58:47,510 --> 03:58:45,000

trip and then when it comes home we can

5623

03:58:50,090 --> 03:58:47,520

analyze how they responded to that

5624

03:58:52,729 --> 03:58:50,100

environment This research will help us

5625

03:58:55,189 --> 03:58:52,739

thrive in space it will help us to go

5626
03:58:57,590 --> 03:58:55,199
further and stay there longer in

5627
03:58:59,630 --> 03:58:57,600
addition to space biology we'll be

5628
03:59:01,370 --> 03:58:59,640
learning about how to make astronauts

5629
03:59:02,990 --> 03:59:01,380
more effective in the Orion in the

5630
03:59:04,670 --> 03:59:03,000
future an example of that is something

5631
03:59:06,830 --> 03:59:04,680
called the Callisto technology

5632
03:59:09,170 --> 03:59:06,840
demonstration Lockheed Martin built the

5633
03:59:11,090 --> 03:59:09,180
Orion spacecraft for NASA and we'll be

5634
03:59:13,309 --> 03:59:11,100
flying a secondary payload that's a

5635
03:59:15,889 --> 03:59:13,319
demonstration payload called Callisto so

5636
03:59:17,990 --> 03:59:15,899
we took the technology from Amazon for

5637
03:59:20,330 --> 03:59:18,000
Alexa and the WebEx technology from

5638
03:59:22,010 --> 03:59:20,340

Cisco and so we built a digital

5639

03:59:25,910 --> 03:59:22,020

assistant if you will it's a custom

5640

03:59:27,849 --> 03:59:25,920

space qualified Alexa Alexa how does the

5641

03:59:30,170 --> 03:59:27,859

life support system work

5642

03:59:32,030 --> 03:59:30,180

Orion's life support system is the

5643

03:59:34,309 --> 03:59:32,040

environmental control and life support

5644

03:59:36,050 --> 03:59:34,319

system oracles and so this payload is

5645

03:59:38,269 --> 03:59:36,060

the demonstration mission to show how

5646

03:59:40,790 --> 03:59:38,279

astronauts in the future could use this

5647

03:59:42,769 --> 03:59:40,800

technology as an Innovative user

5648

03:59:45,410 --> 03:59:42,779

interface so there you have it I hope

5649

03:59:48,170 --> 03:59:45,420

you agree with me this is exciting I'm

5650

03:59:50,330 --> 03:59:48,180

just over the moon excited for the

5651
03:59:53,330 --> 03:59:50,340
Artemis one launch science will conduct

5652
03:59:55,309 --> 03:59:53,340
on Artemis 1 lays the groundwork to

5653
03:59:57,110 --> 03:59:55,319
ensure that we can safely conduct

5654
03:59:59,570 --> 03:59:57,120
scientific activities at the Moon with

5655
04:00:02,210 --> 03:59:59,580
our astronauts going forward this really

5656
04:00:03,650 --> 04:00:02,220
is the stepping stone for us as we take

5657
04:00:07,010 --> 04:00:03,660
that next giant leap in space

5658
04:00:11,510 --> 04:00:09,530
so a lot of great science also happening

5659
04:00:13,550 --> 04:00:11,520
on the International Space Station I got

5660
04:00:15,290 --> 04:00:13,560
to speak with astronauts Jessica Watkins

5661
04:00:17,090 --> 04:00:15,300
and Samantha Christopher Eddie while

5662
04:00:18,769 --> 04:00:17,100
they were still on board about the

5663
04:00:21,769 --> 04:00:18,779

research there that will benefit future

5664

04:00:23,929 --> 04:00:21,779

Artemis missions

5665

04:00:25,729 --> 04:00:23,939

Jessica Samantha your primary job on the

5666

04:00:27,830 --> 04:00:25,739

space station is to maintain the

5667

04:00:30,830 --> 04:00:27,840

orbiting lab and conduct science

5668

04:00:32,990 --> 04:00:30,840

experiments more than 200 before crew 4

5669

04:00:34,910 --> 04:00:33,000

returns home Jessica can you tell me

5670

04:00:37,070 --> 04:00:34,920

about one of the experiments that will

5671

04:00:39,590 --> 04:00:37,080

help return us to the Moon with the

5672

04:00:41,929 --> 04:00:39,600

Artemis program we do a lot of

5673

04:00:44,210 --> 04:00:41,939

experiments where we are looking into

5674

04:00:47,150 --> 04:00:44,220

developing new technologies that will

5675

04:00:50,030 --> 04:00:47,160

enable us to go further into the solar

5676
04:00:52,389 --> 04:00:50,040
system and one of those Technologies was

5677
04:00:55,010 --> 04:00:52,399
the Astro rad

5678
04:00:56,630 --> 04:00:55,020
experimental radiation is is one of the

5679
04:00:58,370 --> 04:00:56,640
challenges that we face when we think

5680
04:01:01,990 --> 04:00:58,380
about going further into the solar

5681
04:01:03,769 --> 04:01:02,000
system and so this vest is an option for

5682
04:01:05,809 --> 04:01:03,779
providing the crew member with

5683
04:01:08,090 --> 04:01:05,819
protection and then one of the

5684
04:01:10,070 --> 04:01:08,100
mannequins on Artemis one launching here

5685
04:01:12,650 --> 04:01:10,080
later this month will also be wearing

5686
04:01:14,870 --> 04:01:12,660
the vest we'll get a sense for its

5687
04:01:16,189 --> 04:01:14,880
Effectiveness on board as well Samantha

5688
04:01:19,010 --> 04:01:16,199

I know that you've been doing a lot of

5689

04:01:21,110 --> 04:01:19,020

work to test how we would grow crops in

5690

04:01:22,670 --> 04:01:21,120

space what crops are you growing on

5691

04:01:24,250 --> 04:01:22,680

space station right right now and what's

5692

04:01:27,650 --> 04:01:24,260

unique about them

5693

04:01:29,330 --> 04:01:27,660

indeed actually right next to uh to us

5694

04:01:31,189 --> 04:01:29,340

as we are talking to you we have a

5695

04:01:34,070 --> 04:01:31,199

little uh space station vegetable garden

5696

04:01:36,710 --> 04:01:34,080

it's called X root and in a few weeks it

5697

04:01:38,990 --> 04:01:36,720

will be full of fully grown hopefully

5698

04:01:40,309 --> 04:01:39,000

tomatoes and carrot plants I don't have

5699

04:01:42,229 --> 04:01:40,319

much of a green thumb but it must

5700

04:01:44,150 --> 04:01:42,239

confess but when I harvested those

5701

04:01:46,250 --> 04:01:44,160

plants and I could really like Breathe

5702

04:01:48,650 --> 04:01:46,260

In All That Smell even if there is no

5703

04:01:51,530 --> 04:01:48,660

soil it still has that smell that you

5704

04:01:53,330 --> 04:01:51,540

would associate on the ground with uh

5705

04:01:55,790 --> 04:01:53,340

walking you know through a vegetable

5706

04:01:57,830 --> 04:01:55,800

garden after a rainy day you know when

5707

04:01:59,929 --> 04:01:57,840

there is that moist the moisture in in

5708

04:02:02,689 --> 04:01:59,939

the air and and that was just so so

5709

04:02:04,729 --> 04:02:02,699

pleasant after you know such a long time

5710

04:02:06,769 --> 04:02:04,739

living away from any kind of natural

5711

04:02:08,630 --> 04:02:06,779

environment it was very very pleasant

5712

04:02:11,809 --> 04:02:08,640

for me if it makes you feel any better I

5713

04:02:13,610 --> 04:02:11,819

also do not have a green thumb

5714

04:02:15,650 --> 04:02:13,620

um so what about water how are you

5715

04:02:18,530 --> 04:02:15,660

testing critical life support systems

5716

04:02:19,990 --> 04:02:18,540

like water to hopefully help us stay off

5717

04:02:24,530 --> 04:02:20,000

Earth longer than we ever have before

5718

04:02:27,469 --> 04:02:24,540

sure yes so um we we kind of use the um

5719

04:02:30,110 --> 04:02:27,479

the tagline that um today's yesterday's

5720

04:02:32,929 --> 04:02:30,120

coffee becomes today's copy

5721

04:02:36,769 --> 04:02:32,939

um so there's a process by which we can

5722

04:02:38,210 --> 04:02:36,779

filter our our urine and so we are at

5723

04:02:42,889 --> 04:02:38,220

the point now where we are able to

5724

04:02:46,429 --> 04:02:42,899

recycle about 96 of the

5725

04:02:48,469 --> 04:02:46,439

um essentially of our our water on board

5726

04:02:51,110 --> 04:02:48,479

and are continuing to test new

5727

04:02:54,110 --> 04:02:51,120

technologies to get even closer to the

5728

04:02:56,929 --> 04:02:54,120

98 utilization rate that we'll need for

5729

04:02:58,729 --> 04:02:56,939

for the moon in particular Samantha what

5730

04:03:01,429 --> 04:02:58,739

are you most excited about for Artemis

5731

04:03:04,550 --> 04:03:01,439

one seeing that gigantic rocket take off

5732

04:03:07,790 --> 04:03:04,560

and uh I think it would be just uh you

5733

04:03:09,950 --> 04:03:07,800

know a sign of of all those great things

5734

04:03:11,570 --> 04:03:09,960

to come Jessica you could one day walk

5735

04:03:13,910 --> 04:03:11,580

on the moon as as part of the Artemis

5736

04:03:16,189 --> 04:03:13,920

program how does that make you feel the

5737

04:03:17,929 --> 04:03:16,199

idea of being able to explore the the

5738

04:03:21,110 --> 04:03:17,939

surface of another planetary body

5739

04:03:23,269 --> 04:03:21,120

especially for me as a geologist and a

5740

04:03:25,790 --> 04:03:23,279

planetary geologist specifically is just

5741

04:03:27,050 --> 04:03:25,800

super exciting all of the the science

5742

04:03:28,910 --> 04:03:27,060

that we're going to be able to conduct

5743

04:03:30,650 --> 04:03:28,920

from the surface of the Moon Jessica

5744

04:03:38,590 --> 04:03:30,660

Samantha thank you so much and before

5745

04:03:43,969 --> 04:03:41,450

I love it on a double backflip at that

5746

04:03:45,530 --> 04:03:43,979

now Kayla you of course lived and worked

5747

04:03:48,290 --> 04:03:45,540

on the International Space Station as

5748

04:03:50,150 --> 04:03:48,300

part of crew three uh you know do you

5749

04:03:51,349 --> 04:03:50,160

enjoy or did you enjoy doing all those

5750

04:03:53,269 --> 04:03:51,359

science experiments while you were there

5751

04:03:55,250 --> 04:03:53,279

it's a lot of hard work yeah it's

5752

04:03:56,990 --> 04:03:55,260

incredible to be a part of the every

5753

04:03:58,969 --> 04:03:57,000

single experiment it's an honor to play

5754

04:04:00,769 --> 04:03:58,979

a small role in it we got to do some

5755

04:04:02,269 --> 04:04:00,779

really cool Tech demonstrations while we

5756

04:04:04,189 --> 04:04:02,279

were up there too so for me as an

5757

04:04:06,650 --> 04:04:04,199

engineer that was really fun that's a

5758

04:04:09,530 --> 04:04:06,660

photo of me doing the first scanning

5759

04:04:11,510 --> 04:04:09,540

electron microscope samples on the

5760

04:04:12,950 --> 04:04:11,520

International Space Station and it was

5761

04:04:14,630 --> 04:04:12,960

cool for me because I worked with a

5762

04:04:16,370 --> 04:04:14,640

scanning electron microscope in my

5763

04:04:18,469 --> 04:04:16,380

graduate school research that took up

5764

04:04:20,450 --> 04:04:18,479

like it was as big as this desk but

5765

04:04:22,910 --> 04:04:20,460

seeing a miniaturized version of those

5766

04:04:24,530 --> 04:04:22,920

that we have up there and imagining how

5767

04:04:26,689 --> 04:04:24,540

we could use it in a lunar or Martian

5768

04:04:28,010 --> 04:04:26,699

laboratory to better analyze samples and

5769

04:04:29,929 --> 04:04:28,020

decide what to bring home was really

5770

04:04:31,910 --> 04:04:29,939

exciting yeah and you touched on this

5771

04:04:33,710 --> 04:04:31,920

earlier before but I I do think it's

5772

04:04:36,769 --> 04:04:33,720

just so important to note again that

5773

04:04:39,410 --> 04:04:36,779

you're doing science for scientists

5774

04:04:42,290 --> 04:04:39,420

who've been working on the their their

5775

04:04:43,790 --> 04:04:42,300

studies for decades some of them so to

5776

04:04:45,830 --> 04:04:43,800

fulfill that how does that make you feel

5777

04:04:47,750 --> 04:04:45,840

it's incredible we're almost like their

5778

04:04:49,550 --> 04:04:47,760

laboratory technicians for that little

5779

04:04:52,309 --> 04:04:49,560

moment in time you know but they've been

5780

04:04:54,110 --> 04:04:52,319

working their entire life sometimes

5781

04:04:56,150 --> 04:04:54,120

decades years to get that science

5782

04:04:57,650 --> 04:04:56,160

payload up there and it's a really

5783

04:04:59,090 --> 04:04:57,660

unique laboratory environment the

5784

04:05:00,530 --> 04:04:59,100

microgravity environment the space

5785

04:05:01,790 --> 04:05:00,540

environment the radiation environment

5786

04:05:03,469 --> 04:05:01,800

like you heard talked about in those

5787

04:05:04,849 --> 04:05:03,479

videos provides an opportunity to do

5788

04:05:06,950 --> 04:05:04,859

science that we just can't do here on

5789

04:05:09,050 --> 04:05:06,960

Earth yeah to think that what we do on

5790

04:05:11,389 --> 04:05:09,060

the International Space Station can fuel

5791

04:05:13,670 --> 04:05:11,399

future Artemis missions I think the fact

5792

04:05:16,010 --> 04:05:13,680

that they go hand in hand is really cool

5793

04:05:18,229 --> 04:05:16,020

all right so let's take some more social

5794

04:05:20,389 --> 04:05:18,239

media questions uh social media is

5795

04:05:22,729 --> 04:05:20,399

buzzing right now since we launched

5796

04:05:25,070 --> 04:05:22,739

about 48 minutes ago so why don't we

5797

04:05:28,910 --> 04:05:25,080

take the first question I think again

5798

04:05:31,090 --> 04:05:28,920

from after oh no let's see Kayla how do

5799

04:05:34,309 --> 04:05:31,100

you feel after a launch

5800

04:05:36,110 --> 04:05:34,319

super inspired I mean

5801
04:05:37,849 --> 04:05:36,120
we talked about it earlier with the red

5802
04:05:39,769 --> 04:05:37,859
crew and in the moments just after

5803
04:05:42,769 --> 04:05:39,779
launch but this is really the

5804
04:05:45,349 --> 04:05:42,779
culmination of a giant team effort it

5805
04:05:46,910 --> 04:05:45,359
takes every single member of our team to

5806
04:05:49,490 --> 04:05:46,920
pull off a successful launch it's

5807
04:05:51,710 --> 04:05:49,500
incredibly complicated incredibly

5808
04:05:53,389 --> 04:05:51,720
challenging and in some cases kind of

5809
04:05:56,750 --> 04:05:53,399
dangerous for a red crew team who inside

5810
04:05:58,969 --> 04:05:56,760
the blast danger area to make a fix that

5811
04:06:01,729 --> 04:05:58,979
was critical today's launch and so to

5812
04:06:04,849 --> 04:06:01,739
see the team succeed and feel that

5813
04:06:07,189 --> 04:06:04,859

excitement was incredible I really still

5814

04:06:08,630 --> 04:06:07,199

have um Charlie Blackwell Thompson's

5815

04:06:10,429 --> 04:06:08,640

words ringing in my head the fact that

5816

04:06:13,429 --> 04:06:10,439

she said the harder the climb the better

5817

04:06:16,309 --> 04:06:13,439

the view 100 correct

5818

04:06:19,250 --> 04:06:16,319

all right next question is from actor

5819

04:06:21,769 --> 04:06:19,260

Jack Black he starred in a movie called

5820

04:06:24,769 --> 04:06:21,779

uh Apollo 10 and a half he has a

5821

04:06:30,590 --> 04:06:27,950

okay Jack's final question I promise

5822

04:06:32,809 --> 04:06:30,600

let's talk about Orion

5823

04:06:36,110 --> 04:06:32,819

how long will it take for Orion to fly

5824

04:06:38,330 --> 04:06:36,120

around the moon and come home and what's

5825

04:06:40,090 --> 04:06:38,340

that re-entry going to be like it sounds

5826

04:06:43,309 --> 04:06:40,100

like it might be a little hot

5827

04:06:46,429 --> 04:06:43,319

coming in hot

5828

04:06:48,349 --> 04:06:46,439

exactly right Jack and is a 26-day

5829

04:06:51,469 --> 04:06:48,359

mission that we have planned for Artemis

5830

04:06:53,150 --> 04:06:51,479

where it will go to the moon go into a

5831

04:06:54,889 --> 04:06:53,160

distant retrograde orbits we'll get a

5832

04:06:57,229 --> 04:06:54,899

few close flybys and then some time in

5833

04:06:58,610 --> 04:06:57,239

deep space past the moon and then yeah

5834

04:07:00,650 --> 04:06:58,620

that re-entry is going to be something

5835

04:07:03,110 --> 04:07:00,660

else it's going to be 5 000 degrees

5836

04:07:05,210 --> 04:07:03,120

Fahrenheit super hot and so we'll be

5837

04:07:06,530 --> 04:07:05,220

looking at how the heat shield performs

5838

04:07:08,389 --> 04:07:06,540

just to ensure that it'll be able to

5839

04:07:10,610 --> 04:07:08,399

protect the crew for that speed and

5840

04:07:14,090 --> 04:07:10,620

temperature that's half as hot as the

5841

04:07:16,070 --> 04:07:14,100

sun yes it's incredibly hot so we rely

5842

04:07:17,990 --> 04:07:16,080

on that heat shield to keep our systems

5843

04:07:20,090 --> 04:07:18,000

and our crews safe but we expect that

5844

04:07:23,389 --> 04:07:20,100

it'll perform well but we're excited to

5845

04:07:27,769 --> 04:07:23,399

see how it it does in about 26 days okay

5846

04:07:32,170 --> 04:07:30,229

what qualifications are required to

5847

04:07:34,670 --> 04:07:32,180

become an astronaut

5848

04:07:37,070 --> 04:07:34,680

you have to study stem you have to have

5849

04:07:38,990 --> 04:07:37,080

a master's degree or higher in a stem

5850

04:07:41,330 --> 04:07:39,000

field but besides that we're looking for

5851
04:07:42,769 --> 04:07:41,340
people who are awesome team players so

5852
04:07:44,210 --> 04:07:42,779
there's a lot of different roads to

5853
04:07:46,130 --> 04:07:44,220
become an astronaut we seem to be

5854
04:07:48,710 --> 04:07:46,140
getting a lot of questions about how

5855
04:07:49,969 --> 04:07:48,720
people themselves can become astronauts

5856
04:07:52,309 --> 04:07:49,979
I think that's really cool that we might

5857
04:07:53,689 --> 04:07:52,319
see and Inspire again people who might

5858
04:07:56,210 --> 04:07:53,699
think about becoming astronauts

5859
04:07:57,889 --> 04:07:56,220
absolutely okay well thank you Kayla and

5860
04:08:00,710 --> 04:07:57,899
thank you for those who sent in those

5861
04:08:02,630 --> 04:08:00,720
questions we are about 50 minutes after

5862
04:08:04,610 --> 04:08:02,640
the launch of Artemis one and we are

5863
04:08:06,769 --> 04:08:04,620

approaching the next critical Milestone

5864

04:08:08,090 --> 04:08:06,779

that's perigee Rays maneuver so let's

5865

04:08:11,530 --> 04:08:08,100

head back over to Leah and Mission

5866

04:08:15,769 --> 04:08:13,910

thanks Megan and you're right we are

5867

04:08:17,990 --> 04:08:15,779

coming up on perigee Ray's maneuver

5868

04:08:20,389 --> 04:08:18,000

about two minutes from now uh we are now

5869

04:08:22,670 --> 04:08:20,399

51 minutes into the flight of Artemis

5870

04:08:24,349 --> 04:08:22,680

one after lifting off at 1 47 a.m

5871

04:08:27,170 --> 04:08:24,359

eastern time from Kennedy Space Center

5872

04:08:30,050 --> 04:08:27,180

the vehicle now traveling over 14 600

5873

04:08:32,030 --> 04:08:30,060

miles per hour so during Orion's orbit

5874

04:08:34,250 --> 04:08:32,040

of Earth it reaches an apogee in a

5875

04:08:36,229 --> 04:08:34,260

perigee the apogee is the highest point

5876
04:08:38,750 --> 04:08:36,239
above Earth's surface and the perigee is

5877
04:08:41,689 --> 04:08:38,760
the lowest therefore this perigee raised

5878
04:08:43,610 --> 04:08:41,699
maneuver is a firing of the icps rl-10

5879
04:08:45,889 --> 04:08:43,620
engine and it's going to raise the

5880
04:08:48,530 --> 04:08:45,899
lowest point of Orion's orbit over Earth

5881
04:08:50,389 --> 04:08:48,540
this also included a checkout of Orion's

5882
04:08:52,490 --> 04:08:50,399
systems and any adjustments to the solar

5883
04:08:54,530 --> 04:08:52,500
arrays all four of those solar arrays as

5884
04:08:56,090 --> 04:08:54,540
you can see are swept back that's going

5885
04:08:58,790 --> 04:08:56,100
to keep them from having any loads

5886
04:09:01,729 --> 04:08:58,800
imparted that might damage them for use

5887
04:09:03,650 --> 04:09:01,739
later in the mission this also the

5888
04:09:05,929 --> 04:09:03,660

perigee Ray's maneuver will put us in

5889

04:09:08,210 --> 04:09:05,939

the proper position for the translunar

5890

04:09:10,729 --> 04:09:08,220

injection burn that's that really big

5891

04:09:14,450 --> 04:09:10,739

and long burn that we need to send us to

5892

04:09:18,530 --> 04:09:16,790

we're about one minute away from the

5893

04:09:35,889 --> 04:09:18,540

perigee Rays maneuver this is a shorter

5894

04:10:02,870 --> 04:09:39,050

about 45 seconds until the perigee Rays

5895

04:10:07,790 --> 04:10:05,330

coming up on 53 minutes into today's

5896

04:10:09,349 --> 04:10:07,800

Mission and we are standing by for the

5897

04:10:11,330 --> 04:10:09,359

start of the perigee raised maneuver

5898

04:10:13,189 --> 04:10:11,340

again this is a firing of the rl-10

5899

04:10:14,689 --> 04:10:13,199

engine on the interim cryogenic

5900

04:10:33,889 --> 04:10:14,699

propulsion stage it's less than 30

5901
04:10:39,170 --> 04:10:36,229
and we have confirmation of perigee

5902
04:10:41,330 --> 04:10:39,180
Ray's maneuver ignition and full thrust

5903
04:10:43,849 --> 04:10:41,340
this is a live view from

5904
04:11:02,030 --> 04:10:43,859
the spacecraft again a really short burn

5905
04:11:06,889 --> 04:11:04,790
and we have confirmation of perigee rays

5906
04:11:09,050 --> 04:11:06,899
maneuver cut off

5907
04:11:10,189 --> 04:11:09,060
flight Dynamics officer reporting on the

5908
04:11:13,070 --> 04:11:10,199
loops here at Mission Control Houston

5909
04:11:15,469 --> 04:11:13,080
that it was a good burn we are now 54

5910
04:11:18,530 --> 04:11:15,479
minutes into the flight Orion traveling

5911
04:11:20,150 --> 04:11:18,540
14 700 miles per hour and that was the

5912
04:11:21,950 --> 04:11:20,160
perigee raised maneuver lifting the

5913
04:11:23,630 --> 04:11:21,960

lowest part of Orion's orbit around the

5914

04:11:26,030 --> 04:11:23,640

Earth and putting us right where we want

5915

04:11:27,650 --> 04:11:26,040

to be for the trans lunar injection burn

5916

04:11:29,929 --> 04:11:27,660

we're looking for that translunar

5917

04:11:33,650 --> 04:11:29,939

injection burn to happen about 1 hour

5918

04:11:35,929 --> 04:11:33,660

and 26 minutes after launch so about 30

5919

04:11:37,969 --> 04:11:35,939

minutes from now that'll be that long

5920

04:11:39,889 --> 04:11:37,979

burn that helps us break free from the

5921

04:11:43,070 --> 04:11:39,899

pull of Earth's gravity and commits the

5922

04:11:44,689 --> 04:11:43,080

spacecraft to a lunar trajectory so with

5923

04:11:46,130 --> 04:11:44,699

successful completion of the pairs you

5924

04:12:23,269 --> 04:11:46,140

raise maneuver I'm going to toss it back

5925

04:12:27,830 --> 04:12:25,969

test I hope you didn't miss it but if

5926
04:12:30,349 --> 04:12:27,840
you did we have a quick replay of the

5927
04:12:34,910 --> 04:12:32,269
Silence of pressure water now flowing

5928
04:12:37,969 --> 04:12:34,920
under the ml

5929
04:12:42,950 --> 04:12:37,979
and here we go 10 hydrogen burnoff

5930
04:12:44,630 --> 04:12:42,960
igniters initiate seven six five four

5931
04:12:48,889 --> 04:12:44,640
stage engine start

5932
04:12:51,889 --> 04:12:48,899
three two one booster's indignation

5933
04:13:02,990 --> 04:12:51,899
and liftoff of Artemis one we rise

5934
04:13:07,550 --> 04:13:05,630
R4 rs25 engines on the core stage and

5935
04:13:14,090 --> 04:13:07,560
two solid rocket boosters now propelling

5936
04:13:17,929 --> 04:13:16,490
very good good control on the role from

5937
04:13:20,150 --> 04:13:17,939
teams in Mission Control Houston all

5938
04:13:22,070 --> 04:13:20,160

good calls so far now 30 seconds into

5939

04:13:23,750 --> 04:13:22,080

the flight of Artemis one

5940

04:13:25,670 --> 04:13:23,760

first Milestone will be forward the

5941

04:13:27,710 --> 04:13:25,680

vehicle to pass the max Q in about one

5942

04:13:29,389 --> 04:13:27,720

minute and nine seconds into launch this

5943

04:13:37,370 --> 04:13:29,399

is the greatest period of atmospheric

5944

04:13:37,380 --> 04:13:46,729

SLS now traveling 607 miles per hour

5945

04:13:50,929 --> 04:13:48,950

you're looking at 8.8 million pounds of

5946

04:13:54,889 --> 04:13:50,939

Maximum thrust quiet here

5947

04:13:58,490 --> 04:13:56,269

the four core stage engines are

5948

04:14:00,229 --> 04:13:58,500

throttling down ahead of passing through

5949

04:14:02,389 --> 04:14:00,239

Now to celebrate Artemis one's

5950

04:14:04,309 --> 04:14:02,399

successful liftoff is NASA administrator

5951

04:14:06,050 --> 04:14:04,319

Bill Nelson administered you got to

5952

04:14:07,610 --> 04:14:06,060

share what you just told Kayla and I you

5953

04:14:09,469 --> 04:14:07,620

said that that was the biggest flame

5954

04:14:12,650 --> 04:14:09,479

you've ever seen that's that's the

5955

04:14:15,650 --> 04:14:12,660

biggest flame I've ever seen it's the

5956

04:14:17,929 --> 04:14:15,660

most acoustical Shockwave that I had

5957

04:14:22,130 --> 04:14:17,939

ever experienced we were out on the roof

5958

04:14:23,389 --> 04:14:22,140

of the launch control center and I'm

5959

04:14:26,150 --> 04:14:23,399

telling you

5960

04:14:28,969 --> 04:14:26,160

you definitely knew that there was some

5961

04:14:31,189 --> 04:14:28,979

energy being expended over there

5962

04:14:33,110 --> 04:14:31,199

yeah what does it mean to you to be the

5963

04:14:34,790 --> 04:14:33,120

leader of our Organization for a

5964

04:14:36,110 --> 04:14:34,800

historic launch like this we've been

5965

04:14:38,450 --> 04:14:36,120

talking about the team it takes to get

5966

04:14:41,510 --> 04:14:38,460

this done how does it feel to be at the

5967

04:14:44,630 --> 04:14:41,520

helm of that ship well I got to talk to

5968

04:14:48,650 --> 04:14:44,640

the launch control center team

5969

04:14:52,130 --> 04:14:48,660

and I said to them you all are a part of

5970

04:14:53,870 --> 04:14:52,140

a great legacy that has been many many

5971

04:14:58,809 --> 04:14:53,880

years coming

5972

04:15:04,130 --> 04:14:58,819

a lot of Sweat and Tears

5973

04:15:06,170 --> 04:15:04,140

and this Legacy is now taking us as we

5974

04:15:08,090 --> 04:15:06,180

explore the heavens

5975

04:15:12,050 --> 04:15:08,100

and um

5976

04:15:14,210 --> 04:15:12,060

it didn't end with Apollo 17. but this

5977

04:15:17,630 --> 04:15:14,220

time we're going back

5978

04:15:19,670 --> 04:15:17,640

and we're going to learn a lot of what

5979

04:15:23,150 --> 04:15:19,680

we have to and then we're going to Mars

5980

04:15:25,189 --> 04:15:23,160

with humans why is it such a priority

5981

04:15:27,110 --> 04:15:25,199

for the agency to land the first woman

5982

04:15:29,570 --> 04:15:27,120

and first person of color on the moon

5983

04:15:33,110 --> 04:15:29,580

through this Artemis program well I

5984

04:15:35,210 --> 04:15:33,120

think it's reflective of us it's

5985

04:15:38,630 --> 04:15:35,220

reflective of America

5986

04:15:39,429 --> 04:15:38,640

uh we are people

5987

04:15:45,590 --> 04:15:39,439

uh

5988

04:15:47,269 --> 04:15:45,600

our Latin emblem is e pluribus unum in

5989

04:15:50,870 --> 04:15:47,279

the uh in the chamber of the United

5990

04:15:55,729 --> 04:15:50,880

States Senate over that main door is e

5991

04:15:57,290 --> 04:15:55,739

pluribus unum out of many one and so our

5992

04:15:59,389 --> 04:15:57,300

astronaut core

5993

04:16:04,130 --> 04:15:59,399

uh reflects that

5994

04:16:05,929 --> 04:16:04,140

and it's going to be uh the first boots

5995

04:16:08,510 --> 04:16:05,939

back on the moon are going to be the

5996

04:16:11,150 --> 04:16:08,520

first woman and the next man

5997

04:16:12,410 --> 04:16:11,160

yeah and another goal of the Artemis

5998

04:16:14,510 --> 04:16:12,420

program is to support Economic

5999

04:16:16,550 --> 04:16:14,520

Development can you talk to us about how

6000

04:16:20,030 --> 04:16:16,560

this program has been able to do that

6001
04:16:23,210 --> 04:16:20,040
for the country well if you put it in

6002
04:16:26,929 --> 04:16:23,220
NASA's economic report terms

6003
04:16:30,769 --> 04:16:26,939
it's billions of dollars affecting the

6004
04:16:34,670 --> 04:16:30,779
economy almost 400 000 jobs but that's

6005
04:16:36,309 --> 04:16:34,680
just direct think of all the indirect

6006
04:16:39,050 --> 04:16:36,319
uh

6007
04:16:41,750 --> 04:16:39,060
expenditures that are causing the

6008
04:16:44,450 --> 04:16:41,760
economy to rise and more jobs for

6009
04:16:47,269 --> 04:16:44,460
example what you guys are doing on the

6010
04:16:50,030 --> 04:16:47,279
station a lot of your research take for

6011
04:16:53,110 --> 04:16:50,040
example the pharmaceutical research

6012
04:16:56,929 --> 04:16:53,120
you're helping already One Drug that's

6013
04:16:59,929 --> 04:16:56,939

uh being manufactured on Earth better

6014

04:17:03,590 --> 04:16:59,939

because of what you learned in space and

6015

04:17:07,189 --> 04:17:03,600

that drug is attacking cancer now what's

6016

04:17:09,410 --> 04:17:07,199

the value of that that's just additional

6017

04:17:13,189 --> 04:17:09,420

value that is added

6018

04:17:14,990 --> 04:17:13,199

I remind everybody in everybody's pocket

6019

04:17:16,309 --> 04:17:15,000

they've got a cell phone and that's got

6020

04:17:23,090 --> 04:17:16,319

a camera

6021

04:17:24,950 --> 04:17:23,100

out of the NASA space program that's

6022

04:17:26,809 --> 04:17:24,960

right I was absolutely in addition to

6023

04:17:29,210 --> 04:17:26,819

those Innovative new technologies and

6024

04:17:30,469 --> 04:17:29,220

the economic impact I think for me

6025

04:17:32,689 --> 04:17:30,479

seeing this launch today it's so

6026
04:17:35,330 --> 04:17:32,699
palpable just that human desire to

6027
04:17:37,189 --> 04:17:35,340
explore what do you think about what

6028
04:17:40,070 --> 04:17:37,199
we're doing to inspire the Artemis and

6029
04:17:42,229 --> 04:17:40,080
the generations to follow us well I

6030
04:17:45,170 --> 04:17:42,239
think all you have to do is walk into a

6031
04:17:47,210 --> 04:17:45,180
classroom of kids and look how their

6032
04:17:49,070 --> 04:17:47,220
eyes get big when you start talking

6033
04:17:51,769 --> 04:17:49,080
about space

6034
04:17:54,650 --> 04:17:51,779
and that is going to multiply itself

6035
04:17:57,650 --> 04:17:54,660
many fold as we go back to the moon and

6036
04:17:59,750 --> 04:17:57,660
then on to Mars uh it's also going to

6037
04:18:02,030 --> 04:17:59,760
bring about a new generation of

6038
04:18:03,349 --> 04:18:02,040

Engineers and mathematicians and

6039

04:18:07,130 --> 04:18:03,359

technologists

6040

04:18:08,990 --> 04:18:07,140

and scientists and all the benefits of

6041

04:18:12,590 --> 04:18:09,000

that additional

6042

04:18:14,389 --> 04:18:12,600

activity and education coming out of the

6043

04:18:17,330 --> 04:18:14,399

Artemis generation

6044

04:18:20,330 --> 04:18:17,340

look what that's going to do for our

6045

04:18:22,849 --> 04:18:20,340

country and our economy as well as for

6046

04:18:25,010 --> 04:18:22,859

our International partners

6047

04:18:27,729 --> 04:18:25,020

and uh

6048

04:18:29,630 --> 04:18:27,739

it's a great day

6049

04:18:31,130 --> 04:18:29,640

couldn't have said a better myself

6050

04:18:32,929 --> 04:18:31,140

administrator thank you so much for

6051
04:18:35,269 --> 04:18:32,939
joining us for this momentous occasion

6052
04:18:37,010 --> 04:18:35,279
as you said this is the beginning of a

6053
04:18:39,530 --> 04:18:37,020
new age in space exploration thank you

6054
04:18:40,849 --> 04:18:39,540
so much thank you ma'am and Kayla that's

6055
04:18:43,910 --> 04:18:40,859
going to do it for us here at the host

6056
04:18:46,670 --> 04:18:43,920
desk uh launch was just the first step

6057
04:18:47,990 --> 04:18:46,680
in a nearly 26 day Mission our

6058
04:18:50,150 --> 04:18:48,000
colleagues in Houston will now continue

6059
04:18:52,429 --> 04:18:50,160
the broadcast to bring you the next big

6060
04:18:55,070 --> 04:18:52,439
milestone to the Moon from Kayla and me

6061
04:19:09,490 --> 04:18:55,080
have a great day and go Artemis one go

6062
04:19:14,269 --> 04:19:11,929
and we had a great ride to orbit today

6063
04:19:16,969 --> 04:19:14,279

we are now one hour and two minutes

6064

04:19:18,830 --> 04:19:16,979

since we launched the Artemis 1 Mission

6065

04:19:21,469 --> 04:19:18,840

Orion is traveling with the interim

6066

04:19:23,630 --> 04:19:21,479

cryogenic propulsion stage now almost 15

6067

04:19:25,309 --> 04:19:23,640

000 miles per hour we recently saw the

6068

04:19:27,830 --> 04:19:25,319

perigee raised maneuver that's where we

6069

04:19:29,330 --> 04:19:27,840

lifted the lowest point of Orion's orbit

6070

04:19:31,189 --> 04:19:29,340

around the Earth and it puts us in the

6071

04:19:33,410 --> 04:19:31,199

perfect position to prepare us for

6072

04:19:55,010 --> 04:19:33,420

translunar injection burn coming up in

6073

04:19:58,849 --> 04:19:57,229

so again we are looking forward to that

6074

04:20:01,189 --> 04:19:58,859

translunar injection burn that's what

6075

04:20:02,870 --> 04:20:01,199

it's going to commit us to our journey

6076

04:20:04,969 --> 04:20:02,880

to the moon and to tell us a little bit

6077

04:20:07,729 --> 04:20:04,979

more about the translunar injection burn

6078

04:20:09,469 --> 04:20:07,739

we've got Dan Hewitt standing by to show

6079

04:20:10,610 --> 04:20:09,479

us on the moon board how it's all going

6080

04:20:12,469 --> 04:20:10,620

to go down

6081

04:20:14,750 --> 04:20:12,479

hey thanks Leah everybody Welcome Back

6082

04:20:16,849 --> 04:20:14,760

To The Moon board so trans lunar

6083

04:20:18,410 --> 04:20:16,859

injection this is the big one just a

6084

04:20:20,570 --> 04:20:18,420

refresher we're going to be using this

6085

04:20:22,610 --> 04:20:20,580

the interim cryogenic propulsion stage

6086

04:20:24,830 --> 04:20:22,620

this is what's taken over for all of our

6087

04:20:26,630 --> 04:20:24,840

in-space propulsion Maneuvers after that

6088

04:20:29,210 --> 04:20:26,640

core stage and those boosters have since

6089

04:20:31,070 --> 04:20:29,220

dropped away modified every stage from

6090

04:20:34,670 --> 04:20:31,080

the Delta IV family Rockets from United

6091

04:20:38,210 --> 04:20:34,680

launch Alliance hydrogen oxygen fueling

6092

04:20:41,450 --> 04:20:38,220

the rl-10b-2 engine produces about 24

6093

04:20:43,550 --> 04:20:41,460

000 pounds of thrust in a vacuum now the

6094

04:20:46,189 --> 04:20:43,560

trans lunar injection is what's going to

6095

04:20:49,189 --> 04:20:46,199

give us the energy to go from low earth

6096

04:20:52,010 --> 04:20:49,199

orbit all the way out here now what does

6097

04:20:54,469 --> 04:20:52,020

that mean here comes a really overly

6098

04:20:57,170 --> 04:20:54,479

simplified orbital mechanics lesson

6099

04:20:59,210 --> 04:20:57,180

let's say you're in orbit around a

6100

04:21:01,429 --> 04:20:59,220

planet say Earth and you're in a nice

6101
04:21:03,590 --> 04:21:01,439
circular orbit but you want to have that

6102
04:21:05,450 --> 04:21:03,600
orbit be even higher well what you can

6103
04:21:08,330 --> 04:21:05,460
do is fire your engine behind you

6104
04:21:11,030 --> 04:21:08,340
increase your speed and that then

6105
04:21:13,370 --> 04:21:11,040
increases the corresponding aperture are

6106
04:21:14,870 --> 04:21:13,380
the highest point of your Orbit on the

6107
04:21:17,330 --> 04:21:14,880
other side and that's how you raise it

6108
04:21:19,910 --> 04:21:17,340
up well if you wanted to make it into a

6109
04:21:22,429 --> 04:21:19,920
nice Circle you could follow up and do

6110
04:21:24,229 --> 04:21:22,439
another burn right here and that would

6111
04:21:25,729 --> 04:21:24,239
raise your perigee or your lowest point

6112
04:21:27,650 --> 04:21:25,739
and then you're in a circular orbit

6113
04:21:29,809 --> 04:21:27,660

around Earth that's essentially called a

6114

04:21:31,969 --> 04:21:29,819

Homen transfer if you've ever followed

6115

04:21:33,950 --> 04:21:31,979

our missions to the space station that's

6116

04:21:35,570 --> 04:21:33,960

what we're doing to kind of gradually

6117

04:21:38,090 --> 04:21:35,580

raise our orbit until we get to the

6118

04:21:40,550 --> 04:21:38,100

space station but for this we're talking

6119

04:21:43,130 --> 04:21:40,560

about a lot more energy to get somewhere

6120

04:21:45,290 --> 04:21:43,140

a lot farther away so what we're

6121

04:21:46,969 --> 04:21:45,300

essentially doing is we're going to be

6122

04:21:49,250 --> 04:21:46,979

in this circular orbit around planet

6123

04:21:52,429 --> 04:21:49,260

Earth and we are going to be firing that

6124

04:21:54,950 --> 04:21:52,439

engine with 24 000 pounds of thrust for

6125

04:21:56,929 --> 04:21:54,960

about 18 minutes and what that does is

6126
04:22:00,349 --> 04:21:56,939
it doesn't just increase your apogee by

6127
04:22:03,710 --> 04:22:00,359
a little it increases it all the way out

6128
04:22:05,689 --> 04:22:03,720
and it's timed so by the time Orion is

6129
04:22:08,090 --> 04:22:05,699
hitting its apogee the highest point of

6130
04:22:10,490 --> 04:22:08,100
that orbit the Moon will have moved into

6131
04:22:12,290 --> 04:22:10,500
position that you're entering into its

6132
04:22:14,450 --> 04:22:12,300
fear of influence you're entering into

6133
04:22:16,550 --> 04:22:14,460
that area where the lunar gravity is

6134
04:22:19,010 --> 04:22:16,560
going to be able to capture you and so

6135
04:22:20,689 --> 04:22:19,020
that's why we're firing the engine for

6136
04:22:22,969 --> 04:22:20,699
that long we need to have that much

6137
04:22:24,830 --> 04:22:22,979
thrust that much time to get the energy

6138
04:22:26,990 --> 04:22:24,840

to go out there so that's the rough

6139

04:22:31,070 --> 04:22:27,000

orbital mechanics of what we're doing

6140

04:22:33,110 --> 04:22:31,080

now after that tli burn is done the icps

6141

04:22:35,929 --> 04:22:33,120

is going to separate its job largely

6142

04:22:37,969 --> 04:22:35,939

done in the Artemis One mission as we

6143

04:22:40,490 --> 04:22:37,979

heard it's got some secondary payloads

6144

04:22:43,370 --> 04:22:40,500

up in this stage adapter here that it's

6145

04:22:45,950 --> 04:22:43,380

going to deploy on its way out the icps

6146

04:22:48,229 --> 04:22:45,960

will have one more burn after tli called

6147

04:22:51,229 --> 04:22:48,239

the disposal burn and what that's going

6148

04:22:53,990 --> 04:22:51,239

to do is put it on a trajectory almost

6149

04:22:55,189 --> 04:22:54,000

looking parallel to that of Orion where

6150

04:22:57,830 --> 04:22:55,199

it's going to go around the Moon

6151
04:23:00,110 --> 04:22:57,840
slingshot away and then go into what's

6152
04:23:01,969 --> 04:23:00,120
called a heliocentric orbit it's

6153
04:23:03,950 --> 04:23:01,979
actually going to go into orbit around

6154
04:23:06,590 --> 04:23:03,960
the sun just like Earth it's going to

6155
04:23:08,870 --> 04:23:06,600
leave the Earth Moon system completely

6156
04:23:10,849 --> 04:23:08,880
and then after that all of the

6157
04:23:14,090 --> 04:23:10,859
propulsion duties get handed over to the

6158
04:23:15,710 --> 04:23:14,100
European service module so it'll be

6159
04:23:17,450 --> 04:23:15,720
using its engines it's going to do the

6160
04:23:18,950 --> 04:23:17,460
outbound trajectory correction burn at

6161
04:23:21,290 --> 04:23:18,960
least the first one on flight day one

6162
04:23:22,969 --> 04:23:21,300
and a couple more until we get out to

6163
04:23:25,610 --> 04:23:22,979

the moon and get ready to head into

6164

04:23:27,650 --> 04:23:25,620

distance retrograde orbit so that's tli

6165

04:23:30,229 --> 04:23:27,660

it's coming up next it's going to be a

6166

04:23:31,790 --> 04:23:30,239

really big moment to pay attention to so

6167

04:23:38,870 --> 04:23:31,800

we'll send it back over to Leah to walk

6168

04:23:43,429 --> 04:23:41,330

thanks Dan we are one hour six minutes

6169

04:23:46,370 --> 04:23:43,439

and 30 seconds into the flight of

6170

04:23:48,950 --> 04:23:46,380

Artemis one now traveling over 15 200

6171

04:23:50,870 --> 04:23:48,960

miles per hour

6172

04:23:52,550 --> 04:23:50,880

again we've recently had the perigee

6173

04:23:54,229 --> 04:23:52,560

raised maneuver and in less than 20

6174

04:23:56,210 --> 04:23:54,239

minutes now we'll be looking for the

6175

04:23:58,429 --> 04:23:56,220

translunar injection burn that Dan just

6176
04:24:00,710 --> 04:23:58,439
showcased that's going to send us to the

6177
04:24:02,450 --> 04:24:00,720
moon but our missions started off with

6178
04:24:31,010 --> 04:24:02,460
an epic show from the space launch

6179
04:24:35,330 --> 04:24:33,349
again the space launch system is what

6180
04:24:39,170 --> 04:24:35,340
carried us into orbit today launching

6181
04:24:41,090 --> 04:24:39,180
off at 1 47 a.m eastern time and we've

6182
04:24:42,650 --> 04:24:41,100
got a couple of special guests from

6183
04:24:44,570 --> 04:24:42,660
Marshall space flight center we have

6184
04:24:46,910 --> 04:24:44,580
Bruce tiller the solid rocket booster

6185
04:24:49,490 --> 04:24:46,920
manager and Johnny Heflin the rs-25

6186
04:24:51,170 --> 04:24:49,500
engine manager to tell us more about the

6187
04:24:53,150 --> 04:24:51,180
maiden voyage of the rocket now they

6188
04:24:55,849 --> 04:24:53,160

both got to watch it live at Kennedy

6189

04:24:57,229 --> 04:24:55,859

Space Center so a big high to you Bruce

6190

04:24:58,250 --> 04:24:57,239

and Johnny thank you so much for joining

6191

04:25:00,290 --> 04:24:58,260

us today

6192

04:25:03,229 --> 04:25:00,300

thank you thank you for having us yes

6193

04:25:10,010 --> 04:25:05,150

and can you tell me a little bit about

6194

04:25:15,410 --> 04:25:12,710

cuate sure so so I manage the booster

6195

04:25:17,630 --> 04:25:15,420

part of the rocket and the boosters were

6196

04:25:18,950 --> 04:25:17,640

fantastic they performed just as we

6197

04:25:20,630 --> 04:25:18,960

expected

6198

04:25:22,309 --> 04:25:20,640

um we got to see some of the data

6199

04:25:24,590 --> 04:25:22,319

obviously the team hadn't plotted at all

6200

04:25:26,689 --> 04:25:24,600

but the pressures looked great you know

6201
04:25:30,110 --> 04:25:26,699
it it burned for just the right amount

6202
04:25:32,269 --> 04:25:30,120
of time and uh the it separated great we

6203
04:25:34,010 --> 04:25:32,279
could see that as well so very pleased

6204
04:25:35,750 --> 04:25:34,020
we were confident it would work well and

6205
04:25:38,570 --> 04:25:35,760
it did very happy

6206
04:25:40,189 --> 04:25:38,580
similar story for RS 25 nominal what we

6207
04:25:42,950 --> 04:25:40,199
call nominal performance the engines

6208
04:25:45,349 --> 04:25:42,960
performed exactly as predicted based on

6209
04:25:46,849 --> 04:25:45,359
the quick look data like the booster

6210
04:25:48,950 --> 04:25:46,859
we've got a lot of data to look at but

6211
04:25:51,950 --> 04:25:48,960
so far the data looks really really good

6212
04:25:54,349 --> 04:25:51,960
these historic rs-25s that have 25

6213
04:25:56,389 --> 04:25:54,359

flights between them on coming off the

6214

04:25:57,530 --> 04:25:56,399

shuttle program so really looking

6215

04:26:01,309 --> 04:25:57,540

forward to getting a look at the data

6216

04:26:04,790 --> 04:26:03,410

that's fantastic and we agree it was it

6217

04:26:06,290 --> 04:26:04,800

was amazing to monitor here and the

6218

04:26:08,269 --> 04:26:06,300

loops were very quiet in Mission Control

6219

04:26:10,610 --> 04:26:08,279

Houston that was a good sign you knew

6220

04:26:12,349 --> 04:26:10,620

that things were going well so we know

6221

04:26:14,870 --> 04:26:12,359

that the launch abort system was

6222

04:26:16,370 --> 04:26:14,880

inactive for this Mission but it will be

6223

04:26:18,229 --> 04:26:16,380

active for when we have crew on board

6224

04:26:20,269 --> 04:26:18,239

for Artemis 2. are there any other

6225

04:26:23,030 --> 04:26:20,279

differences we can expect to see in the

6226

04:26:25,429 --> 04:26:23,040

rocket for Artemis 2. so for the

6227

04:26:27,469 --> 04:26:25,439

boosters by and large no if I talk about

6228

04:26:28,849 --> 04:26:27,479

the boosters from top to bottom we

6229

04:26:30,590 --> 04:26:28,859

didn't we are going to make one change

6230

04:26:33,050 --> 04:26:30,600

though because the crew is on it we're

6231

04:26:36,110 --> 04:26:33,060

going to have a delay timer in there so

6232

04:26:39,290 --> 04:26:36,120

that if for some reason they need to

6233

04:26:43,030 --> 04:26:39,300

abort we have a a few seconds there

6234

04:26:45,830 --> 04:26:43,040

before after they abort before the the

6235

04:26:47,570 --> 04:26:45,840

termination system destroys the rocket

6236

04:26:49,610 --> 04:26:47,580

so we will add that but other than that

6237

04:26:52,189 --> 04:26:49,620

nope these boosters will be the same

6238

04:26:55,610 --> 04:26:52,199

second flight is the first same story

6239

04:26:57,710 --> 04:26:55,620

for rs25 it will be in the next set of

6240

04:27:00,410 --> 04:26:57,720

four uh Heritage engines from the

6241

04:27:01,969 --> 04:27:00,420

shuttle program configuration wise

6242

04:27:05,110 --> 04:27:01,979

they'll be the same as what we flew

6243

04:27:09,410 --> 04:27:07,670

then I'm glad it all went so well and so

6244

04:27:11,149 --> 04:27:09,420

after you get that data back from today

6245

04:27:13,250 --> 04:27:11,159

what's next for your team

6246

04:27:15,649 --> 04:27:13,260

well for my team we've still got a ton

6247

04:27:17,570 --> 04:27:15,659

of work to do we're we're not only I

6248

04:27:20,510 --> 04:27:17,580

mean we're working on at least three

6249

04:27:23,090 --> 04:27:20,520

flight sets at the same time uh and so

6250

04:27:24,590 --> 04:27:23,100

we've we've got two and three and four

6251
04:27:26,450 --> 04:27:24,600
to work on

6252
04:27:28,729 --> 04:27:26,460
um we also are working on a new booster

6253
04:27:31,550 --> 04:27:28,739
that's a composite case design that will

6254
04:27:33,530 --> 04:27:31,560
replace this steel case version that

6255
04:27:34,969 --> 04:27:33,540
we're flying today so so we're excited

6256
04:27:37,070 --> 04:27:34,979
about that and there's a lot a lot of

6257
04:27:39,410 --> 04:27:37,080
work going on there as well so we've got

6258
04:27:43,250 --> 04:27:39,420
a lot to do and we'll just keep doing it

6259
04:27:44,750 --> 04:27:43,260
so rs25 super busy as well we have the

6260
04:27:47,510 --> 04:27:44,760
Artemis 2 engines have already been

6261
04:27:49,429 --> 04:27:47,520
delivered to math and they're on on

6262
04:27:52,309 --> 04:27:49,439
schedule to be installed in the Artemis

6263
04:27:54,590 --> 04:27:52,319

2 core stage in mid-January

6264

04:27:56,630 --> 04:27:54,600

we're also about to start the

6265

04:27:59,090 --> 04:27:56,640

certification test series for the new

6266

04:28:00,769 --> 04:27:59,100

rs-25 engines that we're building we

6267

04:28:03,050 --> 04:28:00,779

have Heritage engines for the first four

6268

04:28:05,689 --> 04:28:03,060

flights beyond that coming in on Artemis

6269

04:28:07,670 --> 04:28:05,699

five we will fly what we call the rs-25

6270

04:28:11,030 --> 04:28:07,680

restart engines that have been

6271

04:28:12,830 --> 04:28:11,040

redesigned to reduce cost and

6272

04:28:14,870 --> 04:28:12,840

re-establish manufacturing for future

6273

04:28:16,370 --> 04:28:14,880

flights so we're really excited to get

6274

04:28:20,030 --> 04:28:16,380

into that certification test series

6275

04:28:23,689 --> 04:28:22,189

all right well thank you both so much

6276

04:28:25,130 --> 04:28:23,699

again for joining us I'm glad that you

6277

04:28:27,290 --> 04:28:25,140

got to watch the launch and a major

6278

04:28:28,670 --> 04:28:27,300

congratulations to you and your teams

6279

04:28:32,030 --> 04:28:28,680

for all of the effort that you've poured

6280

04:28:37,189 --> 04:28:32,040

into this go Artemis great day great day

6281

04:28:42,469 --> 04:28:40,130

all right and we are now one hour and 12

6282

04:28:45,590 --> 04:28:42,479

minutes into the flight of Artemis one

6283

04:28:48,110 --> 04:28:45,600

we are traveling at orbital velocity

6284

04:28:49,849 --> 04:28:48,120

again Orion is currently attached to the

6285

04:28:51,530 --> 04:28:49,859

interim cryogenic propulsion stage which

6286

04:28:53,330 --> 04:28:51,540

recently performed the perigee Rays

6287

04:28:55,130 --> 04:28:53,340

maneuver and we are standing by for

6288

04:28:57,469 --> 04:28:55,140

translunar injection burn now less than

6289

04:29:00,349 --> 04:28:57,479

15 minutes away it's going to be about

6290

04:29:02,210 --> 04:29:00,359

an 18 minute burn that will commit us to

6291

04:29:04,490 --> 04:29:02,220

the Moon

6292

04:29:06,469 --> 04:29:04,500

part of the Artemis program's goal is to

6293

04:29:08,809 --> 04:29:06,479

inspire the next generation of dreamers

6294

04:29:10,610 --> 04:29:08,819

and Explorers so we want to show you

6295

04:29:14,870 --> 04:29:10,620

what students are doing right now to

6296

04:29:18,649 --> 04:29:17,090

NASA's Artemis Mission will land the

6297

04:29:21,469 --> 04:29:18,659

first woman in the first person of

6298

04:29:23,689 --> 04:29:21,479

Heller on the moon and today's students

6299

04:29:26,689 --> 04:29:23,699

are the Artemis generation

6300

04:29:28,490 --> 04:29:26,699

if you're a student you can design and

6301
04:29:30,950 --> 04:29:28,500
build technologies that support the

6302
04:29:33,590 --> 04:29:30,960
Artemis Mission with NASA's Artemis

6303
04:29:36,649 --> 04:29:33,600
student challenges no matter your

6304
04:29:38,450 --> 04:29:36,659
background or experience you're invited

6305
04:29:43,570 --> 04:29:38,460
to choose a challenge that interests you

6306
04:29:43,580 --> 04:29:46,689
robots

6307
04:29:46,699 --> 04:29:50,050
tool

6308
04:29:53,950 --> 04:29:51,860
software

6309
04:29:56,710 --> 04:29:53,960
[Music]

6310
04:29:59,330 --> 04:29:56,720
vehicles

6311
04:30:03,290 --> 04:29:59,340
or other Technologies there's an

6312
04:30:07,969 --> 04:30:05,149
find a mentor and build a team of

6313
04:30:13,090 --> 04:30:10,429

remembering your ideas to life with

6314

04:30:15,250 --> 04:30:13,100

NASA's Artemis students

6315

04:30:18,110 --> 04:30:15,260

visit

6316

04:30:20,030 --> 04:30:18,120

stem.nasa.gov Artemis and see how you

6317

04:30:21,380 --> 04:30:20,040

can join one of NASA's Mission related

6318

04:30:33,849 --> 04:30:21,390

student challenges

6319

04:30:39,830 --> 04:30:37,969

again one hour and 13 minutes 30 seconds

6320

04:30:41,870 --> 04:30:39,840

since liftoff today we are looking

6321

04:30:43,670 --> 04:30:41,880

towards translunar injection burn now

6322

04:30:45,590 --> 04:30:43,680

about 13 minutes away that's going to

6323

04:30:47,929 --> 04:30:45,600

send us to the moon but did you know

6324

04:30:50,210 --> 04:30:47,939

that you were invited to fly on the

6325

04:30:52,309 --> 04:30:50,220

first Artemis Mission too earlier this

6326
04:30:55,130 --> 04:30:52,319
year NASA asked the public to create a

6327
04:30:57,050 --> 04:30:55,140
pass to virtually board Orion anyone who

6328
04:30:58,910 --> 04:30:57,060
signed up got to include their name on a

6329
04:31:01,429 --> 04:30:58,920
flash drive I know my name is on there

6330
04:31:03,830 --> 04:31:01,439
and that flash drive is on Orion right

6331
04:31:11,689 --> 04:31:03,840
now for its Journey around the Moon it

6332
04:31:16,309 --> 04:31:14,149
the Orion spacecraft is designed to

6333
04:31:18,469 --> 04:31:16,319
carry four crew members to lunar orbit

6334
04:31:20,929 --> 04:31:18,479
which we're preparing for on Artemis 2.

6335
04:31:22,550 --> 04:31:20,939
NASA astronaut Randy bresnick brought us

6336
04:31:24,170 --> 04:31:22,560
through the hatch of the vehicle to show

6337
04:31:28,570 --> 04:31:24,180
us where those future crew members will

6338
04:31:33,050 --> 04:31:31,610

this is the Orion crew station where the

6339

04:31:34,610 --> 04:31:33,060

crew will be when they fly the vehicle

6340

04:31:36,170 --> 04:31:34,620

as you can see the commander seats on

6341

04:31:38,210 --> 04:31:36,180

the left the pilot seat is on the right

6342

04:31:41,450 --> 04:31:38,220

compared to the Space Shuttle which had

6343

04:31:43,550 --> 04:31:41,460

over 1200 switches controls and circuit

6344

04:31:47,090 --> 04:31:43,560

breakers Artemis astronauts will have

6345

04:31:49,309 --> 04:31:47,100

much less only about 63. inside the crew

6346

04:31:51,349 --> 04:31:49,319

4 can live and work for up to 21 days at

6347

04:31:53,210 --> 04:31:51,359

a time which is several days longer than

6348

04:31:55,309 --> 04:31:53,220

the previous crude Apollo missions to

6349

04:31:57,410 --> 04:31:55,319

the moon the interior is about 30

6350

04:31:59,149 --> 04:31:57,420

percent larger than those Apollo era

6351
04:32:01,910 --> 04:31:59,159
capsules to give more crew living in

6352
04:32:03,590 --> 04:32:01,920
working space everything crew needs is

6353
04:32:05,210 --> 04:32:03,600
packed right under the floor thanks to

6354
04:32:06,710 --> 04:32:05,220
the Orion storage system under these

6355
04:32:08,870 --> 04:32:06,720
panels is space for everything ranging

6356
04:32:10,670 --> 04:32:08,880
from food clothing sleeping bags to

6357
04:32:12,769 --> 04:32:10,680
science and camera equipment and even

6358
04:32:14,510 --> 04:32:12,779
the tools necessary to perform repairs

6359
04:32:15,950 --> 04:32:14,520
if required on the upper part of the

6360
04:32:18,050 --> 04:32:15,960
crew compartment or what we call the

6361
04:32:19,670 --> 04:32:18,060
overhead is the docking compartment a

6362
04:32:21,410 --> 04:32:19,680
crucial component to Future exploration

6363
04:32:23,149 --> 04:32:21,420

it allows Crews to dock the Orion

6364

04:32:26,030 --> 04:32:23,159

capsule to Gateway NASA's Next

6365

04:32:28,010 --> 04:32:26,040

Generation lunar Outpost once they dock

6366

04:32:29,510 --> 04:32:28,020

Crews will have the ability to or to

6367

04:32:31,309 --> 04:32:29,520

lunar Landers also attached to the

6368

04:32:33,170 --> 04:32:31,319

Gateway and then head down to the

6369

04:32:35,030 --> 04:32:33,180

surface of the Moon through these

6370

04:32:37,070 --> 04:32:35,040

windows the four crew members will have

6371

04:32:38,809 --> 04:32:37,080

amazing front row seats of their journey

6372

04:32:41,090 --> 04:32:38,819

to and from the Moon do you remember

6373

04:32:42,710 --> 04:32:41,100

Apollo 8 and billander's famous photo of

6374

04:32:44,570 --> 04:32:42,720

earthrise as they came around the moon

6375

04:32:46,189 --> 04:32:44,580

and saw it for the first time imagine

6376
04:32:48,170 --> 04:32:46,199
being one of those first crew members on

6377
04:32:50,210 --> 04:32:48,180
Orion having their own modern day

6378
04:32:52,010 --> 04:32:50,220
earthrise and knowing they are traveling

6379
04:32:54,530 --> 04:32:52,020
farther from Earth than humans have ever

6380
04:32:56,450 --> 04:32:54,540
traveled before thanks to thousands of

6381
04:32:57,710 --> 04:32:56,460
people from across the country and

6382
04:33:02,450 --> 04:32:57,720
around the world who have helped with

6383
04:33:04,849 --> 04:33:02,460
the research design construction testing

6384
04:33:06,230 --> 04:33:04,859
and more testing my fellow astronauts

6385
04:33:07,970 --> 04:33:06,240
and I know that whoever gets selected

6386
04:33:09,529 --> 04:33:07,980
for future Artemis missions they're

6387
04:33:11,449 --> 04:33:09,539
going to have the Journey of a Lifetime

6388
04:33:21,470 --> 04:33:11,459

on board the spectacular vehicle we call

6389

04:33:26,689 --> 04:33:23,810

we're now coming up on 10 minutes until

6390

04:33:28,250 --> 04:33:26,699

the translunar injection burn again

6391

04:33:30,289 --> 04:33:28,260

Orion is so attached to the interim

6392

04:33:31,789 --> 04:33:30,299

cryogenic propulsion stage that rl-10

6393

04:33:34,250 --> 04:33:31,799

engine is what's going to perform the

6394

04:33:36,170 --> 04:33:34,260

burn for us but to hear more about Orion

6395

04:33:37,730 --> 04:33:36,180

I'm going to send it back to Dan at the

6396

04:33:39,170 --> 04:33:37,740

Moon board to tell us all about our

6397

04:33:41,330 --> 04:33:39,180

spacecraft

6398

04:33:43,910 --> 04:33:41,340

hey thanks Leah welcome back to the Moon

6399

04:33:46,010 --> 04:33:43,920

board and Orion so it's still attached

6400

04:33:48,349 --> 04:33:46,020

to icps still flying on the very upper

6401
04:33:50,269 --> 04:33:48,359
part of SLS but pretty soon it's going

6402
04:33:52,490 --> 04:33:50,279
to be flying free and after that happens

6403
04:33:54,470 --> 04:33:52,500
it's going to take over all of the

6404
04:33:56,510 --> 04:33:54,480
propulsion all of the flying everything

6405
04:33:57,830 --> 04:33:56,520
for the rest of the mission and so to

6406
04:33:59,631 --> 04:33:57,840
talk a little bit more about propulsion

6407
04:34:01,670 --> 04:33:59,641
let's focus in on this the European

6408
04:34:03,650 --> 04:34:01,680
service module so this is what's going

6409
04:34:05,990 --> 04:34:03,660
to be doing all of our Maneuvers after

6410
04:34:07,670 --> 04:34:06,000
we're done with icps and that translunar

6411
04:34:09,650 --> 04:34:07,680
injection burn and it's going to be

6412
04:34:12,289 --> 04:34:09,660
doing that with a mix of three different

6413
04:34:14,269 --> 04:34:12,299

types of engines first one here on the

6414

04:34:16,490 --> 04:34:14,279

bottom is the large orbital maneuvering

6415

04:34:18,109 --> 04:34:16,500

system engine this one produces about

6416

04:34:20,449 --> 04:34:18,119

six thousand pounds of thrust that's

6417

04:34:22,750 --> 04:34:20,459

going to be doing a lot of your really

6418

04:34:25,670 --> 04:34:22,760

major pushing Maneuvers when we get into

6419

04:34:28,131 --> 04:34:25,680

the powered flybys the insertion into

6420

04:34:30,349 --> 04:34:28,141

distance retrograde orbit the burns to

6421

04:34:32,510 --> 04:34:30,359

start sending us back home that's the

6422

04:34:35,269 --> 04:34:32,520

one that's really applying the most

6423

04:34:36,949 --> 04:34:35,279

force it can also gimbal which

6424

04:34:39,890 --> 04:34:36,959

essentially means it can swivel around

6425

04:34:41,869 --> 04:34:39,900

and that can help your steering it's

6426
04:34:44,090 --> 04:34:41,879
helped out by these eight auxiliary

6427
04:34:45,289 --> 04:34:44,100
thrusters they're in pairs those are a

6428
04:34:48,230 --> 04:34:45,299
little bit smaller each one of those

6429
04:34:51,170 --> 04:34:48,240
produces about 105 pounds of thrust each

6430
04:34:53,269 --> 04:34:51,180
but they add some additional push to

6431
04:34:56,209 --> 04:34:53,279
that orbital maneuvering system engine

6432
04:34:58,551 --> 04:34:56,219
and then we also have 24 reaction

6433
04:35:00,410 --> 04:34:58,561
control system thrusters these smaller

6434
04:35:02,689 --> 04:35:00,420
ones that you can see all around Orion

6435
04:35:04,609 --> 04:35:02,699
those are used for a lot of attitude

6436
04:35:07,250 --> 04:35:04,619
control so again which they can help

6437
04:35:09,769 --> 04:35:07,260
which way you're pointing but also small

6438
04:35:12,170 --> 04:35:09,779

translational Maneuvers so moving side

6439

04:35:15,890 --> 04:35:12,180

to side up down those can be called into

6440

04:35:17,570 --> 04:35:15,900

play now all of those engines share a

6441

04:35:20,390 --> 04:35:17,580

common fuel source they're using what

6442

04:35:22,330 --> 04:35:20,400

are called hypergolic fuels a mix of

6443

04:35:24,830 --> 04:35:22,340

fuel and an oxidizer in this case

6444

04:35:27,230 --> 04:35:24,840

monomethyl hydrazine and nitrogen

6445

04:35:28,789 --> 04:35:27,240

tetroxide now those are long names and

6446

04:35:30,650 --> 04:35:28,799

they're hypergolic fuels what does that

6447

04:35:33,109 --> 04:35:30,660

mean a hypergolic fuel essentially means

6448

04:35:35,510 --> 04:35:33,119

you take your fuel in your oxidizer you

6449

04:35:37,789 --> 04:35:35,520

put them together you get a reaction you

6450

04:35:39,830 --> 04:35:37,799

get an exothermic reaction which creates

6451
04:35:41,689 --> 04:35:39,840
that thrust which comes out you

6452
04:35:44,269 --> 04:35:41,699
don't need an ignition Source like we

6453
04:35:46,670 --> 04:35:44,279
have on SLS which is using oxygen and

6454
04:35:49,070 --> 04:35:46,680
hydrogen they're extremely reliable

6455
04:35:50,689 --> 04:35:49,080
they're very stable you don't have to

6456
04:35:53,449 --> 04:35:50,699
store them at cryogenic temperatures

6457
04:35:55,730 --> 04:35:53,459
which is really necessary for smaller

6458
04:35:57,650 --> 04:35:55,740
spacecraft in orbit because it takes a

6459
04:36:00,949 --> 04:35:57,660
tremendous amount of electrical energy

6460
04:36:03,410 --> 04:36:00,959
just to keep fuels that cold and so we

6461
04:36:05,929 --> 04:36:03,420
can store them at a much closer to room

6462
04:36:08,750 --> 04:36:05,939
temperature essentially when they're on

6463
04:36:10,429 --> 04:36:08,760

board this spacecraft so that's all of

6464

04:36:12,470 --> 04:36:10,439

the primary propulsion that's going to

6465

04:36:14,090 --> 04:36:12,480

take over and again that's going to be

6466

04:36:15,230 --> 04:36:14,100

after we get through translunar

6467

04:36:17,631 --> 04:36:15,240

injection we're going to be doing

6468

04:36:20,029 --> 04:36:17,641

correction burns on the way out a number

6469

04:36:22,189 --> 04:36:20,039

around the Moon as we hang out on

6470

04:36:24,349 --> 04:36:22,199

distant retrograde orbit for about a

6471

04:36:26,750 --> 04:36:24,359

week and then eventually sending us on

6472

04:36:30,230 --> 04:36:26,760

the way back home but still attached to

6473

04:36:32,810 --> 04:36:30,240

icps right now going to detach shortly

6474

04:36:34,429 --> 04:36:32,820

after that burn is complete and then

6475

04:36:36,410 --> 04:36:34,439

Orion will be flying free the service

6476
04:36:38,150 --> 04:36:36,420
module pushing it for the rest of the

6477
04:36:43,789 --> 04:36:38,160
way so with that I'll send it back over

6478
04:36:48,830 --> 04:36:46,369
thank you Dan and yes indeed we are

6479
04:36:50,929 --> 04:36:48,840
looking for tli coming up in about seven

6480
04:36:52,970 --> 04:36:50,939
minutes from now again that's one of a

6481
04:36:55,131 --> 04:36:52,980
long that's a long run for us about 18

6482
04:36:56,990 --> 04:36:55,141
minutes long but before we get to that

6483
04:36:59,150 --> 04:36:57,000
Milestone I have a friend of mine here

6484
04:37:01,070 --> 04:36:59,160
it's Stu McClung the program planning

6485
04:37:03,650 --> 04:37:01,080
and control office chief of staff for

6486
04:37:05,570 --> 04:37:03,660
the Orion program Stu I am so glad that

6487
04:37:07,789 --> 04:37:05,580
you could join us today thank you good

6488
04:37:09,410 --> 04:37:07,799

morning good to be here so how is the

6489

04:37:12,349 --> 04:37:09,420

spacecraft performing so far and what's

6490

04:37:14,689 --> 04:37:12,359

next so so far so well a good uh we had

6491

04:37:16,551 --> 04:37:14,699

good we were clean during the pre-launch

6492

04:37:19,131 --> 04:37:16,561

and uh assets

6493

04:37:21,529 --> 04:37:19,141

um the teams down the hall in the mirror

6494

04:37:23,810 --> 04:37:21,539

taking a look working everything it

6495

04:37:25,490 --> 04:37:23,820

looks good so far so that's good

6496

04:37:26,810 --> 04:37:25,500

and of course you know we got the burn

6497

04:37:30,170 --> 04:37:26,820

cup

6498

04:37:31,670 --> 04:37:30,180

um after the burn we'll start we'll

6499

04:37:34,429 --> 04:37:31,680

start ticking through all of our planned

6500

04:37:37,189 --> 04:37:34,439

events um like we have a solar or the

6501
04:37:38,990 --> 04:37:37,199
the saw mobile survey solar the wings

6502
04:37:41,209 --> 04:37:39,000
will have a modal survey that we'll do

6503
04:37:43,010 --> 04:37:41,219
later this morning one of the main one

6504
04:37:46,250 --> 04:37:43,020
of the first dtos that we'll take a look

6505
04:37:49,131 --> 04:37:46,260
at and evaluate how they how they react

6506
04:37:50,689 --> 04:37:49,141
so dto designated test objective what

6507
04:37:51,949 --> 04:37:50,699
are maybe not what's another one of

6508
04:37:54,830 --> 04:37:51,959
those that we'll be looking at over the

6509
04:37:57,650 --> 04:37:54,840
next 26 days oh we have probably a good

6510
04:38:00,590 --> 04:37:57,660
hundred of them uh the you know

6511
04:38:03,949 --> 04:38:00,600
culminate from everything from like the

6512
04:38:07,551 --> 04:38:03,959
modal survey to how the um the the

6513
04:38:10,789 --> 04:38:07,561

cooling system uh behaves common track

6514

04:38:12,349 --> 04:38:10,799

system on Entry day one of our major

6515

04:38:15,109 --> 04:38:12,359

test objectives is looking at how the

6516

04:38:16,990 --> 04:38:15,119

heat shield and the uh how it handles

6517

04:38:20,390 --> 04:38:17,000

entry Heating

6518

04:38:22,010 --> 04:38:20,400

so how does it feel to be here today and

6519

04:38:25,670 --> 04:38:22,020

see the future of human space

6520

04:38:26,689 --> 04:38:25,680

exploration unfold that's great

6521

04:38:28,310 --> 04:38:26,699

um I was

6522

04:38:29,810 --> 04:38:28,320

I was doing my

6523

04:38:31,310 --> 04:38:29,820

doing my shift in the mirror earlier

6524

04:38:34,250 --> 04:38:31,320

today

6525

04:38:36,650 --> 04:38:34,260

um haven't slept the the emotion and the

6526

04:38:39,230 --> 04:38:36,660

the adrenaline's got me going it's great

6527

04:38:41,631 --> 04:38:39,240

to be a part of this it was great

6528

04:38:44,150 --> 04:38:41,641

watching you're like watching the KSC

6529

04:38:46,010 --> 04:38:44,160

team execute and now it's this is day

6530

04:38:48,349 --> 04:38:46,020

one for us you know we've got 26 days

6531

04:38:51,410 --> 04:38:48,359

for our team to execute now and uh and

6532

04:38:54,410 --> 04:38:51,420

we'll go do our job and you know set the

6533

04:38:56,330 --> 04:38:54,420

stage for future Artemis uh exploration

6534

04:38:57,830 --> 04:38:56,340

and we're excited we're going to be here

6535

04:39:00,590 --> 04:38:57,840

along the way for all those major

6536

04:39:01,849 --> 04:39:00,600

Milestones Burns uh all the other

6537

04:39:03,349 --> 04:39:01,859

exciting events that we are looking

6538

04:39:04,970 --> 04:39:03,359

forward to so thank you so much for

6539

04:39:07,369 --> 04:39:04,980

joining us here

6540

04:39:09,709 --> 04:39:07,379

um we are really excited a big congrats

6541

04:39:11,150 --> 04:39:09,719

to you and your team thanks let's go

6542

04:39:14,390 --> 04:39:11,160

have good burn and let's go to the Moon

6543

04:39:16,010 --> 04:39:14,400

let's do it we are now uh less than five

6544

04:39:17,750 --> 04:39:16,020

minutes away from the trans lunar

6545

04:39:19,730 --> 04:39:17,760

injection burn again this is the burn

6546

04:39:23,390 --> 04:39:19,740

that's going to send us around them

6547

04:39:25,310 --> 04:39:23,400

gonna commit us to a lunar trajectory it

6548

04:39:27,650 --> 04:39:25,320

is approximately an 18 minute burn it's

6549

04:40:07,070 --> 04:39:27,660

a firing of that rl-10 engine on the

6550

04:40:10,610 --> 04:40:09,288

you've got a view here of the white

6551
04:40:12,470 --> 04:40:10,620
flight control room in Mission Control

6552
04:40:14,030 --> 04:40:12,480
Houston this is where all of the teams

6553
04:40:16,910 --> 04:40:14,040
will be monitoring the mission over the

6554
04:40:18,470 --> 04:40:16,920
next 26 days teams monitored launched

6555
04:40:20,150 --> 04:40:18,480
tonight there are of course several

6556
04:40:36,550 --> 04:40:20,160
different shifts that will be working

6557
04:40:40,730 --> 04:40:39,050
all right we are coming up now on about

6558
04:40:43,430 --> 04:40:40,740
three minutes until the translunar

6559
04:40:45,350 --> 04:40:43,440
injection burn

6560
04:40:47,930 --> 04:40:45,360
again this is about an 18 minute long

6561
04:40:49,788 --> 04:40:47,940
burn firing of the rl-10 engine on the

6562
04:40:53,390 --> 04:40:49,798
interim cryogenic propulsion stage

6563
04:40:55,610 --> 04:40:53,400

commits us to uh lunar trajectory it

6564

04:41:03,708 --> 04:40:55,620

helps us break free from the

6565

04:41:07,430 --> 04:41:05,750

in case you missed it in June of this

6566

04:41:08,750 --> 04:41:07,440

year we launched Capstone a small

6567

04:41:12,470 --> 04:41:08,760

satellite launched from New Zealand

6568

04:41:14,208 --> 04:41:12,480

designated to designed to test a unique

6569

04:41:16,310 --> 04:41:14,218

lunar orbit for our future space station

6570

04:41:18,350 --> 04:41:16,320

around the Moon called Gateway and just

6571

04:41:20,690 --> 04:41:18,360

two days ago Capstone arrived at its

6572

04:41:22,070 --> 04:41:20,700

intended orbit around the moon so we're

6573

04:41:24,170 --> 04:41:22,080

very excited for that Milestone it

6574

04:41:57,288 --> 04:41:24,180

really helps pave the way for our future

6575

04:42:02,810 --> 04:42:00,830

we are now 1 hour 20 coming up on 25

6576
04:42:05,990 --> 04:42:02,820
minutes since liftoff from Kennedy Space

6577
04:42:07,970 --> 04:42:06,000
Center today at 1 47 a.m eastern time we

6578
04:42:11,270 --> 04:42:07,980
had a really smooth ride to orbit we saw

6579
04:42:12,948 --> 04:42:11,280
solar we saw solid rocket booster

6580
04:42:14,990 --> 04:42:12,958
jettison as well as launch abort system

6581
04:42:16,550 --> 04:42:15,000
jettison eventually we had core stage

6582
04:42:18,350 --> 04:42:16,560
separation which put us in the

6583
04:42:20,510 --> 04:42:18,360
configuration that we have now with

6584
04:42:23,330 --> 04:42:20,520
Orion connected to the interim cryogenic

6585
04:42:24,770 --> 04:42:23,340
propulsion stage and flying free the

6586
04:42:26,810 --> 04:42:24,780
solar arrays deployed and have been

6587
04:42:29,390 --> 04:42:26,820
swept back in preparation for the

6588
04:42:31,310 --> 04:42:29,400

translunar injection burn earlier we had

6589

04:42:33,110 --> 04:42:31,320

the perigee Rays maneuver which lift to

6590

04:42:34,850 --> 04:42:33,120

the lowest part of Orion's orbit around

6591

04:42:36,590 --> 04:42:34,860

the Earth put us in this perfect

6592

04:42:39,050 --> 04:42:36,600

positioning ahead of translunar

6593

04:42:40,730 --> 04:42:39,060

injection burn a good shot here of our

6594

04:42:43,070 --> 04:42:40,740

two flight controllers on the left you

6595

04:42:44,868 --> 04:42:43,080

saw Judd freeling he is the ascent

6596

04:42:46,788 --> 04:42:44,878

flight controller he's been with his

6597

04:42:48,890 --> 04:42:46,798

team here for the last several hours and

6598

04:42:51,110 --> 04:42:48,900

to his right is Rick labrode he's the

6599

04:42:53,208 --> 04:42:51,120

lead flight controller for a majority of

6600

04:42:55,610 --> 04:42:53,218

the rest of the mission Judd's team will

6601
04:42:59,330 --> 04:42:55,620
take over again once we get back into

6602
04:43:10,090 --> 04:43:01,310
we're now less than a minute away from

6603
04:43:21,410 --> 04:43:12,288
and this is a live view from the

6604
04:43:25,430 --> 04:43:23,810
Australia towards the Pacific Ocean this

6605
04:43:27,350 --> 04:43:25,440
translunar injection burn will begin to

6606
04:43:29,270 --> 04:43:27,360
take it away from the earth breaking it

6607
04:43:30,770 --> 04:43:29,280
free from the pull of gravity we're

6608
04:43:34,368 --> 04:43:30,780
standing by for confirmation that the

6609
04:43:37,910 --> 04:43:36,288
we have confirmation from the booster

6610
04:43:40,070 --> 04:43:37,920
officer that the translunar injection

6611
04:43:41,570 --> 04:43:40,080
burn has begun and that we are at

6612
04:43:43,550 --> 04:43:41,580
maximum thrust

6613
04:43:46,490 --> 04:43:43,560

again this is a long burn about 18

6614

04:43:49,430 --> 04:43:46,500

minutes 1960s and it's a proven reliable

6615

04:43:51,590 --> 04:43:49,440

engine this single engine has 25

6616

04:43:53,690 --> 04:43:51,600

000 pounds of thrust we've already seen

6617

04:43:56,510 --> 04:43:53,700

the icps in action today as it powered

6618

04:43:58,850 --> 04:43:56,520

the parity the sunset

6619

04:44:01,550 --> 04:43:58,860

of the Earth this is the closest Orion

6620

04:44:04,010 --> 04:44:01,560

will be to the Earth until it begins its

6621

04:44:05,810 --> 04:44:04,020

return home from the Moon I'm going to

6622

04:44:08,270 --> 04:44:05,820

keep reporting that number and by the

6623

04:44:11,090 --> 04:44:08,280

end of the trim gravity

6624

04:44:12,110 --> 04:44:11,100

now traveling at 17 000 Sage there are

6625

04:44:14,150 --> 04:44:12,120

other Burns that'll take place

6626
04:44:15,830 --> 04:44:14,160
throughout the mission to direct Orion

6627
04:44:17,810 --> 04:44:15,840
exactly where we want it to PS separate

6628
04:44:25,970 --> 04:44:17,820
so be conducted by using the single main

6629
04:44:31,490 --> 04:44:28,368
coming up on two and a half minutes into

6630
04:44:34,070 --> 04:44:31,500
the trans lunar injection burn and we're

6631
04:44:36,050 --> 04:44:34,080
now traveling over 18 000 miles per hour

6632
04:44:38,270 --> 04:44:36,060
again that speed is going to increase as

6633
04:44:42,708 --> 04:44:38,280
well this is really going to push Orion

6634
04:44:45,708 --> 04:44:42,718
toward the moon and we are now 252 400

6635
04:44:47,448 --> 04:44:45,718
miles away from the Moon

6636
04:44:49,250 --> 04:44:47,458
and they include the lunar Ice Cube

6637
04:44:51,288 --> 04:44:49,260
developed by Morehead State University

6638
04:44:52,670 --> 04:44:51,298

in Kentucky this will search for all

6639

04:44:55,430 --> 04:44:52,680

forms of water with an infrared

6640

04:44:57,350 --> 04:44:55,440

spectrometer Luna map from Arizona State

6641

04:44:59,448 --> 04:44:57,360

University will create higher Fidelity

6642

04:45:01,490 --> 04:44:59,458

maps of near-service hydrogen in craters

6643

04:45:03,050 --> 04:45:01,500

and other permanently Shadow study the

6644

04:45:05,390 --> 04:45:03,060

lunar environment

6645

04:45:07,670 --> 04:45:05,400

and lunar by Lockheed Martin in Colorado

6646

04:45:11,990 --> 04:45:07,680

will perform Advanced infrared Imaging

6647

04:45:15,230 --> 04:45:13,730

now three and a half minutes into the

6648

04:45:18,128 --> 04:45:15,240

translator injection burn again it's

6649

04:45:22,910 --> 04:45:18,138

about an 18 minute burn traveling 18

6650

04:45:26,270 --> 04:45:24,230

quiet on the loops here in mission

6651
04:45:28,128 --> 04:45:26,280
control as the rl-10 engine continues

6652
04:45:32,110 --> 04:45:28,138
doing its job on the interim cryogenic

6653
04:45:36,470 --> 04:45:34,788
we talked about a few of our cubesats we

6654
04:45:38,690 --> 04:45:36,480
also have one preparing to study an

6655
04:45:40,670 --> 04:45:38,700
asteroid the near-earth asteroid Scout

6656
04:45:42,890 --> 04:45:40,680
or nia Scout by Marshall space flight

6657
04:45:45,050 --> 04:45:42,900
center in Alabama will travel by solar

6658
04:45:46,128 --> 04:45:45,060
sail to a near-earth asteroid to take

6659
04:45:48,470 --> 04:45:46,138
pictures of and make other

6660
04:45:50,330 --> 04:45:48,480
characterizations of its surface

6661
04:45:52,070 --> 04:45:50,340
there's a cubesat on board studying

6662
04:45:54,490 --> 04:45:52,080
earth called equilius by the University

6663
04:45:57,110 --> 04:45:54,500

of Tokyo along with jaxa in Japan

6664

04:45:59,448 --> 04:45:57,120

aquilius stands for equilibrium lunar

6665

04:46:01,490 --> 04:45:59,458

Earth 0.6u spacecraft and will travel to

6666

04:46:03,110 --> 04:46:01,500

LaGrange Point 2 Imaging Earth's

6667

04:46:17,470 --> 04:46:03,120

plasmosphere for a better understanding

6668

04:46:22,070 --> 04:46:20,090

we're now coming up on 4 minutes and 45

6669

04:46:24,850 --> 04:46:22,080

seconds into the translunar injection

6670

04:46:28,610 --> 04:46:24,860

burn Orion traveling at 18

6671

04:46:38,990 --> 04:46:31,190

our distance from the Moon continues to

6672

04:46:42,590 --> 04:46:40,730

to highlight some more of our cubesats

6673

04:46:44,570 --> 04:46:42,600

on board we also have bio Sentinel

6674

04:46:46,910 --> 04:46:44,580

developed by Ames Research Center in

6675

04:46:49,310 --> 04:46:46,920

California and we'll use a single yeast

6676
04:46:51,288 --> 04:46:49,320
cell to detect measure and compare the

6677
04:46:53,330 --> 04:46:51,298
impact of deep space radiation on living

6678
04:46:57,470 --> 04:46:53,340
organisms over an extended period of

6679
04:47:02,208 --> 04:46:59,390
Argo moon was developed by the Italian

6680
04:47:03,590 --> 04:47:02,218
space agency and argotech in Italy this

6681
04:47:05,868 --> 04:47:03,600
cubesat will observe the interim

6682
04:47:08,030 --> 04:47:05,878
cryogenic propulsion stage the stage

6683
04:47:09,948 --> 04:47:08,040
that it's firing right now with its

6684
04:47:12,590 --> 04:47:09,958
Advanced Optics and software Imaging

6685
04:47:14,810 --> 04:47:12,600
system and our last Cube sat through the

6686
04:47:16,610 --> 04:47:14,820
Centennial challenge is 10 miles from

6687
04:47:18,770 --> 04:47:16,620
Florida who developed a cubesat that

6688
04:47:20,628 --> 04:47:18,780

will demonstrate propulsion using plasma

6689

04:47:23,570 --> 04:47:20,638

thrusters and will compete in NASA's

6690

04:47:25,910 --> 04:47:23,580

deep space derby

6691

04:47:27,650 --> 04:47:25,920

these cubesats pack a ton of tech and

6692

04:47:29,930 --> 04:47:27,660

Science in a tiny package so they don't

6693

04:47:31,490 --> 04:47:29,940

all have redundant systems and if any of

6694

04:47:33,470 --> 04:47:31,500

the cubesats missions don't go as

6695

04:47:35,690 --> 04:47:33,480

planned it does not affect our primary

6696

04:47:37,610 --> 04:47:35,700

objectives of Orion's Mission this ride

6697

04:47:39,590 --> 04:47:37,620

share opportunity is a rare chance to

6698

04:47:41,330 --> 04:47:39,600

send cubesats belong Beyond low earth

6699

04:47:44,090 --> 04:47:41,340

orbit and we're looking forward to

6700

04:47:47,990 --> 04:47:45,650

we're now six minutes into the

6701
04:47:51,288 --> 04:47:48,000
translunar injection burn Orion

6702
04:47:53,030 --> 04:47:51,298
traveling at 19 500 miles per hour being

6703
04:47:54,770 --> 04:47:53,040
propelled by the interim cryogenic

6704
04:47:56,628 --> 04:47:54,780
propulsion stage

6705
04:47:58,368 --> 04:47:56,638
still quiet here on the loops in Mission

6706
04:48:00,050 --> 04:47:58,378
Control Houston teams are tracking no

6707
04:48:02,270 --> 04:48:00,060
issues during the trans lunar injection

6708
04:48:06,410 --> 04:48:02,280
burn

6709
04:48:26,750 --> 04:48:06,420
we have approximately 11 and a half

6710
04:48:31,490 --> 04:48:29,510
it's also been one hour and 33 minutes

6711
04:48:34,310 --> 04:48:31,500
since liftoff today from Kennedy Space

6712
04:48:36,890 --> 04:48:34,320
Center that was a 1 47 a.m Eastern Time

6713
04:48:39,350 --> 04:48:36,900

launch

6714

04:48:41,270 --> 04:48:39,360

a smooth ride uphill as we heard from

6715

04:48:44,510 --> 04:48:41,280

Bruce tiller and Johnny Heflin working

6716

04:48:45,948 --> 04:48:44,520

with SLS at Marshall space flight center

6717

04:48:48,830 --> 04:48:45,958

and this view from Mission Control

6718

04:48:50,570 --> 04:48:48,840

Houston team's continuing to monitor the

6719

04:48:53,330 --> 04:48:50,580

Artemis One mission this is where they

6720

04:48:55,250 --> 04:48:53,340

will be around the clock for the next 26

6721

04:49:01,010 --> 04:48:55,260

days all the way until we bring Orion

6722

04:49:05,208 --> 04:49:02,570

coming up on seven and a half minutes

6723

04:49:09,948 --> 04:49:05,218

until into the translunar injection burn

6724

04:49:16,610 --> 04:49:12,470

Orion now traveling at almost 20 000

6725

04:49:18,830 --> 04:49:16,620

miles per hour 251 237 miles away from

6726
04:49:25,610 --> 04:49:18,840
the Moon again that number continuing to

6727
04:49:31,610 --> 04:49:28,970
Orion itself is still over Earth

6728
04:49:50,690 --> 04:49:31,620
it is over the Pacific Ocean South of

6729
04:49:54,110 --> 04:49:52,490
as we've mentioned in today's coverage

6730
04:49:56,208 --> 04:49:54,120
multiple countries are represented in

6731
04:49:58,310 --> 04:49:56,218
Artemis 1 through the SLS Orion and

6732
04:50:00,590 --> 04:49:58,320
European service module as well as the

6733
04:50:01,788 --> 04:50:00,600
payloads riding along while NASA is

6734
04:50:03,530 --> 04:50:01,798
leading the Artemis Missions

6735
04:50:05,150 --> 04:50:03,540
International Partnerships will play a

6736
04:50:07,128 --> 04:50:05,160
key role in achieving a sustainable

6737
04:50:10,430 --> 04:50:07,138
presence on the moon while preparing to

6738
04:50:12,110 --> 04:50:10,440

send humans to Mars in 2021 over a dozen

6739

04:50:13,970 --> 04:50:12,120

countries signed the Artemis Accords

6740

04:50:15,650 --> 04:50:13,980

which will establish a common set of

6741

04:50:17,990 --> 04:50:15,660

principles to govern the Civil

6742

04:50:19,610 --> 04:50:18,000

exploration and use of outer space the

6743

04:50:21,590 --> 04:50:19,620

Artemis Accords will create a safe

6744

04:50:23,150 --> 04:50:21,600

transparent environment that facilitates

6745

04:50:25,610 --> 04:50:23,160

exploration science and Commercial

6746

04:50:27,230 --> 04:50:25,620

activities for all of humanity this

6747

04:50:29,208 --> 04:50:27,240

cooperation not only furthers space

6748

04:50:47,890 --> 04:50:29,218

exploration but also enhances peaceful

6749

04:50:52,550 --> 04:50:50,510

we're now over nine minutes into the

6750

04:50:54,230 --> 04:50:52,560

translunar injection burn and 18 minute

6751

04:50:56,150 --> 04:50:54,240

burn so we have

6752

04:50:57,948 --> 04:50:56,160

about nine minutes left we're about

6753

04:51:04,550 --> 04:50:57,958

halfway through the rl-10 engine

6754

04:51:09,190 --> 04:51:06,948

Orion traveling attached to the interim

6755

04:51:49,730 --> 04:51:09,200

cryogenic propulsion stage now over 20

6756

04:51:55,850 --> 04:51:53,390

it's been one hour and 37 minutes since

6757

04:51:57,470 --> 04:51:55,860

we launched today again that was 1 47

6758

04:51:59,930 --> 04:51:57,480

a.m eastern time from Kennedy Space

6759

04:52:01,910 --> 04:51:59,940

Center Orion is still attached to the

6760

04:52:03,948 --> 04:52:01,920

interim cryogenic propulsion stage this

6761

04:52:05,448 --> 04:52:03,958

is the last burn for the interim

6762

04:52:08,030 --> 04:52:05,458

cryogenic propulsion stage while

6763

04:52:19,090 --> 04:52:08,040

attached to Orion it will also have a

6764

04:52:25,310 --> 04:52:22,970

about 10 minutes after we have icps cut

6765

04:52:28,070 --> 04:52:25,320

off Orion will separate from the interim

6766

04:52:29,930 --> 04:52:28,080

cryogenic propulsion stage itself and

6767

04:52:34,910 --> 04:52:29,940

the capsule will be flying free still

6768

04:52:38,750 --> 04:52:36,650

we've got about seven minutes left in

6769

04:52:41,330 --> 04:52:38,760

the translunar injection burn Orion

6770

04:53:23,590 --> 04:52:41,340

traveling now at over 21 000 miles per

6771

04:53:29,208 --> 04:53:27,410

the rl-10 engine continues to fire on

6772

04:53:31,430 --> 04:53:29,218

the interim cryogenic propulsion stage

6773

04:53:33,410 --> 04:53:31,440

powering the translunar injection burn

6774

04:53:37,010 --> 04:53:33,420

this is the second firing of the trans

6775

04:53:38,628 --> 04:53:37,020

or of the icps today the first we saw

6776
04:53:40,610 --> 04:53:38,638
was the perigee Rays maneuver which

6777
04:53:42,288 --> 04:53:40,620
lifted the lowest point of Orion's orbit

6778
04:53:44,930 --> 04:53:42,298
around the Earth and put it in the

6779
04:53:49,250 --> 04:53:44,940
proper positioning for this burn this is

6780
04:53:54,590 --> 04:53:52,368
we're now over 12 minutes into this burn

6781
04:53:57,288 --> 04:53:54,600
again it's about an 18 minute burn so

6782
04:54:00,170 --> 04:53:57,298
less than six minutes left and one hour

6783
04:54:03,110 --> 04:54:00,180
39 minutes since we launched Orion and

6784
04:54:05,390 --> 04:54:03,120
the icps now traveling at over 21 400

6785
04:54:07,850 --> 04:54:05,400
miles per hour and as I promised we

6786
04:54:56,150 --> 04:54:07,860
continue to grow closer to the moon now

6787
04:55:01,730 --> 04:54:59,150
now over 13 minutes into the translunar

6788
04:55:04,250 --> 04:55:01,740

injection burn putting us less than five

6789

04:55:06,288 --> 04:55:04,260

minutes away from cut off we have had a

6790

04:55:10,128 --> 04:55:06,298

nominal burn so far that rl-10 engine

6791

04:55:12,350 --> 04:55:10,138

continues to fire at maximum thrust 25

6792

04:55:19,550 --> 04:55:12,360

000 pounds of thrust we're now traveling

6793

04:55:19,560 --> 04:55:32,150

foreign

6794

04:55:37,010 --> 04:55:34,190

and we've just heard the call for

6795

04:55:39,770 --> 04:55:37,020

Priority One meaning we have reached the

6796

04:55:42,530 --> 04:55:39,780

point at which we could return at lunar

6797

04:55:44,330 --> 04:55:42,540

return or similar speeds testing the

6798

04:55:49,610 --> 04:55:44,340

heat shield as required ahead of flight

6799

04:55:53,330 --> 04:55:51,770

now over 14 minutes under the tree of

6800

04:55:55,970 --> 04:55:53,340

lunar injection burn less than four

6801
04:56:41,330 --> 04:55:55,980
minutes until cut off traveling now at

6802
04:56:45,530 --> 04:56:43,610
now less than three minutes away from

6803
04:56:47,868 --> 04:56:45,540
cut off of the interim cryogenic

6804
04:56:50,330 --> 04:56:47,878
propulsion stage and coming up on one

6805
04:56:53,150 --> 04:56:50,340
hour and 42 minutes into the Artemis One

6806
04:56:54,890 --> 04:56:53,160
mission the rl-10 engine on the interim

6807
04:56:57,410 --> 04:56:54,900
cryogenic propulsion stage continues to

6808
04:56:59,448 --> 04:56:57,420
fire as planned at maximum thrust again

6809
04:57:02,570 --> 04:56:59,458
this is about an 18 minute burn that's

6810
04:57:04,850 --> 04:57:02,580
about twice as long as the ride to orbit

6811
04:57:07,430 --> 04:57:04,860
today so that just shows how much power

6812
04:57:31,690 --> 04:57:07,440
we need to break free from the pull of

6813
04:57:37,010 --> 04:57:34,788

16 minutes now into the translunar

6814

04:57:38,708 --> 04:57:37,020

injection burn Orion traveling at over

6815

04:58:01,690 --> 04:57:38,718

22

6816

04:58:06,350 --> 04:58:04,430

about a minute and a half now until cut

6817

04:58:08,810 --> 04:58:06,360

off of the nrm cryogenic propulsion

6818

04:58:13,430 --> 04:58:08,820

stage again this being an 18 minute burn

6819

04:58:15,610 --> 04:58:13,440

we are now 248 280 miles away from the

6820

04:58:18,650 --> 04:58:15,620

Moon and continuing to grow closer

6821

04:58:53,390 --> 04:58:18,660

605 miles away from Earth and continuing

6822

04:58:58,070 --> 04:58:56,330

less than a minute now until cutoff of

6823

04:59:00,050 --> 04:58:58,080

the icps

6824

04:59:02,628 --> 04:59:00,060

and the end of the translunar injection

6825

04:59:08,090 --> 04:59:02,638

burn we've had a good burn all the way

6826
05:00:01,190 --> 04:59:10,550
and one hour 44 minutes since launch

6827
05:00:05,750 --> 05:00:03,530
and we have cut off of the interim

6828
05:00:07,788 --> 05:00:05,760
cryogenic propulsion stage which has

6829
05:00:16,810 --> 05:00:07,798
committed Orion to the trans lunar

6830
05:00:22,810 --> 05:00:20,448
Orion is now traveling at 22 500 miles

6831
05:00:26,750 --> 05:00:22,820
per hour 247

6832
05:00:28,610 --> 05:00:26,760
450 miles away from Earth

6833
05:00:30,410 --> 05:00:28,620
now that the interim cryogenic

6834
05:00:32,628 --> 05:00:30,420
propulsion stage has completed its

6835
05:00:34,670 --> 05:00:32,638
translunar injection burn it is no

6836
05:00:36,410 --> 05:00:34,680
longer needed to propel us to the moon

6837
05:00:39,530 --> 05:00:36,420
it's done its job and it will separate

6838
05:00:41,448 --> 05:00:39,540

from Orion after it separates those 10

6839

05:00:43,310 --> 05:00:41,458

cubesats we discussed will be deployed

6840

05:00:45,410 --> 05:00:43,320

from the Orion stage adapter which is

6841

05:00:48,350 --> 05:00:45,420

below the service module and above the

6842

05:00:49,850 --> 05:00:48,360

icps each payload will be ejected with a

6843

05:00:52,550 --> 05:00:49,860

spring mechanism from dispensers

6844

05:00:54,170 --> 05:00:52,560

installed on the Orion stage adapter and

6845

05:00:56,330 --> 05:00:54,180

again these will help us study the moon

6846

05:00:58,550 --> 05:00:56,340

and space weather test Innovative

6847

05:01:00,650 --> 05:00:58,560

propulsion Technologies analyze the

6848

05:01:02,930 --> 05:01:00,660

effects of radiation on organisms and

6849

05:01:05,890 --> 05:01:02,940

provide high resolution imagery of the

6850

05:01:08,208 --> 05:01:05,900

Earth and Moon the cubesat deploys will

6851
05:01:11,030 --> 05:01:08,218
start just short of about four hours

6852
05:01:13,368 --> 05:01:11,040
after launch once those cubesats are

6853
05:01:16,128 --> 05:01:13,378
deployed the icps will be on track for

6854
05:01:17,628 --> 05:01:16,138
disposal in a heliocentric orbit meaning

6855
05:01:31,190 --> 05:01:17,638
it will closely Circle the sun until

6856
05:01:31,200 --> 05:01:38,868
foreign

6857
05:01:43,070 --> 05:01:40,788
the next change we'll see is for the

6858
05:01:44,270 --> 05:01:43,080
icps to separate from Orion and the

6859
05:01:46,670 --> 05:01:44,280
service module those will continue

6860
05:02:20,530 --> 05:01:46,680
flying free on their journey toward the

6861
05:02:27,590 --> 05:02:24,170
it's now been an hour 47 minutes and 30

6862
05:02:30,970 --> 05:02:27,600
seconds into the First Flight of the

6863
05:02:35,650 --> 05:02:30,980

Artemis program Orion now traveling 21

6864

05:02:35,660 --> 05:02:44,270

1129 miles away from Earth

6865

05:02:49,970 --> 05:02:46,970

that stage separation from the interim

6866

05:02:52,310 --> 05:02:49,980

cryogenic propulsion stage again should

6867

05:02:53,628 --> 05:02:52,320

be about 10 minutes after the translunar

6868

05:02:55,690 --> 05:02:53,638

injection burn is complete so

6869

05:02:59,030 --> 05:02:55,700

approximately seven minutes from now

6870

05:03:00,708 --> 05:02:59,040

shortly after icps separation Orion's

6871

05:03:02,628 --> 05:03:00,718

service module will fire its auxiliary

6872

05:03:04,788 --> 05:03:02,638

thrusters to move the spacecraft a safe

6873

05:03:07,128 --> 05:03:04,798

distance away from the extended stage

6874

05:03:08,930 --> 05:03:07,138

Orion continues on an outbound path to

6875

05:03:10,490 --> 05:03:08,940

the moon and the Ryan stage adapter

6876

05:03:12,170 --> 05:03:10,500

attached to the interim cryogenic

6877

05:06:00,170 --> 05:03:12,180

propulsion stage will deliver several

6878

05:06:06,770 --> 05:06:03,948

we're now over 1 hour 51 minutes since

6879

05:06:08,570 --> 05:06:06,780

launch today from these uh Kennedy Space

6880

05:06:11,150 --> 05:06:08,580

Center in Florida

6881

05:06:12,830 --> 05:06:11,160

Orion is traveling attached to the

6882

05:06:14,628 --> 05:06:12,840

interim cryogenic propulsion stage but

6883

05:06:16,190 --> 05:06:14,638

not for much longer we look for that

6884

05:06:18,410 --> 05:06:16,200

separation to happen in about five

6885

05:06:20,090 --> 05:06:18,420

minutes at that point Orion will still

6886

05:06:21,890 --> 05:06:20,100

be flying attached to the service module

6887

05:06:23,690 --> 05:06:21,900

and in this animation you can see the

6888

05:06:25,850 --> 05:06:23,700

service module directly below the

6889

05:06:31,430 --> 05:06:25,860

capsule those solar array wings are

6890

05:06:35,150 --> 05:06:33,350

the spacecraft now traveling over twenty

6891

05:06:36,650 --> 05:06:35,160

thousand five hundred and seventy miles

6892

05:06:39,830 --> 05:06:36,660

per hour

6893

05:06:41,590 --> 05:06:39,840

continuing to increase its distance from

6894

05:06:44,810 --> 05:06:41,600

Earth now over

6895

05:06:48,430 --> 05:06:44,820

1780 miles away continuing to decrease

6896

05:08:46,628 --> 05:06:48,440

its distance from the Moon 245

6897

05:08:50,270 --> 05:08:48,890

hearing confirmation from teams here in

6898

05:08:52,010 --> 05:08:50,280

Mission Control Houston that the solar

6899

05:08:54,470 --> 05:08:52,020

arrays are in their proper configuration

6900

05:08:56,810 --> 05:08:54,480

for interim cryogenic propulsion stage

6901
05:08:59,030 --> 05:08:56,820
separation again we just saw the trans

6902
05:09:01,610 --> 05:08:59,040
lunar injection burn a successful

6903
05:09:03,650 --> 05:09:01,620
approximately 18 minute burn that has

6904
05:09:05,208 --> 05:09:03,660
helped Orion break free from the pull of

6905
05:09:07,250 --> 05:09:05,218
Earth's gravity and sending us toward

6906
05:09:09,708 --> 05:09:07,260
the moon we're now standing by for

6907
05:09:12,110 --> 05:09:09,718
separation from that stage now that it

6908
05:09:14,810 --> 05:09:12,120
has done its job for Orion however it

6909
05:09:17,270 --> 05:09:14,820
still has a job to do it will help eject

6910
05:09:23,930 --> 05:09:17,280
some cubesats that will help us study

6911
05:09:29,530 --> 05:09:27,230
Orion now traveling at 19 700 miles per

6912
05:09:35,030 --> 05:09:32,628
2270 miles away from Earth

6913
05:09:54,830 --> 05:09:35,040

we're expecting that stage separation to

6914

05:10:00,350 --> 05:09:57,530

as you can see we have confirmation of

6915

05:10:08,330 --> 05:10:00,360

interim cryogenic propulsion stage from

6916

05:10:11,750 --> 05:10:10,190

with the Earth in the background and the

6917

05:12:31,070 --> 05:10:11,760

Moon is our destination Artemis

6918

05:12:37,610 --> 05:12:34,850

it's been one hour 57 minutes and 40

6919

05:12:39,890 --> 05:12:37,620

seconds since Orion launched Atop The

6920

05:12:43,788 --> 05:12:39,900

SLS from Kennedy Space Center in Florida

6921

05:12:46,070 --> 05:12:43,798

at 1 47 a.m eastern time after a smooth

6922

05:12:47,750 --> 05:12:46,080

ride to orbit a parody raised maneuver

6923

05:12:49,430 --> 05:12:47,760

and a translunar injection burn

6924

05:12:51,948 --> 05:12:49,440

conducted by the interim cryogenic

6925

05:12:53,930 --> 05:12:51,958

propulsion stage Orion is now flying

6926
05:12:56,330 --> 05:12:53,940
free attached to the European service

6927
05:12:58,310 --> 05:12:56,340
module and on its Journey To The Moon

6928
05:13:00,470 --> 05:12:58,320
that might be the end of today's

6929
05:13:02,570 --> 05:13:00,480
broadcast but the Artemis 1 Mission has

6930
05:13:04,550 --> 05:13:02,580
only just begun we'll continue live

6931
05:13:06,288 --> 05:13:04,560
coverage for major Milestones including

6932
05:13:08,990 --> 05:13:06,298
the outbound powered flyby and other

6933
05:13:10,150 --> 05:13:09,000
major Burns but when we're not live you

6934
05:13:13,070 --> 05:13:10,160
can check out

6935
05:13:15,590 --> 05:13:13,080
blogs.nasa.gov Artemis and the NASA

6936
05:13:17,868 --> 05:13:15,600
newsletter for updates on the spacecraft

6937
05:13:19,868 --> 05:13:17,878
we're also excited to introduce Artemis

6938
05:13:22,310 --> 05:13:19,878

all access it's a short video product

6939

05:13:24,230 --> 05:13:22,320

that will provide updates about Mission

6940

05:13:24,948 --> 05:13:24,240

accomplishments with a look at what's to

6941

05:13:27,530 --> 05:13:24,958

come

6942

05:13:29,510 --> 05:13:27,540

as well as inside looks and explainers

6943

05:13:31,730 --> 05:13:29,520

about the mission and if you want to

6944

05:13:33,288 --> 05:13:31,740

stay updated on Mission activities and

6945

05:13:34,910 --> 05:13:33,298

how to watch Splashdown you can still

6946

05:13:37,250 --> 05:13:34,920

register as an online Mission

6947

05:13:39,470 --> 05:13:37,260

participant with NASA's Virtual guest

6948

05:13:41,930 --> 05:13:39,480

program to stay informed as the mission

6949

05:13:43,730 --> 05:13:41,940

progresses virtual Mission participants

6950

05:13:46,310 --> 05:13:43,740

for Artemis 1 will receive curated

6951
05:13:48,850 --> 05:13:46,320
resource and Mission activities straight

6952
05:13:52,610 --> 05:13:48,860
to their inbox you can register at

6953
05:13:55,490 --> 05:13:52,620
go.nasa.gov virtual artemis1 that's a

6954
05:13:57,170 --> 05:13:55,500
Roman numeral one as part of the URL

6955
05:13:59,390 --> 05:13:57,180
don't forget you can also learn about

6956
05:14:01,730 --> 05:13:59,400
the mission on NASA and Artemis social

6957
05:14:03,590 --> 05:14:01,740
media accounts we'll be holding a

6958
05:14:06,050 --> 05:14:03,600
post-launch news conference at Kennedy

6959
05:14:08,330 --> 05:14:06,060
Space Center at 5 a.m Eastern Time 4 a.m

6960
05:14:11,570 --> 05:14:08,340
central time and you can watch live at

6961
05:14:13,610 --> 05:14:11,580
nasa.gov live we'll also be back on the

6962
05:14:15,948 --> 05:14:13,620
air later today for the first orbital

6963
05:14:18,350 --> 05:14:15,958

trajectory correction burn at 9 00 a.m

6964

05:14:20,208 --> 05:14:18,360

eastern time and again at 10 45 a.m

6965

05:14:23,288 --> 05:14:20,218

Eastern to get a look at the first

6966

05:14:26,030 --> 05:14:23,298

images coming down from Orion

6967

05:14:28,368 --> 05:14:26,040

thank you for joining us today for our

6968

05:14:29,868 --> 05:14:28,378

coverage of the Artemis One mission we

6969

05:14:32,628 --> 05:14:29,878

leave you now with a rendition of our

6970

05:14:34,970 --> 05:14:32,638

national anthem performed by Josh Groban

6971

05:14:36,708 --> 05:14:34,980

and jazz pianist Herbie Hancock

6972

05:14:39,410 --> 05:14:36,718

followed by a look back on today's

6973

05:14:41,628 --> 05:14:39,420

historic liftoff as we look toward every

6974

05:14:45,280 --> 05:14:41,638

milestone in this Mission Artemis

6975

05:14:45,290 --> 05:15:05,690

[Music]

6976
05:15:17,960 --> 05:15:11,330
foreign

6977
05:15:17,970 --> 05:15:45,650
[Music]

6978
05:15:45,660 --> 05:15:49,150
today

6979
05:16:17,750 --> 05:15:55,100
who's brought stripes and bright stars

6980
05:16:20,660 --> 05:16:19,010
me

6981
05:16:23,590 --> 05:16:20,670
at straight

6982
05:16:27,630 --> 05:16:23,600
[Music]

6983
05:16:37,480 --> 05:16:27,640
and the rockets

6984
05:16:38,020 --> 05:16:37,490
[Music]

6985
05:16:53,030 --> 05:16:38,030
[Applause]

6986
05:16:53,040 --> 05:16:56,110
foreign

6987
05:16:56,120 --> 05:17:21,128
[Music]

6988
05:17:30,020 --> 05:17:23,470

for the

6989

05:17:30,030 --> 05:17:41,150

[Music]

6990

05:17:41,160 --> 05:17:46,670

foreign

6991

05:18:18,230 --> 05:18:16,190

[Music]

6992

05:18:20,930 --> 05:18:18,240

sounds to pressure water now flowing

6993

05:18:26,090 --> 05:18:22,628

and here we go

6994

05:18:30,590 --> 05:18:26,100

hydrogen burnoff igniters initiate seven

6995

05:18:34,910 --> 05:18:30,600

six five four stage engine start

6996

05:18:37,850 --> 05:18:34,920

three two one booster's indignation

6997

05:18:48,890 --> 05:18:37,860

and liftoff of Artemis one we rise

6998

05:18:53,030 --> 05:18:51,470

all four rs25 engines on the core stage

6999

05:18:55,490 --> 05:18:53,040

and two solid rocket boosters now

7000

05:19:00,110 --> 05:18:55,500

propelling the vehicle at 128 miles per

7001

05:19:04,070 --> 05:19:02,810

good good control on the role from teams

7002

05:19:06,350 --> 05:19:04,080

in Mission Control Houston all good

7003

05:19:08,090 --> 05:19:06,360

calls so far now 30 seconds into the

7004

05:19:09,708 --> 05:19:08,100

flight harness one

7005

05:19:11,390 --> 05:19:09,718

first Milestone will be forward the

7006

05:19:13,190 --> 05:19:11,400

vehicle to pass through Max Q in about

7007

05:19:14,868 --> 05:19:13,200

one minute and nine seconds into launch