1
00:01:00,350 --> 00:00:56,549
[Music]

2
00:01:00,360 --> 00:01:08,469
[Applause]

3
00:01:08,479 --> 00:01:13,760
speed

4
00:01:13,770 --> 00:01:24,230
[Music]

5
00:01:24,240 --> 00:01:31,350
two

6
00:01:35,510 --> 00:01:34,310
discovery clears the tower

7
00:01:37,910 --> 00:01:35,520
discovery

8
00:02:03,670 --> 00:01:37,920
level

9
00:02:05,670 --> 00:02:03,680
[Music]

10
00:02:07,910 --> 00:02:05,680
you're looking live at a united launch

11
00:02:10,949 --> 00:02:07,920
alliance atlas 5 rocket on the launch

12
00:02:12,869 --> 00:02:10,959
pad at space launch complex 41 where we

13
00:02:14,949 --> 00:02:12,879

are less than an hour away from the

14
00:02:17,589 --> 00:02:14,959
launch of boeing starliner to the

15
00:02:19,270 --> 00:02:17,599
international space station

16
00:02:21,190 --> 00:02:19,280
and welcome everyone to the kennedy

17
00:02:23,750 --> 00:02:21,200
space center here in florida it's a

18
00:02:25,350 --> 00:02:23,760
humid day it's a hot day around 83

19
00:02:27,350 --> 00:02:25,360
degrees but it's a wonderful day because

20
00:02:29,750 --> 00:02:27,360
we're launching a rocket and we've got

21
00:02:32,309 --> 00:02:29,760
coverage for you live coverage of boeing

22
00:02:34,790 --> 00:02:32,319
starliner orbital flight test two i'm

23
00:02:36,550 --> 00:02:34,800
daryl nail with nasa and i'm d russell

24
00:02:38,390 --> 00:02:36,560
with boeing communications

25
00:02:40,550 --> 00:02:38,400
boeing crews worked throughout the day

26
00:02:43,270 --> 00:02:40,560
getting starliner ready from launch

27
00:02:45,190 --> 00:02:43,280
complex 41 which is just a few miles

28
00:02:47,350 --> 00:02:45,200
away from us at the cape canaveral space

29
00:02:50,150 --> 00:02:47,360
force station the instantaneous launch

30
00:02:52,309 --> 00:02:50,160
window is scheduled for 6 54 pm eastern

31
00:02:54,070 --> 00:02:52,319
time

32
00:02:56,470 --> 00:02:54,080
this is an uncrewed mission that will

33
00:02:58,550 --> 00:02:56,480
test the starliner spacecraft and atlas

34
00:03:00,869 --> 00:02:58,560
v rocket beginning with launch then

35
00:03:02,830 --> 00:03:00,879
going to docking and undocking and then

36
00:03:05,509 --> 00:03:02,840
of course a return to

37
00:03:07,670 --> 00:03:05,519
earth this test flight will provide

38
00:03:09,509 --> 00:03:07,680

valuable data toward nasa certifying

39
00:03:11,910 --> 00:03:09,519
starliner for regular flights with

40
00:03:13,190 --> 00:03:11,920
astronauts to and from the space station

41
00:03:14,470 --> 00:03:13,200
and the nasa astronauts are really

42
00:03:16,070 --> 00:03:14,480
looking forward to that we're going to

43
00:03:17,509 --> 00:03:16,080
talk to them a little bit later on the

44
00:03:19,270 --> 00:03:17,519
show but let's take you back to

45
00:03:21,509 --> 00:03:19,280
yesterday morning what a beautiful shot

46
00:03:23,750 --> 00:03:21,519
this is look at that this is the roll

47
00:03:26,229 --> 00:03:23,760
out of the rocket to the pad two rail

48
00:03:27,430 --> 00:03:26,239
cars pulling the 3.5 million pound

49
00:03:29,670 --> 00:03:27,440
convoy

50
00:03:31,430 --> 00:03:29,680
to the mobile and the mobile launch

51
00:03:33,830 --> 00:03:31,440
platform along with the rocket and

52
00:03:36,149 --> 00:03:33,840
starliner spacecraft from the vertical

53
00:03:37,990 --> 00:03:36,159
integration facility out to the launch

54
00:03:40,630 --> 00:03:38,000
pad and what a journey

55
00:03:43,270 --> 00:03:40,640
it takes about 20 minutes to travel that

56
00:03:46,470 --> 00:03:43,280
one third of a mile the atlas 5 rocket

57
00:03:49,270 --> 00:03:46,480
there what a great shot standing 172

58
00:03:54,550 --> 00:03:49,280
feet tall or about 52 meters and it

59
00:03:57,110 --> 00:03:54,560
weighs about 979 000 pounds or 444 000

60
00:03:58,149 --> 00:03:57,120
kilograms fully fueled that's a heavy

61
00:03:59,830 --> 00:03:58,159
rocket

62
00:04:02,229 --> 00:03:59,840
fast forward to today and you can see

63
00:04:04,630 --> 00:04:02,239

there from the live shot in preparation

64
00:04:07,110 --> 00:04:04,640
for launch both stages of the atlas v

65
00:04:09,589 --> 00:04:07,120
rocket were fueled up with propellant

66
00:04:10,949 --> 00:04:09,599
and that happened just a few hours ago

67
00:04:13,429 --> 00:04:10,959
and as you can see from some of our

68
00:04:15,429 --> 00:04:13,439
views provided from our launch cameras

69
00:04:18,150 --> 00:04:15,439
it is a beautiful day out we've got a

70
00:04:20,069 --> 00:04:18,160
low cloud deck in the area some clouds

71
00:04:23,189 --> 00:04:20,079
that have developed we'll talk to our

72
00:04:25,430 --> 00:04:23,199
weather officer about that in just a bit

73
00:04:27,749 --> 00:04:25,440
and earlier today another important

74
00:04:29,830 --> 00:04:27,759
pre-launch milestone was completed

75
00:04:32,390 --> 00:04:29,840
boeing's ground crews inside the white

76
00:04:34,390 --> 00:04:32,400
room closed the hatch to the starliner

77
00:04:36,550 --> 00:04:34,400
although there's no crew flying on this

78
00:04:39,749 --> 00:04:36,560
second test flight the boeing closeout

79
00:04:41,990 --> 00:04:39,759
crew is working as if there is

80
00:04:44,629 --> 00:04:42,000
now let's check in with launch weather

81
00:04:46,070 --> 00:04:44,639
officer brian sizik with the 45th space

82
00:04:47,909 --> 00:04:46,080
wing

83
00:04:50,870 --> 00:04:47,919
yeah brian we've got some clouds that

84
00:04:53,030 --> 00:04:50,880
moved in over the area earlier today the

85
00:04:56,550 --> 00:04:53,040
the clouds were not there we had clear

86
00:04:58,390 --> 00:04:56,560
skies and it was looking good but then

87
00:04:59,830 --> 00:04:58,400
we started to see some some cloud cover

88
00:05:01,590 --> 00:04:59,840

and i can see in the background there

89
00:05:03,270 --> 00:05:01,600
that you're tracking that

90
00:05:04,870 --> 00:05:03,280
yes dale you're right and actually those

91
00:05:07,350 --> 00:05:04,880
high clouds that moved and that's you're

92
00:05:09,510 --> 00:05:07,360
seeing that filtered sunshine behind you

93
00:05:11,029 --> 00:05:09,520
right now those actually really helped

94
00:05:12,790 --> 00:05:11,039
for our launch conditions today and let

95
00:05:14,870 --> 00:05:12,800
me explain that a little bit so we have

96
00:05:17,830 --> 00:05:14,880
this high upper level

97
00:05:19,350 --> 00:05:17,840
cloud deck zero stratus clouds that are

98
00:05:21,350 --> 00:05:19,360
moving into the area and that actually

99
00:05:22,390 --> 00:05:21,360
limited the amount of surface heating

100
00:05:24,550 --> 00:05:22,400
that we got throughout the day and

101
00:05:26,469 --> 00:05:24,560
that's how the atmosphere heats up it's

102
00:05:28,070 --> 00:05:26,479
almost like a boiler plate from the

103
00:05:30,070 --> 00:05:28,080
bottom so the surface heats and that

104
00:05:32,390 --> 00:05:30,080
helps bubble up some of those showers

105
00:05:34,870 --> 00:05:32,400
and thunderstorms that we see so often

106
00:05:36,629 --> 00:05:34,880
here in florida in the summertime but as

107
00:05:39,110 --> 00:05:36,639
i mentioned those clouds really help to

108
00:05:41,110 --> 00:05:39,120
limit that heating so we saw a lot less

109
00:05:43,110 --> 00:05:41,120
shower and thunderstorm coverage that

110
00:05:44,390 --> 00:05:43,120
would than we would have otherwise seen

111
00:05:46,469 --> 00:05:44,400
throughout today and if you look a

112
00:05:47,909 --> 00:05:46,479
little bit farther south you can see

113
00:05:49,990 --> 00:05:47,919

where there was less of those upper

114
00:05:51,430 --> 00:05:50,000
level clouds we actually had more of

115
00:05:53,990 --> 00:05:51,440
those showers and thunderstorms

116
00:05:56,230 --> 00:05:54,000
developing so really overall that is

117
00:05:58,150 --> 00:05:56,240
what's leading to some very good launch

118
00:06:00,469 --> 00:05:58,160
conditions today my colleague will

119
00:06:02,629 --> 00:06:00,479
ulrich just briefed at the t-minus one

120
00:06:05,189 --> 00:06:02,639
hour weather brief that the probability

121
00:06:07,830 --> 00:06:05,199
of go is now 90 percent so let's go take

122
00:06:09,510 --> 00:06:07,840
a look at that launch forecast a 90

123
00:06:12,469 --> 00:06:09,520
percent chance will go the current

124
00:06:14,870 --> 00:06:12,479
weather status is go and a 90

125
00:06:17,029 --> 00:06:14,880
chance that we remain go throughout uh

126
00:06:18,870 --> 00:06:17,039
the count and into t zero so overall

127
00:06:20,629 --> 00:06:18,880
conditions are looking really good all

128
00:06:22,790 --> 00:06:20,639
the weather rules we look at are are

129
00:06:24,150 --> 00:06:22,800
both for natural and trigger lighting

130
00:06:26,150 --> 00:06:24,160
and everything is looking good as we

131
00:06:27,830 --> 00:06:26,160
head closer to t-zero guys all right

132
00:06:29,670 --> 00:06:27,840
that's a great update brian we'll check

133
00:06:31,830 --> 00:06:29,680
in with you a little bit later for that

134
00:06:34,230 --> 00:06:31,840
l minus 30

135
00:06:36,309 --> 00:06:34,240
uh briefing by will ulrich to the launch

136
00:06:39,189 --> 00:06:36,319
team there's a distant shot

137
00:06:41,909 --> 00:06:39,199
of the launch pad slick 41 as they call

138
00:06:44,390 --> 00:06:41,919

it we are l minus 48 minutes and

139
00:06:46,469 --> 00:06:44,400
counting just a few miles away from us

140
00:06:48,870 --> 00:06:46,479
is our team of launch commentators at

141
00:06:51,670 --> 00:06:48,880
united launch alliances atlas space

142
00:06:53,110 --> 00:06:51,680
flight operations center or asoc they

143
00:06:54,870 --> 00:06:53,120
are listening in to the launch

144
00:06:55,830 --> 00:06:54,880
operations we're talking about dylan

145
00:06:58,150 --> 00:06:55,840
rice

146
00:07:00,629 --> 00:06:58,160
uh launch director himself for united

147
00:07:03,510 --> 00:07:00,639
launch alliance in fact recently uh

148
00:07:05,270 --> 00:07:03,520
oversaw the goes-t launch well done and

149
00:07:07,189 --> 00:07:05,280
boeing's lauren seabrook the newest

150
00:07:09,189 --> 00:07:07,199
member of boeing's broadcast team

151
00:07:11,189 --> 00:07:09,199
welcome to you both

152
00:07:13,270 --> 00:07:11,199
hey thank you so much daryl dylan and i

153
00:07:16,309 --> 00:07:13,280
are coming to you from the heart of

154
00:07:18,230 --> 00:07:16,319
ula's operations where we are really

155
00:07:21,270 --> 00:07:18,240
just tucked in the middle of everything

156
00:07:23,589 --> 00:07:21,280
going on we are surrounded on all sides

157
00:07:25,589 --> 00:07:23,599
by the men and women the engineers who

158
00:07:27,749 --> 00:07:25,599
are prepping the rocket and actually if

159
00:07:29,589 --> 00:07:27,759
we take a look behind us you can see us

160
00:07:31,350 --> 00:07:29,599
up here kind of above all the action

161
00:07:32,790 --> 00:07:31,360
that's happening down below and you can

162
00:07:34,390 --> 00:07:32,800
see what's happening on the sides here

163
00:07:36,469 --> 00:07:34,400

as well just to give you a better

164
00:07:38,790 --> 00:07:36,479
perspective on where we're able to

165
00:07:40,150 --> 00:07:38,800
listen to the flight loops so dylan why

166
00:07:41,909 --> 00:07:40,160
don't you give us an update on how

167
00:07:44,070 --> 00:07:41,919
things are going with the rocket well

168
00:07:46,309 --> 00:07:44,080
lauren atlas 5 and centaur are fueled

169
00:07:47,589 --> 00:07:46,319
and ready to go the vehicle was rolled

170
00:07:49,110 --> 00:07:47,599
out to the pad yesterday where it was

171
00:07:50,790 --> 00:07:49,120
connected to the propellant storage

172
00:07:51,909 --> 00:07:50,800
farms air conditioning all the other pad

173
00:07:53,189 --> 00:07:51,919
utilities

174
00:07:55,029 --> 00:07:53,199
daryl talked about that just a minute

175
00:07:57,029 --> 00:07:55,039
ago the countdown started this morning

176
00:07:58,390 --> 00:07:57,039
about 7 30. we powered up the rocket

177
00:08:00,469 --> 00:07:58,400
began our final checks of all of our

178
00:08:03,270 --> 00:08:00,479
avionics systems and then started final

179
00:08:05,029 --> 00:08:03,280
preparations out at launch complex 41.

180
00:08:07,589 --> 00:08:05,039
all that work wrapped up around noon and

181
00:08:09,270 --> 00:08:07,599
with complex 41 and launch vehicle ready

182
00:08:10,790 --> 00:08:09,280
we started cryogenic tanking just before

183
00:08:12,550 --> 00:08:10,800
1 pm

184
00:08:14,309 --> 00:08:12,560
cryogenic tanking takes under two hours

185
00:08:15,270 --> 00:08:14,319
to complete and went very very smoothly

186
00:08:17,110 --> 00:08:15,280
today

187
00:08:18,629 --> 00:08:17,120
um for now the vehicle remains in stable

188
00:08:20,629 --> 00:08:18,639

topping and all of our pre-launch checks

189
00:08:22,390 --> 00:08:20,639
are basically complete

190
00:08:24,309 --> 00:08:22,400
the team is active closing out the crew

191
00:08:26,150 --> 00:08:24,319
access tower as we speak once all that

192
00:08:27,189 --> 00:08:26,160
work is wrapped up the team will clear

193
00:08:29,110 --> 00:08:27,199
the pad

194
00:08:31,110 --> 00:08:29,120
this is the 93rd flight of the safe and

195
00:08:33,589 --> 00:08:31,120
reliable atlas 5 launch vehicle the

196
00:08:36,469 --> 00:08:33,599
second flight of the n22 configuration

197
00:08:38,709 --> 00:08:36,479
the 103rd launch from slick 41 and ula's

198
00:08:40,070 --> 00:08:38,719
150th launch overall

199
00:08:41,509 --> 00:08:40,080
this vehicle is equipped with a dual

200
00:08:42,949 --> 00:08:41,519
engine centaur a configuration that is

201
00:08:44,310 --> 00:08:42,959
uniquely capable of providing all the

202
00:08:45,910 --> 00:08:44,320
performance required for storyliner's

203
00:08:47,430 --> 00:08:45,920
mission

204
00:08:49,910 --> 00:08:47,440
so let's take a look at some video that

205
00:08:51,430 --> 00:08:49,920
we recorded just about an hour ago from

206
00:08:52,949 --> 00:08:51,440
our white room

207
00:08:54,710 --> 00:08:52,959
this is when

208
00:08:56,949 --> 00:08:54,720
our pad team was wrapping up

209
00:08:59,190 --> 00:08:56,959
pre-launched procedures like i said it

210
00:09:00,310 --> 00:08:59,200
wrapped up about an hour ago but

211
00:09:02,150 --> 00:09:00,320
some of the things you'll see on your

212
00:09:03,990 --> 00:09:02,160
screen have been happening throughout

213
00:09:06,389 --> 00:09:04,000

the afternoon they've been doing things

214
00:09:07,990 --> 00:09:06,399
like making sure the switches inside the

215
00:09:10,470 --> 00:09:08,000
spacecraft were all in the proper

216
00:09:12,389 --> 00:09:10,480
position they removed ground support

217
00:09:14,550 --> 00:09:12,399
equipment that was no longer needed for

218
00:09:16,949 --> 00:09:14,560
starliner and they've ensured that all

219
00:09:18,949 --> 00:09:16,959
the air ducts were not blocked they also

220
00:09:20,630 --> 00:09:18,959
armed the launch abort system switch

221
00:09:21,910 --> 00:09:20,640
inside the spacecraft that's actually

222
00:09:23,990 --> 00:09:21,920
something that crew will do in the

223
00:09:25,670 --> 00:09:24,000
future but because of course we have no

224
00:09:28,389 --> 00:09:25,680
crew on board today

225
00:09:30,070 --> 00:09:28,399
the pad team took care of that for us

226
00:09:32,310 --> 00:09:30,080
they also checked to see if the gravity

227
00:09:34,630 --> 00:09:32,320
indicator was secure i can tell you i

228
00:09:36,949 --> 00:09:34,640
can confirm the gravity indicator is

229
00:09:39,190 --> 00:09:36,959
tethered to seat number two

230
00:09:40,949 --> 00:09:39,200
and before the hatch closure they purged

231
00:09:42,550 --> 00:09:40,959
the cabin to make sure that the humidity

232
00:09:44,310 --> 00:09:42,560
was at the right level

233
00:09:46,550 --> 00:09:44,320
once the hatch was closed they checked

234
00:09:48,710 --> 00:09:46,560
for leaks by pressurizing it

235
00:09:50,790 --> 00:09:48,720
and they basically do this by pushing

236
00:09:52,870 --> 00:09:50,800
air into the cabin and holding that

237
00:09:54,870 --> 00:09:52,880
pressure for about 10 minutes

238
00:09:56,949 --> 00:09:54,880

it's kind of like inflating a balloon if

239
00:09:58,550 --> 00:09:56,959
you think about if you were

240
00:10:00,790 --> 00:09:58,560
you know pushing air into the balloon

241
00:10:02,870 --> 00:10:00,800
and holding it if there were any holes

242
00:10:04,470 --> 00:10:02,880
in that balloon you would notice it

243
00:10:07,269 --> 00:10:04,480
would start to leak and that would be

244
00:10:09,110 --> 00:10:07,279
very obvious well the telemetry that

245
00:10:11,110 --> 00:10:09,120
feeds back to us can let us know if

246
00:10:13,750 --> 00:10:11,120
there are any leaks and

247
00:10:15,829 --> 00:10:13,760
that way we know that we are safe to fly

248
00:10:17,829 --> 00:10:15,839
and so once they checked the integrity

249
00:10:19,910 --> 00:10:17,839
of the hatch seal they released that air

250
00:10:21,829 --> 00:10:19,920
and then they normalize the pressure

251
00:10:22,949 --> 00:10:21,839
and everything so far has gone really

252
00:10:25,190 --> 00:10:22,959
smoothly

253
00:10:27,590 --> 00:10:25,200
the entire pad team is actually called

254
00:10:29,509 --> 00:10:27,600
the blue team it's made up of five

255
00:10:32,870 --> 00:10:29,519
people from boeing and three people from

256
00:10:33,990 --> 00:10:32,880
ula and dylan they really work together

257
00:10:35,590 --> 00:10:34,000
but they have a lot of different

258
00:10:38,150 --> 00:10:35,600
responsibilities what are some of the

259
00:10:39,990 --> 00:10:38,160
things the ula pat team members do

260
00:10:42,069 --> 00:10:40,000
well the ula team members are there to

261
00:10:43,430 --> 00:10:42,079
really manage the crew access tower

262
00:10:45,590 --> 00:10:43,440
system so they're performing safety

263
00:10:47,590 --> 00:10:45,600

checks to the tower and configuring the

264
00:10:50,150 --> 00:10:47,600
white room prior to

265
00:10:51,590 --> 00:10:50,160
prior to the team leaving the pad

266
00:10:53,030 --> 00:10:51,600
part of that configuration in the white

267
00:10:55,110 --> 00:10:53,040
room will be retracting the starliner

268
00:10:56,790 --> 00:10:55,120
access plank and raising the white room

269
00:10:57,990 --> 00:10:56,800
environmental seal for launch once all

270
00:10:59,269 --> 00:10:58,000
that work is done the blue team will

271
00:11:01,269 --> 00:10:59,279
clear the pad and head for the fallback

272
00:11:03,269 --> 00:11:01,279
area for lunch and we also watched a

273
00:11:05,590 --> 00:11:03,279
really special moment of the team coming

274
00:11:08,069 --> 00:11:05,600
together right at the end of finishing

275
00:11:09,750 --> 00:11:08,079
their closeout procedures they were

276
00:11:11,430 --> 00:11:09,760
arm and arm kind of had their heads

277
00:11:13,829 --> 00:11:11,440
bowed had a final moment there with the

278
00:11:16,230 --> 00:11:13,839
spacecraft before they left so it was a

279
00:11:18,230 --> 00:11:16,240
really special moment and i'm sure

280
00:11:20,470 --> 00:11:18,240
it was special for them as well

281
00:11:22,150 --> 00:11:20,480
so daryl and d we'll go back to you

282
00:11:23,990 --> 00:11:22,160
thank you very much lauren it'll be good

283
00:11:26,630 --> 00:11:24,000
to see that pad team helping the

284
00:11:29,750 --> 00:11:26,640
astronauts get aboard that spacecraft

285
00:11:31,670 --> 00:11:29,760
here soon now after the atlas v launches

286
00:11:36,730 --> 00:11:31,680
with starliner aboard there are several

287
00:11:53,030 --> 00:11:50,310
[Music]

288
00:11:54,389 --> 00:11:53,040

ascent begins at t minus zero liftoff

289
00:11:56,790 --> 00:11:54,399
the end of the countdown and the

290
00:11:59,190 --> 00:11:56,800
beginning of the mission shortly

291
00:12:01,590 --> 00:11:59,200
afterwards at t plus 12 seconds the

292
00:12:03,110 --> 00:12:01,600
rocket rolls lining up starliner with

293
00:12:06,710 --> 00:12:03,120
its target orbit and putting the

294
00:12:09,590 --> 00:12:06,720
astronauts in a heads up position

295
00:12:11,750 --> 00:12:09,600
then around t plus 40 seconds max q

296
00:12:14,069 --> 00:12:11,760
starts that's also known as max

297
00:12:16,310 --> 00:12:14,079
aerodynamic pressure this is a critical

298
00:12:18,870 --> 00:12:16,320
time when the atmospheric forces reach

299
00:12:21,829 --> 00:12:18,880
their height

300
00:12:24,069 --> 00:12:21,839
next at about plus one minute 35 seconds

301
00:12:26,310 --> 00:12:24,079
the two solid rocket boosters run out of

302
00:12:28,870 --> 00:12:26,320
fuel and burn out and about a minute

303
00:12:30,949 --> 00:12:28,880
later they separate from the booster

304
00:12:33,269 --> 00:12:30,959
the atlas booster engine continues to

305
00:12:36,389 --> 00:12:33,279
burn for almost two more minutes

306
00:12:38,790 --> 00:12:36,399
then at approximately plus 430 booster

307
00:12:40,870 --> 00:12:38,800
engine cut off or biko

308
00:12:43,030 --> 00:12:40,880
about five seconds later the booster

309
00:12:45,030 --> 00:12:43,040
separates and so does the ascent cover

310
00:12:47,350 --> 00:12:45,040
on top of starliner

311
00:12:49,750 --> 00:12:47,360
at around four minutes 45 seconds the

312
00:12:52,949 --> 00:12:49,760
centaur upper stage ignites continuing

313
00:12:55,110 --> 00:12:52,959

the push to orbital speeds in a little

314
00:12:56,870 --> 00:12:55,120
after five minutes starliner is free of

315
00:12:59,269 --> 00:12:56,880
the atmosphere and doesn't need

316
00:13:02,069 --> 00:12:59,279
additional aerodynamic support and the

317
00:13:04,629 --> 00:13:02,079
aeroskirt is jettisoned

318
00:13:07,509 --> 00:13:04,639
after a long six plus minute push from

319
00:13:11,030 --> 00:13:07,519
centaur main engine cutoff or miko

320
00:13:13,670 --> 00:13:11,040
happens around 12 minutes after liftoff

321
00:13:16,790 --> 00:13:13,680
then when centaur successfully separates

322
00:13:19,910 --> 00:13:16,800
almost 15 minutes after launch ula's job

323
00:13:22,870 --> 00:13:19,920
is done but starliner is not quite in

324
00:13:25,030 --> 00:13:22,880
orbit yet after a 16 minute coast

325
00:13:27,829 --> 00:13:25,040
starliner ignites four of its orbital

326
00:13:30,310 --> 00:13:27,839
maneuvering and attitude control or omac

327
00:13:32,790 --> 00:13:30,320
engines for the orbital insertion burn

328
00:13:36,710 --> 00:13:32,800
and then 31 minutes after liftoff the

329
00:13:48,230 --> 00:13:36,720
ascent profile is complete

330
00:13:51,110 --> 00:13:49,670
controlling starliner's flight to the

331
00:13:53,910 --> 00:13:51,120
international space station are the

332
00:13:55,269 --> 00:13:53,920
teams at mission control in houston

333
00:13:57,350 --> 00:13:55,279
let's check in with the launch

334
00:13:59,670 --> 00:13:57,360
commentators we will hear immediately

335
00:14:01,509 --> 00:13:59,680
after liftoff nasa's brandy dean and

336
00:14:03,350 --> 00:14:01,519
boeing's josh barrett are joining us

337
00:14:08,230 --> 00:14:03,360
from the johnson space center in houston

338
00:14:12,949 --> 00:14:10,550

thanks so much daryl and dee and welcome

339
00:14:15,269 --> 00:14:12,959
to mission control houston and kevin

340
00:14:17,350 --> 00:14:15,279
good evening um this josh and i have

341
00:14:19,509 --> 00:14:17,360
been listening in um on the team's

342
00:14:21,750 --> 00:14:19,519
preparations all day now they are

343
00:14:23,590 --> 00:14:21,760
controlled today um by a team who's been

344
00:14:25,590 --> 00:14:23,600
here since about 1 p.m central time

345
00:14:27,750 --> 00:14:25,600
listening in and making sure everything

346
00:14:30,710 --> 00:14:27,760
is set for today's launch they're led

347
00:14:33,030 --> 00:14:30,720
today by flight director mike lammers

348
00:14:35,750 --> 00:14:33,040
a longtime flight director he's assisted

349
00:14:37,509 --> 00:14:35,760
by flight director rick hemflink who is

350
00:14:39,350 --> 00:14:37,519
helping him keep an eye on the weather

351
00:14:41,910 --> 00:14:39,360
and any constraints it may pose to us

352
00:14:43,670 --> 00:14:41,920
particularly downrange at a board sites

353
00:14:45,430 --> 00:14:43,680
and as an added bonus we also have

354
00:14:47,509 --> 00:14:45,440
matthew dominic sitting alongside the

355
00:14:48,949 --> 00:14:47,519
two as today's capcom you won't hear him

356
00:14:50,870 --> 00:14:48,959
speaking to the spacecraft today but

357
00:14:52,790 --> 00:14:50,880
he's building up experience from

358
00:14:55,189 --> 00:14:52,800
starliner's next flight when we'll have

359
00:14:57,509 --> 00:14:55,199
crew on board to talk to

360
00:14:59,430 --> 00:14:57,519
and that's right now as some of you been

361
00:15:01,910 --> 00:14:59,440
following this mission are aware that

362
00:15:03,829 --> 00:15:01,920
rosie the rocketeer our anthropometric

363
00:15:05,750 --> 00:15:03,839

test device is sitting in the

364
00:15:08,069 --> 00:15:05,760
commander's seat right now in starliner

365
00:15:10,310 --> 00:15:08,079
now she won't be doing any piloting of

366
00:15:11,910 --> 00:15:10,320
her own she'll be getting a lot of help

367
00:15:13,030 --> 00:15:11,920
from starliner's automated flight

368
00:15:14,949 --> 00:15:13,040
software

369
00:15:16,470 --> 00:15:14,959
and then hopefully some minimal help

370
00:15:18,550 --> 00:15:16,480
from the team here in this control room

371
00:15:20,710 --> 00:15:18,560
on the ground if all is going well but

372
00:15:22,870 --> 00:15:20,720
the team has been commanding the vehicle

373
00:15:24,710 --> 00:15:22,880
since about l minus three hours so just

374
00:15:26,470 --> 00:15:24,720
over two hours ago they've really taken

375
00:15:28,949 --> 00:15:26,480
command of the vehicle here in the

376
00:15:30,870 --> 00:15:28,959
control room behind us we've got console

377
00:15:33,030 --> 00:15:30,880
operators monitoring all their systems

378
00:15:35,670 --> 00:15:33,040
immediately behind us we've got our gnc

379
00:15:37,110 --> 00:15:35,680
and propulsion subsystem operators

380
00:15:38,949 --> 00:15:37,120
the team really seems to be in good

381
00:15:41,829 --> 00:15:38,959
spirits it's been a relatively clean

382
00:15:43,430 --> 00:15:41,839
countdown and uh so far it's it's been

383
00:15:45,509 --> 00:15:43,440
pretty quiet and we're really looking

384
00:15:47,110 --> 00:15:45,519
forward to launch

385
00:15:49,990 --> 00:15:47,120
yeah everything looking good as we count

386
00:15:52,629 --> 00:15:50,000
down to today's 5 54 p.m central launch

387
00:15:55,030 --> 00:15:52,639
time 6 54 eastern

388
00:15:57,030 --> 00:15:55,040

and that is uh just about 39 minutes

389
00:15:58,389 --> 00:15:57,040
away now but of course starliner will be

390
00:15:59,990 --> 00:15:58,399
docking at the international space

391
00:16:02,230 --> 00:16:00,000
station so we want to make sure that the

392
00:16:03,829 --> 00:16:02,240
space station is ready to host us that

393
00:16:05,350 --> 00:16:03,839
means that just down the hall we've got

394
00:16:07,269 --> 00:16:05,360
the international space station flight

395
00:16:08,949 --> 00:16:07,279
control team watching over their systems

396
00:16:10,870 --> 00:16:08,959
and verifying that they're ready we're

397
00:16:12,389 --> 00:16:10,880
going to toss it down there now to gary

398
00:16:14,069 --> 00:16:12,399
jordan who's been watching over with

399
00:16:16,069 --> 00:16:14,079
them

400
00:16:17,189 --> 00:16:16,079
hey thank you brandi and josh yes i'm

401
00:16:19,350 --> 00:16:17,199
right down the hall here in mission

402
00:16:21,030 --> 00:16:19,360
control houston behind me the flight

403
00:16:23,110 --> 00:16:21,040
controllers are looking after the

404
00:16:24,790 --> 00:16:23,120
orbiting lavatory that's the destination

405
00:16:27,110 --> 00:16:24,800
of the boeing starliner the

406
00:16:29,509 --> 00:16:27,120
international space station teams here

407
00:16:30,629 --> 00:16:29,519
are led by flight director anthony varya

408
00:16:33,350 --> 00:16:30,639
right now they're checking out the

409
00:16:35,189 --> 00:16:33,360
station systems to get ready for a go

410
00:16:36,389 --> 00:16:35,199
for launch and making sure that the

411
00:16:38,870 --> 00:16:36,399
station itself

412
00:16:40,629 --> 00:16:38,880
is ready to receive starliner we'll be

413
00:16:42,470 --> 00:16:40,639

watching today's launch closely in this

414
00:16:44,389 --> 00:16:42,480
room but really we'll kick into gear

415
00:16:46,310 --> 00:16:44,399
tomorrow when we set up for joint

416
00:16:48,230 --> 00:16:46,320
operations with the teams down the hall

417
00:16:50,710 --> 00:16:48,240
where brandy and josh are controlling

418
00:16:52,949 --> 00:16:50,720
the boeing starliner shortly after

419
00:16:54,710 --> 00:16:52,959
launch and throughout tonight starliner

420
00:16:56,790 --> 00:16:54,720
will execute a series of burns to

421
00:16:59,030 --> 00:16:56,800
gradually raise its orbit and catch up

422
00:17:00,870 --> 00:16:59,040
with the orbiting lab we'll also see a

423
00:17:03,430 --> 00:17:00,880
series of demonstrations to test

424
00:17:05,990 --> 00:17:03,440
starliner systems and capabilities all

425
00:17:07,590 --> 00:17:06,000
along the way until docking about 24

426
00:17:10,069 --> 00:17:07,600
hours after launch

427
00:17:12,069 --> 00:17:10,079
in the meantime the expedition 67 crew

428
00:17:14,069 --> 00:17:12,079
is in a sleep period getting some rest

429
00:17:16,150 --> 00:17:14,079
before supporting a docking late at

430
00:17:18,230 --> 00:17:16,160
night greenwich meantime tomorrow but we

431
00:17:19,909 --> 00:17:18,240
did hear that the crew uh requested to

432
00:17:21,669 --> 00:17:19,919
watch the launch through the broadcast

433
00:17:23,750 --> 00:17:21,679
so everybody say hi to the crew from

434
00:17:26,069 --> 00:17:23,760
left to right we have nasa astronaut bob

435
00:17:27,909 --> 00:17:26,079
hines european space agency astronaut

436
00:17:30,710 --> 00:17:27,919
samantha christopher reddy of rose

437
00:17:32,789 --> 00:17:30,720
cosmos we have denise matveyev uh oleg

438
00:17:34,070 --> 00:17:32,799

artemyev and sergey korsakov and

439
00:17:36,390 --> 00:17:34,080
rounding out the crew with nasa

440
00:17:38,710 --> 00:17:36,400
astronauts jessica watkins and chell

441
00:17:40,789 --> 00:17:38,720
lindgren lindgren and heinz will be

442
00:17:42,390 --> 00:17:40,799
monitoring starliner's approach and

443
00:17:44,470 --> 00:17:42,400
docking tomorrow

444
00:17:46,310 --> 00:17:44,480
after tomorrow's docking the crew will

445
00:17:48,710 --> 00:17:46,320
open up the hatches the following day

446
00:17:49,990 --> 00:17:48,720
and formally welcome the starliner to

447
00:17:51,909 --> 00:17:50,000
the station

448
00:17:53,830 --> 00:17:51,919
so again the international space station

449
00:17:55,990 --> 00:17:53,840
flight control teams are getting ready

450
00:17:57,590 --> 00:17:56,000
to give their go for launch in the

451
00:17:59,510 --> 00:17:57,600
meantime let's get back to the action

452
00:18:01,270 --> 00:17:59,520
with d and megan over at the kennedy

453
00:18:03,029 --> 00:18:01,280
space center

454
00:18:04,630 --> 00:18:03,039
here to talk about the importance of

455
00:18:06,789 --> 00:18:04,640
this day is kennedy space center

456
00:18:08,630 --> 00:18:06,799
director janet petro and she's with

457
00:18:10,230 --> 00:18:08,640
nasa's megan cruz

458
00:18:11,750 --> 00:18:10,240
dee thank you so much and yes this is

459
00:18:13,830 --> 00:18:11,760
janet petrojana thank you so much for

460
00:18:16,310 --> 00:18:13,840
being here thank you megan well today's

461
00:18:18,230 --> 00:18:16,320
flight test is about certifying boeing's

462
00:18:20,789 --> 00:18:18,240
starliner capsule can you talk to us

463
00:18:23,350 --> 00:18:20,799

about what that means sure that's right

464
00:18:25,350 --> 00:18:23,360
megan um this orbital test flight is

465
00:18:27,029 --> 00:18:25,360
going to be launching of course from

466
00:18:29,270 --> 00:18:27,039
here it's going to be going docking with

467
00:18:30,549 --> 00:18:29,280
the international space station then

468
00:18:31,750 --> 00:18:30,559
it's going to be undocking and then it's

469
00:18:33,909 --> 00:18:31,760
going to be landing in the western

470
00:18:35,110 --> 00:18:33,919
hemisphere and this is a uncrewed test

471
00:18:36,870 --> 00:18:35,120
flight

472
00:18:39,190 --> 00:18:36,880
and then this will allow us to be able

473
00:18:41,190 --> 00:18:39,200
to certify that vehicle so that we will

474
00:18:42,950 --> 00:18:41,200
then be able to put our crew on it for

475
00:18:45,029 --> 00:18:42,960
another test flight and then that'll

476
00:18:47,029 --> 00:18:45,039
lead to services with the um boeing

477
00:18:49,270 --> 00:18:47,039
starliner where we can purchase them

478
00:18:51,830 --> 00:18:49,280
right so then once it's certified then

479
00:18:53,909 --> 00:18:51,840
that means we have a second provider how

480
00:18:56,310 --> 00:18:53,919
will that help nasa's commercial crew

481
00:18:57,909 --> 00:18:56,320
program grow so when we started out this

482
00:19:00,549 --> 00:18:57,919
program you know we always wanted to

483
00:19:03,110 --> 00:19:00,559
have more than one provider so having a

484
00:19:05,590 --> 00:19:03,120
second uh provider that we can purchase

485
00:19:07,190 --> 00:19:05,600
a commercial service from to transport

486
00:19:09,590 --> 00:19:07,200
our astronauts to and from the

487
00:19:11,990 --> 00:19:09,600
international space station gives us a

488
00:19:14,470 --> 00:19:12,000

reliability redundancy that we really

489
00:19:16,549 --> 00:19:14,480
need and we really want uh within our

490
00:19:18,150 --> 00:19:16,559
commercial crew program and that allows

491
00:19:19,909 --> 00:19:18,160
us to do even more research on the

492
00:19:21,830 --> 00:19:19,919
international space station allow us to

493
00:19:23,350 --> 00:19:21,840
do the technology development that we're

494
00:19:25,110 --> 00:19:23,360
going to need as we continue our

495
00:19:27,190 --> 00:19:25,120
exploration mission further out into

496
00:19:28,710 --> 00:19:27,200
deep space back to the moon and then on

497
00:19:30,390 --> 00:19:28,720
to mars so it sounds like a second

498
00:19:32,150 --> 00:19:30,400
provider is going to mean more launches

499
00:19:34,230 --> 00:19:32,160
from here on the space coast you know

500
00:19:36,470 --> 00:19:34,240
how has kennedy space center been

501
00:19:39,590 --> 00:19:36,480
handling this ever-growing role as a

502
00:19:43,350 --> 00:19:39,600
multi-user spaceport so it's interesting

503
00:19:45,430 --> 00:19:43,360
i i found a pamphlet um in my dad's uh

504
00:19:48,710 --> 00:19:45,440
belongings that showed that as early as

505
00:19:51,510 --> 00:19:48,720
the 1970s kennedy was known as america's

506
00:19:53,430 --> 00:19:51,520
spaceport and as you know about 10 years

507
00:19:55,110 --> 00:19:53,440
ago following the retirement of the

508
00:19:57,270 --> 00:19:55,120
space shuttle we embarked on a

509
00:19:59,750 --> 00:19:57,280
transformation to a multi-user spaceport

510
00:20:01,909 --> 00:19:59,760
what you see out here today is a result

511
00:20:04,549 --> 00:20:01,919
of that transformation and so you're

512
00:20:06,870 --> 00:20:04,559
absolutely right we have an awful lot of

513
00:20:08,789 --> 00:20:06,880

launches from here we are a very very

514
00:20:12,390 --> 00:20:08,799
busy spaceport and we're very very proud

515
00:20:14,710 --> 00:20:12,400
of it we have over 250 agreements

516
00:20:16,789 --> 00:20:14,720
close to 100

517
00:20:19,350 --> 00:20:16,799
250 partnerships and 100 separate

518
00:20:21,669 --> 00:20:19,360
agreements out here today and another

519
00:20:24,230 --> 00:20:21,679
just interesting fact one of the first

520
00:20:25,750 --> 00:20:24,240
assets or facilities that we didn't need

521
00:20:28,230 --> 00:20:25,760
after the space shuttle program that we

522
00:20:29,830 --> 00:20:28,240
entered a partnership in is the very one

523
00:20:33,350 --> 00:20:29,840
that the starliner was being built in

524
00:20:36,070 --> 00:20:33,360
today so the c3pf that the starliner was

525
00:20:37,430 --> 00:20:36,080
manufactured and tested in today that

526
00:20:40,070 --> 00:20:37,440
we're going to launch on this test

527
00:20:41,750 --> 00:20:40,080
flight um started uh more than 10 years

528
00:20:44,070 --> 00:20:41,760
ago with that that used to be the

529
00:20:45,750 --> 00:20:44,080
orbiter processing facility or opf 3 as

530
00:20:47,669 --> 00:20:45,760
we knew it so yeah i love when things

531
00:20:49,909 --> 00:20:47,679
come full circle thank you so much janet

532
00:20:52,070 --> 00:20:49,919
you're welcome thank you megan back to

533
00:20:54,230 --> 00:20:52,080
you guys all right thank you megan and

534
00:20:56,390 --> 00:20:54,240
janet great history there on the boeing

535
00:20:58,149 --> 00:20:56,400
facility here at kennedy time now to

536
00:20:59,830 --> 00:20:58,159
find out how the countdown to the launch

537
00:21:02,549 --> 00:20:59,840
of nasa and boeing's orbital flight test

538
00:21:04,710 --> 00:21:02,559

two is going we're at l minus 34 minutes

539
00:21:06,549 --> 00:21:04,720
and counting so let's get back to the

540
00:21:08,870 --> 00:21:06,559
atlas space flight operations center

541
00:21:10,549 --> 00:21:08,880
with lauren and dylan

542
00:21:12,870 --> 00:21:10,559
daryl from where i'm standing right here

543
00:21:15,270 --> 00:21:12,880
i'm able to actually turn around and see

544
00:21:17,270 --> 00:21:15,280
nasa astronaut sunny williams and she's

545
00:21:19,270 --> 00:21:17,280
on console working with her colleagues

546
00:21:21,270 --> 00:21:19,280
and following along with this countdown

547
00:21:23,990 --> 00:21:21,280
of course she's here because we do not

548
00:21:26,230 --> 00:21:24,000
have any crew on board today um we are

549
00:21:29,909 --> 00:21:26,240
taking a rather heavy load of cargo up

550
00:21:31,830 --> 00:21:29,919
with us about 800 pounds up to the iss

551
00:21:33,750 --> 00:21:31,840
rosie the rocketeer is back as you heard

552
00:21:36,470 --> 00:21:33,760
josh mentioned earlier of course she

553
00:21:38,390 --> 00:21:36,480
sort of stole the show last time but

554
00:21:40,390 --> 00:21:38,400
what's really amazing is we were able to

555
00:21:42,710 --> 00:21:40,400
gain so much information from the

556
00:21:44,789 --> 00:21:42,720
sensors that were on her last time that

557
00:21:46,870 --> 00:21:44,799
now we've moved those sensors to other

558
00:21:49,029 --> 00:21:46,880
parts of the spacecraft and to the other

559
00:21:51,350 --> 00:21:49,039
seats in the spacecraft that way we have

560
00:21:53,350 --> 00:21:51,360
a better idea of how other passengers

561
00:21:54,870 --> 00:21:53,360
will ride on starliner

562
00:21:56,470 --> 00:21:54,880
now having her in the commander's seat

563
00:21:58,470 --> 00:21:56,480

also helps maintain the center of

564
00:22:01,029 --> 00:21:58,480
gravity during the mission and you can

565
00:22:02,789 --> 00:22:01,039
see she's wearing the oft2 mission patch

566
00:22:04,870 --> 00:22:02,799
on the right side of her chest and of

567
00:22:07,029 --> 00:22:04,880
course the classic red bandana with

568
00:22:09,029 --> 00:22:07,039
white polka dots hers was actually

569
00:22:11,430 --> 00:22:09,039
autographed by one of the original rosie

570
00:22:13,430 --> 00:22:11,440
the riveters mae cryer

571
00:22:14,470 --> 00:22:13,440
she wrote to her to the moon and the

572
00:22:17,590 --> 00:22:14,480
stars

573
00:22:19,669 --> 00:22:17,600
our rosie named that after that rosie of

574
00:22:22,230 --> 00:22:19,679
course and they are both

575
00:22:24,310 --> 00:22:22,240
they both embody inspiration strength

576
00:22:26,870 --> 00:22:24,320
hope and determination

577
00:22:29,029 --> 00:22:26,880
a famous world war ii icon and boeing

578
00:22:32,230 --> 00:22:29,039
factory worker who helped build planes

579
00:22:34,070 --> 00:22:32,240
at just 17 years old rosie the riveter

580
00:22:36,710 --> 00:22:34,080
recruited scores of women to enter the

581
00:22:38,789 --> 00:22:36,720
workforce in record numbers today boeing

582
00:22:41,350 --> 00:22:38,799
continues its rich history of recruiting

583
00:22:43,750 --> 00:22:41,360
supporting and developing women i can

584
00:22:46,070 --> 00:22:43,760
personally attest to that and as of last

585
00:22:47,830 --> 00:22:46,080
year women made up more than 24 of

586
00:22:49,430 --> 00:22:47,840
boeing's workforce

587
00:22:52,230 --> 00:22:49,440
now let's talk about some of the other

588
00:22:55,029 --> 00:22:52,240

cargo going up they will also be taking

589
00:22:57,669 --> 00:22:55,039
nasa cargo with them uh food and crew

590
00:22:59,510 --> 00:22:57,679
going up for the current expedition crew

591
00:23:03,029 --> 00:22:59,520
and then we will be bringing back about

592
00:23:04,149 --> 00:23:03,039
600 pounds of nasa cargo

593
00:23:05,590 --> 00:23:04,159
we will also be taking some

594
00:23:07,669 --> 00:23:05,600
commemorative items for many

595
00:23:09,909 --> 00:23:07,679
organizations that play a role in

596
00:23:12,230 --> 00:23:09,919
starliner's development including

597
00:23:13,909 --> 00:23:12,240
several american flags mission patches

598
00:23:15,830 --> 00:23:13,919
and other unique items that will make

599
00:23:17,669 --> 00:23:15,840
the trip to orbit and then later we'll

600
00:23:19,430 --> 00:23:17,679
be able to give those back to 14

601
00:23:21,990 --> 00:23:19,440
historically black colleges and

602
00:23:23,909 --> 00:23:22,000
universities throughout the us so pretty

603
00:23:26,710 --> 00:23:23,919
cool for someone to have something

604
00:23:28,310 --> 00:23:26,720
tangible to be able to say this was once

605
00:23:30,070 --> 00:23:28,320
in space

606
00:23:32,149 --> 00:23:30,080
our teams are activating the service

607
00:23:34,310 --> 00:23:32,159
module propulsion system right now for

608
00:23:36,549 --> 00:23:34,320
launch sort of like priming your engine

609
00:23:39,430 --> 00:23:36,559
making sure things are ready to go for

610
00:23:41,110 --> 00:23:39,440
both nominal and abort situations dylan

611
00:23:42,230 --> 00:23:41,120
how are things going to the rocket

612
00:23:43,830 --> 00:23:42,240
well things are going great with the

613
00:23:45,430 --> 00:23:43,840

rocket luring we remain in the final

614
00:23:47,350 --> 00:23:45,440
built-in hold as we continue to prepare

615
00:23:48,870 --> 00:23:47,360
for liftoff there are a few activities

616
00:23:51,190 --> 00:23:48,880
still ahead of us today

617
00:23:52,549 --> 00:23:51,200
the blue team is now clearing the

618
00:23:54,310 --> 00:23:52,559
clearing the tower and clearing the pad

619
00:23:56,310 --> 00:23:54,320
and final preparations for launch are

620
00:23:58,789 --> 00:23:56,320
underway as we prepare the vehicle's

621
00:24:00,710 --> 00:23:58,799
propulsion hydraulic systems for flight

622
00:24:02,070 --> 00:24:00,720
the avionics team will be taking upper

623
00:24:03,990 --> 00:24:02,080
level wind data and loading that into

624
00:24:05,430 --> 00:24:04,000
our flight computer that helps atlas

625
00:24:07,669 --> 00:24:05,440
centaur and starliner kind of steer its

626
00:24:09,510 --> 00:24:07,679
way through the the winds as we move

627
00:24:11,350 --> 00:24:09,520
through the atmosphere

628
00:24:13,590 --> 00:24:11,360
also we'll we'll hear very shortly com

629
00:24:16,230 --> 00:24:13,600
checks between the launch control center

630
00:24:18,070 --> 00:24:16,240
mission control in houston the bmcc at

631
00:24:19,510 --> 00:24:18,080
kennedy space center

632
00:24:21,510 --> 00:24:19,520
and then for crude missions the

633
00:24:23,909 --> 00:24:21,520
astronauts will prepare will participate

634
00:24:25,990 --> 00:24:23,919
in that comm check as well uh once all

635
00:24:27,830 --> 00:24:26,000
that work is done the crew access arm

636
00:24:30,149 --> 00:24:27,840
will be retracted and then the team will

637
00:24:31,990 --> 00:24:30,159
start the final polling for launch

638
00:24:33,510 --> 00:24:32,000

and as you mentioned there are a lot of

639
00:24:35,750 --> 00:24:33,520
things that our crews throughout both

640
00:24:37,750 --> 00:24:35,760
ula and boeing are doing today as sort

641
00:24:39,350 --> 00:24:37,760
of practice for crude launch they don't

642
00:24:41,350 --> 00:24:39,360
necessarily have to do it today but it's

643
00:24:44,070 --> 00:24:41,360
a good time to practice for the next

644
00:24:45,430 --> 00:24:44,080
flight so daryl and d back over to you

645
00:24:47,269 --> 00:24:45,440
all right we'll check back in with you

646
00:24:49,430 --> 00:24:47,279
both in just a little bit

647
00:24:52,230 --> 00:24:49,440
today is boeing's third test of the

648
00:24:53,990 --> 00:24:52,240
starliner capsule in november 2019

649
00:24:55,510 --> 00:24:54,000
boeing successfully completed a pad

650
00:24:57,750 --> 00:24:55,520
abort test which demonstrated the

651
00:24:59,430 --> 00:24:57,760
spacecraft's ability to keep astronauts

652
00:25:02,390 --> 00:24:59,440
safe in the unlikely event of an

653
00:25:04,390 --> 00:25:02,400
emergency on the pad or during flight a

654
00:25:07,430 --> 00:25:04,400
month later starliner launched on the

655
00:25:09,590 --> 00:25:07,440
first orbital flight test or oft the

656
00:25:11,830 --> 00:25:09,600
spacecraft got into orbit and safely

657
00:25:14,070 --> 00:25:11,840
returned from space but did not get into

658
00:25:16,310 --> 00:25:14,080
the proper orbit to rendezvous with the

659
00:25:17,830 --> 00:25:16,320
space station and that leads us to today

660
00:25:19,750 --> 00:25:17,840
with ofc 2.

661
00:25:21,990 --> 00:25:19,760
and starliner's return to the launch pad

662
00:25:24,310 --> 00:25:22,000
comes after months of diligent testing

663
00:25:26,549 --> 00:25:24,320

and analysis work by the boeing team

664
00:25:29,029 --> 00:25:26,559
this became necessary when propulsion

665
00:25:30,789 --> 00:25:29,039
system valves did not open as designed

666
00:25:33,669 --> 00:25:30,799
during pre-launch system checks last

667
00:25:38,840 --> 00:25:33,679
year here's a closer look at our journey

668
00:25:54,789 --> 00:25:53,669
[Music]

669
00:25:55,669 --> 00:25:54,799
three

670
00:25:57,350 --> 00:25:55,679
two

671
00:26:00,630 --> 00:25:57,360
one

672
00:26:03,669 --> 00:26:00,640
and lift off the rise of starliner and a

673
00:26:05,909 --> 00:26:03,679
new era in human space

674
00:26:08,470 --> 00:26:05,919
we're right there again ready to launch

675
00:26:11,029 --> 00:26:08,480
and excited for it i'll walk around and

676
00:26:13,110 --> 00:26:11,039
see everybody they have their a game on

677
00:26:16,230 --> 00:26:13,120
it's taken a village really to get to

678
00:26:19,830 --> 00:26:17,909
on our day of launch for the first

679
00:26:22,549 --> 00:26:19,840
attempt of oft2 we were going through

680
00:26:26,070 --> 00:26:22,559
our nominal day of launch procedures our

681
00:26:28,149 --> 00:26:26,080
nominal checkouts and we found that

682
00:26:29,430 --> 00:26:28,159
during our countdown to launch we had

683
00:26:33,190 --> 00:26:29,440
valves that were not functioning

684
00:26:35,830 --> 00:26:33,200
properly last year's launch attempt was

685
00:26:37,750 --> 00:26:35,840
scrubbed because we could not satisfy

686
00:26:40,070 --> 00:26:37,760
some launch commit criteria that were

687
00:26:42,549 --> 00:26:40,080
put in place in order for us to have a

688
00:26:44,630 --> 00:26:42,559

safe mission the team took a really hard

689
00:26:46,230 --> 00:26:44,640
look at the data and said you know

690
00:26:47,269 --> 00:26:46,240
we're not comfortable with flying we

691
00:26:49,430 --> 00:26:47,279
have to

692
00:26:51,590 --> 00:26:49,440
fail to succeed

693
00:26:53,909 --> 00:26:51,600
failure is just something that you know

694
00:26:55,269 --> 00:26:53,919
it's going to happen but as long as you

695
00:26:56,710 --> 00:26:55,279
learn and that's the reason you want to

696
00:26:58,870 --> 00:26:56,720
be an engineer the reason you want to be

697
00:27:01,990 --> 00:26:58,880
a technician is to solve solve those

698
00:27:04,310 --> 00:27:02,000
problems as they come up we carefully

699
00:27:06,630 --> 00:27:04,320
took a step back we troubleshot the

700
00:27:09,269 --> 00:27:06,640
problem we got to an understanding of

701
00:27:11,269 --> 00:27:09,279
what the failure was we put mitigation

702
00:27:12,950 --> 00:27:11,279
in place and we've proven that that

703
00:27:14,789 --> 00:27:12,960
mitigation works and we've tested the

704
00:27:17,269 --> 00:27:14,799
valve several times

705
00:27:18,870 --> 00:27:17,279
in preparation for this flight so for

706
00:27:20,549 --> 00:27:18,880
this flight we are flying with a brand

707
00:27:22,230 --> 00:27:20,559
new service module we're flying with

708
00:27:24,630 --> 00:27:22,240
entirely new valves and we're also

709
00:27:26,789 --> 00:27:24,640
flying with an integrated

710
00:27:29,990 --> 00:27:26,799
direct purge system which is going to

711
00:27:32,149 --> 00:27:30,000
keep our valves nice and dry and prevent

712
00:27:33,669 --> 00:27:32,159
that corrosion from forming so we ended

713
00:27:35,190 --> 00:27:33,679

up with a higher quality product in the

714
00:27:37,750 --> 00:27:35,200
end which is fantastic because we've

715
00:27:40,630 --> 00:27:37,760
learned a lot from it we really took our

716
00:27:42,870 --> 00:27:40,640
time to get it right

717
00:27:44,710 --> 00:27:42,880
because ultimately our goal is to fly

718
00:27:46,710 --> 00:27:44,720
astronauts safely to and from the

719
00:27:47,510 --> 00:27:46,720
international space station and safety

720
00:27:48,470 --> 00:27:47,520
is

721
00:27:49,990 --> 00:27:48,480
paramount

722
00:27:51,590 --> 00:27:50,000
people that are very passionate about

723
00:27:54,470 --> 00:27:51,600
the work that they do

724
00:27:56,630 --> 00:27:54,480
they understand uh the importance of

725
00:27:59,029 --> 00:27:56,640
every little step that they take

726
00:28:01,110 --> 00:27:59,039
and and it contributes to making this

727
00:28:05,029 --> 00:28:01,120
vehicle the safest and of the highest

728
00:28:09,750 --> 00:28:06,950
it's huge really to have a second crew

729
00:28:11,669 --> 00:28:09,760
transportation system um we really want

730
00:28:13,750 --> 00:28:11,679
that that's the goal of the commercial

731
00:28:15,990 --> 00:28:13,760
crew program every decision that we that

732
00:28:17,510 --> 00:28:16,000
we make we we definitely have the

733
00:28:19,269 --> 00:28:17,520
astronauts

734
00:28:21,430 --> 00:28:19,279
safety in mind

735
00:28:22,870 --> 00:28:21,440
it's not only the astronauts that are

736
00:28:24,630 --> 00:28:22,880
flying it but it's the people working

737
00:28:26,950 --> 00:28:24,640
around the spacecraft our goal is to

738
00:28:28,870 --> 00:28:26,960

keep everyone safe

739
00:28:30,549 --> 00:28:28,880
knowing again that our friends are going

740
00:28:32,149 --> 00:28:30,559
up there and and they're gonna take this

741
00:28:33,669 --> 00:28:32,159
awesome ride to space and come back home

742
00:28:35,750 --> 00:28:33,679
and we're gonna be able to deliver them

743
00:28:37,430 --> 00:28:35,760
back to their families you know safe and

744
00:28:39,830 --> 00:28:37,440
sound

745
00:28:41,909 --> 00:28:39,840
it's pretty special it really is

746
00:28:43,590 --> 00:28:41,919
i am very emotional about it yes because

747
00:28:45,510 --> 00:28:43,600
this has just been a passion of mine for

748
00:28:47,590 --> 00:28:45,520
a long time first launch

749
00:28:49,830 --> 00:28:47,600
proved that we could meet two of the

750
00:28:51,590 --> 00:28:49,840
objectives one was getting successfully

751
00:28:53,029 --> 00:28:51,600
into orbit and two is landing the

752
00:28:54,789 --> 00:28:53,039
vehicle safely

753
00:28:56,710 --> 00:28:54,799
this mission is all about what

754
00:28:58,549 --> 00:28:56,720
everything that happens in between

755
00:28:59,750 --> 00:28:58,559
we're to launch it's going to go great

756
00:29:01,510 --> 00:28:59,760
we're going to come back home and then

757
00:29:02,950 --> 00:29:01,520
we're on to the next one

758
00:29:05,350 --> 00:29:02,960
go bowling

759
00:29:08,140 --> 00:29:05,360
that is my last start it's two words

760
00:29:12,710 --> 00:29:08,150
just go bowling

761
00:29:14,950 --> 00:29:12,720
[Music]

762
00:29:16,870 --> 00:29:14,960
here's a live look inside the boeing

763
00:29:18,549 --> 00:29:16,880

mission control center where the launch

764
00:29:20,789 --> 00:29:18,559
team is working and monitoring

765
00:29:22,789 --> 00:29:20,799
pre-launch operations along with nasa

766
00:29:25,590 --> 00:29:22,799
astronauts that's right dee there's two

767
00:29:27,510 --> 00:29:25,600
nasa astronauts on console with this

768
00:29:30,310 --> 00:29:27,520
launch team today

769
00:29:32,630 --> 00:29:30,320
they are commander barry butch wilmore

770
00:29:33,990 --> 00:29:32,640
and mission specialist mike fink and

771
00:29:36,230 --> 00:29:34,000
there they are they're joining us live

772
00:29:38,389 --> 00:29:36,240
from a room immediately next door to the

773
00:29:40,310 --> 00:29:38,399
bmcc because we didn't want to pull them

774
00:29:42,950 --> 00:29:40,320
too far away from their consoles hey

775
00:29:45,669 --> 00:29:42,960
guys thank you both for taking the time

776
00:29:47,909 --> 00:29:45,679
butch and mike uh you guys were some of

777
00:29:49,990 --> 00:29:47,919
the last people to see and look inside

778
00:29:51,909 --> 00:29:50,000
that spacecraft today mike we have a

779
00:29:53,510 --> 00:29:51,919
shot of you actually

780
00:29:55,750 --> 00:29:53,520
doing some work tell us a little bit

781
00:29:57,430 --> 00:29:55,760
about what you did and what you saw and

782
00:29:58,870 --> 00:29:57,440
how you're feeling

783
00:30:01,510 --> 00:29:58,880
yes uh

784
00:30:04,630 --> 00:30:01,520
starliner looks great myself and

785
00:30:06,389 --> 00:30:04,640
our other astronaut sunny williams who

786
00:30:08,149 --> 00:30:06,399
along with the boeing team

787
00:30:10,549 --> 00:30:08,159
who stayed up late last night getting

788
00:30:12,389 --> 00:30:10,559

the capsule ready uh we performed com

789
00:30:15,430 --> 00:30:12,399
checks back and forth to the mission

790
00:30:17,750 --> 00:30:15,440
control center in houston uh to the

791
00:30:19,430 --> 00:30:17,760
boeing mission control center here in uh

792
00:30:21,430 --> 00:30:19,440
florida at ksc

793
00:30:23,269 --> 00:30:21,440
we did it all through the tdrs which is

794
00:30:32,230 --> 00:30:23,279
a

795
00:30:35,110 --> 00:30:32,240
switches rosie doesn't move so much so

796
00:30:36,870 --> 00:30:35,120
we set them up for and we made sure the

797
00:30:38,810 --> 00:30:36,880
cockpit was ready for launch yeah and i

798
00:30:41,430 --> 00:30:38,820
didn't go because rosie took my spot

799
00:30:43,110 --> 00:30:41,440
[Laughter]

800
00:30:44,710 --> 00:30:43,120
well she is anthropomorphic not

801
00:30:45,590 --> 00:30:44,720
animatronic right

802
00:30:47,269 --> 00:30:45,600
so

803
00:30:48,710 --> 00:30:47,279
we did give her a high five on the way

804
00:30:50,950 --> 00:30:48,720
out yeah

805
00:30:52,389 --> 00:30:50,960
we wish her all the best she's going to

806
00:30:54,149 --> 00:30:52,399
get some great data for us too

807
00:30:56,549 --> 00:30:54,159
especially for the launch loads and the

808
00:30:58,789 --> 00:30:56,559
landing loads so that we know that it's

809
00:31:00,950 --> 00:30:58,799
going to be great for humans to go fly

810
00:31:02,830 --> 00:31:00,960
we have a question for mike fink now why

811
00:31:05,269 --> 00:31:02,840
does nasa need two commercial crew

812
00:31:07,190 --> 00:31:05,279
providers oh we can't keep all of our

813
00:31:09,029 --> 00:31:07,200

eggs in one basket and i think some of

814
00:31:10,710 --> 00:31:09,039
the words that we've been saying in the

815
00:31:12,149 --> 00:31:10,720
past couple days is dissimilar

816
00:31:15,029 --> 00:31:12,159
redundancy in other words we have

817
00:31:17,430 --> 00:31:15,039
another way to go up besides the besides

818
00:31:19,110 --> 00:31:17,440
the spacex and the crew dragon and it's

819
00:31:21,269 --> 00:31:19,120
dissimilar so we're not using the same

820
00:31:22,710 --> 00:31:21,279
rocket or the same uh the same capsule

821
00:31:24,389 --> 00:31:22,720
so if there's something wrong with one

822
00:31:26,950 --> 00:31:24,399
we can still have a chance

823
00:31:28,549 --> 00:31:26,960
to continue our continuous human uh

824
00:31:31,590 --> 00:31:28,559
presence aboard the international space

825
00:31:33,029 --> 00:31:31,600
station and it allows nasa to not worry

826
00:31:34,870 --> 00:31:33,039
about the launches and landings for

827
00:31:37,430 --> 00:31:34,880
space station flight so we can focus on

828
00:31:39,830 --> 00:31:37,440
going to the moon and beyond

829
00:31:41,909 --> 00:31:39,840
butch how does an uncrewed test flight

830
00:31:44,149 --> 00:31:41,919
which is autopilot as you know prepare

831
00:31:45,509 --> 00:31:44,159
you for your flight test where you're

832
00:31:48,950 --> 00:31:45,519
going to be doing some of the manual

833
00:31:50,950 --> 00:31:48,960
flying of starliner yeah i tell you

834
00:31:52,230 --> 00:31:50,960
it is uncrude and we are very jealous

835
00:31:53,990 --> 00:31:52,240
about that

836
00:31:55,590 --> 00:31:54,000
because this is human space flight after

837
00:31:57,669 --> 00:31:55,600
all right but this is a normal

838
00:31:59,269 --> 00:31:57,679

progression this is this is a test

839
00:32:01,990 --> 00:31:59,279
evolution right this is experimental

840
00:32:03,190 --> 00:32:02,000
developmental space flight test and as

841
00:32:04,230 --> 00:32:03,200
you go through we're testing on the

842
00:32:06,310 --> 00:32:04,240
ground as you know all the different

843
00:32:09,110 --> 00:32:06,320
various systems we're in the simulator

844
00:32:10,470 --> 00:32:09,120
testing uh software hardware and of

845
00:32:11,990 --> 00:32:10,480
course this is like i said the normal

846
00:32:14,549 --> 00:32:12,000
progression so we'll go through the

847
00:32:17,590 --> 00:32:14,559
processes to go all the way launch

848
00:32:19,269 --> 00:32:17,600
rendezvous and doc undock fly around

849
00:32:21,509 --> 00:32:19,279
return to earth and enter descent

850
00:32:23,350 --> 00:32:21,519
landing and all of that and we learn an

851
00:32:25,590 --> 00:32:23,360
immense amount through all of those

852
00:32:27,350 --> 00:32:25,600
processes that are beneficial as we go

853
00:32:29,669 --> 00:32:27,360
forward because like you said we do have

854
00:32:31,430 --> 00:32:29,679
also flight test objectives to certify

855
00:32:32,710 --> 00:32:31,440
this spacecraft that we'll be doing when

856
00:32:34,870 --> 00:32:32,720
we have the crude mission which will be

857
00:32:37,350 --> 00:32:34,880
next you know hopefully six months yes

858
00:32:38,630 --> 00:32:37,360
or six is months or so so uh we'll get

859
00:32:40,710 --> 00:32:38,640
there eventually but we have to get this

860
00:32:43,750 --> 00:32:40,720
one done first to make sure that we are

861
00:32:45,669 --> 00:32:43,760
in line for the for that crude mission

862
00:32:48,310 --> 00:32:45,679
mike how does a mission to low earth

863
00:32:51,750 --> 00:32:48,320

orbit help with missions to deep space

864
00:32:54,070 --> 00:32:51,760
yes so uh i was really lucky uh we

865
00:32:55,909 --> 00:32:54,080
when i came here in 1996 we didn't have

866
00:32:57,509 --> 00:32:55,919
a space station yet and with the

867
00:32:59,669 --> 00:32:57,519
international space station we've

868
00:33:01,909 --> 00:32:59,679
learned how to live

869
00:33:03,990 --> 00:33:01,919
in orbit we've been able to

870
00:33:06,149 --> 00:33:04,000
work on some technologies such as our

871
00:33:08,070 --> 00:33:06,159
life support systems and other things

872
00:33:10,549 --> 00:33:08,080
and how to keep humans and living in

873
00:33:12,230 --> 00:33:10,559
space for long periods of time and then

874
00:33:13,909 --> 00:33:12,240
that'll help us when we go to the moon

875
00:33:15,909 --> 00:33:13,919
and mars and other places because we

876
00:33:18,070 --> 00:33:15,919
know how to live in space not just visit

877
00:33:21,430 --> 00:33:18,080
like we we did in the early parts of the

878
00:33:23,110 --> 00:33:21,440
program so it's a natural progression

879
00:33:24,710 --> 00:33:23,120
all right very good and you know what

880
00:33:26,230 --> 00:33:24,720
you guys were both out there at the pad

881
00:33:28,149 --> 00:33:26,240
and we have proof of it we're going to

882
00:33:29,990 --> 00:33:28,159
throw up a picture there you guys are in

883
00:33:33,190 --> 00:33:30,000
front of the rocket that's a nice shot i

884
00:33:34,630 --> 00:33:33,200
think butch you're a little taller yeah

885
00:33:36,310 --> 00:33:34,640
hey we want to thank you both for being

886
00:33:37,990 --> 00:33:36,320
with us really appreciate your time let

887
00:33:40,470 --> 00:33:38,000
you get back on console outstanding

888
00:33:42,149 --> 00:33:40,480

thank you thank you go starliner

889
00:33:43,750 --> 00:33:42,159
all right the 45th space wing just

890
00:33:46,149 --> 00:33:43,760
wrapped up a weather briefing with the

891
00:33:48,470 --> 00:33:46,159
launch team let's bring back in weather

892
00:33:51,110 --> 00:33:48,480
officer brian sizzik to talk about what

893
00:33:53,110 --> 00:33:51,120
was discussed brian will ulrich gave

894
00:33:56,230 --> 00:33:53,120
that briefing your fellow launch weather

895
00:33:58,310 --> 00:33:56,240
officer any updates there

896
00:33:59,750 --> 00:33:58,320
yes you did weather continues to look

897
00:34:01,269 --> 00:33:59,760
really good as you mentioned we just

898
00:34:03,110 --> 00:34:01,279
heard that brief from my colleague will

899
00:34:05,110 --> 00:34:03,120
ulrich the lead launch weather officer

900
00:34:07,190 --> 00:34:05,120
on this mission and weather

901
00:34:08,790 --> 00:34:07,200
continues to look very favorable as we

902
00:34:10,550 --> 00:34:08,800
head closer and closer to t-zero so

903
00:34:12,310 --> 00:34:10,560
here's a little bit of a different look

904
00:34:14,230 --> 00:34:12,320
earlier we looked at satellite now let's

905
00:34:16,950 --> 00:34:14,240
take a live look at the radar there's

906
00:34:18,310 --> 00:34:16,960
complex 41 and a 10 nautical mile ring

907
00:34:20,389 --> 00:34:18,320
around the pad that we're concerned

908
00:34:21,909 --> 00:34:20,399
about in terms of weather and the one

909
00:34:23,430 --> 00:34:21,919
feature that you'll notice here this

910
00:34:25,750 --> 00:34:23,440
squiggly line that's actually the

911
00:34:27,750 --> 00:34:25,760
leading edge of the sea breeze pushing

912
00:34:29,430 --> 00:34:27,760
in and that can often be a trigger for

913
00:34:31,430 --> 00:34:29,440

showers and thunderstorms in the

914
00:34:33,750 --> 00:34:31,440
summertime and late spring as we're in

915
00:34:35,349 --> 00:34:33,760
right now but notice really nothing

916
00:34:37,109 --> 00:34:35,359
going on across central florida and

917
00:34:39,270 --> 00:34:37,119
that's all thanks to those high upper

918
00:34:41,109 --> 00:34:39,280
level serious clouds really limiting the

919
00:34:44,470 --> 00:34:41,119
stability in the atmosphere so we remain

920
00:34:47,510 --> 00:34:44,480
go for weather and a 90 probability of

921
00:34:49,270 --> 00:34:47,520
remaining go as we head into t zero guys

922
00:34:50,950 --> 00:34:49,280
fantastic update thank you very much

923
00:34:52,710 --> 00:34:50,960
brian sizzik launch weather officer with

924
00:34:55,109 --> 00:34:52,720
the 45th space wing

925
00:34:57,430 --> 00:34:55,119
now we're getting down to money time i

926
00:34:59,430 --> 00:34:57,440
know the launch conductor is also

927
00:35:01,670 --> 00:34:59,440
talking to his team and we want to carry

928
00:35:03,670 --> 00:35:01,680
that moment live for you bravo so let's

929
00:35:05,430 --> 00:35:03,680
go back over to lauren and dylan at the

930
00:35:07,430 --> 00:35:05,440
space atlas space flight operations

931
00:35:09,030 --> 00:35:07,440
center

932
00:35:10,390 --> 00:35:09,040
yeah dee we are waiting to hear the

933
00:35:12,310 --> 00:35:10,400
spacecraft

934
00:35:14,310 --> 00:35:12,320
as well as the launch vehicle which will

935
00:35:15,670 --> 00:35:14,320
be coming up here shortly but in the

936
00:35:18,069 --> 00:35:15,680
meantime i want to tell you about some

937
00:35:20,390 --> 00:35:18,079
of the preps that have been going on um

938
00:35:21,589 --> 00:35:20,400

with our team over the last month our

939
00:35:23,750 --> 00:35:21,599
team has been cycling through

940
00:35:25,670 --> 00:35:23,760
starliner's isolation valves every few

941
00:35:28,390 --> 00:35:25,680
days since it was fueled up about 20

942
00:35:29,750 --> 00:35:28,400
days ago and that has continued while

943
00:35:32,230 --> 00:35:29,760
the spacecraft has been out at the

944
00:35:34,390 --> 00:35:32,240
launch complex just a few hours ago they

945
00:35:36,470 --> 00:35:34,400
also cycled through one last time

946
00:35:38,470 --> 00:35:36,480
meaning they made sure each valve opened

947
00:35:40,230 --> 00:35:38,480
and closed with no problem

948
00:35:41,670 --> 00:35:40,240
and everything went well and we are

949
00:35:44,230 --> 00:35:41,680
ready to fly

950
00:35:46,310 --> 00:35:44,240
and they also just a few minutes ago

951
00:35:48,870 --> 00:35:46,320
were able to open the valves and those

952
00:35:51,270 --> 00:35:48,880
will remain open through launch so we

953
00:35:52,950 --> 00:35:51,280
are good to go on all of that

954
00:35:55,270 --> 00:35:52,960
our teams have worked as well on the

955
00:35:57,430 --> 00:35:55,280
mission elapsed timer since oft one to

956
00:35:59,829 --> 00:35:57,440
ensure that it operates nominally today

957
00:36:01,270 --> 00:35:59,839
and during future flights and before we

958
00:36:03,109 --> 00:36:01,280
came on the air the spacecraft and

959
00:36:05,270 --> 00:36:03,119
launch vehicle were synchronized with

960
00:36:07,589 --> 00:36:05,280
the mission elapsed time at l minus

961
00:36:09,510 --> 00:36:07,599
three hours that will be done again

962
00:36:11,510 --> 00:36:09,520
during the terminal count and the flight

963
00:36:12,710 --> 00:36:11,520

director will verify it once we get into

964
00:36:14,390 --> 00:36:12,720
ascent

965
00:36:16,790 --> 00:36:14,400
now again in just a few minutes we are

966
00:36:19,109 --> 00:36:16,800
expecting the starliner readiness poll

967
00:36:21,109 --> 00:36:19,119
let's take a live look now inside the

968
00:36:23,270 --> 00:36:21,119
boeing mission control center that is

969
00:36:25,109 --> 00:36:23,280
where the poll will come from and it is

970
00:36:26,470 --> 00:36:25,119
a very short poll

971
00:36:28,950 --> 00:36:26,480
we will hear the spacecraft launch

972
00:36:30,550 --> 00:36:28,960
conductor louis atchison pull people

973
00:36:33,190 --> 00:36:30,560
inside that room in charge of the

974
00:36:35,670 --> 00:36:33,200
propulsion system and power and many

975
00:36:36,630 --> 00:36:35,680
other subsystems we will hear three

976
00:36:40,790 --> 00:36:36,640
calls

977
00:36:42,950 --> 00:36:40,800
mission support room manager or the msr

978
00:36:45,589 --> 00:36:42,960
and that's because after launch this

979
00:36:47,670 --> 00:36:45,599
room actually turns into mission support

980
00:36:50,630 --> 00:36:47,680
as things shift over to houston so they

981
00:36:52,790 --> 00:36:50,640
are there to have their back of

982
00:36:55,030 --> 00:36:52,800
their colleagues over in houston

983
00:36:56,630 --> 00:36:55,040
we will also hear from the spacecraft

984
00:36:59,109 --> 00:36:56,640
test conductor during that poll who

985
00:37:01,270 --> 00:36:59,119
monitors our power systems and the third

986
00:37:03,750 --> 00:37:01,280
call will come from the flight director

987
00:37:05,750 --> 00:37:03,760
over in mission control so we are

988
00:37:08,790 --> 00:37:05,760

expecting that poll to happen here

989
00:37:11,030 --> 00:37:08,800
pretty soon and i think we will

990
00:37:18,950 --> 00:37:11,040
stay quiet for just a moment and listen

991
00:37:23,109 --> 00:37:21,430
flight stc msr manager this is slick on

992
00:37:25,190 --> 00:37:23,119
lawn shops this time we'll conduct our

993
00:37:26,790 --> 00:37:25,200
cst 100 poll for terminal count report

994
00:37:28,950 --> 00:37:26,800
readiness to support terminal count when

995
00:37:31,670 --> 00:37:28,960
prompted msr manager

996
00:37:33,430 --> 00:37:31,680
msr is ready stc

997
00:37:34,630 --> 00:37:33,440
ect is ready

998
00:37:37,349 --> 00:37:34,640
fight

999
00:37:38,870 --> 00:37:37,359
let it go cst-100 is proceeding with

1000
00:37:41,109 --> 00:37:38,880
final configuration for launch all

1001
00:37:44,150 --> 00:37:41,119
operators monitor lccs and report any

1002
00:37:48,069 --> 00:37:44,160
lcc violations to your operations leads

1003
00:37:51,430 --> 00:37:49,270
smd

1004
00:37:52,550 --> 00:37:51,440
cst 100 is ready for terminal count the

1005
00:37:54,470 --> 00:37:52,560
management pole for launch will be

1006
00:37:57,349 --> 00:37:54,480
conducted on ula channel 3 at l minus

1007
00:38:01,109 --> 00:37:59,030
smd copies

1008
00:38:02,870 --> 00:38:01,119
all right sounds good we are good for

1009
00:38:04,390 --> 00:38:02,880
that so dylan can you talk to us a

1010
00:38:06,310 --> 00:38:04,400
little bit more about the gopher launch

1011
00:38:07,990 --> 00:38:06,320
poll that we're waiting to hear now sure

1012
00:38:09,430 --> 00:38:08,000
lauren so those once that polling is

1013
00:38:10,870 --> 00:38:09,440

done the uh the next big poll is going

1014
00:38:12,950 --> 00:38:10,880
to be coming up at the l minus eight

1015
00:38:14,150 --> 00:38:12,960
minutes is the mission management team

1016
00:38:15,270 --> 00:38:14,160
poll that's going to be conducted right

1017
00:38:16,550 --> 00:38:15,280
next door to us in the mission

1018
00:38:19,510 --> 00:38:16,560
director's center

1019
00:38:21,430 --> 00:38:19,520
and that will be uh ula launch director

1020
00:38:23,349 --> 00:38:21,440
uh lou mangeri who's gonna collect those

1021
00:38:24,870 --> 00:38:23,359
from the spacecraft mission director and

1022
00:38:26,950 --> 00:38:24,880
uh director of engineering in

1023
00:38:28,470 --> 00:38:26,960
preparation for providing the final

1024
00:38:30,069 --> 00:38:28,480
permission to launch

1025
00:38:31,349 --> 00:38:30,079
to chief launch conductor doug lebo at

1026
00:38:33,190 --> 00:38:31,359
the end of our terminal account status

1027
00:38:35,270 --> 00:38:33,200
check

1028
00:38:37,829 --> 00:38:35,280
all right dylan well we are just about

1029
00:38:39,349 --> 00:38:37,839
17 minutes away from launch we will now

1030
00:38:45,589 --> 00:38:39,359
toss it over to our colleagues josh and

1031
00:38:47,829 --> 00:38:47,030
thanks lauren

1032
00:38:49,430 --> 00:38:47,839
it's

1033
00:38:51,030 --> 00:38:49,440
i feel like we've said the word pull a

1034
00:38:52,550 --> 00:38:51,040
whole lot just now because it is this

1035
00:38:54,310 --> 00:38:52,560
point in the countdown when a whole lot

1036
00:38:55,990 --> 00:38:54,320
of pulls happen actually

1037
00:38:58,630 --> 00:38:56,000
flight director mike lammers pulled his

1038
00:39:00,630 --> 00:38:58,640

team right before he reported into our

1039
00:39:03,030 --> 00:39:00,640
spacecraft launch conductor lewis

1040
00:39:04,870 --> 00:39:03,040
atchison back in the bmcc

1041
00:39:07,270 --> 00:39:04,880
um i can't help but smiling because

1042
00:39:10,390 --> 00:39:07,280
we're all go right now it is very quiet

1043
00:39:12,230 --> 00:39:10,400
here in mission control from here on out

1044
00:39:13,589 --> 00:39:12,240
uh console operators will be monitoring

1045
00:39:16,550 --> 00:39:13,599
what's known as their launch commit

1046
00:39:19,910 --> 00:39:16,560
criteria or lcc's and their flight rules

1047
00:39:21,670 --> 00:39:19,920
now those are uh very long very involved

1048
00:39:23,270 --> 00:39:21,680
documents that basically just list the

1049
00:39:25,430 --> 00:39:23,280
parameters that the spacecraft and the

1050
00:39:27,910 --> 00:39:25,440
rocket have to be in to go to flight

1051
00:39:30,069 --> 00:39:27,920
that is uh including both redundant and

1052
00:39:32,470 --> 00:39:30,079
primary systems we want everything on

1053
00:39:34,069 --> 00:39:32,480
starliner working before we go fly today

1054
00:39:35,589 --> 00:39:34,079
and right now everything seems to be

1055
00:39:37,270 --> 00:39:35,599
working so we're we're in a good

1056
00:39:38,790 --> 00:39:37,280
countdown right now that's right there

1057
00:39:40,550 --> 00:39:38,800
are just a few more milestones to get

1058
00:39:42,310 --> 00:39:40,560
through before launch one coming up in

1059
00:39:44,870 --> 00:39:42,320
the next minute or so is uh the

1060
00:39:46,230 --> 00:39:44,880
switching of starliner from external to

1061
00:39:48,390 --> 00:39:46,240
internal power at that point the

1062
00:39:50,470 --> 00:39:48,400
spacecraft will be on battery power from

1063
00:39:52,390 --> 00:39:50,480

there on out but for most parts team

1064
00:39:54,950 --> 00:39:52,400
here is just watching waiting and

1065
00:39:56,550 --> 00:39:54,960
standing ready for a launch now 15

1066
00:39:58,310 --> 00:39:56,560
minutes away

1067
00:40:00,470 --> 00:39:58,320
we'll send you back to florida for now

1068
00:40:03,349 --> 00:40:00,480
but we will be back with you starting at

1069
00:40:05,030 --> 00:40:03,359
liftoff so today so stay tuned darryl

1070
00:40:06,630 --> 00:40:05,040
all right brandi and josh thank you and

1071
00:40:08,470 --> 00:40:06,640
we'll see you then

1072
00:40:10,230 --> 00:40:08,480
nasa is relying on boeing and several

1073
00:40:12,710 --> 00:40:10,240
other providers to help sustain our

1074
00:40:14,870 --> 00:40:12,720
permanent presence in space joining us

1075
00:40:16,470 --> 00:40:14,880
now with more on that is nasa's deputy

1076
00:40:19,990 --> 00:40:16,480
administrator and space shuttle

1077
00:40:21,670 --> 00:40:20,000
astronaut pam melroy she's with me

1078
00:40:23,349 --> 00:40:21,680
yeah there of course pam melroy thank

1079
00:40:25,030 --> 00:40:23,359
you so much for being here

1080
00:40:26,710 --> 00:40:25,040
oh i'm excited to be here this is a

1081
00:40:27,910 --> 00:40:26,720
great day yeah absolutely you know you

1082
00:40:29,510 --> 00:40:27,920
flew on three shuttle missions i'm

1083
00:40:31,829 --> 00:40:29,520
telling you like you don't know

1084
00:40:33,589 --> 00:40:31,839
all to build the international station

1085
00:40:35,829 --> 00:40:33,599
space station so with that in mind how

1086
00:40:38,390 --> 00:40:35,839
does it feel to be here today as nasa

1087
00:40:40,069 --> 00:40:38,400
works to certify a second provider

1088
00:40:42,150 --> 00:40:40,079

meaning more trips hopefully to the

1089
00:40:43,910 --> 00:40:42,160
international space station oh this is a

1090
00:40:46,470 --> 00:40:43,920
great moment you know when we built the

1091
00:40:48,390 --> 00:40:46,480
space station we were really focused on

1092
00:40:50,950 --> 00:40:48,400
all the amazing science that we could do

1093
00:40:52,710 --> 00:40:50,960
and the innovation and so now having

1094
00:40:54,710 --> 00:40:52,720
another way to get there

1095
00:40:57,190 --> 00:40:54,720
just gives us more resilience it allows

1096
00:41:00,230 --> 00:40:57,200
us to do even more science and i think

1097
00:41:01,910 --> 00:41:00,240
as a former shuttle astronaut at a time

1098
00:41:03,990 --> 00:41:01,920
when there were only two human

1099
00:41:05,349 --> 00:41:04,000
spacecraft that were available in the

1100
00:41:06,710 --> 00:41:05,359
entire world

1101
00:41:09,190 --> 00:41:06,720
and now

1102
00:41:12,069 --> 00:41:09,200
we have more and that means more people

1103
00:41:13,589 --> 00:41:12,079
can go to space and uh the innovation

1104
00:41:15,430 --> 00:41:13,599
that happens at the space station is

1105
00:41:16,710 --> 00:41:15,440
just so exciting to think about yeah i

1106
00:41:17,990 --> 00:41:16,720
love how you light up when you talk

1107
00:41:19,750 --> 00:41:18,000
about this because

1108
00:41:21,750 --> 00:41:19,760
tommy i mean it's so important to

1109
00:41:24,309 --> 00:41:21,760
sustain this permanent presence in space

1110
00:41:27,190 --> 00:41:24,319
right it's incredibly important

1111
00:41:30,390 --> 00:41:27,200
we hope to go out into the solar system

1112
00:41:31,190 --> 00:41:30,400
with humans to do science and to explore

1113
00:41:33,430 --> 00:41:31,200

and

1114
00:41:35,349 --> 00:41:33,440
those are really long trips so we really

1115
00:41:37,910 --> 00:41:35,359
need to understand how to live and

1116
00:41:39,990 --> 00:41:37,920
operate in space the international space

1117
00:41:43,030 --> 00:41:40,000
station is providing critical

1118
00:41:45,589 --> 00:41:43,040
technologies that we are testing to go

1119
00:41:48,230 --> 00:41:45,599
on onto the moon and out to mars and

1120
00:41:49,750 --> 00:41:48,240
even beyond but in addition to that what

1121
00:41:54,069 --> 00:41:49,760
we've really found

1122
00:41:57,430 --> 00:41:54,079
is that having a lab allows us to have

1123
00:42:00,309 --> 00:41:57,440
more innovation so the shuttle only flew

1124
00:42:03,510 --> 00:42:00,319
five six seven times a year for about 10

1125
00:42:06,390 --> 00:42:03,520
days to two weeks at a time now we have

1126
00:42:08,069 --> 00:42:06,400
more payloads more experiments we have

1127
00:42:10,309 --> 00:42:08,079
commercial research going on on the

1128
00:42:12,870 --> 00:42:10,319
station so that permanent presence

1129
00:42:14,950 --> 00:42:12,880
allows us to make so much more progress

1130
00:42:16,790 --> 00:42:14,960
so as a former astronaut as a former

1131
00:42:18,790 --> 00:42:16,800
test pilot before that you know can you

1132
00:42:20,870 --> 00:42:18,800
give us some insight into how our nasa

1133
00:42:23,109 --> 00:42:20,880
astronauts must be feeling today as they

1134
00:42:25,670 --> 00:42:23,119
watch this uncrewed test flight

1135
00:42:28,069 --> 00:42:25,680
well for test pilots um

1136
00:42:29,510 --> 00:42:28,079
uh in god we trust everyone else brings

1137
00:42:32,630 --> 00:42:29,520
data so

1138
00:42:34,390 --> 00:42:32,640

what what you see as a test pilot is uh

1139
00:42:36,230 --> 00:42:34,400
the fascination with okay how's

1140
00:42:38,390 --> 00:42:36,240
everything going to work

1141
00:42:40,390 --> 00:42:38,400
what we have learned through many years

1142
00:42:43,190 --> 00:42:40,400
in the aviation side

1143
00:42:44,710 --> 00:42:43,200
is that the engineers do their best

1144
00:42:46,710 --> 00:42:44,720
but there's always things that happen

1145
00:42:48,390 --> 00:42:46,720
that you don't expect and so

1146
00:42:50,950 --> 00:42:48,400
really that's what the crew is looking

1147
00:42:53,109 --> 00:42:50,960
for they're looking for what worked uh

1148
00:42:55,349 --> 00:42:53,119
what we need to continue to work on that

1149
00:42:57,430 --> 00:42:55,359
is actually the meaning of a test flight

1150
00:42:58,870 --> 00:42:57,440
so it's as a tester it's actually a

1151
00:43:00,790 --> 00:42:58,880
great moment to see it come together

1152
00:43:02,630 --> 00:43:00,800
yeah to get that opportunity yes perfect

1153
00:43:03,990 --> 00:43:02,640
jenna thank you so much oh pam thank you

1154
00:43:05,589 --> 00:43:04,000
so much i really appreciate you being

1155
00:43:06,950 --> 00:43:05,599
here thank you i'm thrilled to be here

1156
00:43:08,710 --> 00:43:06,960
back to you guys

1157
00:43:11,030 --> 00:43:08,720
all right thank you very much and we are

1158
00:43:13,670 --> 00:43:11,040
l minus 12 and a half minutes and

1159
00:43:14,870 --> 00:43:13,680
counting until liftoff and you can see

1160
00:43:17,829 --> 00:43:14,880
behind us

1161
00:43:20,309 --> 00:43:17,839
the rockets on the pad atlas 5 starliner

1162
00:43:22,390 --> 00:43:20,319
is ready to go we just heard that uh

1163
00:43:24,550 --> 00:43:22,400

the launch team saying it's a great day

1164
00:43:27,109 --> 00:43:24,560
a beautiful day to go fly starliner and

1165
00:43:29,190 --> 00:43:27,119
we are anticipating it it is a lot of

1166
00:43:30,790 --> 00:43:29,200
anticipation out here for this one and

1167
00:43:33,430 --> 00:43:30,800
ula and boeing are finishing up their

1168
00:43:35,270 --> 00:43:33,440
preparations for launch and so um we

1169
00:43:37,510 --> 00:43:35,280
want to give you one other note

1170
00:43:40,309 --> 00:43:37,520
once starliner launches

1171
00:43:43,030 --> 00:43:40,319
the iss its destination will be flying

1172
00:43:44,950 --> 00:43:43,040
257 statute miles over the north

1173
00:43:46,870 --> 00:43:44,960
atlantic

1174
00:43:48,790 --> 00:43:46,880
now let's head to the atlas space flight

1175
00:43:51,030 --> 00:43:48,800
operations center where lauren and dylan

1176
00:43:53,510 --> 00:43:51,040
will tell us what those teams are doing

1177
00:43:55,589 --> 00:43:53,520
and then they will count us down to lift

1178
00:43:58,550 --> 00:43:55,599
off

1179
00:44:01,109 --> 00:43:58,560
hey d starliner is just about ready to

1180
00:44:03,109 --> 00:44:01,119
switch over to internal power so we're

1181
00:44:05,510 --> 00:44:03,119
waiting for that and then also we are

1182
00:44:08,069 --> 00:44:05,520
going to start seeing that crew access

1183
00:44:10,710 --> 00:44:08,079
arm start to retract back and we will

1184
00:44:12,950 --> 00:44:10,720
see it move quite slowly today but dylan

1185
00:44:14,150 --> 00:44:12,960
if it needed to in case of an emergency

1186
00:44:16,150 --> 00:44:14,160
it could really get out of there pretty

1187
00:44:18,950 --> 00:44:16,160
quickly yeah that's right lauren i just

1188
00:44:20,550 --> 00:44:18,960

heard the command get given to um to

1189
00:44:23,349 --> 00:44:20,560
start the crexus armor attraction but

1190
00:44:25,349 --> 00:44:23,359
that crew access arm rotates 120 degrees

1191
00:44:26,790 --> 00:44:25,359
back to the crew access tower it takes

1192
00:44:28,470 --> 00:44:26,800
just under two minutes to do but it can

1193
00:44:30,230 --> 00:44:28,480
re it can be redeployed in about 15

1194
00:44:31,750 --> 00:44:30,240
seconds in the event of an emergency

1195
00:44:33,430 --> 00:44:31,760
with no crew board we won't see anything

1196
00:44:35,510 --> 00:44:33,440
like that today

1197
00:44:37,750 --> 00:44:35,520
all right and we do want to let you know

1198
00:44:40,069 --> 00:44:37,760
that after liftoff dylan will do the

1199
00:44:41,750 --> 00:44:40,079
flight dynamics from here in the asoc

1200
00:44:43,910 --> 00:44:41,760
then brandi and josh will continue their

1201
00:44:46,390 --> 00:44:43,920
commentary from houston through ascent

1202
00:44:47,910 --> 00:44:46,400
spacecraft separation and the orbital

1203
00:44:49,270 --> 00:44:47,920
insertion burn

1204
00:44:50,950 --> 00:44:49,280
we also want to let you know today that

1205
00:44:52,950 --> 00:44:50,960
we are updating our internal camera

1206
00:44:55,270 --> 00:44:52,960
system on starliner to have more live

1207
00:44:57,030 --> 00:44:55,280
views inside in the future but for today

1208
00:44:59,589 --> 00:44:57,040
we'll be able to watch cameras on the

1209
00:45:01,510 --> 00:44:59,599
rocket we will also have live telemetry

1210
00:45:04,150 --> 00:45:01,520
feeding back that will provide us with a

1211
00:45:06,069 --> 00:45:04,160
real-time look at a spacecraft model

1212
00:45:07,430 --> 00:45:06,079
that we will be able to take a look at

1213
00:45:09,510 --> 00:45:07,440

and know exactly what's happening with

1214
00:45:11,829 --> 00:45:09,520
the spacecraft when video is not

1215
00:45:13,829 --> 00:45:11,839
possible as it moves through the dynamic

1216
00:45:16,230 --> 00:45:13,839
phases of flight

1217
00:45:18,069 --> 00:45:16,240
so we are coming up on l minus 10

1218
00:45:20,550 --> 00:45:18,079
getting very close here and we are now

1219
00:45:23,030 --> 00:45:20,560
waiting um to hear the next call which

1220
00:45:24,390 --> 00:45:23,040
will be to verify that starliner is on

1221
00:45:26,309 --> 00:45:24,400
internal power

1222
00:45:28,150 --> 00:45:26,319
and we were going to

1223
00:45:45,030 --> 00:45:28,160
listen into the loops for

1224
00:45:45,040 --> 00:45:57,670
now on internal power

1225
00:46:01,589 --> 00:46:00,390
today is an instantaneous launch window

1226
00:46:03,750 --> 00:46:01,599
you may be

1227
00:46:05,030 --> 00:46:03,760
sometimes used to seeing that the time

1228
00:46:07,750 --> 00:46:05,040
of launch can

1229
00:46:09,910 --> 00:46:07,760
shift a bit but not for us today we have

1230
00:46:12,630 --> 00:46:09,920
um a launch window that we have to go

1231
00:46:15,190 --> 00:46:12,640
right on the dot and that is because we

1232
00:46:17,750 --> 00:46:15,200
wait to launch till the orbital path for

1233
00:46:19,750 --> 00:46:17,760
the iss aligns up with the space coast

1234
00:46:21,670 --> 00:46:19,760
and with central florida and then once

1235
00:46:23,510 --> 00:46:21,680
we get up into orbit starliner

1236
00:46:26,790 --> 00:46:23,520
essentially plays a game of catch-up

1237
00:46:28,309 --> 00:46:26,800
with the space station it just works to

1238
00:46:31,430 --> 00:46:28,319

catch right up to it and eventually

1239
00:46:45,430 --> 00:46:31,440
reaches the same speed of more than 17

1240
00:46:48,630 --> 00:46:46,790
so lauren we should be hearing in just a

1241
00:46:50,069 --> 00:46:48,640
minute that confirmation that the crew

1242
00:46:54,710 --> 00:46:50,079
access arm is stowed and latched for

1243
00:47:01,270 --> 00:46:57,990
everything is looking good and

1244
00:47:03,910 --> 00:47:01,280
the silence is golden at the moment

1245
00:47:05,670 --> 00:47:03,920
and we're about uh 38 seconds now away

1246
00:47:07,750 --> 00:47:05,680
from the mission management poll that i

1247
00:47:09,910 --> 00:47:07,760
spoke about earlier

1248
00:47:11,270 --> 00:47:09,920
that will lead up to the terminal

1249
00:47:12,870 --> 00:47:11,280
account status check coming up here to

1250
00:47:14,870 --> 00:47:12,880
all minus seven flight verify ordinance

1251
00:47:17,270 --> 00:47:14,880
configured for law

1252
00:47:19,190 --> 00:47:17,280
verified

1253
00:47:21,430 --> 00:47:19,200
and starliner's ordinance is configured

1254
00:47:23,670 --> 00:47:21,440
for launch now that basically means that

1255
00:47:26,630 --> 00:47:23,680
the devices that initiate our separation

1256
00:47:29,030 --> 00:47:26,640
events are ready to support both nominal

1257
00:47:31,190 --> 00:47:29,040
and contingency operations that happen

1258
00:47:37,270 --> 00:47:31,200
or could happen during the ascent

1259
00:47:37,280 --> 00:47:58,390
oh minus eight minutes

1260
00:48:01,430 --> 00:47:59,510
all right and we did here on one of the

1261
00:48:02,870 --> 00:48:01,440
other loops that that mission manager lc

1262
00:48:05,829 --> 00:48:02,880
arm control

1263
00:48:08,390 --> 00:48:05,839

go ahead first step 260 corrects this

1264
00:48:09,589 --> 00:48:08,400
arm stowed for launch roger

1265
00:48:11,430 --> 00:48:09,599
and that call indicating that the

1266
00:48:15,270 --> 00:48:11,440
correct system is now stowed in later

1267
00:48:23,670 --> 00:48:16,790
all steps are complete prior to the

1268
00:48:28,470 --> 00:48:25,109
so we're going to listen in now to chief

1269
00:48:39,990 --> 00:48:28,480
launch conductor doug libo pull his team

1270
00:48:43,990 --> 00:48:41,589
status check to proceed with terminal

1271
00:48:48,390 --> 00:48:44,000
count atlas systems propulsion

1272
00:48:51,910 --> 00:48:48,400
go hydraulic go pneumatic go lo2

1273
00:48:57,910 --> 00:48:51,920
go water pro centaur systems propulsion

1274
00:49:01,349 --> 00:48:57,920
go pneumatic go lo2 so lh2 go has gas go

1275
00:49:05,430 --> 00:49:01,359
electrical system airborne go ground go

1276
00:49:09,430 --> 00:49:05,440
facility go rffps go flight control go

1277
00:49:12,790 --> 00:49:09,440
gcq go out support go come

1278
00:49:17,750 --> 00:49:12,800
go umbilical go arm control

1279
00:49:20,950 --> 00:49:17,760
go ecs go redline monitor go quality go

1280
00:49:23,829 --> 00:49:20,960
top safety manager go ula safety officer

1281
00:49:26,309 --> 00:49:23,839
go vehicle system engineer go anomaly

1282
00:49:28,390 --> 00:49:26,319
chief go range coordinator clear to

1283
00:49:31,190 --> 00:49:28,400
proceed flight director

1284
00:49:33,030 --> 00:49:31,200
houston flooded go launch director you

1285
00:49:34,790 --> 00:49:33,040
have permission to launch

1286
00:49:39,109 --> 00:49:34,800
proceeding with the count

1287
00:49:45,589 --> 00:49:39,119
alc verify t0 is set for 22 colon 54

1288
00:49:48,309 --> 00:49:46,950

and lauren you heard it there it goes

1289
00:49:50,150 --> 00:49:48,319
all the way across the board uh the

1290
00:49:52,630 --> 00:49:50,160
clocks are set and we are ready to pick

1291
00:49:55,510 --> 00:49:52,640
up the count on time for a uh

1292
00:49:56,950 --> 00:49:55,520
for a lift off here in just under six

1293
00:49:58,309 --> 00:49:56,960
minutes and lauren i'll just tell you

1294
00:49:59,510 --> 00:49:58,319
that we have executed the status check

1295
00:50:01,109 --> 00:49:59,520
many times

1296
00:50:04,309 --> 00:50:01,119
we've pulled for launches to the sun the

1297
00:50:06,150 --> 00:50:04,319
moon mars jupiter pluto all manners of

1298
00:50:07,910 --> 00:50:06,160
earth orbits every mission and every

1299
00:50:10,309 --> 00:50:07,920
countdown is unique and exciting but the

1300
00:50:11,750 --> 00:50:10,319
ula team is absolutely thrilled to put

1301
00:50:13,910 --> 00:50:11,760
mighty atlas back in service of human

1302
00:50:15,510 --> 00:50:13,920
space flight and i know that that's

1303
00:50:16,710 --> 00:50:15,520
something the astronauts have told me

1304
00:50:18,630 --> 00:50:16,720
that they

1305
00:50:20,470 --> 00:50:18,640
feel so confident about

1306
00:50:22,950 --> 00:50:20,480
eventually riding on top of an atlas v

1307
00:50:23,829 --> 00:50:22,960
rocket because it's been all over

1308
00:50:26,630 --> 00:50:23,839
uh

1309
00:50:32,150 --> 00:50:26,640
the solar system it's pretty amazing

1310
00:50:35,109 --> 00:50:33,430
we should be hearing starliner

1311
00:50:37,270 --> 00:50:35,119
configured for terminal count here in

1312
00:50:41,750 --> 00:50:37,280
just a few seconds

1313
00:50:47,750 --> 00:50:43,670

lc flight starliner configured for

1314
00:50:52,710 --> 00:50:50,230
there you go starliner is now configured

1315
00:50:55,670 --> 00:50:52,720
for terminal count

1316
00:50:57,349 --> 00:50:55,680
now minus 4 minutes 45 seconds

1317
00:50:59,430 --> 00:50:57,359
all steps are complete prior to terminal

1318
00:51:01,109 --> 00:50:59,440
count

1319
00:51:02,470 --> 00:51:01,119
and lauren with that call that all of

1320
00:51:03,589 --> 00:51:02,480
the work is now complete and the

1321
00:51:05,109 --> 00:51:03,599
computers are going to take over the

1322
00:51:06,870 --> 00:51:05,119
automated countdown at t minus four

1323
00:51:09,270 --> 00:51:06,880
minutes coming up in here in just about

1324
00:51:11,109 --> 00:51:09,280
30 seconds l minus 4 minutes and 30

1325
00:51:31,109 --> 00:51:11,119
seconds

1326
00:51:35,589 --> 00:51:33,589
on my mark the time will be t minus four

1327
00:51:36,710 --> 00:51:35,599
minutes and counting

1328
00:51:37,750 --> 00:51:36,720
three

1329
00:51:38,630 --> 00:51:37,760
two

1330
00:51:43,750 --> 00:51:38,640
one

1331
00:51:48,950 --> 00:51:46,150
355

1332
00:52:08,870 --> 00:51:48,960
ground pyro's enabled

1333
00:52:14,390 --> 00:52:12,710
330 now with hydraulic light pressure

1334
00:52:38,790 --> 00:52:14,400
atlas hydraulic steering system has been

1335
00:52:44,950 --> 00:52:39,829
three minutes

1336
00:52:48,470 --> 00:52:44,960
securing lod topping

1337
00:53:39,109 --> 00:52:49,990
topping of liquid oxygen in the atlas

1338
00:53:44,150 --> 00:53:42,790

two minutes 159

1339
00:53:45,829 --> 00:53:44,160
vehicle internal

1340
00:53:48,870 --> 00:53:45,839
155

1341
00:53:52,150 --> 00:53:48,880
bot sequencer start

1342
00:53:55,670 --> 00:53:52,160
150 securing centaur lh2

1343
00:53:58,230 --> 00:53:57,030
centaur hydrogen and oxygen are now at

1344
00:53:59,270 --> 00:53:58,240
flight level and topping is being

1345
00:54:01,030 --> 00:53:59,280
terminated

1346
00:54:06,390 --> 00:54:01,040
140.

1347
00:54:06,400 --> 00:54:18,870
fcsr

1348
00:54:33,910 --> 00:54:20,630
120.

1349
00:54:39,030 --> 00:54:36,390
eds armed and ready means the emergency

1350
00:54:41,030 --> 00:54:39,040
detection system is now armed and that

1351
00:54:43,510 --> 00:54:41,040
basically just means that if it detects

1352
00:54:47,030 --> 00:54:43,520
something it will change abort system on

1353
00:54:48,950 --> 00:54:47,040
starliner and fire automatically

1354
00:54:50,230 --> 00:54:48,960
would push itself far up and away from

1355
00:54:51,990 --> 00:54:50,240
the rocket

1356
00:54:54,630 --> 00:54:52,000
we're talking a mile up but a mile out

1357
00:54:56,230 --> 00:54:54,640
in just a matter of seconds

1358
00:54:58,870 --> 00:54:56,240
we certainly don't expect to see that

1359
00:55:08,789 --> 00:54:59,829
40.

1360
00:55:13,990 --> 00:55:11,990
30 30 seconds center at flight press

1361
00:55:16,390 --> 00:55:14,000
vehicle is now pressurized for flight

1362
00:55:20,470 --> 00:55:16,400
25 status check

1363
00:55:23,030 --> 00:55:20,480

go atlas go centaur go starliner

1364
00:55:29,109 --> 00:55:23,040
all systems are go for liftoff go

1365
00:55:31,030 --> 00:55:30,069
10

1366
00:55:31,910 --> 00:55:31,040
9

1367
00:55:32,950 --> 00:55:31,920
8

1368
00:55:33,910 --> 00:55:32,960
7

1369
00:55:34,950 --> 00:55:33,920
six

1370
00:55:35,990 --> 00:55:34,960
five

1371
00:55:37,270 --> 00:55:36,000
four

1372
00:55:38,470 --> 00:55:37,280
three

1373
00:55:39,750 --> 00:55:38,480
two

1374
00:55:41,670 --> 00:55:39,760
one

1375
00:55:43,990 --> 00:55:41,680
and liftoff

1376
00:55:45,829 --> 00:55:44,000
starliner is headed back to space on the

1377
00:55:58,970 --> 00:55:45,839
shoulders of atlas powered by a

1378
00:56:03,910 --> 00:56:01,670
[Music]

1379
00:56:10,870 --> 00:56:03,920
we have confirmation of a good met epic

1380
00:56:10,880 --> 00:56:20,950
now let's execute its roll program

1381
00:56:26,390 --> 00:56:22,630
this is the first planned throttle down

1382
00:56:33,910 --> 00:56:26,400
for atlas in preparation for max cube

1383
00:56:37,190 --> 00:56:35,430
right now atmospheric forces are the

1384
00:56:47,829 --> 00:56:37,200
highest starliner atlas will face during

1385
00:56:53,510 --> 00:56:49,750
mach 1 ls5 and starliner are now

1386
00:56:57,910 --> 00:56:55,670
vehicle now throttling up

1387
00:56:59,589 --> 00:56:57,920
up next in about 20 seconds

1388
00:57:17,910 --> 00:56:59,599

rocket boosters will run out of fuel and

1389
00:57:21,589 --> 00:57:20,150
and we have burnout on both srbs good

1390
00:57:23,270 --> 00:57:21,599
crew module forward link connection

1391
00:57:28,470 --> 00:57:23,280
already ready straddling back up to full

1392
00:57:31,190 --> 00:57:29,670
now that we pass the solid rocket

1393
00:57:32,950 --> 00:57:31,200
booster burnout you'll soon see those

1394
00:57:49,910 --> 00:57:32,960
two solid rocket boosters separate from

1395
00:57:53,510 --> 00:57:51,589
atlas 5 now weighs just one half of what

1396
00:58:02,789 --> 00:57:53,520
it did at launch burning propellant at a

1397
00:58:02,799 --> 00:58:09,430
and we have indication of srb jettison

1398
00:58:14,630 --> 00:58:11,670
atlas continues to ascend using solely

1399
00:58:16,270 --> 00:58:14,640
the rd180 engine that's

1400
00:58:24,630 --> 00:58:16,280
about

1401
00:58:27,430 --> 00:58:25,829
already ready is throttling down

1402
00:58:32,470 --> 00:58:27,440
slightly as expected

1403
00:58:36,309 --> 00:58:33,589
teams here on the ground confirming

1404
00:58:37,670 --> 00:58:36,319
starlander has a good trajectory

1405
00:58:39,750 --> 00:58:37,680
we're now

1406
00:58:41,109 --> 00:58:39,760
two minutes and 55 seconds into today's

1407
00:58:53,589 --> 00:58:41,119
flight

1408
00:58:56,630 --> 00:58:55,589
our next throttle down will be to

1409
00:58:59,589 --> 00:58:56,640
control

1410
00:59:02,230 --> 00:58:59,599
acceleration forces uh limit forces on

1411
00:59:12,710 --> 00:59:02,240
the crew to below four g's that is safe

1412
00:59:18,950 --> 00:59:14,630
one minute remaining in this burn one

1413
00:59:30,950 --> 00:59:20,710

already is now throttling to maintain

1414
00:59:34,710 --> 00:59:33,109
starliner flying off the east coast at

1415
00:59:37,910 --> 00:59:34,720
this point at uh

1416
00:59:41,309 --> 00:59:37,920
altitude of 80 kilometers now

1417
00:59:41,319 --> 00:59:46,150
1187 miles per hour

1418
00:59:49,829 --> 00:59:47,910
is just passing

1419
00:59:51,990 --> 00:59:49,839
north carolina virginia

1420
00:59:53,430 --> 00:59:52,000
off the northeastern seaboard

1421
00:59:55,190 --> 00:59:53,440
for those of you watching along the

1422
01:00:11,829 --> 00:59:55,200
coastline you might be able to see this

1423
01:00:11,839 --> 01:00:19,430
and we have beco booster engine cutoff

1424
01:00:30,549 --> 01:00:22,470
we have successful state success staging

1425
01:00:30,559 --> 01:00:39,109
we have ignition on both our l10s

1426
01:00:41,589 --> 01:00:40,309
centaur's now going to close loop

1427
01:00:43,430 --> 01:00:41,599
steering

1428
01:00:44,950 --> 01:00:43,440
just passed through several milestones

1429
01:00:46,230 --> 01:00:44,960
teams here on their teams here on the

1430
01:00:47,910 --> 01:00:46,240
ground reporting that all are looking

1431
01:00:49,510 --> 01:00:47,920
good ascent cover jettison there that

1432
01:00:51,430 --> 01:00:49,520
provided that

1433
01:00:52,630 --> 01:00:51,440
to the top of starliner protecting the

1434
01:01:01,430 --> 01:00:52,640
docking equipment

1435
01:01:05,750 --> 01:01:03,910
and now that starliner and centaur are

1436
01:01:07,589 --> 01:01:05,760
free of the atmosphere well into the

1437
01:01:42,470 --> 01:01:07,599
vacuum of space that era skirt has been

1438
01:01:46,390 --> 01:01:44,630

now six minutes into today's launch

1439
01:01:47,910 --> 01:01:46,400
starliner continuing to accelerate up

1440
01:01:50,470 --> 01:01:47,920
the north american coast everything

1441
01:01:51,670 --> 01:01:50,480
going smoothly so far

1442
01:01:53,190 --> 01:01:51,680
starliner and center have been taking

1443
01:01:54,870 --> 01:01:53,200
through their asset milestones right on

1444
01:01:57,029 --> 01:01:54,880
track including the

1445
01:01:58,870 --> 01:01:57,039
booster sage separation centaur ignition

1446
01:02:00,230 --> 01:01:58,880
and aeroskirt jettison

1447
01:02:01,430 --> 01:02:00,240
number of status cause we'll be

1448
01:02:02,950 --> 01:02:01,440
listening for in the next several

1449
01:02:04,549 --> 01:02:02,960
minutes but if all continues to go well

1450
01:02:06,870 --> 01:02:04,559
the next major milestone to watch out

1451
01:02:08,230 --> 01:02:06,880
for is the main engine cut off

1452
01:02:31,349 --> 01:02:08,240
when starliner will be officially in

1453
01:02:35,270 --> 01:02:33,670
we heard a report from a ula's team we

1454
01:02:36,870 --> 01:02:35,280
had a little bit of an over performance

1455
01:02:38,630 --> 01:02:36,880
on the booster but the

1456
01:02:41,190 --> 01:02:38,640
that's a good thing centaur is more than

1457
01:02:49,510 --> 01:02:41,200
capable of adjusting on the fly in its

1458
01:03:00,789 --> 01:02:51,750
centaur pressures are stable

1459
01:03:04,549 --> 01:03:02,789
flight control teams are also monitoring

1460
01:03:06,950 --> 01:03:04,559
the performance of the sublimator on

1461
01:03:08,549 --> 01:03:06,960
starliner right now the sublimator is

1462
01:03:09,750 --> 01:03:08,559
what is used to control cabin

1463
01:03:11,750 --> 01:03:09,760

temperatures

1464
01:03:14,549 --> 01:03:11,760
going up to space and coming home

1465
01:03:17,190 --> 01:03:14,559
normally we use uh the radiators on the

1466
01:03:18,710 --> 01:03:17,200
service module but

1467
01:03:44,470 --> 01:03:18,720
those are not powered up until we get

1468
01:03:48,870 --> 01:03:46,549
we heard confirmation that saint john's

1469
01:03:50,470 --> 01:03:48,880
abort zone is open

1470
01:03:53,029 --> 01:03:50,480
we

1471
01:03:55,829 --> 01:03:53,039
pre-select these uh splashdown zones in

1472
01:03:56,950 --> 01:03:55,839
the case of any needed aborts um the

1473
01:03:59,349 --> 01:03:56,960
first one

1474
01:04:03,430 --> 01:03:59,359
would be the saint off the coast of st

1475
01:04:21,510 --> 01:04:06,069
we just heard the flight dynamics

1476
01:04:25,270 --> 01:04:22,630
flight controllers here in mission

1477
01:04:26,950 --> 01:04:25,280
control confirming that our main engine

1478
01:04:28,390 --> 01:04:26,960
main engine cutoff time is looking

1479
01:04:29,910 --> 01:04:28,400
stable it is

1480
01:04:31,750 --> 01:04:29,920
going to be 11 minutes and 50 seconds

1481
01:04:34,230 --> 01:04:31,760
into the flight

1482
01:04:36,069 --> 01:04:34,240
we are now eight minutes and 50 seconds

1483
01:05:21,829 --> 01:04:36,079
in so that's still about three minutes

1484
01:05:24,950 --> 01:05:23,430
now one of the next calls that we will

1485
01:05:27,750 --> 01:05:24,960
hear is that the

1486
01:05:29,589 --> 01:05:27,760
shannon aboard zone will be open

1487
01:05:31,670 --> 01:05:29,599
now you can see on your screens that

1488
01:05:33,589 --> 01:05:31,680

starliner is making its way up the north

1489
01:05:35,670 --> 01:05:33,599
american coast just starting to go into

1490
01:05:39,910 --> 01:05:35,680
the atlantic ocean northern atlantic

1491
01:05:44,870 --> 01:05:43,190
we pre-plan our flight trajectories so

1492
01:05:46,150 --> 01:05:44,880
uh we would not

1493
01:05:47,829 --> 01:05:46,160
abort a crew into the middle of the

1494
01:05:49,510 --> 01:05:47,839
ocean they'd be near enough to land for

1495
01:05:51,750 --> 01:05:49,520
quick and speedy recovery so we're still

1496
01:05:55,510 --> 01:05:51,760
in that saint john's abort zone expect

1497
01:05:59,990 --> 01:05:57,990
and we just heard that call shannon now

1498
01:06:01,589 --> 01:06:00,000
open sister langer could potentially

1499
01:06:03,430 --> 01:06:01,599
make that abort landing off the coast of

1500
01:06:05,430 --> 01:06:03,440
ireland now if needed but so far no

1501
01:06:08,630 --> 01:06:05,440
reason to think it will be

1502
01:06:10,069 --> 01:06:08,640
starlin are currently 153 kilometers

1503
01:06:12,470 --> 01:06:10,079
above

1504
01:06:30,630 --> 01:06:12,480
the pacific ocean the atlantic ocean and

1505
01:06:30,640 --> 01:06:42,710
60 seconds to mikko

1506
01:06:49,589 --> 01:06:46,309
we are 11 minutes into today's flight

1507
01:06:51,270 --> 01:06:49,599
centaur and starliner are passing mach

1508
01:06:57,670 --> 01:06:51,280
23

1509
01:07:19,910 --> 01:06:59,589
altitude of just under

1510
01:07:24,630 --> 01:07:21,990
are scheduled to shut down that again is

1511
01:07:27,190 --> 01:07:24,640
coming up at 11 minutes and 50 seconds

1512
01:07:27,200 --> 01:07:33,270
five seconds away now

1513
01:07:33,280 --> 01:07:37,990

and we have miko one

1514
01:07:41,750 --> 01:07:39,990
cent our engines are cut off rcs is now

1515
01:07:43,510 --> 01:07:41,760
in the main engine cut off right on time

1516
01:07:45,910 --> 01:07:43,520
starliner is in space but not done with

1517
01:07:47,190 --> 01:07:45,920
the ascent milestones

1518
01:07:48,630 --> 01:07:47,200
hearing in the room that it was a good

1519
01:07:50,230 --> 01:07:48,640
main engine cut off

1520
01:07:51,910 --> 01:07:50,240
the next milestone we'll be looking for

1521
01:07:53,510 --> 01:07:51,920
is launch vehicle separation when

1522
01:07:59,750 --> 01:07:53,520
starliner will separate from centaur

1523
01:08:02,950 --> 01:08:01,109
even after that happens we'll have about

1524
01:08:04,789 --> 01:08:02,960
15 minutes until our final major

1525
01:08:06,069 --> 01:08:04,799
milestone in today's acid the orbital

1526
01:08:08,150 --> 01:08:06,079
insertion burn that will raise the

1527
01:08:10,390 --> 01:08:08,160
perigee or low point of starliner's

1528
01:08:12,710 --> 01:08:10,400
orbit out of the earth's atmosphere so

1529
01:08:25,430 --> 01:08:12,720
stick with us we're not done yet now 12

1530
01:08:29,269 --> 01:08:27,910
we just heard our atlas console position

1531
01:08:31,829 --> 01:08:29,279
report

1532
01:08:33,910 --> 01:08:31,839
a spacecraft separation for

1533
01:08:35,510 --> 01:08:33,920
14.50 after

1534
01:08:38,309 --> 01:08:35,520
launch

1535
01:08:39,910 --> 01:08:38,319
still about two minutes away

1536
01:08:42,070 --> 01:08:39,920
now right now

1537
01:08:44,309 --> 01:08:42,080
ula teams are confirming that centaur is

1538
01:08:46,550 --> 01:08:44,319

in a good configuration for separation

1539
01:08:48,870 --> 01:08:46,560
making sure that all of the

1540
01:08:50,709 --> 01:08:48,880
pressures in the tanks are stable and it

1541
01:08:57,349 --> 01:08:50,719
will be able to conduct a proper

1542
01:09:30,950 --> 01:08:58,950
flight control teams here in the room

1543
01:09:37,669 --> 01:09:32,950
sixty seconds of spacecraft's up centaur

1544
01:09:40,870 --> 01:09:39,430
just under a minute now and to go until

1545
01:09:42,149 --> 01:09:40,880
the launch vehicle separation with the

1546
01:09:44,070 --> 01:09:42,159
team here on the ground reporting that

1547
01:09:44,950 --> 01:09:44,080
starliner and centaur are both ready for

1548
01:09:46,709 --> 01:09:44,960
it

1549
01:10:00,790 --> 01:09:46,719
in the right orientation and on a stable

1550
01:10:00,800 --> 01:10:17,350
thirty seconds to start our separation

1551
01:10:21,830 --> 01:10:19,270
centaur is holding attitude for

1552
01:10:33,830 --> 01:10:21,840
starliner separation

1553
01:10:42,550 --> 01:10:35,510
and we have confirmation of starliner

1554
01:10:48,709 --> 01:10:45,510
and starliner is flying alone

1555
01:10:54,229 --> 01:10:51,590
confirm good lv separation

1556
01:10:56,550 --> 01:10:54,239
thanks ula

1557
01:10:58,470 --> 01:10:56,560
for a smooth ride to space and thank you

1558
01:11:05,189 --> 01:10:58,480
dylan for your help on that ascent

1559
01:11:08,550 --> 01:11:06,790
that milestone behind us the next one

1560
01:11:10,950 --> 01:11:08,560
we'll be watching for is that orbital

1561
01:11:12,630 --> 01:11:10,960
insertion burn that is going to

1562
01:11:14,630 --> 01:11:12,640
raise the perigee or the low point of

1563
01:11:16,790 --> 01:11:14,640

starliner's orbit

1564
01:11:17,669 --> 01:11:16,800
out of the earth's atmosphere putting it

1565
01:11:19,750 --> 01:11:17,679
but

1566
01:11:21,669 --> 01:11:19,760
in space for its full orbit that's an

1567
01:11:23,990 --> 01:11:21,679
important important milestone to reach

1568
01:11:25,510 --> 01:11:24,000
it's going to be a 45 second burn

1569
01:11:28,390 --> 01:11:25,520
it'll change starliner's velocity about

1570
01:11:30,229 --> 01:11:28,400
85 meters per second or 190 miles per

1571
01:11:32,630 --> 01:11:30,239
hour and that's going to be coming up at

1572
01:11:36,229 --> 01:11:32,640
the 31 minute mark in today's orbit

1573
01:11:38,149 --> 01:11:36,239
we're now just under 16 minutes into

1574
01:11:40,630 --> 01:11:38,159
today's flight so still about 15 minutes

1575
01:11:41,910 --> 01:11:40,640
to go for that

1576
01:11:43,750 --> 01:11:41,920
so there's a number of things that

1577
01:11:45,990 --> 01:11:43,760
flight controllers are working on right

1578
01:11:48,550 --> 01:11:46,000
now they're transitioning starliner from

1579
01:11:50,630 --> 01:11:48,560
its launch mode over to its orbit mode

1580
01:11:53,510 --> 01:11:50,640
that includes powering up things like

1581
01:11:55,430 --> 01:11:53,520
antennas heaters

1582
01:12:02,709 --> 01:11:55,440
and those radiators that i mentioned

1583
01:12:06,390 --> 01:12:04,229
we have good targeting for orbital

1584
01:12:12,310 --> 01:12:06,400
insertion a good ford command link and a

1585
01:12:16,149 --> 01:12:14,229
starliner making its way over the north

1586
01:12:18,149 --> 01:12:16,159
atlantic

1587
01:12:20,790 --> 01:12:18,159
some other things going on right now

1588
01:12:22,470 --> 01:12:20,800

they are powering down some what's

1589
01:12:24,470 --> 01:12:22,480
called demonstration flight

1590
01:12:26,310 --> 01:12:24,480
instrumentation we have some extra

1591
01:12:27,270 --> 01:12:26,320
sensors on there for these demonstration

1592
01:12:28,870 --> 01:12:27,280
flights

1593
01:12:31,510 --> 01:12:28,880
uh we have

1594
01:12:32,950 --> 01:12:31,520
more of them on during uh power descent

1595
01:12:34,390 --> 01:12:32,960
but we don't need some of those right

1596
01:12:36,630 --> 01:12:34,400
now so flight controllers are powering

1597
01:12:37,990 --> 01:12:36,640
some of those down

1598
01:12:40,709 --> 01:12:38,000
but some other things that are powering

1599
01:12:42,070 --> 01:12:40,719
on include those propulsion line heaters

1600
01:12:44,470 --> 01:12:42,080
when

1601
01:12:46,390 --> 01:12:44,480
uh in the vacuum of space and in the

1602
01:12:48,470 --> 01:12:46,400
earth's shadow it gets quite cold around

1603
01:12:52,149 --> 01:12:48,480
negative 250 degrees so we want to make

1604
01:12:54,870 --> 01:12:52,159
sure those propulsion lines don't freeze

1605
01:12:56,709 --> 01:12:54,880
and the the radiators are those little

1606
01:12:59,830 --> 01:12:56,719
small silver disks you might be able to

1607
01:13:02,630 --> 01:12:59,840
see on the side of the service module

1608
01:13:04,229 --> 01:13:02,640
if you remember your high school physics

1609
01:13:06,470 --> 01:13:04,239
the only way you can get rid of heat in

1610
01:13:08,310 --> 01:13:06,480
a vacuum is the radiation

1611
01:13:09,910 --> 01:13:08,320
and so that sublimator will be powering

1612
01:13:11,750 --> 01:13:09,920
down and the radiators will be taking

1613
01:13:13,030 --> 01:13:11,760

care of the heat management for the rest

1614
01:13:16,830 --> 01:13:13,040
of the flight

1615
01:13:22,790 --> 01:13:19,430
home some things that you also might be

1616
01:13:27,030 --> 01:13:22,800
seeing on your screen are some rcs jet

1617
01:13:36,870 --> 01:13:28,630
those are just helping a target for that

1618
01:13:41,350 --> 01:13:38,870
and at about

1619
01:13:43,189 --> 01:13:41,360
l plus 23 the team will transition

1620
01:13:45,030 --> 01:13:43,199
starliner into what's called fine

1621
01:13:48,229 --> 01:13:45,040
pointing mode

1622
01:13:50,870 --> 01:13:48,239
or thrust align mode so those jets that

1623
01:13:53,830 --> 01:13:50,880
you see firing will

1624
01:13:55,590 --> 01:13:53,840
hold a very specific attitude which is

1625
01:13:57,430 --> 01:13:55,600
exactly the attitude that we need for

1626
01:13:58,950 --> 01:13:57,440
that orbital insertion burn as brandy

1627
01:14:01,830 --> 01:13:58,960
mentioned earlier

1628
01:14:03,910 --> 01:14:01,840
we want that 85 meters per second of

1629
01:14:10,149 --> 01:14:03,920
delta v to be going in exactly the right

1630
01:14:17,430 --> 01:14:11,830
and so the the colors you're seeing on

1631
01:14:20,229 --> 01:14:18,950
right

1632
01:14:21,910 --> 01:14:20,239
the colors you're seeing on the screen

1633
01:14:23,990 --> 01:14:21,920
are indicating starliner's track right

1634
01:14:26,830 --> 01:14:24,000
now starliner is currently coming up on

1635
01:14:31,430 --> 01:14:26,840
the coast of europe and is about 100 uh

1636
01:14:34,310 --> 01:14:31,440
224 miles excuse me 139 miles 224

1637
01:14:37,189 --> 01:14:34,320
kilometers above uh the atlantic ocean

1638
01:14:39,750 --> 01:14:37,199

as it makes its way up to the uh to the

1639
01:14:41,830 --> 01:14:39,760
topmost or highest part of this orbit

1640
01:14:43,110 --> 01:14:41,840
it'll be

1641
01:14:45,590 --> 01:14:43,120
heading uh

1642
01:14:47,350 --> 01:14:45,600
southeast over uh europe and and a

1643
01:14:49,750 --> 01:14:47,360
little bit of africa in the next few

1644
01:14:51,189 --> 01:14:49,760
minutes as it begins its uh journey to

1645
01:14:53,110 --> 01:14:51,199
start catching up with the international

1646
01:14:54,470 --> 01:14:53,120
space station again that one of the

1647
01:14:56,070 --> 01:14:54,480
major milestones coming up in

1648
01:14:58,149 --> 01:14:56,080
preparation for that is the orbital

1649
01:14:59,350 --> 01:14:58,159
insertion burn

1650
01:15:02,470 --> 01:14:59,360
coming up at

1651
01:15:43,030 --> 01:15:02,480
the 31 minute mark in today's

1652
01:16:21,990 --> 01:15:44,470
confirmation we still have a good ford

1653
01:16:25,270 --> 01:16:23,350
i'm getting a look at the number of

1654
01:16:27,510 --> 01:16:25,280
teams who have been supporting today's

1655
01:16:30,070 --> 01:16:27,520
launch all across uh

1656
01:16:31,910 --> 01:16:30,080
all across the u.s in particular here in

1657
01:16:34,149 --> 01:16:31,920
houston if you hear of the flight

1658
01:16:36,070 --> 01:16:34,159
director my glamors and rick hempfling

1659
01:16:37,189 --> 01:16:36,080
who's been assisting him particularly

1660
01:16:39,590 --> 01:16:37,199
with the weather with weather

1661
01:16:40,709 --> 01:16:39,600
observations and uh earlier you saw

1662
01:16:42,390 --> 01:16:40,719
several of the teams who have been

1663
01:16:45,590 --> 01:16:42,400

supporting from the launch site in

1664
01:16:49,430 --> 01:16:47,910
now 21 minutes into today's flight

1665
01:16:51,350 --> 01:16:49,440
that's just about 10 minutes away from

1666
01:16:53,430 --> 01:16:51,360
that orbital insertion burn that work

1667
01:17:45,590 --> 01:16:53,440
that we're watching for it's coming up

1668
01:17:49,189 --> 01:17:47,270
so we're about a minute away before the

1669
01:17:51,590 --> 01:17:49,199
flight controllers put starliner into

1670
01:17:53,430 --> 01:17:51,600
its thrust align mode

1671
01:17:55,590 --> 01:17:53,440
once again just making sure that

1672
01:17:57,590 --> 01:17:55,600
starliner is pointed exactly

1673
01:17:59,110 --> 01:17:57,600
at the right attitude

1674
01:18:24,229 --> 01:17:59,120
for that orbital insertion burn it's

1675
01:18:27,910 --> 01:18:26,070
it is otherwise very quiet on the flight

1676
01:18:55,910 --> 01:18:27,920
control loops which

1677
01:18:59,830 --> 01:18:57,669
guidance navigation control officer

1678
01:19:02,870 --> 01:18:59,840
confirmed that starliner is moving

1679
01:19:04,229 --> 01:19:02,880
towards that oi attitude and will begin

1680
01:19:10,229 --> 01:19:04,239
holding

1681
01:19:13,910 --> 01:19:11,590
with that we're going to take a minute

1682
01:19:15,510 --> 01:19:13,920
to pause and toss it back to lauren in

1683
01:19:17,590 --> 01:19:15,520
florida who i believe has a special

1684
01:19:20,830 --> 01:19:17,600
guest there to talk with before they

1685
01:19:23,350 --> 01:19:20,840
wrap up their coverage for the day

1686
01:19:25,270 --> 01:19:23,360
lauren hey brandi thank you very much

1687
01:19:26,950 --> 01:19:25,280
yes joining me now is nasa astronaut

1688
01:19:29,030 --> 01:19:26,960

sunny williams thank you so much for

1689
01:19:30,390 --> 01:19:29,040
being here sunny thanks it's great to be

1690
01:19:31,990 --> 01:19:30,400
here today and i know you've been

1691
01:19:33,990 --> 01:19:32,000
following along i've actually been able

1692
01:19:36,390 --> 01:19:34,000
to see you from my perspective up here i

1693
01:19:38,310 --> 01:19:36,400
saw you in the moment of liftoff you had

1694
01:19:40,229 --> 01:19:38,320
your game face on what was going through

1695
01:19:41,990 --> 01:19:40,239
your mind at that moment yeah it's it's

1696
01:19:43,110 --> 01:19:42,000
pretty amazing actually leading up to

1697
01:19:45,110 --> 01:19:43,120
this i've been thinking about all the

1698
01:19:46,790 --> 01:19:45,120
teams all over the country who are

1699
01:19:49,750 --> 01:19:46,800
supporting this you know of course here

1700
01:19:52,310 --> 01:19:49,760
in florida but then back in houston and

1701
01:19:54,310 --> 01:19:52,320
denver it's just a huge team to get this

1702
01:19:56,470 --> 01:19:54,320
thing off the ground and to get uh

1703
01:19:57,750 --> 01:19:56,480
starliner into flight so at the moment

1704
01:19:58,870 --> 01:19:57,760
of liftoff i have to admit though i was

1705
01:20:02,229 --> 01:19:58,880
thinking about what it's like to be

1706
01:20:04,550 --> 01:20:02,239
sitting inside of there so um you know

1707
01:20:06,149 --> 01:20:04,560
on a bash to just imagine what it will

1708
01:20:08,149 --> 01:20:06,159
be like for the next launch when we have

1709
01:20:10,149 --> 01:20:08,159
people riding in starliner in and this

1710
01:20:11,910 --> 01:20:10,159
atlas v being a human rated rockets

1711
01:20:13,510 --> 01:20:11,920
pretty awesome yeah we heard the guys

1712
01:20:14,950 --> 01:20:13,520
earlier saying they were jealous about

1713
01:20:16,950 --> 01:20:14,960

rosie

1714
01:20:18,950 --> 01:20:16,960
absolutely well just a few months ago we

1715
01:20:21,510 --> 01:20:18,960
were talking about how much confidence

1716
01:20:23,270 --> 01:20:21,520
you have in the atlas 5 rocket and what

1717
01:20:24,629 --> 01:20:23,280
made you say that yeah you know we've

1718
01:20:26,950 --> 01:20:24,639
been here a couple times watching

1719
01:20:29,669 --> 01:20:26,960
launches of course uh not only for

1720
01:20:31,430 --> 01:20:29,679
starliner for oft the first time around

1721
01:20:33,270 --> 01:20:31,440
but also for other payloads that have

1722
01:20:34,790 --> 01:20:33,280
gone up on the atlas v and you know

1723
01:20:36,470 --> 01:20:34,800
they're pretty expensive i told my mom

1724
01:20:38,229 --> 01:20:36,480
at one point in time if they're putting

1725
01:20:40,229 --> 01:20:38,239
that expensive payload on top of that

1726
01:20:42,310 --> 01:20:40,239
rocket i feel pretty good about that and

1727
01:20:43,990 --> 01:20:42,320
i you know i know of the team i've been

1728
01:20:46,310 --> 01:20:44,000
here talked to all a lot of people who

1729
01:20:48,390 --> 01:20:46,320
have worked on this you know this rocket

1730
01:20:49,990 --> 01:20:48,400
both here decatur for example as well in

1731
01:20:52,149 --> 01:20:50,000
denver and i

1732
01:20:53,510 --> 01:20:52,159
understand the engineering or at least i

1733
01:20:55,590 --> 01:20:53,520
tried to understand the engineering that

1734
01:20:56,709 --> 01:20:55,600
goes into this complex machine and you

1735
01:20:59,350 --> 01:20:56,719
know they are

1736
01:21:01,430 --> 01:20:59,360
a a plus you know people doing just such

1737
01:21:03,750 --> 01:21:01,440
a great job so i know that their their

1738
01:21:05,910 --> 01:21:03,760

hearts are with us and ready to launch

1739
01:21:07,750 --> 01:21:05,920
humans into space well we are waiting

1740
01:21:09,910 --> 01:21:07,760
for that orbital insertion burn it is a

1741
01:21:11,510 --> 01:21:09,920
very important milestone for starliner

1742
01:21:12,709 --> 01:21:11,520
what are you watching for here yeah we

1743
01:21:15,189 --> 01:21:12,719
just want to make sure that you know

1744
01:21:16,950 --> 01:21:15,199
that burn goes off without a flaw we get

1745
01:21:19,270 --> 01:21:16,960
uh circularized around the planet and

1746
01:21:20,870 --> 01:21:19,280
then we can all take a a deep breath and

1747
01:21:22,470 --> 01:21:20,880
let the spacecraft fly for a little bit

1748
01:21:25,350 --> 01:21:22,480
and get ready for the rendezvous profile

1749
01:21:26,629 --> 01:21:25,360
for the iss so i think that is really uh

1750
01:21:28,229 --> 01:21:26,639
what we're waiting for just to make sure

1751
01:21:30,149 --> 01:21:28,239
it's going to happen correctly which you

1752
01:21:32,390 --> 01:21:30,159
know all indications are are great the

1753
01:21:34,709 --> 01:21:32,400
spacecraft is working well now sunny i

1754
01:21:36,629 --> 01:21:34,719
see you at the office quite often i see

1755
01:21:38,870 --> 01:21:36,639
the guys at the office quite often you

1756
01:21:40,790 --> 01:21:38,880
guys really have um worked closely with

1757
01:21:42,870 --> 01:21:40,800
the people who have their hands on this

1758
01:21:44,950 --> 01:21:42,880
spacecraft day in and day out what does

1759
01:21:47,750 --> 01:21:44,960
that relationship mean to you

1760
01:21:49,189 --> 01:21:47,760
it's huge like i mentioned um

1761
01:21:51,189 --> 01:21:49,199
during the days leading up to this i

1762
01:21:52,870 --> 01:21:51,199
really was just thinking about the teams

1763
01:21:54,790 --> 01:21:52,880

all of the hard work that they've gone

1764
01:21:56,310 --> 01:21:54,800
you know into getting the spacecraft

1765
01:21:58,629 --> 01:21:56,320
ready to go as well as getting this

1766
01:22:00,629 --> 01:21:58,639
rocket ready to go i know ula has done a

1767
01:22:02,790 --> 01:22:00,639
lot of work uh leading up to this after

1768
01:22:05,510 --> 01:22:02,800
the last attempt and it's this

1769
01:22:06,790 --> 01:22:05,520
relationship is so key um i feel like i

1770
01:22:08,310 --> 01:22:06,800
just want to stay committed to them to

1771
01:22:09,830 --> 01:22:08,320
make sure that we

1772
01:22:11,110 --> 01:22:09,840
we get to the finish line with getting

1773
01:22:13,350 --> 01:22:11,120
people to the international space

1774
01:22:15,910 --> 01:22:13,360
station and so as soon as you guys

1775
01:22:17,270 --> 01:22:15,920
finish up here tonight then what happens

1776
01:22:18,950 --> 01:22:17,280
where are you going next oh heading back

1777
01:22:21,110 --> 01:22:18,960
to houston you know mission control in

1778
01:22:23,189 --> 01:22:21,120
houston right now has has the spacecraft

1779
01:22:25,189 --> 01:22:23,199
and uh we want to watch the rendezvous

1780
01:22:27,270 --> 01:22:25,199
profile you know we're also all three of

1781
01:22:28,709 --> 01:22:27,280
us are sort of sitting in the shoes or

1782
01:22:30,310 --> 01:22:28,719
in the seat of rosie you know wondering

1783
01:22:32,229 --> 01:22:30,320
what it's going to be like and what the

1784
01:22:33,990 --> 01:22:32,239
spacecraft is going to see how it's

1785
01:22:35,669 --> 01:22:34,000
going to act in all of that rendezvous

1786
01:22:37,590 --> 01:22:35,679
profile so we'll be right there

1787
01:22:38,390 --> 01:22:37,600
following along so it's going to be an

1788
01:22:39,830 --> 01:22:38,400

exciting

1789
01:22:41,510 --> 01:22:39,840
24 hours

1790
01:22:44,229 --> 01:22:41,520
i'm racing back i'll be home tonight to

1791
01:22:46,229 --> 01:22:44,239
be able to be in mission control in some

1792
01:22:48,310 --> 01:22:46,239
capacity watching just like here

1793
01:22:50,229 --> 01:22:48,320
watching that rendezvous profile and can

1794
01:22:52,550 --> 01:22:50,239
you tell us much about what would happen

1795
01:22:54,470 --> 01:22:52,560
between uh now and crude flight what

1796
01:22:56,390 --> 01:22:54,480
kind of training do you have to go

1797
01:22:57,910 --> 01:22:56,400
through and what kind of things are we

1798
01:23:00,310 --> 01:22:57,920
going to be working on with starliner

1799
01:23:01,590 --> 01:23:00,320
right so this mission is going to prove

1800
01:23:03,510 --> 01:23:01,600
you know we're going to learn stuff not

1801
01:23:05,270 --> 01:23:03,520
everything is going to go 100 correct

1802
01:23:06,629 --> 01:23:05,280
right we learn stuff every time we take

1803
01:23:08,390 --> 01:23:06,639
something to space and so we're going to

1804
01:23:10,709 --> 01:23:08,400
take those lessons learned from this

1805
01:23:12,790 --> 01:23:10,719
mission and apply it to the next launch

1806
01:23:14,870 --> 01:23:12,800
which is the crude flight test

1807
01:23:17,030 --> 01:23:14,880
but even beside for that we have testing

1808
01:23:18,790 --> 01:23:17,040
that we're ready to go do we have the

1809
01:23:20,629 --> 01:23:18,800
crew validation test which is coming up

1810
01:23:22,470 --> 01:23:20,639
this summer where the three of us will

1811
01:23:24,470 --> 01:23:22,480
be in the spacecraft you know in the

1812
01:23:25,990 --> 01:23:24,480
suits in the seats checking out the

1813
01:23:28,070 --> 01:23:26,000

environmental control system checking

1814
01:23:29,510 --> 01:23:28,080
out the ergonomics making sure we fit

1815
01:23:30,870 --> 01:23:29,520
we're ready to go

1816
01:23:32,629 --> 01:23:30,880
we also be looking working with the

1817
01:23:34,070 --> 01:23:32,639
software folks looking at all the

1818
01:23:36,310 --> 01:23:34,080
displays making sure that all the

1819
01:23:38,310 --> 01:23:36,320
displays um tell us the the right

1820
01:23:39,669 --> 01:23:38,320
information and we understand it

1821
01:23:41,510 --> 01:23:39,679
correctly and we could work with mission

1822
01:23:42,870 --> 01:23:41,520
control with that so there's a lot and

1823
01:23:44,550 --> 01:23:42,880
then it's of cour of course there's

1824
01:23:46,229 --> 01:23:44,560
training with with the control team the

1825
01:23:47,590 --> 01:23:46,239
control team we've had some training

1826
01:23:49,229 --> 01:23:47,600
with them but you know leading up to

1827
01:23:51,669 --> 01:23:49,239
this they've been working on an

1828
01:23:52,870 --> 01:23:51,679
uncrewed version and now you know us

1829
01:23:54,550 --> 01:23:52,880
little pains in the neck are going to be

1830
01:23:56,070 --> 01:23:54,560
sitting in there talking back to them so

1831
01:23:57,750 --> 01:23:56,080
we're going to work through all that

1832
01:23:59,830 --> 01:23:57,760
choreography of how we're going to work

1833
01:24:01,430 --> 01:23:59,840
together in the spacecraft well sonny

1834
01:24:03,030 --> 01:24:01,440
your time is valuable i really

1835
01:24:04,870 --> 01:24:03,040
appreciate you joining us here i know

1836
01:24:07,430 --> 01:24:04,880
you need to get back down to the console

1837
01:24:09,510 --> 01:24:07,440
and follow along so thank you for being

1838
01:24:11,669 --> 01:24:09,520

here and we are going to continue to

1839
01:24:14,310 --> 01:24:11,679
follow along the loops here at the asoc

1840
01:24:15,830 --> 01:24:14,320
and wait for that orbital insertion burn

1841
01:24:17,910 --> 01:24:15,840
which is basically when starliner will

1842
01:24:20,229 --> 01:24:17,920
be up in orbit hanging out until we're

1843
01:24:22,950 --> 01:24:20,239
ready to start the rendezvous process

1844
01:24:25,350 --> 01:24:22,960
and docking tomorrow so for now that's

1845
01:24:27,110 --> 01:24:25,360
it for me and sunny and as well as dylan

1846
01:24:34,390 --> 01:24:27,120
rice here in florida and we'll get you

1847
01:24:38,550 --> 01:24:36,709
thanks so much lauren and great to hear

1848
01:24:40,229 --> 01:24:38,560
from sunny we're now just about two

1849
01:24:43,030 --> 01:24:40,239
minutes away from the orbital insertion

1850
01:24:45,030 --> 01:24:43,040
burn that again is going to be a 45

1851
01:24:47,189 --> 01:24:45,040
second burn it's going to raise the

1852
01:24:48,709 --> 01:24:47,199
perigee of or the low point of

1853
01:24:50,550 --> 01:24:48,719
starliner's orbit out of the earth's

1854
01:24:51,510 --> 01:24:50,560
atmosphere and get get it into a stable

1855
01:24:53,990 --> 01:24:51,520
orbit

1856
01:24:54,950 --> 01:24:54,000
and after that we'll begin checking out

1857
01:24:57,189 --> 01:24:54,960
the

1858
01:25:12,550 --> 01:24:57,199
critical control

1859
01:25:16,550 --> 01:25:14,550
minute and a half until the orbital

1860
01:25:17,669 --> 01:25:16,560
insertion burn starliner is in the burn

1861
01:25:19,750 --> 01:25:17,679
attitude

1862
01:25:21,669 --> 01:25:19,760
you might have seen earlier the nose of

1863
01:25:23,830 --> 01:25:21,679

star starliner might have been pointed

1864
01:25:25,350 --> 01:25:23,840
down towards the earth but that's

1865
01:25:28,950 --> 01:25:25,360
actually the attitude that it needs to

1866
01:25:30,470 --> 01:25:28,960
be because as it orbits around the earth

1867
01:25:33,110 --> 01:25:30,480
it will no longer be pointing at earth

1868
01:25:35,189 --> 01:25:33,120
it will be pointing at that specific

1869
01:25:36,629 --> 01:25:35,199
point in space that the orbital

1870
01:25:42,070 --> 01:25:36,639
insertion burn

1871
01:25:45,030 --> 01:25:43,430
and once again there will be a lot of

1872
01:25:47,830 --> 01:25:45,040
thruster activity

1873
01:25:49,510 --> 01:25:47,840
uh we want those four aft-facing omak

1874
01:25:51,110 --> 01:25:49,520
engines that's about 1200 pounds of

1875
01:25:53,189 --> 01:25:51,120
thrust each

1876
01:25:57,990 --> 01:25:53,199
to be pushing in exactly the right

1877
01:26:01,590 --> 01:25:59,669
oh max standing for orbital maneuvering

1878
01:26:04,790 --> 01:26:01,600
and attitude control they're gonna fire

1879
01:26:07,430 --> 01:26:04,800
for 45 seconds for this burn

1880
01:26:11,830 --> 01:26:07,440
changing starliner's velocity by 85

1881
01:26:13,830 --> 01:26:11,840
meters per second or 190 miles per hour

1882
01:26:36,310 --> 01:26:13,840
30 seconds to go now until that burn

1883
01:26:39,270 --> 01:26:38,390
orbital insertion burn starting in five

1884
01:26:40,229 --> 01:26:39,280
four

1885
01:26:41,110 --> 01:26:40,239
three

1886
01:26:46,070 --> 01:26:41,120
two

1887
01:26:51,030 --> 01:26:48,790
again this burn is going to last for

1888
01:26:52,629 --> 01:26:51,040

45 seconds

1889
01:26:54,790 --> 01:26:52,639
teams here on the ground reporting four

1890
01:27:07,510 --> 01:26:54,800
good orbital maneuvering

1891
01:27:11,510 --> 01:27:09,030
now the colors you're seeing on those

1892
01:27:13,189 --> 01:27:11,520
jets or you are seeing on those jets uh

1893
01:27:15,510 --> 01:27:13,199
they indicate which integrated

1894
01:27:17,270 --> 01:27:15,520
propulsion controller

1895
01:27:19,270 --> 01:27:17,280
uh those jets are mapped to we have

1896
01:27:21,910 --> 01:27:19,280
three ipc's integrated propulsion

1897
01:27:26,070 --> 01:27:21,920
controllers

1898
01:27:33,990 --> 01:27:26,080
oh i cut off in five four three two

1899
01:27:34,000 --> 01:27:44,229
and we have o-i cut off

1900
01:27:56,790 --> 01:27:52,870
and

1901
01:27:59,590 --> 01:27:56,800
director mike lammers we have a good

1902
01:28:01,830 --> 01:27:59,600
orbital insertion burn starliner is in a

1903
01:28:03,350 --> 01:28:01,840
stable circular orbit

1904
01:28:06,470 --> 01:28:03,360
on its way to the international space

1905
01:28:09,430 --> 01:28:07,669
now

1906
01:28:12,550 --> 01:28:09,440
this was a

1907
01:28:15,430 --> 01:28:12,560
a big hurdle to get through early on

1908
01:28:17,990 --> 01:28:15,440
we have a few demos to go on on our way

1909
01:28:20,790 --> 01:28:18,000
to the iss

1910
01:28:22,870 --> 01:28:20,800
and then after that

1911
01:28:23,990 --> 01:28:22,880
hopefully a very good docking but so far

1912
01:28:25,430 --> 01:28:24,000
today

1913
01:28:27,590 --> 01:28:25,440

good launch

1914
01:28:29,350 --> 01:28:27,600
great performance from ula atlas even

1915
01:28:31,990 --> 01:28:29,360
gave us a little bit more of a push than

1916
01:28:34,149 --> 01:28:32,000
we needed but centaur was able to

1917
01:28:36,149 --> 01:28:34,159
adjust accordingly

1918
01:28:38,950 --> 01:28:36,159
place starliner exactly where we needed

1919
01:28:43,830 --> 01:28:41,189
and we have confirmation of a good oi

1920
01:28:46,149 --> 01:28:43,840
burn once again starliner is in orbit

1921
01:28:47,990 --> 01:28:46,159
heading to the iss

1922
01:28:49,750 --> 01:28:48,000
it's a major milestone to get behind us

1923
01:28:51,990 --> 01:28:49,760
but it is really just the beginning

1924
01:28:54,470 --> 01:28:52,000
we've got a number of demonstrations now

1925
01:28:56,470 --> 01:28:54,480
that starliner will have to go through

1926
01:28:57,910 --> 01:28:56,480
ahead of its international space station

1927
01:28:59,350 --> 01:28:57,920
arrival

1928
01:29:01,669 --> 01:28:59,360
those are going to start pretty much

1929
01:29:05,510 --> 01:29:01,679
right away with a checkout of the

1930
01:29:09,430 --> 01:29:07,590
festa stands for vision-based electro

1931
01:29:10,709 --> 01:29:09,440
optical sensory tracking assembly

1932
01:29:12,149 --> 01:29:10,719
they're basically sensors that take

1933
01:29:13,910 --> 01:29:12,159
measurements that starlander uses for

1934
01:29:15,350 --> 01:29:13,920
relative navigation

1935
01:29:17,910 --> 01:29:15,360
starliner has two of them and each

1936
01:29:19,270 --> 01:29:17,920
contains four system sensors

1937
01:29:20,790 --> 01:29:19,280
the camera with a narrow view a camera

1938
01:29:22,709 --> 01:29:20,800

with a wide view

1939
01:29:23,990 --> 01:29:22,719
an infrared camera and a lidar unit that

1940
01:29:44,310 --> 01:29:24,000
uses later

1941
01:29:47,030 --> 01:29:45,430
just a couple more things they're

1942
01:29:49,030 --> 01:29:47,040
working through on their orbital

1943
01:29:51,270 --> 01:29:49,040
insertion checklist we have confirmation

1944
01:29:53,910 --> 01:29:51,280
good radiator activation so those

1945
01:29:55,510 --> 01:29:53,920
radiators are now in control and

1946
01:30:12,310 --> 01:29:55,520
controlling the

1947
01:30:15,350 --> 01:30:14,149
and going back a little bit just to help

1948
01:30:18,229 --> 01:30:15,360
you guys learn a little bit about

1949
01:30:21,189 --> 01:30:18,239
starliner going back to those ipc's

1950
01:30:22,629 --> 01:30:21,199
that blue green and red

1951
01:30:25,189 --> 01:30:22,639
is what

1952
01:30:27,990 --> 01:30:25,199
propulsion controller

1953
01:30:28,709 --> 01:30:28,000
each of those thrusters are mapped to

1954
01:30:30,149 --> 01:30:28,719
so

1955
01:30:32,149 --> 01:30:30,159
if you think of the flight controllers

1956
01:30:33,430 --> 01:30:32,159
like the brain of starliner the ipc's

1957
01:30:35,590 --> 01:30:33,440
are kind of like the nervous system

1958
01:30:37,270 --> 01:30:35,600
translating kind of those commands into

1959
01:30:39,030 --> 01:30:37,280
movement

1960
01:30:41,510 --> 01:30:39,040
so we'll see the team continue to

1961
01:30:43,110 --> 01:30:41,520
exercise those

1962
01:30:45,510 --> 01:30:43,120
throughout the flight

1963
01:30:47,350 --> 01:30:45,520

next up are a couple demos but

1964
01:30:52,070 --> 01:30:47,360
i think for now

1965
01:30:55,430 --> 01:30:53,990
that's right with that last milestone

1966
01:30:57,350 --> 01:30:55,440
safely behind us we're going to say

1967
01:30:58,950 --> 01:30:57,360
goodbye for the night the starliner team

1968
01:31:00,709 --> 01:30:58,960
here in mission control will be

1969
01:31:02,229 --> 01:31:00,719
monitoring continually as starliner

1970
01:31:04,390 --> 01:31:02,239
makes its way towards the international

1971
01:31:06,390 --> 01:31:04,400
space station right now starliner is

1972
01:31:08,550 --> 01:31:06,400
about 118

1973
01:31:11,669 --> 01:31:08,560
miles above the coast of africa heading

1974
01:31:13,110 --> 01:31:11,679
towards the indian ocean and with that

1975
01:31:14,070 --> 01:31:13,120
since the next

1976
01:31:16,229 --> 01:31:14,080
the next

1977
01:31:17,590 --> 01:31:16,239
destination for starliner is going to be

1978
01:31:19,270 --> 01:31:17,600
the international space station we're

1979
01:31:20,790 --> 01:31:19,280
going to get an update from gary jordan

1980
01:31:22,550 --> 01:31:20,800
down the hall in the international space

1981
01:31:25,030 --> 01:31:22,560
station flight control room but that is

1982
01:31:27,030 --> 01:31:25,040
it for josh and i for the night that was

1983
01:31:29,350 --> 01:31:27,040
a great launch and we are excited to see

1984
01:31:31,110 --> 01:31:29,360
starliner on its way gary

1985
01:31:33,669 --> 01:31:31,120
hey thanks brandi and josh it is so

1986
01:31:35,430 --> 01:31:33,679
great to see starliner in a good orbit

1987
01:31:37,270 --> 01:31:35,440
and heading for the international space

1988
01:31:38,870 --> 01:31:37,280

station teams here in the space station

1989
01:31:40,870 --> 01:31:38,880
flight control room will be monitoring

1990
01:31:43,830 --> 01:31:40,880
starliner's approach over the next 24

1991
01:31:45,910 --> 01:31:43,840
hours to dock with the orbiting lab in

1992
01:31:48,310 --> 01:31:45,920
that time it will perform activation and

1993
01:31:50,790 --> 01:31:48,320
checkouts of various systems a few early

1994
01:31:52,870 --> 01:31:50,800
demonstrations of its thrusters guidance

1995
01:31:55,110 --> 01:31:52,880
navigation and control equipment as well

1996
01:31:57,110 --> 01:31:55,120
as its communication systems as it

1997
01:31:58,390 --> 01:31:57,120
executes a series of burns to gradually

1998
01:32:00,629 --> 01:31:58,400
raise its altitude

1999
01:32:03,110 --> 01:32:00,639
and get closer to the station tomorrow

2000
01:32:05,430 --> 01:32:03,120
be sure to tune in for our coverage of

2001
01:32:07,350 --> 01:32:05,440
the approach and docking phase when we

2002
01:32:09,669 --> 01:32:07,360
get inside the approach ellipsoid or

2003
01:32:11,590 --> 01:32:09,679
about a two kilometer marker from the

2004
01:32:13,510 --> 01:32:11,600
station we'll see a few critical

2005
01:32:15,270 --> 01:32:13,520
demonstrations of the starliner to

2006
01:32:17,910 --> 01:32:15,280
verify some of the spacecraft's

2007
01:32:19,830 --> 01:32:17,920
capabilities to keep astronauts safe

2008
01:32:22,149 --> 01:32:19,840
we'll see station astronauts command a

2009
01:32:24,550 --> 01:32:22,159
hold of the starliner and we'll see the

2010
01:32:27,189 --> 01:32:24,560
starliner perform a retreat maneuver in

2011
01:32:28,870 --> 01:32:27,199
the approach corridor after today's

2012
01:32:30,550 --> 01:32:28,880
successful launch we're targeting to

2013
01:32:32,709 --> 01:32:30,560

start our coverage of starliner's

2014
01:32:34,790 --> 01:32:32,719
approach to the station at 3 30 pm

2015
01:32:37,430 --> 01:32:34,800
eastern time tomorrow for a docking

2016
01:32:39,110 --> 01:32:37,440
scheduled for 7 10 pm

2017
01:32:41,270 --> 01:32:39,120
the international space station crew is

2018
01:32:42,950 --> 01:32:41,280
expected to host a welcome ceremony of

2019
01:32:45,510 --> 01:32:42,960
the spacecraft to the station the

2020
01:32:48,390 --> 01:32:45,520
following day and we may get some peaks

2021
01:32:50,390 --> 01:32:48,400
inside the starliner it'll be a busy

2022
01:32:52,790 --> 01:32:50,400
week here in houston during that docked

2023
01:32:54,790 --> 01:32:52,800
phase of style starliner and that's what

2024
01:32:56,310 --> 01:32:54,800
there's a lot to do in the meantime

2025
01:32:58,470 --> 01:32:56,320
that'll do it for us here in mission

2026
01:33:00,229 --> 01:32:58,480
control houston with that i'll send it

2027
01:33:01,990 --> 01:33:00,239
back to daryl indeed over at the kennedy

2028
01:33:04,149 --> 01:33:02,000
space center

2029
01:33:05,830 --> 01:33:04,159
thanks gary i'd like to thank the launch

2030
01:33:08,070 --> 01:33:05,840
and flight teams across the country for

2031
01:33:10,390 --> 01:33:08,080
making this day possible but as you've

2032
01:33:12,470 --> 01:33:10,400
heard many times we know this is the

2033
01:33:14,709 --> 01:33:12,480
first of many critical milestones for

2034
01:33:16,629 --> 01:33:14,719
this test flight once docked the

2035
01:33:18,950 --> 01:33:16,639
starliner will undergo a number of

2036
01:33:20,470 --> 01:33:18,960
checkouts including battery charging

2037
01:33:23,189 --> 01:33:20,480
transferring files through the space

2038
01:33:25,590 --> 01:33:23,199

station downlink hatch open and close

2039
01:33:27,430 --> 01:33:25,600
and cargo transfer and of course all of

2040
01:33:29,669 --> 01:33:27,440
these demonstrations will provide the

2041
01:33:31,430 --> 01:33:29,679
data needed to bring boeing closer to

2042
01:33:33,910 --> 01:33:31,440
having the privilege of carrying

2043
01:33:35,270 --> 01:33:33,920
astronauts to and from the space station

2044
01:33:37,110 --> 01:33:35,280
and nasa astronauts are certainly

2045
01:33:38,709 --> 01:33:37,120
looking forward to that the docking that

2046
01:33:41,830 --> 01:33:38,719
you mentioned scheduled for a little bit

2047
01:33:43,910 --> 01:33:41,840
less than 24 hours from now at 7 10 p.m

2048
01:33:45,510 --> 01:33:43,920
eastern time and while we're talking

2049
01:33:47,189 --> 01:33:45,520
while we're talking schedules make sure

2050
01:33:49,830 --> 01:33:47,199
you stay tuned for a post-launch news

2051
01:33:53,350 --> 01:33:49,840
conference at 9 00 pm eastern time on

2052
01:33:55,669 --> 01:33:53,360
our website nasa.gov forward slash live

2053
01:33:57,110 --> 01:33:55,679
and uh nasa boeing and ula leadership

2054
01:33:59,990 --> 01:33:57,120
will be on hand to answer questions

2055
01:34:02,070 --> 01:34:00,000
about the oft to test flight up until

2056
01:34:04,310 --> 01:34:02,080
this point in time until then

2057
01:34:06,870 --> 01:34:04,320
and then afterwards you can find updates

2058
01:34:09,030 --> 01:34:06,880
at nasa.gov forward slash commercial

2059
01:34:10,310 --> 01:34:09,040
crew all one word and then of course you

2060
01:34:12,390 --> 01:34:10,320
can follow us on twitter as you see

2061
01:34:15,510 --> 01:34:12,400
there on the right hand side at

2062
01:34:17,910 --> 01:34:15,520
commercial underscore crew

2063
01:34:20,070 --> 01:34:17,920

we leave you now with another look at

2064
01:34:21,430 --> 01:34:20,080
the launch of orbital flight test number

2065
01:34:23,750 --> 01:34:21,440
two but before we do that i gotta

2066
01:34:25,350 --> 01:34:23,760
compliment that jacket oh that's a nice

2067
01:34:26,149 --> 01:34:25,360
jacket that's right yeah it's looking

2068
01:34:28,229 --> 01:34:26,159
good

2069
01:34:30,709 --> 01:34:28,239
keep your eye on it yes somebody might

2070
01:34:32,470 --> 01:34:30,719
burgle it from you

2071
01:34:34,229 --> 01:34:32,480
for d russell boeing ula and all of us

2072
01:34:36,310 --> 01:34:34,239
here at the nasa kennedy and johnson

2073
01:35:08,390 --> 01:34:36,320
space centers i'm daryl nail have a good

2074
01:35:08,400 --> 01:35:12,070
two minutes 159

2075
01:35:15,189 --> 01:35:13,510
vehicle internal

2076
01:35:18,149 --> 01:35:15,199
155

2077
01:35:21,430 --> 01:35:18,159
bot sequencer start