

A space shuttle is shown in the process of launching, ascending vertically against a backdrop of a blue sky with scattered white clouds. The shuttle is white with orange external tank and white boosters. A large, bright plume of fire and white smoke trails behind it, indicating the point of liftoff. The shuttle is positioned on the right side of the frame. On the left side, there is a large, billowing cloud of white smoke or steam. In the foreground, there is a tall, thin metal structure, possibly a service tower or part of the launch complex. The overall scene is dynamic and captures the power of the launch.

◀◀ **REPLAY:**
THE SHUTTLE'S
FINAL LAUNCH

1
00:00:01,737 --> 00:00:03,174
This is shuttle launch control

2
00:00:03,174 --> 00:00:04,761
team on a three hours and holding.

3
00:00:05,246 --> 00:00:07,969
Here's our commander, Chris Ferguson.

4
00:00:08,520 --> 00:00:10,224
He's in the suit up room.

5
00:00:11,461 --> 00:00:11,995
He's

6
00:00:13,131 --> 00:00:15,387
having a fit check of his helmet.

7
00:00:19,330 --> 00:00:22,571
He's our commander on this flight and

8
00:00:23,974 --> 00:00:26,581
going over to pilot Doug Hurley.

9
00:00:35,553 --> 00:00:38,359
This is his second trip into space.

10
00:00:40,849 --> 00:00:41,985
He completed his first

11
00:00:41,985 --> 00:00:44,057
spaceflight on STS- 127,

12
00:00:44,057 --> 00:00:44,959
and he's logged more than

13
00:00:44,959 --> 00:00:47,181

376 hours in space.

14

00:00:56,938 --> 00:00:58,258

And here is mission

15

00:00:58,258 --> 00:01:00,413

specialist number one, Sandy Magnus.

16

00:01:01,700 --> 00:01:04,156

This is her third space flight.

17

00:01:04,189 --> 00:01:06,762

She spent more than four months in space

18

00:01:06,762 --> 00:01:08,499

aboard the International Space Station.

19

00:01:13,478 --> 00:01:14,848

She flew on STS-

20

00:01:14,915 --> 00:01:17,588

112, logged 11 days in space,

21

00:01:17,588 --> 00:01:19,593

and then four and a half months

22

00:01:19,827 --> 00:01:22,350

after being on board the space station

23

00:01:23,219 --> 00:01:24,822

as a member of the Expedition

24

00:01:25,959 --> 00:01:26,877

18 crew.

25

00:01:30,286 --> 00:01:31,840

This is Rex Walheim.

26

00:01:32,441 --> 00:01:34,362

He's our mission specialist number two.

27

00:01:34,747 --> 00:01:37,303

He's making his third space flight.

28

00:01:37,336 --> 00:01:39,592

He spent more than 24 days in space

29

00:01:40,728 --> 00:01:44,086

on STS- 110 and has 122.

30

00:01:44,086 --> 00:01:46,091

And he's had five spacewalks

31

00:01:46,091 --> 00:01:48,079

totaling more than 36 hours.

32

00:01:49,516 --> 00:01:52,824

And he's served very effectively

33

00:01:52,824 --> 00:01:54,561

as the chief of the EVA branch.

34

00:01:55,280 --> 00:01:57,519

So the crew now is finishing

35

00:01:57,519 --> 00:01:58,638

their suit up activities

36

00:01:59,657 --> 00:02:03,283

and they are scheduled to leave

37

00:02:03,283 --> 00:02:04,753

for the launch pad in

38

00:02:04,753 --> 00:02:06,557

just about 25 minutes.

39

00:02:08,930 --> 00:02:26,690

And here they come.

40

00:02:26,690 --> 00:02:45,803

Crew going down the elevator

41

00:02:45,819 --> 00:02:47,173

where they'll be greeted by

42

00:02:48,275 --> 00:02:50,113

employees from Kennedy Space Center

43

00:02:50,113 --> 00:02:52,168

and members of the news media.

44

00:02:52,953 --> 00:02:54,390

This is the same elevator

45

00:02:55,861 --> 00:02:57,364

that's been used by the astronauts

46

00:02:57,364 --> 00:02:58,383

ever since Apollo.

47

00:04:51,191 --> 00:04:52,193

And there they go.

48

00:04:53,363 --> 00:04:55,869

Escorted by NASA's security

49

00:04:57,473 --> 00:05:00,413

- also be a helicopter flying overhead.

50

00:05:19,326 --> 00:05:20,613

It's about a 20 minute ride

51
00:05:20,613 --> 00:05:23,069
out to launch Pad 39 A.

52
00:05:27,412 --> 00:05:28,047
That's a shuttle

53
00:05:28,047 --> 00:05:30,119
launch control T minus two hours,

54
00:05:30,269 --> 00:05:32,759
31 minutes, five seconds and counting.

55
00:05:34,463 --> 00:05:36,986
The flight crew is now in the white room

56
00:05:36,986 --> 00:05:38,222
of the orbiter access arm.

57
00:05:39,358 --> 00:05:40,494
Members of the close

58
00:05:40,494 --> 00:05:42,599
out crew are in the white coveralls,

59
00:05:42,599 --> 00:05:44,086
and the astronauts,

60
00:05:44,086 --> 00:05:44,721
of course, are in the

61
00:05:44,721 --> 00:05:47,160
orange pressure suits, the close out

62
00:05:47,160 --> 00:05:49,082
crew will be assisting the astronauts

63
00:05:49,082 --> 00:05:50,519

with their helmets and other equipment

64

00:05:50,519 --> 00:05:52,524

as they enter the orbiter.

65

00:05:55,731 --> 00:05:57,619

This is an incredibly experienced

66

00:05:57,619 --> 00:05:58,471

and dedicated team

67

00:05:58,772 --> 00:06:00,109

that gets the people on the orbiter,

68

00:06:00,109 --> 00:06:00,810

and Travis is in

69

00:06:00,810 --> 00:06:01,529

charge of the whole thing,

70

00:06:01,529 --> 00:06:02,849

and not only is he in charge of this one,

71

00:06:03,049 --> 00:06:04,285

but he's in charge of the whole

72

00:06:04,737 --> 00:06:05,605

whole close out crew.

73

00:06:07,777 --> 00:06:08,980

We can see here Chris Ferguson

74

00:06:08,980 --> 00:06:09,999

getting put into a seat

75

00:06:10,450 --> 00:06:11,653

and the folks that are helping him

76

00:06:11,653 --> 00:06:12,255

get in his seat,

77

00:06:12,255 --> 00:06:14,176

there are the number two,

78

00:06:14,176 --> 00:06:15,279

if you can see the number two on him

79

00:06:15,279 --> 00:06:16,131

is Randy Bresnik.

80

00:06:16,131 --> 00:06:18,203

He's actually a Marine,

81

00:06:18,203 --> 00:06:19,539

a Marine Corps colonel.

82

00:06:19,556 --> 00:06:20,558

He's one of our astronauts.

83

00:06:20,558 --> 00:06:21,761

You can see him in the one screen.

84

00:06:22,279 --> 00:06:24,518

And Randy is actually getting on there

85

00:06:24,518 --> 00:06:25,938

to help out with communication structures

86

00:06:25,938 --> 00:06:26,623

and all this kind of thing.

87

00:06:26,623 --> 00:06:28,762

But the guy running the operation is

88

00:06:29,146 --> 00:06:30,015

Drew Billingsley.

89

00:06:30,015 --> 00:06:30,950

He's number three.

90

00:06:32,287 --> 00:06:33,022

And you can see him

91

00:06:33,022 --> 00:06:34,041

kind of climbing all over there.

92

00:06:38,018 --> 00:06:38,753

If you look in the view

93

00:06:38,753 --> 00:06:39,187

there, you can see

94

00:06:39,187 --> 00:06:40,457

Chris Ferguson right in front of us

95

00:06:40,457 --> 00:06:42,462

and kind of behind to the right

96

00:06:42,729 --> 00:06:43,748

kind of lean over as Randy

97

00:06:43,748 --> 00:06:45,285

Bresnik number two and now disappeared

98

00:06:45,285 --> 00:06:46,605

from sight is Drew Billingsley.

99

00:06:46,939 --> 00:06:47,858

He's called the flight deck

100

00:06:47,858 --> 00:06:49,011

crew insertion technician,

101
00:06:49,011 --> 00:06:50,498
the one that gets them on the upstairs.

102
00:06:50,865 --> 00:06:51,734
Born in Santa Monica,

103
00:06:51,734 --> 00:06:52,837
California, and grew up in

104
00:06:52,837 --> 00:06:54,708
Huntington Beach, served in the U.S.

105
00:06:54,708 --> 00:06:55,042
Army.

106
00:06:55,042 --> 00:06:56,713
He's been in this role for a long time.

107
00:06:57,281 --> 00:06:59,887
He was the initial suit tech in STS-86.

108
00:07:00,405 --> 00:07:01,575
Back in 1997.

109
00:07:05,534 --> 00:07:06,336
What they're doing is they go

110
00:07:06,336 --> 00:07:07,790
through here is as Chris

111
00:07:07,790 --> 00:07:09,076
gets in the seat, there's probably

112
00:07:09,076 --> 00:07:10,313
about nine different connections

113
00:07:10,313 --> 00:07:11,232

that need to be made both

114

00:07:11,900 --> 00:07:12,819

to the vehicle itself

115

00:07:12,819 --> 00:07:14,540

as well as within his own gear there.

116

00:07:14,874 --> 00:07:15,743

And as you can see, we're

117

00:07:15,743 --> 00:07:17,781

pretty much shot as astronauts

118

00:07:17,781 --> 00:07:19,067

just hanging back and let them do it.

119

00:07:19,067 --> 00:07:19,970

The best thing we can do

120

00:07:19,970 --> 00:07:21,523

is let these professionals do their job.

121

00:07:21,824 --> 00:07:22,576

So you can see, Chris,

122

00:07:22,576 --> 00:07:23,411

it just concentrate

123

00:07:23,411 --> 00:07:24,130

on getting his hands

124

00:07:24,130 --> 00:07:25,934

out of the way and making sure that draws

125

00:07:25,934 --> 00:07:27,287

access to what he's working over.

126
00:07:27,287 --> 00:07:27,822
On the right there

127
00:07:27,822 --> 00:07:28,841
is this liquid cooling.

128
00:07:29,326 --> 00:07:30,161
You've got all the straps

129
00:07:30,161 --> 00:07:30,712
that have to come around.

130
00:07:31,030 --> 00:07:32,383
It's a five strap harness.

131
00:07:32,634 --> 00:07:34,004
You have to get the parachute,

132
00:07:34,004 --> 00:07:34,956
which is what you're seeing there.

133
00:07:34,973 --> 00:07:36,226
Randy has the close one.

134
00:07:36,760 --> 00:07:38,147
And Drew has the far one.

135
00:07:38,147 --> 00:07:38,799
You get the parachute

136
00:07:38,799 --> 00:07:40,252
straps that are waiting for the person

137
00:07:40,252 --> 00:07:41,004
who's already in the seat

138
00:07:41,004 --> 00:07:41,539

when you get in.

139

00:07:41,956 --> 00:07:42,975

They put those over the side

140

00:07:42,975 --> 00:07:43,627

and they connect those

141

00:07:43,627 --> 00:07:44,563

and you'll see a real good

142

00:07:44,563 --> 00:07:45,315

shot of that right here.

143

00:07:45,315 --> 00:07:46,551

You'll see them connected in to the

144

00:07:47,620 --> 00:07:49,124

to the straps that Chris

145

00:07:49,124 --> 00:07:50,260

is already into,

146

00:07:50,260 --> 00:07:51,613

that he can with his arm,

147

00:07:51,613 --> 00:07:52,816

his chest strap, everything

148

00:07:52,816 --> 00:07:53,835

so that it's connected there.

149

00:07:54,203 --> 00:07:55,072

And they're essentially doing

150

00:07:55,072 --> 00:07:55,723

all these connections

151
00:07:55,723 --> 00:07:57,761
to make sure he's nice in a nice

152
00:07:57,761 --> 00:07:59,232
and snug in there and all ready to go.

153
00:08:04,444 --> 00:08:05,748
So talked about the two guys in their.

154
00:08:05,748 --> 00:08:07,402
Drew is uh - this is be his 11th mission.

155
00:08:07,402 --> 00:08:08,638
I'm trying to remember Randy,

156
00:08:09,807 --> 00:08:10,776
and this is Randy's first

157
00:08:10,776 --> 00:08:11,495
one is the number two.

158
00:08:11,495 --> 00:08:12,213
Is this the first time

159
00:08:12,213 --> 00:08:13,450
he's actually inside the vehicle

160
00:08:13,450 --> 00:08:15,454
doing this, this the setup here

161
00:08:15,454 --> 00:08:17,560
so I'm sure he's having a lot of fun.

162
00:08:18,846 --> 00:08:21,001
And this looks like Doug Hurley.

163
00:08:21,970 --> 00:08:22,989

He has to be Doug Hurley

164

00:08:23,106 --> 00:08:24,309
going in Marine colonel.

165

00:08:24,309 --> 00:08:26,698
He is fine as a pilot on this flight.

166

00:08:26,698 --> 00:08:27,901
This is his second flight flew

167

00:08:27,901 --> 00:08:29,322
a few years ago on 127.

168

00:08:29,856 --> 00:08:30,725
And he's being helped there.

169

00:08:30,725 --> 00:08:31,544
You can see the guys out

170

00:08:31,544 --> 00:08:31,928
in the white room.

171

00:08:31,928 --> 00:08:32,980
They get everybody ready to go.

172

00:08:33,281 --> 00:08:35,069
Number four, there is Rene Aron's.

173

00:08:35,086 --> 00:08:36,372
He's another long time member.

174

00:08:36,372 --> 00:08:36,940
And by the way,

175

00:08:36,940 --> 00:08:37,842
all the guys that we've talked

176

00:08:37,842 --> 00:08:39,480
about so far, USA employees,

177

00:08:40,031 --> 00:08:41,017
other than Randy Bresnik,

178

00:08:41,017 --> 00:08:41,969
of course, he's the astronaut.

179

00:08:41,969 --> 00:08:43,473
But Renee has been with the United Space

180

00:08:43,473 --> 00:08:44,442
Alliance for a long time.

181

00:08:44,859 --> 00:08:46,296
Twenty seven years in the space program.

182

00:08:46,296 --> 00:08:47,583
He's been for 40 launches,

183

00:08:48,334 --> 00:08:48,834
and he's

184

00:08:49,354 --> 00:08:50,874
he's just doing a great job for us.

185

00:08:50,891 --> 00:08:52,177
He's been the OVCC.

186

00:08:52,578 --> 00:08:54,082
He's actually had Travis Thompson's job.

187

00:08:54,098 --> 00:08:55,118
Travis is number one.

188

00:08:56,053 --> 00:08:57,640

There's only about three or four people

189

00:08:57,640 --> 00:08:58,242
that are qualified

190

00:08:58,242 --> 00:08:59,578
to do that job at any one time.

191

00:08:59,578 --> 00:09:00,514
And Renee is another one.

192

00:09:00,514 --> 00:09:01,917
But in this flight, he's actually

193

00:09:01,917 --> 00:09:03,070
flown the number four rule.

194

00:09:03,455 --> 00:09:05,643
And so he does a great job with that.

195

00:09:05,643 --> 00:09:06,846
He's going to be the hatch technician

196

00:09:06,846 --> 00:09:07,598
when they close the hatch

197

00:09:07,598 --> 00:09:08,651
and take care of all that stuff.

198

00:09:09,269 --> 00:09:10,739
I mentioned that Randy brisling.

199

00:09:10,739 --> 00:09:12,527
He's the ASP astronauts,

200

00:09:12,577 --> 00:09:13,379
of course, called astronaut

201
00:09:13,379 --> 00:09:14,014
support personnel.

202
00:09:14,047 --> 00:09:16,085
When when does he get on board?

203
00:09:16,119 --> 00:09:17,622
He gets on fairly early.

204
00:09:17,622 --> 00:09:18,374
Does he? He does.

205
00:09:18,374 --> 00:09:19,861
He comes out and gets everything

206
00:09:19,861 --> 00:09:21,214
prepared inside the crew cockpit

207
00:09:21,214 --> 00:09:22,267
before the crew gets out there

208
00:09:22,267 --> 00:09:22,902
and make sure that all

209
00:09:22,902 --> 00:09:23,737
their gear is in place.

210
00:09:23,888 --> 00:09:24,539
There's a lot of things

211
00:09:24,539 --> 00:09:25,408
they don't bring with them.

212
00:09:25,408 --> 00:09:26,344
They don't carry out with them

213
00:09:26,344 --> 00:09:27,513

that we take out for them.

214

00:09:27,814 --> 00:09:30,119

And I did this job quite a while ago,

215

00:09:30,119 --> 00:09:32,258

and there's a lot of things you take out

216

00:09:32,258 --> 00:09:32,759

there, get ready.

217

00:09:32,759 --> 00:09:33,962

You essentially triple

218

00:09:33,962 --> 00:09:34,680

check the cockpit

219

00:09:34,680 --> 00:09:35,883

to make sure everything's in place.

220

00:09:40,027 --> 00:09:40,912

You can see Drew there

221

00:09:40,912 --> 00:09:43,402

working with Chris Fergie's

222

00:09:44,120 --> 00:09:44,872

communication gear.

223

00:09:44,889 --> 00:09:46,175

That's the white line that's coming down.

224

00:09:46,192 --> 00:09:47,478

It's actually from the back of the helmet

225

00:09:47,679 --> 00:09:48,882

that connects into the system,

226

00:09:48,882 --> 00:09:49,867

but that's the line

227

00:09:49,867 --> 00:09:50,953

that communication comes through.

228

00:09:51,204 --> 00:09:52,073

So you see that wraps around

229

00:09:52,273 --> 00:09:52,958

a couple of times

230

00:09:52,958 --> 00:09:53,894

in the black piece of gear

231

00:09:53,894 --> 00:09:54,846

we call the hot dog there

232

00:09:54,846 --> 00:09:55,849

- that's a quick disconnect.

233

00:09:56,200 --> 00:09:57,503

Everything that he's been strapped

234

00:09:57,503 --> 00:09:58,689

into the shuttle with

235

00:09:58,906 --> 00:09:59,858

has a quick disconnect

236

00:09:59,858 --> 00:10:01,312

so they can just pull things instead

237

00:10:01,312 --> 00:10:03,217

of having to tightly and do things.

238

00:10:03,217 --> 00:10:04,336

Everything just has a quick pull

239

00:10:04,336 --> 00:10:05,923

that they can take apart in case

240

00:10:05,923 --> 00:10:06,675

they would have to get out

241

00:10:06,675 --> 00:10:07,661

if there's some kind of emergency,

242

00:10:07,677 --> 00:10:08,763

the pad and instead of launch,

243

00:10:08,780 --> 00:10:09,649

they're going to have to get out.

244

00:10:10,067 --> 00:10:10,701

There's a bunch of

245

00:10:10,869 --> 00:10:11,954

quick disconnects she pulls

246

00:10:11,954 --> 00:10:13,241

so they can just for Chris,

247

00:10:13,542 --> 00:10:14,745

he would roll to his right

248

00:10:14,745 --> 00:10:15,764

dropdown down on the MST2 seat

249

00:10:16,181 --> 00:10:18,637

which Drew are not Drew, but

250

00:10:18,821 --> 00:10:19,907

Randy Bresnik is kind of

251

00:10:19,907 --> 00:10:20,743

on over there on the left.

252

00:10:20,743 --> 00:10:22,163

He would drop down on the seat down there

253

00:10:22,163 --> 00:10:23,382

and then get out of the vehicle.

254

00:10:23,399 --> 00:10:25,036

So that's part of the reason

255

00:10:25,036 --> 00:10:25,721

why I take so long

256

00:10:25,721 --> 00:10:26,540

is because everything's

257

00:10:26,540 --> 00:10:27,225

an intricate thing.

258

00:10:27,225 --> 00:10:28,612

You don't want anything to be tangled up.

259

00:10:28,612 --> 00:10:29,230

You don't want anything

260

00:10:29,230 --> 00:10:31,068

that can slow the crewmember down

261

00:10:31,068 --> 00:10:32,287

if they need to get out of the vehicle.

262

00:10:32,304 --> 00:10:32,804

So.

263

00:10:35,846 --> 00:10:37,868

And this is Sandy Magnus.

264

00:10:37,968 --> 00:10:38,636

You saw our mission

265

00:10:38,636 --> 00:10:40,758

specialist number one,

266

00:10:40,758 --> 00:10:42,295

so when she gets in,

267

00:10:42,295 --> 00:10:44,300

I think she's going to be

268

00:10:44,300 --> 00:10:45,870

on the flight deck in the aft

269

00:10:47,040 --> 00:10:48,393

right seat .

270

00:10:48,393 --> 00:10:49,780

Um, I want to.

271

00:10:51,050 --> 00:10:52,503

Step six twenty eight.

272

00:10:52,620 --> 00:10:53,038

That's correct.

273

00:10:53,038 --> 00:10:54,124

We got a good view of it now.

274

00:10:54,992 --> 00:10:55,761

They are complete.

275

00:10:55,878 --> 00:10:57,198

Doug has gotten in from the middle,

276

00:10:57,265 --> 00:10:57,933

and you kind of have to go

277

00:10:57,933 --> 00:10:59,119

in through the middle, through the hatch.

278

00:10:59,119 --> 00:10:59,619

And in the middle,

279

00:10:59,671 --> 00:11:00,272

you kind of take a

280

00:11:00,272 --> 00:11:01,742

right about a 90 degree. Right.

281

00:11:02,010 --> 00:11:03,146

You have to go through the ladder

282

00:11:03,146 --> 00:11:04,048

access, which normally

283

00:11:04,048 --> 00:11:04,683

when you're vertical,

284

00:11:04,683 --> 00:11:05,485

you'd be climbing the ladder.

285

00:11:05,485 --> 00:11:06,571

In this case, you're going right.

286

00:11:06,888 --> 00:11:08,041

And then you actually crawl

287

00:11:08,041 --> 00:11:09,678

on the aft panels and you can see that

288

00:11:09,678 --> 00:11:10,647

Randy is actually standing

289

00:11:10,647 --> 00:11:12,652

on the aft panels there as he gets folks

290

00:11:12,652 --> 00:11:14,005

ready to get in the vehicle.

291

00:11:14,005 --> 00:11:16,194

So we've got things down there

292

00:11:16,194 --> 00:11:17,447

to protect the AFT panels.

293

00:11:17,998 --> 00:11:19,318

Certain place where you can stand like

294

00:11:19,469 --> 00:11:20,187

you noticed, for instance,

295

00:11:20,187 --> 00:11:21,591

Randy is not standing on the switches.

296

00:11:21,591 --> 00:11:22,459

We can't stand there,

297

00:11:22,977 --> 00:11:23,813

but it's kind of intricate.

298

00:11:23,813 --> 00:11:25,049

You have to weave your way around.

299

00:11:25,049 --> 00:11:26,553

And so you come in the hatch,

300

00:11:26,553 --> 00:11:27,171

you turn to your right

301
00:11:27,171 --> 00:11:28,791
for about 90 degrees, go about five feet,

302
00:11:28,791 --> 00:11:30,328
you drop down to the aft panels,

303
00:11:30,663 --> 00:11:32,099
aft lower panels of the flight deck,

304
00:11:32,099 --> 00:11:33,169
and then you climb up on the mission

305
00:11:33,169 --> 00:11:34,021
specialist to seat,

306
00:11:34,188 --> 00:11:35,491
and then you have to get yourself up

307
00:11:35,491 --> 00:11:36,660
in the pilot or commander seat.

308
00:11:36,694 --> 00:11:37,880
So these are the hardest

309
00:11:38,014 --> 00:11:38,665
seats to get into.

310
00:11:38,665 --> 00:11:39,969
And it's kind of a monkey bar thing.

311
00:11:39,969 --> 00:11:41,238
There's a grip up there

312
00:11:41,238 --> 00:11:42,291
that they grab with their hands

313
00:11:42,291 --> 00:11:43,143

and then they put their feet up

314

00:11:43,143 --> 00:11:44,546

there and oftentimes you'll see that

315

00:11:44,880 --> 00:11:46,551

the technicians either drill or Randy

316

00:11:46,551 --> 00:11:47,938

helping them get their feet up there

317

00:11:48,138 --> 00:11:48,990

and get all situated.

318

00:11:48,990 --> 00:11:50,244

And then the critical thing is, is

319

00:11:51,029 --> 00:11:51,647

getting yourself

320

00:11:51,647 --> 00:11:53,184

on the parachute correctly.

321

00:11:53,184 --> 00:11:53,785

You want to get yourself

322

00:11:53,785 --> 00:11:55,039

all the way down in the seat

323

00:11:55,323 --> 00:11:56,509

as far as to the seat pan

324

00:11:56,509 --> 00:11:58,012

as you can, because the shoulder straps,

325

00:11:58,029 --> 00:11:59,132

the parachute can be quite

326

00:12:00,569 --> 00:12:02,223

painful if you don't get a little bit

327

00:12:02,223 --> 00:12:03,091

those a little bit loose.

328

00:12:03,091 --> 00:12:04,278

So got to make sure you're as far down

329

00:12:04,278 --> 00:12:05,330

on the seat pan as possible.

330

00:12:05,330 --> 00:12:06,767

So you'll see a lot of adjustments here

331

00:12:07,435 --> 00:12:08,371

where they're pushing on them

332

00:12:08,371 --> 00:12:09,240

and pulling on people

333

00:12:09,240 --> 00:12:10,309

and getting them in the right place.

334

00:12:10,309 --> 00:12:11,763

And it's kind of a manhandling

335

00:12:11,763 --> 00:12:13,016

task, obviously, with the suit.

336

00:12:13,283 --> 00:12:14,402

The suit weighs a lot.

337

00:12:14,402 --> 00:12:16,040

It usually weighs about 50, 60 pounds.

338

00:12:16,040 --> 00:12:16,524

And so they're carrying

339

00:12:16,524 --> 00:12:18,512

a lot of extra weight and it's bulky

340

00:12:18,512 --> 00:12:19,348

and it's it's hard

341

00:12:19,348 --> 00:12:20,183

to get where you want to go.

342

00:12:20,183 --> 00:12:21,770

And that's why we have so much extra

343

00:12:21,770 --> 00:12:22,856

help in there for these guys, that

344

00:12:23,090 --> 00:12:24,928

this job is almost impossible

345

00:12:24,928 --> 00:12:25,813

to do yourself on the ground.

346

00:12:25,813 --> 00:12:26,933

On orbit, it's pretty easy.

347

00:12:27,267 --> 00:12:28,286

I just have to set things up

348

00:12:28,286 --> 00:12:28,938

and you're floating.

349

00:12:28,938 --> 00:12:29,823

So it's a lot easier.

350

00:12:29,823 --> 00:12:31,611

You can move around a lot more readily.

351
00:12:31,828 --> 00:12:33,081
And the bulkiness doesn't hurt

352
00:12:33,081 --> 00:12:34,885
you nearly as much when you're in zero G

353
00:12:35,119 --> 00:12:36,022
GMT and everything

354
00:12:36,022 --> 00:12:37,375
you just said is complete ready

355
00:12:37,375 --> 00:12:39,029
for IMU platform positioning.

356
00:12:40,081 --> 00:12:40,683
Copy that.

357
00:12:43,757 --> 00:12:44,893
The next milestone

358
00:12:44,893 --> 00:12:46,814
is a check of the orbiter's

359
00:12:46,814 --> 00:12:47,750
flight controls.

360
00:12:50,239 --> 00:12:52,061
[launch control].

361
00:13:03,839 --> 00:13:05,059
And there will be a steering

362
00:13:05,059 --> 00:13:07,548
check of Atlantis's three main engines.

363
00:13:44,488 --> 00:13:45,925

We're finding out that the main engines

364

00:13:45,925 --> 00:13:47,211
are in their start position.

365

00:13:54,980 --> 00:13:57,503
CLS is g for o ET LO2 pressurization.

366

00:14:00,293 --> 00:14:01,312
Starting now, the

367

00:14:01,880 --> 00:14:03,601
retraction of the gaseous oxygen

368

00:14:03,601 --> 00:14:04,787
vent arm, the vent hood.

369

00:14:11,571 --> 00:14:13,793
TLT OTC, clear caution

370

00:14:13,793 --> 00:14:16,900
warning memory, verify

371

00:14:16,900 --> 00:14:20,509
no unexpected errors.

372

00:14:20,509 --> 00:14:22,798
Fuel cells going to internal

373

00:14:23,399 --> 00:14:24,352
external tank camera

374

00:14:24,352 --> 00:14:25,621
being activated at this time.

375

00:14:29,815 --> 00:14:35,078
OTC TLT - no unexpected errors.

376
00:14:35,078 --> 00:14:38,135
Copy that.

377
00:14:38,135 --> 00:14:41,176
Flight crew, OTC, close

378
00:14:41,176 --> 00:14:42,345
and lock your visors

379
00:14:42,345 --> 00:14:46,389
and initiate O2 flow..

380
00:14:48,677 --> 00:14:49,763
T minus two minutes.

381
00:14:53,322 --> 00:14:56,112
[launch control].

382
00:14:58,886 --> 00:14:59,871
Solid rocket booster

383
00:14:59,871 --> 00:15:01,041
cameras being activated.

384
00:15:31,298 --> 00:15:34,973
Sound suppression

385
00:15:34,973 --> 00:15:36,360
water system is being armed.

386
00:15:48,256 --> 00:15:49,241
T minus one minute.

387
00:15:59,333 --> 00:16:01,020
But oxygen and liquid hydrogen

388
00:16:01,020 --> 00:16:02,641

fill and drain valves are closed.

389

00:16:07,536 --> 00:16:09,223

T minus 40 seconds,

390

00:16:09,223 --> 00:16:11,044

handing off to Atlantis's computers

391

00:16:11,412 --> 00:16:12,582

at T minus 31,

392

00:16:13,801 --> 00:16:17,911

T minus 35 33 to hold a

393

00:16:17,928 --> 00:16:19,833

T minus 31 seconds due to a failure.

394

00:16:21,152 --> 00:16:22,589

And we have had a failure.

395

00:16:23,759 --> 00:16:24,628

A sequencer

396

00:16:25,830 --> 00:16:31,210

[inaudible] Go ahead.

397

00:16:31,361 --> 00:16:33,533

We need guys to go

398

00:16:33,549 --> 00:16:36,273

do the verification per the LCC, please.

399

00:16:37,242 --> 00:16:37,576

All right. Standby.

400

00:16:37,576 --> 00:16:41,702

[inaudible] We need to

401
00:16:41,702 --> 00:16:43,407
verify using a camera.

402
00:16:43,407 --> 00:16:45,328
And we're positioning

403
00:16:45,328 --> 00:16:46,748
camera 62 right now.

404
00:16:47,166 --> 00:16:47,500
Okay.

405
00:16:47,500 --> 00:16:49,204
Let us know when 62 is swung over

406
00:16:49,204 --> 00:16:50,257
and you can verify LCC

407
00:16:50,257 --> 00:16:51,593
for GVA retrack please.

408
00:16:57,374 --> 00:16:57,959
And of course, now

409
00:16:57,959 --> 00:16:59,078
we're holding here at 31 seconds

410
00:16:59,078 --> 00:17:01,434
while we get a verification that the GVA

411
00:17:02,403 --> 00:17:03,756
has fully retracted

412
00:17:06,797 --> 00:17:08,183
per our preplan.

413
00:17:08,183 --> 00:17:12,327

This is CMC - we verify retracted.

414

00:17:14,933 --> 00:17:15,952

OK, and you can verify

415

00:17:15,952 --> 00:17:17,272

that is fully retracted per

416

00:17:17,272 --> 00:17:18,509

the instructions that

417

00:17:18,509 --> 00:17:20,664

we developed, correct?

418

00:17:20,898 --> 00:17:21,416

That's correct.

419

00:17:21,950 --> 00:17:22,351

All right.

420

00:17:22,351 --> 00:17:24,406

And [inaudible] concurs

421

00:17:24,473 --> 00:17:25,726

they satisfy the requirement,

422

00:17:25,743 --> 00:17:27,982

the GFC 13 preparked to see I am go.

423

00:17:28,717 --> 00:17:29,652

Okay, I copy that.

424

00:17:29,652 --> 00:17:30,154

And launch director?

425

00:17:30,154 --> 00:17:31,958

Yes, sir, I heard all that and concur.

426
00:17:31,958 --> 00:17:32,760
Press on.

427
00:17:33,478 --> 00:17:33,863
All right.

428
00:17:33,863 --> 00:17:34,363
Very good.

429
00:17:34,949 --> 00:17:36,870
[inaudible]

430
00:17:39,894 --> 00:17:40,312
Very good.

431
00:17:40,312 --> 00:17:43,636
And GLS, do you have concurrence?

432
00:17:43,636 --> 00:17:44,589
Go? It's in work.

433
00:17:45,056 --> 00:17:45,556
Thank you.

434
00:17:45,708 --> 00:17:46,410
Let us know when that's complete.

435
00:17:53,778 --> 00:17:54,413
We have it in work.

436
00:17:58,038 --> 00:17:58,790
All right, guidance.

437
00:18:05,807 --> 00:18:07,695
And just a reminder for folks

438
00:18:07,695 --> 00:18:09,031

who are watching that hold time

439

00:18:09,031 --> 00:18:10,468
in three minutes and 16 seconds.

440

00:18:14,478 --> 00:18:17,920
[inaudible] were ready to go.

441

00:18:18,772 --> 00:18:19,607
All right, very good.

442

00:18:20,409 --> 00:18:21,662
And launch director, with that clean up,

443

00:18:21,662 --> 00:18:22,631
we're going to go ahead and proceed.

444

00:18:22,898 --> 00:18:23,717
Yes, sir. Please do.

445

00:18:23,868 --> 00:18:24,319
All right.

446

00:18:24,319 --> 00:18:25,037
And all personnel,

447

00:18:25,037 --> 00:18:25,638
we are going to pick up

448

00:18:25,638 --> 00:18:27,660
the clock here momentarily and GLS

449

00:18:27,660 --> 00:18:28,763
you can resume the clock on your mark.

450

00:18:28,997 --> 00:18:29,531
Copy that.

451
00:18:30,166 --> 00:18:31,787
Countdown clock will resume on my mark.

452
00:18:32,806 --> 00:18:36,047
Three, two, one, mark.

453
00:18:37,283 --> 00:18:39,338
Go for auto sequence

454
00:18:39,338 --> 00:18:41,243
start Hand off to Atlantis's

455
00:18:41,243 --> 00:18:42,647
computers has occurred

456
00:18:42,697 --> 00:18:44,952
and it's not a rocket booster nozzle

457
00:18:44,952 --> 00:18:46,038
steering check and work.

458
00:18:47,124 --> 00:18:47,624
Twenty.

459
00:18:49,897 --> 00:18:51,134
Firing chain is armed.

460
00:18:52,621 --> 00:18:53,121
15.

461
00:18:54,960 --> 00:18:56,347
Go for main engine start

462
00:18:57,332 --> 00:19:01,776
T minus 10, nine, eight, seven, six.

463
00:19:04,015 --> 00:19:05,936

All three engines up and burning,

464

00:19:06,538 --> 00:19:10,113

two, one, zero and liftoff,

465

00:19:10,113 --> 00:19:12,202

the final liftoff of Atlantis

466

00:19:12,269 --> 00:19:14,156

on the shoulders of the space shuttle

467

00:19:14,424 --> 00:19:16,345

America will continue the dream.

468

00:19:19,937 --> 00:19:21,291

Roger, roll Atlantis.

469

00:19:22,427 --> 00:19:23,446

Houston now controlling

470

00:19:23,446 --> 00:19:24,465

the flight of Atlantis.

471

00:19:25,000 --> 00:19:26,687

The space shuttle spreads its wings

472

00:19:26,687 --> 00:19:28,207

one final time for the start

473

00:19:28,207 --> 00:19:30,129

of a sentimental journey into history.

474

00:19:32,468 --> 00:19:34,640

24 seconds into the flight roll

475

00:19:34,640 --> 00:19:36,010

program, complete Atlantis

476
00:19:36,010 --> 00:19:37,246
now heads down wings

477
00:19:37,246 --> 00:19:38,599
level on the proper alignment

478
00:19:38,599 --> 00:19:39,100
for its eight and

479
00:19:39,100 --> 00:19:40,253
a half minute ride to orbit

480
00:19:40,688 --> 00:19:41,540
four and a half million

481
00:19:41,540 --> 00:19:43,545
pounds of hardware and humans taking aim

482
00:19:43,545 --> 00:19:45,165
on the International Space Station.

483
00:19:47,471 --> 00:19:48,824
40 seconds into the flight,

484
00:19:49,192 --> 00:19:50,361
the three liquid fuel main

485
00:19:50,361 --> 00:19:52,065
engines throttling back to 72

486
00:19:52,065 --> 00:19:53,318
percent of rated performance

487
00:19:53,318 --> 00:19:54,020
in the bucket,

488
00:19:54,020 --> 00:19:55,390

reducing stress on the shuttle

489

00:19:55,390 --> 00:19:57,495

as it goes transonic for the final time.

490

00:20:00,753 --> 00:20:02,307

Engines now revving up, standing

491

00:20:02,307 --> 00:20:03,710

by for the throttle up call.

492

00:20:19,432 --> 00:20:21,487

Atlantis, go at throttle up,

493

00:20:21,487 --> 00:20:24,310

no action, DPDT, throttle

494

00:20:24,310 --> 00:20:27,969

up, no action on DPDT.

495

00:20:27,969 --> 00:20:30,258

That call from CAPCOM Barry Wilmore-

496

00:20:30,258 --> 00:20:32,363

a transducer instrumentation only,

497

00:20:32,363 --> 00:20:33,683

no action required.

498

00:20:39,731 --> 00:20:41,502

Atlantis now 15 miles

499

00:20:41,502 --> 00:20:44,142

in altitude already 16 miles downrange

500

00:20:44,142 --> 00:20:45,027

from the Kennedy Space

501
00:20:45,027 --> 00:20:46,531
Center, one minute, 40 seconds

502
00:20:46,531 --> 00:20:47,166
into the flight.

503
00:20:49,271 --> 00:20:50,173
Atlantis flexing

504
00:20:50,173 --> 00:20:51,844
its muscles one final time.

505
00:20:54,734 --> 00:20:55,603
Atlantis traveling

506
00:20:55,603 --> 00:20:58,276
almost 2600 miles an hour at 21 miles

507
00:20:58,276 --> 00:21:00,432
an altitude, 24 miles downrange,

508
00:21:00,849 --> 00:21:01,902
standing by for solid

509
00:21:01,902 --> 00:21:03,172
rocket booster separation.

510
00:21:16,120 --> 00:21:17,356
Booster officer confirms

511
00:21:17,356 --> 00:21:18,760
staging a good, solid rocket

512
00:21:18,760 --> 00:21:19,812
booster separation.

513
00:21:20,079 --> 00:21:22,402

Guidance now converging the main engines

514

00:21:22,402 --> 00:21:23,872

steering the shuttle on a pinpoint

515

00:21:23,872 --> 00:21:25,509

path to its preliminary orbit.

516

00:21:25,910 --> 00:21:27,765

Two minutes, 20 seconds into the flight.

517

00:21:28,099 --> 00:21:29,302

Atlantis already traveling

518

00:21:29,302 --> 00:21:31,390

thirty two hundred miles an hour, 35

519

00:21:31,390 --> 00:21:33,729

miles in altitude, 50 miles downrange.

520

00:21:35,550 --> 00:21:36,954

The propulsion officer reports

521

00:21:36,954 --> 00:21:38,240

the orbital maneuvering system

522

00:21:38,240 --> 00:21:39,243

engines have ignited

523

00:21:39,543 --> 00:21:41,331

Atlantis, kicking on its afterburners

524

00:21:41,331 --> 00:21:42,417

for one minute, 23

525

00:21:42,417 --> 00:21:43,704

seconds for the final phase

526
00:21:43,704 --> 00:21:44,489
of powered flight.

527
00:21:46,327 --> 00:21:48,281
Atlantis 2 engine tile.

528
00:21:50,403 --> 00:21:51,606
2 engine tile.

529
00:21:51,606 --> 00:21:53,394
That call from CAPCOM [inaudible]

530
00:21:54,179 --> 00:21:56,134
so the in the event of contingency,

531
00:21:56,134 --> 00:21:57,921
you're in plane plus

532
00:21:57,921 --> 00:22:00,377
230 on the [inaudible] page,

533
00:22:00,778 --> 00:22:02,666
no com VIs when you're ready to copy.

534
00:22:04,922 --> 00:22:09,065
[inaudible] ATO 10.

535
00:22:09,065 --> 00:22:10,018
Decimal eight.

536
00:22:10,535 --> 00:22:12,590
Press Damico 14.

537
00:22:12,607 --> 00:22:16,266
Decimal seven.

538
00:22:16,266 --> 00:22:22,648

[inaudible] That's a good

539

00:22:22,648 --> 00:22:24,469
read back Atlantis.

540

00:22:24,469 --> 00:22:26,808
Because of the slightly late launch time,

541

00:22:26,808 --> 00:22:27,944
Capcom Barry Wilmore

542

00:22:27,944 --> 00:22:29,482
reading up to pilot Doug Hurley,

543

00:22:29,482 --> 00:22:30,735
the updated abort

544

00:22:30,735 --> 00:22:32,021
boundaries for Atlantis,

545

00:22:32,355 --> 00:22:34,059
which is flying on the singular power

546

00:22:34,059 --> 00:22:34,811
of its three liquid

547

00:22:34,811 --> 00:22:35,596
fuel main engines,

548

00:22:35,596 --> 00:22:36,966
draining a half a ton of fuel per

549

00:22:36,966 --> 00:22:38,002
second from the shuttle's

550

00:22:38,002 --> 00:22:38,988
large fuel tank.

551
00:22:39,322 --> 00:22:40,809
Three and a half minutes into the flight.

552
00:22:41,076 --> 00:22:42,196
Atlantis traveling forty

553
00:22:42,196 --> 00:22:43,282
two hundred miles an hour.

554
00:22:43,282 --> 00:22:45,103
Fifty four miles, an altitude

555
00:22:45,320 --> 00:22:47,442
already 120 miles downrange

556
00:22:47,442 --> 00:22:48,678
from the Kennedy Space Center.

557
00:22:51,034 --> 00:22:52,320
Three good main engines,

558
00:22:52,487 --> 00:22:54,108
three good auxiliary power units,

559
00:22:54,108 --> 00:22:55,562
three good fuel cells for Atlantis.

560
00:22:55,562 --> 00:22:56,062
Atlantis

561
00:23:05,452 --> 00:23:06,739
negative return.

562
00:23:09,011 --> 00:23:09,696
Negative return,

563
00:23:10,231 --> 00:23:11,701

that call from CAPCOM Barry

564

00:23:11,701 --> 00:23:12,753

Wilmore indicating

565

00:23:12,753 --> 00:23:14,257

that were too high in altitude,

566

00:23:14,374 --> 00:23:16,379

too far down range to return

567

00:23:16,379 --> 00:23:17,649

to the launch site in the event

568

00:23:17,649 --> 00:23:18,634

of an engine failure.

569

00:23:18,969 --> 00:23:20,639

However, Atlantis has three engines

570

00:23:20,639 --> 00:23:21,909

performing perfectly.

571

00:23:25,551 --> 00:23:26,871

Four minutes, 20 seconds

572

00:23:26,871 --> 00:23:27,422

into the flight.

573

00:23:33,303 --> 00:23:35,141

Atlantis currently traveling fifty five

574

00:23:35,141 --> 00:23:36,511

hundred miles an hour, sixty

575

00:23:36,511 --> 00:23:37,898

two miles, an altitude

576
00:23:37,898 --> 00:23:39,635
almost 200 miles downrange.

577
00:23:41,674 --> 00:23:43,562
Four minutes of powered flight remaining.

578
00:23:46,302 --> 00:23:47,170
Atlantis speeding

579
00:23:47,170 --> 00:23:48,674
straight as an arrow toward its state

580
00:23:48,674 --> 00:23:49,810
with the International Space

581
00:23:49,810 --> 00:23:50,946
Station Sunday morning.

582
00:24:01,171 --> 00:24:02,758
Coming up on the five minute mark.

583
00:24:06,718 --> 00:24:07,854
Atlantis now traveling

584
00:24:07,854 --> 00:24:10,260
6,500 miles an hour, sixty

585
00:24:10,310 --> 00:24:11,580
six miles an altitude,

586
00:24:11,580 --> 00:24:13,401
250 miles downrange.

587
00:24:15,890 --> 00:24:18,112
Atlantis Press to ATO.

588
00:24:20,535 --> 00:24:21,922

Press to ATO.

589

00:24:21,922 --> 00:24:24,311

That call indicating we can make minimal

590

00:24:24,478 --> 00:24:25,798

orbital targets in the event

591

00:24:25,798 --> 00:24:26,667

of an engine failure,

592

00:24:26,667 --> 00:24:27,986

all three engines continue

593

00:24:27,986 --> 00:24:29,022

to function normally.

594

00:24:29,373 --> 00:24:31,111

Atlantis will begin its slow roll

595

00:24:31,111 --> 00:24:32,731

to a heads up position shortly.

596

00:24:39,364 --> 00:24:41,252

Five and a half minutes into the flight,

597

00:24:41,820 --> 00:24:43,892

Atlantis traveling 70, 700 miles

598

00:24:43,892 --> 00:24:46,080

an hour, 315 miles downrange.

599

00:24:48,386 --> 00:24:50,608

Atlantis Single Engine Ops three.

600

00:24:52,797 --> 00:24:53,432

Single Engine Ops three.

601
00:25:04,809 --> 00:25:05,494
And the guidance

602
00:25:05,494 --> 00:25:06,848
officer here in Mission Control

603
00:25:06,848 --> 00:25:08,101
confirms that the computers

604
00:25:08,101 --> 00:25:09,370
are commanding the main engines

605
00:25:09,370 --> 00:25:12,127
to swivel [inaudible].

606
00:25:14,600 --> 00:25:16,488
[inaudible] We've

607
00:25:16,488 --> 00:25:17,691
roled to a heads up

608
00:25:17,691 --> 00:25:18,977
position now providing

609
00:25:18,977 --> 00:25:19,980
better communications

610
00:25:19,980 --> 00:25:21,199
to the tracking a data relay

611
00:25:21,199 --> 00:25:22,202
satellite system

612
00:25:22,653 --> 00:25:24,173
as Atlantis heads uphill.

613
00:25:25,827 --> 00:25:28,049

Six minutes, 20 seconds into the flight.

614

00:25:32,794 --> 00:25:35,183

Atlantis Press to MECO.

615

00:25:35,183 --> 00:25:38,257

Press to MECO.

616

00:25:38,257 --> 00:25:40,747

That call indicates that we can make

617

00:25:40,747 --> 00:25:42,785

our normal orbital cutoff

618

00:25:42,802 --> 00:25:43,971

targets in the event

619

00:25:43,971 --> 00:25:44,840

of an engine failure.

620

00:25:44,840 --> 00:25:46,544

However, all three main engines

621

00:25:46,544 --> 00:25:48,633

continue to function normally nominal.

622

00:25:48,649 --> 00:25:50,236

Fergie, go the plus X.

623

00:25:50,353 --> 00:25:51,222

Go the pitch.

624

00:25:54,747 --> 00:25:55,884

Part of that downplaying

625

00:25:55,884 --> 00:25:57,621

go for the plus x, go for the pitch.

626
00:26:00,578 --> 00:26:01,731
That call indicating

627
00:26:01,898 --> 00:26:03,819
that we will be in good shape

628
00:26:03,936 --> 00:26:05,440
for the orientation

629
00:26:05,440 --> 00:26:07,128
of Atlantis for external tank

630
00:26:07,211 --> 00:26:09,550
photography following main engine cutoff.

631
00:26:09,884 --> 00:26:11,421
Now seven minutes into the flight.

632
00:26:17,118 --> 00:26:18,455
One minute, 20 seconds

633
00:26:18,472 --> 00:26:20,360
till main engine cut, Atlantis traveling

634
00:26:20,393 --> 00:26:21,997
12000 miles an hour.

635
00:26:28,078 --> 00:26:28,864
The main engines

636
00:26:28,864 --> 00:26:30,384
will soon be throttling down

637
00:26:30,384 --> 00:26:31,620
once again to limit the stress

638
00:26:31,620 --> 00:26:33,141

on the shuttle and its four crew members

639

00:26:33,141 --> 00:26:34,227

to that of three times

640

00:26:34,227 --> 00:26:35,363

the effect of gravity.

641

00:26:35,730 --> 00:26:36,566

Atlantis currently

642

00:26:36,566 --> 00:26:37,585

traveling at a speed of more

643

00:26:37,585 --> 00:26:39,122

than four miles a second.

644

00:26:42,631 --> 00:26:44,218

One minute of powered flight

645

00:26:44,218 --> 00:26:45,487

remaining for Atlantis.

646

00:26:54,810 --> 00:26:56,598

Three good main engines, three good

647

00:26:56,598 --> 00:26:57,918

auxiliary power units,

648

00:26:57,918 --> 00:26:59,221

three good fuel cells.

649

00:27:00,507 --> 00:27:01,677

Approaching the eight minute

650

00:27:01,677 --> 00:27:02,612

mark into the flight.

651
00:27:05,469 --> 00:27:06,639
Atlantis now traveling

652
00:27:06,639 --> 00:27:09,312
more than 15,000 miles an hour.

653
00:27:22,394 --> 00:27:23,346
Eight minutes, 15

654
00:27:23,346 --> 00:27:25,000
seconds into the flight, standing by

655
00:27:25,000 --> 00:27:26,186
for main engine cutoff.

656
00:27:27,005 --> 00:27:28,509
That'll be followed a few seconds later

657
00:27:28,509 --> 00:27:29,311
by the separation

658
00:27:29,311 --> 00:27:30,480
of the external fuel tank.

659
00:27:37,130 --> 00:27:38,483
Booster officer confirms

660
00:27:38,483 --> 00:27:39,569
main engine cutoff.

661
00:27:40,872 --> 00:27:42,660
For the last time, the space shuttle's

662
00:27:42,660 --> 00:27:44,397
main engines have fallen silent

663
00:27:44,832 --> 00:27:45,818

as the shuttle slips

664

00:27:45,818 --> 00:27:47,672

into the final chapter of a storied

665

00:27:47,672 --> 00:27:48,808

30 year adventure.

666

00:27:50,379 --> 00:27:51,699

Now standing by for external

667

00:27:51,699 --> 00:27:52,567

tank separation.

668

00:28:02,358 --> 00:28:03,678

Atlantis off the tank

669

00:28:04,429 --> 00:28:05,733

commander Chris Ferguson will

670

00:28:05,733 --> 00:28:07,019

be maneuvering Atlantis now

671

00:28:07,019 --> 00:28:08,690

into an orientation to enable

672

00:28:08,690 --> 00:28:09,976

Sandy Magnus to capture

673

00:28:09,993 --> 00:28:11,313

digital still imagery

674

00:28:11,313 --> 00:28:12,182

of the external fuel

675

00:28:12,182 --> 00:28:13,435

tank as it drifts away.

676

00:28:13,652 --> 00:28:15,657

OMES one is not required

677

00:28:15,657 --> 00:28:18,831

your preliminary [inaudible] 37 minutes.