



TROPICS

- 1
00:00:57,840 --> 00:06:13,630
foreign
- 2
00:06:21,730 --> 00:06:19,930
[Music]
- 3
00:06:28,970 --> 00:06:21,740
thank you
- 4
00:06:53,930 --> 00:06:44,570
[Music]
- 5
00:06:53,940 --> 00:06:58,660
foreign
- 6
00:06:58,670 --> 00:07:33,290
[Music]
- 7
00:07:33,300 --> 00:07:38,160
foreign
- 8
00:08:58,970 --> 00:08:06,790
[Music]
- 9
00:08:58,980 --> 00:09:11,150
foreign
- 10
00:10:52,250 --> 00:09:28,340
[Music]
- 11
00:11:03,750 --> 00:10:53,430
foreign
- 12
00:11:35,030 --> 00:11:14,780
[Music]
- 13
00:11:37,250 --> 00:11:35,040

it is 40 minutes past midday here at

14

00:11:39,170 --> 00:11:37,260

Rocket Labs Mission Control Center in

15

00:11:41,269 --> 00:11:39,180

Auckland New Zealand where launch

16

00:11:43,790 --> 00:11:41,279

operations are well underway in the

17

00:11:46,009 --> 00:11:43,800

lead-up to our 36th electron launch

18

00:11:48,769 --> 00:11:46,019

hello and welcome to our live broadcast

19

00:11:51,230 --> 00:11:48,779

for Rocket like a hurricane a dedicated

20

00:11:53,449 --> 00:11:51,240

mission for NASA to launch the tropics

21

00:11:55,910 --> 00:11:53,459

constellation of hurricane monitoring

22

00:11:58,310 --> 00:11:55,920

satellites today's mission is flying

23

00:12:00,769 --> 00:11:58,320

from pad B at Rocket lab launch complex

24

00:12:03,650 --> 00:12:00,779

one our private Spaceport on the Macchio

25

00:12:06,050 --> 00:12:03,660

peninsula in New Zealand t0 for Rocket

26

00:12:08,329 --> 00:12:06,060

like a hurricane is set for 1pm local

27

00:12:10,130 --> 00:12:08,339

time and for our friends at Nasa

28

00:12:11,870 --> 00:12:10,140

watching in the United States that

29

00:12:15,470 --> 00:12:11,880

translates to nine in the evening

30

00:12:19,250 --> 00:12:15,480

Eastern Time 6 p.m Pacific and a very

31

00:12:21,170 --> 00:12:19,260

early 1 am UTC my name is Muriel Baker

32

00:12:23,329 --> 00:12:21,180

and I'm Keegan black and we are thrilled

33

00:12:25,190 --> 00:12:23,339

to be with you for today's Mission our

34

00:12:26,930 --> 00:12:25,200

launch and safety operations teams at

35

00:12:28,730 --> 00:12:26,940

the range in Mahia and here in rocker

36

00:12:31,370 --> 00:12:28,740

Labs Mission Control Center in Auckland

37

00:12:33,230 --> 00:12:31,380

are heading into the final T-minus 18

38

00:12:34,730 --> 00:12:33,240

minutes of the countdown after

39

00:12:36,350 --> 00:12:34,740

methodically proceeding with final

40

00:12:38,990 --> 00:12:36,360

checks and preparations for electron

41

00:12:40,370 --> 00:12:39,000

NASA satellites and the launch pad to

42

00:12:42,170 --> 00:12:40,380

make sure all systems are healthy and

43

00:12:44,750 --> 00:12:42,180

ready for launch we have an exciting

44

00:12:47,629 --> 00:12:44,760

pair of satellites from NASA on electron

45

00:12:49,910 --> 00:12:47,639

today the two three U Cube sets will

46

00:12:52,310 --> 00:12:49,920

begin a new constellation in low earth

47

00:12:54,710 --> 00:12:52,320

orbit to monitor tropical Cyclones

48

00:12:57,710 --> 00:12:54,720

including hurricanes and typhoons around

49

00:13:00,290 --> 00:12:57,720

the world hence the tropics name which

50

00:13:02,629 --> 00:13:00,300

stands for time resolved observations of

51
00:13:05,449 --> 00:13:02,639
precipitation structure and storm

52
00:13:08,329 --> 00:13:05,459
intensity with a constellation of small

53
00:13:10,670 --> 00:13:08,339
sets another great NASA acronym today's

54
00:13:12,590 --> 00:13:10,680
mission is the first of two dedicated

55
00:13:14,750 --> 00:13:12,600
electron launchers to deploy the

56
00:13:17,269 --> 00:13:14,760
constellation this first launch has been

57
00:13:19,190 --> 00:13:17,279
dubbed by the NASA team as Rocket like a

58
00:13:20,930 --> 00:13:19,200
hurricane and in about two weeks time

59
00:13:22,670 --> 00:13:20,940
we'll be following up with a second

60
00:13:24,590 --> 00:13:22,680
launch that mission has been

61
00:13:27,110 --> 00:13:24,600
affectionately called coming to a storm

62
00:13:29,509 --> 00:13:27,120
near you both missions are heading to a

63
00:13:31,430 --> 00:13:29,519

550 kilometer circular altitude above

64

00:13:34,009 --> 00:13:31,440

Earth and an inclination of about 30

65

00:13:35,629 --> 00:13:34,019

degrees this is a unique orbit best

66

00:13:38,329 --> 00:13:35,639

reached with the dedicated launch making

67

00:13:40,850 --> 00:13:38,339

electron the ideal launched vehicle to

68

00:13:42,650 --> 00:13:40,860

deploy Tropics here's more from NASA

69

00:13:44,569 --> 00:13:42,660

about tropics and its importance not

70

00:13:46,250 --> 00:13:44,579

just to NASA's earth science team but

71

00:13:48,110 --> 00:13:46,260

for all of us eager to have more

72

00:13:50,389 --> 00:13:48,120

accurate and more timely information on

73

00:13:53,329 --> 00:13:50,399

powerful storms when they come our way

74

00:13:54,889 --> 00:13:53,339

here's a question how does a group of

75

00:13:57,050 --> 00:13:54,899

satellites

76

00:13:59,090 --> 00:13:57,060

each no more than a foot long help

77

00:14:02,050 --> 00:13:59,100

improve forecasts for tropical storms

78

00:14:04,250 --> 00:14:02,060

and hurricanes let's take a look

79

00:14:08,030 --> 00:14:04,260

hurricanes are some of the most powerful

80

00:14:10,430 --> 00:14:08,040

and destructive weather events on Earth

81

00:14:12,470 --> 00:14:10,440

a 2020 Atlantic hurricane season was

82

00:14:15,050 --> 00:14:12,480

brutal producing a record-breaking

83

00:14:17,389 --> 00:14:15,060

30-name storms

84

00:14:19,790 --> 00:14:17,399

what's more 10 of those storms were

85

00:14:22,910 --> 00:14:19,800

characterized as rapidly intensifying

86

00:14:24,949 --> 00:14:22,920

some throttling up by 100 miles per hour

87

00:14:27,050 --> 00:14:24,959

in under two days

88

00:14:29,210 --> 00:14:27,060

many weather satellites will generally

89

00:14:31,970 --> 00:14:29,220

measure a storm only once every few

90

00:14:35,210 --> 00:14:31,980

hours leaving gaps in coverage where a

91

00:14:37,970 --> 00:14:35,220

storm may quickly strengthen

92

00:14:40,370 --> 00:14:37,980

to help fill this observation Gap NASA

93

00:14:42,410 --> 00:14:40,380

is launching Tropics a collection of

94

00:14:45,650 --> 00:14:42,420

satellites designed to make a big impact

95

00:14:48,350 --> 00:14:45,660

on our understanding of damaging storms

96

00:14:50,449 --> 00:14:48,360

their mission to provide near hourly

97

00:14:53,269 --> 00:14:50,459

observations of a Storm's precipitation

98

00:14:55,129 --> 00:14:53,279

temperature and humidity allowing

99

00:14:57,889 --> 00:14:55,139

scientists to better understand what

100

00:15:00,590 --> 00:14:57,899

drives the storm's intensification

101

00:15:02,210 --> 00:15:00,600

to achieve this researchers at mit's

102

00:15:04,730 --> 00:15:02,220

Lincoln laboratory developed a

103

00:15:07,189 --> 00:15:04,740

miniaturized microwave radiometer that's

104

00:15:08,689 --> 00:15:07,199

about the size of a cup of coffee this

105

00:15:10,430 --> 00:15:08,699

small instrument will measure storm

106

00:15:12,410 --> 00:15:10,440

strength by detecting the thermal

107

00:15:15,670 --> 00:15:12,420

radiation naturally emitted by the

108

00:15:18,350 --> 00:15:15,680

oxygen and water vapor in the air

109

00:15:20,930 --> 00:15:18,360

as earth's climate continues to change

110

00:15:23,389 --> 00:15:20,940

cost effective but powerful satellites

111

00:15:25,310 --> 00:15:23,399

like Tropics will be an important tool

112

00:15:28,790 --> 00:15:25,320

to help us better observe developments

113

00:15:31,910 --> 00:15:28,800

driving rapid changes in powerful storms

114

00:15:39,350 --> 00:15:31,920

and help forecasters better predict and

115

00:15:43,069 --> 00:15:40,970

in effort to get the satellites from

116

00:15:45,350 --> 00:15:43,079

idea to the launch pad with the science

117

00:15:46,670 --> 00:15:45,360

team led by the Lincoln laboratory at

118

00:15:48,410 --> 00:15:46,680

the Massachusetts Institute of

119

00:15:50,509 --> 00:15:48,420

Technology and others including

120

00:15:52,850 --> 00:15:50,519

researchers from the NASA Goddard space

121

00:15:55,250 --> 00:15:52,860

flight center the National Oceanic and

122

00:15:56,449 --> 00:15:55,260

Atmospheric Administration or Noah and

123

00:15:59,090 --> 00:15:56,459

several universities and Commercial

124

00:16:01,490 --> 00:15:59,100

Partners fewer people have been closer

125

00:16:03,110 --> 00:16:01,500

to this Mission than Stuart cook he is

126

00:16:05,090 --> 00:16:03,120

one of the mission managers for the

127

00:16:06,889 --> 00:16:05,100

tropics program and we were lucky enough

128

00:16:08,750 --> 00:16:06,899

to catch up with Stuart earlier in the

129

00:16:13,440 --> 00:16:08,760

week at our production complex let's

130

00:16:21,410 --> 00:16:18,490

[Music]

131

00:16:23,810 --> 00:16:21,420

my name is Stuart cook and I work for

132

00:16:25,790 --> 00:16:23,820

NASA Langley Research Center my job

133

00:16:27,650 --> 00:16:25,800

title is I'm the mission manager for the

134

00:16:30,530 --> 00:16:27,660

tropics project

135

00:16:31,189 --> 00:16:30,540

think about four satellites orbiting the

136

00:16:33,949 --> 00:16:31,199

Earth

137

00:16:37,610 --> 00:16:33,959

these satellites are looking down at

138

00:16:39,829 --> 00:16:37,620

Clouds at storms at uh hurricanes and

139

00:16:42,050 --> 00:16:39,839

they're looking to see how they form how

140

00:16:44,389 --> 00:16:42,060

they intensify or how they get stronger

141

00:16:45,530 --> 00:16:44,399

so with Tropics we have four cubesats

142

00:16:47,569 --> 00:16:45,540

that are going to be orbiting the Earth

143

00:16:49,550 --> 00:16:47,579

they're about the size of a loaf of

144

00:16:51,710 --> 00:16:49,560

bread so very small compared to your

145

00:16:53,930 --> 00:16:51,720

traditional satellites and the beauty of

146

00:16:56,569 --> 00:16:53,940

having four of these things orbiting the

147

00:16:59,449 --> 00:16:56,579

Earth is that they can revisit a storm

148

00:17:01,490 --> 00:16:59,459

every hour which is very different from

149

00:17:03,410 --> 00:17:01,500

how traditional satellites do it they

150

00:17:05,210 --> 00:17:03,420

may come by the same storm once every 10

151
00:17:06,949 --> 00:17:05,220
hours the data from Tropics we're going

152
00:17:09,289 --> 00:17:06,959
to feed that to our partners which are

153
00:17:11,750 --> 00:17:09,299
like Noah the National Hurricane Center

154
00:17:13,730 --> 00:17:11,760
they take it and it helps them improve

155
00:17:16,309 --> 00:17:13,740
their hurricane forecasting hurricane

156
00:17:18,049 --> 00:17:16,319
modeling so when you think about it from

157
00:17:20,090 --> 00:17:18,059
the end users and you look at a TV and

158
00:17:22,130 --> 00:17:20,100
you say hey a hurricane is coming up the

159
00:17:23,630 --> 00:17:22,140
coast of Florida it says the storm could

160
00:17:26,449 --> 00:17:23,640
go this direction it could go this

161
00:17:28,490 --> 00:17:26,459
direction we have improved models that

162
00:17:29,750 --> 00:17:28,500
will have a tighter band of where that

163
00:17:32,330 --> 00:17:29,760

storm is going to be it's giving better

164

00:17:35,450 --> 00:17:32,340

forecast information to not only Noah

165

00:17:38,450 --> 00:17:37,549

uh so for the first launches you know

166

00:17:40,850 --> 00:17:38,460

we're going to have a launch window

167

00:17:44,450 --> 00:17:40,860

maybe two hours that says it can launch

168

00:17:45,529 --> 00:17:44,460

between 1 and 3 P.M New Zealand time the

169

00:17:47,029 --> 00:17:45,539

second launch there's a lot of

170

00:17:49,190 --> 00:17:47,039

synchronization that has to happen so

171

00:17:51,110 --> 00:17:49,200

it's pretty exciting for a company like

172

00:17:52,970 --> 00:17:51,120

rocket lab to be able to do that with

173

00:17:54,529 --> 00:17:52,980

that kind of precision to help us meet

174

00:17:56,150 --> 00:17:54,539

our admission goals

175

00:17:58,070 --> 00:17:56,160

during the launch I'll be in the mission

176
00:17:59,690 --> 00:17:58,080
control center here so that'll be a new

177
00:18:02,330 --> 00:17:59,700
experience I'll be on Console to give

178
00:18:04,549 --> 00:18:02,340
the roll call for all systems go for the

179
00:18:07,610 --> 00:18:04,559
payloads we're just so excited to really

180
00:18:09,650 --> 00:18:07,620
see it happen now I can't just continue

181
00:18:14,920 --> 00:18:09,660
my excitement because it's just a lot of

182
00:18:14,930 --> 00:18:19,430
[Music]

183
00:18:22,970 --> 00:18:21,350
we are very much looking forward to

184
00:18:25,250 --> 00:18:22,980
delivering those spacecraft to their new

185
00:18:27,590 --> 00:18:25,260
home in orbit launching in just 13

186
00:18:29,690 --> 00:18:27,600
minutes time right now in the countdown

187
00:18:31,909 --> 00:18:29,700
we are at that 13 minute Mark and

188
00:18:34,549 --> 00:18:31,919

Counting as our launch team gets into

189

00:18:36,830 --> 00:18:34,559

the final go no go Poll for today's

190

00:18:38,870 --> 00:18:36,840

launch our launch director today is

191

00:18:40,730 --> 00:18:38,880

Joseph carpico he will run through the

192

00:18:43,070 --> 00:18:40,740

list of operators at the range here in

193

00:18:45,710 --> 00:18:43,080

Mission Control to check in on whether

194

00:18:47,570 --> 00:18:45,720

all systems are go for liftoff let's

195

00:19:07,210 --> 00:18:47,580

bring up mission control audio now to

196

00:19:11,330 --> 00:19:09,710

all operators this is the LDN Mission

197

00:19:13,810 --> 00:19:11,340

proceeding with the go no go sequence

198

00:19:18,409 --> 00:19:13,820

stage

199

00:19:20,870 --> 00:19:18,419

abionics avionics let's go GNC GNC is

200

00:19:21,950 --> 00:19:20,880

cool beacon beacon sky

201
00:19:25,909 --> 00:19:21,960
T1

202
00:19:31,310 --> 00:19:25,919
GC GCS go

203
00:19:37,370 --> 00:19:31,320
PLS BLS go RSO all right so let's go met

204
00:19:39,289 --> 00:19:37,380
Madison go mm MMS go LD sub at least up

205
00:19:41,210 --> 00:19:39,299
let's go

206
00:19:43,250 --> 00:19:41,220
the go no go sequence is complete we are

207
00:19:45,110 --> 00:19:43,260
now T minus 11 minutes 30 seconds and

208
00:19:46,909 --> 00:19:45,120
counting we are go for terminal count at

209
00:19:54,110 --> 00:19:46,919
T minus 10 minutes from this time the

210
00:19:58,310 --> 00:19:56,210
great news there from Mission Control we

211
00:20:00,049 --> 00:19:58,320
are go for launch and ready to rock it

212
00:20:02,630 --> 00:20:00,059
like a hurricane for today's first

213
00:20:04,070 --> 00:20:02,640

Tropics launch for NASA you also heard

214

00:20:06,409 --> 00:20:04,080

our launch director confirm today's

215

00:20:09,409 --> 00:20:06,419

liftoff Target which is set for 1pm

216

00:20:10,250 --> 00:20:09,419

local time or 9 pm and 6 PM Eastern and

217

00:20:12,590 --> 00:20:10,260

Pacific

218

00:20:14,330 --> 00:20:12,600

looking back at the launch pad as we

219

00:20:16,430 --> 00:20:14,340

count down to liftoff let's take you

220

00:20:19,250 --> 00:20:16,440

through the electron rocket carrying the

221

00:20:21,350 --> 00:20:19,260

tropics payload electron is a two-stage

222

00:20:23,150 --> 00:20:21,360

to orbit liquid fueled launch vehicle

223

00:20:25,370 --> 00:20:23,160

designed specifically for small

224

00:20:27,650 --> 00:20:25,380

satellite Missions at the bottom of the

225

00:20:30,289 --> 00:20:27,660

first stage is where we have nine 3D

226

00:20:32,150 --> 00:20:30,299

printed Rutherford engines located a

227

00:20:34,669 --> 00:20:32,160

tenth space optimized Rutherford engine

228

00:20:37,130 --> 00:20:34,679

takes us to orbit with our second stage

229

00:20:39,650 --> 00:20:37,140

the Rutherford engines use liquid oxygen

230

00:20:41,570 --> 00:20:39,660

and rp1 kerosene as its propellant and

231

00:20:43,130 --> 00:20:41,580

oxidizer and these are fit into the

232

00:20:45,289 --> 00:20:43,140

engine's combustion chamber in a

233

00:20:47,630 --> 00:20:45,299

world-first way using electric pumps

234

00:20:49,730 --> 00:20:47,640

powered by batteries electron structure

235

00:20:51,169 --> 00:20:49,740

is made of a carbon composite material a

236

00:20:53,510 --> 00:20:51,179

super strong yet very lightweight

237

00:20:55,789 --> 00:20:53,520

material that gives our rocket its sleek

238

00:20:57,830 --> 00:20:55,799

black look it's white now because of the

239

00:20:59,690 --> 00:20:57,840

cold liquid oxygen in electrons tanks

240

00:21:01,669 --> 00:20:59,700

which causes moisture to condensate as

241

00:21:03,289 --> 00:21:01,679

ice on the outside of the rocket the

242

00:21:04,909 --> 00:21:03,299

Tropic satellites are mounted to the

243

00:21:07,370 --> 00:21:04,919

Rocket's kickstage and side electrons

244

00:21:09,350 --> 00:21:07,380

fairing or nose current at around three

245

00:21:11,930 --> 00:21:09,360

minutes into flight that fairing will

246

00:21:13,789 --> 00:21:11,940

separate into two have exposing the

247

00:21:15,650 --> 00:21:13,799

satellites to space ready for deployment

248

00:21:17,570 --> 00:21:15,660

this Mission though is a little

249

00:21:19,549 --> 00:21:17,580

different to a standard electron launch

250

00:21:22,070 --> 00:21:19,559

after this point because typically

251
00:21:23,930 --> 00:21:22,080
electron's second stage would take us to

252
00:21:25,789 --> 00:21:23,940
an elliptical orbit around Earth and

253
00:21:28,430 --> 00:21:25,799
then the kick state would complete a

254
00:21:31,250 --> 00:21:28,440
final circularization burn with its tiny

255
00:21:33,230 --> 00:21:31,260
3D printed Curie engine but for Tropics

256
00:21:35,690 --> 00:21:33,240
the second stage will be used to

257
00:21:37,730 --> 00:21:35,700
circularize the orbit and the kick stage

258
00:21:40,250 --> 00:21:37,740
will instead perform an inclination

259
00:22:07,450 --> 00:21:40,260
change to place the two Tropics cubesats

260
00:22:13,250 --> 00:22:11,390
avionics LD Mission LD Avionics yes sir

261
00:22:14,990 --> 00:22:13,260
please proceed with sequence 56 the

262
00:22:22,010 --> 00:22:15,000
avionics terminal check sequence

263
00:22:37,490 --> 00:22:23,750

s-band to switch to high power for

264

00:22:42,049 --> 00:22:39,649

stage LD on Mission

265

00:22:45,230 --> 00:22:42,059

and this stage please proceed with

266

00:22:47,029 --> 00:22:45,240

sequence 57. after today's first pair be

267

00:22:48,890 --> 00:22:47,039

launched soon after so that the

268

00:22:50,510 --> 00:22:48,900

constellation is up and running in time

269

00:22:53,630 --> 00:22:50,520

for this year's Atlantic hurricane

270

00:22:56,029 --> 00:22:53,640

season beginning in June so even before

271

00:22:57,649 --> 00:22:56,039

we have liftoff today we know our second

272

00:22:59,810 --> 00:22:57,659

rocket will be rolling out to the pad

273

00:23:01,970 --> 00:22:59,820

for launch in approximately two weeks

274

00:23:03,649 --> 00:23:01,980

from now the tropics launches won't be

275

00:23:06,110 --> 00:23:03,659

our fastest launch turnaround to date

276

00:23:08,029 --> 00:23:06,120

that record is just seven days which we

277

00:23:09,770 --> 00:23:08,039

achieved earlier this year with the

278

00:23:11,690 --> 00:23:09,780

mission from Ic2 in Virginia that was

279

00:23:15,049 --> 00:23:11,700

swiftly followed up days later with the

280

00:23:16,490 --> 00:23:15,059

launch from Ic1 in New Zealand but two

281

00:23:18,230 --> 00:23:16,500

weeks between dedicate small set

282

00:23:20,450 --> 00:23:18,240

missions is something that just did not

283

00:23:22,190 --> 00:23:20,460

exist for small sets prior to electron

284

00:23:23,690 --> 00:23:22,200

part of the reason we can deliver these

285

00:23:25,850 --> 00:23:23,700

missions one after the other so quickly

286

00:23:27,770 --> 00:23:25,860

is down to our comprehensive parallel

287

00:23:30,110 --> 00:23:27,780

test programs to repair multiple

288

00:23:31,970 --> 00:23:30,120

electrons for the big day rocket lab

289

00:23:33,649 --> 00:23:31,980

Mission manager Jane McNichol has been

290

00:23:35,330 --> 00:23:33,659

across the entire campaign for Tropics

291

00:23:41,770 --> 00:23:35,340

she has more to share on what's involved

292

00:23:46,490 --> 00:23:44,690

my name is Jane McNichol I'm a mission

293

00:23:48,409 --> 00:23:46,500

manager at Rocket lab and I'm the

294

00:23:50,570 --> 00:23:48,419

mission manager for the two Tropics

295

00:23:52,850 --> 00:23:50,580

missions so as we know the number of

296

00:23:55,909 --> 00:23:52,860

hurricanes we're experiencing every year

297

00:23:59,930 --> 00:23:55,919

is increasing due to climate change and

298

00:24:02,990 --> 00:23:59,940

the intensity of these storms is also

299

00:24:05,630 --> 00:24:03,000

increasing the current technology that

300

00:24:08,270 --> 00:24:05,640

we have on orbit to monitor hurricane

301
00:24:10,430 --> 00:24:08,280
development may only be able to check in

302
00:24:12,950 --> 00:24:10,440
on these storms every couple of hours

303
00:24:16,149 --> 00:24:12,960
but within that time we might see a

304
00:24:19,669 --> 00:24:16,159
storm increase in intensity quite a bit

305
00:24:23,270 --> 00:24:19,679
Tropics is a constellation of four

306
00:24:26,510 --> 00:24:23,280
cubesats that will be able to monitor

307
00:24:28,930 --> 00:24:26,520
near hourly these intense tropical

308
00:24:32,270 --> 00:24:28,940
storms in terms of precipitation

309
00:24:34,850 --> 00:24:32,280
temperature and humidity and collect

310
00:24:37,430 --> 00:24:34,860
this data for us and this data has the

311
00:24:40,250 --> 00:24:37,440
potential to save lives and livelihoods

312
00:24:42,649 --> 00:24:40,260
so it very well aligns with rocket lab's

313
00:24:44,510 --> 00:24:42,659

mission to improve life on Earth by

314

00:24:46,430 --> 00:24:44,520

enabling access to space

315

00:24:48,710 --> 00:24:46,440

before the launch vehicle even makes it

316

00:24:50,930 --> 00:24:48,720

to the launch site on launch day it

317

00:24:52,970 --> 00:24:50,940

undergoes months of rigorous testing

318

00:24:56,029 --> 00:24:52,980

starting with small component testing

319

00:24:58,850 --> 00:24:56,039

like our avionics up into large stack

320

00:25:01,310 --> 00:24:58,860

testing or hot fire testing of our

321

00:25:03,770 --> 00:25:01,320

engines at our test sites and then a

322

00:25:06,230 --> 00:25:03,780

full end-to-end wet dress rehearsal or

323

00:25:08,090 --> 00:25:06,240

practice for launch day and this is all

324

00:25:09,649 --> 00:25:08,100

part of making electron the most

325

00:25:11,810 --> 00:25:09,659

reliable small launcher on the market

326

00:25:14,570 --> 00:25:11,820

once the satellites arrive at the launch

327

00:25:16,750 --> 00:25:14,580

site the satellite team from NASA and

328

00:25:19,190 --> 00:25:16,760

MIT Lincoln Laboratories will be

329

00:25:20,630 --> 00:25:19,200

inspecting and doing some final checks

330

00:25:21,950 --> 00:25:20,640

on the satellites to make sure that

331

00:25:24,049 --> 00:25:21,960

they're ready to be installed on the

332

00:25:26,090 --> 00:25:24,059

launch vehicle in parallel with those

333

00:25:28,010 --> 00:25:26,100

tests rocket lab is also running

334

00:25:29,510 --> 00:25:28,020

additional tests on the launch vehicle

335

00:25:31,549 --> 00:25:29,520

which is fully delivered to the launch

336

00:25:34,010 --> 00:25:31,559

site by this time we'll be doing

337

00:25:36,590 --> 00:25:34,020

integrated testing end to end of our

338

00:25:39,049 --> 00:25:36,600

avionic systems and preparing for the

339

00:25:41,450 --> 00:25:39,059

satellites to be integrated onto the

340

00:25:44,570 --> 00:25:41,460

kick stage then we will encapsulate the

341

00:25:46,730 --> 00:25:44,580

spacecraft and integrate the full launch

342

00:25:49,549 --> 00:25:46,740

vehicle stage one stage two stage three

343

00:25:51,529 --> 00:25:49,559

and roll out four wet dress rehearsal a

344

00:25:53,570 --> 00:25:51,539

wet dress rehearsal is basically a

345

00:25:56,269 --> 00:25:53,580

practice for launch day where we perform

346

00:25:58,190 --> 00:25:56,279

all of the operations like we would on

347

00:26:01,070 --> 00:25:58,200

day of launch including fueling the

348

00:26:02,870 --> 00:26:01,080

vehicle and this gives us extra

349

00:26:05,330 --> 00:26:02,880

assurance that everything will go

350

00:26:07,190 --> 00:26:05,340

according to plan on launch day then

351
00:26:08,630 --> 00:26:07,200
we'll review the data from that test and

352
00:26:11,149 --> 00:26:08,640
proceed with launch

353
00:26:13,010 --> 00:26:11,159
everyone has a hand in helping electron

354
00:26:16,090 --> 00:26:13,020
get to the pad for launch day starting

355
00:26:18,890 --> 00:26:16,100
with our design team into our

356
00:26:22,070 --> 00:26:18,900
manufacturing team as well as our test

357
00:26:23,930 --> 00:26:22,080
and Ic1 Team all the way to Mission

358
00:26:27,230 --> 00:26:23,940
Control and the engineers there behind

359
00:26:30,230 --> 00:26:27,240
me this is a team of dedicated Engineers

360
00:26:33,769 --> 00:26:30,240
who have gained their experience over 30

361
00:26:35,750 --> 00:26:33,779
plus launches here at Rocket lab so as a

362
00:26:38,090 --> 00:26:35,760
mission manager that means that I get to

363
00:26:41,330 --> 00:26:38,100

work closely with our customer NASA and

364

00:26:44,210 --> 00:26:41,340

MIT Lincoln Laboratories and I am so

365

00:26:45,529 --> 00:26:44,220

excited for launch day and being able to

366

00:26:47,870 --> 00:26:45,539

tell them that we've successfully

367

00:26:50,450 --> 00:26:47,880

deployed their satellites in orbit and

368

00:26:53,450 --> 00:26:50,460

see the real work begin there for them

369

00:26:55,490 --> 00:26:53,460

and be able to see the excitement not

370

00:26:57,649 --> 00:26:55,500

just once but twice because we've got

371

00:26:59,149 --> 00:26:57,659

two back-to-back missions coming up so I

372

00:27:00,190 --> 00:26:59,159

can't wait for launch day I'm really

373

00:27:05,269 --> 00:27:00,200

psyched about it

374

00:27:07,789 --> 00:27:05,279

[Music]

375

00:27:09,350 --> 00:27:07,799

as we approach T minus four minutes to

376

00:27:11,029 --> 00:27:09,360

lift off let's take you through the last

377

00:27:13,490 --> 00:27:11,039

moments before those nine Rutherford

378

00:27:15,830 --> 00:27:13,500

engines ignite at two minutes before

379

00:27:18,049 --> 00:27:15,840

left off the ground power supply at the

380

00:27:20,510 --> 00:27:18,059

launch pad is disabled and electron

381

00:27:23,090 --> 00:27:20,520

switches to internal power our launch

382

00:27:25,190 --> 00:27:23,100

safety system the afts will be enabled

383

00:27:26,930 --> 00:27:25,200

at the same time and we can expect to

384

00:27:28,909 --> 00:27:26,940

hear both of those calls from our

385

00:27:31,370 --> 00:27:28,919

operators in Mission Control one after

386

00:27:34,310 --> 00:27:31,380

the other the liquid oxygen supply

387

00:27:36,289 --> 00:27:34,320

valves on stages one and two are closed

388

00:27:38,570 --> 00:27:36,299

about 10 seconds later with another

389

00:27:41,570 --> 00:27:38,580

operator expected to confirm on comms

390

00:27:43,669 --> 00:27:41,580

that locks load is complete at under a

391

00:27:45,409 --> 00:27:43,679

minute to lift off the propellant tanks

392

00:27:47,330 --> 00:27:45,419

will be at their Optimum pressure levels

393

00:27:48,950 --> 00:27:47,340

for launch Ground Control will soon

394

00:27:50,870 --> 00:27:48,960

afterward confirm the water system at

395

00:27:53,090 --> 00:27:50,880

the launch pad is ready to be activated

396

00:27:55,010 --> 00:27:53,100

for when the engines on the rocket

397

00:27:56,450 --> 00:27:55,020

ignite for launch this is what will

398

00:27:59,570 --> 00:27:56,460

cause the large white cloud of water

399

00:28:01,909 --> 00:27:59,580

vapor at liftoff at T minus 10 seconds

400

00:28:04,130 --> 00:28:01,919

the launch director will count down with

401
00:28:06,169 --> 00:28:04,140
the mission clock to lift off the

402
00:28:08,210 --> 00:28:06,179
engines will ignite at minus three

403
00:28:10,310 --> 00:28:08,220
seconds and the launch pads hold down

404
00:28:12,710 --> 00:28:10,320
mechanisms will be released then

405
00:28:15,169 --> 00:28:12,720
electron will take to the skies for its

406
00:28:17,149 --> 00:28:15,179
36th launch for this Tropics mission to

407
00:28:19,070 --> 00:28:17,159
space we'll bring up the audio channels

408
00:28:20,810 --> 00:28:19,080
from Mission Control now to listen in

409
00:28:23,990 --> 00:28:20,820
and then we'll be back with you after

410
00:28:27,590 --> 00:28:26,090
all operators LD on mission where go for

411
00:29:09,830 --> 00:28:27,600
auto sequence start at T minus two

412
00:29:37,850 --> 00:29:12,289
vehicle is on internal power

413
00:29:37,860 --> 00:29:47,389

zone is complete system isn't restarted

414

00:29:47,399 --> 00:29:57,909

foreign

415

00:29:57,919 --> 00:30:19,909

is disabled

416

00:30:37,789 --> 00:30:22,970

Stitch one stitch so press for flight

417

00:30:37,799 --> 00:30:48,289

deleus activated

418

00:30:48,299 --> 00:30:59,210

T minus 20 seconds and counting

419

00:31:09,870 --> 00:31:06,970

ten nine eight seven six five four three

420

00:31:29,060 --> 00:31:09,880

two one

421

00:31:48,769 --> 00:31:34,430

[Music]

422

00:31:53,210 --> 00:31:50,930

electron is soaring through the sky

423

00:31:56,149 --> 00:31:53,220

right now after lifting off from pad B

424

00:31:59,330 --> 00:31:56,159

at launch complex one now on its way to

425

00:32:01,070 --> 00:31:59,340

low earth orbit for NASA and Tropics the

426

00:32:03,409 --> 00:32:01,080

first launch Milestone the rocket will

427

00:32:05,450 --> 00:32:03,419

pass through is Max Q when the forces

428

00:32:07,070 --> 00:32:05,460

against electron are at their Peak as

429

00:32:09,289 --> 00:32:07,080

the rocket moves quickly through the

430

00:32:18,310 --> 00:32:09,299

atmosphere mission control is expected

431

00:32:24,230 --> 00:32:21,769

cleared Max Cube

432

00:32:26,389 --> 00:32:24,240

great news there with Max q and onward

433

00:32:28,669 --> 00:32:26,399

and upward for electron it has only been

434

00:32:31,250 --> 00:32:28,679

about a minute since liftoff and already

435

00:32:33,110 --> 00:32:31,260

in the rocket is at its speeds of over 2

436

00:32:35,450 --> 00:32:33,120

000 kilometers an hour a mere fraction

437

00:32:37,490 --> 00:32:35,460

of the 27 000 plus kilometers an hour

438

00:32:39,289 --> 00:32:37,500

that is orbital velocity which will

439

00:32:42,110 --> 00:32:39,299

reach a hit of payload deployment in the

440

00:32:44,090 --> 00:32:42,120

next 30 minutes or so next though is the

441

00:32:46,789 --> 00:32:44,100

separation of the rocket between stages

442

00:32:48,409 --> 00:32:46,799

one and two for that to happen we first

443

00:32:50,930 --> 00:32:48,419

need the nine Rutherford engines

444

00:32:53,330 --> 00:32:50,940

currently burning hot to shut down an

445

00:32:55,789 --> 00:32:53,340

action called main engine cutoff or Miko

446

00:32:58,130 --> 00:32:55,799

then a few moments later stages one and

447

00:33:01,010 --> 00:32:58,140

two will Spring apart we'll hear that

448

00:33:02,810 --> 00:33:01,020

called out as stage separation then the

449

00:33:05,149 --> 00:33:02,820

single space optimized Rutherford engine

450

00:33:07,610 --> 00:33:05,159

on the second stage will light up and

451
00:33:09,289 --> 00:33:07,620
carry on with the tropics Mission those

452
00:33:22,909 --> 00:33:09,299
Milestones should be taking place at

453
00:33:45,409 --> 00:33:25,130
15 seconds to Miko

454
00:33:50,090 --> 00:33:48,169
stage separation successful

455
00:33:52,610 --> 00:33:50,100
Stitch ignition

456
00:33:54,950 --> 00:33:52,620
exactly as we expect there goes Miko

457
00:33:56,750 --> 00:33:54,960
stage separation and we can now see that

458
00:33:59,269 --> 00:33:56,760
the Rutherford engine nozzle is glowing

459
00:34:00,950 --> 00:33:59,279
hot on the second stage the Tropic

460
00:34:02,870 --> 00:34:00,960
satellites remain in good health on the

461
00:34:04,430 --> 00:34:02,880
electron and soon the rockets on board

462
00:34:06,830 --> 00:34:04,440
computer will command the fairing to

463
00:34:08,389 --> 00:34:06,840

separate and Fall Away Now That We're in

464

00:34:10,070 --> 00:34:08,399

the vacuum of space Tropics doesn't need

465

00:34:11,869 --> 00:34:10,080

the protection of the fairing anymore so

466

00:34:13,730 --> 00:34:11,879

we get rid of that dead weight to

467

00:34:18,349 --> 00:34:13,740

maximize fuel efficiency on the way to

468

00:34:21,889 --> 00:34:20,510

fearing separation successful

469

00:34:23,149 --> 00:34:21,899

if you're looking at the screen at the

470

00:34:25,250 --> 00:34:23,159

right moment just there you will have

471

00:34:26,750 --> 00:34:25,260

seen those two nose cone halves falling

472

00:34:28,790 --> 00:34:26,760

away as planned with the fearing

473

00:34:30,829 --> 00:34:28,800

separation electron is performing

474

00:34:32,690 --> 00:34:30,839

nominally on its way to orbit with a few

475

00:34:35,089 --> 00:34:32,700

minutes between now and our next mission

476

00:34:37,250 --> 00:34:35,099

Milestone the battery hot swap for our

477

00:34:44,770 --> 00:34:37,260

second stage engine at around 6 minutes

478

00:34:44,780 --> 00:35:13,190

God is this no no

479

00:35:17,390 --> 00:35:15,109

electroline Tropics are moving at a good

480

00:35:20,210 --> 00:35:17,400

Pace right now well over 8 000

481

00:35:22,010 --> 00:35:20,220

kilometers an hour at the T plus four

482

00:35:25,069 --> 00:35:22,020

minute Mark into the mission the vehicle

483

00:35:28,069 --> 00:35:25,079

is currently at 234 kilometers in

484

00:35:30,890 --> 00:35:28,079

altitude with another 300 or 50 so

485

00:35:33,890 --> 00:35:30,900

kilometers to go until we reach our 550

486

00:35:35,630 --> 00:35:33,900

kilometer destination getting there is

487

00:35:38,089 --> 00:35:35,640

only one part of the journey though as

488

00:35:40,910 --> 00:35:38,099

Tropics won't be released immediately at

489

00:35:42,589 --> 00:35:40,920

that 550 kilometer first touch the

490

00:35:44,990 --> 00:35:42,599

satellites will remain attached to the

491

00:35:46,490 --> 00:35:45,000

Rocket's third stage and complete a full

492

00:35:48,650 --> 00:35:46,500

loop of Earth before they can be

493

00:35:50,270 --> 00:35:48,660

deployed on their home orbit we'll

494

00:35:52,190 --> 00:35:50,280

explain that process in more detail

495

00:35:59,510 --> 00:35:52,200

later when we get closer to that point

496

00:35:59,520 --> 00:36:08,410

foreign

497

00:36:12,890 --> 00:36:10,910

a quick check of the dials on our screen

498

00:36:15,230 --> 00:36:12,900

tell us that all remains nominal for

499

00:36:17,270 --> 00:36:15,240

electron and Tropics the rocket is

500

00:36:19,130 --> 00:36:17,280

moving steadily at more than 9000

501
00:36:21,890 --> 00:36:19,140
kilometers an hour and we are inching

502
00:36:24,050 --> 00:36:21,900
closer to that 550 kilometer Mark now

503
00:36:26,329 --> 00:36:24,060
the electron has passed more than 300

504
00:36:27,890 --> 00:36:26,339
kilometers altitude to keep the mission

505
00:36:30,290 --> 00:36:27,900
running smoothly we'll have another

506
00:36:32,390 --> 00:36:30,300
launch Milestone coming up soon it is

507
00:36:34,010 --> 00:36:32,400
called the battery hot Swap and it's

508
00:36:35,690 --> 00:36:34,020
essential to keeping our Rutherford

509
00:36:38,089 --> 00:36:35,700
engine running all the way to the

510
00:36:40,670 --> 00:36:38,099
mission's altitude destination that

511
00:36:43,910 --> 00:36:40,680
action is due at around 6 minutes and 52

512
00:37:04,390 --> 00:36:43,920
seconds in flight so in just another one

513
00:37:09,790 --> 00:37:08,089

200 seconds remaining

514

00:37:12,829 --> 00:37:09,800

foreign

515

00:37:15,230 --> 00:37:12,839

hot swap maneuver is a unique action for

516

00:37:16,970 --> 00:37:15,240

our electron rocket when the first two

517

00:37:18,950 --> 00:37:16,980

battery packs applying power to our

518

00:37:21,230 --> 00:37:18,960

electoral pumps on stage two are close

519

00:37:22,370 --> 00:37:21,240

to being drained electron switches to a

520

00:37:24,589 --> 00:37:22,380

fresh battery that will ensure

521

00:37:26,630 --> 00:37:24,599

Rutherford the Rutherford engine lasts

522

00:37:28,069 --> 00:37:26,640

the distance to orbit it's a move our

523

00:37:30,050 --> 00:37:28,079

rocket has performed countless times

524

00:37:32,390 --> 00:37:30,060

before but it is a move unique to

525

00:37:34,010 --> 00:37:32,400

electrons battery hot swap is on its way

526
00:37:35,510 --> 00:37:34,020
in just a few moments so we'll bring up

527
00:37:42,530 --> 00:37:35,520
the mission control comms again to

528
00:37:42,540 --> 00:37:48,650
position

529
00:37:48,660 --> 00:38:01,130
throttle him down

530
00:38:01,140 --> 00:38:05,589
possible successful

531
00:38:09,950 --> 00:38:07,970
just as it was planned the Rutherford

532
00:38:11,750 --> 00:38:09,960
has switched to its new power source

533
00:38:13,849 --> 00:38:11,760
with the battery hot Swap and is

534
00:38:16,430 --> 00:38:13,859
continuing nominally with the tropics

535
00:38:18,470 --> 00:38:16,440
Mission there are a few minutes left in

536
00:38:20,750 --> 00:38:18,480
the engine's burn time before the second

537
00:38:22,910 --> 00:38:20,760
stage completes its final actions for

538
00:38:33,890 --> 00:38:22,920

the mission shutting down Rutherford and

539

00:38:33,900 --> 00:38:39,530

be a little bit different

540

00:38:39,540 --> 00:38:48,890

HVB discharge holding nominal

541

00:38:53,270 --> 00:38:51,109

how beautiful are some of these views

542

00:38:56,450 --> 00:38:53,280

from electron this nominal Rutherford

543

00:38:59,450 --> 00:38:56,460

burn marks our 360th engine in space

544

00:39:02,390 --> 00:38:59,460

inching us closer to our 400th engine

545

00:39:04,849 --> 00:39:02,400

Milestone expected on our 40th electron

546

00:39:07,190 --> 00:39:04,859

launch in fact one of those engines to

547

00:39:10,010 --> 00:39:07,200

fly next will be an engine that we have

548

00:39:12,349 --> 00:39:10,020

already launched before we are taking

549

00:39:15,230 --> 00:39:12,359

the next major step in evolving electron

550

00:39:17,450 --> 00:39:15,240

into a reusable rocket by launching a

551
00:39:20,030 --> 00:39:17,460
pre-flown Rutherford engine on one of

552
00:39:22,069 --> 00:39:20,040
our missions later this year that engine

553
00:39:25,490 --> 00:39:22,079
which flew on our there and Back Again

554
00:39:27,470 --> 00:39:25,500
mission in May 2022 has undergone the

555
00:39:30,349 --> 00:39:27,480
same extensive testing and acceptance

556
00:39:32,030 --> 00:39:30,359
processes as any newly built engine and

557
00:39:34,250 --> 00:39:32,040
has performed flawlessly throughout

558
00:39:36,710 --> 00:39:34,260
multiple full mission duration engine

559
00:39:39,170 --> 00:39:36,720
tests we are very excited to see that

560
00:39:40,970 --> 00:39:39,180
engine back on the pad soon but back to

561
00:39:43,130 --> 00:39:40,980
tropics and that second stage is

562
00:39:45,770 --> 00:39:43,140
performing well and the Tropics payload

563
00:39:48,470 --> 00:39:45,780

is healthy as both continue traveling at

564

00:39:59,150 --> 00:39:48,480

speeds of over 19 000 kilometers per

565

00:39:59,160 --> 00:40:03,109

into burnout detect mode

566

00:40:07,790 --> 00:40:05,870

all right at t plus eight minutes 56

567

00:40:10,550 --> 00:40:07,800

seconds into this mission for NASA and

568

00:40:12,349 --> 00:40:10,560

we are nearly in orbit in a few moments

569

00:40:15,349 --> 00:40:12,359

we'll be able to see that red hot engine

570

00:40:17,930 --> 00:40:15,359

nozzle there start to turn cold once the

571

00:40:19,670 --> 00:40:17,940

engine on stage two shuts down Mission

572

00:40:21,710 --> 00:40:19,680

Control will call out these actions

573

00:40:35,690 --> 00:40:21,720

listen out for Seco confirmed on the

574

00:40:38,930 --> 00:40:37,010

thank you

575

00:40:41,630 --> 00:40:38,940

there it is from Mission Control met

576

00:40:43,790 --> 00:40:41,640

with a good cheer from our team Seco and

577

00:40:45,770 --> 00:40:43,800

Stage separation confirmed that means

578

00:40:47,810 --> 00:40:45,780

our kickstage and Tropic satellites are

579

00:40:50,210 --> 00:40:47,820

now in their phasing orbit of Earth it's

580

00:40:52,190 --> 00:40:50,220

been a perfectly nominal Mission so far

581

00:40:54,589 --> 00:40:52,200

but electrons work isn't quite done yet

582

00:40:57,050 --> 00:40:54,599

that's right Tropics is a bit different

583

00:40:59,569 --> 00:40:57,060

to our usual launches for this Mission

584

00:41:02,089 --> 00:40:59,579

the second stage sending the kickstate

585

00:41:04,010 --> 00:41:02,099

directly into a circular orbit rather

586

00:41:06,050 --> 00:41:04,020

than the kick stage taking the

587

00:41:08,810 --> 00:41:06,060

satellites on its usual elliptical

588

00:41:11,089 --> 00:41:08,820

Journey around Earth first then once the

589

00:41:13,069 --> 00:41:11,099

kickstage passes the equator at what is

590

00:41:15,530 --> 00:41:13,079

called the ascending node the

591

00:41:17,810 --> 00:41:15,540

kickstage's Curie engine lights up to

592

00:41:20,329 --> 00:41:17,820

change its inclination to end up in

593

00:41:22,190 --> 00:41:20,339

tropic's desired orbit so while we wait

594

00:41:23,930 --> 00:41:22,200

for that Curie burn we'll take a short

595

00:41:25,250 --> 00:41:23,940

break on the live stream now and join

596

00:41:26,690 --> 00:41:25,260

you then to hear those final

597

00:41:41,710 --> 00:41:26,700

confirmations come through from Mission

598

00:41:41,720 --> 00:41:53,630

thank you

599

00:41:53,640 --> 00:42:01,900

foreign

600

00:42:35,030 --> 00:42:03,120

[Applause]

601
00:42:35,040 --> 00:42:39,990
two one lift up

602
00:43:08,960 --> 00:42:53,920
[Music]

603
00:43:33,589 --> 00:43:08,970
characters

604
00:44:12,730 --> 00:43:33,599
[Music]

605
00:44:12,740 --> 00:44:16,970
thank you

606
00:44:16,980 --> 00:44:21,910
foreign

607
00:44:21,920 --> 00:44:55,010
[Music]

608
00:44:55,020 --> 00:45:07,480
foreign

609
00:45:07,490 --> 00:45:35,050
[Music]

610
00:45:35,060 --> 00:45:39,360
thank you

611
00:45:51,080 --> 00:45:43,330
[Music]

612
00:45:53,670 --> 00:45:51,090
[Applause]

613
00:46:41,930 --> 00:45:53,680

[Music]

614

00:46:41,940 --> 00:46:53,330

foreign

615

00:47:26,870 --> 00:47:01,120

[Music]

616

00:47:27,970 --> 00:47:26,880

[Applause]

617

00:47:42,190 --> 00:47:27,980

[Music]

618

00:47:42,200 --> 00:47:47,390

thank you

619

00:47:47,400 --> 00:48:11,870

[Music]

620

00:48:11,880 --> 00:48:15,610

foreign

621

00:49:08,760 --> 00:48:32,590

[Music]

622

00:49:11,930 --> 00:49:08,770

thank you

623

00:50:08,690 --> 00:49:11,940

[Music]

624

00:50:08,700 --> 00:50:14,470

thank you

625

00:50:25,370 --> 00:50:20,130

[Music]

626
00:50:25,380 --> 00:50:39,270
foreign

627
00:51:38,520 --> 00:50:50,480
[Music]

628
00:51:51,690 --> 00:51:38,530
foreign

629
00:52:46,670 --> 00:52:35,740
[Music]

630
00:52:46,680 --> 00:52:52,120
foreign

631
00:53:17,850 --> 00:52:57,960
[Music]

632
00:53:26,030 --> 00:53:19,240
[Applause]

633
00:53:36,330 --> 00:53:26,040
[Music]

634
00:53:47,230 --> 00:53:36,340
[Applause]

635
00:54:02,170 --> 00:53:50,170
thank you

636
00:54:11,710 --> 00:54:08,210
[Music]

637
00:54:14,870 --> 00:54:11,720
[Applause]

638
00:54:43,370 --> 00:54:14,880

[Music]

639

00:54:44,460 --> 00:54:43,380

[Applause]

640

00:54:45,150 --> 00:54:44,470

[Music]

641

00:55:21,970 --> 00:54:45,160

[Applause]

642

00:55:21,980 --> 00:55:36,480

thank you

643

00:56:12,410 --> 00:55:42,520

[Music]

644

00:56:23,120 --> 00:56:12,420

[Applause]

645

00:56:23,130 --> 00:56:30,890

[Music]

646

00:56:30,900 --> 00:56:37,570

foreign

647

00:57:44,990 --> 00:57:36,450

[Music]

648

00:57:45,000 --> 00:57:49,840

foreign

649

00:58:35,329 --> 00:58:25,650

[Music]

650

00:58:48,370 --> 00:58:37,920

foreign

651
00:58:59,770 --> 00:58:58,730

[Music]

652
00:59:38,860 --> 00:58:59,780

foreign

653
01:00:04,370 --> 01:00:02,150

[Music]

654
01:00:07,430 --> 01:00:04,380
great to have you back with us for the

655
01:00:09,049 --> 01:00:07,440
webcast of our 36 electron launch the

656
01:00:11,030 --> 01:00:09,059
rocket like a hurricane mission to

657
01:00:14,210 --> 01:00:11,040
deliver the first pair of Tropics

658
01:00:15,770 --> 01:00:14,220
satellites to orbit for NASA we had a

659
01:00:18,049 --> 01:00:15,780
great liftoff from the pad at launch

660
01:00:20,210 --> 01:00:18,059
complex one today where electron cleared

661
01:00:22,430 --> 01:00:20,220
the Mahia Peninsula quickly and made its

662
01:00:24,230 --> 01:00:22,440
Way North East and successfully passed

663
01:00:27,289 --> 01:00:24,240

through early launch Milestones like Max

664

01:00:29,630 --> 01:00:27,299

Q main engine cutoff and separation of

665

01:00:31,609 --> 01:00:29,640

the first and second stage the second

666

01:00:33,770 --> 01:00:31,619

stage performed excellently through its

667

01:00:36,410 --> 01:00:33,780

launch Milestones too including battery

668

01:00:39,710 --> 01:00:36,420

hot Swap and second engine cutoff before

669

01:00:42,109 --> 01:00:39,720

t plus 10 minutes into the mission now

670

01:00:44,690 --> 01:00:42,119

we are here with the kickstage carrying

671

01:00:47,270 --> 01:00:44,700

the Tropic satellites to their 550

672

01:00:49,730 --> 01:00:47,280

kilometer altitude destination as we

673

01:00:52,190 --> 01:00:49,740

come up to Curie engine burn for that

674

01:00:54,109 --> 01:00:52,200

final inclination change Tropics will

675

01:00:56,089 --> 01:00:54,119

then be released from their canisterized

676
01:00:57,950 --> 01:00:56,099
satellite dispensers the safety housing

677
01:01:00,470 --> 01:00:57,960
made by us for this pair of Tropic small

678
01:01:02,150 --> 01:01:00,480
sets we'll have official confirmation of

679
01:01:04,069 --> 01:01:02,160
those actions taking place once the cake

680
01:01:06,650 --> 01:01:04,079
stage passes over the next ground

681
01:01:07,789 --> 01:01:06,660
station off the coast of Portugal but

682
01:01:09,890 --> 01:01:07,799
we'll be following along with the

683
01:01:12,230 --> 01:01:09,900
mission in real time with this animation

684
01:01:13,549 --> 01:01:12,240
of Tropics Journey on the kickstage so

685
01:01:15,230 --> 01:01:13,559
we'll bring up the comms channels to

686
01:02:37,250 --> 01:01:15,240
listen in on the final few moments of

687
01:02:37,260 --> 01:02:43,150
I expected nominator recognition

688
01:02:48,230 --> 01:02:45,710

we're there from Mission Control that

689

01:02:51,170 --> 01:02:48,240

the Curie engine is expected to have now

690

01:02:53,210 --> 01:02:51,180

ignited this engine is reliable and it

691

01:02:54,950 --> 01:02:53,220

gimbals to orient the kickstage in a

692

01:02:57,530 --> 01:02:54,960

very precise manner allowing our

693

01:02:59,750 --> 01:02:57,540

customers pinpoint accuracy for payload

694

01:03:02,450 --> 01:02:59,760

deployment listening in now for the next

695

01:03:55,370 --> 01:03:02,460

Call of Curie shutdown ahead of payload

696

01:03:58,849 --> 01:03:57,230

as Muriel mentioned earlier we're

697

01:04:00,589 --> 01:03:58,859

currently waiting for the Curie engine

698

01:04:02,390 --> 01:04:00,599

shutdown followed by the call for

699

01:04:05,210 --> 01:04:02,400

payload deployment for the first pair of

700

01:04:07,130 --> 01:04:05,220

Tropic satellites for NASA the two 3u

701
01:04:08,990 --> 01:04:07,140
Cube sets are each not much bigger than

702
01:04:10,549 --> 01:04:09,000
a loaf of bread and these small but

703
01:04:13,010 --> 01:04:10,559
extremely powerful satellites will begin

704
01:04:15,049 --> 01:04:13,020
a new constellation in low earth orbit

705
01:04:17,150 --> 01:04:15,059
to monitor tropical Cyclones around the

706
01:04:19,430 --> 01:04:17,160
world Tropics aims to measure

707
01:04:21,650 --> 01:04:19,440
temperature humidity and precipitation

708
01:04:23,930 --> 01:04:21,660
so that we can better understand the

709
01:04:25,970 --> 01:04:23,940
evolution and structure of Storms and

710
01:05:08,890 --> 01:04:25,980
doing so with a high revisit rate within

711
01:05:13,910 --> 01:05:11,630
carry engine shutdown is expected at

712
01:05:16,250 --> 01:05:13,920
around a few minutes from now actually

713
01:05:18,530 --> 01:05:16,260

so not long to go and then a few seconds

714

01:05:20,329 --> 01:05:18,540

later we should hear expected nominal

715

01:05:23,630 --> 01:05:20,339

payload deployment from Mission Control

716

01:05:23,640 --> 01:05:27,890

unexpected

717

01:06:18,849 --> 01:05:29,450

there goes Curie engine shutdown

718

01:06:18,859 --> 01:06:27,470

I expected another pedal deployment

719

01:06:32,329 --> 01:06:29,930

and there is the call out from Mission

720

01:06:35,450 --> 01:06:32,339

Control expected nominal payload

721

01:06:37,789 --> 01:06:35,460

deployment congratulations NASA and the

722

01:06:40,549 --> 01:06:37,799

Tropics team and welcome to your new

723

01:06:42,529 --> 01:06:40,559

home in orbit when the kickstage passes

724

01:06:44,630 --> 01:06:42,539

over the next ground station at Azores

725

01:06:46,549 --> 01:06:44,640

we expect to receive the full Telemetry

726
01:06:48,770 --> 01:06:46,559
package that confirms everything you've

727
01:06:50,390 --> 01:06:48,780
just heard from Mission Control look to

728
01:06:52,670 --> 01:06:50,400
our social media channels for that

729
01:06:55,309 --> 01:06:52,680
update within the hour as we close out

730
01:06:57,289 --> 01:06:55,319
this broadcast for our 36th electron

731
01:06:59,150 --> 01:06:57,299
launch and we'll be back to do it all

732
01:07:01,190 --> 01:06:59,160
over again with NASA for our second

733
01:07:03,289 --> 01:07:01,200
launch for the tropics mission to place

734
01:07:05,750 --> 01:07:03,299
another pair of small sets on orbit for

735
01:07:07,609 --> 01:07:05,760
this important constellation coming to a

736
01:07:09,529 --> 01:07:07,619
storm near you both literally and

737
01:07:11,390 --> 01:07:09,539
figuratively as our next launcher's

738
01:07:13,370 --> 01:07:11,400

mission name is set to fly from launch

739

01:07:15,470 --> 01:07:13,380

complex one in just a couple of weeks

740

01:07:17,450 --> 01:07:15,480

time to help ensure NASA's constellation

741

01:07:19,490 --> 01:07:17,460

is up and running in time ready for this

742

01:07:21,589 --> 01:07:19,500

year's hurricane season set to begin on

743

01:07:23,329 --> 01:07:21,599

June 1st we're going to end the

744

01:07:25,730 --> 01:07:23,339

broadcast now but you can always keep in

745

01:07:28,309 --> 01:07:25,740

touch with us and stay in our orbit by

746

01:07:30,109 --> 01:07:28,319

following us on social media to see or

747

01:07:32,329 --> 01:07:30,119

hear and learn about what we do here at

748

01:07:35,289 --> 01:07:32,339

Rocket lab and to follow along NASA's

749

01:07:37,370 --> 01:07:35,299

Tropics Mission you can head to

750

01:07:39,410 --> 01:07:37,380

blogs.nasa.gov forward slash small

751

01:07:40,910 --> 01:07:39,420

satellites thank you so much for joining

752

01:07:47,540 --> 01:07:40,920

us this is rocket lab Mission Control

753

01:07:55,100 --> 01:07:53,230

[Music]

754

01:08:09,300 --> 01:07:55,110

thank you

755

01:08:09,310 --> 01:08:21,530

[Music]

756

01:08:21,540 --> 01:08:27,840

thank you