1
00:00:00,660 --> 00:00:04,910
[Music]

2
00:00:04,920 --> 00:00:35,270
foreign

3
00:01:13,490 --> 00:00:44,460
[Music]

4
00:01:31,260 --> 00:01:21,050
foreign

5
00:02:07,310 --> 00:01:58,570
[Music]

6
00:02:07,320 --> 00:02:11,480
foreign

7
00:02:28,140 --> 00:02:26,449
[Music]

8
00:02:48,290 --> 00:02:28,150
foreign

9
00:02:48,300 --> 00:03:32,570
[Music]

10
00:03:40,970 --> 00:03:34,620
foreign

11
00:03:43,810 --> 00:03:40,980
[Music]

12
00:03:54,260 --> 00:03:43,820
foreign

13
00:05:34,250 --> 00:04:27,000

[Music]

14
00:05:47,600 --> 00:05:34,260
foreign

15
00:05:47,610 --> 00:06:03,950
[Music]

16
00:06:03,960 --> 00:06:33,920
foreign

17
00:07:12,290 --> 00:06:53,560
[Music]

18
00:07:26,310 --> 00:07:19,610
foreign

19
00:08:06,650 --> 00:07:50,450
[Music]

20
00:08:06,660 --> 00:08:10,140
foreign

21
00:08:26,800 --> 00:08:25,070
[Music]

22
00:08:46,910 --> 00:08:26,810
foreign

23
00:09:37,790 --> 00:09:19,530
[Music]

24
00:09:52,890 --> 00:09:37,800
foreign

25
00:10:28,970 --> 00:10:23,830
[Music]

26
00:10:49,760 --> 00:10:31,760
foreign

27
00:11:35,090 --> 00:10:51,290
[Music]

28
00:11:35,100 --> 00:11:46,230
foreign

29
00:11:59,560 --> 00:11:57,710
[Music]

30
00:12:32,550 --> 00:11:59,570
foreign

31
00:13:10,850 --> 00:12:52,200
[Music]

32
00:13:30,560 --> 00:13:25,069
foreign

33
00:14:12,170 --> 00:14:03,800
[Music]

34
00:14:21,290 --> 00:14:14,540
foreign

35
00:14:24,650 --> 00:14:21,300
[Music]

36
00:14:26,810 --> 00:14:24,660
it's Friday May 26th here at Rocket lab

37
00:14:29,569 --> 00:14:26,820
mission control as we await the liftoff

38
00:14:32,269 --> 00:14:29,579

of our 37th electron launch once again

39
00:14:34,670 --> 00:14:32,279
from pad B at launch complex one hello

40
00:14:36,949 --> 00:14:34,680
and welcome to launch day you're joining

41
00:14:39,170 --> 00:14:36,959
us live for our broadcast of coming to a

42
00:14:40,970 --> 00:14:39,180
storm near you a dedicated launch for

43
00:14:43,550 --> 00:14:40,980
NASA to deploy the second half of the

44
00:14:45,290 --> 00:14:43,560
tropics constellation I'm Imogen Ray and

45
00:14:46,850 --> 00:14:45,300
I'm Keegan black and we're excited to

46
00:14:49,129 --> 00:14:46,860
have you join us for another Tropics

47
00:14:50,509 --> 00:14:49,139
launch it's also an extra special day

48
00:14:52,370 --> 00:14:50,519
for us here at Rocket lab as we

49
00:14:54,650 --> 00:14:52,380
celebrate the sixth anniversary of

50
00:14:57,050 --> 00:14:54,660
electrons first launch we're targeting

51
00:14:58,970 --> 00:14:57,060
liftoff for 3 46 PM New Zealand time

52
00:15:01,250 --> 00:14:58,980
which makes it a late launch for our

53
00:15:04,189 --> 00:15:01,260
West Coast U.S viewers at 8 46 PM

54
00:15:05,870 --> 00:15:04,199
Pacific and a super late 11 46 PM

55
00:15:07,970 --> 00:15:05,880
Eastern for our East Coast viewers

56
00:15:09,350 --> 00:15:07,980
whatever time it is where you are thank

57
00:15:11,150 --> 00:15:09,360
you for joining us and we hope you're

58
00:15:13,850 --> 00:15:11,160
well topped up with coffee

59
00:15:15,769 --> 00:15:13,860
today's launch is the second of two for

60
00:15:17,750 --> 00:15:15,779
NASA to deploy the tropics constellation

61
00:15:19,970 --> 00:15:17,760
which stands for time resolved

62
00:15:23,210 --> 00:15:19,980
observations of precipitation structure

63
00:15:25,129 --> 00:15:23,220

and storm intensity with a constellation

64
00:15:27,170 --> 00:15:25,139
of small SATs this Innovative

65
00:15:29,269 --> 00:15:27,180
constellation of four cubesats will

66
00:15:31,730 --> 00:15:29,279
monitor the formation and evolution of

67
00:15:33,769 --> 00:15:31,740
tropical Cyclones including hurricanes

68
00:15:36,350 --> 00:15:33,779
and will provide rapidly updating

69
00:15:37,610 --> 00:15:36,360
observations of storm intensity this

70
00:15:39,290 --> 00:15:37,620
data will help scientists better

71
00:15:41,269 --> 00:15:39,300
understand the processes that affect

72
00:15:42,710 --> 00:15:41,279
these high impact storms ultimately

73
00:15:44,930 --> 00:15:42,720
leading to improved modeling and

74
00:15:46,910 --> 00:15:44,940
prediction to help save lives here's

75
00:15:49,550 --> 00:15:46,920
more from NASA about the tropics mission

76
00:15:51,230 --> 00:15:49,560
here's a question how does a group of

77
00:15:53,269 --> 00:15:51,240
satellites

78
00:15:55,310 --> 00:15:53,279
each no more than a foot long help

79
00:15:58,370 --> 00:15:55,320
improve forecasts for tropical storms

80
00:16:00,410 --> 00:15:58,380
and hurricanes let's take a look

81
00:16:03,889 --> 00:16:00,420
hurricanes are some of the most powerful

82
00:16:06,650 --> 00:16:03,899
and destructive weather events on Earth

83
00:16:08,689 --> 00:16:06,660
the 2020 Atlantic hurricane season was

84
00:16:11,509 --> 00:16:08,699
brutal producing a record-breaking

85
00:16:13,610 --> 00:16:11,519
30-name storms

86
00:16:16,069 --> 00:16:13,620
what's more 10 of those storms were

87
00:16:19,129 --> 00:16:16,079
characterized as rapidly intensifying

88
00:16:21,230 --> 00:16:19,139

some throttling up by 100 miles per hour

89
00:16:23,269 --> 00:16:21,240
in under two days

90
00:16:25,370 --> 00:16:23,279
many weather satellites will generally

91
00:16:28,189 --> 00:16:25,380
measure a storm only once every few

92
00:16:31,189 --> 00:16:28,199
hours leaving gaps in coverage where a

93
00:16:34,189 --> 00:16:31,199
storm may quickly strengthen

94
00:16:36,590 --> 00:16:34,199
to help fill this observation Gap NASA

95
00:16:38,629 --> 00:16:36,600
is launching Tropics a collection of

96
00:16:41,870 --> 00:16:38,639
satellites designed to make a big impact

97
00:16:44,569 --> 00:16:41,880
on our understanding of damaging storms

98
00:16:46,670 --> 00:16:44,579
their mission to provide near hourly

99
00:16:49,490 --> 00:16:46,680
observations of a Storm's precipitation

100
00:16:51,350 --> 00:16:49,500
temperature and humidity allowing

101
00:16:54,110 --> 00:16:51,360
scientists to better understand what

102
00:16:56,810 --> 00:16:54,120
drives the storm's intensification

103
00:16:58,430 --> 00:16:56,820
to achieve this researchers at mit's

104
00:17:00,889 --> 00:16:58,440
Lincoln laboratory developed a

105
00:17:03,410 --> 00:17:00,899
miniaturized microwave radiometer that's

106
00:17:04,909 --> 00:17:03,420
about the size of a cup of coffee this

107
00:17:06,650 --> 00:17:04,919
small instrument will measure storm

108
00:17:08,630 --> 00:17:06,660
strength by detecting the thermal

109
00:17:11,890 --> 00:17:08,640
radiation naturally emitted by the

110
00:17:14,770 --> 00:17:11,900
oxygen and water vapor in the air

111
00:17:17,150 --> 00:17:14,780
as earth's climate continues to change

112
00:17:19,610 --> 00:17:17,160
cost-effective but powerful satellites

113
00:17:21,590 --> 00:17:19,620

like Tropics will be an important tool

114
00:17:25,069 --> 00:17:21,600
to help us better observe developments

115
00:17:28,130 --> 00:17:25,079
driving rapid changes in powerful storms

116
00:17:34,850 --> 00:17:28,140
and help forecasters better predict and

117
00:17:38,210 --> 00:17:36,529
we're proud to be supporting tropics and

118
00:17:40,669 --> 00:17:38,220
grateful to be once again working with

119
00:17:43,430 --> 00:17:40,679
our mission Partners at Nasa just over

120
00:17:45,289 --> 00:17:43,440
two weeks ago on May 8 electron lifted

121
00:17:47,690 --> 00:17:45,299
off for the first of these two dedicated

122
00:17:50,690 --> 00:17:47,700
launches and successfully deployed two

123
00:17:52,909 --> 00:17:50,700
Tropics cubesats to a 550 kilometer

124
00:17:55,490 --> 00:17:52,919
circular altitude above Earth at an

125
00:17:57,169 --> 00:17:55,500
inclination of about 30 degrees all four

126
00:17:58,909 --> 00:17:57,179
of the tropics cubesats need to be

127
00:18:01,430 --> 00:17:58,919
launched to their operational orbits

128
00:18:03,169 --> 00:18:01,440
within a 60-day period but the sooner

129
00:18:05,510 --> 00:18:03,179
the better which is why we're back on

130
00:18:07,610 --> 00:18:05,520
the pad just 18 days later ready to go

131
00:18:11,810 --> 00:18:07,620
to space again let's catch a replay of

132
00:18:23,630 --> 00:18:19,450
ten nine eight seven six five four three

133
00:18:23,640 --> 00:18:29,510
we have lip dogs

134
00:18:29,520 --> 00:18:46,090
oh this place beginning

135
00:18:58,789 --> 00:18:53,529
[Music]

136
00:18:58,799 --> 00:19:08,210
thank you

137
00:19:08,220 --> 00:19:12,190
hearing separation successful

138
00:19:18,169 --> 00:19:15,830

promotion is still nominal

139
00:19:21,170 --> 00:19:18,179
HVB discharge nominal approaching hot

140
00:19:22,730 --> 00:19:21,180
swap in roughly 30 seconds

141
00:19:25,909 --> 00:19:22,740
[Music]

142
00:19:30,800 --> 00:19:25,919
that's also successful

143
00:19:30,810 --> 00:19:36,070
[Music]

144
00:19:36,080 --> 00:19:46,070
okay what's the deployment confirmed

145
00:19:49,970 --> 00:19:48,350
Tropics has been a massive team effort

146
00:19:51,289 --> 00:19:49,980
with the science team led by the Lincoln

147
00:19:53,630 --> 00:19:51,299
laboratory at the Massachusetts

148
00:19:55,370 --> 00:19:53,640
Institute of Technology and others

149
00:19:57,529 --> 00:19:55,380
including researchers from NASA Goddard

150
00:19:59,510 --> 00:19:57,539
space flight center the National Oceanic

151
00:20:01,190 --> 00:19:59,520
and Atmospheric Administration or NOAA

152
00:20:03,590 --> 00:20:01,200
and several universities and Commercial

153
00:20:05,390 --> 00:20:03,600
Partners so with one launch down we're

154
00:20:06,890 --> 00:20:05,400
excited to get the next away today ahead

155
00:20:09,409 --> 00:20:06,900
of the North American hurricane season

156
00:20:11,990 --> 00:20:09,419
just like our first Tropics launch

157
00:20:14,029 --> 00:20:12,000
today's mission is flying from pad B at

158
00:20:15,770 --> 00:20:14,039
Rocket lab launch complex one our

159
00:20:18,169 --> 00:20:15,780
private orbital Spaceport on New

160
00:20:19,970 --> 00:20:18,179
Zealand's Mahia Peninsula as we approach

161
00:20:21,830 --> 00:20:19,980
the final minutes in the countdown our

162
00:20:23,930 --> 00:20:21,840
launch operators at range control in

163
00:20:25,549 --> 00:20:23,940

Mahia and here in rocket Labs Mission

164
00:20:27,890 --> 00:20:25,559
Control are working through their final

165
00:20:29,810 --> 00:20:27,900
checks before liftoff commanding this

166
00:20:32,390 --> 00:20:29,820
overall effort is launch director Yulia

167
00:20:34,070 --> 00:20:32,400
vembacher shortly Yulia will ask all

168
00:20:35,870 --> 00:20:34,080
operators for an update on their launch

169
00:20:38,029 --> 00:20:35,880
status to determine if they are good to

170
00:20:40,190 --> 00:20:38,039
proceed with today's plan launch this is

171
00:20:41,630 --> 00:20:40,200
called the go no-go poll where operators

172
00:20:43,549 --> 00:20:41,640
will indicate if their systems are green

173
00:20:45,470 --> 00:20:43,559
go for launch or red which means they're

174
00:20:47,330 --> 00:20:45,480
working an issue let's listen into that

175
00:20:50,390 --> 00:20:47,340
Poll for all greens and goes across the

176
00:20:53,750 --> 00:20:50,400
board this is LDN Mission Court we are

177
00:20:55,430 --> 00:20:53,760
proceeding now with the Go Logo sequence

178
00:20:59,810 --> 00:20:55,440
stage

179
00:21:02,450 --> 00:20:59,820
status goal Avionics

180
00:21:03,650 --> 00:21:02,460
score

181
00:21:05,270 --> 00:21:03,660
we can

182
00:21:07,730 --> 00:21:05,280
be gone let's go

183
00:21:14,510 --> 00:21:07,740
T1 T1 let's go

184
00:21:24,190 --> 00:21:14,520
QC qcs go PLS PLS go RSO

185
00:21:24,200 --> 00:21:30,649
polling for go no go

186
00:21:30,659 --> 00:21:38,630
coming back later to meet RF

187
00:21:38,640 --> 00:21:42,590
rfl the admission code

188
00:21:52,730 --> 00:21:45,049

thank you mm

189
00:21:57,230 --> 00:21:54,890
they go no girls sequence is now

190
00:21:59,570 --> 00:21:57,240
complete we are T-minus 11 minutes and

191
00:22:01,430 --> 00:21:59,580
58 seconds and counting and we are going

192
00:22:03,289 --> 00:22:01,440
for terminal count at T minus 10 minutes

193
00:22:08,289 --> 00:22:03,299
from this time the three-way procedure

194
00:22:11,990 --> 00:22:10,190
fantastic news there from Mission

195
00:22:14,330 --> 00:22:12,000
Control All Greens across the board

196
00:22:16,010 --> 00:22:14,340
which is what we want to hear we are go

197
00:22:18,470 --> 00:22:16,020
for launch which means we are coming to

198
00:22:21,049 --> 00:22:18,480
a storm near you very soon indeed we're

199
00:22:23,270 --> 00:22:21,059
on track for a liftoff of 3 46 p.m New

200
00:22:54,110 --> 00:22:23,280
Zealand time today in about 10 minutes

201
00:22:54,120 --> 00:22:57,070
foreign

202
00:23:02,390 --> 00:22:59,570
we're also celebrating a special

203
00:23:04,610 --> 00:23:02,400
anniversary for our favorite rocket on

204
00:23:06,830 --> 00:23:04,620
May 25th six years ago from launch

205
00:23:09,289 --> 00:23:06,840
complex one electron took to the skies

206
00:23:11,390 --> 00:23:09,299
for the very first time as it crossed

207
00:23:14,270 --> 00:23:11,400
the Carmen line and completed a perfect

208
00:23:16,370 --> 00:23:14,280
first stage burn stage separation second

209
00:23:18,950 --> 00:23:16,380
stage ignition and fairing separation

210
00:23:21,169 --> 00:23:18,960
electron became the first orbital class

211
00:23:23,570 --> 00:23:21,179
rocket successfully launched from a

212
00:23:26,570 --> 00:23:23,580
private launch site and opened up a new

213
00:23:28,789 --> 00:23:26,580

era in re in regular and reliable launch

214
00:23:31,130 --> 00:23:28,799
for small satellites the flight also

215
00:23:32,990 --> 00:23:31,140
ticked a few other world firsts the

216
00:23:35,210 --> 00:23:33,000
first launch for an all-carbon composite

217
00:23:37,130 --> 00:23:35,220
rocket with the world's first 3D printed

218
00:23:40,850 --> 00:23:37,140
engines powered by a completely new

219
00:23:43,010 --> 00:23:40,860
electric pump fed cycle 36 launches and

220
00:23:44,930 --> 00:23:43,020
161 satellites deployed to space later

221
00:23:47,510 --> 00:23:44,940
today we're ready to launch our latest

222
00:23:49,669 --> 00:23:47,520
pair of sets to space on electron and

223
00:23:52,190 --> 00:23:49,679
wish it a very happy sixth launch

224
00:23:54,590 --> 00:23:52,200
adversary as it flies today's launch

225
00:23:56,029 --> 00:23:54,600
will be our 37th electron Mission but

226
00:23:57,770 --> 00:23:56,039
the way we go to space for the two

227
00:23:59,870 --> 00:23:57,780
Tropics launchers is a little different

228
00:24:02,149 --> 00:23:59,880
from a standard electron mission to low

229
00:24:03,890 --> 00:24:02,159
earth orbit the launch follows a

230
00:24:05,270 --> 00:24:03,900
standard format for this for the first

231
00:24:07,250 --> 00:24:05,280
six or so minutes of the mission

232
00:24:09,470 --> 00:24:07,260
electron will lift off from the pad

233
00:24:11,810 --> 00:24:09,480
thanks to the nine Rutherford engines on

234
00:24:13,490 --> 00:24:11,820
the Rocket's first stage these engines

235
00:24:15,950 --> 00:24:13,500
will burn for around two and a half

236
00:24:18,529 --> 00:24:15,960
minutes lofting electron to about 90

237
00:24:20,450 --> 00:24:18,539
kilometers above Earth's surface from

238
00:24:22,909 --> 00:24:20,460

here electrons first and second stages

239
00:24:25,250 --> 00:24:22,919
will separate with the spent first stage

240
00:24:27,350 --> 00:24:25,260
falling back to Earth shortly after this

241
00:24:29,270 --> 00:24:27,360
a single vacuum optimized rather fit

242
00:24:31,370 --> 00:24:29,280
engine will ignite on electron's Second

243
00:24:32,990 --> 00:24:31,380
Stage to propel the kickstage and

244
00:24:35,570 --> 00:24:33,000
Tropics cubesats for another seven

245
00:24:37,669 --> 00:24:35,580
minutes positioning them at that 550

246
00:24:39,710 --> 00:24:37,679
kilometer altitude this is where the

247
00:24:42,169 --> 00:24:39,720
mission departs from our standard format

248
00:24:43,909 --> 00:24:42,179
typically electron's second stage takes

249
00:24:46,250 --> 00:24:43,919
the kick stages and payloads to an

250
00:24:48,350 --> 00:24:46,260
elliptical orbit and we use the small 3D

251
00:24:50,570 --> 00:24:48,360
printed Curie engine on the kickstage to

252
00:24:52,190 --> 00:24:50,580
circularize the orbit for the tropics

253
00:24:54,110 --> 00:24:52,200
launchers the second Sage is used to

254
00:24:55,730 --> 00:24:54,120
circularize the orbit and instead the

255
00:24:57,830 --> 00:24:55,740
kickstages carry engine and conducts

256
00:24:59,510 --> 00:24:57,840
what's called a plane change maneuver to

257
00:25:01,850 --> 00:24:59,520
position the tropics cubesats at an

258
00:25:03,770 --> 00:25:01,860
inclination of 30 degrees the best spot

259
00:25:05,630 --> 00:25:03,780
for monitoring the formation of tropical

260
00:25:07,610 --> 00:25:05,640
storms here's more from guidance

261
00:25:09,230 --> 00:25:07,620
navigation and control team lead George

262
00:25:12,409 --> 00:25:09,240
Buchanan

263
00:25:14,050 --> 00:25:12,419

navigation and control engineer team

264
00:25:17,750 --> 00:25:14,060
lead but you can just call me George

265
00:25:20,149 --> 00:25:17,760
[Music]

266
00:25:21,710 --> 00:25:20,159
for the GNC team clients navigation and

267
00:25:23,390 --> 00:25:21,720
control is in charge of making sure that

268
00:25:25,850 --> 00:25:23,400
electron gets to the right orbit so the

269
00:25:27,590 --> 00:25:25,860
inclination of an orbit is the Tilt so a

270
00:25:29,570 --> 00:25:27,600
zero degree basically means you're going

271
00:25:31,070 --> 00:25:29,580
all the way around the equator 90 degree

272
00:25:32,810 --> 00:25:31,080
means that you're going up and over the

273
00:25:35,390 --> 00:25:32,820
North Pole and the South Pole

274
00:25:37,310 --> 00:25:35,400
so with the normal electron we'll go to

275
00:25:38,990 --> 00:25:37,320
a transfer orbit with our stage two so

276
00:25:40,909 --> 00:25:39,000
that means that we're in around about

277
00:25:42,710 --> 00:25:40,919
the right orbit but slightly slightly

278
00:25:44,450 --> 00:25:42,720
too low and then we use our kick stage

279
00:25:46,490 --> 00:25:44,460
just to boost us up before we deploy

280
00:25:48,830 --> 00:25:46,500
payloads so for Tropics we've got to do

281
00:25:50,210 --> 00:25:48,840
a couple of sneaky things so firstly we

282
00:25:52,669 --> 00:25:50,220
do a dog League which is basically where

283
00:25:54,649 --> 00:25:52,679
our trajectory actually bends around and

284
00:25:56,450 --> 00:25:54,659
so we head up north rather than heading

285
00:25:58,789 --> 00:25:56,460
out east and then we sort of curve as

286
00:26:00,409 --> 00:25:58,799
we're flying and then the second thing

287
00:26:02,269 --> 00:26:00,419
which we have to do is we use our

288
00:26:04,190 --> 00:26:02,279

kickstage to do an honorable inclination

289
00:26:05,930 --> 00:26:04,200
change which basically tilts the orbit

290
00:26:07,669 --> 00:26:05,940
which we're in to be in the right one so

291
00:26:08,990 --> 00:26:07,679
for Tropics between liftoff and payload

292
00:26:10,370 --> 00:26:09,000
deployment most of it will look very

293
00:26:11,630 --> 00:26:10,380
similar however what's a little bit

294
00:26:13,549 --> 00:26:11,640
different for Tropics is that we'll be

295
00:26:15,289 --> 00:26:13,559
at the right altitude already so if

296
00:26:16,850 --> 00:26:15,299
you're watching look carefully at the

297
00:26:18,350 --> 00:26:16,860
video and also at the the altitude

298
00:26:20,450 --> 00:26:18,360
overlay you'll see that we're much

299
00:26:22,789 --> 00:26:20,460
higher than normal so we go onto a coast

300
00:26:24,950 --> 00:26:22,799
until we get close to the equator and at

301
00:26:26,810 --> 00:26:24,960
that point our Tech stage will light its

302
00:26:28,430 --> 00:26:26,820
carry engine and do an inclination

303
00:26:30,289 --> 00:26:28,440
change we'll actually be pointing

304
00:26:32,210 --> 00:26:30,299
sideways and burning sideways so we'll

305
00:26:34,370 --> 00:26:32,220
be traveling up along this way and

306
00:26:35,690 --> 00:26:34,380
actually thrusting at right angles for

307
00:26:37,490 --> 00:26:35,700
that which is which is highly unusual

308
00:26:40,190 --> 00:26:37,500
just what you need to do to do this

309
00:26:42,049 --> 00:26:40,200
change shortly after that we'll do a

310
00:26:43,669 --> 00:26:42,059
payload deployment and so we'll actually

311
00:26:45,409 --> 00:26:43,679
be deploying outside of ground station

312
00:26:47,029 --> 00:26:45,419
range and so we won't have live

313
00:26:49,010 --> 00:26:47,039

confirmation of that until we get over

314
00:26:50,690 --> 00:26:49,020
our ground stations in Europe

315
00:26:52,130 --> 00:26:50,700
yeah so we've done this maneuver before

316
00:26:54,289 --> 00:26:52,140
in fact we did it for the first Tropics

317
00:26:56,090 --> 00:26:54,299
Mission just a couple of weeks ago and

318
00:26:57,950 --> 00:26:56,100
we expect it to do exactly the same

319
00:26:59,750 --> 00:26:57,960
thing we'll head up north to a dog leg

320
00:27:04,490 --> 00:26:59,760
inclination change and deploy some more

321
00:27:08,390 --> 00:27:06,049
the fixed stage gives us a lot more

322
00:27:10,010 --> 00:27:08,400
flexibility on orbit and so we can do a

323
00:27:11,510 --> 00:27:10,020
lot of missions which a traditional

324
00:27:13,909 --> 00:27:11,520
large launch vehicle may not be able to

325
00:27:16,490 --> 00:27:13,919
do so we can wait before doing Burns we

326
00:27:18,289 --> 00:27:16,500
can light up to you know dozens of times

327
00:27:19,610 --> 00:27:18,299
with this little kickstage and we can

328
00:27:21,649 --> 00:27:19,620
point it in any direction we want to

329
00:27:23,930 --> 00:27:21,659
it's also fairly flexible because it's

330
00:27:25,490 --> 00:27:23,940
this Photon bus we can change it so

331
00:27:27,230 --> 00:27:25,500
sometimes We'll add additional batteries

332
00:27:28,789 --> 00:27:27,240
so we get a longer Mission or we'll

333
00:27:30,289 --> 00:27:28,799
change the amount of RCs if we want to

334
00:27:32,390 --> 00:27:30,299
do a lot more maneuvering and pointing

335
00:27:34,250 --> 00:27:32,400
when a customer comes to us with some

336
00:27:35,930 --> 00:27:34,260
interesting requirements then we sit

337
00:27:37,730 --> 00:27:35,940
down as a team and work out how we can

338
00:27:39,470 --> 00:27:37,740

get electron to meet these and so this

339
00:27:40,730 --> 00:27:39,480
will be doing a bunch of simulations to

340
00:27:43,250 --> 00:27:40,740
make sure the trajectories will get us

341
00:27:44,870 --> 00:27:43,260
to the right orbit we'll also run tests

342
00:27:46,450 --> 00:27:44,880
on actual Hardware to make sure that we

343
00:27:48,649 --> 00:27:46,460
can meet any requirements that way

344
00:27:50,090 --> 00:27:48,659
sometimes we'll do things like change

345
00:27:51,710 --> 00:27:50,100
the design of the vehicle so we'll be

346
00:27:53,210 --> 00:27:51,720
talking to other teams and this is

347
00:27:55,430 --> 00:27:53,220
something which electron being quite

348
00:27:57,409 --> 00:27:55,440
customizable and being really agile is

349
00:27:58,970 --> 00:27:57,419
great for yeah I really love these

350
00:27:59,930 --> 00:27:58,980
science missions being able to do

351
00:28:01,370 --> 00:27:59,940
something which you know is actually

352
00:28:03,350 --> 00:28:01,380
going to have a really positive impact

353
00:28:04,370 --> 00:28:03,360
on millions of people it's something

354
00:28:10,190 --> 00:28:04,380
really special

355
00:28:14,570 --> 00:28:12,350
we look forward to hearing confirmation

356
00:28:16,430 --> 00:28:14,580
in around 30 minutes from now that the

357
00:28:19,010 --> 00:28:16,440
kickstage has completed that plan change

358
00:28:21,769 --> 00:28:19,020
maneuver and the final Tropics cubesats

359
00:28:23,930 --> 00:28:21,779
are safely in orbit we're just four

360
00:28:25,669 --> 00:28:23,940
minutes away now from launch two minutes

361
00:28:27,649 --> 00:28:25,679
before liftoff the ground power supply

362
00:28:29,990 --> 00:28:27,659
at the launch pad is disabled and

363
00:28:31,669 --> 00:28:30,000

electron switches to internal power our

364
00:28:33,710 --> 00:28:31,679
launch safety system the autonomous

365
00:28:35,210 --> 00:28:33,720
flight termination system will be

366
00:28:37,070 --> 00:28:35,220
enabled at the same time and we can

367
00:28:39,350 --> 00:28:37,080
expect to hear both of those calls from

368
00:28:41,330 --> 00:28:39,360
our operators in Mission Control the

369
00:28:43,190 --> 00:28:41,340
liquid oxygen supply valves on stages 1

370
00:28:45,049 --> 00:28:43,200
and 2 will be closed a few seconds later

371
00:28:49,010 --> 00:28:45,059
shortly followed by another operator

372
00:28:51,230 --> 00:28:49,020
confirming that Lock's load is complete

373
00:28:52,850 --> 00:28:51,240
to lift off the propellant tanks will be

374
00:28:54,950 --> 00:28:52,860
at their Optimum pressure levels for

375
00:28:57,049 --> 00:28:54,960
launch Ground Control will then confirm

376
00:28:59,029 --> 00:28:57,059
that the water Deluge system on the pad

377
00:29:00,769 --> 00:28:59,039
is ready to be activated for when the

378
00:29:02,630 --> 00:29:00,779
engines on the rocket ignite for launch

379
00:29:05,390 --> 00:29:02,640
this is what will cause the large white

380
00:29:07,250 --> 00:29:05,400
cloud of water vapor at liftoff at T

381
00:29:09,649 --> 00:29:07,260
minus 10 seconds you'll hear the launch

382
00:29:11,269 --> 00:29:09,659
director counting down to liftoff those

383
00:29:13,370 --> 00:29:11,279
nine Rutherford engines we've mentioned

384
00:29:15,289 --> 00:29:13,380
before will ignite at T minus three

385
00:29:17,750 --> 00:29:15,299
seconds and the launch pad's hold down

386
00:29:20,210 --> 00:29:17,760
mechanisms will be released electron

387
00:29:22,370 --> 00:29:20,220
will then take to the skies for its 37th

388
00:29:24,169 --> 00:29:22,380

launch and the final Tropics cubesats

389
00:29:44,149 --> 00:29:24,179
will be on their way to space let's

390
00:29:49,669 --> 00:29:46,510
foreign

391
00:29:52,789 --> 00:29:49,679
Mission code from now on there should be

392
00:29:54,769 --> 00:29:52,799
no red flags on your critical lccs we

393
00:29:57,649 --> 00:29:54,779
can Aldi on Mission code

394
00:29:59,930 --> 00:29:57,659
LD v-con

395
00:30:03,350 --> 00:29:59,940
we can please lock the auto sequence and

396
00:30:07,250 --> 00:30:04,850
Ed

397
00:30:08,990 --> 00:30:07,260
thank you and we can't please confirm

398
00:30:11,029 --> 00:30:09,000
that all expected primary flight

399
00:30:12,769 --> 00:30:11,039
computer askers are green

400
00:30:14,450 --> 00:30:12,779
confirmed

401
00:30:16,669 --> 00:30:14,460
thank you

402
00:30:18,889 --> 00:30:16,679
to everyone on Mission code we are go

403
00:30:20,090 --> 00:30:18,899
for auto sequence start at T minus two

404
00:30:56,830 --> 00:30:20,100
minutes

405
00:31:25,909 --> 00:30:59,149
vehicle is on internal power

406
00:31:45,250 --> 00:31:28,310
load is complete system is in

407
00:31:45,260 --> 00:32:06,409
anti-gathering is disabled

408
00:32:24,649 --> 00:32:10,070
stage one stage two press for flight

409
00:32:24,659 --> 00:32:35,330
Deluge activated

410
00:32:35,340 --> 00:32:44,870
T-minus 19 seconds and counting

411
00:33:14,210 --> 00:32:52,930
ten nine eight seven six five four three

412
00:33:14,220 --> 00:33:34,630
[Music]

413
00:33:40,310 --> 00:33:37,909

HPV disjudged and that is a beautiful

414
00:33:42,409 --> 00:33:40,320
liftoff for electron the final two

415
00:33:45,230 --> 00:33:42,419
trophic satellites are on their way and

416
00:33:46,850 --> 00:33:45,240
coming to a storm near you with electron

417
00:33:49,070 --> 00:33:46,860
now having cleared the pad the next

418
00:33:50,870 --> 00:33:49,080
Milestone is Max Q This is the point

419
00:33:52,730 --> 00:33:50,880
where the forces on electron are at

420
00:33:54,110 --> 00:33:52,740
their greatest so we'll listen out for

421
00:34:05,769 --> 00:33:54,120
clearance of that key moment from

422
00:34:10,690 --> 00:34:08,450
clear Max Q

423
00:34:12,770 --> 00:34:10,700
[Applause]

424
00:34:14,930 --> 00:34:12,780
long enough

425
00:34:16,669 --> 00:34:14,940
and there we have it electron has passed

426
00:34:19,250 --> 00:34:16,679
through Max q and continues on the way

427
00:34:22,129 --> 00:34:19,260
to space right now electron is traveling

428
00:34:25,550 --> 00:34:22,139
at over 2 000 kilometers per hour and is

429
00:34:28,190 --> 00:34:25,560
at an altitude of 20 kilometers now

430
00:34:30,470 --> 00:34:28,200
coming up next is main engine cutoff or

431
00:34:32,690 --> 00:34:30,480
Miko where the nine rather fit engines

432
00:34:34,310 --> 00:34:32,700
on electron's first stage shut down to

433
00:34:36,470 --> 00:34:34,320
make way for separation between the

434
00:34:38,570 --> 00:34:36,480
first and second stages within seconds

435
00:34:40,669 --> 00:34:38,580
the single space optimized Rutherford

436
00:34:42,470 --> 00:34:40,679
engine on the second stage will ignite

437
00:34:44,570 --> 00:34:42,480
to carry the kickstage and the Tropic

438
00:34:46,369 --> 00:34:44,580

satellites all the way to orbit that

439
00:34:48,290 --> 00:34:46,379
should take place shortly at around t

440
00:34:49,790 --> 00:34:48,300
plus two and a half minutes so let's

441
00:34:51,889 --> 00:34:49,800
listen into that call from Mission

442
00:34:53,810 --> 00:34:51,899
Control

443
00:34:56,030 --> 00:34:53,820
stage one proportion still nominal

444
00:35:10,670 --> 00:34:56,040
please stand by for making roughly at 30

445
00:35:15,170 --> 00:35:13,069
15 seconds to Miko

446
00:35:26,569 --> 00:35:15,180
I was at Chatham station

447
00:35:26,579 --> 00:35:30,460
and make a confirm

448
00:35:30,470 --> 00:35:35,390
[Applause]

449
00:35:35,400 --> 00:35:40,550
ation

450
00:35:45,770 --> 00:35:43,130
and just like clockwork we have had Miko

451
00:35:47,750 --> 00:35:45,780
stage one and stage two separation and

452
00:35:49,970 --> 00:35:47,760
ignition of electron's second stage

453
00:35:52,069 --> 00:35:49,980
coming up very shortly we'll also see

454
00:35:54,890 --> 00:35:52,079
electrons fairing separate and Fall Away

455
00:35:56,510 --> 00:35:54,900
these two carbon composite halves form a

456
00:35:58,010 --> 00:35:56,520
protective nose cone over the Tropic

457
00:36:00,050 --> 00:35:58,020
satellites keeping them safe during

458
00:36:01,790 --> 00:36:00,060
Ascent once we're in space though

459
00:36:03,710 --> 00:36:01,800
they're not needed as the forces on

460
00:36:05,030 --> 00:36:03,720
electron are not nearly as great so we

461
00:36:12,609 --> 00:36:05,040
can get rid of them and clear the way

462
00:36:17,270 --> 00:36:14,930
now for this Mission because we're

463
00:36:19,250 --> 00:36:17,280

headed to that 550 kilometer circular

464
00:36:20,930 --> 00:36:19,260
orbit straight away with stage two we're

465
00:36:23,270 --> 00:36:20,940
leaving the fairing attached just a

466
00:36:24,770 --> 00:36:23,280
little bit longer than usual that

467
00:36:44,170 --> 00:36:24,780
jettison event should be coming up in

468
00:37:01,250 --> 00:36:45,890
operation

469
00:37:06,290 --> 00:37:03,829
and that's bearing separation confirmed

470
00:37:08,630 --> 00:37:06,300
we are at four minutes into flight now

471
00:37:11,150 --> 00:37:08,640
and coming up next is a process unique

472
00:37:12,829 --> 00:37:11,160
to electron battery hotspot the pumps on

473
00:37:14,810 --> 00:37:12,839
electrons Rutherford engines are powered

474
00:37:16,790 --> 00:37:14,820
by electron pumps which draw their

475
00:37:18,410 --> 00:37:16,800
energy from batteries once we deplete

476
00:37:19,609 --> 00:37:18,420
the batteries they are dead weight that

477
00:37:21,530 --> 00:37:19,619
we don't want to carry all the way to

478
00:37:23,690 --> 00:37:21,540
orbit so we eject batteries and swap

479
00:37:25,550 --> 00:37:23,700
over to a fresh set in Flight that

480
00:37:27,410 --> 00:37:25,560
Milestone is coming up just before seven

481
00:37:56,030 --> 00:37:27,420
minutes into the flight so still a ways

482
00:38:00,829 --> 00:37:58,250
so far for today's Mission we've had a

483
00:38:02,630 --> 00:38:00,839
perfect liftoff with clad Max Q had a

484
00:38:04,329 --> 00:38:02,640
good first stage burn and separation of

485
00:38:06,770 --> 00:38:04,339
electrons first and second stages

486
00:38:08,930 --> 00:38:06,780
fearing has also separated as planned

487
00:38:11,270 --> 00:38:08,940
and now we're five minutes into the

488
00:38:13,550 --> 00:38:11,280

mission so far a nominal mission for

489
00:38:15,710 --> 00:38:13,560
coming to a storm near you the second of

490
00:38:33,910 --> 00:38:15,720
two dedicated launches to deploy a storm

491
00:38:48,849 --> 00:38:37,069
Stage Door proportion is still holding

492
00:38:48,859 --> 00:38:55,730
200 seconds remaining

493
00:38:59,450 --> 00:38:57,170
now we're coming up on that

494
00:39:00,890 --> 00:38:59,460
all-important battery hot swap powering

495
00:39:02,270 --> 00:39:00,900
engines with batteries is one of the

496
00:39:04,370 --> 00:39:02,280
things that makes the Rutherford engine

497
00:39:06,349 --> 00:39:04,380
special the single stage 2 engine

498
00:39:08,510 --> 00:39:06,359
requires a longer duration than the

499
00:39:10,430 --> 00:39:08,520
stage 1 engines so we have to hot swap

500
00:39:12,410 --> 00:39:10,440
the spent batteries to a third fresh one

501
00:39:14,030 --> 00:39:12,420
this is one of the final gates to orbit

502
00:39:15,410 --> 00:39:14,040
so let's listen into the operators in

503
00:39:34,030 --> 00:39:15,420
mission control for that cool

504
00:39:34,040 --> 00:39:50,070
throttling down

505
00:39:59,569 --> 00:39:57,109
[Applause]

506
00:40:01,310 --> 00:39:59,579
and there you have it a clean hot spot

507
00:40:03,470 --> 00:40:01,320
for the second stage Rutherford engine

508
00:40:05,329 --> 00:40:03,480
electron continues to orbit with around

509
00:40:07,849 --> 00:40:05,339
two minutes remaining in today's stage

510
00:40:10,190 --> 00:40:07,859
two Burn Speed is good altitude is good

511
00:40:12,170 --> 00:40:10,200
electron is good t plus seven minutes

512
00:40:13,910 --> 00:40:12,180
into the second Tropics mission for NASA

513
00:40:15,470 --> 00:40:13,920

just in time for the Atlantic hurricane

514
00:40:17,690 --> 00:40:15,480
season and commencing at the start of

515
00:40:19,730 --> 00:40:17,700
June these two cubesats along with the

516
00:40:21,109 --> 00:40:19,740
two that we launched just 18 days ago

517
00:40:22,790 --> 00:40:21,119
will provide members of the

518
00:40:24,950 --> 00:40:22,800
meteorological Community with hourly

519
00:40:26,690 --> 00:40:24,960
returns over the same storm to more

520
00:40:28,370 --> 00:40:26,700
accurately predict patterns which could

521
00:41:09,550 --> 00:40:28,380
save the lives and livelihoods of

522
00:41:15,410 --> 00:41:12,349
t plus eight minutes in and we are now

523
00:41:17,569 --> 00:41:15,420
around 30 kilometers away from that 550

524
00:41:19,609 --> 00:41:17,579
kilometer Target orbit as George

525
00:41:21,770 --> 00:41:19,619
mentioned in the video earlier this

526
00:41:23,930 --> 00:41:21,780
stage 2 burn is taking us all the way to

527
00:41:26,030 --> 00:41:23,940
a circular orbit then we have that dog

528
00:41:27,950 --> 00:41:26,040
leg inclination change just over the

529
00:41:30,530 --> 00:41:27,960
equator to put us in the correct plane

530
00:41:32,630 --> 00:41:30,540
for payload deployment coming up at 33

531
00:41:34,730 --> 00:41:32,640
minutes into the mission electron is

532
00:41:36,770 --> 00:41:34,740
continuing well at speeds of overnight

533
00:41:38,990 --> 00:41:36,780
second stage completes its burn because

534
00:41:40,730 --> 00:41:39,000
the nozzle glowing bright orange on your

535
00:41:42,950 --> 00:41:40,740
screen right now we'll turn back to gray

536
00:41:44,810 --> 00:41:42,960
as it cools down after the engine shuts

537
00:41:46,730 --> 00:41:44,820
off immediately after that shutdown

538
00:41:48,589 --> 00:41:46,740

electron's kickstage separates from the

539
00:41:50,450 --> 00:41:48,599
second stage and in around one minute

540
00:41:52,010 --> 00:41:50,460
the carry engine will ignite and begin

541
00:41:54,170 --> 00:41:52,020
that plane change maneuver ahead of

542
00:41:55,790 --> 00:41:54,180
payload deployment again Mission Control

543
00:42:11,329 --> 00:41:55,800
will pull out these actions so let's

544
00:42:11,339 --> 00:42:16,849
SQL confirm

545
00:42:16,859 --> 00:42:23,569
stage three separation

546
00:42:28,670 --> 00:42:26,390
and that is Seiko confirmed as planned

547
00:42:30,950 --> 00:42:28,680
the kickstage has also cleanly separated

548
00:42:32,930 --> 00:42:30,960
ready for that final Curie burn in

549
00:42:35,329 --> 00:42:32,940
around 20 minutes from now followed by

550
00:42:37,670 --> 00:42:35,339
payload deployment at t plus 33 minutes

551
00:42:39,589 --> 00:42:37,680
because this final burn and deployment

552
00:42:41,750 --> 00:42:39,599
of the tropics cubesats happens in a

553
00:42:43,310 --> 00:42:41,760
ground station blackout Zone we won't

554
00:42:45,890 --> 00:42:43,320
get live confirmation of those

555
00:42:48,050 --> 00:42:45,900
milestones we also won't have live video

556
00:42:49,609 --> 00:42:48,060
footage of the deployment process so

557
00:42:51,470 --> 00:42:49,619
here's a quick animation to show you

558
00:42:55,920 --> 00:42:51,480
what will be happening in orbit just 25

559
00:42:55,930 --> 00:43:03,710
[Music]

560
00:43:03,720 --> 00:43:07,120
thank you

561
00:43:52,309 --> 00:43:12,230
[Music]

562
00:43:52,319 --> 00:43:58,490
foreign

563
00:44:02,630 --> 00:44:00,130

[Music]

564
00:44:04,430 --> 00:44:02,640
since we won't have live coverage of

565
00:44:06,230 --> 00:44:04,440
payload deployment we'll take a short

566
00:44:09,170 --> 00:44:06,240
break from the broadcast and join you

567
00:44:11,150 --> 00:44:09,180
again in around t plus 45 minutes to

568
00:44:13,190 --> 00:44:11,160
provide an update on deployment and to

569
00:44:14,750 --> 00:44:13,200
confirm Mission success we'll leave

570
00:44:16,670 --> 00:44:14,760
Mission Control comms up during this

571
00:44:18,589 --> 00:44:16,680
Coast phase so you can hear it as soon

572
00:44:30,309 --> 00:44:18,599
as it happens we'll be back with you

573
00:44:55,970 --> 00:44:32,390
thank you

574
00:44:58,890 --> 00:44:55,980
[Music]

575
00:45:38,660 --> 00:44:58,900
foreign

576
00:45:53,470 --> 00:45:46,700
[Music]

577
00:45:53,480 --> 00:46:02,490
thank you

578
00:46:59,870 --> 00:46:32,870
[Music]

579
00:46:59,880 --> 00:47:06,190
foreign

580
00:47:59,930 --> 00:47:14,720
[Music]

581
00:47:59,940 --> 00:48:03,830
thank you

582
00:48:03,840 --> 00:48:10,609
[Music]

583
00:48:10,619 --> 00:48:18,060
foreign

584
00:48:47,380 --> 00:48:45,710
[Music]

585
00:49:14,860 --> 00:48:47,390
foreign

586
00:49:21,180 --> 00:49:20,569
[Music]

587
00:50:00,920 --> 00:49:21,190
foreign

588
00:50:00,930 --> 00:50:40,069

[Music]

589
00:50:40,079 --> 00:50:43,860
foreign

590
00:51:47,750 --> 00:51:08,370
[Music]

591
00:51:47,760 --> 00:51:50,830
foreign

592
00:52:29,080 --> 00:52:10,490
[Music]

593
00:52:51,010 --> 00:52:29,090
thank you

594
00:52:51,020 --> 00:53:06,950
[Music]

595
00:53:06,960 --> 00:53:12,960
foreign

596
00:54:21,930 --> 00:53:32,100
[Music]

597
00:54:44,550 --> 00:54:21,940
foreign

598
00:54:44,560 --> 00:55:45,049
[Music]

599
00:55:45,059 --> 00:55:50,790
foreign

600
00:56:10,730 --> 00:56:07,050
[Music]

601
00:56:24,330 --> 00:56:13,570
[Applause]

602
00:56:29,160 --> 00:56:28,420
[Music]

603
00:56:35,020 --> 00:56:29,170
[Applause]

604
00:57:36,220 --> 00:56:44,550
[Music]

605
00:57:37,310 --> 00:57:36,230
[Applause]

606
00:57:38,700 --> 00:57:37,320
[Music]

607
00:58:17,809 --> 00:57:38,710
[Applause]

608
00:58:17,819 --> 00:58:35,360
foreign

609
00:59:05,290 --> 00:58:47,860
[Music]

610
00:59:15,980 --> 00:59:05,300
[Applause]

611
00:59:15,990 --> 00:59:37,010
[Music]

612
00:59:37,020 --> 00:59:43,090
foreign

613
01:00:42,349 --> 01:00:03,660

[Music]

614
01:00:42,840 --> 01:00:42,359
thank you

615
01:01:15,700 --> 01:00:42,850
foreign

616
01:02:26,809 --> 01:01:35,390
[Music]

617
01:02:26,819 --> 01:02:34,310
foreign

618
01:06:33,109 --> 01:03:15,510
[Music]

619
01:06:33,119 --> 01:07:12,020
unexpected Curry shut down

620
01:07:12,030 --> 01:07:22,309
[Music]

621
01:07:33,510 --> 01:07:23,430
foreign

622
01:08:29,209 --> 01:07:56,810
[Music]

623
01:08:29,219 --> 01:08:33,559
foreign

624
01:08:33,569 --> 01:09:08,870
[Music]

625
01:09:42,410 --> 01:09:10,889
thank you

626
01:09:42,420 --> 01:09:53,139
two one lift up

627
01:09:53,149 --> 01:10:13,070
[Music]

628
01:10:13,080 --> 01:10:20,270
TCL down range

629
01:10:51,830 --> 01:10:21,900
disregard

630
01:10:51,840 --> 01:11:20,700
foreign

631
01:12:52,140 --> 01:11:22,010
[Music]

632
01:13:01,010 --> 01:12:52,150
thank you

633
01:13:01,890 --> 01:13:01,020
[Music]

634
01:13:14,630 --> 01:13:01,900
[Applause]

635
01:13:14,640 --> 01:13:27,110
foreign

636
01:15:42,649 --> 01:14:15,430
[Music]

637
01:15:42,659 --> 01:15:46,230
foreign

638
01:16:24,890 --> 01:15:56,800

[Music]

639
01:16:37,710 --> 01:16:26,000
thank you

640
01:16:41,450 --> 01:16:39,310
[Music]

641
01:16:42,830 --> 01:16:41,460
ldgcl mission

642
01:16:45,649 --> 01:16:42,840
y

643
01:16:49,010 --> 01:16:45,659
some five requirements are completed

644
01:16:52,490 --> 01:16:49,020
copy thank you and just checking in that

645
01:16:53,810 --> 01:16:52,500
Romeo 7800 are you happy with its

646
01:16:56,030 --> 01:16:53,820
progress as well

647
01:17:05,470 --> 01:16:56,040
affirmative it's in works just warming

648
01:17:35,709 --> 01:17:21,810
[Music]

649
01:17:35,719 --> 01:17:46,560
apologies go ahead to a PLS

650
01:18:08,810 --> 01:17:57,850
[Music]

651
01:18:08,820 --> 01:18:25,120
foreign

652
01:19:28,550 --> 01:18:32,990
[Music]

653
01:19:28,560 --> 01:20:05,290
foreign

654
01:20:25,550 --> 01:20:21,550
[Music]

655
01:20:25,560 --> 01:20:28,850
velocity

656
01:20:33,090 --> 01:20:30,890
relatively

657
01:20:38,850 --> 01:20:33,100
thousand five

658
01:21:15,560 --> 01:20:42,920
[Music]

659
01:21:15,570 --> 01:21:19,310
[Applause]

660
01:21:21,950 --> 01:21:21,580
[Music]

661
01:21:32,930 --> 01:21:21,960
[Applause]

662
01:21:32,940 --> 01:21:40,310
[Music]

663
01:21:40,320 --> 01:21:44,930

all right

664
01:21:48,580 --> 01:21:45,830
foreign

665
01:21:50,720 --> 01:21:48,590
[Music]

666
01:22:04,070 --> 01:21:50,730
[Applause]

667
01:22:06,110 --> 01:22:04,080
[Music]

668
01:22:08,630 --> 01:22:06,120
to have you back with us for the webcast

669
01:22:10,189 --> 01:22:08,640
of our 37th electron launch they're

670
01:22:11,990 --> 01:22:10,199
coming to a storm near you launch to

671
01:22:13,430 --> 01:22:12,000
deploy the final two satellites in

672
01:22:16,189 --> 01:22:13,440
NASA's store monitoring Tropics

673
01:22:17,630 --> 01:22:16,199
constellation we had a Flawless liftoff

674
01:22:19,610 --> 01:22:17,640
from the power to launch complex one

675
01:22:21,410 --> 01:22:19,620
today and a nominal flight all the way

676
01:22:24,050 --> 01:22:21,420
through to kickstage separation as

677
01:22:26,030 --> 01:22:24,060
planned now as mentioned the final state

678
01:22:27,709 --> 01:22:26,040
phase of today's launch including the

679
01:22:29,870 --> 01:22:27,719
curry engine burn for the plane change

680
01:22:32,450 --> 01:22:29,880
maneuver and payload deployment took

681
01:22:33,830 --> 01:22:32,460
place in a ground station blackout Zone

682
01:22:35,750 --> 01:22:33,840
you wouldn't have been able to hear that

683
01:22:37,370 --> 01:22:35,760
over the Nets but we are thrilled to

684
01:22:40,310 --> 01:22:37,380
confirm that today's mission is yet

685
01:22:42,169 --> 01:22:40,320
another success the kickstages Curie

686
01:22:44,030 --> 01:22:42,179
engine performed well positioning the

687
01:22:46,250 --> 01:22:44,040
Tropic satellites at a 30 degree

688
01:22:47,930 --> 01:22:46,260

inclination for deployment we have

689
01:22:49,790 --> 01:22:47,940
confirmation that the satellites have

690
01:22:51,530 --> 01:22:49,800
separated cleanly from their deployers

691
01:22:54,470 --> 01:22:51,540
and are now settling into their new

692
01:22:57,229 --> 01:22:54,480
homes on orbit ready for the 2023 storm

693
01:22:59,630 --> 01:22:57,239
season congratulations to the launch

694
01:23:02,149 --> 01:22:59,640
Team and to our mission Partners at Nasa

695
01:23:05,090 --> 01:23:02,159
the tropics constellation is officially

696
01:23:07,010 --> 01:23:05,100
on orbit we are so very proud to support

697
01:23:09,229 --> 01:23:07,020
this important Mission and grateful to

698
01:23:11,570 --> 01:23:09,239
be entrusted by NASA once again to

699
01:23:13,189 --> 01:23:11,580
deliver Mission success so with that

700
01:23:14,750 --> 01:23:13,199
we're going to close out today's live

701
01:23:17,750 --> 01:23:14,760
coverage but don't forget to follow

702
01:23:20,450 --> 01:23:17,760
rocket lab and NASA on social media for

703
01:23:22,550 --> 01:23:20,460
more photos videos and additional detail

704
01:23:24,530 --> 01:23:22,560
about today's Mission and to follow

705
01:23:26,510 --> 01:23:24,540
along NASA's Tropics Mission now that

706
01:23:27,850 --> 01:23:26,520
all of the spacecraft are on orbit you

707
01:23:29,990 --> 01:23:27,860
can head to

708
01:23:32,149 --> 01:23:30,000
blogs.nasa.gov forward slash small

709
01:23:33,709 --> 01:23:32,159
satellites thank you so much for joining

710
01:23:37,680 --> 01:23:33,719
us this is rocket lab Mission Control

711
01:23:57,560 --> 01:23:56,030
[Music]

712
01:24:17,209 --> 01:23:57,570
foreign