



1
00:00:29,840 --> 00:00:45,430

you

2
00:00:49,270 --> 00:00:47,350

currently looking at the mobile launcher

3
00:00:51,750 --> 00:00:49,280

platform and one of the solid rocket

4
00:00:54,229 --> 00:00:51,760

boosters

5
00:00:55,510 --> 00:00:54,239

ice team is on the zero level of the

6
00:00:57,110 --> 00:00:55,520

platform

7
00:00:59,590 --> 00:00:57,120

making inspections

8
00:01:00,790 --> 00:00:59,600

scanning the orbiter vehicle recording

9
00:01:04,390 --> 00:01:00,800

temperatures

10
00:01:08,310 --> 00:01:04,400

and making note of any any uh

11
00:01:12,390 --> 00:01:09,830

one of the one of the activities the

12
00:01:14,390 --> 00:01:12,400

team performs at this level

13
00:01:16,469 --> 00:01:14,400

is uh pulling down of some sensors that

14

00:01:19,749 --> 00:01:16,479

are located in between the uh space

15

00:01:22,230 --> 00:01:19,759

shuttle orbiter and the external tank

16

00:01:24,070 --> 00:01:22,240

you can see the uh the lines to those

17

00:01:26,950 --> 00:01:24,080

sensors are

18

00:01:35,429 --> 00:01:26,960

to the left-hand side of the booster in

19

00:01:38,550 --> 00:01:36,950

once the ice team finishes their

20

00:01:41,109 --> 00:01:38,560

inspection they'll be coming back here

21

00:01:42,870 --> 00:01:41,119

to the launch control center and they'll

22

00:01:44,870 --> 00:01:42,880

make a report to

23

00:01:50,389 --> 00:01:44,880

launch controllers on

24

00:01:56,469 --> 00:01:53,590

the sts-65 crew has been preparing for

25

00:01:57,990 --> 00:01:56,479

about a year for this flight today

26

00:02:22,390 --> 00:01:58,000

gotta yeah this today will be the

27

00:02:28,630 --> 00:02:24,710

and we have a picture of bob cabana now

28

00:02:32,150 --> 00:02:30,390

just completed a weather briefing and uh

29

00:02:34,150 --> 00:02:32,160

very optimistic today about today's

30

00:02:35,990 --> 00:02:34,160

launch

31

00:02:48,110 --> 00:02:36,000

cabana is a member of the red team for

32

00:02:54,390 --> 00:02:51,990

sts-65 pilot jim halsell

33

00:02:56,150 --> 00:02:54,400

also a member of the red team

34

00:03:05,830 --> 00:02:56,160

playing for the first time today on the

35

00:03:09,750 --> 00:03:07,990

mission specialist and payload commander

36

00:03:11,830 --> 00:03:09,760

for this flight rick keep

37

00:03:13,830 --> 00:03:11,840

he's flying for the third time today on

38

00:03:16,229 --> 00:03:13,840

the space shuttle

39

00:03:18,630 --> 00:03:16,239

he's a member of the red team

40

00:03:21,350 --> 00:03:18,640

he'll be working inside the iml space

41

00:03:23,030 --> 00:03:21,360

lab as part of the science crew with

42

00:03:27,670 --> 00:03:23,040

some primary responsibility for

43

00:03:27,680 --> 00:03:31,110

and across the room

44

00:03:41,430 --> 00:03:34,470

we've got mission specialist carl walls

45

00:03:41,440 --> 00:03:45,430

walls is a member of the blue team

46

00:03:51,270 --> 00:03:48,869

mission specialist leroy chow

47

00:04:01,670 --> 00:03:51,280

he's part of the space lab science crew

48

00:04:01,680 --> 00:04:08,869

mission specialist don thomas

49

00:04:08,879 --> 00:04:15,030

thomas is born in cleveland ohio

50

00:04:18,949 --> 00:04:16,949

he's a member of the blue team

51
00:04:21,030 --> 00:04:18,959
flying for the first time today

52
00:04:22,790 --> 00:04:21,040
and we have japanese payload specialist

53
00:04:24,950 --> 00:04:22,800
chiaki mukhai

54
00:04:29,670 --> 00:04:24,960
making history in japan as the first

55
00:04:36,550 --> 00:04:31,909
mukai is a member of the red team and is

56
00:04:37,749 --> 00:04:36,560
also part of the space lab science crew

57
00:04:39,749 --> 00:04:37,759
should be involved in the science

58
00:04:50,070 --> 00:04:39,759
activities going on in the international

59
00:04:59,990 --> 00:04:52,390
commander bob cabana

60
00:05:00,000 --> 00:05:41,189
good morning thank you all

61
00:05:45,110 --> 00:05:42,870
flight crew will be making uh

62
00:05:48,469 --> 00:05:45,120
communications checks with

63
00:05:50,950 --> 00:05:48,479

the test conductors here at ksc and also

64

00:05:55,110 --> 00:05:50,960

at like at mission control they'll be

65

00:06:03,909 --> 00:05:58,230

ms one loud and clear ms2 loud and clear

66

00:06:41,670 --> 00:06:05,590

copy happy loud and clear also going

67

00:06:41,680 --> 00:06:47,110

t-minus eight minutes and counting

68

00:06:50,550 --> 00:06:49,350

otc plt that is complete

69

00:06:53,350 --> 00:06:50,560

okay

70

00:06:54,950 --> 00:06:53,360

ntd houston fly i'll go fight yes at

71

00:06:56,629 --> 00:06:54,960

this time i'd like to give a go for the

72

00:06:58,790 --> 00:06:56,639

rtls weather both the observed and

73

00:07:00,710 --> 00:06:58,800

forecast to this uh conditions and we'll

74

00:07:08,150 --> 00:07:00,720

go for launch hi copy thank you launch

75

00:07:12,710 --> 00:07:11,270

launch director ntd-212 go ahead if the

76
00:07:14,150 --> 00:07:12,720
flight has cleared his weather command

77
00:07:15,430 --> 00:07:14,160
there we go and that puts us fully ready

78
00:07:18,710 --> 00:07:15,440
to proceed

79
00:07:21,110 --> 00:07:18,720
okay stand by and uh mmp chairman

80
00:07:23,830 --> 00:07:21,120
roger our weather constraint is cleared

81
00:07:25,830 --> 00:07:23,840
clear to launch okay copy well with that

82
00:07:28,070 --> 00:07:25,840
ncd you can take out the whole pending

83
00:07:30,629 --> 00:07:28,080
at five minutes and see if we can keep

84
00:07:33,270 --> 00:07:30,639
the clock going for another seven t/s

85
00:07:43,430 --> 00:07:33,280
copies i'll do that thank you

86
00:07:47,830 --> 00:07:45,110
t-minus seven minutes and counting we've

87
00:07:50,309 --> 00:07:47,840
gotten a clearance to launch today

88
00:07:53,189 --> 00:07:50,319

rtls weather has uh is going to hold out

89

00:07:59,830 --> 00:07:53,199

for us for a 12 43 p.m eastern time

90

00:08:04,950 --> 00:08:02,150

also the weather at our town site is

91

00:08:06,390 --> 00:08:04,960

also clear for launch today

92

00:08:08,150 --> 00:08:06,400

the orbiter's access arm is being

93

00:08:17,430 --> 00:08:08,160

retracted away from the vehicle at this

94

00:08:21,909 --> 00:08:19,909

copy ms2

95

00:08:25,510 --> 00:08:21,919

otcl

96

00:08:29,029 --> 00:08:25,520

go ahead the seaters are still on copy

97

00:08:35,909 --> 00:08:31,029

roger five steps headline heaters coming

98

00:08:42,469 --> 00:08:40,630

otccr that's complete copy

99

00:08:49,190 --> 00:08:42,479

the gaseous oxygen vent hood is now

100

00:08:51,750 --> 00:08:50,230

otc

101
00:08:53,190 --> 00:08:51,760
the caution warning is clear but no

102
00:08:56,230 --> 00:08:53,200
unexpected errors

103
00:09:00,150 --> 00:08:58,310
and with that columbia otc i'd like to

104
00:09:02,230 --> 00:09:00,160
wish you all a very successful two weeks

105
00:09:06,389 --> 00:09:02,240
on orbit and with that uh close and lock

106
00:09:06,399 --> 00:09:17,190
roger thanks

107
00:09:17,200 --> 00:09:30,310
t-minus 20 seconds

108
00:09:34,630 --> 00:09:33,030
we have a go for engine start six

109
00:09:35,590 --> 00:09:34,640
five four

110
00:09:36,710 --> 00:09:35,600
three

111
00:09:37,750 --> 00:09:36,720
two

112
00:09:40,550 --> 00:09:37,760
one

113
00:09:42,550 --> 00:09:40,560

booster ignition and liftoff

114

00:09:52,630 --> 00:09:42,560

liftoff of columbia on a multi-nation

115

00:09:58,070 --> 00:09:54,070

houston now controlling columbia

116

00:10:00,470 --> 00:09:58,080

underway on its 17th trip to space

117

00:10:11,110 --> 00:10:00,480

zombie already traveling 250 miles an

118

00:10:14,550 --> 00:10:12,630

three engines unborn columbia now

119

00:10:16,069 --> 00:10:14,560

throttling back to two-thirds throttle

120

00:10:18,310 --> 00:10:16,079

to prepare the spacecraft to pass

121

00:10:24,949 --> 00:10:18,320

through the area of maximum air pressure

122

00:10:24,959 --> 00:10:28,790

columbia go at throttle up

123

00:10:32,470 --> 00:10:31,190

rusher go through

124

00:10:51,430 --> 00:10:32,480

me columbia's three engines now back at

125

00:10:56,389 --> 00:10:53,350

food officer confirms a good separation

126
00:10:57,590 --> 00:10:56,399
of the solid rockets altitude now 172

127
00:10:59,350 --> 00:10:57,600
thousand feet

128
00:11:01,910 --> 00:10:59,360
columbia 33 miles east of the kennedy

129
00:11:01,920 --> 00:11:12,949
now traveling 3 500 miles an

130
00:11:15,910 --> 00:11:14,389
have a still picture hour us sitting on

131
00:11:17,350 --> 00:11:15,920
the flight deck right now that's

132
00:11:21,509 --> 00:11:17,360
affirmative we got a real good picture

133
00:11:25,829 --> 00:11:23,110
okay well here it comes i'll narrate

134
00:11:28,470 --> 00:11:25,839
this is just after main engine start

135
00:11:44,870 --> 00:11:28,480
and the solids are to light off here

136
00:11:58,069 --> 00:11:46,710
we just completed the

137
00:12:01,590 --> 00:11:59,590
i'll tell you it was a beautiful day for

138
00:12:03,750 --> 00:12:01,600

a launch uh

139

00:12:05,829 --> 00:12:03,760

the main engine's lit on time and carl

140

00:12:07,750 --> 00:12:05,839

was a little worried

141

00:12:08,470 --> 00:12:07,760

from his previous flights not worried

142

00:12:10,310 --> 00:12:08,480

but

143

00:12:12,870 --> 00:12:10,320

he doesn't get excited until the solids

144

00:12:34,949 --> 00:12:12,880

lit and then when the solids lit we uh

145

00:12:37,590 --> 00:12:36,230

i wish we could

146

00:12:39,670 --> 00:12:37,600

show you what you were seeing out the

147

00:12:42,310 --> 00:12:39,680

windows unfortunately where the camera

148

00:12:45,190 --> 00:12:42,320

is placed all we can get is uh

149

00:12:48,230 --> 00:12:45,200

the shaking inside it as you can see

150

00:12:49,269 --> 00:12:48,240

vibrate rates pretty good on the

151
00:12:51,350 --> 00:12:49,279
solids

152
00:12:53,590 --> 00:12:51,360
and we're being pushed back in our seats

153
00:12:55,590 --> 00:12:53,600
at their amount but nothing compared to

154
00:12:57,350 --> 00:12:55,600
the last two minutes of the flight when

155
00:12:58,550 --> 00:12:57,360
the main engines are really accelerating

156
00:13:01,670 --> 00:12:58,560
us out to our

157
00:13:06,310 --> 00:13:03,350
i'll tell you bob from our perspective

158
00:13:12,230 --> 00:13:06,320
this is a great footage as we just never

159
00:13:16,550 --> 00:13:14,389
pay attention we're coming up to

160
00:13:18,870 --> 00:13:16,560
srb pretty soon here you can see the

161
00:13:21,110 --> 00:13:18,880
flash out the front windows jim and i

162
00:13:22,949 --> 00:13:21,120
have cue cards over the hud to block the

163
00:13:25,350 --> 00:13:22,959

sunlight coming in so we can see all the

164

00:13:27,110 --> 00:13:25,360

displays but you'll still see the

165

00:14:54,389 --> 00:13:27,120

flash from the step motors around the

166

00:14:54,399 --> 00:14:59,590

all events open

167

00:14:59,600 --> 00:15:04,150

t-zero srb ignition

168

00:15:04,160 --> 00:15:08,310

liftoff confirmed

169

00:15:13,269 --> 00:15:11,350

houston columbia roll program

170

00:15:15,189 --> 00:15:13,279

roger roll columbia

171

00:15:18,870 --> 00:15:15,199

people seize the row

172

00:15:21,430 --> 00:15:20,389

why didn't your delta state processor

173

00:15:25,030 --> 00:15:21,440

look good

174

00:15:25,040 --> 00:15:30,790

booster how the three engines look

175

00:15:34,150 --> 00:15:32,629

negative return columbia houston

176

00:15:37,990 --> 00:15:34,160

negative return

177

00:15:41,990 --> 00:15:39,430

three engines look real good flying

178

00:15:46,550 --> 00:15:45,110

prop you go for the photo dto go

179

00:15:48,550 --> 00:15:46,560

i don't know how we doing at miko

180

00:15:51,110 --> 00:15:48,560

nominal velocity flight i wonder speed

181

00:15:52,829 --> 00:15:51,120

homes are required okay for this okay

182

00:15:55,670 --> 00:15:52,839

capcom

183

00:15:57,749 --> 00:15:55,680

etc okay nominal columbia houston

184

00:16:00,790 --> 00:15:57,759

nominal miko no ohms one required go for

185

00:16:03,670 --> 00:16:00,800

the at photo dto

186

00:16:09,350 --> 00:16:03,680

go for the t photo dto namo mako plus x

187

00:16:09,360 --> 00:16:44,069

30 seconds hand over the pages

188

00:16:44,079 --> 00:16:51,990

that will be that power system

189

00:16:55,749 --> 00:16:54,230

this is jim trying to float for the

190

00:16:56,550 --> 00:16:55,759

first time in his life let's go for it

191

00:16:59,110 --> 00:16:56,560

man

192

00:17:01,189 --> 00:16:59,120

this feels really weird

193

00:17:03,110 --> 00:17:01,199

okay i'm going to call the ground here

194

00:17:28,630 --> 00:17:03,120

jewish floating student columbia canyon

195

00:17:28,640 --> 00:17:33,350

i'll let them get into the father-in-law

196

00:17:41,990 --> 00:17:35,270

oh we got a cpl

197

00:17:44,830 --> 00:17:43,430

okay

198

00:18:12,150 --> 00:17:44,840

it smells like a

199

00:18:16,070 --> 00:18:14,390

well rick we're glad to see you folks

200

00:18:17,909 --> 00:18:16,080

come floating out of the tunnel and now

201
00:18:23,270 --> 00:18:17,919
we're assured that this just just didn't

202
00:18:26,230 --> 00:18:24,789
well we had to look out the window and

203
00:19:11,909 --> 00:18:26,240
make sure that there was really a space

204
00:19:16,310 --> 00:19:13,750
the electrophoresis unit is used to

205
00:19:17,750 --> 00:19:16,320
separate uh proteins and what we're

206
00:19:20,070 --> 00:19:17,760
doing today is we're trying to separate

207
00:19:21,750 --> 00:19:20,080
a mixture of proteins by applying an

208
00:19:26,230 --> 00:19:21,760
electric field

209
00:19:27,669 --> 00:19:26,240
against the current a flow of

210
00:19:30,950 --> 00:19:27,679
buffer solution

211
00:19:32,950 --> 00:19:30,960
with the sample stream of the

212
00:19:34,470 --> 00:19:32,960
protein

213
00:19:35,590 --> 00:19:34,480

okay i'll just kind of go from top to

214

00:19:39,029 --> 00:19:35,600

bottom here

215

00:19:42,070 --> 00:19:39,039

this is the ramsey's facility here

216

00:19:44,230 --> 00:19:42,080

and on the top is the power supply

217

00:19:46,870 --> 00:19:44,240

followed by the control

218

00:19:49,270 --> 00:19:46,880

and display keyboard here

219

00:19:51,990 --> 00:19:49,280

where you control all the pumps and you

220

00:19:54,150 --> 00:19:52,000

know input all the different things this

221

00:19:56,070 --> 00:19:54,160

is the stowage one the storage

222

00:19:57,909 --> 00:19:56,080

compartment

223

00:19:59,750 --> 00:19:57,919

and here we have the different sample

224

00:20:01,990 --> 00:19:59,760

trays for the different experiments

225

00:20:04,150 --> 00:20:02,000

we're going to run

226

00:20:07,350 --> 00:20:04,160

we have the gear drawers that slide out

227

00:20:09,350 --> 00:20:07,360

these are the sample bags here

228

00:20:14,310 --> 00:20:09,360

this is uh the sample of the stuff that

229

00:20:18,150 --> 00:20:15,909

we also have some more of these sample

230

00:20:19,909 --> 00:20:18,160

things in the crimp and after we're done

231

00:20:22,710 --> 00:20:19,919

collecting we freeze the samples in the

232

00:20:27,190 --> 00:20:25,669

coming down this is the main cell here

233

00:20:29,029 --> 00:20:27,200

this is where the electrophoresis

234

00:20:31,669 --> 00:20:29,039

happens

235

00:20:33,669 --> 00:20:31,679

and here's the cell buffer pump it's a

236

00:20:35,590 --> 00:20:33,679

peristaltic

237

00:20:39,029 --> 00:20:35,600

a bunch of different tubes and just

238

00:20:43,270 --> 00:20:39,039

that's the medium that the

239

00:20:47,990 --> 00:20:45,590

this is the sample compartment

240

00:20:49,669 --> 00:20:48,000

the sample just slides right in here

241

00:20:52,310 --> 00:20:49,679

another peristaltic pump pumps the

242

00:21:00,070 --> 00:20:52,320

sample up through the chamber where it

243

00:21:04,549 --> 00:21:03,830

the collection areas the collection tray

244

00:21:06,710 --> 00:21:04,559

and

245

00:21:08,390 --> 00:21:06,720

the different each 41

246

00:21:14,149 --> 00:21:08,400

collects every 41

247

00:21:17,750 --> 00:21:15,990

and this is just some uh some of the

248

00:21:20,230 --> 00:21:17,760

plumbing of the equipment you know the

249

00:21:21,990 --> 00:21:20,240

different fluid loops a couple valves

250

00:21:24,149 --> 00:21:22,000

things like that

251
00:21:26,630 --> 00:21:24,159
that in a nutshell is the ramsey's

252
00:21:28,549 --> 00:21:26,640
facility

253
00:21:30,870 --> 00:21:28,559
i'm standing here next to biorack i

254
00:21:33,029 --> 00:21:30,880
think a biorack is sort of a mini space

255
00:21:35,190 --> 00:21:33,039
station because it's got these are fruit

256
00:21:37,110 --> 00:21:35,200
flies one of many experiments there's

257
00:21:39,029 --> 00:21:37,120
some 200 containers with different

258
00:21:41,270 --> 00:21:39,039
science going on in most of them it's

259
00:21:43,350 --> 00:21:41,280
got centrifuges for 1g controls you can

260
00:21:44,789 --> 00:21:43,360
see those in the background it's got

261
00:21:46,710 --> 00:21:44,799
incubators that run at two different

262
00:21:48,390 --> 00:21:46,720
temperatures and there's experiments

263
00:21:49,669 --> 00:21:48,400

from all over the world in biorack so

264

00:21:51,510 --> 00:21:49,679

it's a lot of fun to work because

265

00:21:53,669 --> 00:21:51,520

there's a lot of different things it's

266

00:21:55,830 --> 00:21:53,679

got its own cooler and down below it's

267

00:21:57,430 --> 00:21:55,840

got a glove box so that we can work with

268

00:21:59,590 --> 00:21:57,440

toxic things that we wouldn't otherwise

269

00:22:01,990 --> 00:21:59,600

be able to work with in space because we

270

00:22:04,310 --> 00:22:02,000

keep them contained inside the glove box

271

00:22:05,990 --> 00:22:04,320

so here i'm putting some things in there

272

00:22:07,750 --> 00:22:06,000

and here's a shot from right in front

273

00:22:09,510 --> 00:22:07,760

just as i'm loading some things into the

274

00:22:11,909 --> 00:22:09,520

centrifuge we stop the centrifuge put

275

00:22:14,710 --> 00:22:11,919

some containers in that way we can do

276

00:22:15,909 --> 00:22:14,720

controls on board do the exact same

277

00:22:17,029 --> 00:22:15,919

thing they're in the exact same

278

00:22:19,350 --> 00:22:17,039

environment

279

00:22:21,510 --> 00:22:19,360

except that some are being spun at one g

280

00:22:23,830 --> 00:22:21,520

and some are being kept at zero g

281

00:22:26,710 --> 00:22:23,840

and today just for example besides the

282

00:22:28,870 --> 00:22:26,720

fruit flies i've irrigated some little

283

00:22:30,789 --> 00:22:28,880

seeds which are going to

284

00:22:32,230 --> 00:22:30,799

be growing in space and then we'll fix

285

00:22:33,750 --> 00:22:32,240

them later and sort of capture their

286

00:22:35,510 --> 00:22:33,760

development

287

00:22:37,909 --> 00:22:35,520

here i'm getting getting into stowage

288

00:22:40,149 --> 00:22:37,919

for uh nazimi which lives right next to

289

00:22:41,350 --> 00:22:40,159

biorack it has a lot of similarity or a

290

00:22:43,669 --> 00:22:41,360

lot of

291

00:22:45,430 --> 00:22:43,679

relationship with my iraq it's different

292

00:22:47,750 --> 00:22:45,440

in that it's got a variable speed center

293

00:22:50,390 --> 00:22:47,760

fusion meanwhile chiaki is over on the

294

00:22:52,470 --> 00:22:50,400

uh at the workbench rack uh working on

295

00:22:54,470 --> 00:22:52,480

some experiments that will go into ffeu

296

00:22:55,669 --> 00:22:54,480

here where she's borrowing the biorack

297

00:22:58,070 --> 00:22:55,679

glovebox

298

00:22:59,669 --> 00:22:58,080

to do to inject some fluids from one

299

00:23:01,669 --> 00:22:59,679

syringe into another

300

00:23:04,230 --> 00:23:01,679

she's going to use these to run in the

301
00:23:05,990 --> 00:23:04,240
ffu electrophoresis unit which we were

302
00:23:08,310 --> 00:23:06,000
able to rescue by

303
00:23:10,789 --> 00:23:08,320
sort of repeated ifm's earlier in the

304
00:23:13,350 --> 00:23:10,799
week so we've been very happy to get to

305
00:23:15,669 --> 00:23:13,360
do some fflu work because it's one of

306
00:23:17,830 --> 00:23:15,679
the facilities on board and in fact it

307
00:23:19,590 --> 00:23:17,840
was the last facility to repair

308
00:23:20,950 --> 00:23:19,600
we've now had all the facilities worked

309
00:23:22,149 --> 00:23:20,960
in fact we kind of added up over the

310
00:23:23,110 --> 00:23:22,159
course of the flight we've been able to

311
00:23:26,149 --> 00:23:23,120
rescue

312
00:23:29,270 --> 00:23:26,159
significant parts of five of the

313
00:23:32,230 --> 00:23:29,280

of the 20 or so facilities on board with

314

00:23:34,310 --> 00:23:32,240

ifms between the new removing the newt

315

00:23:37,750 --> 00:23:34,320

which was required to keep the fish

316

00:23:39,590 --> 00:23:37,760

package alive and repairing the eris

317

00:23:40,950 --> 00:23:39,600

echo machine which was required for both

318

00:23:42,630 --> 00:23:40,960

edomp

319

00:23:45,270 --> 00:23:42,640

and the canadian spinal changes in

320

00:23:47,669 --> 00:23:45,280

microgravity and then of course the ffbu

321

00:23:49,430 --> 00:23:47,679

that i already talked about and the sort

322

00:23:51,029 --> 00:23:49,440

of lucky touch with the fingers to get

323

00:23:54,070 --> 00:23:51,039

the hrm data

324

00:23:55,669 --> 00:23:54,080

from the rrmj jackie's using a

325

00:23:58,149 --> 00:23:55,679

microscope here just as you would on the

326

00:24:00,549 --> 00:23:58,159

ground to look at this condition of the

327

00:24:02,870 --> 00:24:00,559

cells that are in these little cassettes

328

00:24:05,430 --> 00:24:02,880

here's a look at the medaka the fish

329

00:24:07,590 --> 00:24:05,440

that are in one of those little packages

330

00:24:09,750 --> 00:24:07,600

two two males two family females in the

331

00:24:12,070 --> 00:24:09,760

lower right corner you might be able to

332

00:26:06,070 --> 00:24:12,080

pick out uh some eggs it's a little bit

333

00:26:08,470 --> 00:26:07,510

go ahead george

334

00:26:10,230 --> 00:26:08,480

yeah

335

00:26:12,950 --> 00:26:10,240

the nasda team traced back the last

336

00:26:15,750 --> 00:26:12,960

usage of that cck

337

00:26:17,830 --> 00:26:15,760

mic and it was during

338

00:26:37,190 --> 00:26:17,840

the new injection so it may have been

339

00:26:41,190 --> 00:26:38,789

just looking at the eggs quickly before

340

00:26:42,870 --> 00:26:41,200

i put them in uh looks like we have

341

00:26:46,390 --> 00:26:42,880

stages i'm just guessing right now

342

00:26:49,269 --> 00:26:46,400

looking by eye 35 to 38

343

00:26:50,870 --> 00:26:49,279

with most of the uh eggs here

344

00:26:52,630 --> 00:26:50,880

some of them have clearly defined tail

345

00:26:54,470 --> 00:26:52,640

buds and i can see the tails and some of

346

00:26:56,070 --> 00:26:54,480

the gills starting to form

347

00:26:57,750 --> 00:26:56,080

uh with some of the eggs there so they

348

00:26:58,710 --> 00:26:57,760

look uh they all look pretty healthy

349

00:27:01,190 --> 00:26:58,720

here

350

00:27:03,830 --> 00:27:01,200

i can see maybe uh

351

00:27:05,269 --> 00:27:03,840

one or two possibly eggs that aren't

352

00:27:08,070 --> 00:27:05,279

doing so well but the other ones are all

353

00:27:08,080 --> 00:27:15,350

okay dance it's very good news

354

00:29:15,190 --> 00:27:17,669

now we got uh transfor here under the

355

00:29:21,830 --> 00:29:19,350

okay so ifm w-48 uh for step three wait

356

00:29:23,750 --> 00:29:21,840

till the uh nozzle temps are greater

357

00:29:25,269 --> 00:29:23,760

than 200 and i'll check back when

358

00:29:27,750 --> 00:29:25,279

complete uh we'll put it in work right

359

00:29:30,070 --> 00:29:27,760

away

360

00:29:33,269 --> 00:29:30,080

that's correct carl and be advised you

361

00:29:37,029 --> 00:29:33,279

have 11 hours of bullets

362

00:29:37,039 --> 00:30:08,630

okay

363

00:30:11,990 --> 00:30:10,310

and i just want to let you know that

364

00:30:13,990 --> 00:30:12,000

we've got live downlink now from the

365

00:33:57,509 --> 00:30:14,000

ball right glove box

366

00:34:02,070 --> 00:33:59,669

he was back there busily working on

367

00:34:05,110 --> 00:34:02,080

experiments the scientist factor had a

368

00:34:06,870 --> 00:34:05,120

real uh difficult timeline

369

00:34:08,710 --> 00:34:06,880

here's a reenactment i just want to show

370

00:34:10,230 --> 00:34:08,720

you how rick filled the syringe to over

371

00:34:12,310 --> 00:34:10,240

pressure the pump

372

00:34:14,710 --> 00:34:12,320

we uh we squeezed out a ball of water on

373

00:34:16,470 --> 00:34:14,720

the end of the straw and that straw

374

00:34:18,710 --> 00:34:16,480

is not touching the syringe the ball of

375

00:34:21,030 --> 00:34:18,720

water is just floating freely and rick

376

00:34:22,950 --> 00:34:21,040

is pulling back on the end of the

377

00:34:34,389 --> 00:34:22,960

syringe sucking the water into it with

378

00:34:37,349 --> 00:34:35,829

and what i'd like to do this morning is

379

00:34:39,030 --> 00:34:37,359

give you a brief explanation about one

380

00:34:42,230 --> 00:34:39,040

of the major facilities we have here on

381

00:34:45,750 --> 00:34:42,240

iml2 and this is the aaeu which is short

382

00:34:47,829 --> 00:34:45,760

for aquatic animal experiment units

383

00:34:49,349 --> 00:34:47,839

and essentially this is a aquarium in

384

00:34:51,510 --> 00:34:49,359

space

385

00:34:54,069 --> 00:34:51,520

divided up into two halves

386

00:34:55,750 --> 00:34:54,079

over here we have the aquatic package

387

00:34:57,109 --> 00:34:55,760

and on the other side we have the fish

388

00:35:03,750 --> 00:34:57,119

package

389

00:35:08,790 --> 00:35:06,470
and three of these tanks have uh

390

00:35:12,390 --> 00:35:08,800
red belly japanese newts in them and

391

00:35:15,430 --> 00:35:13,670
we have one nude and two of the

392

00:35:17,109 --> 00:35:15,440
containers and then one of the tanks we

393

00:35:18,710 --> 00:35:17,119
have two newts in there

394

00:35:20,870 --> 00:35:18,720
and in all the tanks we have an egg

395

00:35:23,750 --> 00:35:20,880
chamber also with many different uh nude

396

00:35:25,349 --> 00:35:23,760
eggs in them up to 70 or 80 eggs per uh

397

00:35:26,310 --> 00:35:25,359
water tank here

398

00:35:28,310 --> 00:35:26,320
and what we're doing with this

399

00:35:30,150 --> 00:35:28,320
experiment is having the nudes lay eggs

400

00:35:32,310 --> 00:35:30,160
in space and we're interested in how

401
00:35:33,670 --> 00:35:32,320
these eggs develop multiply and develop

402
00:35:34,790 --> 00:35:33,680
under zero gravity

403
00:35:36,310 --> 00:35:34,800
conditions

404
00:35:37,910 --> 00:35:36,320
and we'll compare these eggs to those

405
00:35:40,310 --> 00:35:37,920
grown on the ground ones that have

406
00:35:42,790 --> 00:35:40,320
developed under 1g conditions

407
00:35:44,950 --> 00:35:42,800
so this is one of our red bellied nuts

408
00:35:46,550 --> 00:35:44,960
one of them that i looked at just a few

409
00:35:48,710 --> 00:35:46,560
days ago if you were watching has laid

410
00:35:50,390 --> 00:35:48,720
36 eggs already so we know we have a

411
00:35:55,670 --> 00:35:50,400
number of great eggs for the scientists

412
00:36:00,550 --> 00:35:59,030
besides the afternoons here we have uh

413
00:36:02,790 --> 00:36:00,560

another tank with fish in it called

414

00:36:04,870 --> 00:36:02,800

medaka and these are small kill fish

415

00:36:06,630 --> 00:36:04,880

they're about the size of guppies and we

416

00:36:08,550 --> 00:36:06,640

have four in there two males and two

417

00:36:09,990 --> 00:36:08,560

females and in this experiment we're

418

00:36:13,910 --> 00:36:10,000

interested in the mating behavior of the

419

00:36:15,510 --> 00:36:13,920

guppies of the medaka fish here

420

00:36:18,150 --> 00:36:15,520

and then on the uh

421

00:36:20,150 --> 00:36:18,160

fish package we have goldfish you might

422

00:36:22,069 --> 00:36:20,160

have seen some of the downlink from this

423

00:36:23,670 --> 00:36:22,079

and i'll shine the light on there

424

00:36:25,190 --> 00:36:23,680

and hopefully you can

425

00:36:26,710 --> 00:36:25,200

get a view of some of the fish swimming

426

00:36:29,190 --> 00:36:26,720

by

427

00:36:31,109 --> 00:36:29,200

we have six different goldfish in here

428

00:36:32,710 --> 00:36:31,119

and as you can see they're looping

429

00:36:34,470 --> 00:36:32,720

around

430

00:36:35,829 --> 00:36:34,480

they don't quite know which way is up

431

00:36:37,829 --> 00:36:35,839

since we don't have a gravity vector

432

00:36:39,430 --> 00:36:37,839

here for them and we've been watching

433

00:36:41,190 --> 00:36:39,440

and monitoring their swimming behavior

434

00:36:42,790 --> 00:36:41,200

for the last couple of days

435

00:36:44,870 --> 00:36:42,800

we have a door up here that we open and

436

00:36:48,710 --> 00:36:44,880

close to give them the day night cycles

437

00:36:55,910 --> 00:36:51,589

okay don we have some very good video of

438

00:36:58,950 --> 00:36:57,430

okay copy that uh let me know if you

439

00:37:08,230 --> 00:36:58,960

like the focus changes at all i tried to

440

00:37:08,240 --> 00:37:12,630

okay pi says focus is very good

441

00:37:12,640 --> 00:37:30,550

okay copy that's great

442

00:37:30,560 --> 00:37:33,829

okay copy

443

00:37:38,550 --> 00:37:35,030

cooler

444

00:37:40,150 --> 00:37:38,560

transfer four containers but to ptc one

445

00:37:42,470 --> 00:37:40,160

rack one charlie

446

00:37:45,990 --> 00:37:42,480

that's a good copy

447

00:37:47,750 --> 00:37:46,000

and this uh containers are

448

00:37:48,829 --> 00:37:47,760

107

449

00:37:50,710 --> 00:37:48,839

bond

450

00:37:51,750 --> 00:37:50,720

three

451
00:37:53,589 --> 00:37:51,760
from

452
00:38:48,310 --> 00:37:53,599
one or eight

453
00:38:52,550 --> 00:38:51,190
space approximately four lero

454
00:39:10,870 --> 00:38:52,560
i

455
00:39:10,880 --> 00:39:15,190
go ahead lero

456
00:39:18,870 --> 00:39:17,750
uh kimberly before i begin t i'd like to

457
00:39:22,550 --> 00:39:18,880
uh

458
00:39:24,710 --> 00:39:22,560
slime mold here

459
00:39:26,790 --> 00:39:24,720
if the pi's agree i'm going to re-center

460
00:39:28,390 --> 00:39:26,800
the target

461
00:39:29,589 --> 00:39:28,400
that's affirmatively roy the piano on

462
00:39:30,790 --> 00:39:29,599
the ground was just saying the same

463
00:40:23,990 --> 00:39:30,800

thing we're going to have you do it

464

00:40:28,150 --> 00:40:26,390

uh jim and his tape chain shots i heard

465

00:41:04,950 --> 00:40:28,160

you kept him really busy this morning

466

00:41:09,589 --> 00:41:06,390

thanks for waiting

467

00:41:13,030 --> 00:41:09,599

and i'm ready to copy

468

00:41:15,109 --> 00:41:13,040

huntsville space lab on campus

469

00:41:17,910 --> 00:41:15,119

we we want to do 804 right we're going

470

00:41:20,069 --> 00:41:17,920

to power cycle it

471

00:41:21,510 --> 00:41:20,079

that's affirmative they were resetting

472

00:41:25,349 --> 00:41:21,520

some of their internal software and they

473

00:41:25,359 --> 00:44:15,190

okay it's coming right now

474

00:44:18,790 --> 00:44:16,630

nice to be able to communicate through

475

00:44:21,270 --> 00:44:18,800

the modem back and forth with the folks

476

00:44:23,270 --> 00:44:21,280

back home and even you mario

477

00:44:24,710 --> 00:44:23,280

and i uh i left the same time a little

478

00:44:27,030 --> 00:44:24,720

longer and i said i just

479

00:44:28,790 --> 00:44:27,040

uh recording met and stuff here before i

480

00:44:30,550 --> 00:44:28,800

get started on the readings between the

481

00:44:32,309 --> 00:44:30,560

commanders and pilot seat on the flight

482

00:44:33,750 --> 00:44:32,319

deck i just thought it was really neat

483

00:44:36,550 --> 00:44:33,760

to be able to work with equipment like

484

00:44:38,309 --> 00:44:36,560

this you really adapt to uh microgravity

485

00:44:40,630 --> 00:44:38,319

very quickly and it seems totally

486

00:44:42,230 --> 00:44:40,640

natural uh just using a piece of

487

00:44:44,230 --> 00:44:42,240

equipment setting it off to the side

488

00:44:47,270 --> 00:44:44,240

letting it float and writing something

489

00:44:48,630 --> 00:44:47,280

down or going off to something else

490

00:44:49,990 --> 00:44:48,640

it just seems like you've been doing it

491

00:44:52,470 --> 00:44:50,000

all your life once you've been up here

492

00:44:54,630 --> 00:44:52,480

for a while

493

00:44:57,750 --> 00:44:54,640

and uh my final scene uh for this

494

00:44:59,750 --> 00:44:57,760

morning jackie was able to talk to the

495

00:45:01,829 --> 00:44:59,760

children at tarabashi school in her

496

00:45:02,790 --> 00:45:01,839

hometown via cyrex

497

00:45:04,390 --> 00:45:02,800

uh

498

00:45:06,309 --> 00:45:04,400

has been a lot of fun she wasn't talking

499

00:45:07,349 --> 00:45:06,319

directly via srx but through a bridge in

500

00:45:08,150 --> 00:45:07,359

hawaii

501
00:45:09,829 --> 00:45:08,160
and

502
00:45:11,750 --> 00:45:09,839
she really enjoyed that the children

503
00:45:13,589 --> 00:45:11,760
enjoyed it immensely and it it really

504
00:45:15,670 --> 00:45:13,599
has been nice to be able to talk to

505
00:45:17,910 --> 00:45:15,680
school children around the world we've

506
00:45:19,910 --> 00:45:17,920
covered the southern us

507
00:45:22,630 --> 00:45:19,920
tokyo and germany now

508
00:45:25,030 --> 00:45:22,640
on this flight and it always

509
00:45:27,190 --> 00:45:25,040
is an encouragement to them and to us to

510
00:45:35,670 --> 00:45:27,200
hear how excited they are about space

511
00:45:40,710 --> 00:45:38,390
uh i've been looking at a new lens well

512
00:45:43,030 --> 00:45:40,720
not a new lens a different lens on the

513
00:45:46,390 --> 00:45:43,040

hasselblad camera same lens we always

514

00:45:48,790 --> 00:45:46,400

fly but instead of the infinity stop

515

00:45:51,750 --> 00:45:48,800

set on the ground we're focusing it in

516

00:45:53,589 --> 00:45:51,760

flight and looking at a different a

517

00:45:55,829 --> 00:45:53,599

couple of different focusing screens to

518

00:45:57,190 --> 00:45:55,839

see how we might get more accurate

519

00:45:58,630 --> 00:45:57,200

pictures

520

00:46:00,870 --> 00:45:58,640

we do an excellent job as you know

521

00:46:02,390 --> 00:46:00,880

documenting the changes in the earth on

522

00:46:03,910 --> 00:46:02,400

our shuttle missions and the earth is

523

00:46:05,670 --> 00:46:03,920

constantly changing and we want to

524

00:46:06,710 --> 00:46:05,680

ensure that we have the best pictures

525

00:48:29,190 --> 00:46:06,720

possible

526
00:48:56,630 --> 00:48:43,990
okay

527
00:49:06,150 --> 00:48:58,870
where's the cape north or south it's

528
00:49:06,160 --> 00:50:36,950
there it is there it is beautiful

529
00:50:36,960 --> 00:50:45,670
three four nine ten

530
00:50:45,680 --> 00:51:02,549
11.

531
00:51:02,559 --> 00:51:19,030
zero pad six

532
00:51:19,040 --> 00:51:33,109
about 10 minutes

533
00:51:33,119 --> 00:51:42,870
not yet

534
00:51:51,829 --> 00:51:44,309
okay good

535
00:51:51,839 --> 00:52:02,069
okay we're starting to decelerate now

536
00:52:11,430 --> 00:52:04,069
yeah we got about 1.3 g's right now

537
00:52:11,440 --> 00:52:16,630
mach 15 property

538
00:52:16,640 --> 00:53:11,109

okay

539

00:53:11,119 --> 00:53:24,870
179.

540

00:53:24,880 --> 00:53:40,950
one and a half

541

00:53:44,230 --> 00:53:42,630
it's very quiet uh here in mission

542

00:53:47,910 --> 00:53:44,240
control all of columbia systems

543

00:53:50,470 --> 00:53:47,920
continuing to perform uh uh in excellent

544

00:53:59,510 --> 00:53:50,480
fashion there are no issues at all in

545

00:54:20,630 --> 00:54:01,349
sonic booms announcing columbia's

546

00:54:20,640 --> 00:54:30,549
the landing gear is now down

547

00:54:30,559 --> 00:54:48,549
main gear touchdown

548

00:54:53,750 --> 00:54:51,589
and nose gear touchdown

549

00:54:54,790 --> 00:54:53,760
columbia completing its 17th voyage in

550

00:54:57,750 --> 00:54:54,800
space

551
00:54:59,829 --> 00:54:57,760
completing 236 orbits of the earth

552
00:55:02,790 --> 00:54:59,839
rolling out on runway 3-3 at the kennedy

553
00:55:29,109 --> 00:55:02,800
space center completing 6 million 143

554
00:55:41,589 --> 00:55:30,790
flight repositioning is completed and

555
00:55:45,589 --> 00:55:43,910
i'm glide slope on center line

556
00:55:47,270 --> 00:55:45,599
hey on and on

557
00:55:49,270 --> 00:55:47,280
columbia houston on glide slope on

558
00:55:53,589 --> 00:55:49,280
centerline surface winds one five zero

559
00:55:57,349 --> 00:55:54,470
roger

560
00:55:57,359 --> 00:56:01,670
english in columbia will stop

561
00:56:04,870 --> 00:56:03,270
roger will stop

562
00:56:07,829 --> 00:56:04,880
welcome home columbia excellent

563
00:56:09,430 --> 00:56:07,839

excellent job your ex your record of 15

564

00:56:11,270 --> 00:56:09,440

days on orbit for the shuttle has

565

00:56:13,430 --> 00:56:11,280

brought us closer to the next giant leap

566

00:56:15,109 --> 00:56:13,440

for humankind when we live permanently