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MISSION CONTROL

PAO



1  
00:00:04,230 --> 00:00:02,710  
hi everybody josh byerly here inside

2  
00:00:06,470 --> 00:00:04,240  
mission control i'm joined again by

3  
00:00:07,909 --> 00:00:06,480  
bruce manners who is a project executive

4  
00:00:10,070 --> 00:00:07,919  
for nasa's commercial orbital

5  
00:00:12,150 --> 00:00:10,080  
transportation services program or cots

6  
00:00:13,589 --> 00:00:12,160  
as we like to call it now kotz we've

7  
00:00:15,350 --> 00:00:13,599  
talked about several times here on nasa

8  
00:00:17,269 --> 00:00:15,360  
television you see the result of that

9  
00:00:19,029 --> 00:00:17,279  
work right now onboard the international

10  
00:00:21,269 --> 00:00:19,039  
space station with spacex being

11  
00:00:22,710 --> 00:00:21,279  
currently docked and delivering quite a

12  
00:00:25,429 --> 00:00:22,720  
bit of supplies to the space station

13  
00:00:27,109 --> 00:00:25,439

orbital sciences is the other company

14

00:00:28,630 --> 00:00:27,119

that is working to provide cargo

15

00:00:30,070 --> 00:00:28,640

capability to the space station bruce

16

00:00:31,830 --> 00:00:30,080

works very closely with them so we

17

00:00:33,750 --> 00:00:31,840

thought we'd get bruce to give us an

18

00:00:35,190 --> 00:00:33,760

update on exactly how orbital is doing

19

00:00:36,630 --> 00:00:35,200

and what's ahead over the next couple of

20

00:00:38,150 --> 00:00:36,640

months for the company

21

00:00:39,270 --> 00:00:38,160

uh we're at a real exciting time in the

22

00:00:41,750 --> 00:00:39,280

program right now we've got a lot of

23

00:00:43,590 --> 00:00:41,760

hardware that's stacked up uh we're

24

00:00:44,630 --> 00:00:43,600

completed the pad at wallops flight

25

00:00:47,270 --> 00:00:44,640

facility where the where they're going

26  
00:00:48,790 --> 00:00:47,280  
to be launching the antares rocket from

27  
00:00:49,830 --> 00:00:48,800  
that pad is now finished to the point

28  
00:00:51,990 --> 00:00:49,840  
where they've been able to hand it over

29  
00:00:53,830 --> 00:00:52,000  
to orbital so they can roll out their

30  
00:00:56,310 --> 00:00:53,840  
first stage vehicle to do a hot stage

31  
00:00:57,910 --> 00:00:56,320  
stage one hot fire test on the pad

32  
00:00:59,830 --> 00:00:57,920  
so orbitals right now they've got uh

33  
00:01:00,950 --> 00:00:59,840  
that test vehicle on the pad they're

34  
00:01:02,389 --> 00:01:00,960  
getting ready to

35  
00:01:03,910 --> 00:01:02,399  
to start doing some cold flow tests

36  
00:01:05,350 --> 00:01:03,920  
where we start flowing fuel to the to

37  
00:01:07,270 --> 00:01:05,360  
the vehicle that'll check out all the

38  
00:01:09,910 --> 00:01:07,280

systems for both the vehicle and also

39

00:01:11,270 --> 00:01:09,920

the pad and the ground ops and all that

40

00:01:13,270 --> 00:01:11,280

and then ultimately in about a month or

41

00:01:14,390 --> 00:01:13,280

so uh once they once they initiate the

42

00:01:15,990 --> 00:01:14,400

the

43

00:01:17,670 --> 00:01:16,000

cold flow tests we're expecting in about

44

00:01:20,230 --> 00:01:17,680

a month after that we would do a hot

45

00:01:21,350 --> 00:01:20,240

fire stage one hot fire on the pad

46

00:01:24,070 --> 00:01:21,360

which will be

47

00:01:26,390 --> 00:01:24,080

a really excellent test to

48

00:01:27,990 --> 00:01:26,400

validate the the design of the the first

49

00:01:29,510 --> 00:01:28,000

stage of the vehicle uh that'd be the

50

00:01:31,749 --> 00:01:29,520

first time they've fired two engines at

51  
00:01:33,429 --> 00:01:31,759  
once and uh we think it'll be a real

52  
00:01:35,270 --> 00:01:33,439  
good test to demonstrate both the ground

53  
00:01:37,109 --> 00:01:35,280  
ops and also the uh the system the

54  
00:01:37,990 --> 00:01:37,119  
flight systems let's talk about wallops

55  
00:01:39,270 --> 00:01:38,000  
for a second because i think a lot of

56  
00:01:41,109 --> 00:01:39,280  
people don't realize there's a big

57  
00:01:42,389 --> 00:01:41,119  
difference you know spacex uses cape

58  
00:01:43,910 --> 00:01:42,399  
canaveral which everybody's heard of you

59  
00:01:45,109 --> 00:01:43,920  
know it's on the air force side it's not

60  
00:01:47,030 --> 00:01:45,119  
technically kennedy space center but

61  
00:01:48,630 --> 00:01:47,040  
it's on on the air force side uh they've

62  
00:01:49,749 --> 00:01:48,640  
got their pad down there

63  
00:01:51,270 --> 00:01:49,759

orbital decided to go a different

64

00:01:52,389 --> 00:01:51,280

direction they're going up to wallops

65

00:01:53,910 --> 00:01:52,399

which will give us it's an important

66

00:01:55,830 --> 00:01:53,920

thing because it gives us a different

67

00:01:57,749 --> 00:01:55,840

spaceport up there on the east coast but

68

00:01:58,789 --> 00:01:57,759

that's actually a nasa facility that

69

00:02:00,310 --> 00:01:58,799

they're sort of talk about the

70

00:02:01,749 --> 00:02:00,320

arrangement it's sort of a different a

71

00:02:03,990 --> 00:02:01,759

different setup it is a very different

72

00:02:05,910 --> 00:02:04,000

setup um they

73

00:02:07,030 --> 00:02:05,920

decided to fly from wallops in virginia

74

00:02:08,790 --> 00:02:07,040

that gave them a couple of different

75

00:02:10,630 --> 00:02:08,800

advantages in their mind uh and i think

76  
00:02:12,070 --> 00:02:10,640  
that those have largely panned out they

77  
00:02:13,750 --> 00:02:12,080  
first of all it's it's geographically

78  
00:02:14,710 --> 00:02:13,760  
very close to their main offices and

79  
00:02:16,710 --> 00:02:14,720  
gives us

80  
00:02:19,190 --> 00:02:16,720  
they're in dallas virginia so it's uh

81  
00:02:21,110 --> 00:02:19,200  
very simple and easy for them to uh

82  
00:02:24,070 --> 00:02:21,120  
transport their spacecraft

83  
00:02:25,830 --> 00:02:24,080  
from from over to the flight facility

84  
00:02:27,670 --> 00:02:25,840  
and then also it gives them an

85  
00:02:29,990 --> 00:02:27,680  
opportunity to

86  
00:02:31,430 --> 00:02:30,000  
open up a new range for a mid-sized

87  
00:02:34,390 --> 00:02:31,440  
launch vehicle

88  
00:02:36,309 --> 00:02:34,400

and they felt that they would have

89

00:02:37,750 --> 00:02:36,319

you know better relationship have a good

90

00:02:40,070 --> 00:02:37,760

to find a good relationship with with

91

00:02:42,309 --> 00:02:40,080

with wallops for that sort of purpose

92

00:02:44,470 --> 00:02:42,319

and uh it's worked out pretty well for

93

00:02:45,910 --> 00:02:44,480

them it's a big stretch for for wallops

94

00:02:48,229 --> 00:02:45,920

and myanmar the mid-atlantic regional

95

00:02:51,110 --> 00:02:48,239

spaceport um which is actually a state

96

00:02:52,790 --> 00:02:51,120

of virginia entity uh the pad in the

97

00:02:55,830 --> 00:02:52,800

partnering arrangement there is is

98

00:02:59,270 --> 00:02:55,840

unique uh the pad is actually it sits on

99

00:03:01,190 --> 00:02:59,280

nasa ground at wallops nasa wallops but

100

00:03:03,430 --> 00:03:01,200

it's actually a state-owned

101  
00:03:04,869 --> 00:03:03,440  
and operated launch pad

102  
00:03:06,470 --> 00:03:04,879  
put together by the state of virginia

103  
00:03:08,630 --> 00:03:06,480  
and under the auspices of the

104  
00:03:09,910 --> 00:03:08,640  
mid-atlantic regional spaceport or mars

105  
00:03:11,430 --> 00:03:09,920  
right so basically what's happening is

106  
00:03:13,270 --> 00:03:11,440  
you've got this land that's at wallops

107  
00:03:14,710 --> 00:03:13,280  
that is managed by mars like you talked

108  
00:03:15,990 --> 00:03:14,720  
about they've been working over the past

109  
00:03:18,630 --> 00:03:16,000  
several months to get the pad ready they

110  
00:03:19,910 --> 00:03:18,640  
finally handed it over to orbital

111  
00:03:20,949 --> 00:03:19,920  
basically said okay here you go now you

112  
00:03:22,710 --> 00:03:20,959  
can go ahead and roll your rocket out

113  
00:03:24,149 --> 00:03:22,720

there and start start ground processing

114

00:03:25,509 --> 00:03:24,159

right yes

115

00:03:26,789 --> 00:03:25,519

so let's talk about they've got a test

116

00:03:27,910 --> 00:03:26,799

flight coming up

117

00:03:29,270 --> 00:03:27,920

hopefully by the end of the year where

118

00:03:31,190 --> 00:03:29,280

they're going to test actually n teres

119

00:03:32,789 --> 00:03:31,200

which is the rocket and then coming up

120

00:03:34,470 --> 00:03:32,799

in the spring of 2013 that's when

121

00:03:36,149 --> 00:03:34,480

they're going to fly a flight sort of

122

00:03:37,430 --> 00:03:36,159

similar to what spacex did where they go

123

00:03:39,589 --> 00:03:37,440

up to the station do these demonstration

124

00:03:41,750 --> 00:03:39,599

maneuvers and do checkouts right yes if

125

00:03:43,270 --> 00:03:41,760

you look at the overall program of the

126

00:03:44,949 --> 00:03:43,280

demonstration that they're going to be

127

00:03:47,430 --> 00:03:44,959

executing it's similar in a lot of ways

128

00:03:50,070 --> 00:03:47,440

to what spacex already has executed uh

129

00:03:52,070 --> 00:03:50,080

in in december we're hoping to do the uh

130

00:03:53,429 --> 00:03:52,080

uh as you said a test of the antares

131

00:03:55,670 --> 00:03:53,439

launch vehicle it'll be a full-up test

132

00:03:57,910 --> 00:03:55,680

it'll be a full-up antares

133

00:03:59,830 --> 00:03:57,920

it'll be very similar to what spacex had

134

00:04:02,309 --> 00:03:59,840

done for a couple of times previously

135

00:04:04,309 --> 00:04:02,319

once under cots and once independently

136

00:04:05,509 --> 00:04:04,319

they're made in flight but it will be a

137

00:04:07,190 --> 00:04:05,519

full up demonstration of the launch

138

00:04:10,149 --> 00:04:07,200

vehicle they'll actually launch a

139

00:04:11,270 --> 00:04:10,159

payload mass simulator that's the same

140

00:04:13,830 --> 00:04:11,280

size and

141

00:04:15,830 --> 00:04:13,840

mold line and mass characteristics as

142

00:04:17,509 --> 00:04:15,840

the cygnus spacecraft and put that into

143

00:04:18,629 --> 00:04:17,519

orbit uh around

144

00:04:20,069 --> 00:04:18,639

and also they're gonna launch a couple

145

00:04:21,830 --> 00:04:20,079

secondary payloads that they would yeah

146

00:04:24,230 --> 00:04:21,840

that they have but it'll be a full up

147

00:04:26,550 --> 00:04:24,240

test of the of the launch vehicle um

148

00:04:29,430 --> 00:04:26,560

and we should show that that systems all

149

00:04:31,430 --> 00:04:29,440

check out and work out properly

150

00:04:33,110 --> 00:04:31,440

assuming success there then they've also

151  
00:04:35,749 --> 00:04:33,120  
independently been developed or putting

152  
00:04:38,710 --> 00:04:35,759  
together the next launch vehicle

153  
00:04:40,310 --> 00:04:38,720  
it's largely uh in good shape

154  
00:04:42,230 --> 00:04:40,320  
they've got all the pieces at wallops

155  
00:04:44,710 --> 00:04:42,240  
are for it already and then they also

156  
00:04:47,270 --> 00:04:44,720  
have the full cygnus spacecraft and so

157  
00:04:49,670 --> 00:04:47,280  
in the early first quarter early second

158  
00:04:50,790 --> 00:04:49,680  
quarter of next year they're hoping to

159  
00:04:51,909 --> 00:04:50,800  
do their full up mission to the

160  
00:04:53,270 --> 00:04:51,919  
international space station where they

161  
00:04:54,870 --> 00:04:53,280  
would demonstrate delivering cargo to

162  
00:04:56,550 --> 00:04:54,880  
the international space station

163  
00:04:58,230 --> 00:04:56,560

talk about you know there was a i guess

164

00:05:00,150 --> 00:04:58,240

sort of a strategic choice that was made

165

00:05:02,550 --> 00:05:00,160

by orbital versus spacex spacex can

166

00:05:03,909 --> 00:05:02,560

return things back to earth uh you know

167

00:05:05,430 --> 00:05:03,919

we need that capability to bring things

168

00:05:07,830 --> 00:05:05,440

back orbital decided to go along the

169

00:05:09,670 --> 00:05:07,840

lines of what htv atv and progress do

170

00:05:10,870 --> 00:05:09,680

which is to burn up in the atmosphere

171

00:05:12,469 --> 00:05:10,880

but that's beneficial too because

172

00:05:14,150 --> 00:05:12,479

obviously you gotta you know you can

173

00:05:16,070 --> 00:05:14,160

imagine not taking the trash out at your

174

00:05:17,189 --> 00:05:16,080

house over six months it would get a

175

00:05:18,710 --> 00:05:17,199

little cluttered you know so it's

176

00:05:20,469 --> 00:05:18,720

important to actually get stuff off the

177

00:05:21,830 --> 00:05:20,479

station and to send it back what are the

178

00:05:23,510 --> 00:05:21,840

benefits of that i mean it sort of

179

00:05:25,029 --> 00:05:23,520

simplifies the spacecraft design a bit

180

00:05:26,790 --> 00:05:25,039

right it simplified the spacecraft's

181

00:05:28,390 --> 00:05:26,800

design for them um i think orbital

182

00:05:30,070 --> 00:05:28,400

decided early on that they wanted they

183

00:05:32,150 --> 00:05:30,080

they wanted to get more involved with

184

00:05:35,430 --> 00:05:32,160

manned space flight they didn't want to

185

00:05:38,790 --> 00:05:35,440

uh make a huge leap into uh developing a

186

00:05:40,150 --> 00:05:38,800

full up returnable vehicle they they

187

00:05:42,469 --> 00:05:40,160

have a lot of experience in commercial

188

00:05:43,990 --> 00:05:42,479

spacecraft and in in launch vehicles for

189

00:05:46,390 --> 00:05:44,000

smaller launch vehicles like their

190

00:05:48,790 --> 00:05:46,400

pegasus and minotaur launch vehicles

191

00:05:50,390 --> 00:05:48,800

so this seemed to be to them and i think

192

00:05:51,830 --> 00:05:50,400

it is a good marriage of it was a

193

00:05:53,670 --> 00:05:51,840

stretch goal for them to get into the

194

00:05:54,710 --> 00:05:53,680

demand space flight and develop

195

00:05:55,990 --> 00:05:54,720

to be delivering cargo to the

196

00:05:57,430 --> 00:05:56,000

international space station but not a

197

00:05:58,870 --> 00:05:57,440

huge reach to where they were also

198

00:06:00,790 --> 00:05:58,880

deliver developing a vehicle that would

199

00:06:02,230 --> 00:06:00,800

return right

200

00:06:04,309 --> 00:06:02,240

so you know i was up there i guess a few

201  
00:06:05,749 --> 00:06:04,319  
weeks ago and i was actually i'm very

202  
00:06:08,309 --> 00:06:05,759  
impressed to see they've actually got

203  
00:06:09,670 --> 00:06:08,319  
all these cygnus vehicles that are just

204  
00:06:11,510 --> 00:06:09,680  
in different stages of being built i

205  
00:06:13,350 --> 00:06:11,520  
mean they're very very far along with it

206  
00:06:14,710 --> 00:06:13,360  
it's very cool to see that yes they've

207  
00:06:16,469 --> 00:06:14,720  
they've you know at this point they're

208  
00:06:18,230 --> 00:06:16,479  
really into a production mode on those

209  
00:06:19,909 --> 00:06:18,240  
spacecraft they have

210  
00:06:22,070 --> 00:06:19,919  
we have the spacecraft for the

211  
00:06:24,790 --> 00:06:22,080  
demonstration mission is you know pretty

212  
00:06:26,070 --> 00:06:24,800  
much i would say uh finished

213  
00:06:27,590 --> 00:06:26,080

with it's all its development hardware

214

00:06:29,749 --> 00:06:27,600

testing uh they're going through some

215

00:06:31,270 --> 00:06:29,759

some risk reduction activities right now

216

00:06:33,110 --> 00:06:31,280

they also have wright following right

217

00:06:34,790 --> 00:06:33,120

along their first

218

00:06:36,870 --> 00:06:34,800

mission or vehicle that they used for

219

00:06:38,309 --> 00:06:36,880

the that will be used for their crs

220

00:06:40,150 --> 00:06:38,319

mission their first actual cargo

221

00:06:41,909 --> 00:06:40,160

delivery to the space station it's

222

00:06:43,510 --> 00:06:41,919

largely finished as well and sitting

223

00:06:45,510 --> 00:06:43,520

waiting uh you know finishing up its

224

00:06:46,710 --> 00:06:45,520

integration tests and and

225

00:06:47,990 --> 00:06:46,720

they really have gotten into a

226

00:06:49,350 --> 00:06:48,000

production mode and if you go there as

227

00:06:51,189 --> 00:06:49,360

you said you can see

228

00:06:52,550 --> 00:06:51,199

various vehicles in flow and in in

229

00:06:54,710 --> 00:06:52,560

production just as you would go if you

230

00:06:56,550 --> 00:06:54,720

were to go to a ford plant and see a

231

00:06:58,070 --> 00:06:56,560

number of cars in production

232

00:06:59,350 --> 00:06:58,080

at the beginning there's stuff that

233

00:07:01,430 --> 00:06:59,360

looks like lots of different pieces and

234

00:07:02,790 --> 00:07:01,440

at the end there's a spacecraft yeah

235

00:07:04,230 --> 00:07:02,800

let's talk about you know how you work

236

00:07:05,510 --> 00:07:04,240

with the company we spent a lot of time

237

00:07:07,270 --> 00:07:05,520

talking with mike corcott who's your

238

00:07:09,189 --> 00:07:07,280

counterpart that worked with spacex as

239

00:07:10,150 --> 00:07:09,199

part of the cots program and

240

00:07:11,510 --> 00:07:10,160

um

241

00:07:13,350 --> 00:07:11,520

you know he talked about some of the

242

00:07:14,790 --> 00:07:13,360

lessons learned you know sort of finding

243

00:07:16,550 --> 00:07:14,800

this new path working with these

244

00:07:18,390 --> 00:07:16,560

commercial companies how closely have

245

00:07:19,749 --> 00:07:18,400

you been talking to him and sort of what

246

00:07:21,510 --> 00:07:19,759

they learned lessons learned you know

247

00:07:22,550 --> 00:07:21,520

working with spacex and and you know now

248

00:07:24,550 --> 00:07:22,560

seeing the flight up there that's on

249

00:07:25,909 --> 00:07:24,560

board the space station now uh how close

250

00:07:27,909 --> 00:07:25,919

to have you worked with him we've we

251  
00:07:29,430 --> 00:07:27,919  
worked quite closely uh we talked uh you

252  
00:07:31,029 --> 00:07:29,440  
know he was just down the hallway from

253  
00:07:32,469 --> 00:07:31,039  
me in the office and so we did talk

254  
00:07:34,790 --> 00:07:32,479  
quite a bit about what the experiences

255  
00:07:36,790 --> 00:07:34,800  
they were having we just uh were able to

256  
00:07:38,870 --> 00:07:36,800  
sit down and talk with orbital

257  
00:07:40,230 --> 00:07:38,880  
um to give them some some direct lessons

258  
00:07:41,110 --> 00:07:40,240  
learned that we all had picked up from

259  
00:07:43,270 --> 00:07:41,120  
from the

260  
00:07:44,550 --> 00:07:43,280  
first mission from spacex that

261  
00:07:45,990 --> 00:07:44,560  
reinforced some of the things we were

262  
00:07:47,830 --> 00:07:46,000  
already doing

263  
00:07:50,150 --> 00:07:47,840

like simulating and doing lots of sims

264

00:07:51,909 --> 00:07:50,160

with the operations teams and we you

265

00:07:53,029 --> 00:07:51,919

know we were able to roll lots of

266

00:07:54,150 --> 00:07:53,039

lessons learned into what we're doing

267

00:07:55,589 --> 00:07:54,160

here yeah

268

00:07:56,790 --> 00:07:55,599

do you look at the spacex mission now

269

00:07:58,309 --> 00:07:56,800

you see the spacecraft that's up there

270

00:07:59,350 --> 00:07:58,319

actually uh you know attached to the

271

00:08:00,629 --> 00:07:59,360

space station to go okay you know we're

272

00:08:02,710 --> 00:08:00,639

getting this is about to become very

273

00:08:04,869 --> 00:08:02,720

real uh see it's getting pretty pretty

274

00:08:06,469 --> 00:08:04,879

close absolutely uh we did start a long

275

00:08:08,309 --> 00:08:06,479

time after we started two years after

276

00:08:09,909 --> 00:08:08,319

spacex that's right because spacex

277

00:08:12,629 --> 00:08:09,919

started in 2006 you guys started in

278

00:08:15,589 --> 00:08:12,639

2008. yes we had they had a two-year

279

00:08:18,150 --> 00:08:15,599

head start on us um so seeing them now

280

00:08:19,670 --> 00:08:18,160

delivering their first uh cargo to the

281

00:08:21,670 --> 00:08:19,680

space station under the crs contract you

282

00:08:23,830 --> 00:08:21,680

know it really is inspiring for us to

283

00:08:26,950 --> 00:08:23,840

realize where we uh where we're gonna

284

00:08:28,869 --> 00:08:26,960

end up and also that how far we've come

285

00:08:31,830 --> 00:08:28,879

with you know starting two years after

286

00:08:34,149 --> 00:08:31,840

them and really now ending six months or

287

00:08:35,670 --> 00:08:34,159

a year after the uh after their they've

288

00:08:37,269 --> 00:08:35,680

they completed up i feel like we made a

289

00:08:38,389 --> 00:08:37,279

lot of ground up yeah well bruce thanks

290

00:08:40,630 --> 00:08:38,399

a lot for coming along of course we'll

291

00:08:41,750 --> 00:08:40,640

uh we'll pay close attention as orbital

292

00:08:42,790 --> 00:08:41,760

continues to move towards this test

293

00:08:44,470 --> 00:08:42,800

flight coming up toward the end of the

294

00:08:46,230 --> 00:08:44,480

year and uh the uh the flight up to the

295

00:08:48,630 --> 00:08:46,240

space station in the spring of 2013

296

00:08:49,910 --> 00:08:48,640

which is not not that far away as these

297

00:08:51,829 --> 00:08:49,920

months seem to go by pretty quickly

298

00:08:53,350 --> 00:08:51,839

don't they yes they do it's been a

299

00:08:54,389 --> 00:08:53,360

pleasure thank you very much so if you

300

00:08:56,310 --> 00:08:54,399

want to find out the latest about

301

00:08:59,910 --> 00:08:56,320

orbitals we have a new link set up on

302

00:09:03,829 --> 00:08:59,920

the nasa website just go to [www.nasa.gov](http://www.nasa.gov)