1
00:00:06,740 --> 00:00:05,120
good afternoon thank you for joining us

2
00:00:09,230 --> 00:00:06,750
here at nasa's kennedy space center in

3
00:00:11,959 --> 00:00:09,240
florida for this commercial partnership

4
00:00:13,459 --> 00:00:11,969
announcement between NASA and ATK it's

5
00:00:15,259 --> 00:00:13,469
my pleasure to introduce our speakers

6
00:00:17,390 --> 00:00:15,269
today we'll hear a few comments and then

7
00:00:19,090 --> 00:00:17,400
take questions here at Kennedy and if we

8
00:00:22,310 --> 00:00:19,100
have anyone on the phone line our

9
00:00:26,480 --> 00:00:22,320
speakers today are ed mango NASA's

10
00:00:28,640 --> 00:00:26,490
Commercial Crew program manager Kent

11
00:00:30,470 --> 00:00:28,650
Rominger vice president of strategy and

12
00:00:35,150 --> 00:00:30,480
business development for ATK aerospace

13
00:00:40,910 --> 00:00:35,160

systems and John Schumacher atrium EADS

14
00:00:42,889 --> 00:00:40,920
North America mr. mango Thank you Thank

15
00:00:45,139 --> 00:00:42,899
You Kendra so you like to welcome

16
00:00:47,889 --> 00:00:45,149
everybody here today and it's a great

17
00:00:50,029 --> 00:00:47,899
day to talk about commercial crew today

18
00:00:52,220 --> 00:00:50,039
overall the Commercial Crew program is

19
00:00:54,650 --> 00:00:52,230
going very well we're making progress in

20
00:00:56,569 --> 00:00:54,660
many different areas of how we're

21
00:00:58,279 --> 00:00:56,579
proceeding with the program as you know

22
00:01:00,260 --> 00:00:58,289
Cece def to which kicked off a number of

23
00:01:02,119 --> 00:01:00,270
months ago and we're making very steady

24
00:01:03,850 --> 00:01:02,129
progress with that we're on time and on

25
00:01:06,859 --> 00:01:03,860
budget across the board on our

26
00:01:08,899 --> 00:01:06,869
milestones that we have projected today

27
00:01:13,880 --> 00:01:08,909
we want to announce that we are starting

28
00:01:16,010 --> 00:01:13,890
a new unfunded SI with with 80k an essay

29
00:01:19,160 --> 00:01:16,020
is an approach in which we both share

30
00:01:20,749 --> 00:01:19,170
data and we both share ideas to move

31
00:01:23,480 --> 00:01:20,759
forward with the particular design or a

32
00:01:25,520 --> 00:01:23,490
particular concept we believe that this

33
00:01:28,130 --> 00:01:25,530
effort that we start today and we'll go

34
00:01:30,800 --> 00:01:28,140
through next spring and will allow ATK

35
00:01:33,200 --> 00:01:30,810
and the Commercial Crew team our team of

36
00:01:35,480 --> 00:01:33,210
managers engineers and safety folks to

37
00:01:38,569 --> 00:01:35,490
explore the Liberty design that ATK is

38
00:01:41,179 --> 00:01:38,579

wanting to talk about we will have a

39
00:01:43,340 --> 00:01:41,189
series of milestones over the next six

40
00:01:44,840 --> 00:01:43,350
or nine months in which we want to talk

41
00:01:47,270 --> 00:01:44,850
about their design I'm going to talk

42
00:01:49,789 --> 00:01:47,280
about their requirements how they plan

43
00:01:51,410 --> 00:01:49,799
to implement their requirements against

44
00:01:53,630 --> 00:01:51,420
their design talk about the capabilities

45
00:01:56,420 --> 00:01:53,640
of the liberty system as a whole and

46
00:01:58,010 --> 00:01:56,430
understand how how they plan to work it

47
00:01:59,929 --> 00:01:58,020
in the international approach I

48
00:02:01,940 --> 00:01:59,939
personally think this international

49
00:02:04,670 --> 00:02:01,950
approach is a outstanding opportunity to

50
00:02:06,830 --> 00:02:04,680
understand what is best about individual

51
00:02:09,490 --> 00:02:06,840
companies and put those together to make

52
00:02:12,850 --> 00:02:09,500
the best capability for

53
00:02:14,500 --> 00:02:12,860
for the world we also want to explore if

54
00:02:18,730 --> 00:02:14,510
this capability can be used in a

55
00:02:20,740 --> 00:02:18,740
commercial crew type of purpose which

56
00:02:22,000 --> 00:02:20,750
for us is to trying to get crew the

57
00:02:23,890 --> 00:02:22,010
International Space Station and low

58
00:02:26,470 --> 00:02:23,900
Earth orbit by the middle of the decade

59
00:02:28,900 --> 00:02:26,480
I look forward to expanding the

60
00:02:32,020 --> 00:02:28,910
knowledge base both for NASA as well as

61
00:02:33,670 --> 00:02:32,030
for ATK and their partners NASA will

62
00:02:35,680 --> 00:02:33,680
bring the expertise that we have on

63
00:02:37,780 --> 00:02:35,690

board with the Commercial Crew program

64
00:02:40,449 --> 00:02:37,790
will bring that expertise to bear to

65
00:02:42,820 --> 00:02:40,459
help ATK and give them our expertise and

66
00:02:46,540 --> 00:02:42,830
at the same time we we want to discuss

67
00:02:48,070 --> 00:02:46,550
what ATK and e ad s want to want to

68
00:02:51,330 --> 00:02:48,080
think about in this Liberty system and

69
00:02:53,979 --> 00:02:51,340
work with them we look forward to this

70
00:02:55,750 --> 00:02:53,989
cooperation i also like now to introduce

71
00:02:58,180 --> 00:02:55,760
Kent there's going to talk a little bit

72
00:03:00,250 --> 00:02:58,190
more about the liberty system so thank

73
00:03:03,130 --> 00:03:00,260
you and first of all we're delighted to

74
00:03:05,170 --> 00:03:03,140
be here very much looking forward to

75
00:03:06,760 --> 00:03:05,180
this opportunity to work with NASA the

76
00:03:09,100 --> 00:03:06,770
experts in human space flight in the

77
00:03:10,990 --> 00:03:09,110
world what I want to start off with is

78
00:03:14,410 --> 00:03:11,000
I'd like to show a video it's all about

79
00:03:16,720 --> 00:03:14,420
50 seconds so it will pictorially show

80
00:03:19,990 --> 00:03:16,730
us what Liberty is so if we will please

81
00:03:23,229 --> 00:03:20,000
roll that video so here is a picture of

82
00:03:25,870 --> 00:03:23,239
Liberty the first stage and it is an

83
00:03:27,880 --> 00:03:25,880
evolved rocket motor from the Space

84
00:03:30,130 --> 00:03:27,890
Shuttle boosters that were used the

85
00:03:32,949 --> 00:03:30,140
second stage comes as part of the area

86
00:03:34,570 --> 00:03:32,959
on five system the core but we're

87
00:03:36,850 --> 00:03:34,580
looking at a vehicle flying right now

88
00:03:38,740 --> 00:03:36,860

because both pieces of this system have

89
00:03:40,810 --> 00:03:38,750
extensive flight experience with very

90
00:03:43,330 --> 00:03:40,820
impressive records as a matter of fact

91
00:03:45,310 --> 00:03:43,340
just last week we had a test firing on

92
00:03:48,400 --> 00:03:45,320
development motor 3 that 5 segment

93
00:03:50,289 --> 00:03:48,410
that's the first stage and now we're

94
00:03:52,990 --> 00:03:50,299
looking at the upper stage engine which

95
00:03:55,180 --> 00:03:53,000
has 45 consecutive successful flights

96
00:03:57,610 --> 00:03:55,190
and as part of a system that is the most

97
00:04:01,870 --> 00:03:57,620
successful commercial launcher on the on

98
00:04:03,670 --> 00:04:01,880
the planet so but lastly here we see the

99
00:04:05,800 --> 00:04:03,680
launch infrastructure right here at the

100
00:04:07,960 --> 00:04:05,810
Kennedy Space Center this is where we

101
00:04:09,880 --> 00:04:07,970
intend on launching Liberty from you

102
00:04:11,770 --> 00:04:09,890
know the real bottom line is we want to

103
00:04:14,259 --> 00:04:11,780
be Florida's launch system provider with

104
00:04:16,509 --> 00:04:14,269
our Liberty vehicle a couple of more

105
00:04:18,310 --> 00:04:16,519
points when you say hey well well what

106
00:04:21,279 --> 00:04:18,320
is Liberty you know why would I want

107
00:04:23,110 --> 00:04:21,289
Liberty and the reason why you want it

108
00:04:26,230 --> 00:04:23,120
is we believe Liberty offers

109
00:04:30,010 --> 00:04:26,240
safest most reliable means of putting

110
00:04:32,890 --> 00:04:30,020
our crew on orbit when I say our crew on

111
00:04:35,650 --> 00:04:32,900
orbit we have the capability with 44,000

112
00:04:38,020 --> 00:04:35,660
pounds of lift into Leo to launch any of

113
00:04:41,469 --> 00:04:38,030

the Commercial Crew provider vehicles

114
00:04:44,680 --> 00:04:41,479
that are out there to date what's really

115
00:04:46,960 --> 00:04:44,690
fascinating with this is how well the

116
00:04:49,000 --> 00:04:46,970
upper stage matches up with our first

117
00:04:51,070 --> 00:04:49,010
stage you would think they would have

118
00:04:53,100 --> 00:04:51,080
been designed to go with each other but

119
00:04:55,689 --> 00:04:53,110
in fact they weren't but they made up

120
00:04:57,400 --> 00:04:55,699
probably as well if not better than if

121
00:04:59,770 --> 00:04:57,410
we intentionally try to design it that

122
00:05:03,629 --> 00:04:59,780
way the other thing that I'd like to

123
00:05:07,210 --> 00:05:03,639
emphasize is in 2010 President Obama

124
00:05:08,890 --> 00:05:07,220
signed in a new space policy and part of

125
00:05:10,930 --> 00:05:08,900
that space policy one of the changes

126
00:05:13,150 --> 00:05:10,940
from the previous one was the fact that

127
00:05:15,370 --> 00:05:13,160
it said we want to expand our

128
00:05:18,610 --> 00:05:15,380
international cooperation in space

129
00:05:21,610 --> 00:05:18,620
flight so we are taking what we believe

130
00:05:23,980 --> 00:05:21,620
is a very good relationship from the

131
00:05:26,950 --> 00:05:23,990
space station with ESO with the european

132
00:05:28,270 --> 00:05:26,960
space agency and nasa and that legacy we

133
00:05:30,760 --> 00:05:28,280
just saw involving it into the

134
00:05:33,550 --> 00:05:30,770
commercial world so if you look at our

135
00:05:35,980 --> 00:05:33,560
Liberty system NASA developed the first

136
00:05:38,110 --> 00:05:35,990
stage in the five segments booster the

137
00:05:40,600 --> 00:05:38,120
upper stage was developed by isa the

138
00:05:42,159 --> 00:05:40,610

european space agency to commercial

139
00:05:44,650 --> 00:05:42,169
companies now are taken that and

140
00:05:46,990 --> 00:05:44,660
applying it commercially so we feel very

141
00:05:49,659 --> 00:05:47,000
fortunate to have what we believe is a

142
00:05:50,980 --> 00:05:49,669
very rigorous design unlike any other

143
00:05:53,320 --> 00:05:50,990
out there that was designed to lift

144
00:05:55,990 --> 00:05:53,330
humans from the start and we're applying

145
00:05:58,089 --> 00:05:56,000
commercial processes and practices to it

146
00:06:02,800 --> 00:05:58,099
to offer it at the best possible value

147
00:06:06,189 --> 00:06:02,810
for our nation's space program the other

148
00:06:07,900 --> 00:06:06,199
thing is it's it's there's a reason I'm

149
00:06:10,180 --> 00:06:07,910
sitting here at the Kennedy Space Center

150
00:06:12,010 --> 00:06:10,190
we ATK asked to come in to Kennedy Space

151
00:06:14,290 --> 00:06:12,020
Center because this is going to be the

152
00:06:16,390 --> 00:06:14,300
home of Liberty clearly the

153
00:06:19,990 --> 00:06:16,400
infrastructure the kennedy space center

154
00:06:22,529 --> 00:06:20,000
right here is set up perfectly to enable

155
00:06:25,180 --> 00:06:22,539
us to process liberty launched Liberty

156
00:06:27,159 --> 00:06:25,190
so not just use the infrastructure but

157
00:06:28,930 --> 00:06:27,169
the people and the people here at the

158
00:06:31,630 --> 00:06:28,940
Kennedy Space Center so we wind up

159
00:06:34,120 --> 00:06:31,640
bringing jobs into Florida and using the

160
00:06:36,250 --> 00:06:34,130
existing expertise that we've developed

161
00:06:37,010 --> 00:06:36,260
over the last five decades and to my

162
00:06:40,369 --> 00:06:37,020
knowledge

163
00:06:43,400 --> 00:06:40,379

you know we are if not the only one one

164
00:06:45,050 --> 00:06:43,410
of the launchers looking at really

165
00:06:49,670 --> 00:06:45,060
taking advantage of this great

166
00:06:51,790 --> 00:06:49,680
capability that is is here today what I

167
00:06:55,850 --> 00:06:51,800
would like to do at this point now is

168
00:06:57,710 --> 00:06:55,860
just tell you that the ATK team is

169
00:06:59,899 --> 00:06:57,720
greatly enhanced by earning

170
00:07:01,520 --> 00:06:59,909
international partner and to represent

171
00:07:04,520 --> 00:07:01,530
them sitting next to me is John

172
00:07:08,059 --> 00:07:04,530
shoemaker so John it's all yours thanks

173
00:07:10,249 --> 00:07:08,069
Ken just a couple of remarks I wanted I

174
00:07:13,370 --> 00:07:10,259
can't tell you how excited we are to be

175
00:07:14,990 --> 00:07:13,380
here today and on behalf of Astrium Andy

176
00:07:17,390 --> 00:07:15,000
80s North America at first like to thank

177
00:07:18,980 --> 00:07:17,400
edmee go and the NASA team for their

178
00:07:21,080 --> 00:07:18,990
leadership in this Commercial Crew

179
00:07:23,270 --> 00:07:21,090
development program and then to our

180
00:07:27,110 --> 00:07:23,280
partners ATK we think it's an honor to

181
00:07:28,999 --> 00:07:27,120
be on this team with 80k they had the

182
00:07:31,219 --> 00:07:29,009
innovative look almost a year ago to

183
00:07:33,830 --> 00:07:31,229
come to a stream and talk to them about

184
00:07:35,659 --> 00:07:33,840
could we put the the best of us and

185
00:07:38,029 --> 00:07:35,669
european launch vehicle capability

186
00:07:41,719 --> 00:07:38,039
together and add tremendously was as

187
00:07:44,480 --> 00:07:41,729
Kent just said we think is the most

188
00:07:47,420 --> 00:07:44,490

competitive most capable very safe very

189
00:07:49,610 --> 00:07:47,430
reliable vehicle for commercial crew

190
00:07:53,300 --> 00:07:49,620
transport and and to do that right here

191
00:07:55,219 --> 00:07:53,310
at the Kennedy Space Center so if I

192
00:07:57,980 --> 00:07:55,229
don't jump out of my chair I can tell

193
00:07:59,689 --> 00:07:57,990
you we are very excited for us the

194
00:08:01,730 --> 00:07:59,699
partnership builds on over a decade of

195
00:08:03,080 --> 00:08:01,740
experience that Astrium and you've

196
00:08:04,879 --> 00:08:03,090
probably seen it here at the cape and

197
00:08:08,269 --> 00:08:04,889
johnson astron north america has worked

198
00:08:10,580 --> 00:08:08,279
on space shuttle and Space Station and

199
00:08:12,709 --> 00:08:10,590
in several different aspects of space

200
00:08:15,170 --> 00:08:12,719
station so we see this as a national

201
00:08:16,879 --> 00:08:15,180
progression and in part of the the

202
00:08:21,519 --> 00:08:16,889
growing cooperation between the US and

203
00:08:26,839 --> 00:08:21,529
Europe in space capabilities as Kent

204
00:08:29,779 --> 00:08:26,849
spoke to it uses the ariane 5 core stage

205
00:08:32,540 --> 00:08:29,789
as an upper stage with the the at its

206
00:08:35,110 --> 00:08:32,550
heart the Vulcan 2 engine which is phone

207
00:08:38,240 --> 00:08:35,120
45 times successfully a tremendously

208
00:08:41,600 --> 00:08:38,250
successful and capable flight proven

209
00:08:43,760 --> 00:08:41,610
system we also think we bring the

210
00:08:45,530 --> 00:08:43,770
experience of operating the Ariane

211
00:08:47,780 --> 00:08:45,540
system the commercial aspects of that

212
00:08:50,389 --> 00:08:47,790
the commercial aspects of going to that

213
00:08:50,870 --> 00:08:50,399

larger market place in a marketplace and

214
00:08:53,600 --> 00:08:50,880
in some

215
00:08:57,830 --> 00:08:53,610
the ideas about modularity innovation

216
00:09:00,470 --> 00:08:57,840
and to bring that competitive force into

217
00:09:03,140 --> 00:09:00,480
the the whole discussion and we an ATK

218
00:09:04,730 --> 00:09:03,150
have had a really good time talking that

219
00:09:08,240 --> 00:09:04,740
through and how does liberty best

220
00:09:09,530 --> 00:09:08,250
advance that so just in some I would

221
00:09:11,360 --> 00:09:09,540
tell you we think this brings together

222
00:09:14,660 --> 00:09:11,370
the best of us and european launch

223
00:09:16,130 --> 00:09:14,670
vehicle capabilities into a the most

224
00:09:18,230 --> 00:09:16,140
competitive vehicle and then this

225
00:09:19,220 --> 00:09:18,240
commercial trade space so again thanks

226
00:09:21,620 --> 00:09:19,230
very much for the opportunity the

227
00:09:23,840 --> 00:09:21,630
privilege to be here today thank you

228
00:09:25,670 --> 00:09:23,850
we'll take questions from the room we do

229
00:09:27,260 --> 00:09:25,680
have reporters on the phone line we'll

230
00:09:28,610 --> 00:09:27,270
start here at Kennedy and then we'll

231
00:09:30,920 --> 00:09:28,620
take as many questions as we can from

232
00:09:32,390 --> 00:09:30,930
the phones let's start over here once

233
00:09:33,950 --> 00:09:32,400
the microphone comes your way please

234
00:09:35,570 --> 00:09:33,960
state your name affiliation and to whom

235
00:09:40,040 --> 00:09:35,580
you're addressing your question start

236
00:09:42,290 --> 00:09:40,050
with Jay Jay barbri with NBC I have a

237
00:09:44,000 --> 00:09:42,300
four-part or should I ask it in one part

238
00:09:46,910 --> 00:09:44,010

or you want me to throw all the fours

239
00:09:51,110 --> 00:09:46,920
out there yeah let's say let's start one

240
00:09:52,730 --> 00:09:51,120
at a time okay 1st Kent will you be able

241
00:09:56,810 --> 00:09:52,740
with this agreement to use the

242
00:10:00,080 --> 00:09:56,820
facilities the vab and crawler and

243
00:10:02,480 --> 00:10:00,090
launch pad as you did with areas one do

244
00:10:04,700 --> 00:10:02,490
you have that type of agreement so yeah

245
00:10:06,710 --> 00:10:04,710
we've got a couple agreements in work

246
00:10:07,820 --> 00:10:06,720
actually multiple Jay kind of an

247
00:10:09,350 --> 00:10:07,830
overarching agreement and then

248
00:10:11,930 --> 00:10:09,360
individual Space Act agreements that

249
00:10:15,560 --> 00:10:11,940
we've been working with the various NASA

250
00:10:18,560 --> 00:10:15,570
centers and people to in fact utilize as

251
00:10:21,280 --> 00:10:18,570
much infrastructure as it makes sense so

252
00:10:23,770 --> 00:10:21,290
the vertical Assembly Building our

253
00:10:26,960 --> 00:10:23,780
operations our concept of operations

254
00:10:29,360 --> 00:10:26,970
absolutely does we have the upper stage

255
00:10:31,430 --> 00:10:29,370
being shipped in just like today on the

256
00:10:34,760 --> 00:10:31,440
area on 5 it's shipped out of Europe

257
00:10:36,620 --> 00:10:34,770
down to the equator for launch it'll be

258
00:10:38,480 --> 00:10:36,630
shipped in here the first stage will

259
00:10:40,490 --> 00:10:38,490
coming on rail like it did for the space

260
00:10:42,470 --> 00:10:40,500
shuttle they'll go to the vertical

261
00:10:44,810 --> 00:10:42,480
Assembly Building where they get stacked

262
00:10:47,900 --> 00:10:44,820
assembled and the spacecraft will come

263
00:10:51,680 --> 00:10:47,910

in as well and then out of the vab

264
00:10:54,380 --> 00:10:51,690
you'll roll out on a launch pad out to

265
00:10:56,230 --> 00:10:54,390
the launch facility so yes I guess is

266
00:10:59,180 --> 00:10:56,240
the answer that that is the plan

267
00:11:01,460 --> 00:10:59,190
obviously you estimate that it will

268
00:11:03,780 --> 00:11:01,470
create for can see here yeah you know

269
00:11:06,210 --> 00:11:03,790
our best guess initially is around 300

270
00:11:09,000 --> 00:11:06,220
jobs that will bring in 300 years to

271
00:11:11,730 --> 00:11:09,010
utilize that'll create here in Florida

272
00:11:14,550 --> 00:11:11,740
and you know you've said in the past at

273
00:11:20,010 --> 00:11:14,560
Liberty is already human rated as is the

274
00:11:22,560 --> 00:11:20,020
Aryan 5a stage is it more that you have

275
00:11:24,210 --> 00:11:22,570
to do unlike other people who are going

276
00:11:26,370 --> 00:11:24,220
to be launching here none of them are

277
00:11:31,380 --> 00:11:26,380
certified is there more that you have to

278
00:11:33,480 --> 00:11:31,390
do to certify liberty to carry a crew so

279
00:11:35,130 --> 00:11:33,490
ang ating you know that one's very near

280
00:11:37,350 --> 00:11:35,140
and dear to my heart ensuring that we

281
00:11:39,240 --> 00:11:37,360
have a very reliable and safe vehicle

282
00:11:42,810 --> 00:11:39,250
and if you look at the human rating

283
00:11:45,780 --> 00:11:42,820
standards they are pretty honors in in

284
00:11:50,220 --> 00:11:45,790
fact you have to start from conception

285
00:11:51,900 --> 00:11:50,230
to have a system that meets those in the

286
00:11:54,510 --> 00:11:51,910
first stage absolutely does because it

287
00:11:56,790 --> 00:11:54,520
was designed with those in mind the

288
00:11:59,520 --> 00:11:56,800

second stage as well out of a stream

289
00:12:02,550 --> 00:11:59,530
that arion five was designed to lift her

290
00:12:04,890 --> 00:12:02,560
me so space plane and make no mistake

291
00:12:07,530 --> 00:12:04,900
NASA's human rating requirements have

292
00:12:09,750 --> 00:12:07,540
been out there and so people around the

293
00:12:12,330 --> 00:12:09,760
globe look at those requirements and

294
00:12:13,740 --> 00:12:12,340
they don't necessarily have to design to

295
00:12:16,020 --> 00:12:13,750
those requirements but they are taking

296
00:12:18,900 --> 00:12:16,030
into account so the Erion five our core

297
00:12:21,480 --> 00:12:18,910
stage our upper stage was in fact

298
00:12:23,480 --> 00:12:21,490
designed initially to carry humans it

299
00:12:26,670 --> 00:12:23,490
has not been flying that way today so

300
00:12:28,700 --> 00:12:26,680
but we use the word scarred the system

301
00:12:33,000 --> 00:12:28,710
is scarred with various paths

302
00:12:34,590 --> 00:12:33,010
redundancies structure meets those human

303
00:12:41,630 --> 00:12:34,600
rating requirements or is very close to

304
00:12:44,030 --> 00:12:41,640
them so I believe we have a unique

305
00:12:47,040 --> 00:12:44,040
capability when it comes to human rating

306
00:12:50,100 --> 00:12:47,050
but even larger than that the system

307
00:12:52,680 --> 00:12:50,110
itself the real beauty of it is it's

308
00:12:55,560 --> 00:12:52,690
extremely simple and if we if we look at

309
00:12:57,870 --> 00:12:55,570
the rocket it's got one engine for first

310
00:13:01,140 --> 00:12:57,880
stage one inch in for second stage and

311
00:13:02,940 --> 00:13:01,150
you're on orbit so the philosophy is if

312
00:13:05,250 --> 00:13:02,950
you minimize the things that can go

313
00:13:07,470 --> 00:13:05,260

wrong that can cause you to have a bad

314
00:13:09,470 --> 00:13:07,480
day or not get to orbit you know if we

315
00:13:12,240 --> 00:13:09,480
look at recent failures Soyuz progress

316
00:13:15,540 --> 00:13:12,250
that was the third stage that resulted

317
00:13:17,400 --> 00:13:15,550
in the the progress not getting into

318
00:13:18,780 --> 00:13:17,410
orbit on Liberty that's not

319
00:13:20,879 --> 00:13:18,790
problem because we don't need a third

320
00:13:24,449 --> 00:13:20,889
stage we it's the design is so simple

321
00:13:28,590 --> 00:13:24,459
that in fact we get into orbit with

322
00:13:32,420 --> 00:13:28,600
dependent just on two engines for my

323
00:13:38,309 --> 00:13:32,430
final four parter for ED heading back in

324
00:13:41,369 --> 00:13:38,319
1956 von Braun rolled redstone number 29

325
00:13:43,110 --> 00:13:41,379
out to the launch pad he had a satellite

326
00:13:45,030 --> 00:13:43,120
on board and it was going to launch it

327
00:13:47,639 --> 00:13:45,040
he was stopped by the Department of

328
00:13:50,429 --> 00:13:47,649
Defense he was told to take 29 back to

329
00:13:53,069 --> 00:13:50,439
the hangar he took it back he later

330
00:13:55,050 --> 00:13:53,079
launched our first satellite but for him

331
00:13:57,360 --> 00:13:55,060
to be given an opportunity to launch

332
00:13:59,970 --> 00:13:57,370
that first satellite he had to go

333
00:14:02,429 --> 00:13:59,980
through watching Vanguard fail and two

334
00:14:05,220 --> 00:14:02,439
or three other steps fell after the

335
00:14:07,139 --> 00:14:05,230
simple rocket put up our first satellite

336
00:14:09,569 --> 00:14:07,149
following a simple rocket that put up

337
00:14:11,759 --> 00:14:09,579
the shuttles I mean put up the Soviets

338
00:14:14,280 --> 00:14:11,769

for a satellite now the question here is

339
00:14:16,019 --> 00:14:14,290
this suppose at Liberty works here it's

340
00:14:18,210 --> 00:14:16,029
already been out here the facilities are

341
00:14:20,910 --> 00:14:18,220
out here suppose it's ready to take

342
00:14:22,740 --> 00:14:20,920
crews back to the space station if we

343
00:14:25,710 --> 00:14:22,750
got the problems that we have with the

344
00:14:27,689 --> 00:14:25,720
Soyuz three rocket is NASA going to push

345
00:14:29,970 --> 00:14:27,699
for them to go ahead and do it or are

346
00:14:32,129 --> 00:14:29,980
they going to have to sit back and wait

347
00:14:35,009 --> 00:14:32,139
for you these other rockets to get ready

348
00:14:36,900 --> 00:14:35,019
man rated and go will they be any

349
00:14:38,999 --> 00:14:36,910
influence from the agency to fly the

350
00:14:42,059 --> 00:14:39,009
first cruise possible to the

351
00:14:46,079 --> 00:14:42,069
International Space Station see a good

352
00:14:47,699 --> 00:14:46,089
question i would say that for this

353
00:14:49,199 --> 00:14:47,709
effort we're doing under this essay

354
00:14:52,530 --> 00:14:49,209
we're going to look at the capabilities

355
00:14:54,689 --> 00:14:52,540
of this Liberty system and yes both

356
00:14:57,210 --> 00:14:54,699
components have flown before and they

357
00:14:59,280 --> 00:14:57,220
both have good histories in the past I

358
00:15:02,189 --> 00:14:59,290
think we have to look at the integration

359
00:15:04,710 --> 00:15:02,199
of those pieces how that how that

360
00:15:07,259 --> 00:15:04,720
mission profile will look for essent and

361
00:15:09,540 --> 00:15:07,269
then we will look at that from a

362
00:15:11,519 --> 00:15:09,550
technical standpoint what Commercial

363
00:15:14,480 --> 00:15:11,529

Crew program wants to do is we don't

364
00:15:17,309 --> 00:15:14,490
want to be in business of integrating a

365
00:15:20,549 --> 00:15:17,319
spacecraft with launch vehicles so we're

366
00:15:23,040 --> 00:15:20,559
very interested in helping ATK and their

367
00:15:23,580 --> 00:15:23,050
partners in exploring what capability

368
00:15:26,310 --> 00:15:23,590
they do have

369
00:15:29,340 --> 00:15:26,320
and then we encourage them to go work

370
00:15:31,020 --> 00:15:29,350
with spacecraft providers create those

371
00:15:32,600 --> 00:15:31,030
partnerships and then come forward and

372
00:15:35,070 --> 00:15:32,610
say now they have a solution and

373
00:15:38,400 --> 00:15:35,080
whatever whenever that solution can meet

374
00:15:41,760 --> 00:15:38,410
our requirements and they can deliver

375
00:15:43,890 --> 00:15:41,770
crew on orbit safely then then that is

376
00:15:48,510 --> 00:15:43,900
the one that will go use as soon as we

377
00:15:52,590 --> 00:15:48,520
can Irene thanks Irene Klotz with the

378
00:15:54,120 --> 00:15:52,600
Reuters improbably 44 Kent the can you

379
00:15:56,070 --> 00:15:54,130
talk a little bit about the scope of

380
00:15:58,290 --> 00:15:56,080
this space act agreement in other words

381
00:16:01,500 --> 00:15:58,300
is 300 people that you said would be

382
00:16:03,570 --> 00:16:01,510
hired is that envisioned you're like now

383
00:16:05,460 --> 00:16:03,580
once since your agreement is signed or

384
00:16:08,490 --> 00:16:05,470
is that were you talking more in the

385
00:16:12,030 --> 00:16:08,500
future and also if if there's any

386
00:16:14,580 --> 00:16:12,040
changes between this contract that you

387
00:16:16,770 --> 00:16:14,590
signed and what you had proposed to NASA

388
00:16:22,800 --> 00:16:16,780

under the CC devs is kind of like your

389
00:16:26,340 --> 00:16:22,810
CC dev to proposal re reborn and a new a

390
00:16:28,830 --> 00:16:26,350
new arrangement yeah so I'll start with

391
00:16:31,800 --> 00:16:28,840
your second question first and yes the

392
00:16:36,540 --> 00:16:31,810
the Space Act agreement was lined out

393
00:16:38,460 --> 00:16:36,550
and started initially as CCDF to SAA the

394
00:16:40,770 --> 00:16:38,470
one difference is is the funding level

395
00:16:43,440 --> 00:16:40,780
and so the milestones that we have in

396
00:16:46,050 --> 00:16:43,450
their appropriate with with where we are

397
00:16:47,520 --> 00:16:46,060
today and where we're moving the fact is

398
00:16:49,170 --> 00:16:47,530
we'd been a little further along with a

399
00:16:52,650 --> 00:16:49,180
funded agree with them with an unfunded

400
00:16:55,200 --> 00:16:52,660
but the milestones the cooperation back

401
00:16:56,760 --> 00:16:55,210
and forth with NASA I envision will be

402
00:17:01,230 --> 00:16:56,770
very very similar to what it would have

403
00:17:03,210 --> 00:17:01,240
been on a cc dev two awards so we're

404
00:17:06,780 --> 00:17:03,220
very excited to be working with these

405
00:17:08,280 --> 00:17:06,790
folks and the jobs yes the jobs will

406
00:17:10,770 --> 00:17:08,290
come on incrementally as we work through

407
00:17:14,480 --> 00:17:10,780
the program well with the majority of

408
00:17:18,300 --> 00:17:14,490
them probably about a year from flight

409
00:17:20,580 --> 00:17:18,310
is processes and vehicle processing

410
00:17:22,890 --> 00:17:20,590
starts coming into Florida and that'll

411
00:17:24,780 --> 00:17:22,900
be full up you know within a couple of

412
00:17:28,080 --> 00:17:24,790
months of that first launch for the

413
00:17:29,340 --> 00:17:28,090

processing so are you saying that with

414
00:17:31,980 --> 00:17:29,350
this base act agreement you're actually

415
00:17:34,860 --> 00:17:31,990
planning on a launch and if so when do

416
00:17:36,890 --> 00:17:34,870
you anticipate that would occur so this

417
00:17:38,510 --> 00:17:36,900
space act agreement is through

418
00:17:41,330 --> 00:17:38,520
March you know so it's a relatively

419
00:17:44,120 --> 00:17:41,340
short period in the philosophy was I

420
00:17:46,160 --> 00:17:44,130
believe in propellant ed talked but i

421
00:17:49,610 --> 00:17:46,170
think the philosophy was just like ccdf

422
00:17:52,520 --> 00:17:49,620
to it will end and then the next set of

423
00:17:55,550 --> 00:17:52,530
agreements will be put in place IDC the

424
00:17:58,190 --> 00:17:55,560
integrated design contract so we are

425
00:18:01,330 --> 00:17:58,200
absolutely leveraging this to advance as

426
00:18:04,670 --> 00:18:01,340
far as we can and then competing on IDC

427
00:18:06,140 --> 00:18:04,680
and as far as a launch date you know

428
00:18:08,330 --> 00:18:06,150
that will be determined by funding

429
00:18:11,810 --> 00:18:08,340
profiles and progress that is made but

430
00:18:13,730 --> 00:18:11,820
what I can tell you is as I look at

431
00:18:16,040 --> 00:18:13,740
systems out there particularly

432
00:18:18,440 --> 00:18:16,050
spacecraft systems and our launcher I

433
00:18:20,540 --> 00:18:18,450
believe that we are ahead of all the

434
00:18:24,290 --> 00:18:20,550
systems so we can be ready when the

435
00:18:26,360 --> 00:18:24,300
space vehicles are ready to fly then i

436
00:18:29,900 --> 00:18:26,370
guess i will add that you know the whole

437
00:18:33,260 --> 00:18:29,910
concept of CCF to was to mature

438
00:18:35,510 --> 00:18:33,270

capabilities and move progress move

439
00:18:39,080 --> 00:18:35,520
forward on progress towards Commercial

440
00:18:42,320 --> 00:18:39,090
Crew systems and so this unfunded

441
00:18:44,750 --> 00:18:42,330
agreement now we have with 80k as part

442
00:18:46,640 --> 00:18:44,760
of that CCDF to profile if you look at

443
00:18:49,490 --> 00:18:46,650
it as a overall portfolio of what we

444
00:18:51,920 --> 00:18:49,500
want to go do as it being unfunded you

445
00:18:54,140 --> 00:18:51,930
know from the taxpayer standpoint really

446
00:18:56,090 --> 00:18:54,150
the techs payer is helping to make sure

447
00:18:58,970 --> 00:18:56,100
that NASA team can support the

448
00:19:01,340 --> 00:18:58,980
discussions and an eight DK is using

449
00:19:04,130 --> 00:19:01,350
their internal capabilities in order to

450
00:19:05,990 --> 00:19:04,140
go fund their half of the agreement from

451
00:19:07,610 --> 00:19:06,000
at this particular point it's a great

452
00:19:09,860 --> 00:19:07,620
way to do business and explore the

453
00:19:12,800 --> 00:19:09,870
capabilities that ATK has with other

454
00:19:15,050 --> 00:19:12,810
British system this this whole idea of

455
00:19:17,150 --> 00:19:15,060
CCF too will come to an end towards next

456
00:19:19,850 --> 00:19:17,160
spring and summer of next year and then

457
00:19:23,570 --> 00:19:19,860
we'll move into the next phase what this

458
00:19:27,020 --> 00:19:23,580
helps by starting today with 80k is it

459
00:19:29,450 --> 00:19:27,030
helps them move their system and moves

460
00:19:33,170 --> 00:19:29,460
their system progress forward so that

461
00:19:36,350 --> 00:19:33,180
then they can work to compete in the

462
00:19:38,840 --> 00:19:36,360
next round if they wish to do so

463
00:19:41,840 --> 00:19:38,850

bill bill where we see if he has a two

464
00:19:43,010 --> 00:19:41,850
quick ones for me I wanna make sure I

465
00:19:44,690 --> 00:19:43,020
understand this Kent what you're saying

466
00:19:45,950 --> 00:19:44,700
is that you're going to study this you

467
00:19:48,320 --> 00:19:45,960
and NASA are both going to look at this

468
00:19:50,060 --> 00:19:48,330
system for the next six to nine months

469
00:19:51,350 --> 00:19:50,070
or however long that lasts and then

470
00:19:53,330 --> 00:19:51,360
there's another decision point coming

471
00:19:55,130 --> 00:19:53,340
and if you guys don't get money from

472
00:19:57,500 --> 00:19:55,140
NASA at that point is that the end of

473
00:19:59,419 --> 00:19:57,510
this or would you keep going beyond

474
00:20:00,980 --> 00:19:59,429
there on your own yeah so bill what I

475
00:20:04,280 --> 00:20:00,990
was really trying to say is we are

476
00:20:06,140 --> 00:20:04,290
working as we have been with the Liberty

477
00:20:09,470 --> 00:20:06,150
maturing the Liberty system towards

478
00:20:12,409 --> 00:20:09,480
ultimately a launch NASA and now the the

479
00:20:14,510 --> 00:20:12,419
Space Act agreement enables us to work

480
00:20:18,380 --> 00:20:14,520
much more closely with NASA and vice

481
00:20:22,159 --> 00:20:18,390
versa to along that goal and it really

482
00:20:24,470 --> 00:20:22,169
isn't you know digital that either a we

483
00:20:27,140 --> 00:20:24,480
do continue or don't continue with an

484
00:20:30,470 --> 00:20:27,150
IDC award for example our goal is to

485
00:20:32,870 --> 00:20:30,480
continue working liberty and again it's

486
00:20:36,289 --> 00:20:32,880
paced by funding amongst other things

487
00:20:39,380 --> 00:20:36,299
but for us the space act agreement is

488
00:20:41,870 --> 00:20:39,390

very exciting because it enables NASA to

489
00:20:43,299 --> 00:20:41,880
gain more insight into Liberty which i

490
00:20:45,830 --> 00:20:43,309
think is a great thing and it also

491
00:20:48,799 --> 00:20:45,840
enables us to leverage all this

492
00:20:51,530 --> 00:20:48,809
expertise that's here one more from me

493
00:20:52,909 --> 00:20:51,540
what about how does liability work in

494
00:20:54,409 --> 00:20:52,919
the sense when you have loaded fuel

495
00:20:58,070 --> 00:20:54,419
segments in a government building like

496
00:20:59,810 --> 00:20:58,080
the vab just just in general liability

497
00:21:01,460 --> 00:20:59,820
for a commercial operation whereas in

498
00:21:03,080 --> 00:21:01,470
the past that's always been I guess

499
00:21:05,180 --> 00:21:03,090
self-insured by the government if there

500
00:21:06,890 --> 00:21:05,190
was a mishap or something and be if

501
00:21:08,240 --> 00:21:06,900
everything really did go well and this

502
00:21:10,100 --> 00:21:08,250
really did march down the road when

503
00:21:11,690 --> 00:21:10,110
would when were the earliest be that we

504
00:21:13,310 --> 00:21:11,700
could see actual flight hardware out

505
00:21:17,330 --> 00:21:13,320
there on the pad getting ready to go on

506
00:21:19,909 --> 00:21:17,340
a test flight for example so if you want

507
00:21:23,060 --> 00:21:19,919
to take that foot in the lie doing how

508
00:21:25,190 --> 00:21:23,070
to answer okay that is a very good

509
00:21:28,310 --> 00:21:25,200
question we are working the solutions

510
00:21:30,080 --> 00:21:28,320
for commercial entities coming into

511
00:21:31,789 --> 00:21:30,090
government facilities that happens

512
00:21:33,350 --> 00:21:31,799
that's not something that's new to

513
00:21:36,320 --> 00:21:33,360

commercial crew that happens quite a lot

514
00:21:38,020 --> 00:21:36,330
happens even today at this center but it

515
00:21:40,070 --> 00:21:38,030
also happens in other centers and other

516
00:21:41,700 --> 00:21:40,080
government facilities where commercial

517
00:21:44,130 --> 00:21:41,710
entities come into those

518
00:21:45,960 --> 00:21:44,140
nice when they enter into agreements or

519
00:21:49,470 --> 00:21:45,970
contracts or whatever the right

520
00:21:52,860 --> 00:21:49,480
mechanism is the rules for liability are

521
00:21:55,230 --> 00:21:52,870
then laid out and for Commercial Crew

522
00:21:57,299 --> 00:21:55,240
those rules are also being laid out and

523
00:21:59,399 --> 00:21:57,309
as we move into the next phase you'll

524
00:22:03,240 --> 00:21:59,409
see how those rules will be set up so

525
00:22:05,029 --> 00:22:03,250
that the liability for NASA on our

526
00:22:08,490 --> 00:22:05,039
government facilities has taken care of

527
00:22:09,750 --> 00:22:08,500
either by NASA or by the partner the

528
00:22:11,220 --> 00:22:09,760
commercial partner and that might be in

529
00:22:13,980 --> 00:22:11,230
there but it is unique to each

530
00:22:16,409 --> 00:22:13,990
particular Center in each particular

531
00:22:19,110 --> 00:22:16,419
facility depends what else is going on

532
00:22:20,700 --> 00:22:19,120
in the facility it depends when NASA

533
00:22:22,740 --> 00:22:20,710
might need the facility for other

534
00:22:25,730 --> 00:22:22,750
activities so all that plays into the

535
00:22:28,769 --> 00:22:25,740
mix so there isn't a clear-cut answer

536
00:22:31,080 --> 00:22:28,779
except to say that liability of

537
00:22:34,799 --> 00:22:31,090
government facilities is very important

538
00:22:37,139 --> 00:22:34,809

obviously to the NASA and so we have we

539
00:22:40,279 --> 00:22:37,149
want to be rolling out what those rules

540
00:22:43,320 --> 00:22:40,289
are over as we move into the next phase

541
00:22:44,490 --> 00:22:43,330
if I could just add to that in my fact

542
00:22:47,340 --> 00:22:44,500
the last several weeks there have been

543
00:22:49,409 --> 00:22:47,350
meetings to that very issue bill and

544
00:22:51,990 --> 00:22:49,419
what I've seen is based on history and

545
00:22:55,590 --> 00:22:52,000
what we've learned over the years NASA

546
00:22:58,409 --> 00:22:55,600
is re-evaluating in leveraging a lot of

547
00:23:01,470 --> 00:22:58,419
data to make a pretty informed decision

548
00:23:03,600 --> 00:23:01,480
so that if it works commercially they

549
00:23:06,450 --> 00:23:03,610
are enabling it so you know hats off to

550
00:23:09,180 --> 00:23:06,460
everything we see going to your question

551
00:23:10,590 --> 00:23:09,190
about hey when can we fly we've we've

552
00:23:14,220 --> 00:23:10,600
kind of always been on regular saying

553
00:23:16,980 --> 00:23:14,230
hey we can meet an IOC in 2015 and again

554
00:23:24,640 --> 00:23:16,990
when the spacecraft are ready we will be

555
00:23:30,820 --> 00:23:24,650
ready 15 for IOC 2015 4 IOC

556
00:23:35,470 --> 00:23:30,830
it's sorry you don't that's I get told

557
00:23:38,110 --> 00:23:35,480
that all the time Jason I had todd todd

558
00:23:42,250 --> 00:23:38,120
halvorson with florida today i have a

559
00:23:45,850 --> 00:23:42,260
couple if i could so far in CC dev one

560
00:23:49,240 --> 00:23:45,860
NC c-dub to NASA as invested primarily

561
00:23:51,040 --> 00:23:49,250
in the development of piloted spacecraft

562
00:23:52,570 --> 00:23:51,050
that would actually be on top of the

563
00:23:55,930 --> 00:23:52,580

launch vehicle rather than a launch

564
00:24:00,070 --> 00:23:55,940
vehicle I was wondering if in the next

565
00:24:03,220 --> 00:24:00,080
round NASA would consider actually

566
00:24:04,930 --> 00:24:03,230
funding the commercial development are

567
00:24:06,760 --> 00:24:04,940
providing seed money for a launch

568
00:24:08,650 --> 00:24:06,770
vehicle rather than a spacecraft and

569
00:24:12,840 --> 00:24:08,660
what you think about the importance of

570
00:24:17,640 --> 00:24:12,850
having more than one US launch vehicle

571
00:24:22,210 --> 00:24:17,650
available during the Commercial Crew era

572
00:24:27,130 --> 00:24:22,220
t from the program standpoint you know

573
00:24:29,980 --> 00:24:27,140
we foresee caf2 we did have most of our

574
00:24:31,420 --> 00:24:29,990
funding all went to spacecraft and part

575
00:24:34,420 --> 00:24:31,430
of that rationale was we really thought

576
00:24:36,700 --> 00:24:34,430
spacecraft was the long pole in order to

577
00:24:39,340 --> 00:24:36,710
getting a complete system we have

578
00:24:41,980 --> 00:24:39,350
entered into unfunded essays with

579
00:24:44,890 --> 00:24:41,990
another launch vehicle provider as well

580
00:24:46,410 --> 00:24:44,900
as a DK and so we are very interested in

581
00:24:49,750 --> 00:24:46,420
making sure that the launch vehicle

582
00:24:52,840 --> 00:24:49,760
capabilities are also there when the

583
00:24:54,370 --> 00:24:52,850
spacecraft is not ready to be used so we

584
00:24:55,960 --> 00:24:54,380
think that we have a portfolio that

585
00:25:00,220 --> 00:24:55,970
addresses both launch vehicle as well

586
00:25:02,200 --> 00:25:00,230
spacecraft in terms of the next phase I

587
00:25:03,820 --> 00:25:02,210
think we've made it pretty clear from

588
00:25:05,800 --> 00:25:03,830

the Commercial Crew program standpoint

589
00:25:09,490 --> 00:25:05,810
that the next phase we want the

590
00:25:11,050 --> 00:25:09,500
integrated system we do not we NASA do

591
00:25:12,900 --> 00:25:11,060
not want to be the integrator of a

592
00:25:15,900 --> 00:25:12,910
launch vehicle in spacecraft we want

593
00:25:19,150 --> 00:25:15,910
industry just as you would if you're

594
00:25:21,130 --> 00:25:19,160
building a new aircraft they figure out

595
00:25:22,860 --> 00:25:21,140
what power plants to put on an aircraft

596
00:25:25,570 --> 00:25:22,870
when engines to put on the aircraft and

597
00:25:27,130 --> 00:25:25,580
also to build the aircraft itself and

598
00:25:29,200 --> 00:25:27,140
the passenger could make a billet ease

599
00:25:31,360 --> 00:25:29,210
all that and then they sell that to the

600
00:25:32,620 --> 00:25:31,370
customers in this case that's sort of

601
00:25:34,140 --> 00:25:32,630
the approach we're looking for we want a

602
00:25:36,270 --> 00:25:34,150
complete system that

603
00:25:37,740 --> 00:25:36,280
that industry wants to bring to us and

604
00:25:41,010 --> 00:25:37,750
then we'll evaluate those different

605
00:25:45,560 --> 00:25:41,020
capabilities and to go from there just

606
00:25:50,220 --> 00:25:45,570
as a problem for Kent the spacecraft

607
00:25:53,190 --> 00:25:50,230
developers in the commercial area all

608
00:25:55,230 --> 00:25:53,200
seem to be lining up to get on board the

609
00:25:59,790 --> 00:25:55,240
United Launch Alliance Atlas rocket I

610
00:26:02,190 --> 00:25:59,800
think Sierra Nevada and you know

611
00:26:05,730 --> 00:26:02,200
everybody but SpaceX seems to want to

612
00:26:08,610 --> 00:26:05,740
fly on Atlas who are you guys talking to

613
00:26:11,610 --> 00:26:08,620

and can you talk a little bit about

614
00:26:14,610 --> 00:26:11,620
whether or not anybody could launch on

615
00:26:16,980 --> 00:26:14,620
this vehicle yeah so so Todd the real

616
00:26:20,340 --> 00:26:16,990
quick answer to that is hey we're

617
00:26:21,660 --> 00:26:20,350
talking to everybody that we can and you

618
00:26:23,820 --> 00:26:21,670
mentioned SpaceX they're kind of

619
00:26:26,910 --> 00:26:23,830
self-contained so that being the

620
00:26:28,260 --> 00:26:26,920
exception with Liberty you know we

621
00:26:30,150 --> 00:26:28,270
showed up a little bit later than the

622
00:26:32,580 --> 00:26:30,160
Atlas 5 that's been flying haven't said

623
00:26:34,530 --> 00:26:32,590
that what we found are a couple of

624
00:26:36,240 --> 00:26:34,540
things folks are very interested in

625
00:26:38,730 --> 00:26:36,250
Liberty because of the value that we

626
00:26:42,060 --> 00:26:38,740
bring so you know Giada mentioned that

627
00:26:43,890 --> 00:26:42,070
we're competitive we believe pricing

628
00:26:45,450 --> 00:26:43,900
wash for the performance nobody can

629
00:26:47,010 --> 00:26:45,460
match what Liberty can do and

630
00:26:48,810 --> 00:26:47,020
particularly if you look at the

631
00:26:51,120 --> 00:26:48,820
reliability and safety of the systems

632
00:26:53,460 --> 00:26:51,130
the heritage of our systems so we're

633
00:26:55,650 --> 00:26:53,470
talking to all the folks and we've had

634
00:27:00,000 --> 00:26:55,660
real good reception from the folks out

635
00:27:02,760 --> 00:27:00,010
there so our goal is to lift be able to

636
00:27:05,580 --> 00:27:02,770
lift everybody and eventually be signed

637
00:27:08,070 --> 00:27:05,590
on with folks to lift all the spacecraft

638
00:27:10,770 --> 00:27:08,080

out there because performance wise we

639
00:27:12,450 --> 00:27:10,780
can do that we'll take one more question

640
00:27:14,190 --> 00:27:12,460
here in the room before going to the

641
00:27:16,140 --> 00:27:14,200
phone lines and then we'll come back to

642
00:27:18,120 --> 00:27:16,150
Kennedy if there any follow-up so Jason

643
00:27:20,670 --> 00:27:18,130
please Jason Ryan with America's space

644
00:27:22,410 --> 00:27:20,680
org I believe this question kind of

645
00:27:25,440 --> 00:27:22,420
follows up on what Todd was asking and

646
00:27:27,420 --> 00:27:25,450
it's for ED there seems to be a diverse

647
00:27:29,460 --> 00:27:27,430
range of launch vehicles as well as

648
00:27:32,100 --> 00:27:29,470
spacecraft that are being developed at

649
00:27:34,260 --> 00:27:32,110
one time now after challenger in

650
00:27:36,300 --> 00:27:34,270
Colombia we experienced a two-year gap

651
00:27:39,120 --> 00:27:36,310
before we could fly astronauts again is

652
00:27:40,890 --> 00:27:39,130
what we're seeing here potentially be

653
00:27:43,290 --> 00:27:40,900
like if there's a similar accident one

654
00:27:44,910 --> 00:27:43,300
of the i want to say fleet of different

655
00:27:47,480 --> 00:27:44,920
launch vehicles that are potentially

656
00:27:50,799 --> 00:27:47,490
launching astronauts if there's a

657
00:27:53,030 --> 00:27:50,809
bad day as it were that would probably

658
00:27:55,460 --> 00:27:53,040
alleviate that issue wouldn't it or is

659
00:27:57,470 --> 00:27:55,470
that what NASA is working towards or not

660
00:27:59,270 --> 00:27:57,480
to have a diverse range of launch

661
00:28:02,020 --> 00:27:59,280
vehicle providers provide service to the

662
00:28:04,490 --> 00:28:02,030
International Space Station thank you

663
00:28:06,070 --> 00:28:04,500

good good strategic question and we

664
00:28:08,450 --> 00:28:06,080
talked about that question quite a lot

665
00:28:10,610 --> 00:28:08,460
within the program and with an agency

666
00:28:13,270 --> 00:28:10,620
from the Commercial Crew program

667
00:28:16,580 --> 00:28:13,280
standpoint we would like multiple

668
00:28:19,760 --> 00:28:16,590
providers by the time we get the station

669
00:28:23,000 --> 00:28:19,770
the best way we know how in order to

670
00:28:25,790 --> 00:28:23,010
keep a capability going would be to have

671
00:28:27,500 --> 00:28:25,800
multiple capabilities in which if one

672
00:28:29,630 --> 00:28:27,510
capability cannot support we can go to

673
00:28:33,110 --> 00:28:29,640
another one now that assumes that

674
00:28:35,270 --> 00:28:33,120
there's a adequate amount of funding in

675
00:28:37,190 --> 00:28:35,280
order to go do that and the fixed kurma

676
00:28:38,990 --> 00:28:37,200
investment that the NASA would bring to

677
00:28:41,480 --> 00:28:39,000
the table has to be large enough to do

678
00:28:43,490 --> 00:28:41,490
that at the same point you know in order

679
00:28:46,280 --> 00:28:43,500
to go in orbit orbit is really an

680
00:28:48,500 --> 00:28:46,290
international kind of affair and so we

681
00:28:50,870 --> 00:28:48,510
will still always have a Russian

682
00:28:52,640 --> 00:28:50,880
capability that I don't think we're

683
00:28:55,340 --> 00:28:52,650
going to say no to I think there's also

684
00:28:56,720 --> 00:28:55,350
some capability that is dissimilar and

685
00:29:00,560 --> 00:28:56,730
when you use the Russian capability as

686
00:29:03,080 --> 00:29:00,570
compared to a system that is focused in

687
00:29:04,820 --> 00:29:03,090
the United States the goal is to have

688
00:29:06,740 --> 00:29:04,830

multiple capabilities in order to get to

689
00:29:09,260 --> 00:29:06,750
the Earth orbit and now that is our goal

690
00:29:11,210 --> 00:29:09,270
for the foreseeable future and see

691
00:29:13,340 --> 00:29:11,220
sitive too and in our next phases we

692
00:29:17,660 --> 00:29:13,350
very much want to have as many companies

693
00:29:19,220 --> 00:29:17,670
as we can afford basically from a from a

694
00:29:23,600 --> 00:29:19,230
design standpoint which is that really

695
00:29:25,760 --> 00:29:23,610
this phase in the next phase well now go

696
00:29:27,470 --> 00:29:25,770
to the phone lines I will call your name

697
00:29:29,210 --> 00:29:27,480
if you have a question please state your

698
00:29:31,280 --> 00:29:29,220
affiliation and to whom you're

699
00:29:33,669 --> 00:29:31,290
addressing your question or let us know

700
00:29:37,700 --> 00:29:33,679
if you don't have one mark Kerr oh

701
00:29:41,980 --> 00:29:37,710
thanks mark crow for aviation week can

702
00:29:45,020 --> 00:29:41,990
you explain the range or number of crew

703
00:29:48,440 --> 00:29:45,030
that you are sized with liberty to

704
00:29:51,380 --> 00:29:48,450
launch on a single mission and also if

705
00:29:54,350 --> 00:29:51,390
you might touch on whether you would

706
00:29:56,419 --> 00:29:54,360
consider a second launch site like in

707
00:29:58,790 --> 00:29:56,429
kourou french guiana in addition to

708
00:29:59,520 --> 00:29:58,800
Kennedy or your kind of all in at

709
00:30:04,980 --> 00:29:59,530
Kennedy is

710
00:30:07,290 --> 00:30:04,990
or yes so mark if you look at the size

711
00:30:09,780 --> 00:30:07,300
of crew the numbers I've seen from the

712
00:30:12,180 --> 00:30:09,790
spacecraft or seven is the largest

713
00:30:14,550 --> 00:30:12,190

number I've seen our performance is such

714
00:30:16,410 --> 00:30:14,560
that if somebody developed a little bit

715
00:30:18,450 --> 00:30:16,420
bigger spacecraft I believe we could

716
00:30:22,380 --> 00:30:18,460
lift them into low-earth orbit but the

717
00:30:24,800 --> 00:30:22,390
goin number is seven so which is a great

718
00:30:26,940 --> 00:30:24,810
number and it helps a business case and

719
00:30:29,880 --> 00:30:26,950
particularly for the spacecraft right

720
00:30:32,100 --> 00:30:29,890
flying the crew bigger is better for to

721
00:30:33,630 --> 00:30:32,110
help them close of business case as far

722
00:30:35,970 --> 00:30:33,640
as launch sites right now our

723
00:30:38,070 --> 00:30:35,980
concentration is on Florida just because

724
00:30:40,620 --> 00:30:38,080
of so much that it naturally offers and

725
00:30:43,110 --> 00:30:40,630
has readily available to us at minimum

726
00:30:45,420 --> 00:30:43,120
cost and in the commercial world the

727
00:30:47,220 --> 00:30:45,430
minimum cost just means value back to

728
00:30:50,550 --> 00:30:47,230
the customer for the the dollars per

729
00:30:52,830 --> 00:30:50,560
ride having said that we are absolutely

730
00:30:54,450 --> 00:30:52,840
are looking at all the markets for

731
00:30:55,980 --> 00:30:54,460
liberty and that's really one of the

732
00:30:58,170 --> 00:30:55,990
advantage a launcher has over our

733
00:31:00,480 --> 00:30:58,180
spacecraft is that in addition to crew

734
00:31:03,090 --> 00:31:00,490
we have cargo and then we have

735
00:31:07,020 --> 00:31:03,100
satellites gto so we are evaluating

736
00:31:11,880 --> 00:31:07,030
other other missions as well as launch

737
00:31:17,510 --> 00:31:11,890
sites mark you have a follow-up no thank

738
00:31:21,900 --> 00:31:17,520

you very much alan Boyle thank you a

739
00:31:24,900 --> 00:31:21,910
couple of related questions one is do

740
00:31:30,170 --> 00:31:24,910
you and what exactly kind of work do you

741
00:31:41,580 --> 00:31:38,760
fights and are there and is is there any

742
00:31:45,840 --> 00:31:41,590
scenario where NASA would be paid by ATK

743
00:31:47,790 --> 00:31:45,850
for services rendered so interesting

744
00:31:50,790 --> 00:31:47,800
question and the answer to the last one

745
00:31:52,950 --> 00:31:50,800
is yes as a matter of fact as we look at

746
00:31:55,470 --> 00:31:52,960
different trajectory analysis with the

747
00:31:57,660 --> 00:31:55,480
capabilities nASA has there is

748
00:31:59,790 --> 00:31:57,670
absolutely a scenario where we pay NASA

749
00:32:02,250 --> 00:31:59,800
for services so it's kind of interesting

750
00:32:04,940 --> 00:32:02,260
how the tables can maybe flip but if you

751
00:32:09,450 --> 00:32:04,950
look at the expertise around the world

752
00:32:13,200 --> 00:32:09,460
you realize hey this is where it is in

753
00:32:15,149 --> 00:32:13,210
for some cases the other one is

754
00:32:17,159 --> 00:32:15,159
you know we're in between our systems

755
00:32:19,409 --> 00:32:17,169
design review and our preliminary design

756
00:32:22,919 --> 00:32:19,419
review and we're working through those

757
00:32:25,320 --> 00:32:22,929
milestones as we go so the additional

758
00:32:28,909 --> 00:32:25,330
design analysis cycles for one which is

759
00:32:33,810 --> 00:32:28,919
very key in getting us to the PDR that's

760
00:32:38,820 --> 00:32:33,820
initially what we're working on Alan did

761
00:32:40,500 --> 00:32:38,830
you have a follow up there there is a

762
00:32:43,139 --> 00:32:40,510
little bit of a follow-up I'm just

763
00:32:47,360 --> 00:32:43,149

trying to digest all this there's a

764
00:32:51,419 --> 00:32:47,370
little bit of crosswalk on the phone but

765
00:32:57,419 --> 00:32:51,429
no not at this time thank you okay Mike

766
00:32:59,700 --> 00:32:57,429
wall yes mike wall from space com I

767
00:33:03,000 --> 00:32:59,710
guess I just had a brief question could

768
00:33:04,950 --> 00:33:03,010
you give an idea of what yeah what the

769
00:33:08,190 --> 00:33:04,960
potential impact of this is going to be

770
00:33:11,340 --> 00:33:08,200
on your sort of on like and I'm in the

771
00:33:12,750 --> 00:33:11,350
actual progress of this rocket I mean

772
00:33:14,279 --> 00:33:12,760
how much of a difference is it going to

773
00:33:16,799 --> 00:33:14,289
make in the taste of your progress are

774
00:33:18,930 --> 00:33:16,809
we talking about six months like I don't

775
00:33:20,669 --> 00:33:18,940
know nine months development increase or

776
00:33:23,460 --> 00:33:20,679
or is only way you can put any numbers

777
00:33:27,120 --> 00:33:23,470
on kind of how this is is actually going

778
00:33:29,909 --> 00:33:27,130
to find I have an impact on on what you

779
00:33:32,340 --> 00:33:29,919
guys are doing yeah you know that's a

780
00:33:35,190 --> 00:33:32,350
really good question but I don't know

781
00:33:38,190 --> 00:33:35,200
how to answer that you know what what I

782
00:33:39,840 --> 00:33:38,200
would say is hey maybe in a month if you

783
00:33:43,470 --> 00:33:39,850
asked me that question I have a much

784
00:33:46,620 --> 00:33:43,480
better idea having evaluated kind of how

785
00:33:49,380 --> 00:33:46,630
we are proceeding and moving but it

786
00:33:51,480 --> 00:33:49,390
unfortunate mark i don't know i'm

787
00:33:55,110 --> 00:33:51,490
struggling coming up with an answer to

788
00:33:57,810 --> 00:33:55,120

that one for you mike did you have a

789
00:34:00,180 --> 00:33:57,820
follow-up sure sure yes could you just

790
00:34:02,519 --> 00:34:00,190
give an example of if some of the things

791
00:34:04,440 --> 00:34:02,529
you can do with this partnership that if

792
00:34:09,839 --> 00:34:04,450
you couldn't have done maybe just with

793
00:34:11,820 --> 00:34:09,849
your own personnel so you know one

794
00:34:14,099 --> 00:34:11,830
example is the Space Act agreement we're

795
00:34:16,290 --> 00:34:14,109
sitting here in Florida having said that

796
00:34:17,849 --> 00:34:16,300
so for the launching the engineering

797
00:34:20,669 --> 00:34:17,859
there's a lot of expertise there but

798
00:34:21,899 --> 00:34:20,679
also this team is compromised a lot of

799
00:34:26,220 --> 00:34:21,909
folks from the Marshall Space Flight

800
00:34:27,060 --> 00:34:26,230
Center that have worked with our 5

801
00:34:30,630 --> 00:34:27,070
segment mo

802
00:34:33,780 --> 00:34:30,640
a lot in have a lot of data it's at the

803
00:34:37,370 --> 00:34:33,790
CVR level that we will leverage as we

804
00:34:42,750 --> 00:34:37,380
produce as we progress towards our PDR

805
00:34:44,880 --> 00:34:42,760
so you know again the detailed analysis

806
00:34:47,220 --> 00:34:44,890
cycles that we're working towards well

807
00:34:48,810 --> 00:34:47,230
NASA will be involved and part of that

808
00:34:50,790 --> 00:34:48,820
and I'm trying to be careful you're not

809
00:34:54,540 --> 00:34:50,800
getting ass into trouble because there

810
00:34:56,370 --> 00:34:54,550
are certain regulations on how much the

811
00:34:58,040 --> 00:34:56,380
government can do along with a

812
00:35:01,350 --> 00:34:58,050
commercial company and at the same time

813
00:35:05,010 --> 00:35:01,360

the guidance II advise the evaluation is

814
00:35:08,430 --> 00:35:05,020
absolutely critical so you know and I

815
00:35:12,420 --> 00:35:08,440
might love that when you're away it's

816
00:35:14,880 --> 00:35:12,430
all coming see good question for for

817
00:35:17,370 --> 00:35:14,890
this particular essay a NASA will be

818
00:35:19,920 --> 00:35:17,380
bringing to the table a number of skill

819
00:35:24,630 --> 00:35:19,930
capabilities in which we will offer

820
00:35:27,060 --> 00:35:24,640
those 280 k and e ad s in the evaluation

821
00:35:29,490 --> 00:35:27,070
of their Liberty system those systems

822
00:35:33,090 --> 00:35:29,500
would include things like structural

823
00:35:36,200 --> 00:35:33,100
analysis thermal analysis vibration

824
00:35:38,940 --> 00:35:36,210
analysis the hard core engineering

825
00:35:42,360 --> 00:35:38,950
capabilities you need to understand how

826
00:35:44,810 --> 00:35:42,370
you're going to take a capability that

827
00:35:47,610 --> 00:35:44,820
were two separate capabilities that is a

828
00:35:49,200 --> 00:35:47,620
first stage and another first stage and

829
00:35:51,870 --> 00:35:49,210
put them together in a unique

830
00:35:53,250 --> 00:35:51,880
combination and so nASA has those

831
00:35:57,660 --> 00:35:53,260
capabilities that we can bring to bear

832
00:35:59,310 --> 00:35:57,670
to help check what ATK and EAD s have

833
00:36:01,410 --> 00:35:59,320
been talking about and they're what the

834
00:36:03,390 --> 00:36:01,420
homework they've been doing if they were

835
00:36:05,490 --> 00:36:03,400
like us to do the homework that is they

836
00:36:07,190 --> 00:36:05,500
would like us to do the analysis then it

837
00:36:10,470 --> 00:36:07,200
gets into a probably an earlier question

838
00:36:11,850 --> 00:36:10,480

at that point ATK then comes forward and

839
00:36:13,950 --> 00:36:11,860
says they would like NASA to produce

840
00:36:16,410 --> 00:36:13,960
that for them and they pay NASA for that

841
00:36:19,080 --> 00:36:16,420
capability when it comes to evaluating

842
00:36:21,660 --> 00:36:19,090
their their system their requirements

843
00:36:24,420 --> 00:36:21,670
and there are detailed design we can do

844
00:36:28,290 --> 00:36:24,430
that as part of the SAA and it's no cost

845
00:36:31,320 --> 00:36:28,300
to 280 k we do that in house because for

846
00:36:34,640 --> 00:36:31,330
NASA it helps us understand what Liberty

847
00:36:38,390 --> 00:36:34,650
system is all about and it also helps in

848
00:36:40,580 --> 00:36:38,400
tree specifically ATK and EAD s

849
00:36:42,350 --> 00:36:40,590
understand because we're bringing us

850
00:36:45,230 --> 00:36:42,360
expertise to bear that have worked other

851
00:36:47,750 --> 00:36:45,240
systems like five segments and like

852
00:36:49,160 --> 00:36:47,760
other liquid boosters and so we bring

853
00:36:50,840 --> 00:36:49,170
all that to bear and that's what we

854
00:36:52,940 --> 00:36:50,850
bring to the agreement during this

855
00:36:55,370 --> 00:36:52,950
particular time if we did not have an

856
00:36:58,610 --> 00:36:55,380
agreement and ATK wanted to come forward

857
00:37:00,920 --> 00:36:58,620
and talk about these particular analyses

858
00:37:03,290 --> 00:37:00,930
or these particular products we would

859
00:37:04,760 --> 00:37:03,300
have to fit that into our overall plan

860
00:37:07,310 --> 00:37:04,770
of work that we would have for NASA

861
00:37:09,800 --> 00:37:07,320
folks over the next six months to a year

862
00:37:11,990 --> 00:37:09,810
and and we would not have an agreement

863
00:37:14,780 --> 00:37:12,000

by which we would give priority to this

864
00:37:16,970 --> 00:37:14,790
particular capability by having an essay

865
00:37:19,370 --> 00:37:16,980
now it says NASA is stepping up and we

866
00:37:22,060 --> 00:37:19,380
want to make this a priority to take our

867
00:37:24,530 --> 00:37:22,070
resources and use it on those specific

868
00:37:33,950 --> 00:37:24,540
analytical capabilities at ATK would

869
00:37:36,320 --> 00:37:33,960
like us look at Joe Baumann the nightly

870
00:37:38,900 --> 00:37:36,330
news blog for the deseret news in Salt

871
00:37:40,820 --> 00:37:38,910
Lake my question is I have a couple

872
00:37:44,440 --> 00:37:40,830
questions first of all will this affect

873
00:37:48,170 --> 00:37:44,450
the workforce and Utah a key apk has and

874
00:37:49,700 --> 00:37:48,180
secondly what is do we learn that we

875
00:37:53,930 --> 00:37:49,710
don't already know about the performance

876
00:37:56,960 --> 00:37:53,940
of these vehicles thank you so the first

877
00:37:59,600 --> 00:37:56,970
answer is Joe yes in Utah Liberty will

878
00:38:01,910 --> 00:37:59,610
stabilize the existing workforce and and

879
00:38:04,160 --> 00:38:01,920
part of what the liberty system does in

880
00:38:06,620 --> 00:38:04,170
fact if you look at between our first

881
00:38:09,160 --> 00:38:06,630
stage in our second stage there are

882
00:38:11,840 --> 00:38:09,170
manufacturing lines that exist today I

883
00:38:13,790 --> 00:38:11,850
guess the second stage line at this

884
00:38:15,530 --> 00:38:13,800
point in time is busier than the first

885
00:38:17,960 --> 00:38:15,540
stage line but they are exist in opening

886
00:38:22,820 --> 00:38:17,970
so we are just leveraging work forces

887
00:38:26,360 --> 00:38:22,830
that exist and I just forgot your second

888
00:38:29,210 --> 00:38:26,370

question wondering what do you need to

889
00:38:31,820 --> 00:38:29,220
learn about the two different vehicles

890
00:38:34,190 --> 00:38:31,830
that you don't already know oh yes so

891
00:38:36,320 --> 00:38:34,200
what we need to learn is although both

892
00:38:37,970 --> 00:38:36,330
stages have a lot of flight time and

893
00:38:40,850 --> 00:38:37,980
experience at least that they have

894
00:38:43,940 --> 00:38:40,860
evolved from it has not flown as a

895
00:38:46,130 --> 00:38:43,950
system so integrating a system is a lot

896
00:38:47,099 --> 00:38:46,140
easier said than done so we need to

897
00:38:49,670 --> 00:38:47,109
learn how

898
00:38:53,130 --> 00:38:49,680
a system interacts as we put it together

899
00:38:55,289 --> 00:38:53,140
we need to make ensure that the avionics

900
00:38:57,930 --> 00:38:55,299
system the electronics to control the

901
00:38:59,999 --> 00:38:57,940
stack in fact trajectory wise make it go

902
00:39:02,549 --> 00:39:00,009
where it's supposed to go that we fully

903
00:39:04,319 --> 00:39:02,559
appreciate the load stresses and the

904
00:39:07,019 --> 00:39:04,329
environments that this vehicle goes

905
00:39:09,299 --> 00:39:07,029
through as well as we're assembling it

906
00:39:11,460 --> 00:39:09,309
ensure that the quality is there that in

907
00:39:13,950 --> 00:39:11,470
fact it is going together as designed

908
00:39:16,499 --> 00:39:13,960
and meets all of the requirements the

909
00:39:18,299 --> 00:39:16,509
safety requirements so even though

910
00:39:25,890 --> 00:39:18,309
they're very mature systems there is a

911
00:39:28,069 --> 00:39:25,900
lot to learn still Robert Pearlman hi

912
00:39:31,200 --> 00:39:28,079
Robert Pearlman with collectspace.com

913
00:39:32,789 --> 00:39:31,210

just to clarify the Space Act agreement

914
00:39:34,859 --> 00:39:32,799
address or enable the use of space

915
00:39:37,859 --> 00:39:34,869
shuttle flowing solid rocket motor

916
00:39:39,749 --> 00:39:37,869
hardware cases of the segments for

917
00:39:41,700 --> 00:39:39,759
liberty as a commercial launch vehicle

918
00:39:44,880 --> 00:39:41,710
or if not as those components already

919
00:39:47,519 --> 00:39:44,890
belong to a DK are there SRM related

920
00:39:51,299 --> 00:39:47,529
hardware that belongs to NASA is that

921
00:39:53,670 --> 00:39:51,309
this agreement affords a PK to use of so

922
00:39:55,289 --> 00:39:53,680
great question this space act agreement

923
00:39:57,089 --> 00:39:55,299
actually is an agreement with the

924
00:39:59,460 --> 00:39:57,099
Commercial Crew folks and it's

925
00:40:02,940 --> 00:39:59,470
independent of a similar agreement that

926
00:40:05,880 --> 00:40:02,950
in fact we do need and plan on using to

927
00:40:08,220 --> 00:40:05,890
leverage the rsr arm hardware through a

928
00:40:09,989 --> 00:40:08,230
different agreement one of those a Space

929
00:40:12,660 --> 00:40:09,999
Act agreement to in fact utilize that

930
00:40:16,589 --> 00:40:12,670
our SRM hardware but again it is not

931
00:40:19,789 --> 00:40:16,599
this specific space act agreement Robert

932
00:40:25,289 --> 00:40:19,799
do you have a follow-up okay thank you

933
00:40:27,900 --> 00:40:25,299
Dan Leone yeah I this will be a question

934
00:40:29,970 --> 00:40:27,910
for ed I guess you mentioned somebody

935
00:40:31,170 --> 00:40:29,980
mentioned earlier that all of these

936
00:40:33,029 --> 00:40:31,180
wonderful things we're talking about

937
00:40:35,549 --> 00:40:33,039
today are contingent on the funding

938
00:40:38,069 --> 00:40:35,559

picture just for clarity should I

939
00:40:39,809 --> 00:40:38,079
interpret that to mean that you all are

940
00:40:42,390 --> 00:40:39,819
planning this out including the upcoming

941
00:40:43,979 --> 00:40:42,400
integrated design that's going to be the

942
00:40:45,900 --> 00:40:43,989
next commercial crew thing you all

943
00:40:49,019 --> 00:40:45,910
anticipating doing you're planning based

944
00:40:51,420 --> 00:40:49,029
on the 2012 request of 850 million if we

945
00:40:58,380 --> 00:40:51,430
come in below that should we expect to

946
00:41:04,750 --> 00:41:02,530
etsy this is ed let's see yeah our

947
00:41:07,870 --> 00:41:04,760
planning is based on the president's

948
00:41:10,990 --> 00:41:07,880
proposal that he gives to Congress every

949
00:41:13,530 --> 00:41:11,000
year and so we look at that proposal and

950
00:41:16,210 --> 00:41:13,540
we and we build a program around that

951
00:41:17,890 --> 00:41:16,220
that is not to say that we look at all

952
00:41:20,140 --> 00:41:17,900
kinds of information and try to figure

953
00:41:22,930 --> 00:41:20,150
out how and how we would react to

954
00:41:25,840 --> 00:41:22,940
various capabilities if the numbers are

955
00:41:27,850 --> 00:41:25,850
less or more I will tell you in order to

956
00:41:30,730 --> 00:41:27,860
get a capability to the Earth orbit by

957
00:41:33,400 --> 00:41:30,740
the middle of the decade and in order to

958
00:41:35,980 --> 00:41:33,410
have that with competition we need a

959
00:41:38,800 --> 00:41:35,990
robust budget capability in order to

960
00:41:41,470 --> 00:41:38,810
make Commercial Crew work and and work

961
00:41:43,930 --> 00:41:41,480
safely if we don't have enough funds

962
00:41:46,060 --> 00:41:43,940
then you're going to either stretch out

963
00:41:48,670 --> 00:41:46,070

the schedule or you're going to make it

964
00:41:51,070 --> 00:41:48,680
less safe and i can tell you myself and

965
00:41:53,170 --> 00:41:51,080
the program is not against making us

966
00:41:55,630 --> 00:41:53,180
safe at all so we will make it as safe

967
00:41:57,310 --> 00:41:55,640
as it needs to that means we may not get

968
00:41:58,450 --> 00:41:57,320
there by the middle of the decade and if

969
00:42:02,080 --> 00:41:58,460
you don't get there by the middle of the

970
00:42:03,580 --> 00:42:02,090
decade normal program that takes longer

971
00:42:06,100 --> 00:42:03,590
than it's expected will end up costing

972
00:42:08,260 --> 00:42:06,110
more money because you're you're keeping

973
00:42:10,150 --> 00:42:08,270
the workforce that you have in place

974
00:42:12,130 --> 00:42:10,160
around longer in order to finish the

975
00:42:15,460 --> 00:42:12,140
work that you have to get done and so

976
00:42:19,960 --> 00:42:15,470
our plan is pretty solid and it does

977
00:42:22,330 --> 00:42:19,970
match with what has been requested from

978
00:42:24,880 --> 00:42:22,340
the executive branch of the government

979
00:42:27,190 --> 00:42:24,890
and so that's what we build our plans to

980
00:42:29,260 --> 00:42:27,200
and by having a robust capability we

981
00:42:33,700 --> 00:42:29,270
will be able to get something in orbit

982
00:42:36,790 --> 00:42:33,710
that is a focused on a u.s. system by

983
00:42:44,400 --> 00:42:36,800
the middle of the decade next on the

984
00:42:52,330 --> 00:42:49,390
okay Kenneth Chang hi thank you had two

985
00:42:54,090 --> 00:42:52,340
questions for add mango one is how many

986
00:42:56,500 --> 00:42:54,100
NASA people will be working on this and

987
00:42:59,020 --> 00:42:56,510
the second question is does this play

988
00:43:02,770 --> 00:42:59,030

into a larger strategy or a NASA human

989
00:43:04,360 --> 00:43:02,780
spaceflight meaning that it seems like

990
00:43:06,310 --> 00:43:04,370
it'd be a really smart thing to do if

991
00:43:08,110 --> 00:43:06,320
you're looking to reduce the cost of

992
00:43:09,850 --> 00:43:08,120
boosters for the Space Launch System or

993
00:43:12,160 --> 00:43:09,860
maybe even a gateway for getting

994
00:43:14,170 --> 00:43:12,170
international cooperation well with this

995
00:43:18,580 --> 00:43:14,180
decision just simply in the context of

996
00:43:21,940 --> 00:43:18,590
Commercial Crew see the first question

997
00:43:24,910 --> 00:43:21,950
how big is the NASA team the detailed

998
00:43:27,310 --> 00:43:24,920
NASA team is approximately a dozen to

999
00:43:29,560 --> 00:43:27,320
two dozen folks and that will be pretty

1000
00:43:31,600 --> 00:43:29,570
much full time on this effort they will

1001
00:43:33,940 --> 00:43:31,610
then be able to reach back and we call

1002
00:43:35,860 --> 00:43:33,950
that our part of our insight team our

1003
00:43:39,400 --> 00:43:35,870
insight team will probably be a new

1004
00:43:42,010 --> 00:43:39,410
order of 50 individuals but not all will

1005
00:43:43,720 --> 00:43:42,020
be full time as we work through the next

1006
00:43:47,580 --> 00:43:43,730
nine months and do this in valuation

1007
00:43:50,380 --> 00:43:47,590
with 80 k and e ad s in terms of our

1008
00:43:53,710 --> 00:43:50,390
purpose our purpose is for commercial

1009
00:43:56,860 --> 00:43:53,720
crew which is to create a capability for

1010
00:43:58,390 --> 00:43:56,870
low Earth orbit the rules that we are

1011
00:43:59,890 --> 00:43:58,400
trying to follow and the rules that we

1012
00:44:03,550 --> 00:43:59,900
would like to engage on as we want an

1013
00:44:06,580 --> 00:44:03,560

American leadership system and by having

1014
00:44:08,380 --> 00:44:06,590
an 80 k and e ad s system we believe

1015
00:44:10,260 --> 00:44:08,390
that that matches the requirements that

1016
00:44:13,240 --> 00:44:10,270
that we would like an American

1017
00:44:15,700 --> 00:44:13,250
leadership system in order to go into

1018
00:44:19,800 --> 00:44:15,710
low-earth orbit at the same point I

1019
00:44:23,470 --> 00:44:19,810
can't tell you how I think it's great

1020
00:44:25,180 --> 00:44:23,480
from a national capability for the

1021
00:44:26,620 --> 00:44:25,190
United States to reach out to its

1022
00:44:29,530 --> 00:44:26,630
international partners because when

1023
00:44:31,690 --> 00:44:29,540
you're on orbit you know there's no

1024
00:44:33,610 --> 00:44:31,700
lines between the countries it's it's a

1025
00:44:35,440 --> 00:44:33,620
planet and so let's use the best

1026
00:44:37,480 --> 00:44:35,450
capabilities we have in the planet in

1027
00:44:40,360 --> 00:44:37,490
order to put together our system and I

1028
00:44:42,550 --> 00:44:40,370
think that's what ATK and AES is trying

1029
00:44:46,030 --> 00:44:42,560
to propose to us so I welcome that kind

1030
00:44:48,610 --> 00:44:46,040
of partnership Kenneth do you have a

1031
00:44:52,210 --> 00:44:48,620
follow-up question for mrs. Schumacher

1032
00:44:55,920 --> 00:44:52,220
has a stream started work on air

1033
00:45:00,580 --> 00:44:58,960
there is a series of activities that

1034
00:45:03,220 --> 00:45:00,590
were gone since almost a year now I

1035
00:45:06,610 --> 00:45:03,230
guess Kent with looking at as ken said

1036
00:45:09,280 --> 00:45:06,620
adapting that the both of the vulcain

1037
00:45:11,650 --> 00:45:09,290
the if I could area in five core stage

1038
00:45:13,030 --> 00:45:11,660

as a second stage air start and some

1039
00:45:14,980 --> 00:45:13,040
other aspects of that as well as

1040
00:45:17,800 --> 00:45:14,990
integration with the five segments solid

1041
00:45:20,710 --> 00:45:17,810
so that discussion and some preliminary

1042
00:45:25,890 --> 00:45:20,720
work has gone on and has gone in

1043
00:45:34,200 --> 00:45:28,360
we'll take our last questions on the

1044
00:45:43,180 --> 00:45:37,720
okay well hug mark did you have

1045
00:45:44,650 --> 00:45:43,190
questions okay we'll come back here to

1046
00:45:49,770 --> 00:45:44,660
your Kennedy to take some follow-up Todd

1047
00:45:56,680 --> 00:45:52,510
todd halvorson of florida today and i

1048
00:45:59,830 --> 00:45:56,690
actually have to would would this launch

1049
00:46:03,790 --> 00:45:59,840
vehicle be capable of launching the

1050
00:46:06,550 --> 00:46:03,800
Orion spacecraft as envisioned now and

1051
00:46:10,060 --> 00:46:06,560
for ed I was wondering if you could kind

1052
00:46:14,500 --> 00:46:10,070
of walk us through what the next step is

1053
00:46:16,870 --> 00:46:14,510
after CC Deb to how much money you

1054
00:46:21,760 --> 00:46:16,880
anticipate having for a third round of

1055
00:46:26,170 --> 00:46:21,770
investment and what that whole stage

1056
00:46:28,810 --> 00:46:26,180
would look like so yeah I'll take the

1057
00:46:32,530 --> 00:46:28,820
first question you right now we left

1058
00:46:34,360 --> 00:46:32,540
over 44,000 pounds so no Ryan lite

1059
00:46:36,280 --> 00:46:34,370
version to go to the space station the

1060
00:46:39,220 --> 00:46:36,290
tot is yes we have the performance for

1061
00:46:43,330 --> 00:46:39,230
that if you want to launch the beyond

1062
00:46:45,160 --> 00:46:43,340
Leo version with a couple of you know

1063
00:46:47,860 --> 00:46:45,170

call it tweaks but one of our challenges

1064
00:46:49,240 --> 00:46:47,870
on Liberty has been because we're

1065
00:46:51,580 --> 00:46:49,250
commercial and we're trying to get to

1066
00:46:54,700 --> 00:46:51,590
market is inexpensively and as quickly

1067
00:46:56,380 --> 00:46:54,710
as possible we are passing up a number

1068
00:46:58,960 --> 00:46:56,390
of performance enhancements that we

1069
00:47:01,120 --> 00:46:58,970
right now we just don't need but there

1070
00:47:03,370 --> 00:47:01,130
are you know from the expansion ratio on

1071
00:47:05,020 --> 00:47:03,380
the the nozzle to pull in some inert

1072
00:47:07,240 --> 00:47:05,030
weight out of the upper stage because we

1073
00:47:09,960 --> 00:47:07,250
initially made it beefy just to make it

1074
00:47:14,070 --> 00:47:09,970
much quicker and easier to get to market

1075
00:47:17,500 --> 00:47:14,080
the long answer is yes we can lift

1076
00:47:19,720 --> 00:47:17,510
beyond leo Orion as well with a few

1077
00:47:24,640 --> 00:47:19,730
performance enhancements that are all

1078
00:47:27,190 --> 00:47:24,650
that sophisticated it's the in terms of

1079
00:47:29,980 --> 00:47:27,200
the overall plan I think we we did

1080
00:47:31,870 --> 00:47:29,990
address that a couple months ago so I'll

1081
00:47:33,940 --> 00:47:31,880
try to summarize it here and we in the

1082
00:47:36,520 --> 00:47:33,950
near term will be having more discussion

1083
00:47:38,320 --> 00:47:36,530
with industry and with the public about

1084
00:47:40,960 --> 00:47:38,330
what our future plans are for the

1085
00:47:43,000 --> 00:47:40,970
program CC debt you know it's a it's a

1086
00:47:45,100 --> 00:47:43,010
hybrid kind of approach in which CC dev

1087
00:47:47,680 --> 00:47:45,110
one and two were really focused on

1088
00:47:51,550 --> 00:47:47,690

moving forward the capabilities of

1089
00:47:53,980 --> 00:47:51,560
partners of contractors or of industry

1090
00:47:56,260 --> 00:47:53,990
moving those capabilities forward as

1091
00:47:58,240 --> 00:47:56,270
quickly as possible and then we won't

1092
00:48:01,810 --> 00:47:58,250
help them do that NASA would help with

1093
00:48:04,780 --> 00:48:01,820
our funded SaaS and our unfunded essays

1094
00:48:06,520 --> 00:48:04,790
help with our expertise that's these two

1095
00:48:08,860 --> 00:48:06,530
phases the next phase is really want to

1096
00:48:12,100 --> 00:48:08,870
get into integrated design capabilities

1097
00:48:14,230 --> 00:48:12,110
we need to match spacecraft with the

1098
00:48:16,150 --> 00:48:14,240
launch vehicle with a ground system or a

1099
00:48:19,240 --> 00:48:16,160
launch system as well as with the

1100
00:48:21,610 --> 00:48:19,250
on-orbit capability to work on low Earth

1101
00:48:24,880 --> 00:48:21,620
orbit our set of requirements that are

1102
00:48:26,530 --> 00:48:24,890
on the table today are out publicly and

1103
00:48:29,500 --> 00:48:26,540
folks can look at them are really

1104
00:48:32,440 --> 00:48:29,510
related towards our primary mission from

1105
00:48:34,330 --> 00:48:32,450
a NASA standpoint which is to get a crew

1106
00:48:36,310 --> 00:48:34,340
for crew the International Space Station

1107
00:48:38,830 --> 00:48:36,320
by the middle of the decade and so

1108
00:48:41,590 --> 00:48:38,840
that's the next phase is an integrated

1109
00:48:43,450 --> 00:48:41,600
design phase the following phase is our

1110
00:48:46,510 --> 00:48:43,460
certification phase now we have an

1111
00:48:49,660 --> 00:48:46,520
integrated design both NASA and our

1112
00:48:51,370 --> 00:48:49,670
partners have agreed to that design we

1113
00:48:52,900 --> 00:48:51,380

sign up the debt design we sign up the

1114
00:48:55,480 --> 00:48:52,910
how we're going to go do certification

1115
00:48:57,310 --> 00:48:55,490
with the net design and then that that

1116
00:49:00,190 --> 00:48:57,320
fourth day is really is that

1117
00:49:01,570 --> 00:49:00,200
certification process that phase will

1118
00:49:05,350 --> 00:49:01,580
last quite some time because

1119
00:49:07,090 --> 00:49:05,360
certification against the human rating

1120
00:49:09,550 --> 00:49:07,100
certification requirements we have on

1121
00:49:12,040 --> 00:49:09,560
the table today is quite extensive we

1122
00:49:14,290 --> 00:49:12,050
have to make sure the system is safe and

1123
00:49:15,880 --> 00:49:14,300
can perform and once it does that then

1124
00:49:19,210 --> 00:49:15,890
we'll enter the next phase which

1125
00:49:21,279 --> 00:49:19,220
our services phase for ISS that services

1126
00:49:23,589 --> 00:49:21,289
phase is we hope to be by the middle of

1127
00:49:25,960 --> 00:49:23,599
the decade and will basically include at

1128
00:49:28,329 --> 00:49:25,970
least two flights a year on rotations

1129
00:49:30,339 --> 00:49:28,339
about every six months you know the

1130
00:49:32,019 --> 00:49:30,349
Commercial Crew program has two focuses

1131
00:49:34,599 --> 00:49:32,029
the first is our capability get the

1132
00:49:36,220 --> 00:49:34,609
international space station with an

1133
00:49:40,630 --> 00:49:36,230
american-made system or american-led

1134
00:49:43,569 --> 00:49:40,640
system the second is to encourage the

1135
00:49:46,329 --> 00:49:43,579
capability of commercial systems for

1136
00:49:49,240 --> 00:49:46,339
other purposes in low-earth orbit and so

1137
00:49:51,609 --> 00:49:49,250
we our goal and within the program is to

1138
00:49:53,410 --> 00:49:51,619

facilitate both with the priority being

1139
00:49:56,440 --> 00:49:53,420
we need to figure out how to get the ISS

1140
00:50:03,370 --> 00:49:56,450
with a american-led system as soon as we

1141
00:50:07,390 --> 00:50:03,380
can Irene for Kent what's the size of

1142
00:50:12,490 --> 00:50:07,400
the ATK and EAD s a workforce on Liberty

1143
00:50:14,680 --> 00:50:12,500
oh gosh if you look at the folks that we

1144
00:50:20,680 --> 00:50:14,690
have working on Liberty and pulling on

1145
00:50:25,390 --> 00:50:20,690
the combined size is probably around 35

1146
00:50:27,549 --> 00:50:25,400
folks 35 to 40 do you have is there a

1147
00:50:30,849 --> 00:50:27,559
business case without commercial crew

1148
00:50:33,539 --> 00:50:30,859
without NASA the there there is a

1149
00:50:39,490 --> 00:50:33,549
business case it's not as strong and so

1150
00:50:41,859 --> 00:50:39,500
Liberty actually it's a very good leo

1151
00:50:44,109 --> 00:50:41,869
vehicle for this kind of performance so

1152
00:50:47,849 --> 00:50:44,119
if you look at NASA between crew and

1153
00:50:51,249 --> 00:50:47,859
cargo Liberty fits into that very well

1154
00:50:53,920 --> 00:50:51,259
for an example by cliff into a TV as a

1155
00:50:55,870 --> 00:50:53,930
transfer resupply vehicle Liberty fits

1156
00:50:58,870 --> 00:50:55,880
into that quarter category as well

1157
00:51:02,559 --> 00:50:58,880
having said that there absolutely is a

1158
00:51:04,779 --> 00:51:02,569
very strong pull for the satellite world

1159
00:51:07,900 --> 00:51:04,789
particularly US government satellite

1160
00:51:12,059 --> 00:51:07,910
world as well that we believe offers a

1161
00:51:14,829 --> 00:51:12,069
more robust business case Jason Jason

1162
00:51:16,569 --> 00:51:14,839
Ryan for America's based on org and I

1163
00:51:18,099 --> 00:51:16,579

see me playing second fiddle to Todd

1164
00:51:20,980 --> 00:51:18,109
today because my question kind of comes

1165
00:51:24,390 --> 00:51:20,990
off of his again I noted one an

1166
00:51:27,910 --> 00:51:24,400
illustration that ATK Liberty was shown

1167
00:51:29,530 --> 00:51:27,920
launching cst-100 which is by Boeing

1168
00:51:31,240 --> 00:51:29,540
dreamchaser which is by sierra nevada

1169
00:51:32,920 --> 00:51:31,250
you got your Ryan light which is by

1170
00:51:35,380 --> 00:51:32,930
Lockheed Martin and I guess my question

1171
00:51:37,420 --> 00:51:35,390
is more of a technical one is is ATK

1172
00:51:39,370 --> 00:51:37,430
developing like a universal mating

1173
00:51:42,010 --> 00:51:39,380
adapter or maybe a pair of adapters that

1174
00:51:44,320 --> 00:51:42,020
could attach a different space crafts at

1175
00:51:46,360 --> 00:51:44,330
the top of liberty thank you yeah the

1176
00:51:49,690 --> 00:51:46,370
quick answer is yes who absolutely with

1177
00:51:52,620 --> 00:51:49,700
a universal space adapter and I think if

1178
00:51:54,910 --> 00:51:52,630
you look in a guest space X aside but

1179
00:51:56,410 --> 00:51:54,920
everybody and dream chaser is a little

1180
00:51:59,110 --> 00:51:56,420
bit unique as well being the winged

1181
00:52:01,420 --> 00:51:59,120
vehicle but for capsules I think the

1182
00:52:02,920 --> 00:52:01,430
goal amongst all of us competing and

1183
00:52:05,590 --> 00:52:02,930
commercial cruise in fact to have a

1184
00:52:08,500 --> 00:52:05,600
common interface because it's through a

1185
00:52:11,920 --> 00:52:08,510
common interface that we can be very

1186
00:52:15,220 --> 00:52:11,930
efficient with who who fits on top

1187
00:52:18,370 --> 00:52:15,230
without exorbitant amount of costs to

1188
00:52:20,650 --> 00:52:18,380

have each one is a unique design so the

1189
00:52:23,500 --> 00:52:20,660
answer is yes so common interfaces the

1190
00:52:26,950 --> 00:52:23,510
design concept will take one last

1191
00:52:31,000 --> 00:52:26,960
question from Jay excuse me Jay barberry

1192
00:52:33,160 --> 00:52:31,010
with NBC can't you mention hardware here

1193
00:52:36,460 --> 00:52:33,170
in the next few months its Hardware on

1194
00:52:39,400 --> 00:52:36,470
its way what will you be doing for this

1195
00:52:42,660 --> 00:52:39,410
first phase here testing and carrying on

1196
00:52:46,270 --> 00:52:42,670
and can you envision any scenario where

1197
00:52:47,920 --> 00:52:46,280
some European contract might be

1198
00:52:50,380 --> 00:52:47,930
interested I know they have area on

1199
00:52:52,450 --> 00:52:50,390
doing a great job but is there any way

1200
00:52:55,990 --> 00:52:52,460
that possibly Europe might come into

1201
00:53:00,580 --> 00:52:56,000
this ISA fly some manned spacecraft from

1202
00:53:04,500 --> 00:53:00,590
here so you know I'm looking at shoes

1203
00:53:07,420 --> 00:53:04,510
for help on that one yeah Clinton I

1204
00:53:10,180 --> 00:53:07,430
we're really focused on right now Jay is

1205
00:53:12,910 --> 00:53:10,190
is this torsional career development

1206
00:53:14,920 --> 00:53:12,920
with NASA US market that type of thing

1207
00:53:17,440 --> 00:53:14,930
and bringing that capability here and as

1208
00:53:19,960 --> 00:53:17,450
Ken talked to earlier use the tremendous

1209
00:53:21,790 --> 00:53:19,970
human spaceflight capability that's here

1210
00:53:26,330 --> 00:53:21,800
as Kennedy and go next gen on that so

1211
00:53:28,880 --> 00:53:26,340
that's really the focus now let's go

1212
00:53:32,480 --> 00:53:28,890
the next few months yeah so in the next

1213
00:53:35,210 --> 00:53:32,490

few months it's right now it's paper it

1214
00:53:36,530 --> 00:53:35,220
is paper so as we're working towards you

1215
00:53:39,220 --> 00:53:36,540
know once we get to critical design

1216
00:53:42,220 --> 00:53:39,230
review then we start on the hardware

1217
00:53:45,530 --> 00:53:42,230
haven't seen that we do have an

1218
00:53:47,360 --> 00:53:45,540
electronics lab avionics lab and that

1219
00:53:49,310 --> 00:53:47,370
does involve hardware and so we do have

1220
00:53:51,170 --> 00:53:49,320
hardware and systems running there but

1221
00:53:53,450 --> 00:53:51,180
there are in our laboratories our

1222
00:53:55,700 --> 00:53:53,460
development laboratories back in Utah in

1223
00:53:59,480 --> 00:53:55,710
kind of other places around the nation

1224
00:54:03,110 --> 00:53:59,490
including EAD s as far as Florida's

1225
00:54:05,390 --> 00:54:03,120
concerned no you know not for for

1226
00:54:11,060 --> 00:54:05,400
certainly not within the next year would

1227
00:54:12,890 --> 00:54:11,070
there be hard we're headed in here and

1228
00:54:15,500 --> 00:54:12,900
also the one other thing I'd touch on

1229
00:54:16,850 --> 00:54:15,510
too because again the focus is

1230
00:54:19,010 --> 00:54:16,860
Commercial Crew development that's very

1231
00:54:20,030 --> 00:54:19,020
but as Ken talked about earlier as you

1232
00:54:21,830 --> 00:54:20,040
talk about some of the cargo

1233
00:54:24,890 --> 00:54:21,840
applications for example etv

1234
00:54:26,720 --> 00:54:24,900
possibilities and things like that again

1235
00:54:29,300 --> 00:54:26,730
there's lots of possibilities as we get

1236
00:54:31,190 --> 00:54:29,310
rolling in this this work the unfunded

1237
00:54:35,720 --> 00:54:31,200
Space Act looks us get further along

1238
00:54:38,690 --> 00:54:35,730

looking at all those options that will

1239
00:54:40,340 --> 00:54:38,700
conclude today's NASA ATK commercial

1240
00:54:41,810 --> 00:54:40,350
partnership announcement for more

1241
00:54:48,950 --> 00:54:41,820
information on NASA's Commercial Crew