
Marshall Space Flight Center
Mark McEylea
Marshall Mission Operations Laboratory

1
00:00:03,750 --> 00:00:01,590
and welcome to marshall space flight

2
00:00:05,910 --> 00:00:03,760
center i'm shannon redinger and i'm a

3
00:00:08,629 --> 00:00:05,920
public affairs officer here

4
00:00:12,150 --> 00:00:08,639
and uh today we're so glad you are all

5
00:00:13,749 --> 00:00:12,160
here we are excited to announce the work

6
00:00:17,029 --> 00:00:13,759
the center is going to be doing with

7
00:00:20,150 --> 00:00:17,039
sierra nevada and teledon brown

8
00:00:21,910 --> 00:00:20,160
so now i am going to introduce our panel

9
00:00:24,550 --> 00:00:21,920
and they're going to be telling us more

10
00:00:27,750 --> 00:00:24,560
about this expanded collaboration

11
00:00:30,550 --> 00:00:27,760
so the first person on our panel is paul

12
00:00:32,950 --> 00:00:30,560
gilbert and he is the deputy manager for

13
00:00:34,310 --> 00:00:32,960

flight programs and partnerships office

14
00:00:37,270 --> 00:00:34,320
here at marshall

15
00:00:39,750 --> 00:00:37,280
um and then we have mark cerangelo he is

16
00:00:41,350 --> 00:00:39,760
the corporate vice president and head of

17
00:00:45,190 --> 00:00:41,360
sierra nevada

18
00:00:47,510 --> 00:00:45,200
space systems then we have rex jevedon

19
00:00:50,389 --> 00:00:47,520
and he is the executive vice president

20
00:00:53,430 --> 00:00:50,399
of telodyne technologies and then we

21
00:00:56,229 --> 00:00:53,440
have mark maclie and he is chief of the

22
00:00:58,709 --> 00:00:56,239
advanced planning and integration office

23
00:01:00,069 --> 00:00:58,719
for marshall's mission operations

24
00:01:01,990 --> 00:01:00,079
laboratory

25
00:01:03,910 --> 00:01:02,000
so now i'm going to turn it over to paul

26
00:01:06,230 --> 00:01:03,920
and he is going to talk about flight

27
00:01:07,910 --> 00:01:06,240
programs and partnerships okay thank you

28
00:01:09,429 --> 00:01:07,920
shannon good morning everyone i'm paul

29
00:01:11,030 --> 00:01:09,439
gilbert i'm the deputy

30
00:01:13,510 --> 00:01:11,040
manager for the flight programs and

31
00:01:15,830 --> 00:01:13,520
partnerships office and as you can guess

32
00:01:18,230 --> 00:01:15,840
from our long title part of our office

33
00:01:19,510 --> 00:01:18,240
contains partnerships which is an

34
00:01:21,510 --> 00:01:19,520
organization

35
00:01:22,390 --> 00:01:21,520
i call it external facing and what it

36
00:01:24,550 --> 00:01:22,400
does

37
00:01:27,190 --> 00:01:24,560
it tries to help industry and the

38
00:01:29,109 --> 00:01:27,200

community when they need to get access

39
00:01:30,469 --> 00:01:29,119
to marshall's unique capabilities so a

40
00:01:31,270 --> 00:01:30,479
little bit like the help desk at the

41
00:01:33,749 --> 00:01:31,280
mall

42
00:01:35,749 --> 00:01:33,759
where do i go i need something how do i

43
00:01:37,670 --> 00:01:35,759
get it what is it so they're the help

44
00:01:40,149 --> 00:01:37,680
desk that comes in we're here this

45
00:01:42,149 --> 00:01:40,159
morning though because we're very proud

46
00:01:43,749 --> 00:01:42,159
part of the work we do is to support

47
00:01:45,670 --> 00:01:43,759
commercial space

48
00:01:47,830 --> 00:01:45,680
a big initiative of nasa and the

49
00:01:49,830 --> 00:01:47,840
administrations and so we're very

50
00:01:52,310 --> 00:01:49,840
pleased to be here this morning to be

51
00:01:54,550 --> 00:01:52,320
here with the sierra nevada corporation

52
00:01:56,630 --> 00:01:54,560
their space systems division to talk

53
00:01:58,630 --> 00:01:56,640
about a collaboration with them

54
00:02:01,830 --> 00:01:58,640
now when you think of these space act

55
00:02:03,749 --> 00:02:01,840
agreements basically fancy name it is

56
00:02:06,069 --> 00:02:03,759
just a small contract

57
00:02:08,469 --> 00:02:06,079
between someone and the government to do

58
00:02:10,469 --> 00:02:08,479
work and it's a way for them to get to

59
00:02:12,630 --> 00:02:10,479
our capabilities they may they're

60
00:02:15,589 --> 00:02:12,640
typically not large dollars but they're

61
00:02:17,670 --> 00:02:15,599
very critical in that they give access

62
00:02:19,750 --> 00:02:17,680
and i would equate it to i like still

63
00:02:22,630 --> 00:02:19,760

like to work on my car

64
00:02:25,110 --> 00:02:22,640
and sometimes i can't quite get it done

65
00:02:27,270 --> 00:02:25,120
and i need a special piece of test gear

66
00:02:29,110 --> 00:02:27,280
that only the dealer may have

67
00:02:31,030 --> 00:02:29,120
or i need a mechanic to troubleshoot it

68
00:02:33,190 --> 00:02:31,040
because i can't figure it out i don't

69
00:02:35,430 --> 00:02:33,200
want to buy the whole dealership i just

70
00:02:37,910 --> 00:02:35,440
want to go in and pay for them

71
00:02:40,390 --> 00:02:37,920
to help me a little bit so i can finish

72
00:02:41,670 --> 00:02:40,400
the job i started space acts work the

73
00:02:44,790 --> 00:02:41,680
same way

74
00:02:47,030 --> 00:02:44,800
industry may have some need to get some

75
00:02:48,070 --> 00:02:47,040
technical consultation or ideas or a

76
00:02:49,750 --> 00:02:48,080
test done

77
00:02:51,430 --> 00:02:49,760
and this is a way for them to come in

78
00:02:53,110 --> 00:02:51,440
and get that without buying the whole

79
00:02:54,790 --> 00:02:53,120
dealership and so it's a critical

80
00:02:56,790 --> 00:02:54,800
transfer

81
00:02:58,630 --> 00:02:56,800
uh the effort we're going to talk about

82
00:02:59,830 --> 00:02:58,640
today and they'll give you more details

83
00:03:02,070 --> 00:02:59,840
on it

84
00:03:05,430 --> 00:03:02,080
fits in with nasa's strong support of

85
00:03:07,270 --> 00:03:05,440
going with developing commercial space

86
00:03:09,750 --> 00:03:07,280
from a marshall standpoint it's an

87
00:03:12,869 --> 00:03:09,760
important collaboration to reach out and

88
00:03:15,190 --> 00:03:12,879

work with industry in the u.s and to let

89
00:03:17,190 --> 00:03:15,200
them have access to our capability

90
00:03:19,270 --> 00:03:17,200
it's also critical though when we sign

91
00:03:21,750 --> 00:03:19,280
up to this we're basically almost like a

92
00:03:22,869 --> 00:03:21,760
commercial company we need to deliver

93
00:03:26,630 --> 00:03:22,879
what

94
00:03:28,630 --> 00:03:26,640
mark sorangelo needs in his company

95
00:03:30,869 --> 00:03:28,640
and get it out on schedule to help them

96
00:03:32,869 --> 00:03:30,879
do their job

97
00:03:34,309 --> 00:03:32,879
why is marshall involved well most of

98
00:03:35,990 --> 00:03:34,319
you know especially if you're local

99
00:03:38,070 --> 00:03:36,000
marshall has

100
00:03:40,869 --> 00:03:38,080
close to 50 years experience in space

101
00:03:42,710 --> 00:03:40,879
doing design development and testing and

102
00:03:45,509 --> 00:03:42,720
we've got a litany of skills from

103
00:03:47,509 --> 00:03:45,519
propulsion to space systems to life

104
00:03:50,070 --> 00:03:47,519
support

105
00:03:51,110 --> 00:03:50,080
materials advanced manufacturing in this

106
00:03:53,670 --> 00:03:51,120
case

107
00:03:55,670 --> 00:03:53,680
all the way back to to sky lab we have

108
00:03:57,589 --> 00:03:55,680
been working science and payload

109
00:04:00,070 --> 00:03:57,599
operations and integration and so we'll

110
00:04:02,070 --> 00:04:00,080
talk about that a little more the

111
00:04:04,070 --> 00:04:02,080
partnership opportunities when people

112
00:04:06,149 --> 00:04:04,080
come in to work with us it could be

113
00:04:08,630 --> 00:04:06,159

anything from i need some time to get

114
00:04:10,710 --> 00:04:08,640
some technical consultation

115
00:04:12,869 --> 00:04:10,720
somebody may need to buy borrow one of

116
00:04:15,110 --> 00:04:12,879
our special machines for a few weeks to

117
00:04:17,349 --> 00:04:15,120
do some run themselves on or they may

118
00:04:19,030 --> 00:04:17,359
want to hire us to do testing and so

119
00:04:20,550 --> 00:04:19,040
things come in in different ways again

120
00:04:23,270 --> 00:04:20,560
to be just kind of like the car dealer

121
00:04:25,510 --> 00:04:23,280
scenario different needs and you do it

122
00:04:27,510 --> 00:04:25,520
currently we've got about 200 partners

123
00:04:29,189 --> 00:04:27,520
we're working with and these ebb and

124
00:04:30,469 --> 00:04:29,199
flow and they're always in flow and so

125
00:04:32,390 --> 00:04:30,479
there's different work we're doing

126
00:04:34,550 --> 00:04:32,400
supporting the community and again

127
00:04:36,790 --> 00:04:34,560
commercial space is critical

128
00:04:39,270 --> 00:04:36,800
and sierra nevada and their dream tracer

129
00:04:41,510 --> 00:04:39,280
is a critical part of that program

130
00:04:44,230 --> 00:04:41,520
and so i'm pleased now to introduce mark

131
00:04:46,550 --> 00:04:44,240
syrangelo he's the vice president

132
00:04:48,230 --> 00:04:46,560
from sierra nevada corporation space

133
00:04:49,830 --> 00:04:48,240
systems and he'll talk some more about

134
00:04:51,430 --> 00:04:49,840
the activity

135
00:04:53,350 --> 00:04:51,440
thank you well thank you paul

136
00:04:55,510 --> 00:04:53,360
good morning everyone

137
00:04:57,270 --> 00:04:55,520
it's a real pleasure for me to be here i

138
00:05:02,550 --> 00:04:57,280

was wandering around the mall and i ran

139
00:05:06,950 --> 00:05:04,469
it's the easiest way to get here

140
00:05:08,870 --> 00:05:06,960
uh but it is really that kind of story

141
00:05:10,469 --> 00:05:08,880
for from our company from my perspective

142
00:05:12,390 --> 00:05:10,479
space is a team sport

143
00:05:14,710 --> 00:05:12,400
and we're building the best america's

144
00:05:16,469 --> 00:05:14,720
team around this project that we can we

145
00:05:18,710 --> 00:05:16,479
can build and that means going to people

146
00:05:20,870 --> 00:05:18,720
who have the expertise the knowledge

147
00:05:23,110 --> 00:05:20,880
and the ability to make us better and

148
00:05:25,749 --> 00:05:23,120
really what today is about is that story

149
00:05:27,830 --> 00:05:25,759
we're adding to our team uh a team that

150
00:05:29,749 --> 00:05:27,840
has really grown and represents a

151
00:05:31,350 --> 00:05:29,759
substantial portion of the the best of

152
00:05:33,270 --> 00:05:31,360
the space industry in the united states

153
00:05:35,110 --> 00:05:33,280
and beyond and i wanted to just to give

154
00:05:37,510 --> 00:05:35,120
you a little bit of insight into who we

155
00:05:39,270 --> 00:05:37,520
are as a company our program and and

156
00:05:42,390 --> 00:05:39,280
this relationship and our partnership as

157
00:05:44,469 --> 00:05:42,400
we go forward so before i uh i do that i

158
00:05:46,230 --> 00:05:44,479
want to recognize that beyond the people

159
00:05:48,230 --> 00:05:46,240
that are here we are really have been

160
00:05:49,749 --> 00:05:48,240
expanding in uh in alabama and we have a

161
00:05:51,510 --> 00:05:49,759
number of our other partners who are in

162
00:05:53,590 --> 00:05:51,520
the room or or

163
00:05:55,510 --> 00:05:53,600

listening in today

164
00:05:57,189 --> 00:05:55,520
lockheed martin united launch alliance

165
00:05:59,430 --> 00:05:57,199
and draper all of whom have presence

166
00:06:00,629 --> 00:05:59,440
here in alabama and we also have been

167
00:06:02,310 --> 00:06:00,639
reaching out to a number of other

168
00:06:04,150 --> 00:06:02,320
organizations here in the state core

169
00:06:06,309 --> 00:06:04,160
technologies the university of alabama

170
00:06:09,110 --> 00:06:06,319
and huntsville university of alabama and

171
00:06:11,510 --> 00:06:09,120
birmingham as well as the hudson alpha

172
00:06:13,510 --> 00:06:11,520
research center and this is a growing

173
00:06:15,430 --> 00:06:13,520
group of organizations who either are

174
00:06:17,430 --> 00:06:15,440
directly helping us or working on

175
00:06:19,670 --> 00:06:17,440
something that we think is important to

176
00:06:21,110 --> 00:06:19,680
our america's space future and we'd like

177
00:06:21,990 --> 00:06:21,120
to thank them for being part of this as

178
00:06:24,309 --> 00:06:22,000
well and

179
00:06:25,590 --> 00:06:24,319
continuing the relationship with us what

180
00:06:27,189 --> 00:06:25,600
i'd like to do for the next few minutes

181
00:06:28,790 --> 00:06:27,199
if i could is introduce our company a

182
00:06:29,830 --> 00:06:28,800
little bit more in detail in our program

183
00:06:32,070 --> 00:06:29,840
and then we'll talk about the

184
00:06:33,670 --> 00:06:32,080
relationship and partnership

185
00:06:35,110 --> 00:06:33,680
you know

186
00:06:37,510 --> 00:06:35,120
one of the things i find every time i

187
00:06:39,270 --> 00:06:37,520
come here to alabama is that there's a a

188
00:06:40,710 --> 00:06:39,280

passion and people come into this

189
00:06:42,870 --> 00:06:40,720
industry because we believe in what

190
00:06:44,550 --> 00:06:42,880
we're doing and and we think it's a

191
00:06:46,550 --> 00:06:44,560
wonderful place to be but it's also

192
00:06:47,990 --> 00:06:46,560
something in our soul in our hearts and

193
00:06:49,510 --> 00:06:48,000
one of my favorite sayings if i was in

194
00:06:51,749 --> 00:06:49,520
heaven i would do exactly what i'm doing

195
00:06:53,110 --> 00:06:51,759
now forever i think if you walked around

196
00:06:54,629 --> 00:06:53,120
the center here today you would find

197
00:06:57,909 --> 00:06:54,639
many people that would relate to this

198
00:06:59,029 --> 00:06:57,919
type of a feeling and we uh we try to

199
00:07:00,550 --> 00:06:59,039
see things from a little bit of a

200
00:07:02,550 --> 00:07:00,560
different perspective one of my favorite

201
00:07:04,469 --> 00:07:02,560
pictures is this this picture which is

202
00:07:06,710 --> 00:07:04,479
the first picture of earth taken from

203
00:07:08,309 --> 00:07:06,720
from the moon by a human and it really

204
00:07:10,870 --> 00:07:08,319
put our world in a different perspective

205
00:07:12,710 --> 00:07:10,880
in the 1960s and we look at our program

206
00:07:14,309 --> 00:07:12,720
as really being something that looks at

207
00:07:16,390 --> 00:07:14,319
life from a different perspective one

208
00:07:17,589 --> 00:07:16,400
that believes in partnership believes in

209
00:07:19,189 --> 00:07:17,599
relationships and believes in

210
00:07:20,230 --> 00:07:19,199
collaboration

211
00:07:21,510 --> 00:07:20,240
we

212
00:07:22,950 --> 00:07:21,520
as a company

213
00:07:25,589 --> 00:07:22,960

some of you may know us some of you may

214
00:07:28,390 --> 00:07:25,599
not we're 100 owned by our management we

215
00:07:30,309 --> 00:07:28,400
have close to 3000 employees now

216
00:07:32,390 --> 00:07:30,319
a little under 2 billion a year

217
00:07:34,230 --> 00:07:32,400
organization i've been profitable for a

218
00:07:35,749 --> 00:07:34,240
long time we've been in space flight now

219
00:07:38,070 --> 00:07:35,759
over 25 years

220
00:07:40,710 --> 00:07:38,080
and have over 420 space missions to our

221
00:07:42,950 --> 00:07:40,720
credit uh about 4 000 things we've built

222
00:07:44,870 --> 00:07:42,960
for space and so far and every time i

223
00:07:46,790 --> 00:07:44,880
say this i have to smile we have we've

224
00:07:49,110 --> 00:07:46,800
had no no on orbit failures and we'd

225
00:07:50,390 --> 00:07:49,120
like to continue that way now this year

226
00:07:52,150 --> 00:07:50,400
we're going to be launching something

227
00:07:54,070 --> 00:07:52,160
that we've built every three weeks and

228
00:07:54,950 --> 00:07:54,080
have over 70 successful missions from

229
00:07:56,710 --> 00:07:54,960
nasa

230
00:07:59,350 --> 00:07:56,720
and operations and business in 20

231
00:08:00,950 --> 00:07:59,360
countries right now we represent a

232
00:08:03,029 --> 00:08:00,960
collective group of people throughout

233
00:08:05,430 --> 00:08:03,039
the united states we have offices in 20

234
00:08:08,790 --> 00:08:05,440
different states 30 different facilities

235
00:08:11,029 --> 00:08:08,800
in the united states right now

236
00:08:13,110 --> 00:08:11,039
and our product lines beyond space range

237
00:08:14,710 --> 00:08:13,120
from aviation we're one of the largest

238
00:08:16,070 --> 00:08:14,720

converter of airplanes for the us

239
00:08:17,510 --> 00:08:16,080
government we have hundreds of planes

240
00:08:19,990 --> 00:08:17,520
that are in operation around the world

241
00:08:21,909 --> 00:08:20,000
right now and in space we do four things

242
00:08:24,150 --> 00:08:21,919
we are one of the largest builders small

243
00:08:25,510 --> 00:08:24,160
satellites we're one of the most

244
00:08:27,909 --> 00:08:25,520
significant builders of space

245
00:08:29,510 --> 00:08:27,919
technologies essentially the mechanical

246
00:08:31,909 --> 00:08:29,520
and electrical mechanical parts that

247
00:08:33,509 --> 00:08:31,919
make many other spaceships work

248
00:08:35,350 --> 00:08:33,519
we are propulsion company we're not a

249
00:08:37,350 --> 00:08:35,360
rocket launch company we build motors

250
00:08:38,630 --> 00:08:37,360
that move things in space and finally

251
00:08:40,149 --> 00:08:38,640
what we're here to talk about we're the

252
00:08:42,790 --> 00:08:40,159
owner operator and developer of the

253
00:08:43,750 --> 00:08:42,800
dream chaser which is a leo low earth

254
00:08:47,750 --> 00:08:43,760
orbit

255
00:08:51,190 --> 00:08:49,750
last year we celebrated our 25th year

256
00:08:52,070 --> 00:08:51,200
and we went back and looked back and

257
00:08:53,430 --> 00:08:52,080
said

258
00:08:54,870 --> 00:08:53,440
realizing that we've been to seven

259
00:08:56,630 --> 00:08:54,880
planets with something we've built the

260
00:08:59,030 --> 00:08:56,640
moon and the sun and we've been to mars

261
00:09:01,030 --> 00:08:59,040
uh almost a dozen times over our history

262
00:09:02,550 --> 00:09:01,040
it's it's really quite a series of

263
00:09:04,070 --> 00:09:02,560

programs that we've been involved with

264
00:09:05,590 --> 00:09:04,080
including most recently doing the

265
00:09:07,910 --> 00:09:05,600
birthing mechanism for the orbital

266
00:09:09,509 --> 00:09:07,920
science cygnus program a very successful

267
00:09:10,550 --> 00:09:09,519
program that has resupplied the space

268
00:09:12,070 --> 00:09:10,560
station

269
00:09:13,990 --> 00:09:12,080
we've done a series of missions

270
00:09:15,910 --> 00:09:14,000
throughout nasa's history

271
00:09:17,750 --> 00:09:15,920
several mars missions including the mars

272
00:09:19,110 --> 00:09:17,760
science laboratory we're on the orion

273
00:09:21,430 --> 00:09:19,120
program

274
00:09:23,509 --> 00:09:21,440
as some of you know curiosity last year

275
00:09:25,030 --> 00:09:23,519
or two years ago landed on mars we

276
00:09:27,190 --> 00:09:25,040
helped build the descent system that

277
00:09:28,790 --> 00:09:27,200
made that happen one of the most

278
00:09:31,110 --> 00:09:28,800
significant moments i think in our

279
00:09:32,710 --> 00:09:31,120
history and when you realize

280
00:09:33,829 --> 00:09:32,720
that you see pictures like this and

281
00:09:36,070 --> 00:09:33,839
you've helped

282
00:09:38,150 --> 00:09:36,080
do things like land a robotic

283
00:09:39,670 --> 00:09:38,160
exploration vehicle on mars you realize

284
00:09:41,590 --> 00:09:39,680
why this is such a great industry and

285
00:09:43,190 --> 00:09:41,600
why collaboration and partnerships are

286
00:09:45,110 --> 00:09:43,200
such a wonderful thing

287
00:09:47,509 --> 00:09:45,120
we do a series of other missions for

288
00:09:48,470 --> 00:09:47,519

nasa including most recently we're

289
00:09:49,750 --> 00:09:48,480
joining

290
00:09:51,750 --> 00:09:49,760
what is going to be a fascinating

291
00:09:52,550 --> 00:09:51,760
mission to to study the sun from the

292
00:09:53,910 --> 00:09:52,560
most

293
00:09:56,230 --> 00:09:53,920
closest point that it's ever been

294
00:09:58,630 --> 00:09:56,240
studied from before

295
00:10:00,870 --> 00:09:58,640
we're on several large programs for

296
00:10:02,630 --> 00:10:00,880
commercial satellite programs as well as

297
00:10:04,630 --> 00:10:02,640
a number of u.s government satellite

298
00:10:07,030 --> 00:10:04,640
efforts

299
00:10:08,870 --> 00:10:07,040
part of what we do is that we all we are

300
00:10:10,470 --> 00:10:08,880
very involved with very

301
00:10:12,790 --> 00:10:10,480
most types of commercial space

302
00:10:14,550 --> 00:10:12,800
activities and this is a rocket motor

303
00:10:17,269 --> 00:10:14,560
that we build and test it's our hybrid

304
00:10:19,670 --> 00:10:17,279
rocket motor the motor is used not only

305
00:10:21,190 --> 00:10:19,680
on our dream chaser vehicle but also as

306
00:10:22,870 --> 00:10:21,200
part of the virgin galactic program

307
00:10:24,790 --> 00:10:22,880
which is the first commercial tourism

308
00:10:26,470 --> 00:10:24,800
program that is slated to start its

309
00:10:29,509 --> 00:10:26,480
operations this year we're the main

310
00:10:30,550 --> 00:10:29,519
rocket motor provider for that program

311
00:10:32,230 --> 00:10:30,560
and that

312
00:10:34,230 --> 00:10:32,240
that program is now flying in test

313
00:10:35,829 --> 00:10:34,240

flight and we're very proud to be part

314
00:10:38,310 --> 00:10:35,839
of that and part of the the future of

315
00:10:39,910 --> 00:10:38,320
that sector of our industry as well

316
00:10:41,829 --> 00:10:39,920
but mostly today what we wanted to talk

317
00:10:43,509 --> 00:10:41,839
about is our dream chaser dream chaser

318
00:10:45,509 --> 00:10:43,519
is a program

319
00:10:46,870 --> 00:10:45,519
that actually started back in nasa it

320
00:10:48,310 --> 00:10:46,880
was originally a program called the

321
00:10:51,030 --> 00:10:48,320
hl-20

322
00:10:53,030 --> 00:10:51,040
in the 1980s and 90s nasa was looking

323
00:10:54,550 --> 00:10:53,040
forward to building a

324
00:10:57,030 --> 00:10:54,560
crew rescue vehicle for the space

325
00:10:59,030 --> 00:10:57,040
station and it designed such a vehicle

326
00:11:01,350 --> 00:10:59,040
this vehicle had about eight to ten

327
00:11:03,269 --> 00:11:01,360
years of of design work done primarily

328
00:11:05,750 --> 00:11:03,279
at the langley research facility and

329
00:11:07,590 --> 00:11:05,760
nasa's facility in in virginia and then

330
00:11:09,190 --> 00:11:07,600
for a variety of reasons including the

331
00:11:11,350 --> 00:11:09,200
uh the space station going down to a

332
00:11:14,389 --> 00:11:11,360
much smaller complement of people

333
00:11:16,310 --> 00:11:14,399
the this the program was put on hold we

334
00:11:19,509 --> 00:11:16,320
took it out of out of the attic as i

335
00:11:22,470 --> 00:11:19,519
like to say or out of the nasa program

336
00:11:24,150 --> 00:11:22,480
office in in 2004 and have been

337
00:11:25,750 --> 00:11:24,160
developing it as a vehicle since that

338
00:11:26,790 --> 00:11:25,760

point in time

339
00:11:28,550 --> 00:11:26,800
it has

340
00:11:30,310 --> 00:11:28,560
in our view when we first started

341
00:11:32,710 --> 00:11:30,320
looking at this we had really two goals

342
00:11:34,550 --> 00:11:32,720
in mind one was that we realized at some

343
00:11:36,389 --> 00:11:34,560
point the space shuttle was going to

344
00:11:38,389 --> 00:11:36,399
retire and having a

345
00:11:40,870 --> 00:11:38,399
lifting body space plane that could very

346
00:11:42,230 --> 00:11:40,880
much do some of the missions that that

347
00:11:44,310 --> 00:11:42,240
the shuttle did not all of them

348
00:11:45,910 --> 00:11:44,320
obviously but many of them would be a

349
00:11:48,710 --> 00:11:45,920
good thing to have in the american space

350
00:11:50,550 --> 00:11:48,720
fleet this is a picture i like to use um

351
00:11:52,630 --> 00:11:50,560
because really of two reasons one is

352
00:11:54,230 --> 00:11:52,640
that while the size here is is very

353
00:11:56,470 --> 00:11:54,240
different we like to look at this as big

354
00:11:59,030 --> 00:11:56,480
brother little brother in some ways but

355
00:12:00,389 --> 00:11:59,040
we we really understand that to really

356
00:12:01,829 --> 00:12:00,399
move forward in the space industry you

357
00:12:03,350 --> 00:12:01,839
have to respect the past and you have to

358
00:12:07,030 --> 00:12:03,360
respect the people who have been in this

359
00:12:08,949 --> 00:12:07,040
and i like to say publicly that that 135

360
00:12:11,110 --> 00:12:08,959
shuttle flights really have made us a

361
00:12:12,629 --> 00:12:11,120
better company a better uh organization

362
00:12:14,870 --> 00:12:12,639
and certainly i've learned a lot from it

363
00:12:16,870 --> 00:12:14,880

and we're very proud to to continue that

364
00:12:18,949 --> 00:12:16,880
legacy of what was done by nasa in the

365
00:12:20,629 --> 00:12:18,959
shuttle program in our minds

366
00:12:21,829 --> 00:12:20,639
what we also like to point out in this

367
00:12:24,069 --> 00:12:21,839
is that if

368
00:12:26,389 --> 00:12:24,079
many people realize that the shuttle had

369
00:12:28,150 --> 00:12:26,399
a terrific job in building space station

370
00:12:30,069 --> 00:12:28,160
and opening up low earth orbit to

371
00:12:31,430 --> 00:12:30,079
research and development we feel like

372
00:12:32,710 --> 00:12:31,440
we're continuing that on with our

373
00:12:34,069 --> 00:12:32,720
vehicle and

374
00:12:35,829 --> 00:12:34,079
while these two vehicles are very

375
00:12:38,310 --> 00:12:35,839
different in size we actually have

376
00:12:40,710 --> 00:12:38,320
similar space inside the dream chaser

377
00:12:43,829 --> 00:12:40,720
for for cargo or for critical cargo and

378
00:12:45,509 --> 00:12:43,839
pressurized work for for humans and it's

379
00:12:47,350 --> 00:12:45,519
quite an honor for us to be continuing

380
00:12:48,870 --> 00:12:47,360
this program

381
00:12:50,710 --> 00:12:48,880
recently some of you know that we were

382
00:12:52,550 --> 00:12:50,720
down in florida and

383
00:12:54,870 --> 00:12:52,560
showing off the the legacy a little bit

384
00:12:56,790 --> 00:12:54,880
um this is our model of dream chaser

385
00:12:58,949 --> 00:12:56,800
next to the final spot where shuttle

386
00:13:00,949 --> 00:12:58,959
discovery landed and we took this photo

387
00:13:02,790 --> 00:13:00,959
because we have so many people from from

388
00:13:04,230 --> 00:13:02,800

nasa who have joined us we're quite

389
00:13:05,750 --> 00:13:04,240
honored to have our program lead for

390
00:13:08,150 --> 00:13:05,760
dream chaser be

391
00:13:09,910 --> 00:13:08,160
steve lindsey and john curry steve in

392
00:13:12,230 --> 00:13:09,920
particular as as we were looking at

393
00:13:15,509 --> 00:13:12,240
discovery here was a five-time shuttle

394
00:13:17,430 --> 00:13:15,519
pilot has over 1600 hours in space and

395
00:13:19,670 --> 00:13:17,440
led the nasa astronaut office for a long

396
00:13:20,470 --> 00:13:19,680
time and now he and a terrific group of

397
00:13:22,550 --> 00:13:20,480
people

398
00:13:24,710 --> 00:13:22,560
are leading our dream chaser effort and

399
00:13:26,230 --> 00:13:24,720
we do this because it is a blend we

400
00:13:27,990 --> 00:13:26,240
think that it's important to take the

401
00:13:30,389 --> 00:13:28,000
best of nasa the best of industry the

402
00:13:32,310 --> 00:13:30,399
best of university as well as what we

403
00:13:33,910 --> 00:13:32,320
can do as a as a company and put them

404
00:13:35,030 --> 00:13:33,920
all together and make a very successful

405
00:13:36,870 --> 00:13:35,040
program

406
00:13:38,550 --> 00:13:36,880
if i'd like to give you a brief video to

407
00:13:52,710 --> 00:13:38,560
show you the reality of where we are

408
00:13:56,230 --> 00:13:55,030
our vehicle is made of cob of composite

409
00:13:58,790 --> 00:13:56,240
primarily

410
00:14:00,470 --> 00:13:58,800
and that composite is is put together to

411
00:14:51,990 --> 00:14:00,480
create one of the strongest space

412
00:14:56,069 --> 00:14:53,990
as we developed the program we developed

413
00:14:58,550 --> 00:14:56,079

a series of test vehicles before we

414
00:15:00,710 --> 00:14:58,560
built our first full-size

415
00:15:02,710 --> 00:15:00,720
flight test vehicle in our world this is

416
00:15:04,949 --> 00:15:02,720
the equivalent of our enterprise as

417
00:15:06,949 --> 00:15:04,959
shuttle did its work

418
00:15:08,949 --> 00:15:06,959
that work was done using another nasa

419
00:15:11,030 --> 00:15:08,959
center we brought it out to the dryden

420
00:15:14,550 --> 00:15:11,040
center in mojave which is where it did

421
00:15:16,870 --> 00:15:14,560
its several of its toe test ground tests

422
00:15:18,790 --> 00:15:16,880
as well as captive carry and its first

423
00:15:20,710 --> 00:15:18,800
free flight test

424
00:15:22,389 --> 00:15:20,720
using as we are talking about today a

425
00:15:24,710 --> 00:15:22,399
partnership a great partnership with

426
00:15:52,550 --> 00:15:24,720
nasa and dryden as well as the us air

427
00:15:52,560 --> 00:16:08,710
please

428
00:16:13,030 --> 00:16:11,110
we are quite fortunate on this

429
00:16:14,870 --> 00:16:13,040
on this effort for dreamchaser to really

430
00:16:17,110 --> 00:16:14,880
be able to be building what we think is

431
00:16:19,269 --> 00:16:17,120
america's dream team for space

432
00:16:22,470 --> 00:16:19,279
currently we have over 15 industrial

433
00:16:24,150 --> 00:16:22,480
companies seven nasa centers and several

434
00:16:25,829 --> 00:16:24,160
universities as part of our team and

435
00:16:27,590 --> 00:16:25,839
that and that is growing and the

436
00:16:29,590 --> 00:16:27,600
philosophy here is really quite simple

437
00:16:31,509 --> 00:16:29,600
we we looked at this and said if we can

438
00:16:32,790 --> 00:16:31,519

do it if we have the the ability

439
00:16:34,790 --> 00:16:32,800
internally to do it then we might

440
00:16:35,910 --> 00:16:34,800
consider doing it but if we don't we're

441
00:16:37,430 --> 00:16:35,920
not going to build in we're going to

442
00:16:39,269 --> 00:16:37,440
look to the outside and bring on the

443
00:16:41,030 --> 00:16:39,279
best of the best from from industry to

444
00:16:42,870 --> 00:16:41,040
to be able to help us

445
00:16:44,790 --> 00:16:42,880
this has really been a i think a

446
00:16:46,629 --> 00:16:44,800
terrific way for us to grow we we

447
00:16:48,389 --> 00:16:46,639
certainly have the best team in the

448
00:16:50,790 --> 00:16:48,399
country and we now represent employment

449
00:16:52,310 --> 00:16:50,800
and suppliers in over 30 states

450
00:16:54,710 --> 00:16:52,320
working for the dream chaser program

451
00:16:56,470 --> 00:16:54,720
including obviously here in alabama

452
00:16:58,069 --> 00:16:56,480
it's uh it's quite the collection and

453
00:16:59,990 --> 00:16:58,079
when i travel around the country i get

454
00:17:01,590 --> 00:17:00,000
to meet people who really are so

455
00:17:03,350 --> 00:17:01,600
thrilled to be part of the next

456
00:17:05,350 --> 00:17:03,360
generation of america's space program

457
00:17:06,630 --> 00:17:05,360
it's uh it's really quite rewarding to

458
00:17:08,870 --> 00:17:06,640
see that

459
00:17:11,189 --> 00:17:08,880
uh recently uh some of you may know that

460
00:17:12,870 --> 00:17:11,199
we we were down in florida making an

461
00:17:14,150 --> 00:17:12,880
announcement and what you see here is

462
00:17:15,909 --> 00:17:14,160
the atlas v

463
00:17:19,270 --> 00:17:15,919

rocket which is the rocket that will be

464
00:17:21,029 --> 00:17:19,280
taking us to space on our human flights

465
00:17:23,350 --> 00:17:21,039
in the background as the actual atlas

466
00:17:25,270 --> 00:17:23,360
and the foreground is is our vehicle

467
00:17:26,870 --> 00:17:25,280
standing on top of the rocket as it will

468
00:17:28,069 --> 00:17:26,880
look in the future and

469
00:17:31,350 --> 00:17:28,079
we're very fortunate to have

470
00:17:33,510 --> 00:17:31,360
administrator bolden there as well as

471
00:17:36,470 --> 00:17:33,520
bob cabana who runs the nasa center in

472
00:17:40,549 --> 00:17:36,480
florida steve lindsey and michael gas

473
00:17:43,510 --> 00:17:41,350
that

474
00:17:44,950 --> 00:17:43,520
announcement was the was a critical part

475
00:17:46,470 --> 00:17:44,960
in our juncture and one of the great

476
00:17:47,909 --> 00:17:46,480
things about doing this is that you

477
00:17:49,909 --> 00:17:47,919
spend a lot of time

478
00:17:51,350 --> 00:17:49,919
dreaming about what you do and we're now

479
00:17:53,190 --> 00:17:51,360
in the phase of bringing that dream into

480
00:17:54,870 --> 00:17:53,200
reality we made the announcement that we

481
00:17:57,909 --> 00:17:54,880
have acquired our first

482
00:18:00,390 --> 00:17:57,919
rocket to uh go to orbit and that launch

483
00:18:01,750 --> 00:18:00,400
date will be november 2016. what's

484
00:18:03,909 --> 00:18:01,760
particularly critical and i think is

485
00:18:06,070 --> 00:18:03,919
most important here is that that is a

486
00:18:08,070 --> 00:18:06,080
multi-state effort as well the rocket

487
00:18:09,990 --> 00:18:08,080
the atlas v is built here in alabama at

488
00:18:12,230 --> 00:18:10,000

the decatur facility

489
00:18:14,150 --> 00:18:12,240
and in our view uh from the launch side

490
00:18:16,390 --> 00:18:14,160
it's really a collective of being able

491
00:18:18,070 --> 00:18:16,400
to be designed in colorado the rocket is

492
00:18:20,630 --> 00:18:18,080
built in alabama and it's launched in

493
00:18:22,630 --> 00:18:20,640
florida and it's really in my view

494
00:18:24,710 --> 00:18:22,640
bringing american jobs bringing jobs

495
00:18:26,870 --> 00:18:24,720
back to america and really expanding our

496
00:18:28,390 --> 00:18:26,880
space industry our our goal and our

497
00:18:30,230 --> 00:18:28,400
target here is currently the united

498
00:18:32,070 --> 00:18:30,240
states is acquiring all its human space

499
00:18:33,430 --> 00:18:32,080
flight from the russian space program

500
00:18:35,270 --> 00:18:33,440
and while that has worked well and

501
00:18:37,029 --> 00:18:35,280
there's been no issues we think it's

502
00:18:38,470 --> 00:18:37,039
best to be able to bring those jobs

503
00:18:40,549 --> 00:18:38,480
bring that money back to the united

504
00:18:43,270 --> 00:18:40,559
states and bring those jobs back here to

505
00:18:45,350 --> 00:18:43,280
places like alabama and uh to allow us

506
00:18:46,710 --> 00:18:45,360
to to move forward and fly proudly the

507
00:18:51,190 --> 00:18:46,720
the work that we can build here in the

508
00:18:54,630 --> 00:18:53,029
what you uh sometimes in life you you

509
00:18:57,029 --> 00:18:54,640
get the the opportunity to do something

510
00:18:58,950 --> 00:18:57,039
special certainly flying space vehicles

511
00:19:00,549 --> 00:18:58,960
and building an america's next human

512
00:19:02,310 --> 00:19:00,559
space flight vehicle special but even

513
00:19:04,789 --> 00:19:02,320

more than that through a series of

514
00:19:07,909 --> 00:19:04,799
coincidences we had our first flight on

515
00:19:10,870 --> 00:19:07,919
october 26th of 20 2013

516
00:19:13,029 --> 00:19:10,880
that happened to be the exact time hour

517
00:19:15,350 --> 00:19:13,039
and place and location that the shuttle

518
00:19:17,430 --> 00:19:15,360
enterprise finished its career of five

519
00:19:18,630 --> 00:19:17,440
flights and it was really sort of one of

520
00:19:20,630 --> 00:19:18,640
those coincidences i couldn't have

521
00:19:22,070 --> 00:19:20,640
planned it was aided in part by the

522
00:19:23,990 --> 00:19:22,080
government shutdown

523
00:19:26,470 --> 00:19:24,000
and it just turned out that uh we we

524
00:19:27,830 --> 00:19:26,480
wound up flying on the same day that

525
00:19:29,990 --> 00:19:27,840
we uh

526
00:19:32,150 --> 00:19:30,000
it's uh it's one of those things we

527
00:19:34,630 --> 00:19:32,160
really do appreciate that support

528
00:19:36,950 --> 00:19:34,640
but i i put this up here because for us

529
00:19:38,870 --> 00:19:36,960
it really is that it was it was symbolic

530
00:19:41,110 --> 00:19:38,880
in a way that enterprise was meant to

531
00:19:42,950 --> 00:19:41,120
fly and test the shuttle and atmospheric

532
00:19:44,549 --> 00:19:42,960
conditions and our our vehicle this

533
00:19:46,870 --> 00:19:44,559
first vehicle was meant to do the same

534
00:19:48,950 --> 00:19:46,880
thing and as that program ended we felt

535
00:19:50,870 --> 00:19:48,960
we were the tortures being passed and we

536
00:19:52,870 --> 00:19:50,880
were picking it up and hopefully proudly

537
00:19:55,190 --> 00:19:52,880
carrying it to the future

538
00:19:57,190 --> 00:19:55,200

we uh sierra nevada is uh here in

539
00:19:58,870 --> 00:19:57,200
huntsville we've been here since 2012.

540
00:20:01,110 --> 00:19:58,880
we are expanding our presence here we're

541
00:20:02,070 --> 00:20:01,120
expecting a growth this year of about 25

542
00:20:03,750 --> 00:20:02,080
percent

543
00:20:05,750 --> 00:20:03,760
in the local area and we have multiple

544
00:20:08,070 --> 00:20:05,760
businesses here we have our integration

545
00:20:10,150 --> 00:20:08,080
integrated mission systems business here

546
00:20:12,390 --> 00:20:10,160
which does unmanned air aircraft systems

547
00:20:13,510 --> 00:20:12,400
and supports that many programs in that

548
00:20:15,669 --> 00:20:13,520
area we have a communication and

549
00:20:17,909 --> 00:20:15,679
navigation systems group here which is

550
00:20:20,070 --> 00:20:17,919
expanding things like automatic takeoff

551
00:20:21,669 --> 00:20:20,080
and landing and we are now obviously are

552
00:20:23,270 --> 00:20:21,679
expanding our space presence here so

553
00:20:25,590 --> 00:20:23,280
huntsville is becoming a critical part

554
00:20:27,350 --> 00:20:25,600
of our future

555
00:20:29,590 --> 00:20:27,360
what we're going to talk about today is

556
00:20:31,110 --> 00:20:29,600
really the the missions the potential

557
00:20:32,710 --> 00:20:31,120
missions the growth of missions for

558
00:20:34,549 --> 00:20:32,720
dream chaser and we look at those in

559
00:20:37,190 --> 00:20:34,559
really three different ways

560
00:20:39,270 --> 00:20:37,200
servicing in space doing extended

561
00:20:41,510 --> 00:20:39,280
science and space and being able to

562
00:20:43,990 --> 00:20:41,520
really understand and

563
00:20:45,350 --> 00:20:44,000

be able to utilize the technologies that

564
00:20:47,029 --> 00:20:45,360
are built here on

565
00:20:52,470 --> 00:20:47,039
in places like alabama for doing

566
00:20:55,909 --> 00:20:53,909
and i'd like to

567
00:20:58,149 --> 00:20:55,919
stop there and we'll we'll be able to

568
00:21:00,230 --> 00:20:58,159
come back to the rest of this but we are

569
00:21:01,830 --> 00:21:00,240
announcing today an expansion of our

570
00:21:03,350 --> 00:21:01,840
relationship with the marshall space

571
00:21:05,669 --> 00:21:03,360
flight center we have been working

572
00:21:06,789 --> 00:21:05,679
together now for uh well over two almost

573
00:21:08,549 --> 00:21:06,799
two years

574
00:21:10,230 --> 00:21:08,559
and we really are looking to the future

575
00:21:11,990 --> 00:21:10,240
and saying what we can do together how

576
00:21:14,070 --> 00:21:12,000
we can work together how can we utilize

577
00:21:16,230 --> 00:21:14,080
the great people here at marshall and

578
00:21:17,669 --> 00:21:16,240
and the work that's being done and

579
00:21:19,190 --> 00:21:17,679
really be able to

580
00:21:21,430 --> 00:21:19,200
advance the different mission concepts

581
00:21:22,950 --> 00:21:21,440
that we have for for dream chaser we're

582
00:21:24,710 --> 00:21:22,960
concurrently bringing on board and

583
00:21:27,110 --> 00:21:24,720
expanding our relationship with teledine

584
00:21:28,390 --> 00:21:27,120
brown and the rest of this conference is

585
00:21:29,669 --> 00:21:28,400
really going to talk about those two

586
00:21:31,830 --> 00:21:29,679
relationships but they are really

587
00:21:33,270 --> 00:21:31,840
symbolic of of our effort and what we're

588
00:21:36,070 --> 00:21:33,280

trying to do here

589
00:21:39,110 --> 00:21:36,080
i'd like to um start by uh introducing

590
00:21:41,669 --> 00:21:39,120
taylor brown and rex sitting here in my

591
00:21:44,149 --> 00:21:41,679
left really is no introduction necessary

592
00:21:45,270 --> 00:21:44,159
for this company

593
00:21:47,590 --> 00:21:45,280
now over

594
00:21:49,270 --> 00:21:47,600
since 1953

595
00:21:51,190 --> 00:21:49,280
the elements of teledyne have been doing

596
00:21:53,350 --> 00:21:51,200
work on our space program and pretty

597
00:21:55,350 --> 00:21:53,360
much anything that has touched the space

598
00:21:56,230 --> 00:21:55,360
program this organization has has

599
00:21:57,750 --> 00:21:56,240
touched

600
00:21:59,830 --> 00:21:57,760
really has been one of the premier

601
00:22:01,669 --> 00:21:59,840
engineering firms that has been involved

602
00:22:03,909 --> 00:22:01,679
in all the the major historic movements

603
00:22:05,510 --> 00:22:03,919
forward of of nasa and the space program

604
00:22:07,350 --> 00:22:05,520
and we're so fortunate to be able to

605
00:22:09,350 --> 00:22:07,360
have them come on board and and help us

606
00:22:10,710 --> 00:22:09,360
and move us forward most importantly i

607
00:22:12,710 --> 00:22:10,720
think someone like

608
00:22:14,470 --> 00:22:12,720
rex who's given his heart and soul to

609
00:22:16,549 --> 00:22:14,480
this industry and is a terrific leader

610
00:22:18,070 --> 00:22:16,559
for this organization and and really for

611
00:22:20,310 --> 00:22:18,080
our industry i'm very proud to be able

612
00:22:21,990 --> 00:22:20,320
to to have him join our team and and to

613
00:22:24,149 --> 00:22:22,000

make sure that i stay online and kick me

614
00:22:25,510 --> 00:22:24,159
in the rear end if i don't so rex i'd

615
00:22:26,870 --> 00:22:25,520
like to turn it over to you and maybe we

616
00:22:27,909 --> 00:22:26,880
can talk a little bit thank you thank

617
00:22:29,669 --> 00:22:27,919
you mark

618
00:22:31,830 --> 00:22:29,679
uh first i'd like to thank uh by the way

619
00:22:33,350 --> 00:22:31,840
welcome uh good morning to all of you

620
00:22:34,870 --> 00:22:33,360
i'd like to thank nasa marshall for

621
00:22:36,870 --> 00:22:34,880
hosting this event

622
00:22:39,190 --> 00:22:36,880
uh it's personally and professionally

623
00:22:41,590 --> 00:22:39,200
gratifying for me to make connections

624
00:22:43,190 --> 00:22:41,600
back here in huntsville and i thought it

625
00:22:44,789 --> 00:22:43,200
was uh

626
00:22:46,230 --> 00:22:44,799
sort of interesting and coincidental to

627
00:22:47,830 --> 00:22:46,240
be sharing the press table with paul

628
00:22:49,909 --> 00:22:47,840
gilbert here we talked about this last

629
00:22:52,310 --> 00:22:49,919
night but paul and i started our nasa

630
00:22:54,070 --> 00:22:52,320
careers almost exactly the same time he

631
00:22:55,510 --> 00:22:54,080
was integrating missions for space lab

632
00:22:57,590 --> 00:22:55,520
and i was trying to develop payloads for

633
00:22:59,190 --> 00:22:57,600
some of those same space lab missions

634
00:23:00,630 --> 00:22:59,200
and it's interesting that that common

635
00:23:02,710 --> 00:23:00,640
ground brings us back together here

636
00:23:04,789 --> 00:23:02,720
today so so good to be sitting here with

637
00:23:07,669 --> 00:23:04,799
paul now i wanted to thank mark

638
00:23:09,750 --> 00:23:07,679

uh sarangalo from sierra nevada for

639
00:23:11,110 --> 00:23:09,760
inviting us to participate in this event

640
00:23:12,710 --> 00:23:11,120
i thought it was

641
00:23:14,710 --> 00:23:12,720
an especially generous gesture on your

642
00:23:16,310 --> 00:23:14,720
part mark so thanks for having us

643
00:23:19,029 --> 00:23:16,320
participate in this exciting team with

644
00:23:22,149 --> 00:23:19,039
you mark and i met at the u.s

645
00:23:23,430 --> 00:23:22,159
german aerospace roundtable last fall in

646
00:23:24,710 --> 00:23:23,440
germany and we were both over there

647
00:23:26,950 --> 00:23:24,720
trying to build

648
00:23:28,870 --> 00:23:26,960
our international space portfolio

649
00:23:30,470 --> 00:23:28,880
portfolios if you will trying to

650
00:23:32,950 --> 00:23:30,480
establish some interesting relationships

651
00:23:35,350 --> 00:23:32,960
with the german space agency dlr

652
00:23:37,750 --> 00:23:35,360
and so we find that we have some common

653
00:23:39,750 --> 00:23:37,760
ground in other areas as well so

654
00:23:41,190 --> 00:23:39,760
so thank you mark for having us do this

655
00:23:42,549 --> 00:23:41,200
there are two dimensions to our

656
00:23:44,470 --> 00:23:42,559
relationship to

657
00:23:46,470 --> 00:23:44,480
sierra nevada on this

658
00:23:48,070 --> 00:23:46,480
with regard to the dream chaser program

659
00:23:49,350 --> 00:23:48,080
last fall we executed a teaming

660
00:23:52,630 --> 00:23:49,360
agreement

661
00:23:54,149 --> 00:23:52,640
with uh with sierra nevada to

662
00:23:56,149 --> 00:23:54,159
for the follow-on commercial crew

663
00:23:57,750 --> 00:23:56,159

program which is still in competition

664
00:23:59,590 --> 00:23:57,760
and per that agreement we will be the

665
00:24:01,830 --> 00:23:59,600
preferred provider for the dream lab

666
00:24:03,430 --> 00:24:01,840
science payload and cargo integration

667
00:24:05,270 --> 00:24:03,440
uh and so we're very pleased to join the

668
00:24:06,630 --> 00:24:05,280
dream chaser team with with some of the

669
00:24:08,789 --> 00:24:06,640
well-regarded companies that mark

670
00:24:11,029 --> 00:24:08,799
already mentioned and also uh some

671
00:24:13,029 --> 00:24:11,039
interesting university partners as well

672
00:24:14,310 --> 00:24:13,039
and then second we're engaged in the in

673
00:24:16,549 --> 00:24:14,320
the mission scenario planning and

674
00:24:18,470 --> 00:24:16,559
analysis through the space act agreement

675
00:24:19,830 --> 00:24:18,480
that mark referenced earlier with the

676
00:24:21,669 --> 00:24:19,840
marshall space flight center so they

677
00:24:23,110 --> 00:24:21,679
have a relationship to marshall we have

678
00:24:24,950 --> 00:24:23,120
a relationship to marshall and through

679
00:24:26,950 --> 00:24:24,960
that we're able to do some of this

680
00:24:28,549 --> 00:24:26,960
mission planning and mission analysis

681
00:24:31,110 --> 00:24:28,559
that will be interesting and important

682
00:24:32,710 --> 00:24:31,120
for the future of the program

683
00:24:34,070 --> 00:24:32,720
mark talked about it already in one of

684
00:24:35,590 --> 00:24:34,080
his charts but we're looking at some

685
00:24:36,789 --> 00:24:35,600
very interesting mission scenarios

686
00:24:38,390 --> 00:24:36,799
including

687
00:24:40,549 --> 00:24:38,400
performing science wild dock to the

688
00:24:42,230 --> 00:24:40,559

space station satellite servicing

689
00:24:44,230 --> 00:24:42,240
mission sorting missions that do science

690
00:24:46,870 --> 00:24:44,240
independent of the space station so this

691
00:24:48,549 --> 00:24:46,880
vehicle is capable of a lot of different

692
00:24:50,310 --> 00:24:48,559
interesting mission profiles and we're

693
00:24:52,789 --> 00:24:50,320
helping to assess that and work through

694
00:24:54,390 --> 00:24:52,799
those scenarios with the company

695
00:24:56,070 --> 00:24:54,400
it was mainly our rich history that's

696
00:24:57,750 --> 00:24:56,080
already been alluded to here but our

697
00:24:59,029 --> 00:24:57,760
rich history and payload development and

698
00:25:00,870 --> 00:24:59,039
integration that connected us to the

699
00:25:03,029 --> 00:25:00,880
dream chaser program

700
00:25:04,390 --> 00:25:03,039
we do have a 55-year history in human

701
00:25:06,149 --> 00:25:04,400
space flight that goes all the way back

702
00:25:08,310 --> 00:25:06,159
to explorer one

703
00:25:11,190 --> 00:25:08,320
many of you in the room will know that

704
00:25:13,990 --> 00:25:11,200
nasa launched a satellite in january of

705
00:25:15,669 --> 00:25:14,000
1958 in response to sputnik it was

706
00:25:17,990 --> 00:25:15,679
really sputnik is really what led to the

707
00:25:19,909 --> 00:25:18,000
creation of nasa through the space act

708
00:25:21,510 --> 00:25:19,919
and uh brown engineering as it was known

709
00:25:23,510 --> 00:25:21,520
back in those days was involved in the

710
00:25:25,110 --> 00:25:23,520
integration of that payload so

711
00:25:26,950 --> 00:25:25,120
our integra our payload integration

712
00:25:28,470 --> 00:25:26,960
capability in history goes literally

713
00:25:30,230 --> 00:25:28,480

back to the very first

714
00:25:31,990 --> 00:25:30,240
u.s satellite ever to be put in orbit

715
00:25:34,470 --> 00:25:32,000
and we're proud of that fact

716
00:25:35,990 --> 00:25:34,480
we've been working with nasa in nasa

717
00:25:38,230 --> 00:25:36,000
marshall in particular in this payload

718
00:25:39,909 --> 00:25:38,240
integration activity for all these years

719
00:25:41,750 --> 00:25:39,919
we were involved with the integration

720
00:25:43,350 --> 00:25:41,760
and operation of over 20 different space

721
00:25:46,549 --> 00:25:43,360
lab missions

722
00:25:48,310 --> 00:25:46,559
that occurred between 1983 and 1998

723
00:25:50,149 --> 00:25:48,320
we are the team with nasa that has

724
00:25:52,149 --> 00:25:50,159
performed payload operation science

725
00:25:54,390 --> 00:25:52,159
operations on the international space

726
00:25:56,310 --> 00:25:54,400
station for the last 15 years

727
00:25:58,230 --> 00:25:56,320
that's what we do so payload operations

728
00:26:00,310 --> 00:25:58,240
payload integration is really really

729
00:26:03,190 --> 00:26:00,320
where we live and we're glad to be able

730
00:26:06,390 --> 00:26:03,200
to translate that capability uh to to

731
00:26:10,230 --> 00:26:08,070
uh and finally i will offer that

732
00:26:12,950 --> 00:26:10,240
teledyne brown i would say uh and

733
00:26:14,470 --> 00:26:12,960
teledon uh largely embraces the

734
00:26:15,750 --> 00:26:14,480
particular kind of commercial business

735
00:26:18,310 --> 00:26:15,760
model that we see

736
00:26:20,390 --> 00:26:18,320
sierra nevada undertaking here with nasa

737
00:26:22,230 --> 00:26:20,400
uh we find it i i find it easy to

738
00:26:24,149 --> 00:26:22,240

endorse a program that's

739
00:26:26,549 --> 00:26:24,159
that has a symbiotic nature to it where

740
00:26:28,789 --> 00:26:26,559
we depend upon one another i think mark

741
00:26:30,230 --> 00:26:28,799
put it extremely well when he said space

742
00:26:31,750 --> 00:26:30,240
is a team sport

743
00:26:33,350 --> 00:26:31,760
we believe that to be the case and the

744
00:26:36,630 --> 00:26:33,360
challenges that are brought about by

745
00:26:38,310 --> 00:26:36,640
space require complex solutions require

746
00:26:39,830 --> 00:26:38,320
integrated teams and great efforts and

747
00:26:42,870 --> 00:26:39,840
so uh that's the way that we see this

748
00:26:44,710 --> 00:26:42,880
one going uh to cite an example telodyne

749
00:26:46,789 --> 00:26:44,720
um has a program has a space act

750
00:26:49,190 --> 00:26:46,799
agreement actually with with nasa to put

751
00:26:50,710 --> 00:26:49,200
a commercial space imaging platform on

752
00:26:52,870 --> 00:26:50,720
the international space station we call

753
00:26:54,230 --> 00:26:52,880
that the muses program where we'll be

754
00:26:55,669 --> 00:26:54,240
running a commercial business doing

755
00:26:57,990 --> 00:26:55,679
earth imaging

756
00:27:01,110 --> 00:26:58,000
we've built a ground operations center

757
00:27:02,789 --> 00:27:01,120
here at our teledyne brown side on 300

758
00:27:04,630 --> 00:27:02,799
sparkman drive

759
00:27:06,310 --> 00:27:04,640
to take the data to do the data analysis

760
00:27:08,470 --> 00:27:06,320
and distribute the data and we've talked

761
00:27:11,510 --> 00:27:08,480
with snc about using that same

762
00:27:13,110 --> 00:27:11,520
capability on the dreamchaser program

763
00:27:14,789 --> 00:27:13,120

the point is that we're finding

764
00:27:16,630 --> 00:27:14,799
interesting ways to work together with

765
00:27:19,430 --> 00:27:16,640
each other with nasa

766
00:27:21,190 --> 00:27:19,440
and even with other governments like dlr

767
00:27:23,750 --> 00:27:21,200
to tackle the complex challenges that

768
00:27:25,190 --> 00:27:23,760
space offers to us so again very pleased

769
00:27:26,149 --> 00:27:25,200
to be a part of this event part of this

770
00:27:27,909 --> 00:27:26,159
team and

771
00:27:28,870 --> 00:27:27,919
thank you mark and back to you thank you

772
00:27:30,630 --> 00:27:28,880
rex

773
00:27:32,230 --> 00:27:30,640
one of the reasons that we think that

774
00:27:33,830 --> 00:27:32,240
this is so important is that dreamchaser

775
00:27:35,669 --> 00:27:33,840
has a lot of attributes but it is a

776
00:27:38,070 --> 00:27:35,679
runway landing vehicle and it brings

777
00:27:39,510 --> 00:27:38,080
things home from space with very low

778
00:27:41,350 --> 00:27:39,520
g-forces

779
00:27:43,110 --> 00:27:41,360
what we do at the iss what we do in

780
00:27:44,710 --> 00:27:43,120
low-earth orbit is really not

781
00:27:46,390 --> 00:27:44,720
observation right now we're not there

782
00:27:48,230 --> 00:27:46,400
only to take pictures that people can

783
00:27:50,310 --> 00:27:48,240
see we're there to do real science and

784
00:27:52,470 --> 00:27:50,320
real research and being able to bring

785
00:27:54,470 --> 00:27:52,480
that real science home bring it home to

786
00:27:56,549 --> 00:27:54,480
a runway bring it home with the least

787
00:27:58,310 --> 00:27:56,559
disruptive force possible enables that

788
00:27:59,430 --> 00:27:58,320

science really to to move to the next

789
00:28:01,510 --> 00:27:59,440
level

790
00:28:03,590 --> 00:28:01,520
and as part of this as as rex mentioned

791
00:28:06,149 --> 00:28:03,600
we're looking at how we can maximize the

792
00:28:08,070 --> 00:28:06,159
utility of the vehicle once once we are

793
00:28:09,750 --> 00:28:08,080
starting to operate in low earth orbit

794
00:28:10,630 --> 00:28:09,760
in a couple of years

795
00:28:12,230 --> 00:28:10,640
we

796
00:28:14,470 --> 00:28:12,240
have had a similar wonderful

797
00:28:16,789 --> 00:28:14,480
relationship developing with nasa

798
00:28:18,070 --> 00:28:16,799
centers around the country and and here

799
00:28:19,669 --> 00:28:18,080
in huntsville we started our

800
00:28:22,789 --> 00:28:19,679
relationship with the nasa space

801
00:28:24,230 --> 00:28:22,799
marshall space flight center in 2012

802
00:28:26,310 --> 00:28:24,240
when we started doing some really

803
00:28:28,310 --> 00:28:26,320
critical work with wind tunnel

804
00:28:29,669 --> 00:28:28,320
examination is the is the vehicle going

805
00:28:31,990 --> 00:28:29,679
to fly the way we think it's going to

806
00:28:33,990 --> 00:28:32,000
fly and the the terrific people here at

807
00:28:36,070 --> 00:28:34,000
marshall helped us down that road prove

808
00:28:37,909 --> 00:28:36,080
that our concept and it began

809
00:28:38,870 --> 00:28:37,919
the road that we we now continue on

810
00:28:41,190 --> 00:28:38,880
today

811
00:28:43,510 --> 00:28:41,200
uh the dinner the data generated really

812
00:28:45,350 --> 00:28:43,520
enabled us to understand that yes we can

813
00:28:47,350 --> 00:28:45,360

do this we can't fly we can do what we

814
00:28:49,110 --> 00:28:47,360
need to do and and we're quite fortunate

815
00:28:51,590 --> 00:28:49,120
to have the really the best people here

816
00:28:53,190 --> 00:28:51,600
at marshall be able to work on that

817
00:28:54,710 --> 00:28:53,200
as we continue on we're looking at

818
00:28:57,190 --> 00:28:54,720
science missions for dream chaser what

819
00:28:59,510 --> 00:28:57,200
we can do and again we think that the

820
00:29:01,750 --> 00:28:59,520
space flight center here in

821
00:29:03,830 --> 00:29:01,760
huntsville has a capability of taking us

822
00:29:06,630 --> 00:29:03,840
to the next level

823
00:29:07,669 --> 00:29:06,640
really when you think about payloads

824
00:29:09,190 --> 00:29:07,679
you really have to think about

825
00:29:11,029 --> 00:29:09,200
huntsville and nasa and huntsville

826
00:29:12,870 --> 00:29:11,039
there's been now

827
00:29:14,389 --> 00:29:12,880
operations for over well over 100

828
00:29:16,310 --> 00:29:14,399
different instruments and many many

829
00:29:18,070 --> 00:29:16,320
different programs here and as we

830
00:29:20,310 --> 00:29:18,080
started looking at how could dream

831
00:29:21,750 --> 00:29:20,320
chaser be a supplement to what's going

832
00:29:23,190 --> 00:29:21,760
on in low earth orbit we certainly

833
00:29:24,389 --> 00:29:23,200
wanted to be able to have the best of

834
00:29:26,549 --> 00:29:24,399
that

835
00:29:29,190 --> 00:29:26,559
technology most of those people join us

836
00:29:31,669 --> 00:29:29,200
on this on this effort uh dream chaser

837
00:29:33,830 --> 00:29:31,679
is is a program that really we think is

838
00:29:35,510 --> 00:29:33,840

is a continuation of not only what the

839
00:29:37,510 --> 00:29:35,520
shuttle was doing but an extension of

840
00:29:39,590 --> 00:29:37,520
what we're doing at the on the iss and

841
00:29:41,110 --> 00:29:39,600
low earth orbit so i'd like to turn it

842
00:29:43,350 --> 00:29:41,120
over to someone whose name i can't

843
00:29:44,870 --> 00:29:43,360
forget since it's mark

844
00:29:47,029 --> 00:29:44,880
and have him tell us a little bit more

845
00:29:49,269 --> 00:29:47,039
about uh what we're doing here in in

846
00:29:51,029 --> 00:29:49,279
huntsville and in his operation and

847
00:29:52,950 --> 00:29:51,039
certainly the long history that that he

848
00:29:54,710 --> 00:29:52,960
and the center has in reaching out in

849
00:29:56,549 --> 00:29:54,720
partnerships like this mark yeah thank

850
00:29:57,430 --> 00:29:56,559
you mark i want to wish everybody a good

851
00:29:59,669 --> 00:29:57,440
morning

852
00:30:01,110 --> 00:29:59,679
um you know as an engineer uh it's

853
00:30:04,070 --> 00:30:01,120
always a good day when you get to work

854
00:30:07,029 --> 00:30:04,080
with highly motivated highly innovative

855
00:30:08,470 --> 00:30:07,039
people like the folks at sierra nevada

856
00:30:10,470 --> 00:30:08,480
the mission operations lab here at

857
00:30:11,510 --> 00:30:10,480
marshall space flight center has a long

858
00:30:14,630 --> 00:30:11,520
history

859
00:30:16,389 --> 00:30:14,640
of being what i call science enablers

860
00:30:18,630 --> 00:30:16,399
we're not the scientists but we've done

861
00:30:21,110 --> 00:30:18,640
a lot through the years to really

862
00:30:22,950 --> 00:30:21,120
enhance and advocate for and bring home

863
00:30:25,269 --> 00:30:22,960

the science for a lot of

864
00:30:28,389 --> 00:30:25,279
uh scientists at universities in private

865
00:30:31,750 --> 00:30:28,399
industry and within the agency itself um

866
00:30:34,389 --> 00:30:31,760
and uh this this stretches way back um

867
00:30:36,789 --> 00:30:34,399
space lab was where i eventually got

868
00:30:38,149 --> 00:30:36,799
involved as i was coming along in my

869
00:30:39,190 --> 00:30:38,159
career and

870
00:30:40,870 --> 00:30:39,200
we had a

871
00:30:42,870 --> 00:30:40,880
very successful program there that

872
00:30:44,149 --> 00:30:42,880
evolved into the international space

873
00:30:46,549 --> 00:30:44,159
station

874
00:30:48,549 --> 00:30:46,559
the mission operations lab really leads

875
00:30:49,909 --> 00:30:48,559
the payload operations integration

876
00:30:52,710 --> 00:30:49,919
efforts

877
00:30:54,950 --> 00:30:52,720
for the international space station and

878
00:30:57,350 --> 00:30:54,960
provides really the mission planning and

879
00:30:59,029 --> 00:30:57,360
the overall

880
00:31:01,669 --> 00:30:59,039
goals priorities

881
00:31:03,269 --> 00:31:01,679
helps execute what happens in terms of

882
00:31:05,669 --> 00:31:03,279
science on the international space

883
00:31:08,470 --> 00:31:05,679
station

884
00:31:09,750 --> 00:31:08,480
when you look at the the dream chaser uh

885
00:31:11,590 --> 00:31:09,760
vehicle

886
00:31:13,590 --> 00:31:11,600
she just begs the question of what more

887
00:31:15,909 --> 00:31:13,600
can she do she's she's designed for the

888
00:31:18,149 --> 00:31:15,919

commercial crew commercial cargo

889
00:31:20,070 --> 00:31:18,159
functions but when you start looking at

890
00:31:22,710 --> 00:31:20,080
or you think okay there are other things

891
00:31:24,870 --> 00:31:22,720
and so sierra nevada has come to us

892
00:31:28,070 --> 00:31:24,880
primarily because of our

893
00:31:29,430 --> 00:31:28,080
long experience in enabling science and

894
00:31:31,590 --> 00:31:29,440
our understanding of the kinds of

895
00:31:33,669 --> 00:31:31,600
payloads we've seen through the years

896
00:31:34,870 --> 00:31:33,679
the kind of capabilities that a vehicle

897
00:31:36,230 --> 00:31:34,880
will need

898
00:31:38,070 --> 00:31:36,240
some of the

899
00:31:39,669 --> 00:31:38,080
criteria for

900
00:31:40,470 --> 00:31:39,679
different kinds of science missions

901
00:31:42,630 --> 00:31:40,480
whether you're talking about

902
00:31:44,149 --> 00:31:42,640
microgravity science in the materials

903
00:31:45,669 --> 00:31:44,159
world or whether you're talking about

904
00:31:47,190 --> 00:31:45,679
life sciences

905
00:31:48,389 --> 00:31:47,200
and so we're going to be working with

906
00:31:50,710 --> 00:31:48,399
them

907
00:31:52,630 --> 00:31:50,720
it's really a team effort to to define

908
00:31:53,830 --> 00:31:52,640
mission profiles that make sense for

909
00:31:56,070 --> 00:31:53,840
their vehicle

910
00:31:57,990 --> 00:31:56,080
and give them an opportunity to go back

911
00:31:59,190 --> 00:31:58,000
and and really decide

912
00:32:01,909 --> 00:31:59,200
in the long run how they're going to

913
00:32:03,990 --> 00:32:01,919

output this vehicle for science uh both

914
00:32:05,350 --> 00:32:04,000
in attach station mode potentially and

915
00:32:07,190 --> 00:32:05,360
in sorting mode

916
00:32:08,230 --> 00:32:07,200
so that i'll talk about you mark thank

917
00:32:09,830 --> 00:32:08,240
you mark

918
00:32:11,110 --> 00:32:09,840
uh as we uh

919
00:32:12,630 --> 00:32:11,120
conclude this we'll open up for

920
00:32:14,549 --> 00:32:12,640
questions here in a second but i i'd

921
00:32:16,389 --> 00:32:14,559
like to just end by saying

922
00:32:17,029 --> 00:32:16,399
thank you to to you all for showing up

923
00:32:20,149 --> 00:32:17,039
and

924
00:32:22,630 --> 00:32:20,159
in us when i first started coming here

925
00:32:24,789 --> 00:32:22,640
we noticed that the the cars license

926
00:32:26,710 --> 00:32:24,799
tags said stars fell on

927
00:32:28,710 --> 00:32:26,720
on alabama and

928
00:32:30,549 --> 00:32:28,720
i think we take that literally in space

929
00:32:32,470 --> 00:32:30,559
because we we look at the stars a lot

930
00:32:34,549 --> 00:32:32,480
but i think beyond that it's more than

931
00:32:36,630 --> 00:32:34,559
just the the thought of looking at stars

932
00:32:39,029 --> 00:32:36,640
it's the people involved and really what

933
00:32:41,350 --> 00:32:39,039
we we are doing is bringing the stars of

934
00:32:42,789 --> 00:32:41,360
our industry together and certainly

935
00:32:44,950 --> 00:32:42,799
huntsville and al and the rest of

936
00:32:46,870 --> 00:32:44,960
alabama is going to be a continued a

937
00:32:48,630 --> 00:32:46,880
really significant part of our of our

938
00:32:50,789 --> 00:32:48,640

program and i'd like to

939
00:32:53,110 --> 00:32:50,799
extend my appreciation to my to my

940
00:32:54,549 --> 00:32:53,120
guests here and to nasa for hosting this

941
00:32:55,750 --> 00:32:54,559
and for all the people behind here

942
00:32:56,549 --> 00:32:55,760
because it's it's really been a

943
00:32:58,710 --> 00:32:56,559
collective effort with the

944
00:33:00,630 --> 00:32:58,720
communications department as well so

945
00:33:02,870 --> 00:33:00,640
we'll take some questions now

946
00:33:06,310 --> 00:33:02,880
okay and we just would like to thank our

947
00:33:08,870 --> 00:33:06,320
panel for um talking to us today and now

948
00:33:22,950 --> 00:33:08,880
we will open it up to the media that is

949
00:33:26,789 --> 00:33:25,029
you you talk about the

950
00:33:29,110 --> 00:33:26,799
huntsville the rest of alabama being

951
00:33:31,590 --> 00:33:29,120
very key when it comes to economic

952
00:33:33,029 --> 00:33:31,600
development and scientific contributions

953
00:33:35,029 --> 00:33:33,039
can you go into more detail about how

954
00:33:36,630 --> 00:33:35,039
you'll be utilizing and what

955
00:33:39,190 --> 00:33:36,640
specifically you'll be doing in this

956
00:33:41,590 --> 00:33:39,200
partnership with uah with hudson alpha

957
00:33:44,149 --> 00:33:41,600
institute for biotechnology and other

958
00:33:47,750 --> 00:33:44,159
local corporations sure

959
00:33:48,789 --> 00:33:47,760
i i think just to to start we

960
00:33:50,310 --> 00:33:48,799
as i mentioned we're going to be

961
00:33:53,190 --> 00:33:50,320
building our rocket here which is a big

962
00:33:54,870 --> 00:33:53,200
deal and that's certainly a an important

963
00:33:56,549 --> 00:33:54,880

element of our starting but what we're

964
00:33:57,990 --> 00:33:56,559
looking at doing the space the dream

965
00:33:59,830 --> 00:33:58,000
chaser essentially

966
00:34:01,430 --> 00:33:59,840
is you can think of it as a mobile

967
00:34:02,710 --> 00:34:01,440
science lab much like we have on the

968
00:34:05,269 --> 00:34:02,720
space station

969
00:34:07,509 --> 00:34:05,279
it has the capability of doing on orbit

970
00:34:08,790 --> 00:34:07,519
research in a variety of different ways

971
00:34:10,149 --> 00:34:08,800
and we think one of the most critical

972
00:34:11,669 --> 00:34:10,159
ways to do that is looking at the whole

973
00:34:13,669 --> 00:34:11,679
bioscience area

974
00:34:15,909 --> 00:34:13,679
to be able to understand

975
00:34:17,589 --> 00:34:15,919
things in space that we can't do here on

976
00:34:19,030 --> 00:34:17,599
earth and that is what's being done in

977
00:34:20,869 --> 00:34:19,040
part on the space station but there are

978
00:34:22,389 --> 00:34:20,879
a lot of experiments that really don't

979
00:34:24,710 --> 00:34:22,399
need the long duration work that's on

980
00:34:26,069 --> 00:34:24,720
the station or perhaps aren't best used

981
00:34:28,149 --> 00:34:26,079
on the station so we think we can be

982
00:34:29,990 --> 00:34:28,159
supplementing that what we found here in

983
00:34:31,430 --> 00:34:30,000
alabama through the organizations that

984
00:34:33,990 --> 00:34:31,440
you mentioned is that there's a terrific

985
00:34:36,069 --> 00:34:34,000
knowledge base of already how to connect

986
00:34:37,669 --> 00:34:36,079
that type of research with the type of

987
00:34:39,270 --> 00:34:37,679
research we might do in leo and we're

988
00:34:41,190 --> 00:34:39,280

exploring how do we put those two

989
00:34:43,030 --> 00:34:41,200
together how do we make those

990
00:34:44,550 --> 00:34:43,040
that type of research enabled by the

991
00:34:46,069 --> 00:34:44,560
dream chaser and by what we're trying to

992
00:34:48,149 --> 00:34:46,079
accomplish and the gentleman here at the

993
00:34:49,669 --> 00:34:48,159
table and their organizations are really

994
00:34:51,270 --> 00:34:49,679
going to help facilitate the

995
00:34:53,510 --> 00:34:51,280
construction of what that might look

996
00:34:55,030 --> 00:34:53,520
like inside the vehicle as well as then

997
00:34:56,629 --> 00:34:55,040
we're reaching out to the organization

998
00:34:58,150 --> 00:34:56,639
saying saying what experiments might

999
00:34:59,430 --> 00:34:58,160
they be able to do if we had this

1000
00:35:01,829 --> 00:34:59,440
capacity

1001
00:35:03,750 --> 00:35:01,839
how many companies though and how many

1002
00:35:06,230 --> 00:35:03,760
institutions are we talking about can

1003
00:35:07,270 --> 00:35:06,240
you talk about that as well as dollars

1004
00:35:08,870 --> 00:35:07,280
and people

1005
00:35:10,630 --> 00:35:08,880
uh i really can't yet listen i'll be

1006
00:35:12,310 --> 00:35:10,640
honest we're beginning this this

1007
00:35:14,790 --> 00:35:12,320
dialogue we are reaching out to the

1008
00:35:16,470 --> 00:35:14,800
organizations this is i would i would

1009
00:35:18,230 --> 00:35:16,480
consider this the kickoff point for what

1010
00:35:19,829 --> 00:35:18,240
we're trying to accomplish

1011
00:35:21,510 --> 00:35:19,839
we could we could project but then that

1012
00:35:22,870 --> 00:35:21,520
wouldn't be honest so we'd rather come

1013
00:35:24,069 --> 00:35:22,880

out and say that we're starting the

1014
00:35:26,310 --> 00:35:24,079
dialogue with these important

1015
00:35:28,069 --> 00:35:26,320
organizations and really trying to look

1016
00:35:29,510 --> 00:35:28,079
at what's the best way to move forward

1017
00:35:30,870 --> 00:35:29,520
hopefully you'll come back to the next

1018
00:35:32,870 --> 00:35:30,880
level of conference we'll have where

1019
00:35:35,430 --> 00:35:32,880
i'll be able to to outline those more

1020
00:35:36,950 --> 00:35:35,440
more in uh specifics but really we now

1021
00:35:39,190 --> 00:35:36,960
are starting to fly the dream chaser and

1022
00:35:41,030 --> 00:35:39,200
once we start flying we then can look at

1023
00:35:43,270 --> 00:35:41,040
what else can we do what missions can we

1024
00:35:45,190 --> 00:35:43,280
accomplish what concepts can we work at

1025
00:35:47,430 --> 00:35:45,200
and today's organization is to take us

1026
00:35:49,190 --> 00:35:47,440
to the next level both on the design of

1027
00:35:56,950 --> 00:35:49,200
the vehicle as well as the beginnings of

1028
00:35:56,960 --> 00:35:57,589
of board

1029
00:36:01,990 --> 00:35:59,750
that folks in your corporation and here

1030
00:36:04,069 --> 00:36:02,000
at marshall and and telegram brown

1031
00:36:06,550 --> 00:36:04,079
exhibit and uh you know for the

1032
00:36:09,750 --> 00:36:06,560
non-space professional for

1033
00:36:11,109 --> 00:36:09,760
uh you know the average joe blow the

1034
00:36:13,910 --> 00:36:11,119
average citizen

1035
00:36:16,069 --> 00:36:13,920
who may hear commercial space and

1036
00:36:17,750 --> 00:36:16,079
commercial as opposed to what or you

1037
00:36:19,349 --> 00:36:17,760
know may not exactly know exactly what

1038
00:36:21,510 --> 00:36:19,359

we're dealing with here

1039
00:36:22,870 --> 00:36:21,520
can you explain why these days you know

1040
00:36:25,109 --> 00:36:22,880
in an era where you know nasa is

1041
00:36:27,750 --> 00:36:25,119
essentially having to

1042
00:36:29,270 --> 00:36:27,760
validate themselves and you know can you

1043
00:36:31,270 --> 00:36:29,280
can you talk about why these

1044
00:36:34,310 --> 00:36:31,280
collaborations are so important for not

1045
00:36:36,390 --> 00:36:34,320
only just the continued mission and

1046
00:36:37,430 --> 00:36:36,400
self-education really but just for even

1047
00:36:39,270 --> 00:36:37,440
just for

1048
00:36:40,630 --> 00:36:39,280
the next generation for posterity for

1049
00:36:42,470 --> 00:36:40,640
the next generation of those who are

1050
00:36:44,630 --> 00:36:42,480
going to continue what what we want to

1051
00:36:46,310 --> 00:36:44,640
accomplish here of course thank you and

1052
00:36:47,589 --> 00:36:46,320
thanks for the question i think there's

1053
00:36:49,270 --> 00:36:47,599
a couple answers there you guys with

1054
00:36:51,270 --> 00:36:49,280
long questions so if you will i'll take

1055
00:36:52,310 --> 00:36:51,280
uh i'll take it in different pieces to

1056
00:36:55,190 --> 00:36:52,320
start with

1057
00:36:56,870 --> 00:36:55,200
i wanted to to really congratulate nasa

1058
00:36:58,390 --> 00:36:56,880
on having the courage to look at this

1059
00:37:00,550 --> 00:36:58,400
differently it's not easy for a

1060
00:37:02,390 --> 00:37:00,560
government agency to look at the future

1061
00:37:04,150 --> 00:37:02,400
and say we need to to think about how

1062
00:37:05,829 --> 00:37:04,160
we're going to work together this is a

1063
00:37:07,349 --> 00:37:05,839

public private partnership the program

1064
00:37:09,510 --> 00:37:07,359
that we're involved in and it's a unique

1065
00:37:11,510 --> 00:37:09,520
one in many ways and and so far a very

1066
00:37:13,670 --> 00:37:11,520
successful one and we feel very

1067
00:37:15,510 --> 00:37:13,680
benefited by being able to look at it

1068
00:37:18,069 --> 00:37:15,520
that way it is a true partnership my

1069
00:37:20,150 --> 00:37:18,079
inclination is is to reach out to my

1070
00:37:21,910 --> 00:37:20,160
partners in nasa and the companies that

1071
00:37:23,430 --> 00:37:21,920
are working with us to to see when we

1072
00:37:24,790 --> 00:37:23,440
have something new to do that's where we

1073
00:37:26,150 --> 00:37:24,800
go first

1074
00:37:28,950 --> 00:37:26,160
but really why are we doing this we're

1075
00:37:31,190 --> 00:37:28,960
doing this in many ways to to stimulate

1076
00:37:34,069 --> 00:37:31,200
the the stem education side of our

1077
00:37:35,670 --> 00:37:34,079
country to stimulate our thought process

1078
00:37:38,069 --> 00:37:35,680
most people if you talk to people in

1079
00:37:39,510 --> 00:37:38,079
space myself included we got stimulated

1080
00:37:41,750 --> 00:37:39,520
at one point in time something happened

1081
00:37:43,910 --> 00:37:41,760
in our past that made us realize this is

1082
00:37:45,670 --> 00:37:43,920
where we wanted to be and part of our

1083
00:37:47,270 --> 00:37:45,680
obligation as leaders in this industry

1084
00:37:49,109 --> 00:37:47,280
is to look to the future and say what

1085
00:37:51,190 --> 00:37:49,119
can we do to stimulate the next

1086
00:37:52,870 --> 00:37:51,200
generation of people the next generation

1087
00:37:54,870 --> 00:37:52,880
of kids and if you see the children who

1088
00:37:56,390 --> 00:37:54,880

come up to dream chaser and you see what

1089
00:37:57,270 --> 00:37:56,400
they do when they look at it i don't

1090
00:37:59,109 --> 00:37:57,280
know whether or not they're going to

1091
00:38:00,390 --> 00:37:59,119
build a better space vehicle than i do

1092
00:38:02,310 --> 00:38:00,400
but i do know that it's going to make

1093
00:38:03,990 --> 00:38:02,320
them think about science and think about

1094
00:38:06,069 --> 00:38:04,000
what they can do and how they can expand

1095
00:38:08,310 --> 00:38:06,079
their minds and that's part of what we

1096
00:38:10,310 --> 00:38:08,320
carry with us going forward

1097
00:38:13,430 --> 00:38:10,320
and as we do that i think we also look

1098
00:38:15,109 --> 00:38:13,440
at and saying that our job here is

1099
00:38:17,349 --> 00:38:15,119
we feel we're part of a long-term

1100
00:38:18,390 --> 00:38:17,359
partnership in nasa's future

1101
00:38:20,390 --> 00:38:18,400
a lot of people

1102
00:38:22,630 --> 00:38:20,400
wonder where nasa is going i don't i

1103
00:38:24,230 --> 00:38:22,640
think it's on a terrific track we're

1104
00:38:26,390 --> 00:38:24,240
very supportive of the space launch

1105
00:38:29,030 --> 00:38:26,400
system of the orion program our job is

1106
00:38:30,790 --> 00:38:29,040
not to go beyond leo our job is to to

1107
00:38:32,390 --> 00:38:30,800
really look at low earth orbit and try

1108
00:38:34,790 --> 00:38:32,400
to provide the best transportation

1109
00:38:37,270 --> 00:38:34,800
system and platform that we can

1110
00:38:39,270 --> 00:38:37,280
and in doing so make as much of that uh

1111
00:38:41,430 --> 00:38:39,280
based here in the united states and in

1112
00:38:43,030 --> 00:38:41,440
our partner partner companies and

1113
00:38:45,190 --> 00:38:43,040

countries as we can

1114
00:38:47,670 --> 00:38:45,200
and we think at the end of the day that

1115
00:38:50,470 --> 00:38:47,680
will make an opportunity for those

1116
00:38:51,670 --> 00:38:50,480
students who are on board now we have a

1117
00:38:53,510 --> 00:38:51,680
one of the things i like to talk about

1118
00:38:54,550 --> 00:38:53,520
we have a really active internship

1119
00:38:57,030 --> 00:38:54,560
program we're going to be bringing

1120
00:38:58,950 --> 00:38:57,040
people from alabama on board are as in

1121
00:39:00,550 --> 00:38:58,960
interns in our program and i used to

1122
00:39:01,910 --> 00:39:00,560
think that they were we were giving them

1123
00:39:03,190 --> 00:39:01,920
an opportunity

1124
00:39:05,030 --> 00:39:03,200
and then they show up and then you

1125
00:39:06,470 --> 00:39:05,040
realize that what they're really doing

1126
00:39:08,630 --> 00:39:06,480
is they're stimulating the people like

1127
00:39:11,349 --> 00:39:08,640
me in this industry and and we really

1128
00:39:13,430 --> 00:39:11,359
just are very fortunate to be able to to

1129
00:39:17,829 --> 00:39:13,440
help move that next generation along so

1130
00:39:17,839 --> 00:39:23,270
okay do we have other questions

1131
00:39:27,030 --> 00:39:25,349
mark how will you go about soliciting

1132
00:39:28,630 --> 00:39:27,040
and exploiting the things that dream

1133
00:39:30,230 --> 00:39:28,640
teacher you believe it can do on the

1134
00:39:32,710 --> 00:39:30,240
scientific realm

1135
00:39:35,109 --> 00:39:32,720
well what we what we tend to do is start

1136
00:39:37,430 --> 00:39:35,119
looking at the basic capabilities and

1137
00:39:39,510 --> 00:39:37,440
see what can grow off of those in terms

1138
00:39:41,510 --> 00:39:39,520

of some potential science

1139
00:39:43,510 --> 00:39:41,520
types of science there's uh when you

1140
00:39:45,349 --> 00:39:43,520
look at space station you have things

1141
00:39:47,510 --> 00:39:45,359
like material science furnaces you have

1142
00:39:49,990 --> 00:39:47,520
things like glove boxes we have an

1143
00:39:51,910 --> 00:39:50,000
express rack which gives a standard

1144
00:39:54,069 --> 00:39:51,920
interface for different flavors of

1145
00:39:56,710 --> 00:39:54,079
science but they can use that same

1146
00:39:58,870 --> 00:39:56,720
common interface for rapid integration

1147
00:40:01,829 --> 00:39:58,880
so i'm anticipating that the dream

1148
00:40:04,550 --> 00:40:01,839
chaser will lend itself to some of those

1149
00:40:07,190 --> 00:40:04,560
concepts and then when you look at

1150
00:40:08,069 --> 00:40:07,200
actual mission requirements

1151
00:40:09,829 --> 00:40:08,079
you know

1152
00:40:12,310 --> 00:40:09,839
some missions microgravity kind of

1153
00:40:13,910 --> 00:40:12,320
missions want very low disturbances

1154
00:40:15,990 --> 00:40:13,920
there's things that dream chaser could

1155
00:40:18,310 --> 00:40:16,000
do in a sorting mode uncrewed that could

1156
00:40:20,870 --> 00:40:18,320
give very low disturbances for payloads

1157
00:40:24,069 --> 00:40:20,880
that need you know a short duration

1158
00:40:26,069 --> 00:40:24,079
flight but but low microgravity so it

1159
00:40:28,230 --> 00:40:26,079
really starts with assessing you know

1160
00:40:30,310 --> 00:40:28,240
where the design is today

1161
00:40:31,829 --> 00:40:30,320
looking at

1162
00:40:34,390 --> 00:40:31,839
what what we've learned from space

1163
00:40:36,870 --> 00:40:34,400

station learn look at our best practices

1164
00:40:39,430 --> 00:40:36,880
in terms of payload integration and

1165
00:40:41,750 --> 00:40:39,440
really just talking and conceptualizing

1166
00:40:45,270 --> 00:40:41,760
with the team on

1167
00:40:47,510 --> 00:40:45,280
you know what it could potentially do

1168
00:40:50,310 --> 00:40:47,520
okay so now we're going to take a few

1169
00:40:53,270 --> 00:40:50,320
questions from our teleconference line

1170
00:40:55,990 --> 00:40:53,280
so we will open it up and camilla if you

1171
00:40:58,550 --> 00:40:56,000
would uh put through the first uh

1172
00:41:02,230 --> 00:40:58,560
question that we have and i'll put the

1173
00:41:06,390 --> 00:41:04,790
no problem thank you so much today's um

1174
00:41:07,589 --> 00:41:06,400
question and answer session has begun on

1175
00:41:11,190 --> 00:41:07,599
the phone line

1176
00:41:12,069 --> 00:41:11,200
press stars and one on your touchstone

1177
00:41:13,270 --> 00:41:12,079
phone

1178
00:41:15,430 --> 00:41:13,280
and you'll be queued up for your

1179
00:41:17,349 --> 00:41:15,440
question once you are queued up

1180
00:41:19,349 --> 00:41:17,359
um just record your first and last name

1181
00:41:21,270 --> 00:41:19,359
and your media affiliation

1182
00:41:22,630 --> 00:41:21,280
and um you can go ahead and queue your

1183
00:41:24,230 --> 00:41:22,640
question up

1184
00:41:25,750 --> 00:41:24,240
and again if you have a question on the

1185
00:41:28,069 --> 00:41:25,760
phone line press star then one on your

1186
00:41:30,950 --> 00:41:28,079
touchstone phone record your first and

1187
00:41:32,309 --> 00:41:30,960
last name and your media affiliation

1188
00:41:50,069 --> 00:41:32,319

and at this time we'll wait for our

1189
00:41:53,510 --> 00:41:51,510
it's how you know you've thrown a good

1190
00:41:55,910 --> 00:41:53,520
press conference go ahead

1191
00:41:57,750 --> 00:41:55,920
my question is now that i have a panel

1192
00:42:00,069 --> 00:41:57,760
of experts in front of me and in this

1193
00:42:02,230 --> 00:42:00,079
room for the last five days the world

1194
00:42:03,829 --> 00:42:02,240
has been watching malaysia and the

1195
00:42:06,069 --> 00:42:03,839
airline are there

1196
00:42:08,550 --> 00:42:06,079
and no one can find it

1197
00:42:09,750 --> 00:42:08,560
has nasa and rex with your expertise

1198
00:42:12,230 --> 00:42:09,760
with nasa

1199
00:42:14,870 --> 00:42:12,240
has nasa been asked for any of its

1200
00:42:17,670 --> 00:42:14,880
assets it certainly has some that can

1201
00:42:19,510 --> 00:42:17,680
perhaps contribute to the location or is

1202
00:42:21,990 --> 00:42:19,520
there anything with sierra nevada is

1203
00:42:24,550 --> 00:42:22,000
there anything technologically out there

1204
00:42:28,230 --> 00:42:24,560
that hasn't been tapped to help

1205
00:42:31,910 --> 00:42:30,309
so i'll take a crack at that liz i i

1206
00:42:33,430 --> 00:42:31,920
don't know the answer to the question

1207
00:42:34,710 --> 00:42:33,440
since i'm not no longer inside the

1208
00:42:36,550 --> 00:42:34,720
government but

1209
00:42:38,150 --> 00:42:36,560
there's certainly a variety of of us

1210
00:42:39,670 --> 00:42:38,160
government assets that could be brought

1211
00:42:41,430 --> 00:42:39,680
to bear there and i'll be surprised that

1212
00:42:43,750 --> 00:42:41,440
they have been

1213
00:42:45,750 --> 00:42:43,760

what would those be well satellites and

1214
00:42:46,630 --> 00:42:45,760
things like that imaging systems

1215
00:42:51,270 --> 00:42:46,640
um

1216
00:42:53,430 --> 00:42:51,280
ocean or something like that but

1217
00:42:55,750 --> 00:42:53,440
uh and and i'll be surprised if they

1218
00:42:57,270 --> 00:42:55,760
haven't been scouring just about all the

1219
00:42:58,630 --> 00:42:57,280
commercial and all the government

1220
00:43:00,710 --> 00:42:58,640
imagery that's available to see if they

1221
00:43:02,309 --> 00:43:00,720
can find anything

1222
00:43:05,109 --> 00:43:02,319
that kind of requests would typically

1223
00:43:07,270 --> 00:43:05,119
come in at headquarters somewhere so

1224
00:43:08,950 --> 00:43:07,280
from the center perspective we haven't

1225
00:43:10,390 --> 00:43:08,960
heard it but it would come in and like

1226
00:43:12,390 --> 00:43:10,400
rex said it would probably go to one of

1227
00:43:13,910 --> 00:43:12,400
the satellite divisions like the science

1228
00:43:15,910 --> 00:43:13,920
mission directorate

1229
00:43:17,430 --> 00:43:15,920
or someone but that would be worked at

1230
00:43:18,790 --> 00:43:17,440
headquarters and so we don't have any

1231
00:43:21,190 --> 00:43:18,800
knowledge of it well i had a question

1232
00:43:22,470 --> 00:43:21,200
for instance like was severe severe was

1233
00:43:24,470 --> 00:43:22,480
able to see

1234
00:43:27,670 --> 00:43:24,480
so many interesting things with the

1235
00:43:29,589 --> 00:43:27,680
mayan ruins and that was in a low depth

1236
00:43:31,109 --> 00:43:29,599
i thought well this is a low depth area

1237
00:43:33,270 --> 00:43:31,119
is that something that

1238
00:43:35,030 --> 00:43:33,280

one could possibly think about another

1239
00:43:36,309 --> 00:43:35,040
application

1240
00:43:37,750 --> 00:43:36,319
they absolutely could and that's the

1241
00:43:39,270 --> 00:43:37,760
correct analogy and in the case of

1242
00:43:41,349 --> 00:43:39,280
severe what they're doing is their

1243
00:43:42,790 --> 00:43:41,359
they're tasking either commercial or

1244
00:43:44,790 --> 00:43:42,800
government satellites to produce that

1245
00:43:46,630 --> 00:43:44,800
imagery for them and so that's exactly

1246
00:43:48,790 --> 00:43:46,640
what you do put a request in see if you

1247
00:43:51,109 --> 00:43:48,800
can find an image that's relevant to it

1248
00:43:52,870 --> 00:43:51,119
and hopefully find something and i'm

1249
00:43:55,030 --> 00:43:52,880
very certain they're doing that

1250
00:43:56,950 --> 00:43:55,040
is there anything with any of your jobs

1251
00:43:59,190 --> 00:43:56,960
that they're looking for technology now

1252
00:44:03,349 --> 00:43:59,200
that can actually be put on a commercial

1253
00:44:07,430 --> 00:44:04,790
not that i'm aware of

1254
00:44:09,589 --> 00:44:07,440
not directly

1255
00:44:10,950 --> 00:44:09,599
so so if we if we have no other

1256
00:44:13,589 --> 00:44:10,960
questions then we'll close it out but

1257
00:44:14,470 --> 00:44:13,599
are they i think we do have okay

1258
00:44:16,309 --> 00:44:14,480
so

1259
00:44:18,069 --> 00:44:16,319
we'll take our first question from the

1260
00:44:19,829 --> 00:44:18,079
phone line

1261
00:44:22,230 --> 00:44:19,839
the first question comes from al

1262
00:44:26,790 --> 00:44:22,240
schrader independent inventor your line

1263
00:44:30,710 --> 00:44:29,109

hello this alfred schrader hi albert

1264
00:44:32,470 --> 00:44:30,720
it's mark sorangelo how are you yeah

1265
00:44:34,630 --> 00:44:32,480
mark um i'm down here in florida

1266
00:44:36,950 --> 00:44:34,640
actually i'm right directly from this

1267
00:44:38,470 --> 00:44:36,960
kennedy space center as it is at one

1268
00:44:41,589 --> 00:44:38,480
time like say it's a beautiful day here

1269
00:44:43,829 --> 00:44:41,599
it's amazing but anyhow um

1270
00:44:50,870 --> 00:44:43,839
the dream chaser is using a new fuel

1271
00:44:56,069 --> 00:44:53,190
okay can we get you to uh ask your

1272
00:44:57,510 --> 00:44:56,079
question again please your uh

1273
00:45:00,550 --> 00:44:57,520
volume wasn't

1274
00:45:02,550 --> 00:45:00,560
very good is it too high or too low

1275
00:45:06,150 --> 00:45:02,560
turn up just a little bit

1276
00:45:10,630 --> 00:45:08,390
the dream chaser is using what in our

1277
00:45:13,270 --> 00:45:10,640
industry is a relatively new fuel system

1278
00:45:14,950 --> 00:45:13,280
uh the butadine and nitrous can you

1279
00:45:16,870 --> 00:45:14,960
explain how that is different how it

1280
00:45:18,630 --> 00:45:16,880
works

1281
00:45:19,910 --> 00:45:18,640
uh sure i

1282
00:45:21,829 --> 00:45:19,920
there are a couple elements of the dream

1283
00:45:23,430 --> 00:45:21,839
chasers propulsion that i think are

1284
00:45:25,510 --> 00:45:23,440
notable the first is that we have no

1285
00:45:26,950 --> 00:45:25,520
hazardous materials on board this is as

1286
00:45:29,589 --> 00:45:26,960
far as we know this first human

1287
00:45:32,470 --> 00:45:29,599
spaceship that has done that

1288
00:45:35,270 --> 00:45:32,480

we we use a main propulsion system that

1289
00:45:37,270 --> 00:45:35,280
uses nitrous oxide which is laughing gas

1290
00:45:40,309 --> 00:45:37,280
that's what your dentist gives you the

1291
00:45:42,309 --> 00:45:40,319
fuel is a derivative of rubber and it's

1292
00:45:44,710 --> 00:45:42,319
quite safe and quite stable

1293
00:45:46,550 --> 00:45:44,720
and the system that we use to do small

1294
00:45:49,829 --> 00:45:46,560
movements in space which is a reaction

1295
00:45:52,069 --> 00:45:49,839
control system uses an ethanol based

1296
00:45:54,069 --> 00:45:52,079
fuel so between all those essentially

1297
00:45:56,790 --> 00:45:54,079
what that means is that the the dream

1298
00:45:58,710 --> 00:45:56,800
chaser has no hazardous materials and

1299
00:45:59,750 --> 00:45:58,720
that really helps us in two important

1300
00:46:03,190 --> 00:45:59,760
ways

1301
00:46:06,069 --> 00:46:03,200
being very safe and stable as a flight

1302
00:46:08,230 --> 00:46:06,079
vehicle it allows us to when we land go

1303
00:46:09,670 --> 00:46:08,240
right up to the vehicle unlike the space

1304
00:46:11,750 --> 00:46:09,680
shuttle which had a lot of poisonous

1305
00:46:13,270 --> 00:46:11,760
materials and had to be safe we can

1306
00:46:14,950 --> 00:46:13,280
actually go right up to the vehicle much

1307
00:46:15,910 --> 00:46:14,960
like if you go up to a regional jet you

1308
00:46:17,589 --> 00:46:15,920
can

1309
00:46:19,190 --> 00:46:17,599
put the stairway up and take the people

1310
00:46:20,870 --> 00:46:19,200
off and take the critical experiments

1311
00:46:21,990 --> 00:46:20,880
off so if you can imagine if we're

1312
00:46:23,589 --> 00:46:22,000
bringing home

1313
00:46:25,670 --> 00:46:23,599

an astronaut who isn't well or if we're

1314
00:46:27,510 --> 00:46:25,680
bringing home a very critically time

1315
00:46:30,710 --> 00:46:27,520
sensitive experiment the ability to do

1316
00:46:31,910 --> 00:46:30,720
that allows us to to move as as rapidly

1317
00:46:34,230 --> 00:46:31,920
as possible

1318
00:46:36,790 --> 00:46:34,240
the other uh interesting feature is that

1319
00:46:38,150 --> 00:46:36,800
we are able to land at any commercial

1320
00:46:40,069 --> 00:46:38,160
airport

1321
00:46:41,910 --> 00:46:40,079
and we are looking at whether or not we

1322
00:46:44,550 --> 00:46:41,920
want to do that but the vehicle has the

1323
00:46:45,750 --> 00:46:44,560
ability to land basically any places 737

1324
00:46:48,309 --> 00:46:45,760
can land

1325
00:46:50,470 --> 00:46:48,319
and as we look forward to how we want to

1326
00:46:51,990 --> 00:46:50,480
operate where we're what we're doing

1327
00:46:53,670 --> 00:46:52,000
with the vehicles sometimes it may be

1328
00:46:55,589 --> 00:46:53,680
very important to bring those

1329
00:46:57,990 --> 00:46:55,599
experiments back as close as possible to

1330
00:47:02,150 --> 00:46:58,000
where they need to be analyzed

1331
00:47:06,150 --> 00:47:03,349
you're pretty much committed on your

1332
00:47:07,990 --> 00:47:06,160
landing can these engines be restarted

1333
00:47:09,750 --> 00:47:08,000
they can be restarted in space but

1334
00:47:11,589 --> 00:47:09,760
they're they're not re-uh we're not

1335
00:47:13,109 --> 00:47:11,599
going to be restarting them on the on

1336
00:47:15,349 --> 00:47:13,119
the return trip home once we've

1337
00:47:17,349 --> 00:47:15,359
committed to coming back

1338
00:47:19,670 --> 00:47:17,359

so we are able to use them in space as

1339
00:47:21,589 --> 00:47:19,680
restartable throttle motors and what

1340
00:47:23,349 --> 00:47:21,599
that allows us to do from a scientific

1341
00:47:26,309 --> 00:47:23,359
point of view or from a repair and

1342
00:47:28,470 --> 00:47:26,319
construction point of view is to to

1343
00:47:31,109 --> 00:47:28,480
potentially conceive different missions

1344
00:47:34,309 --> 00:47:31,119
at different places in orbit uh from the

1345
00:47:37,270 --> 00:47:35,430
well that's pretty good well thank you

1346
00:47:39,990 --> 00:47:37,280
very much yeah thank you

1347
00:47:41,750 --> 00:47:40,000
okay so do we have any more questions

1348
00:47:44,470 --> 00:47:41,760
like one more if we have any

1349
00:47:45,349 --> 00:47:44,480
uh others in the audience

1350
00:47:47,829 --> 00:47:45,359
okay

1351
00:47:58,470 --> 00:47:47,839
well thank you all for coming today

1352
00:48:03,589 --> 00:48:00,390
okay camilla i

1353
00:48:05,109 --> 00:48:03,599
i think your person may have gotten lost

1354
00:48:07,270 --> 00:48:05,119
so we're gonna

1355
00:48:09,270 --> 00:48:07,280
go ahead and conclude the press

1356
00:48:10,309 --> 00:48:09,280
conference we would like to thank our

1357
00:48:13,349 --> 00:48:10,319
panel

1358
00:48:15,349 --> 00:48:13,359
um paul mark rex mark thank you all so

1359
00:48:18,309 --> 00:48:15,359
much we'd like to thank all of you for