1
00:00:05,090 --> 00:00:03,800
good afternoon thank you for joining us

2
00:00:07,190 --> 00:00:05,100
for today's crew news conference with

3
00:00:08,509 --> 00:00:07,200
the sts-132 crew we'll start with

4
00:00:10,700 --> 00:00:08,519
introductions and then take questions

5
00:00:12,709 --> 00:00:10,710
we'll start with the introduction of

6
00:00:14,270 --> 00:00:12,719
commander ken ham ken was born in

7
00:00:15,709 --> 00:00:14,280
plainfield new jersey he holds

8
00:00:17,330 --> 00:00:15,719
bachelor's degree from the US Naval

9
00:00:19,220 --> 00:00:17,340
Academy and a Masters of Science from

10
00:00:20,929 --> 00:00:19,230
the Naval Postgraduate School he's a

11
00:00:22,790 --> 00:00:20,939
captain in the US Navy and has logged

12
00:00:24,740 --> 00:00:22,800
more than 5,000 flight hours in more

13
00:00:27,410 --> 00:00:24,750

than 40 different aircraft Kim was

14
00:00:30,650 --> 00:00:27,420
selected by nasa in june of 1998 he flew

15
00:00:32,269 --> 00:00:30,660
as a pilot on sts-1 24 in 2008 on that

16
00:00:34,819 --> 00:00:32,279
mission he accumulated more than 13 days

17
00:00:40,760 --> 00:00:34,829
in space well now it can introduce his

18
00:00:42,740 --> 00:00:40,770
crew Mexico this is actually thank you

19
00:00:44,630 --> 00:00:42,750
guys for all shown for everyone showing

20
00:00:46,610 --> 00:00:44,640
up here and for everyone out there

21
00:00:47,600 --> 00:00:46,620
listening because what that means is

22
00:00:50,389 --> 00:00:47,610
that you have an interest in space

23
00:00:51,740 --> 00:00:50,399
flight and and that's a wonderful thing

24
00:00:54,139 --> 00:00:51,750
because there's an awful lot of work

25
00:00:57,889 --> 00:00:54,149
that goes into this I'm not going to

26
00:00:59,569 --> 00:00:57,899
talk about the payload today or much

27
00:01:00,950 --> 00:00:59,579
about our operations because I know that

28
00:01:03,410 --> 00:01:00,960
was briefed much earlier today from

29
00:01:05,299 --> 00:01:03,420
people that are a lot smarter than me or

30
00:01:08,600 --> 00:01:05,309
maybe even my five best friends over

31
00:01:10,700 --> 00:01:08,610
here I will give you a few thoughts of

32
00:01:13,399 --> 00:01:10,710
my own on what I've learned in the last

33
00:01:15,320 --> 00:01:13,409
year that'll be pretty brief and then

34
00:01:19,520 --> 00:01:15,330
I'll introduce these wonderful

35
00:01:22,670 --> 00:01:19,530
individuals down the line I'm a

36
00:01:25,030 --> 00:01:22,680
first-time commander and what I've

37
00:01:28,730 --> 00:01:25,040
learned as a commander in the last year

38
00:01:32,090 --> 00:01:28,740

has pretty much blown me away and and in

39
00:01:33,830 --> 00:01:32,100
that process I've witnessed all of the

40
00:01:37,819 --> 00:01:33,840
folks that are involved in this process

41
00:01:40,010 --> 00:01:37,829
of getting a space shuttle and a launch

42
00:01:43,730 --> 00:01:40,020
package the payload up to orbit and

43
00:01:46,280 --> 00:01:43,740
assembled up there in space just a

44
00:01:48,499 --> 00:01:46,290
couple days ago I had the privilege of

45
00:01:51,170 --> 00:01:48,509
sitting down with the commander of the

46
00:01:52,130 --> 00:01:51,180
very last mission sts-131 who's a good

47
00:01:56,780 --> 00:01:52,140
friend of mine I've known him for a long

48
00:01:59,870 --> 00:01:56,790
time and and one thing that stood out in

49
00:02:01,700 --> 00:01:59,880
that's al Poindexter indexes mind was

50
00:02:03,980 --> 00:02:01,710
when he flew up to space station and

51
00:02:06,109 --> 00:02:03,990
looked out the window he had to

52
00:02:08,889 --> 00:02:06,119
basically stop and pause and look at the

53
00:02:12,260 --> 00:02:08,899
enormity of space station up there

54
00:02:13,640 --> 00:02:12,270
circling the globe in the heavens and it

55
00:02:15,710 --> 00:02:13,650
actually kind of

56
00:02:19,069 --> 00:02:15,720
made him stop and think for a little bit

57
00:02:20,360 --> 00:02:19,079
and I I remember having the same thought

58
00:02:22,100 --> 00:02:20,370
on my first flight it'll probably be

59
00:02:23,509 --> 00:02:22,110
even more astounding this time because

60
00:02:26,630 --> 00:02:23,519
it's the space station is a lot bigger

61
00:02:29,990 --> 00:02:26,640
but it really makes you think about all

62
00:02:32,390 --> 00:02:30,000
the engineering all of the processing

63
00:02:34,819 --> 00:02:32,400

the building of space station the

64
00:02:38,750 --> 00:02:34,829
launching of missions the trainers the

65
00:02:39,920 --> 00:02:38,760
flight controllers I can guarantee you

66
00:02:41,630 --> 00:02:39,930
right now there's a whole bunch of

67
00:02:43,670 --> 00:02:41,640
people somewhere in town right now that

68
00:02:45,199 --> 00:02:43,680
are asleep because they were up last

69
00:02:48,110 --> 00:02:45,209
night being flight controllers doing

70
00:02:52,550 --> 00:02:48,120
what they do day in and day out and it's

71
00:02:54,550 --> 00:02:52,560
really it's really impressive so for us

72
00:02:57,740 --> 00:02:54,560
and I'm going to put some words in a

73
00:03:03,490 --> 00:02:57,750
cruise mouth here it is an absolute

74
00:03:10,759 --> 00:03:08,599
there are thousands of folks that are

75
00:03:13,429 --> 00:03:10,769
involved in every mission and when you

76
00:03:15,379 --> 00:03:13,439
think about how Space Station started to

77
00:03:19,490 --> 00:03:15,389
where we are today almost done building

78
00:03:22,309 --> 00:03:19,500
it there are hundreds of thousands and

79
00:03:25,839 --> 00:03:22,319
we get to represent them that is our

80
00:03:29,170 --> 00:03:25,849
privilege and hopefully we do a good job

81
00:03:31,569 --> 00:03:29,180
getting there we take it we take that

82
00:03:34,670 --> 00:03:31,579
that right that privilege if you will

83
00:03:36,140 --> 00:03:34,680
very seriously even though we do have

84
00:03:39,729 --> 00:03:36,150
like to have a lot of fun along the way

85
00:03:41,659 --> 00:03:39,739
now hopefully we won't have too much fun

86
00:03:42,770 --> 00:03:41,669
let's see going down the line here a

87
00:03:44,750 --> 00:03:42,780
little bit let me introduce these guys

88
00:03:46,520 --> 00:03:44,760

because we made a deal beforehand that I

89
00:03:47,569 --> 00:03:46,530
got to do the introductions say a few

90
00:03:49,670 --> 00:03:47,579
words and then I don't have to answer

91
00:03:51,319 --> 00:03:49,680
any more questions they're going to

92
00:03:53,449 --> 00:03:51,329
answer all the questions so

93
00:03:55,430 --> 00:03:53,459
introductions and we all kind of have

94
00:03:58,189 --> 00:03:55,440
nicknames if you pay attention through

95
00:04:01,909 --> 00:03:58,199
the flight you'll see people call me

96
00:04:06,500 --> 00:04:01,919
hawk comes from ham hock hoc k this is

97
00:04:13,339 --> 00:04:08,270
I had to actually look up what your real

98
00:04:15,789 --> 00:04:13,349
first name was Tony and I sort of come

99
00:04:18,650 --> 00:04:15,799
from the same hometown figuratively and

100
00:04:21,560 --> 00:04:18,660
and what I mean by that is we both spent

101
00:04:24,590 --> 00:04:21,570
a lot of time in f-18 cockpits on

102
00:04:26,450 --> 00:04:24,600
aircraft carriers never knew each other

103
00:04:28,700 --> 00:04:26,460
in the fleet but all aircraft carriers

104
00:04:30,110 --> 00:04:28,710
operate the same way and we all get

105
00:04:32,990 --> 00:04:30,120
afraid of the same things and learn

106
00:04:34,969 --> 00:04:33,000
about the same stuff so when tony and i

107
00:04:37,760 --> 00:04:34,979
got assigned together it was almost like

108
00:04:39,230 --> 00:04:37,770
we were brothers and that helps a lot we

109
00:04:41,719 --> 00:04:39,240
can communicate frequently without

110
00:04:42,950 --> 00:04:41,729
speaking which helps sometimes we have

111
00:04:48,050 --> 00:04:42,960
to translate that for some of the other

112
00:04:49,820 --> 00:04:48,060
folks tony is a certified smart guy like

113
00:04:53,990 --> 00:04:49,830

everybody else on the crew he came from

114
00:04:58,040 --> 00:04:54,000
he went to school and MIT and he last

115
00:05:01,400 --> 00:04:58,050
flew as the pilot on sts-1 19 delivering

116
00:05:04,850 --> 00:05:01,410
that was the last solar array and which

117
00:05:07,159 --> 00:05:04,860
he flew since I last flu so maybe you've

118
00:05:09,439 --> 00:05:07,169
seen the station bigger as bigger than

119
00:05:13,400 --> 00:05:09,449
anyone else here but it's a it's even

120
00:05:16,010 --> 00:05:13,410
bigger now which is kind of neat Tony

121
00:05:18,860 --> 00:05:16,020
also just got selected as a captain in

122
00:05:20,629 --> 00:05:18,870
the Navy which is as a big step pretty

123
00:05:22,189 --> 00:05:20,639
nice comes with a pay raise that'll come

124
00:05:25,670 --> 00:05:22,199
along here hopefully in a year or so and

125
00:05:28,310 --> 00:05:25,680
then he can entertain us with a party as

126
00:05:32,810 --> 00:05:28,320
it's a good tradition moving down the

127
00:05:37,100 --> 00:05:32,820
line is garrett reisman PhD Cal Tech

128
00:05:45,050 --> 00:05:37,110
correct another certified smart guy we

129
00:05:49,730 --> 00:05:45,060
call him big G because he's big Garrett

130
00:05:55,430 --> 00:05:49,740
is the lead EV a four EV a number one

131
00:05:57,610 --> 00:05:55,440
which is a tricky EV a assembling the

132
00:06:00,939 --> 00:05:57,620
new k u antenna for space station and

133
00:06:04,670 --> 00:06:00,949
the boom it goes on as well as another

134
00:06:06,649 --> 00:06:04,680
addition to the dexter arm up there on

135
00:06:08,810 --> 00:06:06,659
station it's really tricky it's a packed

136
00:06:11,659 --> 00:06:08,820
dva he's going out the door with steve

137
00:06:15,080 --> 00:06:11,669
bowen over there we'll get to shortly

138
00:06:18,379 --> 00:06:15,090

and it's a lot of responsibility that he

139
00:06:20,210 --> 00:06:18,389
has in addition to that he is also going

140
00:06:24,050 --> 00:06:20,220
to be driving

141
00:06:26,270 --> 00:06:24,060
big arm for the task of birthing mrm one

142
00:06:29,180 --> 00:06:26,280
which you can you can talk about later

143
00:06:31,670 --> 00:06:29,190
is a totally unique first time we've

144
00:06:37,150 --> 00:06:31,680
ever tried to do a module birthing with

145
00:06:43,160 --> 00:06:37,160
with this approach moving down Mike good

146
00:06:44,900 --> 00:06:43,170
good we call him bueno he is just

147
00:06:47,990 --> 00:06:44,910
recently retired from the Air Force as a

148
00:06:52,790 --> 00:06:48,000
colonel and he's a weapon systems

149
00:06:53,930 --> 00:06:52,800
officer Mike had I almost promised I

150
00:06:56,180 --> 00:06:53,940
wasn't going to say this but he just

151
00:06:58,190 --> 00:06:56,190
came back from the last Hubble servicing

152
00:07:00,800 --> 00:06:58,200
mission Mike likes to remind us that

153
00:07:06,470 --> 00:07:00,810
he's a hubble crew member at every turn

154
00:07:10,250 --> 00:07:06,480
which is pretty entertaining and mike is

155
00:07:13,760 --> 00:07:10,260
going to lead a VA number three which is

156
00:07:17,120 --> 00:07:13,770
a tricky EV a again in that it is going

157
00:07:20,120 --> 00:07:17,130
to finish up all the hard primary tasks

158
00:07:21,620 --> 00:07:20,130
and then accomplish as many of the geta

159
00:07:23,540 --> 00:07:21,630
heads as we can and what makes that

160
00:07:24,740 --> 00:07:23,550
tricky is it's really hard to plan out

161
00:07:27,470 --> 00:07:24,750
exactly what you're going to do and

162
00:07:30,980 --> 00:07:27,480
practice it in the pools over the last

163
00:07:32,630 --> 00:07:30,990

year so he's going to have to figure out

164
00:07:34,130 --> 00:07:32,640
what he needs to do essentially the

165
00:07:39,110 --> 00:07:34,140
night before they go outside on a VA

166
00:07:42,680 --> 00:07:39,120
which is no small feat moving down steve

167
00:07:45,710 --> 00:07:42,690
bowen another captain in the Navy we

168
00:07:52,520 --> 00:07:45,720
call him Steve oh he's particularly

169
00:07:54,830 --> 00:07:52,530
talkative steve is the Steve happens to

170
00:07:57,440 --> 00:07:54,840
be the one submarine officer that we've

171
00:07:58,810 --> 00:07:57,450
ever had as an astronaut and along with

172
00:08:01,040 --> 00:07:58,820
that comes some pretty interesting

173
00:08:03,200 --> 00:08:01,050
experience and a unique perspective on

174
00:08:05,180 --> 00:08:03,210
what it's like to live in a steel tube

175
00:08:08,330 --> 00:08:05,190
if you will and the space station is not

176
00:08:12,080 --> 00:08:08,340
that far removed from that Steve is

177
00:08:15,830 --> 00:08:12,090
going to lead EV a number 2 which is the

178
00:08:19,310 --> 00:08:15,840
bulk of the battery removal and

179
00:08:21,350 --> 00:08:19,320
replacement task on p6 and to be quite

180
00:08:23,150 --> 00:08:21,360
honest a lot of the success of all of

181
00:08:26,020 --> 00:08:23,160
our EVs in general are going to lie on

182
00:08:28,279 --> 00:08:26,030
his shoulders and getting that task as

183
00:08:32,120 --> 00:08:28,289
accomplished as possible to make room on

184
00:08:33,469 --> 00:08:32,130
EV a 3 so we can finish EBA three tests

185
00:08:34,010 --> 00:08:33,479
as well as go back and clean up anything

186
00:08:36,560 --> 00:08:34,020
that didn't get

187
00:08:39,440 --> 00:08:36,570
done any va1 so we're asking a lot of

188
00:08:43,910 --> 00:08:39,450

steve blass see down there is pure

189
00:08:47,000 --> 00:08:43,920
sellers we call him epi I don't know if

190
00:08:50,030 --> 00:08:47,010
he'll divulge why probably not that's a

191
00:08:52,460 --> 00:08:50,040
good nickname at a good story appears

192
00:08:55,130 --> 00:08:52,470
has by far the most experience in space

193
00:08:58,730 --> 00:08:55,140
out of anyone on the crew he's flown

194
00:09:00,680 --> 00:08:58,740
twice before done six EV a's one of the

195
00:09:02,060 --> 00:09:00,690
only direction pieces of direction i got

196
00:09:06,340 --> 00:09:02,070
from my boss when this crew is assigned

197
00:09:11,180 --> 00:09:06,350
was don't let pierce go outside so peers

198
00:09:14,180 --> 00:09:11,190
VA for good reason so peers bit off on

199
00:09:16,640 --> 00:09:14,190
attempting a whole new approach to

200
00:09:18,320 --> 00:09:16,650
spaceflight he's now our main armed

201
00:09:20,300 --> 00:09:18,330
operator for the big arm on Space

202
00:09:22,700 --> 00:09:20,310
Station which meant after we were

203
00:09:24,620 --> 00:09:22,710
assigned he had to go off to school in

204
00:09:26,240 --> 00:09:24,630
Canada learn how to run this big arm and

205
00:09:28,520 --> 00:09:26,250
then learn how to operate it in

206
00:09:31,280 --> 00:09:28,530
conjunction with all the EVs and every

207
00:09:34,460 --> 00:09:31,290
one of our ABS is very big arm intensive

208
00:09:37,100 --> 00:09:34,470
so Pierce is going to be operating that

209
00:09:38,450 --> 00:09:37,110
arm from inside the cupola which should

210
00:09:40,280 --> 00:09:38,460
be the first time where we're doing

211
00:09:43,280 --> 00:09:40,290
assembly flight operations from the

212
00:09:49,390 --> 00:09:43,290
cupola and that should be some pretty

213
00:09:52,550 --> 00:09:49,400

spectacular views in addition epi is our

214
00:09:54,590 --> 00:09:52,560
science officer if you will in charge of

215
00:09:56,270 --> 00:09:54,600
just about everything to do with the

216
00:09:58,400 --> 00:09:56,280
payload science that we're doing on

217
00:10:00,280 --> 00:09:58,410
board and some of the stuff that's

218
00:10:03,080 --> 00:10:00,290
happening on space station itself and

219
00:10:05,930 --> 00:10:03,090
then in addition to that he is also the

220
00:10:08,630 --> 00:10:05,940
mrm one payload commander he will be

221
00:10:11,840 --> 00:10:08,640
doing all the commanding to the vehicle

222
00:10:14,390 --> 00:10:11,850
to the module from both space shuttle

223
00:10:16,940 --> 00:10:14,400
and from space station through the

224
00:10:19,460 --> 00:10:16,950
Russian laptop system talking to the

225
00:10:21,860 --> 00:10:19,470
module through the arm which is it

226
00:10:24,410 --> 00:10:21,870
sounds kind of easy but it's not it's a

227
00:10:27,560 --> 00:10:24,420
very complex system fortunately Pierce's

228
00:10:31,090 --> 00:10:27,570
is pretty fluent in Russian which helps

229
00:10:34,460 --> 00:10:31,100
them understand our Russian payload I

230
00:10:37,010 --> 00:10:34,470
think I ran out of people didn't so

231
00:10:42,680 --> 00:10:37,020
that's it for introductions I guess we

232
00:10:43,730 --> 00:10:42,690
can open it up on our we're gonna start

233
00:10:45,200 --> 00:10:43,740
with questions here from the Johnson

234
00:10:46,070 --> 00:10:45,210
Space Center will start on this side if

235
00:10:47,750 --> 00:10:46,080
you can

236
00:10:49,190 --> 00:10:47,760
indicate if you have a question and

237
00:10:52,370 --> 00:10:49,200
state your name and affiliation go ahead

238
00:10:54,890 --> 00:10:52,380

well tomorrow at CBS i'll ask big G a

239
00:10:57,080 --> 00:10:54,900
question if I can you know we're talking

240
00:10:58,880 --> 00:10:57,090
earlier during the earlier briefings

241
00:11:00,740 --> 00:10:58,890
about how progress is used to be kind of

242
00:11:02,240 --> 00:11:00,750
Dhakaan and get the station with some

243
00:11:04,820 --> 00:11:02,250
pretty good motion compared to what you

244
00:11:06,860 --> 00:11:04,830
guys normally do I'm just curious if you

245
00:11:09,650 --> 00:11:06,870
could describe a little bit the docking

246
00:11:10,910 --> 00:11:09,660
with SS RMS and you know the kind of

247
00:11:12,440 --> 00:11:10,920
rates are kind of motions you're going

248
00:11:16,880 --> 00:11:12,450
to put on that thing to get to get the

249
00:11:19,700 --> 00:11:16,890
mechanism to engage it's it's a very

250
00:11:21,530 --> 00:11:19,710
good question the as you mentioned that

251
00:11:22,970 --> 00:11:21,540
this module is originally designed to

252
00:11:25,450 --> 00:11:22,980
fly up like all the other Russian

253
00:11:28,730 --> 00:11:25,460
modules and doc under its own power

254
00:11:31,310 --> 00:11:28,740
autonomously so the way they do that is

255
00:11:32,870 --> 00:11:31,320
they just have a big cone and the big

256
00:11:35,210 --> 00:11:32,880
probe and they get a good running start

257
00:11:37,640 --> 00:11:35,220
and that's it's almost like bringing

258
00:11:40,310 --> 00:11:37,650
train cars together when I was inside

259
00:11:42,980 --> 00:11:40,320
the station a couple times when docking

260
00:11:46,520 --> 00:11:42,990
occurs and you could feel or come in so

261
00:11:49,280 --> 00:11:46,530
it's definitely an event so what we're

262
00:11:52,460 --> 00:11:49,290
trying to do here is very different and

263
00:11:55,660 --> 00:11:52,470

even though we call it the mini mrm one

264
00:11:58,040 --> 00:11:55,670
step for the mini research module and

265
00:11:59,390 --> 00:11:58,050
that's why by way that's also why I got

266
00:12:02,420 --> 00:11:59,400
the job of docking here because they

267
00:12:04,880 --> 00:12:02,430
needed a mini astronaut to dr. mini

268
00:12:06,830 --> 00:12:04,890
research module but they call it many

269
00:12:15,290 --> 00:12:06,840
but like many things is actually very

270
00:12:16,880 --> 00:12:15,300
big and and it's pervert to have on the

271
00:12:18,800 --> 00:12:16,890
very end of the arm when the arm fully

272
00:12:23,270 --> 00:12:18,810
extended is a lot of dynamics at play

273
00:12:25,970 --> 00:12:23,280
and so the arm can't get the kind of

274
00:12:27,950 --> 00:12:25,980
ramming speed that it normally develops

275
00:12:29,870 --> 00:12:27,960
under its normal nominal means of

276
00:12:30,950 --> 00:12:29,880
docking with the system so we're going

277
00:12:32,690 --> 00:12:30,960
to be restricted to coming in

278
00:12:35,060 --> 00:12:32,700
approximately five times slower and

279
00:12:39,890 --> 00:12:35,070
that's the fastest that the arm can can

280
00:12:41,120 --> 00:12:39,900
do safely right or progress or user or

281
00:12:45,860 --> 00:12:41,130
the way this thing would normally duck

282
00:12:49,220 --> 00:12:45,870
so but what we hope to do is with the

283
00:12:51,260 --> 00:12:49,230
arm we hope to have very fine control

284
00:12:54,140 --> 00:12:51,270
and have it come right down the middle

285
00:12:56,720 --> 00:12:54,150
and so there's a lot of people work

286
00:12:57,079 --> 00:12:56,730
really hard to love analysis to verify

287
00:12:59,449 --> 00:12:57,089
that

288
00:13:00,920 --> 00:12:59,459

is going to work but the exciting thing

289
00:13:03,949 --> 00:13:00,930
is that has never been done before and

290
00:13:07,970 --> 00:13:03,959
so I'm sure we're all be watching very

291
00:13:11,689 --> 00:13:07,980
carefully as we bring that in on flight

292
00:13:14,509 --> 00:13:11,699
day 5 and I'll just well actually I move

293
00:13:15,670 --> 00:13:14,519
ahead i'll talk about this later um i'll

294
00:13:18,819 --> 00:13:15,680
stick with you real quick though on

295
00:13:20,569 --> 00:13:18,829
first e VA I guess moving the S cat

296
00:13:22,069 --> 00:13:20,579
clearances looked pretty tight in the

297
00:13:25,100 --> 00:13:22,079
video they were showing us during the EV

298
00:13:27,949 --> 00:13:25,110
a briefing and peptide is that and how

299
00:13:29,689 --> 00:13:27,959
how worried are you not worried the

300
00:13:31,400 --> 00:13:29,699
wrong word how much could certainly is

301
00:13:33,949 --> 00:13:31,410
there about you know banging the thing

302
00:13:35,619 --> 00:13:33,959
on something or or whatever i'll be

303
00:13:39,819 --> 00:13:35,629
holding it so i'm really concerned

304
00:13:43,999 --> 00:13:39,829
that's the the dishes is pretty fragile

305
00:13:48,670 --> 00:13:44,009
and we're instructed not to bump that

306
00:13:50,660 --> 00:13:48,680
into anything so Pierce's is going to be

307
00:13:52,040 --> 00:13:50,670
operating the big arm and i'll be

308
00:13:53,360 --> 00:13:52,050
standing on the end of it while we bring

309
00:13:55,460 --> 00:13:53,370
the dish out of the structure and at

310
00:13:57,350 --> 00:13:55,470
that point that this comes very close to

311
00:14:01,160 --> 00:13:57,360
the boom of the arm as you probably saw

312
00:14:03,049 --> 00:14:01,170
in the video and I end it there worried

313
00:14:04,400 --> 00:14:03,059

something for me is that I can't really

314
00:14:06,230 --> 00:14:04,410
see it because I have a big face full of

315
00:14:08,540 --> 00:14:06,240
dish and the boom is on the other side

316
00:14:11,900 --> 00:14:08,550
so I'm gonna be counting on piers here

317
00:14:14,059 --> 00:14:11,910
to talk me through it and give me nice

318
00:14:15,980 --> 00:14:14,069
calls like guys so you got over a foot

319
00:14:17,689 --> 00:14:15,990
you're looking good and that'll make me

320
00:14:19,699 --> 00:14:17,699
that'll make my heart rate come down and

321
00:14:22,220 --> 00:14:19,709
as he will have to coordinate very

322
00:14:24,259 --> 00:14:22,230
carefully at that moment is when we come

323
00:14:25,579 --> 00:14:24,269
to closest so it's a definitely an area

324
00:14:27,799 --> 00:14:25,589
concern is something we're going to

325
00:14:29,419 --> 00:14:27,809
we've practiced a lot both in the pool

326
00:14:32,780 --> 00:14:29,429
but probably more importantly in a

327
00:14:33,980 --> 00:14:32,790
virtual reality lab that we use and that

328
00:14:34,910 --> 00:14:33,990
practice I think it's going to pay

329
00:14:37,699 --> 00:14:34,920
dividends because I think we have a

330
00:14:39,290 --> 00:14:37,709
pretty good coordination between us and

331
00:14:43,009 --> 00:14:39,300
will hopefully get her done but stay

332
00:14:44,960 --> 00:14:43,019
tuned hi I'm mark Kirkman interspace

333
00:14:46,160 --> 00:14:44,970
news um since we're kind of celebrating

334
00:14:47,809 --> 00:14:46,170
Atlantis with this apply it I got a

335
00:14:49,790 --> 00:14:47,819
question for I guess Hawk and Tony

336
00:14:52,129 --> 00:14:49,800
probably but if any of y'all have an

337
00:14:55,869 --> 00:14:52,139
input please chime in this morning I

338
00:14:58,579 --> 00:14:55,879

asked Jerry Ross the airplane business

339
00:15:00,679 --> 00:14:58,589
every aircraft every tail number has its

340
00:15:01,999 --> 00:15:00,689
own quirks and i was wondering within

341
00:15:02,989 --> 00:15:02,009
the astronaut office and particularly

342
00:15:05,090 --> 00:15:02,999
when you're getting ready for this fight

343
00:15:06,350 --> 00:15:05,100
are there any nuances or anything in

344
00:15:08,509 --> 00:15:06,360
particular or unique

345
00:15:10,850 --> 00:15:08,519
Atlantis that they briefed you about or

346
00:15:12,079 --> 00:15:10,860
tell you about or say Atlantis does this

347
00:15:13,730 --> 00:15:12,089
differently than some of the other

348
00:15:15,980 --> 00:15:13,740
orders and then the other part of my

349
00:15:17,870 --> 00:15:15,990
question is a it will stop if you given

350
00:15:19,100 --> 00:15:17,880
any thought to how that how that's going

351
00:15:23,750 --> 00:15:19,110
to feel knowing that that's the last

352
00:15:28,190 --> 00:15:23,760
time Atlantis is going to roll all yours

353
00:15:32,269 --> 00:15:28,200
I think I think we'll talk about will

354
00:15:34,490 --> 00:15:32,279
stop after hot gets us at far I hate to

355
00:15:39,350 --> 00:15:34,500
get too far ahead of myself the quirks

356
00:15:42,050 --> 00:15:39,360
on Atlantis are are all little small

357
00:15:44,750 --> 00:15:42,060
things and more interesting tidbits

358
00:15:48,079 --> 00:15:44,760
except for one that I talked about at T

359
00:15:50,329 --> 00:15:48,089
CDT there's a basically an extension

360
00:15:51,590 --> 00:15:50,339
cord if you will a power cord capability

361
00:15:53,870 --> 00:15:51,600
that the other two space shuttles have

362
00:15:56,420 --> 00:15:53,880
that Atlantis doesn't allows you to take

363
00:15:59,090 --> 00:15:56,430

space station power and power the

364
00:16:00,560 --> 00:15:59,100
orbiter while you're docked and Atlantis

365
00:16:03,920 --> 00:16:00,570
doesn't have that capability so that

366
00:16:06,230 --> 00:16:03,930
will limit the duration of our stay so

367
00:16:07,850 --> 00:16:06,240
if we run into any difficulties like big

368
00:16:10,519 --> 00:16:07,860
G not getting them our m1 docked right

369
00:16:12,019 --> 00:16:10,529
away or or Stevo and bueno being slow on

370
00:16:14,630 --> 00:16:12,029
the batteries and stuff it'll take it a

371
00:16:16,069 --> 00:16:14,640
limit the ability to stay in and to

372
00:16:17,750 --> 00:16:16,079
continue working different issues but

373
00:16:20,210 --> 00:16:17,760
that's known that's been Atlantis's

374
00:16:22,699 --> 00:16:20,220
config the whole time the other little

375
00:16:26,600 --> 00:16:22,709
one is one of the lights is burned out

376
00:16:28,220 --> 00:16:26,610
on a system that we use but we cover up

377
00:16:29,780 --> 00:16:28,230
the lights with our fingers so it's kind

378
00:16:31,189 --> 00:16:29,790
of hard to tell if they're on or not

379
00:16:32,509 --> 00:16:31,199
since your fingers are over the top of

380
00:16:36,350 --> 00:16:32,519
them and that's putting out the drag

381
00:16:38,360 --> 00:16:36,360
chute we get I guess for lights when we

382
00:16:39,650 --> 00:16:38,370
when we deploy the drag chute it's

383
00:16:41,720 --> 00:16:39,660
pretty obvious when it comes out because

384
00:16:44,210 --> 00:16:41,730
it it tugs on you as it slows you down

385
00:16:46,519 --> 00:16:44,220
one of those four we expect to not come

386
00:16:49,420 --> 00:16:46,529
on I guess actually there's eight and so

387
00:16:51,829 --> 00:16:49,430
two of the eight Montcalm low and then

388
00:16:54,230 --> 00:16:51,839

lights are kind of important to me on

389
00:16:56,630 --> 00:16:54,240
discovery we lost the light in the in

390
00:16:58,250 --> 00:16:56,640
the restroom and that's a pretty

391
00:17:00,110 --> 00:16:58,260
important light and so we've had during

392
00:17:01,970 --> 00:17:00,120
the flow Atlantis has had a couple of

393
00:17:02,960 --> 00:17:01,980
light bulbs burned out normally no big

394
00:17:05,090 --> 00:17:02,970
deal you just go in there and change

395
00:17:06,230 --> 00:17:05,100
them out but but we only got one in the

396
00:17:07,699 --> 00:17:06,240
restroom so I want to make sure that

397
00:17:12,720 --> 00:17:07,709
one's working for these guys to keep

398
00:17:20,199 --> 00:17:15,120
hi Robert Pearlman with collectspace.com

399
00:17:21,760 --> 00:17:20,209
as commander ham mentioned well you've

400
00:17:24,309 --> 00:17:21,770
all flown to space before you all have

401
00:17:27,130 --> 00:17:24,319
experience in space this will be your

402
00:17:30,040 --> 00:17:27,140
all your last space shuttle mission and

403
00:17:32,770 --> 00:17:30,050
taking an example from peers about

404
00:17:34,720 --> 00:17:32,780
learning a new task or coming up with a

405
00:17:37,090 --> 00:17:34,730
new challenge I wonder if each of you

406
00:17:38,860 --> 00:17:37,100
that care to answer how you are

407
00:17:43,330 --> 00:17:38,870
approaching this flight will either from

408
00:17:45,310 --> 00:17:43,340
a professional new challenge or for

409
00:17:47,919 --> 00:17:45,320
personal desire of what memories you

410
00:17:54,840 --> 00:17:47,929
want to capture on on this being your

411
00:18:02,410 --> 00:17:54,850
last shuttle flight Thanks point oh

412
00:18:06,940 --> 00:18:02,420
thank you I tried not to make eye

413
00:18:09,820 --> 00:18:06,950

contact well that's it's an interesting

414
00:18:12,490 --> 00:18:09,830
question for me it's going to be there's

415
00:18:13,720 --> 00:18:12,500
a lot to look forward to as as Ken

416
00:18:15,190 --> 00:18:13,730
described as crew has a lot of

417
00:18:18,760 --> 00:18:15,200
experience that we've all flown before

418
00:18:21,460 --> 00:18:18,770
it's a highly qualified crew and since

419
00:18:22,930 --> 00:18:21,470
Ken brought it up something about me go

420
00:18:24,880 --> 00:18:22,940
and I was going to say anything but to

421
00:18:32,799 --> 00:18:24,890
hit though the ice has been broken now

422
00:18:34,450 --> 00:18:32,809
so I can talk about Hubble the my only

423
00:18:35,740 --> 00:18:34,460
other flight was to Hubble so that

424
00:18:37,630 --> 00:18:35,750
there's a lot to look forward to on this

425
00:18:39,760 --> 00:18:37,640
flight going to a new destination to the

426
00:18:41,770 --> 00:18:39,770
International Space Station for me to

427
00:18:44,020 --> 00:18:41,780
see it for the first time and I thought

428
00:18:45,700 --> 00:18:44,030
Hubble was big so I can't imagine what

429
00:18:48,220 --> 00:18:45,710
the station is going to look like as we

430
00:18:50,200 --> 00:18:48,230
rendezvous with it and then getting to

431
00:18:53,980 --> 00:18:50,210
go through that hatch and and into that

432
00:18:55,660 --> 00:18:53,990
building orbiting space station is going

433
00:18:57,730 --> 00:18:55,670
to be incredible and and then going out

434
00:19:00,280 --> 00:18:57,740
a different air lock on the spacewalks

435
00:19:01,750 --> 00:19:00,290
you know on the space walks in my last

436
00:19:03,280 --> 00:19:01,760
plate we went out the shuttle and just

437
00:19:04,330 --> 00:19:03,290
hung out in the payload Bay which was

438
00:19:06,970 --> 00:19:04,340

like going out and working in your

439
00:19:09,340 --> 00:19:06,980
garage this time I'm going to go out the

440
00:19:10,540 --> 00:19:09,350
airlock from the station and get to you

441
00:19:12,190 --> 00:19:10,550
know wander around the neighborhood a

442
00:19:15,040 --> 00:19:12,200
little bit and go out to the very end of

443
00:19:17,890 --> 00:19:15,050
the p6 truss work on batteries with both

444
00:19:19,480 --> 00:19:17,900
these guys Steven Garrett and I'm really

445
00:19:21,039 --> 00:19:19,490
looking forward to the view out there

446
00:19:22,749 --> 00:19:21,049
just hanging on

447
00:19:24,489 --> 00:19:22,759
you know at the end of the world out

448
00:19:27,519 --> 00:19:24,499
there and just get in to watch the earth

449
00:19:35,109 --> 00:19:27,529
go by below so I'm a lot to look forward

450
00:19:38,080 --> 00:19:35,119
to okay no other ones other questions in

451
00:19:40,779 --> 00:19:38,090
a sec good Greg Dobbs hi from hdnet

452
00:19:42,999 --> 00:19:40,789
television to technical questions the

453
00:19:45,190 --> 00:19:43,009
first one is four for big G highly

454
00:19:49,479 --> 00:19:45,200
technical how tall are you and what do

455
00:19:54,430 --> 00:19:49,489
you weigh hey to earn that Nicholas here

456
00:19:55,749 --> 00:19:54,440
on earth or hey I was told that there

457
00:20:01,060 --> 00:19:55,759
wouldn't be any personal questions today

458
00:20:02,440 --> 00:20:01,070
yeah um well uh that's why I'm glad that

459
00:20:03,940 --> 00:20:02,450
we're all sitting down because I kind of

460
00:20:05,529 --> 00:20:03,950
look like a pig me when we all stand up

461
00:20:12,159 --> 00:20:05,539
and do these press conferences but I'm

462
00:20:17,349 --> 00:20:12,169
five foot four and a half and a hundred

463
00:20:22,210 --> 00:20:17,359

and seventy-two pounds so it's all it's

464
00:20:23,680 --> 00:20:22,220
all a basalt it's all muscle and-and-and

465
00:20:27,609 --> 00:20:23,690
but the thing is that you do grow in

466
00:20:31,629 --> 00:20:27,619
space in fact that's really the whole

467
00:20:34,389 --> 00:20:31,639
reason I signed up for this job so you

468
00:20:36,940 --> 00:20:34,399
my last mission I grew over a niche so I

469
00:20:40,570 --> 00:20:36,950
got up to around I got a pretty close to

470
00:20:42,759 --> 00:20:40,580
five six and I've the video me standing

471
00:20:45,489 --> 00:20:42,769
next to a tape measure to prove it so

472
00:20:46,659 --> 00:20:45,499
that's I'm like Pete you're asking

473
00:20:49,149 --> 00:20:46,669
before but what we're looking forward to

474
00:20:50,409 --> 00:20:49,159
about going back to space well that's

475
00:20:53,499 --> 00:20:50,419
been with don't tape measures

476
00:20:55,659 --> 00:20:53,509
growing space to know the other very

477
00:20:59,190 --> 00:20:55,669
technical question for any couple of you

478
00:21:04,299 --> 00:20:59,200
if you don't mind none of a terrible

479
00:21:05,680 --> 00:21:04,309
we'll see after two weeks can you talk

480
00:21:06,999 --> 00:21:05,690
about what it was like it's not

481
00:21:11,399 --> 00:21:07,009
something you get to do on every mission

482
00:21:17,139 --> 00:21:14,979
steve-o I thought before so it was I

483
00:21:19,599 --> 00:21:17,149
didn't get underway on it this time but

484
00:21:21,279 --> 00:21:19,609
last time I actually waited before it

485
00:21:23,529 --> 00:21:21,289
started rolling and I spent a lot of

486
00:21:26,320 --> 00:21:23,539
time on Navy ships and submarines and it

487
00:21:28,119 --> 00:21:26,330
was literally like a ship moving it just

488
00:21:29,529 --> 00:21:28,129

seemed like the building was moving away

489
00:21:33,129 --> 00:21:29,539
from you the vehicle didn't feel like it

490
00:21:34,060 --> 00:21:33,139
was moving it also smooth this time it

491
00:21:35,950 --> 00:21:34,070
was fantastic

492
00:21:38,620 --> 00:21:35,960
and a little bit different because we

493
00:21:40,690 --> 00:21:38,630
get out there late at night and there

494
00:21:45,010 --> 00:21:40,700
was a crowd of people out there halogen

495
00:21:46,300 --> 00:21:45,020
lights and it seemed it was a lot of fun

496
00:21:49,060 --> 00:21:46,310
there were a lot of a lot of enthusiasm

497
00:21:51,520 --> 00:21:49,070
a lot of people out there wishing us

498
00:21:54,430 --> 00:21:51,530
well watching the vehicle go by we got a

499
00:21:57,310 --> 00:21:54,440
pretty good image of the vehicle shadow

500
00:22:00,220 --> 00:21:57,320
up against the vab so it looks like the

501
00:22:01,840 --> 00:22:00,230
bat signal from the old TV series so

502
00:22:05,320 --> 00:22:01,850
that was all very exciting then we got a

503
00:22:07,450 --> 00:22:05,330
chance to run around and look at the

504
00:22:10,630 --> 00:22:07,460
vehicle as it was rolling down away from

505
00:22:12,580 --> 00:22:10,640
the VAB and some of the lights in the

506
00:22:14,110 --> 00:22:12,590
distance with the blue glow in the mist

507
00:22:18,880 --> 00:22:14,120
it was pretty pretty interesting pretty

508
00:22:21,730 --> 00:22:18,890
exciting stephen clark was spaceflight

509
00:22:24,280 --> 00:22:21,740
now for a hawk or whoever else would

510
00:22:26,530 --> 00:22:24,290
like to field this since this is

511
00:22:28,450 --> 00:22:26,540
Atlantis's last scheduled flight is

512
00:22:29,710 --> 00:22:28,460
there anything we planned during the

513
00:22:32,620 --> 00:22:29,720

mission or you're carrying with you to

514
00:22:37,150 --> 00:22:32,630
commemorate that milestone in space

515
00:22:44,410 --> 00:22:37,160
history piers I think it's well for you

516
00:22:48,160 --> 00:22:44,420
hook you forgot our deal driver first

517
00:22:50,230 --> 00:22:48,170
off we're officially calling the six of

518
00:22:52,870 --> 00:22:50,240
us are calling this the first last

519
00:22:54,960 --> 00:22:52,880
flight of Atlantis and I think that's

520
00:22:58,330 --> 00:22:54,970
appropriate because we really don't know

521
00:22:59,950 --> 00:22:58,340
what she's going to do next she's

522
00:23:01,390 --> 00:22:59,960
definitely got to get serviced and be

523
00:23:06,850 --> 00:23:01,400
ready to launch as launch on need

524
00:23:08,290 --> 00:23:06,860
orbiter and you know because the

525
00:23:09,820 --> 00:23:08,300
likelihood that she could fly again I

526
00:23:12,610 --> 00:23:09,830
don't think we're going to do a whole

527
00:23:13,810 --> 00:23:12,620
lot to try to make sure that it is the

528
00:23:22,900 --> 00:23:13,820
last flight I think that would kind of

529
00:23:25,330 --> 00:23:22,910
be a the wrong juju if you will well

530
00:23:27,580 --> 00:23:25,340
right in the middle of it the nose down

531
00:23:28,660 --> 00:23:27,590
to doing the operation but that we're

532
00:23:30,640 --> 00:23:28,670
kind of aware there is a sense of

533
00:23:32,560 --> 00:23:30,650
history here I mean these three

534
00:23:36,190 --> 00:23:32,570
surviving shuttles they're pieces of

535
00:23:38,890 --> 00:23:36,200
history we've been to you know the

536
00:23:41,260 --> 00:23:38,900
Constitution and hms victory for myself

537
00:23:43,690 --> 00:23:41,270
these old ships that marked the state of

538
00:23:44,659 --> 00:23:43,700

Technology well these three ships will

539
00:23:52,159 --> 00:23:44,669
go down in history to

540
00:23:57,510 --> 00:23:55,620
Jill tolk with cohasset men are Mariner

541
00:23:59,399 --> 00:23:57,520
in Massachusetts and also Bay Area

542
00:24:02,039 --> 00:23:59,409
Houston magazine question for the

543
00:24:03,810 --> 00:24:02,049
spacewalkers what do you expect will be

544
00:24:07,049 --> 00:24:03,820
your biggest challenge outside the hatch

545
00:24:11,970 --> 00:24:07,059
and to what portions of the EVs are you

546
00:24:13,799 --> 00:24:11,980
most looking forward Steve's already

547
00:24:17,909 --> 00:24:13,809
that's it yeah that's true she did

548
00:24:19,919 --> 00:24:17,919
didn't see ya yeah you know Annie va1

549
00:24:21,720 --> 00:24:19,929
the hardest part is actually just going

550
00:24:23,279 --> 00:24:21,730
to be running the VA as written because

551
00:24:26,310 --> 00:24:23,289
we've never been able to practice it as

552
00:24:30,480 --> 00:24:26,320
written in the NBL or even in the VR lab

553
00:24:33,750 --> 00:24:30,490
the way we've had to practice and train

554
00:24:36,240 --> 00:24:33,760
all the stuff is simulated out of

555
00:24:39,029 --> 00:24:36,250
sequence and it's a very difficult

556
00:24:40,740 --> 00:24:39,039
you're it's gonna put this thing

557
00:24:42,389 --> 00:24:40,750
together it's got a tough job holding

558
00:24:44,789 --> 00:24:42,399
standing on the arm basically though

559
00:24:47,190 --> 00:24:44,799
about half if not a little more than

560
00:24:49,680 --> 00:24:47,200
half the entire TVA it's going to

561
00:24:51,690 --> 00:24:49,690
acquire a lot of concentration so on TV

562
00:24:54,029 --> 00:24:51,700
a one you know that's the we've never

563
00:24:57,090 --> 00:24:54,039

been able to run it as written evh two

564
00:24:58,470 --> 00:24:57,100
and three well Evie a three from Mike we

565
00:25:01,049 --> 00:24:58,480
have no idea what he's really going to

566
00:25:03,779 --> 00:25:01,059
end up doing up so really depends on

567
00:25:05,789 --> 00:25:03,789
what we do on TV a two and on TV a two

568
00:25:07,200 --> 00:25:05,799
and the batteries in general we've not

569
00:25:10,019 --> 00:25:07,210
been able to practice them either as

570
00:25:11,279 --> 00:25:10,029
written we end up reversing it because

571
00:25:14,639 --> 00:25:11,289
of the constraints and the arm in the

572
00:25:16,350 --> 00:25:14,649
NBL you actually stand on the arm and

573
00:25:18,330 --> 00:25:16,360
the NBL to go to the battery palette

574
00:25:20,279 --> 00:25:18,340
whereas in reality will be standing on

575
00:25:23,580 --> 00:25:20,289
the truss of the space station and the

576
00:25:25,889 --> 00:25:23,590
piers we bring the palette to us so it's

577
00:25:28,649 --> 00:25:25,899
a it's reversed and so that the

578
00:25:32,640 --> 00:25:28,659
difficulties we've had to overcome yes

579
00:25:38,400 --> 00:25:32,650
it is different yeah

580
00:25:40,710 --> 00:25:38,410
my gosh but right got it right so but

581
00:25:42,480 --> 00:25:40,720
that you know that getting past that

582
00:25:44,370 --> 00:25:42,490
mental image and understanding that that

583
00:25:46,500 --> 00:25:44,380
difference exists is biting me the

584
00:25:48,810 --> 00:25:46,510
hardest thing as far as the EVs and then

585
00:25:50,970 --> 00:25:48,820
there's always the general concerns with

586
00:25:55,350 --> 00:25:50,980
EPA's just getting up a hatch and

587
00:25:58,320 --> 00:25:55,360
getting out there to do work thanks a

588
00:26:00,150 --> 00:25:58,330

lot now I have a light-hearted question

589
00:26:02,250 --> 00:26:00,160
you all are pretty tight as a crew good

590
00:26:04,470 --> 00:26:02,260
sense of humor what sort of in-flight

591
00:26:07,220 --> 00:26:04,480
entertainment might we expect if you had

592
00:26:19,050 --> 00:26:07,230
an IMAX camera what would we see nothing

593
00:26:20,640 --> 00:26:19,060
absolutely nothing those are broken it

594
00:26:25,560 --> 00:26:20,650
might be best to wait for that movie to

595
00:26:27,120 --> 00:26:25,570
come out everything we've got as each

596
00:26:29,250 --> 00:26:27,130
crew gets to lay down their own

597
00:26:31,500 --> 00:26:29,260
priorities and what we think is

598
00:26:34,770 --> 00:26:31,510
important in a flight and we sat down

599
00:26:37,440 --> 00:26:34,780
almost a year ago together and discussed

600
00:26:39,660 --> 00:26:37,450
what we basically what we thought we

601
00:26:42,300 --> 00:26:39,670
needed to get done number one was

602
00:26:44,190 --> 00:26:42,310
accomplished the mission and then two

603
00:26:46,260 --> 00:26:44,200
and three is don't hurt anybody don't

604
00:26:48,390 --> 00:26:46,270
hurt any big pieces of space hardware

605
00:26:50,430 --> 00:26:48,400
like a space shuttle or space station

606
00:26:53,370 --> 00:26:50,440
and the number four right behind all

607
00:26:54,810 --> 00:26:53,380
that was have fun doing it and let

608
00:26:57,390 --> 00:26:54,820
people around you know that we're having

609
00:26:59,070 --> 00:26:57,400
fun and I think we've a whole bunch of

610
00:27:01,350 --> 00:26:59,080
our trainers are here today and they

611
00:27:04,350 --> 00:27:01,360
might agree that we've had a little fun

612
00:27:06,390 --> 00:27:04,360
over the last year but we're still

613
00:27:10,460 --> 00:27:06,400

getting the mission done so yeah we are

614
00:27:15,149 --> 00:27:12,840
hi Eric burger with the Houston

615
00:27:16,440 --> 00:27:15,159
Chronicle maybe it just one of the two

616
00:27:18,200 --> 00:27:16,450
guys that are going to be changing out

617
00:27:21,600 --> 00:27:18,210
the batteries talk a little bit about

618
00:27:23,010 --> 00:27:21,610
the challenges of that I mean when

619
00:27:24,779 --> 00:27:23,020
people outside of the space program

620
00:27:27,180 --> 00:27:24,789
think of changing a battery they may

621
00:27:29,789 --> 00:27:27,190
think of their car talk a little bit

622
00:27:34,279 --> 00:27:29,799
about the task that you'll be performing

623
00:27:40,080 --> 00:27:37,500
these are these aren't double a's you

624
00:27:41,130 --> 00:27:40,090
know I have four brothers and one of my

625
00:27:43,049 --> 00:27:41,140
brothers likes to give me a hard time

626
00:27:44,760 --> 00:27:43,059
about you know going up flying up in

627
00:27:47,100 --> 00:27:44,770
space and changing batteries he thinks

628
00:27:49,019 --> 00:27:47,110
this is not a very very difficult task

629
00:27:52,710 --> 00:27:49,029
not a big deal but these are these are

630
00:27:56,310 --> 00:27:52,720
like 400 pound nickel hydrogen batteries

631
00:27:57,720 --> 00:27:56,320
there's a size of a very big suitcase

632
00:27:59,639 --> 00:27:57,730
probably bigger than the airlines would

633
00:28:04,139 --> 00:27:59,649
let you take on without charging you

634
00:28:06,899 --> 00:28:04,149
extra but and they they're pretty tricky

635
00:28:09,779 --> 00:28:06,909
you know this this is a task similar to

636
00:28:12,120 --> 00:28:09,789
what they did on on 127 just on the

637
00:28:14,159 --> 00:28:12,130
other side of the truss that they were

638
00:28:15,810 --> 00:28:14,169

out there on the end of p6 and they had

639
00:28:18,720 --> 00:28:15,820
to replace six of these batteries too

640
00:28:21,149 --> 00:28:18,730
and it's a challenge getting the

641
00:28:23,039 --> 00:28:21,159
batteries just on and off the pallet

642
00:28:25,470 --> 00:28:23,049
there's a soft doc they're basically

643
00:28:27,899 --> 00:28:25,480
just connected with the two bolts so you

644
00:28:30,029 --> 00:28:27,909
think you to be pretty simple but just

645
00:28:34,409 --> 00:28:30,039
the alignment and the tolerances are

646
00:28:36,810 --> 00:28:34,419
very tight and there's a there's a you

647
00:28:39,570 --> 00:28:36,820
have to get the soft dock the battery on

648
00:28:40,950 --> 00:28:39,580
to the pallet and before you can drive

649
00:28:43,019 --> 00:28:40,960
the bolts and just getting it all

650
00:28:45,029 --> 00:28:43,029
aligned and as you're as you're pushing

651
00:28:48,779 --> 00:28:45,039
the battery on to the palette that's on

652
00:28:51,120 --> 00:28:48,789
the robotic arm and it's stretched out

653
00:28:53,100 --> 00:28:51,130
to the very limits of its capabilities

654
00:28:55,230 --> 00:28:53,110
there's a lot of dynamics and a lot of

655
00:28:57,889 --> 00:28:55,240
motion that goes with that so you have

656
00:29:02,039 --> 00:28:57,899
to be careful when you're pushing not to

657
00:29:03,750 --> 00:29:02,049
you know excite that motion and just end

658
00:29:05,490 --> 00:29:03,760
up pushing the pallet away from you and

659
00:29:06,750 --> 00:29:05,500
that you're still you know holding onto

660
00:29:09,570 --> 00:29:06,760
this battery trying to get it in and

661
00:29:11,310 --> 00:29:09,580
then there's a as we get the batteries

662
00:29:14,430 --> 00:29:11,320
off the pallet we have to sort of

663
00:29:16,889 --> 00:29:14,440

Shepherd them you know pass them back

664
00:29:18,450 --> 00:29:16,899
and forth between the two of us because

665
00:29:20,310 --> 00:29:18,460
the arm can't get us all the way out to

666
00:29:22,380 --> 00:29:20,320
the very end of the the trust where

667
00:29:23,620 --> 00:29:22,390
we're actually going to put them in so

668
00:29:28,210 --> 00:29:23,630
it's it's

669
00:29:34,300 --> 00:29:28,220
tricky job and you know we're looking

670
00:29:35,680 --> 00:29:34,310
forward to it yeah Jim Oberg remember

671
00:29:38,620 --> 00:29:35,690
with NBC I could follow up the last

672
00:29:39,910 --> 00:29:38,630
question about having fun the common

673
00:29:41,980 --> 00:29:39,920
experience I've heard from people back

674
00:29:43,120 --> 00:29:41,990
from missions is it never lasted quite

675
00:29:45,120 --> 00:29:43,130
long enough and there were several

676
00:29:48,520 --> 00:29:45,130
things you want do but you never got to

677
00:29:50,470 --> 00:29:48,530
at the G or PG level can you describe

678
00:29:53,260 --> 00:29:50,480
some of things that you didn't get to do

679
00:30:04,870 --> 00:29:53,270
last time that you determine not to miss

680
00:30:08,350 --> 00:30:04,880
this time my top priorities is pretty

681
00:30:11,170 --> 00:30:08,360
easy the cupola was not installed when I

682
00:30:12,310 --> 00:30:11,180
was at the space station and so I'm

683
00:30:19,440 --> 00:30:12,320
looking forward to getting out there and

684
00:30:24,250 --> 00:30:22,420
for me I just taken taking pictures

685
00:30:26,380 --> 00:30:24,260
especially outside on the EPA's last

686
00:30:29,380 --> 00:30:26,390
time I had to ebas and didn't take a

687
00:30:31,590 --> 00:30:29,390
single picture just had my just very

688
00:30:33,460 --> 00:30:31,600

focused and my you know my nose and the

689
00:30:35,280 --> 00:30:33,470
telescope so I'm looking forward to

690
00:30:37,360 --> 00:30:35,290
again being out there at the end of p6

691
00:30:39,280 --> 00:30:37,370
out there on the end of the trust from

692
00:30:42,070 --> 00:30:39,290
the station and just taking it all in

693
00:30:44,230 --> 00:30:42,080
looking at that huge vehicle looking

694
00:30:48,010 --> 00:30:44,240
back at the shuttle that's several

695
00:30:49,750 --> 00:30:48,020
hundred feet away and you know seeing

696
00:30:52,570 --> 00:30:49,760
these guys in the in the little windows

697
00:30:55,180 --> 00:30:52,580
back there but but taking some pictures

698
00:31:00,670 --> 00:30:55,190
while I'm out there of the other guys of

699
00:31:02,050 --> 00:31:00,680
myself I think just simply like like

700
00:31:04,830 --> 00:31:02,060
anything you do in life the second time

701
00:31:08,560 --> 00:31:04,840
you do it you remember it more I

702
00:31:10,300 --> 00:31:08,570
remember a cent from my last flight and

703
00:31:11,800 --> 00:31:10,310
i remember it was an awful lot of fun

704
00:31:13,270 --> 00:31:11,810
and I remember looking at the window but

705
00:31:15,040 --> 00:31:13,280
I don't exactly remember a whole lot of

706
00:31:16,450 --> 00:31:15,050
it this time I'm going to remember more

707
00:31:19,240 --> 00:31:16,460
and the same with entry and the same

708
00:31:22,270 --> 00:31:19,250
with day-to-day living on orbit this

709
00:31:25,990 --> 00:31:22,280
time around it's going to be I think a

710
00:31:28,900 --> 00:31:26,000
little easier to not be overwhelmed and

711
00:31:31,180 --> 00:31:28,910
that'll make a difference I'm looking

712
00:31:32,650 --> 00:31:31,190
forward to seeing stations pretty much

713
00:31:34,320 --> 00:31:32,660

complete this is like ninety-eight

714
00:31:36,060 --> 00:31:34,330
percent complete by the time we get

715
00:31:39,090 --> 00:31:36,070
that and pretty much all of us when we

716
00:31:42,330 --> 00:31:39,100
started out in the job there wasn't

717
00:31:44,610 --> 00:31:42,340
there you know or only just that so this

718
00:31:48,240 --> 00:31:44,620
is terrific to finally see this huge

719
00:31:55,019 --> 00:31:48,250
edifice put together in one piece it'll

720
00:31:56,279 --> 00:31:55,029
be really something all right but that

721
00:32:01,529 --> 00:31:56,289
we're going to switch now at Kennedy

722
00:32:03,720 --> 00:32:01,539
Space Center yes hello Marcia Dunn

723
00:32:06,090 --> 00:32:03,730
associated press for the commander and

724
00:32:07,919 --> 00:32:06,100
who else might like to answer whether

725
00:32:10,740 --> 00:32:07,929
it's the first last flight of Atlantis

726
00:32:12,960 --> 00:32:10,750
or the real last flight there aren't too

727
00:32:16,110 --> 00:32:12,970
many Shuttle missions left even with an

728
00:32:17,519 --> 00:32:16,120
extra one or two and does that run

729
00:32:20,159 --> 00:32:17,529
through your mind at all the winding

730
00:32:23,490 --> 00:32:20,169
down of this program is there any sense

731
00:32:25,080 --> 00:32:23,500
of subdue pneus or I don't know the

732
00:32:26,700 --> 00:32:25,090
flight director told us earlier he's

733
00:32:28,649 --> 00:32:26,710
treating this with reverence and I'm

734
00:32:30,000 --> 00:32:28,659
just wondering if this enters into your

735
00:32:32,700 --> 00:32:30,010
thoughts at all ways you get ready to

736
00:32:37,620 --> 00:32:32,710
fly Atlantis for the last or next to

737
00:32:39,029 --> 00:32:37,630
last time I I think you can't in a lot

738
00:32:42,210 --> 00:32:39,039

of ways you can't really afford to get

739
00:32:44,879 --> 00:32:42,220
too distracted by thinking about the

740
00:32:46,320 --> 00:32:44,889
words you just said this is probably the

741
00:32:47,399 --> 00:32:46,330
kind of thing especially if it does turn

742
00:32:48,659 --> 00:32:47,409
out to be the last flight of Atlantis

743
00:32:50,220 --> 00:32:48,669
this is probably the kind of thing

744
00:32:52,830 --> 00:32:50,230
that's really going to hit all of us

745
00:32:55,320 --> 00:32:52,840
after we're done with the mission and we

746
00:32:58,620 --> 00:32:55,330
realize what part of history we may have

747
00:33:02,399 --> 00:32:58,630
played like Pierce alluded to a little

748
00:33:04,680 --> 00:33:02,409
earlier and I'll put some more words on

749
00:33:07,259 --> 00:33:04,690
it i think the space shuttle as a

750
00:33:11,039 --> 00:33:07,269
machine is the single most incredible

751
00:33:12,240 --> 00:33:11,049
machine humanity has ever built space

752
00:33:17,039 --> 00:33:12,250
station might be right up there with it

753
00:33:18,779 --> 00:33:17,049
but it is an incredible machine the fact

754
00:33:23,460 --> 00:33:18,789
of the matter is though if we want to

755
00:33:26,100 --> 00:33:23,470
use our national assets to do space

756
00:33:28,230 --> 00:33:26,110
exploration beyond low Earth orbit you

757
00:33:29,820 --> 00:33:28,240
can't do that in the space show so that

758
00:33:31,620 --> 00:33:29,830
there's the logical side of all of us

759
00:33:33,779 --> 00:33:31,630
that realize that the program has to

760
00:33:34,980 --> 00:33:33,789
come to an end at some point and it is

761
00:33:37,470 --> 00:33:34,990
an honor and a privilege for us to

762
00:33:43,379 --> 00:33:37,480
represent being being part of the that

763
00:33:45,180 --> 00:33:43,389

crew at the end I think that's all my my

764
00:33:46,590 --> 00:33:45,190
head has gotten around that question so

765
00:33:51,140 --> 00:33:46,600
far it'll probably look a whole lot

766
00:33:56,520 --> 00:33:54,409
thank you and a question for Garrett

767
00:34:00,090 --> 00:33:56,530
when you came back from your long

768
00:34:01,890 --> 00:34:00,100
mission you were happy to be of smaller

769
00:34:04,380 --> 00:34:01,900
stature because you were bouncing around

770
00:34:06,539 --> 00:34:04,390
right after the long flight here at the

771
00:34:07,860 --> 00:34:06,549
news conference I remember certainly

772
00:34:10,619 --> 00:34:07,870
unlike many other long-duration

773
00:34:13,260 --> 00:34:10,629
astronauts and I'm wondering if it will

774
00:34:15,570 --> 00:34:13,270
there be any advantages to being five

775
00:34:20,250 --> 00:34:15,580
foot four and a half during a spacewalk

776
00:34:22,169 --> 00:34:20,260
and I'm wondering what the lower limit

777
00:34:24,210 --> 00:34:22,179
is for space walking I remember once

778
00:34:26,940 --> 00:34:24,220
upon a time an astronaut was too small

779
00:34:29,040 --> 00:34:26,950
to spacewalk and and these are questions

780
00:34:36,149 --> 00:34:29,050
as by someone considerably smaller than

781
00:34:38,960 --> 00:34:36,159
yourself starting to feel a little star

782
00:34:40,980 --> 00:34:38,970
feel a little typecast here and its crew

783
00:34:47,399 --> 00:34:40,990
you should want to ask something about

784
00:34:54,180 --> 00:34:47,409
the my job as ms one on a scent and well

785
00:34:57,540 --> 00:34:54,190
it actually being a shorter stature and

786
00:35:00,270 --> 00:34:57,550
and kind of stocky is anecdotally an

787
00:35:05,490 --> 00:35:00,280
advantage for landing as she as you

788
00:35:07,080 --> 00:35:05,500

noted we've guys and gals of this type

789
00:35:11,190 --> 00:35:07,090
of body build tend to for whatever

790
00:35:13,740 --> 00:35:11,200
reason I do better as far as readapting

791
00:35:15,480 --> 00:35:13,750
to gravity right after landing we don't

792
00:35:16,980 --> 00:35:15,490
really know why and actually are we have

793
00:35:21,599 --> 00:35:16,990
a lot of smart people trying to figure

794
00:35:23,010 --> 00:35:21,609
that out but so it's it it does is an

795
00:35:25,560 --> 00:35:23,020
advantage for that and for limbo contest

796
00:35:29,190 --> 00:35:25,570
I can't say it's an advantage for space

797
00:35:32,220 --> 00:35:29,200
walking because often having a longer

798
00:35:34,890 --> 00:35:32,230
reach is is useful but what I've found

799
00:35:37,220 --> 00:35:34,900
is that you can accommodate that by just

800
00:35:39,359 --> 00:35:37,230
changing your body position and I might

801
00:35:43,410 --> 00:35:39,369
approach the same task with a slightly

802
00:35:45,030 --> 00:35:43,420
different angle so it's it's hasn't

803
00:35:47,280 --> 00:35:45,040
really been much of a limitation the

804
00:35:49,500 --> 00:35:47,290
factor in the reason that there's an

805
00:35:52,410 --> 00:35:49,510
issue about size of the crew membrane

806
00:35:54,090 --> 00:35:52,420
and space walking it's simply a result

807
00:35:56,970 --> 00:35:54,100
of the suits that we have we only have

808
00:35:58,290 --> 00:35:56,980
three sizes we don't have a small we

809
00:36:00,990 --> 00:35:58,300
have a medium a large and an extra large

810
00:36:02,250 --> 00:36:01,000
and that what really determined

811
00:36:04,200 --> 00:36:02,260
ability to work in the suit is not

812
00:36:06,510 --> 00:36:04,210
necessarily your height or your reach

813
00:36:10,080 --> 00:36:06,520

but it's more the distance between your

814
00:36:12,780 --> 00:36:10,090
shoulders because if if if the suit

815
00:36:14,910 --> 00:36:12,790
comes out to here and you only come out

816
00:36:17,220 --> 00:36:14,920
to here then you end up in the suit kind

817
00:36:19,620 --> 00:36:17,230
of not being able to get a full access

818
00:36:22,380 --> 00:36:19,630
to your work envelope and that poses a

819
00:36:28,170 --> 00:36:22,390
big problem for people who are more

820
00:36:35,090 --> 00:36:28,180
slender so for example what bueno here

821
00:36:38,580 --> 00:36:37,440
we still got I still got time to get to

822
00:36:43,320 --> 00:36:38,590
know you man when that launched it for

823
00:36:45,960 --> 00:36:43,330
another week bueno or my sitting next to

824
00:36:47,760 --> 00:36:45,970
me actually runs in a smaller suit size

825
00:36:50,100 --> 00:36:47,770
than I do and it's driven again not by

826
00:36:52,620 --> 00:36:50,110
our height obviously but by our with

827
00:36:55,350 --> 00:36:52,630
she'll stand up bank the bank you ask us

828
00:37:01,620 --> 00:36:55,360
go back to back yeah I think that's also

829
00:37:04,350 --> 00:37:01,630
a mess of it hi this is James Dean from

830
00:37:07,500 --> 00:37:04,360
Florida today with a few questions first

831
00:37:10,370 --> 00:37:07,510
possibly for peers I was wondering if

832
00:37:12,810 --> 00:37:10,380
there's any significant differences

833
00:37:14,310 --> 00:37:12,820
working with a Russian payload compared

834
00:37:16,410 --> 00:37:14,320
to one for many of your other

835
00:37:19,950 --> 00:37:16,420
international partners other than the

836
00:37:21,540 --> 00:37:19,960
different language obviously well yeah

837
00:37:24,060 --> 00:37:21,550
this this one turns out to be quite

838
00:37:25,470 --> 00:37:24,070

complicated because were not only

839
00:37:28,490 --> 00:37:25,480
dealing with Russian payload but we're

840
00:37:31,950 --> 00:37:28,500
talking through all the US and other

841
00:37:36,030 --> 00:37:31,960
boxes to actually reach it so to send a

842
00:37:37,620 --> 00:37:36,040
command to the Russian module we have to

843
00:37:40,020 --> 00:37:37,630
send it through a whole lot of boxes in

844
00:37:41,760 --> 00:37:40,030
the u.s. segment which then finds its

845
00:37:44,390 --> 00:37:41,770
way up through the arm and then it sort

846
00:37:46,620 --> 00:37:44,400
of stuck into the ear of the module and

847
00:37:48,540 --> 00:37:46,630
translated into Russian somehow and then

848
00:37:51,870 --> 00:37:48,550
the Russian computer says okay I'll do

849
00:37:53,490 --> 00:37:51,880
it about eight seconds later so where

850
00:37:56,220 --> 00:37:53,500
I'm looking forward to being patient

851
00:37:57,450 --> 00:37:56,230
while we're doing this making sure that

852
00:37:59,370 --> 00:37:57,460
the stuff that we send out there goes

853
00:38:01,350 --> 00:37:59,380
through little telephone links ends up

854
00:38:03,270 --> 00:38:01,360
in Russian module we get confirmation

855
00:38:06,420 --> 00:38:03,280
that it's doing what is supposed to do

856
00:38:07,490 --> 00:38:06,430
and then proceed as Garrett was talking

857
00:38:09,750 --> 00:38:07,500
about earlier we're going to be

858
00:38:11,520 --> 00:38:09,760
pretending to dock this like a Soyuz

859
00:38:12,400 --> 00:38:11,530
he's going to use the arm and very

860
00:38:14,770 --> 00:38:12,410
carefully a pro

861
00:38:16,450 --> 00:38:14,780
the docking cone we're going to extend

862
00:38:18,910 --> 00:38:16,460
the probe and we're going to fool it

863
00:38:21,100 --> 00:38:18,920

into thinking its docking itself and

864
00:38:22,630 --> 00:38:21,110
that's how it's going to activate all

865
00:38:30,480 --> 00:38:22,640
those lectures and pokes and stuff like

866
00:38:33,970 --> 00:38:30,490
that should be interesting Thanks second

867
00:38:37,120 --> 00:38:33,980
you guys understandably I guess don't

868
00:38:38,530 --> 00:38:37,130
want dwell too much on the the last this

869
00:38:40,720 --> 00:38:38,540
being the last flight for Atlantis but

870
00:38:43,240 --> 00:38:40,730
it is built into the design of your

871
00:38:45,760 --> 00:38:43,250
mission patch and I was wondering if

872
00:38:49,960 --> 00:38:45,770
whomever oversaw that design could talk

873
00:38:52,960 --> 00:38:49,970
about how you got to to that image and

874
00:38:58,840 --> 00:38:52,970
if Atlantis doesn't pack fly again we

875
00:39:01,630 --> 00:38:58,850
have to consider a redesign there's a

876
00:39:02,980 --> 00:39:01,640
lot of work but I think I think we're

877
00:39:06,760 --> 00:39:02,990
all pretty pleased with how the patch

878
00:39:09,700 --> 00:39:06,770
came out and it we did know that if it's

879
00:39:12,010 --> 00:39:09,710
not Atlantis's last flight it is the as

880
00:39:14,050 --> 00:39:12,020
we've talked about quite a bit the end

881
00:39:15,400 --> 00:39:14,060
of an era and and the end of the we're

882
00:39:17,770 --> 00:39:15,410
approaching the end of the space shuttle

883
00:39:19,240 --> 00:39:17,780
program one way or the other so having

884
00:39:21,280 --> 00:39:19,250
the shuttle and the landis in particular

885
00:39:23,080 --> 00:39:21,290
flying off into the sunset I think

886
00:39:26,320 --> 00:39:23,090
certainly is appropriate and we really

887
00:39:27,760 --> 00:39:26,330
felt that given this point in history

888
00:39:30,010 --> 00:39:27,770

that it was important to recognize that

889
00:39:33,460 --> 00:39:30,020
on the patch and then we hedge our bets

890
00:39:36,250 --> 00:39:33,470
a little bit by pointing out that since

891
00:39:38,380 --> 00:39:36,260
the shuttle actually flies towards the

892
00:39:42,790 --> 00:39:38,390
East actually flying into the sunrise

893
00:39:46,660 --> 00:39:42,800
and that Sun is rising over our new

894
00:39:48,940 --> 00:39:46,670
module which is in rest of it is its

895
00:39:52,420 --> 00:39:48,950
name in Russian and what that means is

896
00:39:54,840 --> 00:39:52,430
done so it's also the Sun rising on the

897
00:39:58,030 --> 00:39:54,850
promise of a heralding I believe

898
00:39:59,320 --> 00:39:58,040
heralding the promise of new research

899
00:40:05,140 --> 00:39:59,330
that will be performed inside this

900
00:40:07,540 --> 00:40:05,150
module thanks and finally for Captain

901
00:40:09,760 --> 00:40:07,550
ham you you've discussed a little bit

902
00:40:14,110 --> 00:40:09,770
about how having an all veteran crew

903
00:40:18,100 --> 00:40:14,120
helped to streamline I guess your

904
00:40:19,900 --> 00:40:18,110
training flow wonder how rushed has this

905
00:40:22,510 --> 00:40:19,910
flow been for you given that many of you

906
00:40:25,609 --> 00:40:22,520
flown recently and what are some of the

907
00:40:26,809 --> 00:40:25,619
things that that you skipped that you

908
00:40:31,690 --> 00:40:26,819
you probably would have had to do if you

909
00:40:35,809 --> 00:40:31,700
had one or more rookies on the group

910
00:40:37,700 --> 00:40:35,819
things that we skipped were half of the

911
00:40:44,809 --> 00:40:37,710
Christmas holidays break and spring

912
00:40:48,440 --> 00:40:44,819
break wish we could have those back this

913
00:40:50,569 --> 00:40:48,450

has been a bit of a rushed flow and that

914
00:40:52,430 --> 00:40:50,579
is for a various number of reasons that

915
00:40:55,700 --> 00:40:52,440
aren't really important at this time but

916
00:40:58,039 --> 00:40:55,710
what our training team every every crew

917
00:40:59,569 --> 00:40:58,049
has a shuttle training team and a space

918
00:41:04,130 --> 00:40:59,579
station train team that tries to

919
00:41:05,779 --> 00:41:04,140
accomplish this very long list of tasks

920
00:41:08,319 --> 00:41:05,789
that are laid out in a crew training

921
00:41:11,569 --> 00:41:08,329
catalog and they've done a great job of

922
00:41:14,960 --> 00:41:11,579
actually crediting many of the classes

923
00:41:17,630 --> 00:41:14,970
that were in that catalog with our

924
00:41:19,609 --> 00:41:17,640
recent space flight experience and and

925
00:41:21,980 --> 00:41:19,619
that helped out immensely and they came

926
00:41:23,720 --> 00:41:21,990
up with a plan that got us from where we

927
00:41:26,989 --> 00:41:23,730
were when we were assigned to the launch

928
00:41:29,140 --> 00:41:26,999
day in fact our training schedule

929
00:41:32,269 --> 00:41:29,150
scheduler she's here in this room

930
00:41:33,680 --> 00:41:32,279
actually managed to get us two days of

931
00:41:35,509 --> 00:41:33,690
vacation before we go into quarantine

932
00:41:37,249 --> 00:41:35,519
this friday which is absolutely

933
00:41:40,039 --> 00:41:37,259
spectacular and we can all go home and

934
00:41:41,089 --> 00:41:40,049
and mow the lawn and catch up on the

935
00:41:43,970 --> 00:41:41,099
things that we need to do before you go

936
00:41:46,160 --> 00:41:43,980
to space for couple weeks so we were

937
00:41:49,249 --> 00:41:46,170
simply able to make it because these

938
00:41:51,349 --> 00:41:49,259

guys are so squared away and it didn't

939
00:41:56,210 --> 00:41:51,359
embarrass us through your training so

940
00:41:57,440 --> 00:41:56,220
far we got a couple more days to go okay

941
00:42:03,499 --> 00:41:57,450
with that we're going to switch now to

942
00:42:06,229 --> 00:42:03,509
headquarters thank you this is a tark

943
00:42:08,299 --> 00:42:06,239
Melek from space calm and my first

944
00:42:10,700 --> 00:42:08,309
question is for maybe Garrett or four

945
00:42:14,420 --> 00:42:10,710
piers I'm just thinking about when you

946
00:42:17,059 --> 00:42:14,430
install the mrm one modules you'll be

947
00:42:18,680 --> 00:42:17,069
installing a Russian module to an

948
00:42:20,569 --> 00:42:18,690
International Space Station carried by

949
00:42:23,180 --> 00:42:20,579
an American spaceship and wielded by a

950
00:42:25,430 --> 00:42:23,190
Canadian robotic arm and I mean it just

951
00:42:27,680 --> 00:42:25,440
seems you know it's interesting to see

952
00:42:28,519 --> 00:42:27,690
all of that tie together at the station

953
00:42:30,559 --> 00:42:28,529
I'm just wondering what your thoughts

954
00:42:32,720 --> 00:42:30,569
are on on what is a nearly complete

955
00:42:37,579 --> 00:42:32,730
space station that will be completely in

956
00:42:38,880 --> 00:42:37,589
just two more flights well you know in

957
00:42:40,920 --> 00:42:38,890
many levels this

958
00:42:42,630 --> 00:42:40,930
project has been a smashing success and

959
00:42:44,309 --> 00:42:42,640
I think one of them is the whole

960
00:42:46,470 --> 00:42:44,319
business of international partnerships

961
00:42:49,490 --> 00:42:46,480
you would never have thought 20 years

962
00:42:53,099 --> 00:42:49,500
ago that we'd be able to pull it off

963
00:42:55,529 --> 00:42:53,109

European Union Japan Canada and Russia

964
00:42:57,329 --> 00:42:55,539
all being strong players in this so I

965
00:42:59,309 --> 00:42:57,339
think it's tremendous accomplishment it

966
00:43:03,420 --> 00:42:59,319
really is that that we now have a fully

967
00:43:05,190 --> 00:43:03,430
functioning space station and the fact

968
00:43:07,109 --> 00:43:05,200
that so many different nations involved

969
00:43:09,569 --> 00:43:07,119
is actually played to the strength of

970
00:43:11,430 --> 00:43:09,579
the project when some of our equipment

971
00:43:14,099 --> 00:43:11,440
didn't work the Russians helped out with

972
00:43:16,410 --> 00:43:14,109
their stuff and vice versa so I think

973
00:43:18,299 --> 00:43:16,420
this is going to be a very solid first

974
00:43:20,789 --> 00:43:18,309
step to the future of space exploration

975
00:43:28,920 --> 00:43:20,799
which I expect to be international as

976
00:43:31,410 --> 00:43:28,930
well thank you and for commander hem you

977
00:43:32,849 --> 00:43:31,420
mentioned I guess some of the benefits

978
00:43:33,809 --> 00:43:32,859
of having an all veteran crew and I'm

979
00:43:35,519 --> 00:43:33,819
just wondering if there have been any

980
00:43:38,009 --> 00:43:35,529
drawbacks maybe too many cooks in the

981
00:43:39,559 --> 00:43:38,019
kitchen so to speak and has it been a

982
00:43:42,029 --> 00:43:39,569
challenge to kind of maintain your focus

983
00:43:43,859 --> 00:43:42,039
given the pace of your training and a

984
00:43:46,319 --> 00:43:43,869
lot of the would be the background noise

985
00:43:49,680 --> 00:43:46,329
of the the shuttle program standing and

986
00:43:52,440 --> 00:43:49,690
the future of NASA over these last month

987
00:43:54,809 --> 00:43:52,450
a half or so that's actually a good

988
00:43:55,859 --> 00:43:54,819

question but the answer is no I don't

989
00:43:58,980 --> 00:43:55,869
think any of us have been really

990
00:44:02,700 --> 00:43:58,990
distracted by all of the uncertainty

991
00:44:04,859 --> 00:44:02,710
that is out there right now if I may

992
00:44:08,880 --> 00:44:04,869
digress a little bit and answer a bit of

993
00:44:12,059 --> 00:44:08,890
a different question when we're down at

994
00:44:14,549 --> 00:44:12,069
the Cape last week at TCT two weeks ago

995
00:44:16,410 --> 00:44:14,559
and we talked to a lot of folks that are

996
00:44:18,029 --> 00:44:16,420
down there working on the vehicle

997
00:44:22,259 --> 00:44:18,039
working at the launchpad working in

998
00:44:24,779 --> 00:44:22,269
launch control and almost every time you

999
00:44:26,970 --> 00:44:24,789
have a conversation with someone some

1000
00:44:29,370 --> 00:44:26,980
sentence in there ends with if I still

1001
00:44:31,019 --> 00:44:29,380
have a job and this is this is because

1002
00:44:34,440 --> 00:44:31,029
the future is somewhat uncertain right

1003
00:44:36,180 --> 00:44:34,450
now and on a very personal level that

1004
00:44:38,430 --> 00:44:36,190
affects their paycheck and their ability

1005
00:44:40,349 --> 00:44:38,440
to pay their mortgage and and and all

1006
00:44:43,980 --> 00:44:40,359
that and as you can imagine that's

1007
00:44:45,839 --> 00:44:43,990
probably pretty scary however every

1008
00:44:49,200 --> 00:44:45,849
single person we met down there has a

1009
00:44:51,730 --> 00:44:49,210
smile on their face and it's motivated

1010
00:44:54,950 --> 00:44:51,740
to do the best job they can do that

1011
00:44:56,900 --> 00:44:54,960
that air that attitude is present here

1012
00:44:59,990 --> 00:44:56,910
at the Johnson Space Center and I think

1013
00:45:02,029 --> 00:45:00,000

it's a testament to the the caliber of

1014
00:45:04,520 --> 00:45:02,039
the folks that work in this program I

1015
00:45:06,380 --> 00:45:04,530
think folks that want to get involved in

1016
00:45:08,150 --> 00:45:06,390
space exploration aren't in it for the

1017
00:45:10,220 --> 00:45:08,160
money they're in it for space

1018
00:45:11,480 --> 00:45:10,230
exploration and they're true

1019
00:45:13,670 --> 00:45:11,490
professionals they're working it all the

1020
00:45:15,890 --> 00:45:13,680
way to the end now we're trying to do

1021
00:45:17,779 --> 00:45:15,900
that on our part as well and again we

1022
00:45:21,980 --> 00:45:17,789
get to represent that effort and it's a

1023
00:45:23,569 --> 00:45:21,990
it's pretty much an honor okay with that

1024
00:45:28,829 --> 00:45:23,579
we will now switch over to the Glenn

1025
00:45:33,200 --> 00:45:30,989
it's John mangles from the flame dealer

1026
00:45:38,009 --> 00:45:33,210
in Cleveland I took questions for

1027
00:45:41,700 --> 00:45:38,019
Colonel good first captain ham talked

1028
00:45:43,499 --> 00:45:41,710
about your responsibilities with the get

1029
00:45:44,849 --> 00:45:43,509
alongs the additional sort of bonus work

1030
00:45:46,049 --> 00:45:44,859
they have that sounds a bit

1031
00:45:47,880 --> 00:45:46,059
nerve-wracking I wonder if you could

1032
00:45:49,170 --> 00:45:47,890
talk in more detail about how how you

1033
00:45:52,499 --> 00:45:49,180
plan for that and sort of how you

1034
00:45:57,569 --> 00:45:52,509
mentally approach it well thanks John

1035
00:45:59,279 --> 00:45:57,579
thanks for joining us today I guess on I

1036
00:46:04,079 --> 00:45:59,289
didn't Steve's been telling me all along

1037
00:46:05,069 --> 00:46:04,089
that dev for EV a3 that you're not going

1038
00:46:08,249 --> 00:46:05,079

to know what you're going to do until

1039
00:46:11,160 --> 00:46:08,259
the night before and so my last mission

1040
00:46:12,599 --> 00:46:11,170
now is much more used to having it very

1041
00:46:14,249 --> 00:46:12,609
planned out and we practiced and

1042
00:46:16,259 --> 00:46:14,259
practiced and practiced what we're going

1043
00:46:18,690 --> 00:46:16,269
to do and for this mission it's much

1044
00:46:23,579 --> 00:46:18,700
more going to be thinking on your feet

1045
00:46:27,120 --> 00:46:23,589
and on the fly Ichi VA is dependent on

1046
00:46:29,069 --> 00:46:27,130
the one before it and will affect what

1047
00:46:31,499 --> 00:46:29,079
we get done on the first dva will affect

1048
00:46:35,579 --> 00:46:31,509
how we do on the second one and then on

1049
00:46:37,469 --> 00:46:35,589
the third one so I'm looking forward to

1050
00:46:39,479 --> 00:46:37,479
as i said earlier just going out a

1051
00:46:42,150 --> 00:46:39,489
different air lock out onto the station

1052
00:46:44,549 --> 00:46:42,160
and just having those experiences we're

1053
00:46:46,589 --> 00:46:44,559
going to i'm confident that we're going

1054
00:46:49,589 --> 00:46:46,599
to get it all done and we're going to

1055
00:46:51,900 --> 00:46:49,599
work hard with the team inside the

1056
00:46:53,880 --> 00:46:51,910
vehicle Tony's got it's an open book

1057
00:46:55,979 --> 00:46:53,890
test this flying in space thing in the

1058
00:46:57,719 --> 00:46:55,989
and the spacewalks tony has all the

1059
00:47:01,650 --> 00:46:57,729
answers he's going to tell us what to do

1060
00:47:05,609 --> 00:47:01,660
as we go along and we really are looking

1061
00:47:07,739 --> 00:47:05,619
forward to getting everything done Thank

1062
00:47:10,200 --> 00:47:07,749
You second you come from a long

1063
00:47:12,959 --> 00:47:10,210

tradition of Ohio born and bred

1064
00:47:15,390 --> 00:47:12,969
astronauts particularly on the shuttle

1065
00:47:16,469 --> 00:47:15,400
crews not the least of which is is John

1066
00:47:19,410 --> 00:47:16,479
Glenn I wonder if you could talk about

1067
00:47:22,650 --> 00:47:19,420
being a part of that Ohio astronaut

1068
00:47:24,900 --> 00:47:22,660
tradition well it's it's really an honor

1069
00:47:28,170 --> 00:47:24,910
i'm not sure why there's so many

1070
00:47:30,150 --> 00:47:28,180
astronauts from ohio I'll quote my buddy

1071
00:47:32,940 --> 00:47:30,160
Mike Foreman who's in the class ahead of

1072
00:47:36,870 --> 00:47:32,950
us in the class of 98 with I think he

1073
00:47:38,670 --> 00:47:36,880
was in your class hawk he said and this

1074
00:47:40,529 --> 00:47:38,680
is a joke but he said that there's a lot

1075
00:47:45,840 --> 00:47:40,539
of folks in Ohio that are looking for

1076
00:47:52,690 --> 00:47:50,560
yeah he's he's a funny guy he's also

1077
00:47:55,030 --> 00:47:52,700
from Ohio he grew up in Wadsworth where

1078
00:47:57,010 --> 00:47:55,040
my mom and dad did and you know his his

1079
00:47:59,170 --> 00:47:57,020
parents knew my parents and so it's it's

1080
00:48:00,340 --> 00:47:59,180
really pretty neat to you know hook up

1081
00:48:02,650 --> 00:48:00,350
with them here I didn't know him before

1082
00:48:04,360 --> 00:48:02,660
we got together down here at Johnson

1083
00:48:07,030 --> 00:48:04,370
Space Center and we're training together

1084
00:48:09,900 --> 00:48:07,040
so but they're there have been a lot of

1085
00:48:12,940 --> 00:48:09,910
very interesting and successful

1086
00:48:15,010 --> 00:48:12,950
astronauts from Ohio John Glenn Neil

1087
00:48:18,250 --> 00:48:15,020
Armstrong and it's a real privilege to

1088
00:48:20,200 --> 00:48:18,260

be you know just listed on the same page

1089
00:48:22,540 --> 00:48:20,210
with those guys and and just to have the

1090
00:48:29,830 --> 00:48:22,550
opportunity to go fly in space I feel

1091
00:48:33,100 --> 00:48:29,840
very lucky that's our last question from

1092
00:48:34,240 --> 00:48:33,110
Glenn would that will return back here

1093
00:48:35,710 --> 00:48:34,250
to the Johnson Space Center where we've

1094
00:48:37,300 --> 00:48:35,720
got a couple follow-ups on the side

1095
00:48:41,710 --> 00:48:37,310
again it feels that your name and

1096
00:48:44,650 --> 00:48:41,720
affiliation marker Oh for aviation week

1097
00:48:47,590 --> 00:48:44,660
I have a question for the for the arm

1098
00:48:49,180 --> 00:48:47,600
operators and using the cupola and how

1099
00:48:52,420 --> 00:48:49,190
that improves the work that you're

1100
00:48:54,910 --> 00:48:52,430
trying to do on this mission if it does

1101
00:48:58,000 --> 00:48:54,920
and it's and I'm also interested in

1102
00:49:01,600 --> 00:48:58,010
whether you could even do the mrm dock

1103
00:49:07,210 --> 00:49:01,610
without having that vantage point if it

1104
00:49:09,400 --> 00:49:07,220
helps you with that it's a it's a

1105
00:49:11,830 --> 00:49:09,410
tremendous help being able to look at

1106
00:49:13,990 --> 00:49:11,840
the window it's something that we have

1107
00:49:15,880 --> 00:49:14,000
developed techniques over the years of

1108
00:49:18,220 --> 00:49:15,890
the space station program to overcome

1109
00:49:21,640 --> 00:49:18,230
not having a window and usually it

1110
00:49:24,280 --> 00:49:21,650
involves using three four five sometimes

1111
00:49:25,630 --> 00:49:24,290
even more camera views and you get a

1112
00:49:27,250 --> 00:49:25,640
little piece of information from each

1113
00:49:29,980 --> 00:49:27,260

camera view but it makes your job much

1114
00:49:31,420 --> 00:49:29,990
more difficult your primary concern when

1115
00:49:34,630 --> 00:49:31,430
you're operating that the robot arm is

1116
00:49:35,920 --> 00:49:34,640
not hitting anything as you move

1117
00:49:39,220 --> 00:49:35,930
something that's big exam room one

1118
00:49:41,770 --> 00:49:39,230
around and to do that often you reliant

1119
00:49:43,900 --> 00:49:41,780
on bits of pieces of information on all

1120
00:49:46,870 --> 00:49:43,910
different camera views sometimes you

1121
00:49:49,390 --> 00:49:46,880
can't just see it in one view having the

1122
00:49:52,360 --> 00:49:49,400
cupola there for example when I bring

1123
00:49:54,040 --> 00:49:52,370
the mm one from the payload Bay over to

1124
00:49:55,120 --> 00:49:54,050
where it's installed on the space

1125
00:49:57,160 --> 00:49:55,130
station

1126
00:49:59,350 --> 00:49:57,170
I can look out the window and I have to

1127
00:50:01,600 --> 00:49:59,360
look at anything else and I know that

1128
00:50:04,120 --> 00:50:01,610
I'm fine and that all is well and I can

1129
00:50:06,580 --> 00:50:04,130
proceed whereas if I I could do the task

1130
00:50:09,100 --> 00:50:06,590
from the lab without the window of you

1131
00:50:10,750 --> 00:50:09,110
but I have to use a multitude of cameras

1132
00:50:12,460 --> 00:50:10,760
and constantly pan and tilt them and it

1133
00:50:14,440 --> 00:50:12,470
just adds to your operator workload

1134
00:50:15,610 --> 00:50:14,450
there's nothing quite like being able to

1135
00:50:18,430 --> 00:50:15,620
look at the window and see where you're

1136
00:50:20,470 --> 00:50:18,440
going so it's something I'm really

1137
00:50:22,510 --> 00:50:20,480
looking forward to I did robotics ops my

1138
00:50:23,740 --> 00:50:22,520

last flight without the cupola and I

1139
00:50:27,790 --> 00:50:23,750
predicted it's going to be a tremendous

1140
00:50:29,410 --> 00:50:27,800
advantage this time fine Stephen Clark

1141
00:50:31,870 --> 00:50:29,420
spaceflight now again for the

1142
00:50:34,540 --> 00:50:31,880
spacewalkers about the p6 battery change

1143
00:50:36,250 --> 00:50:34,550
out is there it has there been any sort

1144
00:50:39,340 --> 00:50:36,260
of change to the procedure from what the

1145
00:50:41,920 --> 00:50:39,350
127 guys did any tips from them about

1146
00:50:46,090 --> 00:50:41,930
don't do this this is a better way to do

1147
00:50:47,800 --> 00:50:46,100
this etc yeah we learned a lot was

1148
00:50:49,270 --> 00:50:47,810
supposed to 127 crew when they came back

1149
00:50:51,430 --> 00:50:49,280
and there were some technical changes

1150
00:50:53,020 --> 00:50:51,440
they made to the battery palette that

1151
00:50:55,680 --> 00:50:53,030
mostly what we learned we learned from

1152
00:50:58,180 --> 00:50:55,690
those guys and what they did outside

1153
00:51:00,160 --> 00:50:58,190
they just had a tremendous amount of

1154
00:51:02,470 --> 00:51:00,170
information and applied by the time they

1155
00:51:04,570 --> 00:51:02,480
get to their sixth battery they felt

1156
00:51:06,430 --> 00:51:04,580
that they understood and they tried to

1157
00:51:08,290 --> 00:51:06,440
pass that on to us so we've taken their

1158
00:51:09,460 --> 00:51:08,300
what they did for training we've tried

1159
00:51:11,260 --> 00:51:09,470
to add to it based on their

1160
00:51:13,420 --> 00:51:11,270
recommendations we got a lot of

1161
00:51:15,520 --> 00:51:13,430
techniques we've actually changed from

1162
00:51:17,490 --> 00:51:15,530
the way we started before we spoke to

1163
00:51:19,930 --> 00:51:17,500

them till asked they came back and

1164
00:51:21,370 --> 00:51:19,940
learned what they did we changed our

1165
00:51:24,610 --> 00:51:21,380
techniques as to how we're handling the

1166
00:51:28,060 --> 00:51:24,620
batteries so we're building on what they

1167
00:51:29,350 --> 00:51:28,070
did and hopefully we can do it a little

1168
00:51:33,100 --> 00:51:29,360
more efficiently based on what they

1169
00:51:35,680 --> 00:51:33,110
accomplished I'm Marianne Dyson with

1170
00:51:37,090 --> 00:51:35,690
National Space Society the science

1171
00:51:38,590 --> 00:51:37,100
fiction and fantasy writers of america

1172
00:51:40,750 --> 00:51:38,600
are holding the nebula awards in

1173
00:51:43,630 --> 00:51:40,760
conjunction with your launch and they'll

1174
00:51:45,790 --> 00:51:43,640
be there watching and I was just

1175
00:51:47,500 --> 00:51:45,800
wondering if any of you were influenced

1176
00:51:49,330 --> 00:51:47,510
by a science fiction book or movie when

1177
00:51:50,890 --> 00:51:49,340
you were growing up and that influenced

1178
00:51:56,100 --> 00:51:50,900
you to go into your career in the space

1179
00:52:01,020 --> 00:51:58,710
I was watching following the whole

1180
00:52:05,880 --> 00:52:01,030
business of you know the assault on the

1181
00:52:09,120 --> 00:52:05,890
moon in the late 60s and at a very

1182
00:52:12,630 --> 00:52:09,130
impressionable age about 13 years old I

1183
00:52:15,480 --> 00:52:12,640
saw 2001 and I was completely captivated

1184
00:52:18,180 --> 00:52:15,490
I think the images that Stanley Kubrick

1185
00:52:20,820 --> 00:52:18,190
put together in that movie the shuttle

1186
00:52:22,020 --> 00:52:20,830
coming up the space station and people

1187
00:52:24,140 --> 00:52:22,030
working on the moon and all the rest of

1188
00:52:27,360 --> 00:52:24,150

it it made a huge impression on me and

1189
00:52:32,010 --> 00:52:27,370
it stayed with me and the real thing has

1190
00:52:33,690 --> 00:52:32,020
not disappointed hi I'm mark Kirkman

1191
00:52:34,950 --> 00:52:33,700
with interspace news again little

1192
00:52:36,000 --> 00:52:34,960
hesitant to ask this question because I

1193
00:52:38,450 --> 00:52:36,010
don't know how much you want to get into

1194
00:52:40,140 --> 00:52:38,460
the Voodoo that is crew assignments but

1195
00:52:43,170 --> 00:52:40,150
every crew seems to have a different

1196
00:52:44,400 --> 00:52:43,180
dynamic and our cursory look at you says

1197
00:52:46,020 --> 00:52:44,410
that you all have a pretty great dynamic

1198
00:52:49,110 --> 00:52:46,030
so I was wondering when they come to you

1199
00:52:52,320 --> 00:52:49,120
as a commander but do you have any input

1200
00:52:53,820 --> 00:52:52,330
into who comes on board you go well got

1201
00:52:55,680 --> 00:52:53,830
such as such as available i'd really

1202
00:52:57,750 --> 00:52:55,690
like to fly with this guy he's got the

1203
00:53:00,930 --> 00:52:57,760
right skill set etc how do you put the

1204
00:53:03,270 --> 00:53:00,940
crew together but the real answer is I

1205
00:53:05,220 --> 00:53:03,280
don't put the crew together but to get a

1206
00:53:08,370 --> 00:53:05,230
little more to the what you're getting

1207
00:53:12,660 --> 00:53:08,380
at nobody comes to the prospective

1208
00:53:13,920 --> 00:53:12,670
commander and says who do you want on

1209
00:53:16,260 --> 00:53:13,930
your mission it just doesn't work that

1210
00:53:18,720 --> 00:53:16,270
way in fact you don't even really know

1211
00:53:21,090 --> 00:53:18,730
you're on the mission for sure until it

1212
00:53:24,020 --> 00:53:21,100
actually gets assigned what I tried to

1213
00:53:27,150 --> 00:53:24,030

do is take the initiative and go ask and

1214
00:53:29,790 --> 00:53:27,160
just see what happened and it actually

1215
00:53:31,680 --> 00:53:29,800
worked out pretty well that's a that's

1216
00:53:34,680 --> 00:53:31,690
really all I know of the process but i'm

1217
00:53:38,060 --> 00:53:34,690
very pleased with the result but you're

1218
00:53:44,510 --> 00:53:41,450
bill Harwood cbs4 peers again also 2001

1219
00:53:45,980 --> 00:53:44,520
when I was a kid too and I remember over

1220
00:53:47,990 --> 00:53:45,990
the years thinking that the scenes we

1221
00:53:49,910 --> 00:53:48,000
saw in 1968 when that movie came out

1222
00:53:51,470 --> 00:53:49,920
were believable you know we all thought

1223
00:53:53,510 --> 00:53:51,480
that that's what you'd have or something

1224
00:53:55,670 --> 00:53:53,520
like that in 2001 and you say the real

1225
00:53:57,230 --> 00:53:55,680
thing hasn't disappointed but but just

1226
00:54:00,470 --> 00:53:57,240
is someone who thinks about this sort of

1227
00:54:02,030 --> 00:54:00,480
thing are you not is it when you look at

1228
00:54:04,610 --> 00:54:02,040
what you have today versus what we

1229
00:54:06,680 --> 00:54:04,620
thought might be real back in 68 it's

1230
00:54:08,180 --> 00:54:06,690
not like that and I'm curious if you had

1231
00:54:09,920 --> 00:54:08,190
any thoughts along those lines so if

1232
00:54:10,970 --> 00:54:09,930
disappointments not the right word that

1233
00:54:13,310 --> 00:54:10,980
you don't wish we were further along

1234
00:54:14,390 --> 00:54:13,320
it's very least well of course we all

1235
00:54:18,020 --> 00:54:14,400
wish we were further along and I think

1236
00:54:20,630 --> 00:54:18,030
that in the 60s that the rate of change

1237
00:54:22,430 --> 00:54:20,640
the rate of achievement was so rapid in

1238
00:54:23,990 --> 00:54:22,440

our expectations were really raised you

1239
00:54:26,990 --> 00:54:24,000
know we went from nothing to a lunar

1240
00:54:28,910 --> 00:54:27,000
landing in 10 years it was incredible so

1241
00:54:31,010 --> 00:54:28,920
it's all taking a bit longer than we

1242
00:54:33,160 --> 00:54:31,020
thought when auction 2001 but I think

1243
00:54:35,150 --> 00:54:33,170
we're going to get there I think that

1244
00:54:37,550 --> 00:54:35,160
during our lifetimes we're going to see

1245
00:54:38,990 --> 00:54:37,560
people on Mars exploring Mars and really

1246
00:54:41,620 --> 00:54:39,000
look forward to that it's going to be as

1247
00:54:45,320 --> 00:54:41,630
much fun watching it as doing it frankly

1248
00:54:49,400 --> 00:54:45,330
so it's a great age to be alive in I'm

1249
00:54:51,050 --> 00:54:49,410
really enjoying it okay thank you all

1250
00:54:52,250 --> 00:54:51,060
very much that concludes our briefing a

1251
00:54:53,630 --> 00:54:52,260
reminder you can find out the latest