



1
00:00:17,720 --> 00:00:15,530
good morning and happy new year welcome

2
00:00:19,790 --> 00:00:17,730
to NASA headquarters and our post flight

3
00:00:23,029 --> 00:00:19,800
briefing with a space shuttle crew of

4
00:00:24,830 --> 00:00:23,039
sts-1 29 the 31st flight of the space

5
00:00:27,170 --> 00:00:24,840
shuttle to the International Space

6
00:00:28,970 --> 00:00:27,180
Station i'm alan ladd booth from the

7
00:00:31,550 --> 00:00:28,980
office of communication I'm your host

8
00:00:33,979 --> 00:00:31,560
today in addition to the employees from

9
00:00:35,479 --> 00:00:33,989
NASA headquarters we welcome some very

10
00:00:37,670 --> 00:00:35,489
special guests who are here in the

11
00:00:39,530 --> 00:00:37,680
audience this morning the teachers and

12
00:00:42,110 --> 00:00:39,540
students from the Congressional schools

13
00:00:46,580 --> 00:00:42,120

of Virginia the Edmund Burke school of

14

00:00:48,440 --> 00:00:46,590

Washington DC and the first the first

15

00:00:58,400 --> 00:00:48,450

District community outreach youth group

16

00:01:00,529 --> 00:00:58,410

of Washington DC since President Obama

17

00:01:02,840 --> 00:01:00,539

announced the administration's educate

18

00:01:05,660 --> 00:01:02,850

to innovate campaign last week it's

19

00:01:07,429 --> 00:01:05,670

especially appropriate that we have so

20

00:01:10,190 --> 00:01:07,439

many teachers and students here with us

21

00:01:12,350 --> 00:01:10,200

today the educate to innovate initiative

22

00:01:15,020 --> 00:01:12,360

is designed to improve the participation

23

00:01:18,320 --> 00:01:15,030

and performance of America's students in

24

00:01:21,230 --> 00:01:18,330

science technology engineering and math

25

00:01:22,880 --> 00:01:21,240

this campaign will include efforts not

26
00:01:25,609 --> 00:01:22,890
only from the federal government and

27
00:01:28,190 --> 00:01:25,619
agencies such as NASA but also from

28
00:01:30,710 --> 00:01:28,200
leading companies foundations nonprofit

29
00:01:33,350 --> 00:01:30,720
organizations and we're going to work to

30
00:01:36,200 --> 00:01:33,360
help students become more adept at

31
00:01:38,149 --> 00:01:36,210
science and math with only one u.s.

32
00:01:41,480 --> 00:01:38,159
module left to install at the

33
00:01:43,819 --> 00:01:41,490
International Space Station the STS 129

34
00:01:46,399 --> 00:01:43,829
mission was devoted to the delivery of

35
00:01:49,100 --> 00:01:46,409
equipment and materials that will enable

36
00:01:52,100 --> 00:01:49,110
increase and efficient utilization of

37
00:01:54,770 --> 00:01:52,110
the station capabilities once assembly

38
00:01:58,249 --> 00:01:54,780

is complete later this year commander

39

00:02:00,770 --> 00:01:58,259

Charlie hoba led the STS 129 mission

40

00:02:02,749 --> 00:02:00,780

aboard the space shuttle Atlantis for

41

00:02:05,120 --> 00:02:02,759

you students in the audience looking for

42

00:02:07,399 --> 00:02:05,130

role models you have to go no further

43

00:02:09,800 --> 00:02:07,409

than to listen to Charlie and his fellow

44

00:02:12,250 --> 00:02:09,810

crew members they are concrete evidence

45

00:02:13,850 --> 00:02:12,260

of the value of dedicated training

46

00:02:15,590 --> 00:02:13,860

teamwork

47

00:02:18,350 --> 00:02:15,600

and a demonstration of what can happen

48

00:02:21,290 --> 00:02:18,360

when one follows their dreams so please

49

00:02:23,120 --> 00:02:21,300

join me in extending a warm and rousing

50

00:02:25,040 --> 00:02:23,130

headquarters welcome to commander

51
00:02:36,210 --> 00:02:25,050
Charlie hoba who will introduce the

52
00:02:39,880 --> 00:02:38,260
thanks Alan and good morning and say

53
00:02:41,949 --> 00:02:39,890
it's a pleasure to be standing in front

54
00:02:44,199 --> 00:02:41,959
of you to be able to relay some of the

55
00:02:46,870 --> 00:02:44,209
joys thrills excitement that we had

56
00:02:51,580 --> 00:02:46,880
during our mission and the things we do

57
00:02:53,710 --> 00:02:51,590
is a it's really hard to call a job with

58
00:02:58,110 --> 00:02:53,720
that I'd like to introduce my pilot

59
00:03:00,990 --> 00:02:58,120
first captain Barry Wilmore we

60
00:03:04,199 --> 00:03:01,000
affectionately refer to him as butch

61
00:03:06,370 --> 00:03:04,209
former a seven f-18 pilot test pilot

62
00:03:08,020 --> 00:03:06,380
back butch and i were at Pax River

63
00:03:16,440 --> 00:03:08,030

together so I've known butch for quite a

64

00:03:22,720 --> 00:03:19,690

Leland has the distinction of not only

65

00:03:25,449 --> 00:03:22,730

being a superb mission specialist but of

66

00:03:27,729 --> 00:03:25,459

course having a background in pro

67

00:03:30,430 --> 00:03:27,739

football and of course high school

68

00:03:33,160 --> 00:03:30,440

football both these guys had football

69

00:03:34,930 --> 00:03:33,170

backgrounds in college and and squared

70

00:03:36,400 --> 00:03:34,940

off against one another a couple times

71

00:03:39,039 --> 00:03:36,410

on orbit hopefully we will see a little

72

00:03:46,360 --> 00:03:39,049

bit of that next lieutenant colonel

73

00:03:48,310 --> 00:03:46,370

Randy bresnick called him comrade f-18

74

00:03:53,289 --> 00:03:48,320

pilot in the Marine Corps fellow marine

75

00:03:56,289 --> 00:03:53,299

friend of mine also a test pilot

76

00:04:00,370 --> 00:03:56,299

background that that's if you're keeping

77

00:04:06,240 --> 00:04:00,380

track that's three so far next captain

78

00:04:11,080 --> 00:04:09,010

went to one of the finest institutions

79

00:04:15,070 --> 00:04:11,090

of higher learning known to man the u.s.

80

00:04:18,970 --> 00:04:15,080

Naval Academy a few years before me he's

81

00:04:22,680 --> 00:04:18,980

that the most seasoned member of our

82

00:04:32,250 --> 00:04:22,690

crew in years only I think so and

83

00:04:37,540 --> 00:04:35,860

Bobby Bobby was a medical doctor and

84

00:04:41,290 --> 00:04:37,550

thought he'd be another kind of doctor

85

00:04:42,640 --> 00:04:41,300

also got a PhD so from from right to

86

00:04:44,470 --> 00:04:42,650

left or left or right depending on your

87

00:04:46,420 --> 00:04:44,480

vantage point we go from the least

88

00:04:49,720 --> 00:04:46,430

educated to the most educated which is

89

00:05:07,270 --> 00:04:49,730

Bobby so with that well sit down we will

90

00:05:10,500 --> 00:05:07,280

show you our video start off we had the

91

00:05:14,350 --> 00:05:10,510

space shuttle Atlantis it was a

92

00:05:20,230 --> 00:05:14,360

beautiful day in November suit-up room

93

00:05:28,570 --> 00:05:20,240

is a myself butch might get in his suit

94

00:05:30,340 --> 00:05:28,580

ready to go Bobby Conrad and lastly

95

00:05:32,740 --> 00:05:30,350

Leland everybody's cool cool calm

96

00:05:34,780 --> 00:05:32,750

collected ready to go walk out through

97

00:05:37,060 --> 00:05:34,790

the hallway getting prepped for the

98

00:05:42,490 --> 00:05:37,070

downstairs portion which is the Isle of

99

00:05:45,160 --> 00:05:42,500

Leland Melvin fan club yeah you can you

100

00:05:47,470 --> 00:05:45,170

can hear the fans in the background we

101
00:05:48,670 --> 00:05:47,480
have right out out to the pad display

102
00:05:50,620 --> 00:05:48,680
the first time we've ever been out the

103
00:05:53,230 --> 00:05:50,630
space shuttle where there's nobody there

104
00:05:56,050 --> 00:05:53,240
but ourselves and there's a suit up guys

105
00:05:58,720 --> 00:05:56,060
that they get us inside the vehicle it's

106
00:06:01,360 --> 00:05:58,730
pretty that's almost lonely pretty

107
00:06:03,370 --> 00:06:01,370
serene we get in the white room which is

108
00:06:07,270 --> 00:06:03,380
where we put our final items of clothing

109
00:06:10,450 --> 00:06:07,280
on you can see the kind of escalates in

110
00:06:15,100 --> 00:06:10,460
a little bit more fun and ends up with a

111
00:06:18,980 --> 00:06:17,420
okay whose wife was having a baby I'm

112
00:06:21,890 --> 00:06:18,990
stood up in the mid deck now that's

113
00:06:24,409 --> 00:06:21,900

whining get flight deck and mid dec

114

00:06:27,200 --> 00:06:24,419

calls all strapped in together we get in

115

00:06:28,670 --> 00:06:27,210

there about to naff 23 hours prior so

116

00:06:33,800 --> 00:06:28,680

we're laying on a jockstrap quite a

117

00:06:36,920 --> 00:06:33,810

while whatever the candy father they're

118

00:06:40,790 --> 00:06:36,930

walking which is good luck on TV backers

119

00:06:44,029 --> 00:06:40,800

and enter thanking word writer take a

120

00:06:49,760 --> 00:06:44,039

couple here override yep another crop of

121

00:06:55,129 --> 00:06:49,770

you know it thanks very much every

122

00:06:57,620 --> 00:06:55,139

country it pretty paid worry and even

123

00:07:03,529 --> 00:06:57,630

that you're clear lon lam got me clear

124

00:07:06,379 --> 00:07:03,539

up wearing chain is armed sound

125

00:07:18,589 --> 00:07:06,389

suppression water system activated t

126
00:07:21,540 --> 00:07:18,599
minus 10 nine eight seven six liftoff of

127
00:07:24,450 --> 00:07:21,550
space shuttle atlantis fish

128
00:07:31,080 --> 00:07:24,460
resupply and to do research the

129
00:07:37,120 --> 00:07:33,820
pretty exciting first couple of minutes

130
00:07:38,770 --> 00:07:37,130
sit there everybody's really kind of

131
00:07:40,600 --> 00:07:38,780
rested and peaceful and then towards the

132
00:07:42,580 --> 00:07:40,610
very end you start cranking getting

133
00:07:45,330 --> 00:07:42,590
things going and you can you can tell

134
00:07:47,470 --> 00:07:45,340
you're going as soon as those SRBs light

135
00:07:53,320 --> 00:07:47,480
you know you're going somewhere in

136
00:07:56,260 --> 00:07:53,330
already speaking solids you get up to

137
00:07:58,360 --> 00:07:56,270
about 250 thousand feet solids are

138
00:07:59,530 --> 00:07:58,370

propellants completely gone so you want

139

00:08:01,390 --> 00:07:59,540

to get rid of that extra weight in those

140

00:08:03,790 --> 00:08:01,400

canisters so they can just come off like

141

00:08:05,650 --> 00:08:03,800

I said about 150 and you continue on

142

00:08:09,280 --> 00:08:05,660

uphill for another couple of minutes

143

00:08:11,050 --> 00:08:09,290

about Mach 13 about 300 plus thousand

144

00:08:12,670 --> 00:08:11,060

feet you finally get to the point where

145

00:08:14,230 --> 00:08:12,680

you do a roll two heads up where you

146

00:08:15,640 --> 00:08:14,240

start bouncing communication signals

147

00:08:16,900 --> 00:08:15,650

instead of back off the ground you

148

00:08:18,730 --> 00:08:16,910

bounce them off of satellites and this

149

00:08:20,530 --> 00:08:18,740

is what's taking place right here as we

150

00:08:23,080 --> 00:08:20,540

roll the heads up and then eight and a

151
00:08:24,850 --> 00:08:23,090
half minutes after it starts the engines

152
00:08:27,130 --> 00:08:24,860
cut off and then you separate from the

153
00:08:28,540 --> 00:08:27,140
external tank and you're there you go

154
00:08:30,790 --> 00:08:28,550
from a light blue at launch and

155
00:08:31,990 --> 00:08:30,800
eventually just sorta fades to black and

156
00:08:33,550 --> 00:08:32,000
it gets darker and it's just a

157
00:08:35,140 --> 00:08:33,560
miraculous thing to watch as you get up

158
00:08:36,610 --> 00:08:35,150
and start looking you know looking out

159
00:08:38,589 --> 00:08:36,620
the window at the blackness of space

160
00:08:39,820 --> 00:08:38,599
then right after we got brought out we

161
00:08:42,400 --> 00:08:39,830
pulled out a camera just to show each

162
00:08:43,839 --> 00:08:42,410
other in our own suits then shall we

163
00:08:52,890 --> 00:08:43,849

open those payload bay doors so we can

164

00:08:56,740 --> 00:08:55,330

and we have to do a couple of burns to

165

00:08:59,530 --> 00:08:56,750

circularize our orbit and you can see a

166

00:09:00,940 --> 00:08:59,540

fire off these burns and you'll see

167

00:09:03,400 --> 00:09:00,950

those owns into orbital maneuvering

168

00:09:04,570 --> 00:09:03,410

system engines in the back just glowing

169

00:09:10,810 --> 00:09:04,580

brightly just a beautiful beautiful

170

00:09:12,610 --> 00:09:10,820

sight kind of chaos down here getting

171

00:09:14,350 --> 00:09:12,620

out of our orange suits and putting

172

00:09:16,720 --> 00:09:14,360

everything away see we just have bags

173

00:09:18,370 --> 00:09:16,730

everywhere for a while until we get

174

00:09:20,590 --> 00:09:18,380

everything stowed back where it needs to

175

00:09:22,960 --> 00:09:20,600

go I'm kind of lost down here underneath

176
00:09:25,210 --> 00:09:22,970
this piece of equipment bottoms playing

177
00:09:27,460 --> 00:09:25,220
with a drink bag they're getting out

178
00:09:29,200 --> 00:09:27,470
some checklist this is played a tune out

179
00:09:30,970 --> 00:09:29,210
we're actually getting ready to inspect

180
00:09:34,780 --> 00:09:30,980
the vehicles tiles make sure we didn't

181
00:09:38,110 --> 00:09:34,790
have any damage during our launch good

182
00:09:40,870 --> 00:09:38,120
looking Butch there so these guys are

183
00:09:41,980 --> 00:09:40,880
pulling out the robotic arm and I don't

184
00:09:43,300 --> 00:09:41,990
know why I talked about this because I

185
00:09:45,070 --> 00:09:43,310
didn't I'm the only guy on the crew that

186
00:09:47,380 --> 00:09:45,080
wasn't allowed to talk touch the robotic

187
00:09:49,840 --> 00:09:47,390
arm I was down shaving and here's butch

188
00:09:55,030 --> 00:09:49,850

he's got the electric version and rainy

189

00:09:57,040 --> 00:09:55,040

was exercising and then we have these

190

00:09:59,260 --> 00:09:57,050

big spacewalk suits that we're going to

191

00:10:01,000 --> 00:09:59,270

use eventually we take those out of the

192

00:10:03,100 --> 00:10:01,010

airlock snow them and of course there's

193

00:10:10,660 --> 00:10:03,110

always time for stupid astronaut food

194

00:10:15,070 --> 00:10:10,670

tricks which needs something to do so we

195

00:10:17,380 --> 00:10:15,080

totally blow up this football yeah third

196

00:10:19,510 --> 00:10:17,390

day we're on orbit is is dedicated to

197

00:10:22,120 --> 00:10:19,520

this fine in station getting there and

198

00:10:24,240 --> 00:10:22,130

getting prepped for our spacewalk which

199

00:10:26,920 --> 00:10:24,250

is the next day so it's a very busy day

200

00:10:28,930 --> 00:10:26,930

when we launch the space station is

201
00:10:31,360 --> 00:10:28,940
almost three-quarters of the way around

202
00:10:33,130 --> 00:10:31,370
the Earth away from us so we go into

203
00:10:37,780 --> 00:10:33,140
lower orbit and catch up to them with a

204
00:10:39,820 --> 00:10:37,790
with our lower orbit being faster Space

205
00:10:42,730 --> 00:10:39,830
Station just gets bigger and bigger for

206
00:10:45,820 --> 00:10:42,740
those full three days to where we

207
00:10:48,220 --> 00:10:45,830
rendezvous from up underneath it do this

208
00:10:50,290 --> 00:10:48,230
pitch maneuver which is really to just

209
00:10:52,630 --> 00:10:50,300
expose the underside of our vehicle to

210
00:10:54,910 --> 00:10:52,640
see if we had any type of potential

211
00:10:57,670 --> 00:10:54,920
thermal protection system damage and

212
00:11:00,400 --> 00:10:57,680
usually it's pretty clean but it's one

213
00:11:02,290 --> 00:11:00,410

last check and this is what it looks

214

00:11:03,970 --> 00:11:02,300

like coming out the back end of it when

215

00:11:05,830 --> 00:11:03,980

we see the station again we're basically

216

00:11:09,550 --> 00:11:05,840

blind on intercourse is where

217

00:11:11,500 --> 00:11:09,560

underneath it with the tile exposed but

218

00:11:15,340 --> 00:11:11,510

this is the eventual end of that

219

00:11:18,310 --> 00:11:15,350

maneuver still underneath we get to

220

00:11:20,530 --> 00:11:18,320

within about five hundred feet before we

221

00:11:22,810 --> 00:11:20,540

transition to directly out in front of

222

00:11:25,990 --> 00:11:22,820

it and this is an inset that actually

223

00:11:27,640 --> 00:11:26,000

shows the space station and and our

224

00:11:29,500 --> 00:11:27,650

mating interface coming together and

225

00:11:31,810 --> 00:11:29,510

then we'll show you a little cocktail

226

00:11:36,610 --> 00:11:31,820

bar the very terminal phase here

227

00:11:46,650 --> 00:11:36,620

probably ready with the camera ready got

228

00:11:53,090 --> 00:11:49,790

9 inches

229

00:11:55,730 --> 00:11:53,100

ready to mention fire the initial times

230

00:11:58,280 --> 00:11:55,740

I've got captured everything we do is a

231

00:12:00,320 --> 00:11:58,290

team effort it's all individuals working

232

00:12:02,269 --> 00:12:00,330

together it's never just one person so

233

00:12:04,460 --> 00:12:02,279

that's really the the fun part of is

234

00:12:06,350 --> 00:12:04,470

just working together as a crew what we

235

00:12:08,210 --> 00:12:06,360

were as a crew of six now once we get to

236

00:12:10,519 --> 00:12:08,220

station get the hatches up we're now a

237

00:12:12,590 --> 00:12:10,529

crew at 12 and most of these guys we

238

00:12:14,269 --> 00:12:12,600

haven't really had a chance to work with

239

00:12:15,980 --> 00:12:14,279

and training we trained very well

240

00:12:18,680 --> 00:12:15,990

together as a group of six they trained

241

00:12:21,440 --> 00:12:18,690

as a group of six and now we're 12 to do

242

00:12:23,000 --> 00:12:21,450

this next so after talking to the

243

00:12:26,060 --> 00:12:23,010

station we had to I get to work with

244

00:12:27,650 --> 00:12:26,070

robotics here's butch moving the we call

245

00:12:29,690 --> 00:12:27,660

it the waffle one and waffle to their

246

00:12:31,850 --> 00:12:29,700

like waffle cones but they have a lot of

247

00:12:33,040 --> 00:12:31,860

about 30,000 pounds of spare parts that

248

00:12:35,540 --> 00:12:33,050

we're putting on to the space station

249

00:12:37,519 --> 00:12:35,550

express logistics carrier one which

250

00:12:39,980 --> 00:12:37,529

attached it to the station to the truss

251

00:12:41,630 --> 00:12:39,990

and robotics is kind of like playing a

252

00:12:43,550 --> 00:12:41,640

big video game sometimes you don't have

253

00:12:44,960 --> 00:12:43,560

any window views to look out of

254

00:12:46,340 --> 00:12:44,970

especially on the space station side so

255

00:12:47,960 --> 00:12:46,350

you have to do everything with with

256

00:12:50,389 --> 00:12:47,970

camera views how many video game players

257

00:12:53,540 --> 00:12:50,399

are in here okay got quite a few so

258

00:12:55,790 --> 00:12:53,550

you'd be great robotic arm operators but

259

00:12:58,550 --> 00:12:55,800

we had to use the arm also to the

260

00:13:00,230 --> 00:12:58,560

shallow arm to grapple the LC 1 and 2

261

00:13:02,030 --> 00:13:00,240

and then we take it out of the payload

262

00:13:04,010 --> 00:13:02,040

bay you see it there lots of spare parts

263

00:13:06,710 --> 00:13:04,020

on it and then we have to hand this off

264

00:13:10,579 --> 00:13:06,720

to the station arm the bigger arm call

265

00:13:12,530 --> 00:13:10,589

it the SS rms and it's a much bigger arm

266

00:13:14,870 --> 00:13:12,540

much more capable arm in the smaller arm

267

00:13:16,699 --> 00:13:14,880

on the shuttle and here we go we've

268

00:13:20,630 --> 00:13:16,709

rappeling so we're driving the arm into

269

00:13:23,060 --> 00:13:20,640

the grapple fixture and then the the

270

00:13:25,010 --> 00:13:23,070

space station arm goes away goes into a

271

00:13:28,610 --> 00:13:25,020

viewing position and now we're going to

272

00:13:31,040 --> 00:13:28,620

install lc2 and it's a very very tight

273

00:13:33,860 --> 00:13:31,050

tolerances very difficult times and it

274

00:13:35,090 --> 00:13:33,870

was a very lot of fun we didn't want to

275

00:13:36,650 --> 00:13:35,100

take an opportunity to give you a little

276

00:13:39,170 --> 00:13:36,660

tour the inside of the station this is

277

00:13:42,019 --> 00:13:39,180

obviously video that sped up quite a bit

278

00:13:43,910 --> 00:13:42,029

little shaky listen to this better patan

279

00:13:45,410 --> 00:13:43,920

yeah this is the Russian segment looking

280

00:13:47,210 --> 00:13:45,420

in the various modules down to the dock

281

00:13:50,840 --> 00:13:47,220

apartment up to the newest module called

282

00:13:52,189 --> 00:13:50,850

mr m 2 and then turning around through

283

00:13:54,110 --> 00:13:52,199

the functional cargo block and then see

284

00:13:56,509 --> 00:13:54,120

the guys doing a little work getting

285

00:14:01,700 --> 00:13:56,519

prepped for their spacewalks on through

286

00:14:04,130 --> 00:14:01,710

the lab by the space potty there

287

00:14:05,540 --> 00:14:04,140

see the guys into node 2 getting closer

288

00:14:08,120 --> 00:14:05,550

to where we're docked to the station

289

00:14:09,980 --> 00:14:08,130

we'll look right into the Columbus

290

00:14:11,360 --> 00:14:09,990

module and then back to the left we're

291

00:14:13,970 --> 00:14:11,370

looking at the Japanese experimental

292

00:14:15,650 --> 00:14:13,980

module then we'll turn our way around

293

00:14:17,000 --> 00:14:15,660

and then back through the shuttles

294

00:14:20,060 --> 00:14:17,010

airlock which is where we obviously

295

00:14:22,250 --> 00:14:20,070

docked to the station making a lot of

296

00:14:25,220 --> 00:14:22,260

turns into the mid-deck see our

297

00:14:28,940 --> 00:14:25,230

commander there doing some water ops up

298

00:14:30,770 --> 00:14:28,950

to the flight deck and all told it's

299

00:14:32,300 --> 00:14:30,780

longer than a football field so quite a

300

00:14:37,100 --> 00:14:32,310

quite a lot of ground we cover there in

301
00:14:38,990 --> 00:14:37,110
about 20 seconds three spacewalks for

302
00:14:40,730 --> 00:14:39,000
the mission and you can see us move in

303
00:14:43,490 --> 00:14:40,740
one of those spacewalk suits we call

304
00:14:46,010 --> 00:14:43,500
that an emu a big white suit that we

305
00:14:50,420 --> 00:14:46,020
wear when we go outside into the airlock

306
00:14:53,060 --> 00:14:50,430
and getting ready and then here we are

307
00:14:55,610 --> 00:14:53,070
just about to start suiting up for a VA

308
00:14:57,260 --> 00:14:55,620
number one first spacewalk there's me

309
00:15:00,050 --> 00:14:57,270
get in my suit Bobby's getting his

310
00:15:01,550 --> 00:15:00,060
helmet on there me VA stands for extra

311
00:15:05,690 --> 00:15:01,560
vehicular activity that's what that's

312
00:15:07,610 --> 00:15:05,700
what we call spacewalks so well we get

313
00:15:09,140 --> 00:15:07,620

in these suits and everybody checks to

314

00:15:11,330 --> 00:15:09,150

make sure they're all latched and and

315

00:15:15,590 --> 00:15:11,340

buttoned up real tight and we go outside

316

00:15:18,320 --> 00:15:15,600

and on a VA number one our first goal

317

00:15:20,320 --> 00:15:18,330

was to take this very antenna that we

318

00:15:22,610 --> 00:15:20,330

had taken up in our payload Bay and

319

00:15:25,780 --> 00:15:22,620

transfer that over to the space station

320

00:15:28,460 --> 00:15:25,790

so that's me down in the payload Bay

321

00:15:30,710 --> 00:15:28,470

taking the loosening the bolts on this

322

00:15:32,660 --> 00:15:30,720

antenna and Bobby's coming over he's

323

00:15:34,820 --> 00:15:32,670

riding the end of the robotic arm there

324

00:15:36,860 --> 00:15:34,830

and he's coming down into the payload

325

00:15:39,800 --> 00:15:36,870

Bay so he can take this antenna once

326

00:15:43,280 --> 00:15:39,810

it's unbolted and transported over to

327

00:15:44,840 --> 00:15:43,290

the space station butch and Leland are

328

00:15:48,710 --> 00:15:44,850

working hard they're on the video game

329

00:15:52,600 --> 00:15:48,720

driving him around here's Bobby taken

330

00:15:55,490 --> 00:15:52,610

hold of that thing and moving away and

331

00:15:57,650 --> 00:15:55,500

then I met him over on the other side on

332

00:16:01,670 --> 00:15:57,660

the space station side we bolted it in

333

00:16:03,980 --> 00:16:01,680

and there's a great view of Bobby Aston

334

00:16:10,130 --> 00:16:03,990

Randy was inside kind of directing all

335

00:16:12,960 --> 00:16:10,140

of this and coming up on the robotic arm

336

00:16:15,900 --> 00:16:12,970

or we're actually doing some lubing

337

00:16:18,210 --> 00:16:15,910

putting some grease in there so that you

338

00:16:21,300 --> 00:16:18,220

can see the wire mechanism moving there

339

00:16:24,449 --> 00:16:21,310

this gives you a sense of what it looked

340

00:16:26,639 --> 00:16:24,459

like outside it's in outer space it's

341

00:16:28,949 --> 00:16:26,649

actually vacuum so there's no air that's

342

00:16:32,040 --> 00:16:28,959

why we have to get into the space suits

343

00:16:36,530 --> 00:16:32,050

for the for the spacewalks it's a really

344

00:16:39,379 --> 00:16:36,540

spectacular view and there I am again

345

00:16:46,290 --> 00:16:39,389

doing the same thing over on another

346

00:16:49,050 --> 00:16:46,300

robotic arm that was the first spacewalk

347

00:16:52,590 --> 00:16:49,060

and then the second spacewalk was a Mike

348

00:16:54,869 --> 00:16:52,600

and I going out my first time and you

349

00:16:56,699 --> 00:16:54,879

see how much effort it takes couple

350

00:16:59,340 --> 00:16:56,709

people to suit us up each time get our

351
00:17:01,949 --> 00:16:59,350
tools on us get prep to go outside the

352
00:17:03,749 --> 00:17:01,959
door our second spacewalk was moving

353
00:17:09,270 --> 00:17:03,759
some antennas around doing some more

354
00:17:12,210 --> 00:17:09,280
work with our Express logistics carriers

355
00:17:15,419 --> 00:17:12,220
we also installed a few other items

356
00:17:18,449 --> 00:17:15,429
outboard the European module so a bunch

357
00:17:21,480 --> 00:17:18,459
of external work that allows the station

358
00:17:22,799 --> 00:17:21,490
had better capability in the future you

359
00:17:24,539 --> 00:17:22,809
can see some of these views it's pretty

360
00:17:25,890 --> 00:17:24,549
amazing if you saw my NASA TV the views

361
00:17:27,299 --> 00:17:25,900
from our helmet cams there's a view of

362
00:17:29,700 --> 00:17:27,309
the commander in the window of the space

363
00:17:31,680 --> 00:17:29,710

shuttle looking from the EV a person's

364

00:17:33,299 --> 00:17:31,690

point of view and while we call it the

365

00:17:35,070 --> 00:17:33,309

spacewalk and you can see that we don't

366

00:17:36,600 --> 00:17:35,080

use our legs for anything except to hold

367

00:17:38,460 --> 00:17:36,610

us in a foot restraint it's really all

368

00:17:39,840 --> 00:17:38,470

walking with your hand so you're you're

369

00:17:41,250 --> 00:17:39,850

working with your hands for all your

370

00:17:43,230 --> 00:17:41,260

tools and everything that you're working

371

00:17:45,120 --> 00:17:43,240

with is you also need to walk everywhere

372

00:17:46,500 --> 00:17:45,130

so that's why it does get tiring because

373

00:17:48,630 --> 00:17:46,510

the only thing you're using is your

374

00:17:50,370 --> 00:17:48,640

hands now if the space suit inflated

375

00:17:53,070 --> 00:17:50,380

like it is you're always fighting the

376

00:17:54,810 --> 00:17:53,080

inflation every time you want to close

377

00:17:56,789 --> 00:17:54,820

your hand so that's one of things and

378

00:17:58,980 --> 00:17:56,799

why we train so long and hard for

379

00:18:01,830 --> 00:17:58,990

spacewalks to get in condition for that

380

00:18:03,450 --> 00:18:01,840

can see with no gravity to help you fall

381

00:18:05,399 --> 00:18:03,460

out of the suit you need a little help

382

00:18:07,020 --> 00:18:05,409

from your friends helping to get out and

383

00:18:10,169 --> 00:18:07,030

we call this one kind of like birth in

384

00:18:12,299 --> 00:18:10,179

the baby cow as butch has to stand on

385

00:18:14,520 --> 00:18:12,309

Mike's legs and then hold the arms up

386

00:18:17,669 --> 00:18:14,530

and try and push him out because there's

387

00:18:19,799 --> 00:18:17,679

no force ie gravity to help him fall out

388

00:18:22,690 --> 00:18:19,809

there's my upper arms are so muscular

389

00:18:26,570 --> 00:18:25,220

but while spacewalks are going on you're

390

00:18:27,860 --> 00:18:26,580

the host of people you saw the people

391

00:18:29,360 --> 00:18:27,870

inside the reading the script you got

392

00:18:31,970 --> 00:18:29,370

the robotics folks that are moving the

393

00:18:33,620 --> 00:18:31,980

arm you got you know the commander his

394

00:18:35,029 --> 00:18:33,630

job was the overall goalie and keep

395

00:18:38,320 --> 00:18:35,039

track of everything that was going on

396

00:18:40,730 --> 00:18:38,330

and also do some other events then

397

00:18:42,470 --> 00:18:40,740

fertile earth at last space walk Mike

398

00:18:44,419 --> 00:18:42,480

took the training wheels off Bobby and I

399

00:18:48,799 --> 00:18:44,429

and we got to go out together Mike was

400

00:18:50,570 --> 00:18:48,809

now the guy inside during the IV while

401
00:18:53,629 --> 00:18:50,580
Bob that I went out there for the last

402
00:18:55,519 --> 00:18:53,639
spacewalk of the flight and the big goal

403
00:18:59,750 --> 00:18:55,529
on this one was after we installed some

404
00:19:02,480 --> 00:18:59,760
science platforms out on one of the big

405
00:19:03,740 --> 00:19:02,490
cargo platforms this big huge 1200 pound

406
00:19:05,509 --> 00:19:03,750
tank you see in front of you we

407
00:19:09,220 --> 00:19:05,519
basically Bobby and I pulled that off

408
00:19:11,659 --> 00:19:09,230
the cargo platform turned it so that the

409
00:19:14,750 --> 00:19:11,669
robotics folks because he could grab it

410
00:19:16,850 --> 00:19:14,760
with the space station arm so that was a

411
00:19:18,080 --> 00:19:16,860
pretty pretty neat feat to get this huge

412
00:19:19,250 --> 00:19:18,090
thing that weighs a whole bunch we'd

413
00:19:21,169 --> 00:19:19,260

never be able to pick up here on earth

414

00:19:23,240 --> 00:19:21,179

but you'll see how easy it is for Bobby

415

00:19:25,549 --> 00:19:23,250

I just to turn this thing and point the

416

00:19:31,159 --> 00:19:25,559

grapple fixture up so the arm can go

417

00:19:32,570 --> 00:19:31,169

ahead and grab it also when you're

418

00:19:35,570 --> 00:19:32,580

moving something that massive you move

419

00:19:36,919 --> 00:19:35,580

kind of slow and deliberate and Leland

420

00:19:39,440 --> 00:19:36,929

and Butch did a great job grabbing it

421

00:19:40,870 --> 00:19:39,450

from us and then our job was to clean up

422

00:19:43,519 --> 00:19:40,880

a few things and then we basically

423

00:19:45,889 --> 00:19:43,529

spacewalk tour there are spaced crawl

424

00:19:48,230 --> 00:19:45,899

back to the airlock so we can meet the

425

00:19:51,259 --> 00:19:48,240

arm with the tank and then it's put it

426

00:19:53,149 --> 00:19:51,269

on its installed position and sort of

427

00:19:55,820 --> 00:19:53,159

throughout all the practice we did in

428

00:19:58,580 --> 00:19:55,830

the neutral buoyancy laboratory in the

429

00:20:00,680 --> 00:19:58,590

virtual reality lab we're able to fly

430

00:20:02,659 --> 00:20:00,690

this thing in space on the robotic arm

431

00:20:04,610 --> 00:20:02,669

within inches of the install position

432

00:20:06,740 --> 00:20:04,620

them using their cameras and also the

433

00:20:09,440 --> 00:20:06,750

views from Bobby and my helmet cameras

434

00:20:12,320 --> 00:20:09,450

and then Bobby I put it in place for its

435

00:20:13,970 --> 00:20:12,330

fret ability be used on station then

436

00:20:15,980 --> 00:20:13,980

after that spacewalk we got the news

437

00:20:17,690 --> 00:20:15,990

that my daughter Abigail had been born

438

00:20:18,889 --> 00:20:17,700

and I was able to share that good news

439

00:20:22,549 --> 00:20:18,899

with the crew with the traditional

440

00:20:25,820 --> 00:20:22,559

cigars no smoking in space so we had the

441

00:20:28,610 --> 00:20:25,830

bubble gum cigars now we also had a

442

00:20:31,220 --> 00:20:28,620

little time to to play around with the

443

00:20:33,250 --> 00:20:31,230

football that would never happen it was

444

00:20:38,930 --> 00:20:33,260

a great stink

445

00:20:40,540 --> 00:20:38,940

that's why Leland let the NFL and but on

446

00:20:43,760 --> 00:20:40,550

the serious side there's a lot of

447

00:20:46,130 --> 00:20:43,770

scientific work that is going on in the

448

00:20:49,340 --> 00:20:46,140

station now we participate in a lot of

449

00:20:50,960 --> 00:20:49,350

the experiments you can see you saw some

450

00:20:54,200 --> 00:20:50,970

experiments with plants there we also

451
00:20:57,100 --> 00:20:54,210
did some some cell biology experiments

452
00:21:01,070 --> 00:20:57,110
that's what Leland's doing right there

453
00:21:03,200 --> 00:21:01,080
and we also did some experiments just

454
00:21:05,810 --> 00:21:03,210
measuring how much taller you get in

455
00:21:09,320 --> 00:21:05,820
outer space everybody gets taller when

456
00:21:11,150 --> 00:21:09,330
they go in outer space one of the other

457
00:21:13,220 --> 00:21:11,160
things we do in space is we transfer

458
00:21:14,810 --> 00:21:13,230
items from the station back to the

459
00:21:16,280 --> 00:21:14,820
shuttle things that have to come back

460
00:21:17,360 --> 00:21:16,290
down like Nicole's shoes and her

461
00:21:19,520 --> 00:21:17,370
clothing when she had been in space for

462
00:21:21,800 --> 00:21:19,530
three months so here's scorch using his

463
00:21:23,600 --> 00:21:21,810

legs there's comrade actually taking a

464

00:21:25,610 --> 00:21:23,610

big payload back over to the station

465

00:21:29,810 --> 00:21:25,620

it's going to do this little Superman

466

00:21:32,240 --> 00:21:29,820

maneuver here here we go taking up into

467

00:21:34,100 --> 00:21:32,250

the top of the gym also exercise in

468

00:21:36,380 --> 00:21:34,110

space here's a butch working doing some

469

00:21:38,240 --> 00:21:36,390

squats here's course using the same

470

00:21:39,920 --> 00:21:38,250

machine to do bench press about ten

471

00:21:43,100 --> 00:21:39,930

pounds i think it's about five pounds i

472

00:21:45,200 --> 00:21:43,110

think here's a here's Mike on the cycle

473

00:21:47,240 --> 00:21:45,210

ergometer over in the shuttle side and

474

00:21:49,460 --> 00:21:47,250

then here's Jeff running on The Colbert

475

00:21:51,640 --> 00:21:49,470

which is a treadmill the bungees help

476

00:21:54,590 --> 00:21:51,650

hold you down like simulating gravity

477

00:21:56,480 --> 00:21:54,600

also delicious food from all over the

478

00:21:59,300 --> 00:21:56,490

world we're sitting here having some I

479

00:22:01,640 --> 00:21:59,310

think these are calf cheeks yeah from

480

00:22:02,690 --> 00:22:01,650

Russian delicacy but we're all just kind

481

00:22:04,850 --> 00:22:02,700

of sitting around having a good time

482

00:22:06,830 --> 00:22:04,860

it's a you worked hard during the day

483

00:22:09,020 --> 00:22:06,840

you eat and you play hard at night and

484

00:22:10,490 --> 00:22:09,030

just a really good moment to I reflect

485

00:22:11,840 --> 00:22:10,500

on the day and just all the different

486

00:22:14,980 --> 00:22:11,850

cultures and people that we have around

487

00:22:17,780 --> 00:22:14,990

the world helping us do this mission

488

00:22:21,320 --> 00:22:17,790

next we had our last transfer item item

489

00:22:23,150 --> 00:22:21,330

9 14 nicole getting transferred over

490

00:22:24,410 --> 00:22:23,160

from the station to the shuttle we're

491

00:22:26,740 --> 00:22:24,420

waving goodbye saying goodbye to

492

00:22:28,970 --> 00:22:26,750

everyone and it was a great moment

493

00:22:30,350 --> 00:22:28,980

coming back in Jeff and the two

494

00:22:33,320 --> 00:22:30,360

commanders are saying their final

495

00:22:35,870 --> 00:22:33,330

goodbyes and I coming over with a close

496

00:22:38,220 --> 00:22:35,880

the hatch and get back home

497

00:22:40,289 --> 00:22:38,230

all good things must come to an end so

498

00:22:41,760 --> 00:22:40,299

yeah eventually did have to undock but

499

00:22:43,260 --> 00:22:41,770

before we did when we actually close the

500

00:22:44,789 --> 00:22:43,270

hatch had a little fun with water that's

501
00:22:46,560 --> 00:22:44,799
what happens with water when you get in

502
00:22:50,010 --> 00:22:46,570
zero g you stick your nose in it and

503
00:22:53,100 --> 00:22:50,020
then Mike showing off his STS 129

504
00:22:54,450 --> 00:22:53,110
ensemble and then just prior to our

505
00:22:56,490 --> 00:22:54,460
undocking counting down the time

506
00:22:58,110 --> 00:22:56,500
everybody is getting ready various roles

507
00:23:00,480 --> 00:22:58,120
this court said earlier it is a team

508
00:23:02,490 --> 00:23:00,490
effort everything we do so obviously

509
00:23:04,230 --> 00:23:02,500
undocking is well I was on the controls

510
00:23:07,560 --> 00:23:04,240
but everybody's got a role that they

511
00:23:15,360 --> 00:23:07,570
play very important and here we go just

512
00:23:19,560 --> 00:23:15,370
about physical separation concocted ccs

513
00:23:23,159 --> 00:23:19,570

is good ok we repeat declare I got out

514

00:23:25,169 --> 00:23:23,169

my legs you fly out directly in front of

515

00:23:26,760 --> 00:23:25,179

the station eventually we did a complete

516

00:23:28,380 --> 00:23:26,770

fly around we need to do some photo

517

00:23:30,600 --> 00:23:28,390

documentation of the exterior of the

518

00:23:31,950 --> 00:23:30,610

station so we fly completely around the

519

00:23:33,690 --> 00:23:31,960

station here the guys are a little sped

520

00:23:35,789 --> 00:23:33,700

up video see how chaotic it is in the

521

00:23:37,590 --> 00:23:35,799

overhead windows is everybody's grabbing

522

00:23:39,600 --> 00:23:37,600

the candidates cameras doing that photo

523

00:23:41,430 --> 00:23:39,610

documentation i just mentioned fly

524

00:23:44,310 --> 00:23:41,440

around the station at about 600 feet

525

00:23:46,409 --> 00:23:44,320

thereabouts and you'll see here in the

526

00:23:47,789 --> 00:23:46,419

next shot what the station looks like

527

00:23:50,580 --> 00:23:47,799

from our vantage point and also a little

528

00:23:53,789 --> 00:23:50,590

sped up vide there in the box as we flew

529

00:23:55,680 --> 00:23:53,799

around just beautiful beautiful views as

530

00:23:57,240 --> 00:23:55,690

the contrasting of the gold of the solar

531

00:23:59,850 --> 00:23:57,250

arrays and the silver the station itself

532

00:24:03,060 --> 00:23:59,860

and the blue earth below with the super

533

00:24:06,120 --> 00:24:03,070

black us universe in the background is

534

00:24:12,240 --> 00:24:06,130

just just really beautiful miraculous

535

00:24:16,789 --> 00:24:12,250

with beautiful views as we say goodbye

536

00:24:21,659 --> 00:24:19,380

visually we did the burns to leave the

537

00:24:25,409 --> 00:24:21,669

station and got a cut caught a couple of

538

00:24:32,090 --> 00:24:25,419

use of the earth below also a shot of

539

00:24:38,580 --> 00:24:34,230

looking out the windows at the curvature

540

00:24:45,140 --> 00:24:38,590

of the earth so we do some more burns to

541

00:24:49,260 --> 00:24:47,250

again beautiful site that's that's

542

00:24:56,610 --> 00:24:49,270

obviously the border between Tennessee

543

00:24:58,740 --> 00:24:56,620

and Virginia down there and it's also

544

00:25:10,830 --> 00:24:58,750

sticking in space again fun with water

545

00:25:13,440 --> 00:25:10,840

and eminem's we've been in space for

546

00:25:16,230 --> 00:25:13,450

about 11 days now it's time to head back

547

00:25:19,050 --> 00:25:16,240

you see gravity started to pick up as

548

00:25:21,210 --> 00:25:19,060

Leland showing he's not dropping his his

549

00:25:23,220 --> 00:25:21,220

list he's actually just letting go of it

550

00:25:27,600 --> 00:25:23,230

now it doesn't float in front of him and

551
00:25:30,450 --> 00:25:27,610
actually Falls Mach 25 was the goal and

552
00:25:32,010 --> 00:25:30,460
we we hit that pretty well otherwise you

553
00:25:35,030 --> 00:25:32,020
don't get this really cool blue patch

554
00:25:37,560 --> 00:25:35,040
like book butch has on his gesture

555
00:25:40,680 --> 00:25:37,570
landing back in Florida is was great we

556
00:25:43,880 --> 00:25:40,690
came screaming up the coast of Florida

557
00:25:47,430 --> 00:25:43,890
from south to north to a beautiful

558
00:25:52,860 --> 00:25:47,440
morning day a little little breezy a

559
00:25:56,850 --> 00:25:52,870
little cool but very picturesque landing

560
00:25:59,790 --> 00:25:56,860
went went very well you go from zero g 2

561
00:26:02,160 --> 00:25:59,800
1 g + 1 g seems like 4 g's your face

562
00:26:03,780 --> 00:26:02,170
starts to sag and if i if you had any

563
00:26:06,150 --> 00:26:03,790

wrinkles they go away and zero g but

564

00:26:11,700 --> 00:26:06,160

they come right back as soon as you hit

565

00:26:13,920 --> 00:26:11,710

a gravity environment the sad thing

566

00:26:16,860 --> 00:26:13,930

about this whole event here is is right

567

00:26:18,450 --> 00:26:16,870

about entry time is where you think hey

568

00:26:20,490 --> 00:26:18,460

we you know we had this great crew we

569

00:26:23,700 --> 00:26:20,500

had a great time and now it's coming to

570

00:26:25,860 --> 00:26:23,710

an end kind of Enza ends a little page

571

00:26:29,490 --> 00:26:25,870

in your book of true life fun

572

00:26:31,230 --> 00:26:29,500

experiences after after getting in

573

00:26:34,590 --> 00:26:31,240

cleaned up a little bit you get to come

574

00:26:37,740 --> 00:26:34,600

out and see all the guys from the top

575

00:26:39,750 --> 00:26:37,750

down that allowed you to have such a

576

00:26:42,570 --> 00:26:39,760

tremendous experience and then the

577

00:26:44,070 --> 00:26:42,580

unique event here is getting to get

578

00:26:47,460 --> 00:26:44,080

outside the vehicle you've been living

579

00:26:48,810 --> 00:26:47,470

in for 11 days and and seeing what would

580

00:27:00,149 --> 00:26:48,820

held you up there so it's really

581

00:27:05,200 --> 00:27:02,440

well that was trying to encapsulate to

582

00:27:09,129 --> 00:27:05,210

12 days in about 20 minutes so there's

583

00:27:11,109 --> 00:27:09,139

and a main thing we tell you to is a you

584

00:27:14,440 --> 00:27:11,119

know the flight the flight is just the

585

00:27:18,070 --> 00:27:14,450

the culmination of what had been over a

586

00:27:21,759 --> 00:27:18,080

year's worth of planning and scheduling

587

00:27:23,950 --> 00:27:21,769

and for us about nine months of true

588

00:27:26,109 --> 00:27:23,960

dedicated training together as a group

589

00:27:28,599 --> 00:27:26,119

just to be able to pull off those 12

590

00:27:32,049 --> 00:27:28,609

days and the thing the thing that's

591

00:27:33,609 --> 00:27:32,059

really amazing is you know the flight

592

00:27:35,649 --> 00:27:33,619

itself is over in the blink of an eye

593

00:27:38,080 --> 00:27:35,659

but the true life experience is that you

594

00:27:39,580 --> 00:27:38,090

you come to enjoy it's just the the

595

00:27:42,310 --> 00:27:39,590

teamwork and working together as a group

596

00:27:45,369 --> 00:27:42,320

getting ready and then just executing

597

00:27:47,469 --> 00:27:45,379

something as fun as a space flight with

598

00:27:51,039 --> 00:27:47,479

that we'd like to open it up to

599

00:27:53,649 --> 00:27:51,049

questions you guys might have I guess

600

00:27:55,060 --> 00:27:53,659

there are a couple and could we kill dim

601
00:27:59,589 --> 00:27:55,070
these lights just a little bit so we can

602
00:28:09,570 --> 00:27:59,599
see who's asking the questions go ahead

603
00:28:14,619 --> 00:28:12,339
the question was what fabric do they use

604
00:28:17,710 --> 00:28:14,629
to make the spacewalks who sell it my

605
00:28:19,560 --> 00:28:17,720
cancer well this those suits are are you

606
00:28:21,849 --> 00:28:19,570
know they have to be their own little

607
00:28:23,739 --> 00:28:21,859
personal space ship basically because

608
00:28:25,839 --> 00:28:23,749
they have to protect us from the vacuum

609
00:28:26,950 --> 00:28:25,849
of space and the extreme temperatures

610
00:28:29,049 --> 00:28:26,960
that we're going to experience out there

611
00:28:32,889 --> 00:28:29,059
so there are multiple layers of fabric

612
00:28:35,229 --> 00:28:32,899
the inner the innermost fabric is sort

613
00:28:37,029 --> 00:28:35,239

of a bladder rubber material to keep the

614

00:28:39,339 --> 00:28:37,039

pressure that we have inside there

615

00:28:41,049 --> 00:28:39,349

inside and then there are layers of

616

00:28:44,999 --> 00:28:41,059

fabric on the outside to protect that

617

00:28:48,249 --> 00:28:45,009

that inner fabric from anything outside

618

00:28:50,259 --> 00:28:48,259

you know we might brush up against but

619

00:28:52,479 --> 00:28:50,269

it is a pretty amazing piece of

620

00:28:55,229 --> 00:28:52,489

equipment provides us the cooling that

621

00:28:57,070 --> 00:28:55,239

we need the oxygen obviously the

622

00:28:58,960 --> 00:28:57,080

communication so that we can talk to

623

00:29:01,989 --> 00:28:58,970

everybody on the ground and and back

624

00:29:08,289 --> 00:29:01,999

inside so pretty neat to pre-meet the

625

00:29:11,889 --> 00:29:08,299

thing odd during the video you mentioned

626
00:29:12,640 --> 00:29:11,899
the various modules that there wasn't

627
00:29:18,390 --> 00:29:12,650
space

628
00:29:24,430 --> 00:29:20,830
which ran out of fingers to count our

629
00:29:26,080 --> 00:29:24,440
sorry thanks oh how you count the the

630
00:29:27,730 --> 00:29:26,090
Soyuz could be counted as a single

631
00:29:29,530 --> 00:29:27,740
module but it actually has two parts to

632
00:29:31,300 --> 00:29:29,540
it so if you counted both parts as a

633
00:29:35,820 --> 00:29:31,310
separate module I mean you'd come up

634
00:29:40,870 --> 00:29:35,830
with one two three four five six seven

635
00:29:42,370 --> 00:29:40,880
fingers 9 10 11 12 13 14 from Tennessee

636
00:29:48,580 --> 00:29:42,380
can count that's a wag that's a quick

637
00:29:50,470 --> 00:29:48,590
count 14 inch including shuttle it's a

638
00:29:52,630 --> 00:29:50,480

it's a really good question he asked it

639

00:29:54,660 --> 00:29:52,640

and the the thing to mention it's not

640

00:29:57,400 --> 00:29:54,670

just modules that come up but it's also

641

00:29:59,530 --> 00:29:57,410

external parts in other words all those

642

00:30:02,470 --> 00:29:59,540

trust pieces like at least in my

643

00:30:03,790 --> 00:30:02,480

experience the first flight we had we

644

00:30:06,430 --> 00:30:03,800

really didn't have much other than a

645

00:30:09,040 --> 00:30:06,440

single solar array mounted on top of the

646

00:30:11,650 --> 00:30:09,050

lab actually that that's kind of a lie

647

00:30:14,320 --> 00:30:11,660

but essentially that's that's what we

648

00:30:15,940 --> 00:30:14,330

had now over the over the flights in

649

00:30:17,920 --> 00:30:15,950

addition to building the modules in the

650

00:30:20,170 --> 00:30:17,930

pressurized volume inside you also had

651
00:30:22,000 --> 00:30:20,180
flight after flight to give you all the

652
00:30:23,950 --> 00:30:22,010
power generation thermal rejection

653
00:30:27,130 --> 00:30:23,960
capability and cooling that's required

654
00:30:28,980 --> 00:30:27,140
to keep the the station up and living

655
00:30:32,110 --> 00:30:28,990
and breathing through that whole time so

656
00:30:35,110 --> 00:30:32,120
every every flight that we do is usually

657
00:30:37,180 --> 00:30:35,120
packed with with tens of thousands of

658
00:30:39,790 --> 00:30:37,190
pounds of equipment in our case we had

659
00:30:41,980 --> 00:30:39,800
almost 30,000 pounds that we delivered

660
00:30:43,900 --> 00:30:41,990
to the station so the numerous flights

661
00:30:47,470 --> 00:30:43,910
that we take up you know every one of

662
00:30:49,780 --> 00:30:47,480
them is jam-packed with equipment and

663
00:30:51,010 --> 00:30:49,790

the amazing part of those 14 you know

664

00:30:52,510 --> 00:30:51,020

different items are talking about plus

665

00:30:54,160 --> 00:30:52,520

all the extra trusting scorched Emma

666

00:30:56,410 --> 00:30:54,170

they weren't all built in the same place

667

00:30:57,910 --> 00:30:56,420

and so it was like you making something

668

00:30:59,200 --> 00:30:57,920

your school and the kids over here from

669

00:31:00,790 --> 00:30:59,210

another school making something have

670

00:31:02,050 --> 00:31:00,800

gone taking it you know on the other

671

00:31:03,580 --> 00:31:02,060

side of the planet and fitting together

672

00:31:05,230 --> 00:31:03,590

and have it all work and that's the

673

00:31:07,240 --> 00:31:05,240

amazing part about the International

674

00:31:08,320 --> 00:31:07,250

Space Station that stuff built on the

675

00:31:10,570 --> 00:31:08,330

other side of the planet it's

676
00:31:12,100 --> 00:31:10,580
everybody's doing the same engineering

677
00:31:13,420 --> 00:31:12,110
and taking the drawings and making the

678
00:31:14,950 --> 00:31:13,430
stuff to the exact tolerances that we

679
00:31:20,560 --> 00:31:14,960
can go up into space put together and it

680
00:31:24,680 --> 00:31:20,570
all works um how many gallons of fuel

681
00:31:27,420 --> 00:31:24,690
does it take to launch the spaceship

682
00:31:30,150 --> 00:31:27,430
you know I don't know the exact number

683
00:31:32,190 --> 00:31:30,160
but I do know that the propellant that

684
00:31:34,290 --> 00:31:32,200
is flowing into the three main engines

685
00:31:36,930 --> 00:31:34,300
from on the back end of the space

686
00:31:39,360 --> 00:31:36,940
shuttle every second is about equal to

687
00:31:41,040 --> 00:31:39,370
the size of a standard swimming pool so

688
00:31:42,900 --> 00:31:41,050

you've got that much propellant liquid

689

00:31:44,670 --> 00:31:42,910

hydrogen and liquid oxygen flowing at

690

00:31:47,310 --> 00:31:44,680

very very high rates you got 17-inch

691

00:31:48,990 --> 00:31:47,320

valves on each side the hydrogen side

692

00:31:50,670 --> 00:31:49,000

and the oxygen side that is routed to

693

00:31:52,680 --> 00:31:50,680

those three engines and it's pretty

694

00:31:54,990 --> 00:31:52,690

remarkable how much propellant does flow

695

00:31:56,100 --> 00:31:55,000

in it and it works fantastic it's over

696

00:31:58,800 --> 00:31:56,110

the eight and a half minutes to orbit

697

00:32:04,520 --> 00:31:58,810

that's about Laura 500 seconds that's

698

00:32:14,640 --> 00:32:12,810

what kind of training did you do Wow I'm

699

00:32:16,740 --> 00:32:14,650

trying to think that's it's a that's a

700

00:32:18,540 --> 00:32:16,750

loaded question you don't even you don't

701
00:32:21,930 --> 00:32:18,550
even know how expensive that one is up

702
00:32:24,560 --> 00:32:21,940
Bobby you want to try it oh well it

703
00:32:28,550 --> 00:32:24,570
depends on what your role is

704
00:32:33,270 --> 00:32:28,560
specifically is we all work as a team so

705
00:32:36,360 --> 00:32:33,280
we divided up the different tasks some

706
00:32:38,220 --> 00:32:36,370
of us of course you know we're

707
00:32:41,960 --> 00:32:38,230
responsible for flying the space shift

708
00:32:45,000 --> 00:32:41,970
commander and pilot others of us were

709
00:32:48,510 --> 00:32:45,010
basically doing things like spacewalks

710
00:32:49,940 --> 00:32:48,520
others doing the robotic operations and

711
00:32:52,290 --> 00:32:49,950
then there's a whole bunch of other

712
00:32:55,230 --> 00:32:52,300
activities that go on on the spaceship

713
00:32:57,510 --> 00:32:55,240

that different people are responsible

714

00:32:58,800 --> 00:32:57,520

for that you you know you saw some of

715

00:33:00,570 --> 00:32:58,810

that in the movie when we were actually

716

00:33:03,150 --> 00:33:00,580

docking to the space station and

717

00:33:07,140 --> 00:33:03,160

undocking so we trained for all of that

718

00:33:09,720 --> 00:33:07,150

stuff all the specific task we also just

719

00:33:13,020 --> 00:33:09,730

do some training just to get used to

720

00:33:15,570 --> 00:33:13,030

each other as a team so it's almost like

721

00:33:18,900 --> 00:33:15,580

to some extent almost like a sports team

722

00:33:21,570 --> 00:33:18,910

getting used to each other get it

723

00:33:24,120 --> 00:33:21,580

knowing what you know our strengths

724

00:33:29,850 --> 00:33:24,130

weaknesses are and understanding how to

725

00:33:36,560 --> 00:33:29,860

manage everything why equipment you used

726

00:33:44,969 --> 00:33:43,379

what equipment to use to repair we've

727

00:33:47,279 --> 00:33:44,979

for the robotics training we use a lot

728

00:33:50,700 --> 00:33:47,289

of computers in a lot of simulation

729

00:33:52,259 --> 00:33:50,710

because we don't have the actual robotic

730

00:33:53,690 --> 00:33:52,269

arm on the ground because it's too heavy

731

00:33:58,080 --> 00:33:53,700

gravity will pull it down we do have a

732

00:34:00,749 --> 00:33:58,090

simulated arm that is it's it's about

733

00:34:02,820 --> 00:34:00,759

the same size as the the big arm on the

734

00:34:04,320 --> 00:34:02,830

space station but all the stuff that we

735

00:34:06,359 --> 00:34:04,330

do is pretty much like a video game like

736

00:34:08,789 --> 00:34:06,369

I mentioned before so that that robotics

737

00:34:11,369 --> 00:34:08,799

training works like that the pool that

738

00:34:15,720 --> 00:34:11,379

they use it's a what is it 50 million

739

00:34:17,789 --> 00:34:15,730

gallon full six million yeah huge pool

740

00:34:21,210 --> 00:34:17,799

for simulating the spacewalk so when

741

00:34:22,619 --> 00:34:21,220

when Bobby and comrade and Mike or

742

00:34:25,109 --> 00:34:22,629

submitting the spacewalks they're in

743

00:34:26,190 --> 00:34:25,119

their white white suits but you can't do

744

00:34:28,049 --> 00:34:26,200

it you know you have to have a

745

00:34:30,149 --> 00:34:28,059

microgravity type environment so you

746

00:34:32,010 --> 00:34:30,159

used neutral buoyancy in the water just

747

00:34:33,119 --> 00:34:32,020

like you float in the water to simulate

748

00:34:37,379 --> 00:34:33,129

that kind of training so that's another

749

00:34:39,000 --> 00:34:37,389

facility we use we have a for the ascent

750

00:34:41,069 --> 00:34:39,010

we have like a motion based simulator

751
00:34:42,359 --> 00:34:41,079
it's like a another big video game where

752
00:34:44,519 --> 00:34:42,369
you sit in there and you actually move

753
00:34:46,769 --> 00:34:44,529
like you're doing a launch and then you

754
00:34:48,569 --> 00:34:46,779
land turns down and acts like you're

755
00:34:50,399 --> 00:34:48,579
landing so lots of different facilities

756
00:34:53,010 --> 00:34:50,409
for equipment that we use for our

757
00:34:57,420 --> 00:34:53,020
training the question is that does that

758
00:34:59,130 --> 00:34:57,430
answer your question okay um what parts

759
00:35:08,279 --> 00:34:59,140
to you did you deliver to the

760
00:35:11,400 --> 00:35:08,289
International Space Station Oh answer

761
00:35:14,400 --> 00:35:11,410
that these are the logistics carriers we

762
00:35:17,099 --> 00:35:14,410
had they were about you know close to

763
00:35:19,859 --> 00:35:17,109

30,000 pounds with with the weight of

764

00:35:22,880 --> 00:35:19,869

the carrier and the parts the parts that

765

00:35:26,700 --> 00:35:22,890

we delivered where these bitty real big

766

00:35:28,740 --> 00:35:26,710

replaceable units for items that are

767

00:35:31,349 --> 00:35:28,750

just intended to keep the space station

768

00:35:33,420 --> 00:35:31,359

going for a long period of time we had a

769

00:35:35,700 --> 00:35:33,430

couple control moment jars for example

770

00:35:39,089 --> 00:35:35,710

that what these things do or their big

771

00:35:40,760 --> 00:35:39,099

gyroscopes that they're spun up there's

772

00:35:43,559 --> 00:35:40,770

four of them they're out of

773

00:35:47,400 --> 00:35:43,569

intentionally out of alignment so as we

774

00:35:48,030 --> 00:35:47,410

rotate around the earth there's torques

775

00:35:49,860 --> 00:35:48,040

that are import

776

00:35:52,350 --> 00:35:49,870

arted on these gyroscopes to actually

777

00:35:54,300 --> 00:35:52,360

keep the space station in its desired

778

00:35:57,000 --> 00:35:54,310

attitude or point in the right direction

779

00:36:00,090 --> 00:35:57,010

which is extremely important for having

780

00:36:01,470 --> 00:36:00,100

things such as thermal conditioning on

781

00:36:03,960 --> 00:36:01,480

this station and things getting too hot

782

00:36:05,760 --> 00:36:03,970

too cold but also if you think about the

783

00:36:07,410 --> 00:36:05,770

big solar rays and be able to point them

784

00:36:09,450 --> 00:36:07,420

and have them an orientation where you

785

00:36:11,130 --> 00:36:09,460

can get power during the time that

786

00:36:13,620 --> 00:36:11,140

you're in a light phase and as we go

787

00:36:16,500 --> 00:36:13,630

around New York earth there's you know

788

00:36:18,780 --> 00:36:16,510

what 11 day time cycle is about 90

789

00:36:21,690 --> 00:36:18,790

minutes so we see sunrise sunset 90

790

00:36:24,990 --> 00:36:21,700

minutes we had 15 orbits per day on a

791

00:36:27,780 --> 00:36:25,000

normal day so those those we had we had

792

00:36:30,390 --> 00:36:27,790

pump modules for for cooling we brought

793

00:36:33,090 --> 00:36:30,400

this high-pressure gas tank we had spare

794

00:36:34,950 --> 00:36:33,100

parts for the robotics arms and the list

795

00:36:39,180 --> 00:36:34,960

goes on from there but these were the

796

00:36:42,600 --> 00:36:39,190

big big pieces that would be spacewalker

797

00:36:44,430 --> 00:36:42,610

robotic installed if if a certain

798

00:36:47,040 --> 00:36:44,440

component was to fail and needed to be

799

00:36:49,800 --> 00:36:47,050

replaced so we were basically stocking

800

00:36:51,300 --> 00:36:49,810

the station externally with big spare

801
00:36:53,880 --> 00:36:51,310
parts and then we also had a bunch of

802
00:36:55,590 --> 00:36:53,890
things internally that that Leland was

803
00:36:58,680 --> 00:36:55,600
the master of of making sure that

804
00:37:00,450 --> 00:36:58,690
they're the right spare parts that we

805
00:37:01,980 --> 00:37:00,460
transferred inside got to the right

806
00:37:06,480 --> 00:37:01,990
place and we brought the right things

807
00:37:09,240 --> 00:37:06,490
back good question what inspired you to

808
00:37:15,870 --> 00:37:09,250
become an astronaut for NASA little baby

809
00:37:17,850 --> 00:37:15,880
that is a very good question and and

810
00:37:19,560 --> 00:37:17,860
there's many things that I could answer

811
00:37:21,540 --> 00:37:19,570
but I'll just pick a few of the things

812
00:37:24,660 --> 00:37:21,550
that inspired me personally I think

813
00:37:28,650 --> 00:37:24,670

growing up watching the space program it

814

00:37:30,630 --> 00:37:28,660

is definitely unique tasks that we have

815

00:37:33,510 --> 00:37:30,640

the opportunity to do as astronauts and

816

00:37:35,400 --> 00:37:33,520

the opportunity to try to strive to be

817

00:37:37,440 --> 00:37:35,410

involved and take a take a role in that

818

00:37:39,240 --> 00:37:37,450

never dreaming that I'd actually be one

819

00:37:41,130 --> 00:37:39,250

of the guys sitting on the pointy end of

820

00:37:44,070 --> 00:37:41,140

the rocket when it launches but just to

821

00:37:46,350 --> 00:37:44,080

play a role and and be involved in that

822

00:37:49,230 --> 00:37:46,360

I truly when I was your age I really

823

00:37:51,090 --> 00:37:49,240

enjoyed technology I enjoyed learning

824

00:37:54,900 --> 00:37:51,100

about things I learned in joining how

825

00:37:57,090 --> 00:37:54,910

things worked what made things go I was

826

00:37:59,100 --> 00:37:57,100

very intrigued and I came to learn that

827

00:38:01,140 --> 00:37:59,110

a lot of the things technology wise

828

00:38:01,680 --> 00:38:01,150

there's a lot of math involved so I

829

00:38:03,720 --> 00:38:01,690

became

830

00:38:06,180 --> 00:38:03,730

interested in math I truly did and I

831

00:38:09,750 --> 00:38:06,190

enjoyed learning mathematics and getting

832

00:38:11,490 --> 00:38:09,760

on up in the geometry and algebra and

833

00:38:12,750 --> 00:38:11,500

trigonometry and calculus and all of

834

00:38:14,430 --> 00:38:12,760

those things as I went along it was

835

00:38:16,560 --> 00:38:14,440

really really intriguing to me so I

836

00:38:18,540 --> 00:38:16,570

think it was the big picture of what

837

00:38:20,880 --> 00:38:18,550

really inspired me was just learning and

838

00:38:22,980 --> 00:38:20,890

taking the opportunity to learn as far

839

00:38:26,990 --> 00:38:22,990

as we possibly can so for me that was

840

00:38:27,000 --> 00:38:35,840

what does it feel like in zero gravity

841

00:38:40,320 --> 00:38:38,670

have you ever been floating in the bath

842

00:38:42,150 --> 00:38:40,330

where the temperature is about the same

843

00:38:44,250 --> 00:38:42,160

what your body is and you really can't

844

00:38:46,140 --> 00:38:44,260

tell where your body ends in your and

845

00:38:48,690 --> 00:38:46,150

the water starts it's something like

846

00:38:50,580 --> 00:38:48,700

that because there's no forces on your

847

00:38:52,230 --> 00:38:50,590

body and your body just naturally goes

848

00:38:53,970 --> 00:38:52,240

when you're not doing something to a

849

00:38:56,460 --> 00:38:53,980

position that's comfortable for it so

850

00:38:59,370 --> 00:38:56,470

zero gravity I've got to be really

851
00:39:02,610 --> 00:38:59,380
really comfortable once you get used to

852
00:39:03,810 --> 00:39:02,620
it because your body just you know takes

853
00:39:05,130 --> 00:39:03,820
a little bit to adapt to it but then

854
00:39:07,440 --> 00:39:05,140
once it's there it's like it was meant

855
00:39:09,690 --> 00:39:07,450
to be there because it's so easy to move

856
00:39:13,380 --> 00:39:09,700
around and the neat part I found was

857
00:39:14,670 --> 00:39:13,390
that it seemed like we're all wired for

858
00:39:16,110 --> 00:39:14,680
and that anybody could do it doesn't

859
00:39:18,990 --> 00:39:16,120
take somebody special or special

860
00:39:20,880 --> 00:39:19,000
training because our bodies have these

861
00:39:24,390 --> 00:39:20,890
accelerometers and these David bility to

862
00:39:25,920 --> 00:39:24,400
make understand sensations and so if you

863
00:39:27,420 --> 00:39:25,930

were pushing off somewhere in zero

864

00:39:28,440 --> 00:39:27,430

gravity your eyes were telling you

865

00:39:30,000 --> 00:39:28,450

weren't going exactly where you wanted

866

00:39:31,710 --> 00:39:30,010

to go all I need to do is reach out your

867

00:39:33,360 --> 00:39:31,720

hand and your body knew exactly where to

868

00:39:35,460 --> 00:39:33,370

put the vector to push off somewhere

869

00:39:36,990 --> 00:39:35,470

with just a fingertip to redirect you to

870

00:39:38,970 --> 00:39:37,000

fly where you wanted to go so that's

871

00:39:40,350 --> 00:39:38,980

where it really seemed like it was you

872

00:39:41,850 --> 00:39:40,360

didn't have to be an experienced space

873

00:39:43,290 --> 00:39:41,860

fighter to go there because you know his

874

00:39:45,900 --> 00:39:43,300

first time space fighters for a few of

875

00:39:48,630 --> 00:39:45,910

us it was very very natural to you know

876

00:39:50,730 --> 00:39:48,640

for your body to go ahead and do that

877

00:39:51,690 --> 00:39:50,740

and sleeping which is you know so

878

00:39:53,130 --> 00:39:51,700

comfortable because you don't have to

879

00:39:54,480 --> 00:39:53,140

worry about a pillow or a hot spot on

880

00:39:56,220 --> 00:39:54,490

the bed or rolling on your side because

881

00:40:02,310 --> 00:39:56,230

he's floated right where your body

882

00:40:05,160 --> 00:40:02,320

wanted to be and it was very happy what

883

00:40:09,060 --> 00:40:05,170

could have gone wrong um and liftoff or

884

00:40:12,900 --> 00:40:09,070

um just randomly in space

885

00:40:20,250 --> 00:40:12,910

who's asking that question oh the adult

886

00:40:23,760 --> 00:40:20,260

in the back sorry I was curious um you

887

00:40:25,650 --> 00:40:23,770

know it's gonna be three million to be

888

00:40:28,230 --> 00:40:25,660

exact but yeah that's a lot of people

889

00:40:31,800 --> 00:40:28,240

ask you know are you are you afraid or

890

00:40:34,410 --> 00:40:31,810

you do you have any fears as you go up

891

00:40:36,180 --> 00:40:34,420

you're worried about anything and the

892

00:40:38,580 --> 00:40:36,190

biggest the biggest fear that I think

893

00:40:40,560 --> 00:40:38,590

collectively I guess I could say that we

894

00:40:43,290 --> 00:40:40,570

all have is just doing something wrong

895

00:40:45,060 --> 00:40:43,300

our selves not worried about what's

896

00:40:46,590 --> 00:40:45,070

going to happen vehicle related or

897

00:40:49,410 --> 00:40:46,600

anything else and there's a myriad of

898

00:40:53,060 --> 00:40:49,420

things that can go wrong it's it's a

899

00:40:57,270 --> 00:40:53,070

it's a risky business but it's a very

900

00:40:59,460 --> 00:40:57,280

worthwhile endeavor and it's a it's it's

901
00:41:02,270 --> 00:40:59,470
total enjoyments sheer pleasure it's

902
00:41:04,980 --> 00:41:02,280
it's teamwork it's excitement it's the

903
00:41:07,860 --> 00:41:04,990
leading edge of technology it's it's

904
00:41:11,250 --> 00:41:07,870
it's a foreign environment it's you know

905
00:41:14,880 --> 00:41:11,260
the risks are worth are worth taking for

906
00:41:17,610 --> 00:41:14,890
all of us and we trained extensively in

907
00:41:20,820 --> 00:41:17,620
fact almost too much for things that go

908
00:41:23,520 --> 00:41:20,830
wrong and Butch and I and Leland and

909
00:41:25,830 --> 00:41:23,530
comrade it's a flight deck crew spend

910
00:41:29,250 --> 00:41:25,840
all kinds of time going through all

911
00:41:31,980 --> 00:41:29,260
kinds of convoluted twisted cases of

912
00:41:34,950 --> 00:41:31,990
failures of different systems all at the

913
00:41:38,070 --> 00:41:34,960

same time and staggered and interrelated

914

00:41:39,720 --> 00:41:38,080

and confusing and real brain teasers and

915

00:41:41,700 --> 00:41:39,730

there there are a lot of fun to work

916

00:41:46,290 --> 00:41:41,710

through its AIT's a it's a it's exciting

917

00:41:48,570 --> 00:41:46,300

stuff it's real dynamic but in eight and

918

00:41:51,650 --> 00:41:48,580

a half minutes at least half your

919

00:41:54,720 --> 00:41:51,660

training is gone and you haven't even

920

00:41:57,500 --> 00:41:54,730

gotten into orbit or just basically got

921

00:42:00,120 --> 00:41:57,510

into a suborbital trajectory and you're

922

00:42:03,630 --> 00:42:00,130

you know most the time you spent

923

00:42:05,790 --> 00:42:03,640

training is is is finished because those

924

00:42:07,650 --> 00:42:05,800

those scenarios didn't pan out or you

925

00:42:10,230 --> 00:42:07,660

already took care of it and it was no

926
00:42:13,980 --> 00:42:10,240
big deal because you were well trained

927
00:42:16,740 --> 00:42:13,990
but the thing that that that happens

928
00:42:19,200 --> 00:42:16,750
more often than not is this year in on

929
00:42:21,750 --> 00:42:19,210
orbit for 11 days and you're you're

930
00:42:22,289 --> 00:42:21,760
doing one thing after another and

931
00:42:25,109 --> 00:42:22,299
they're all

932
00:42:27,150 --> 00:42:25,119
front and you didn't have extent you

933
00:42:28,499 --> 00:42:27,160
you're trained well but you there's so

934
00:42:30,660 --> 00:42:28,509
much that you need to learn that you

935
00:42:32,579 --> 00:42:30,670
just got to pick it up and do it you're

936
00:42:35,099 --> 00:42:32,589
always more concerned with with doing

937
00:42:37,739 --> 00:42:35,109
something incorrect that way and usually

938
00:42:40,349 --> 00:42:37,749

the impacts aren't so bad but the time

939

00:42:43,979 --> 00:42:40,359

spent there is is not as extensive

940

00:42:46,739 --> 00:42:43,989

because we do very extensively trained

941

00:42:48,779 --> 00:42:46,749

for things to go wrong in our dynamic

942

00:42:52,349 --> 00:42:48,789

phases of flight and we're well well

943

00:42:59,150 --> 00:42:52,359

prepared for that thanks for the adult

944

00:43:05,249 --> 00:43:01,109

any other adults want to ask any

945

00:43:07,289 --> 00:43:05,259

questions what background did you have

946

00:43:11,609 --> 00:43:07,299

to prepare yourselves to apply for the

947

00:43:13,859 --> 00:43:11,619

job of astronaut probably a hundred

948

00:43:15,150 --> 00:43:13,869

astronauts working in Houston in our

949

00:43:17,969 --> 00:43:15,160

astronaut office in a hundred different

950

00:43:21,359 --> 00:43:17,979

backgrounds you know so we each have a

951
00:43:24,419 --> 00:43:21,369
little bit varied background a couple of

952
00:43:29,609 --> 00:43:24,429
us four of us I guess naval aviators

953
00:43:32,489 --> 00:43:29,619
including the two Marines and now that's

954
00:43:36,269 --> 00:43:32,499
not a slight that we we cherish the rink

955
00:43:38,669 --> 00:43:36,279
or a part of the Naval Service but so

956
00:43:43,469 --> 00:43:38,679
four of us us the ride you guys give to

957
00:43:45,479 --> 00:43:43,479
go to war my ship so some of us four of

958
00:43:47,910 --> 00:43:45,489
us came through the flight training

959
00:43:50,160 --> 00:43:47,920
naval flight training and became pilots

960
00:43:51,719 --> 00:43:50,170
and test pilots and and our but our

961
00:43:54,660 --> 00:43:51,729
educational backgrounds are all a little

962
00:43:57,059 --> 00:43:54,670
bit different then we have the two smart

963
00:43:59,959 --> 00:43:57,069

guys Bobby sachar especially here on the

964

00:44:03,029 --> 00:43:59,969

end with his PhD in medical degree and

965

00:44:05,640 --> 00:44:03,039

Leland with his background in the NFL

966

00:44:07,679 --> 00:44:05,650

and then he's actually a fiber optics

967

00:44:09,660 --> 00:44:07,689

expert so you can ask him questions

968

00:44:12,089 --> 00:44:09,670

about how fiber optics work because he's

969

00:44:13,919 --> 00:44:12,099

a he's a world-renowned expert fiber

970

00:44:18,479 --> 00:44:13,929

optics we don't bring that up pretty

971

00:44:20,009 --> 00:44:18,489

much but it's the truth and so we you

972

00:44:22,410 --> 00:44:20,019

know on my first flight we had a

973

00:44:24,179 --> 00:44:22,420

veterinarian for our true medical

974

00:44:27,839 --> 00:44:24,189

officer this time we had a real doctor

975

00:44:29,849 --> 00:44:27,849

but even we even haven't have a

976

00:44:31,499 --> 00:44:29,859

veterinarian astronaut so the

977

00:44:34,130 --> 00:44:31,509

backgrounds you know we have people with

978

00:44:35,920 --> 00:44:34,140

PhDs in chemistry and biology

979

00:44:38,620 --> 00:44:35,930

astrophysics and

980

00:44:44,800 --> 00:44:38,630

and a lot of very smart people there you

981

00:44:47,650 --> 00:44:44,810

know just not very many on this group is

982

00:44:52,960 --> 00:44:47,660

there internet on the International

983

00:44:54,520 --> 00:44:52,970

Space Station yeah well they're they're

984

00:44:56,470 --> 00:44:54,530

actually working on that right now Jeff

985

00:44:58,420 --> 00:44:56,480

Williams and TJ creamer are up there

986

00:45:00,100 --> 00:44:58,430

trying to put together a crew land and

987

00:45:02,590 --> 00:45:00,110

that would allow them to do Twitter

988

00:45:06,700 --> 00:45:02,600

directly from space as well as surf the

989

00:45:10,690 --> 00:45:06,710

internet so that's coming very soon your

990

00:45:13,750 --> 00:45:10,700

question um I'm from store Hobson and

991

00:45:16,330 --> 00:45:13,760

what you said that you going you grow

992

00:45:19,600 --> 00:45:16,340

when you're in space house how tall did

993

00:45:23,830 --> 00:45:19,610

you go I had varies from person to

994

00:45:27,430 --> 00:45:23,840

person but can be up to a few no I was

995

00:45:34,810 --> 00:45:27,440

very sad Bobby actually got a call from

996

00:45:38,650 --> 00:45:34,820

the Washington Wizards it can be up to a

997

00:45:42,550 --> 00:45:38,660

couple of inches and it probably happens

998

00:45:46,180 --> 00:45:42,560

because the disks in your spine actually

999

00:45:48,130 --> 00:45:46,190

kind of they kind of get larger because

1000

00:45:49,810 --> 00:45:48,140

here on the ground of course it's

1001
00:45:52,180 --> 00:45:49,820
gravity and it kind of scrunches

1002
00:45:54,070 --> 00:45:52,190
everything down when you go up in outer

1003
00:45:56,020 --> 00:45:54,080
space all of a sudden you know that

1004
00:45:59,710 --> 00:45:56,030
forces on you so it just allows your

1005
00:46:03,220 --> 00:45:59,720
back to to stretch out and so so that's

1006
00:46:05,100 --> 00:46:03,230
what happens that can actually be a

1007
00:46:07,030 --> 00:46:05,110
little bit painful so I don't know what

1008
00:46:08,650 --> 00:46:07,040
comrades talking about being so

1009
00:46:10,630 --> 00:46:08,660
comfortable sleeping but you know for a

1010
00:46:12,850 --> 00:46:10,640
first few days or so you get some back

1011
00:46:14,260 --> 00:46:12,860
pain because you're you are stretching

1012
00:46:16,450 --> 00:46:14,270
you're getting in positions that are

1013
00:46:19,900 --> 00:46:16,460

you're not really used to and sometimes

1014

00:46:23,740 --> 00:46:19,910

that can be uncomfortable so this is

1015

00:46:28,390 --> 00:46:23,750

like growing pains but growing pains for

1016

00:46:31,240 --> 00:46:28,400

old men how are you going to restock or

1017

00:46:36,100 --> 00:46:31,250

refuel the space station if there are no

1018

00:46:40,240 --> 00:46:36,110

if the specials being retired there's

1019

00:46:42,130 --> 00:46:40,250

actually this space station the space

1020

00:46:45,730 --> 00:46:42,140

station itself has a lot of visiting

1021

00:46:49,130 --> 00:46:45,740

vehicles that are a part of what we call

1022

00:46:52,160 --> 00:46:49,140

a traffic plan or just a scheduled

1023

00:46:55,370 --> 00:46:52,170

land of events of vehicles that come up

1024

00:46:57,079 --> 00:46:55,380

that we have russian progress is what

1025

00:46:59,450 --> 00:46:57,089

they're called they're similar to the

1026

00:47:02,329 --> 00:46:59,460

Soyuz but they they're basically for

1027

00:47:08,120 --> 00:47:02,339

restocking we have a European vehicle

1028

00:47:10,220 --> 00:47:08,130

that's a hard it basically uses the same

1029

00:47:11,960 --> 00:47:10,230

type of mating mechanism that the

1030

00:47:15,099 --> 00:47:11,970

progress does in other words it comes up

1031

00:47:17,750 --> 00:47:15,109

and actually hard mates to the station

1032

00:47:20,630 --> 00:47:17,760

itself and then we will also have a

1033

00:47:22,700 --> 00:47:20,640

Japanese transfer vehicle that comes up

1034

00:47:25,990 --> 00:47:22,710

underneath the space station and and

1035

00:47:28,609 --> 00:47:26,000

just kind of hovers essentially at about

1036

00:47:32,150 --> 00:47:28,619

30 feet and we actually grab it with a

1037

00:47:34,160 --> 00:47:32,160

robotic arm and then attach it and and

1038

00:47:37,640 --> 00:47:34,170

these vehicles have a lot of capability

1039

00:47:41,750 --> 00:47:37,650

for bringing up not only food and

1040

00:47:45,529 --> 00:47:41,760

equipment but also gas for for breathing

1041

00:47:47,779 --> 00:47:45,539

atmosphere and fuel and everything you

1042

00:47:53,450 --> 00:47:47,789

need so we're pretty well equipped that

1043

00:47:56,210 --> 00:47:53,460

way I'm a high schooler from Edmund

1044

00:47:57,769 --> 00:47:56,220

Burke and I was wondering what the

1045

00:48:03,009 --> 00:47:57,779

dangers were when your space walking

1046

00:48:10,579 --> 00:48:07,990

dangerous dangers of space walking up we

1047

00:48:13,069 --> 00:48:10,589

you know we take every precaution and we

1048

00:48:16,339 --> 00:48:13,079

train hours and hours in our pool in

1049

00:48:17,990 --> 00:48:16,349

Houston before we do these spacewalks we

1050

00:48:19,069 --> 00:48:18,000

always remain tethered to the outside of

1051

00:48:21,170 --> 00:48:19,079

the space station I don't know if you

1052

00:48:24,440 --> 00:48:21,180

saw in the video and one scene you could

1053

00:48:27,589 --> 00:48:24,450

actually see Randy's tether it's a it's

1054

00:48:29,329 --> 00:48:27,599

like a steel cable and it is always

1055

00:48:33,170 --> 00:48:29,339

attached to the space station with so we

1056

00:48:35,420 --> 00:48:33,180

we can't float away but you know talking

1057

00:48:37,329 --> 00:48:35,430

about preparing for problems what could

1058

00:48:39,289 --> 00:48:37,339

go wrong we trained quite a bit on

1059

00:48:41,329 --> 00:48:39,299

problems that we could have during our

1060

00:48:43,460 --> 00:48:41,339

space walks and we were pretty lucky I

1061

00:48:46,039 --> 00:48:43,470

think on the whole because we didn't

1062

00:48:48,890 --> 00:48:46,049

have very many problems but Bobby and I

1063

00:48:51,170 --> 00:48:48,900

had a bolt that was a little hard to to

1064

00:48:53,269 --> 00:48:51,180

loosen on on one of the spacewalks and

1065

00:48:55,819 --> 00:48:53,279

you know we're working on stuff out

1066

00:48:57,620 --> 00:48:55,829

there that maybe a boat that was

1067

00:48:59,180 --> 00:48:57,630

tightened five years ago on the ground

1068

00:49:01,160 --> 00:48:59,190

and then launched into space and it's

1069

00:49:01,640 --> 00:49:01,170

been flying up there for a long time and

1070

00:49:06,529 --> 00:49:01,650

go

1071

00:49:08,630 --> 00:49:06,539

around the earth and you know might be a

1072

00:49:11,690 --> 00:49:08,640

little tough to loosen those bolts so we

1073

00:49:13,220 --> 00:49:11,700

prepared quite a bit for problems and we

1074

00:49:18,140 --> 00:49:13,230

were fortunate we didn't have any but

1075

00:49:21,049 --> 00:49:18,150

too many but ok for to kind of see ya on

1076
00:49:24,970 --> 00:49:21,059
top of the cable that we stay tethered

1077
00:49:27,589 --> 00:49:24,980
to we also have a backpack called safer

1078
00:49:30,589 --> 00:49:27,599
which is simplified aid for Evie a

1079
00:49:32,390 --> 00:49:30,599
rescue which is basically a nitrogen

1080
00:49:36,829 --> 00:49:32,400
pack that we wear on our backs and if we

1081
00:49:38,450 --> 00:49:36,839
were to somehow come untethered one of

1082
00:49:40,220 --> 00:49:38,460
our buddies disconnects us or something

1083
00:49:42,710 --> 00:49:40,230
I don't know but how that could happen

1084
00:49:44,779 --> 00:49:42,720
but wouldn't be your buddy after that we

1085
00:49:46,250 --> 00:49:44,789
can actually fly back to the space

1086
00:49:48,170 --> 00:49:46,260
station we have enough nitrogen in this

1087
00:49:49,460 --> 00:49:48,180
backpack to fly us back and that's

1088
00:49:51,410 --> 00:49:49,470

another thing that we train in the

1089

00:49:54,500 --> 00:49:51,420

virtual reality laboratory in Houston we

1090

00:49:56,120 --> 00:49:54,510

put on goggles and and you see you're

1091

00:49:58,519 --> 00:49:56,130

out on the outside of space station and

1092

00:49:59,660 --> 00:49:58,529

they can flip you off and off of the

1093

00:50:01,789 --> 00:49:59,670

space station and you're tumbling

1094

00:50:03,980 --> 00:50:01,799

backwards and then you pull out this

1095

00:50:07,760 --> 00:50:03,990

thing and turn it on and and fly

1096

00:50:11,289 --> 00:50:07,770

yourself back so we we prepare for for

1097

00:50:14,359 --> 00:50:11,299

as many eventualities as we can think of

1098

00:50:17,609 --> 00:50:14,369

okay we have time for three more

1099

00:50:20,500 --> 00:50:17,619

questions so make sure they're good

1100

00:50:26,349 --> 00:50:20,510

how many months of training do you have

1101
00:50:29,829 --> 00:50:26,359
to do before you go into space how many

1102
00:50:33,579 --> 00:50:29,839
months of training to go through the 41

1103
00:50:37,270 --> 00:50:33,589
we gotta sign as a flight in September

1104
00:50:39,039 --> 00:50:37,280
and we did some training that fall and

1105
00:50:40,930 --> 00:50:39,049
like scorch said you know it's really

1106
00:50:43,030 --> 00:50:40,940
nine months before the mission after the

1107
00:50:45,130 --> 00:50:43,040
new year we really got into hot and

1108
00:50:46,900 --> 00:50:45,140
heavy full-blooded training and then we

1109
00:50:49,270 --> 00:50:46,910
launched November so from assignment in

1110
00:50:53,200 --> 00:50:49,280
September to launch in November as you

1111
00:50:55,660 --> 00:50:53,210
can see was basically 14 months there

1112
00:50:58,240 --> 00:50:55,670
used to be you know a period of time

1113
00:51:02,079 --> 00:50:58,250

when our missions were a little less

1114

00:51:04,930 --> 00:51:02,089

complex the minimum they ever used to

1115

00:51:07,180 --> 00:51:04,940

have would be six months but twelve

1116

00:51:12,640 --> 00:51:07,190

months is more desired so I was probably

1117

00:51:15,549 --> 00:51:12,650

simply approximately how many years does

1118

00:51:20,829 --> 00:51:15,559

it take for all the training in all for

1119

00:51:24,250 --> 00:51:20,839

one mission I think the question is how

1120

00:51:27,039 --> 00:51:24,260

many months total for one mission yeah

1121

00:51:36,039 --> 00:51:27,049

basically we're just rounded to a year

1122

00:51:40,780 --> 00:51:36,049

it's pretty easy good question oh what's

1123

00:51:42,130 --> 00:51:40,790

your favorite part of being in space you

1124

00:51:45,130 --> 00:51:42,140

probably have to ask each one of us

1125

00:51:54,410 --> 00:51:45,140

individually I'll just say being with

1126
00:52:01,590 --> 00:51:57,540
see ya all right I got the answer first

1127
00:52:05,580 --> 00:52:01,600
go ahead you can't top that being in

1128
00:52:06,900 --> 00:52:05,590
space is fantastic but I didn't think

1129
00:52:09,450 --> 00:52:06,910
about this ahead of time but we've been

1130
00:52:12,690 --> 00:52:09,460
back since the 27th and November but it

1131
00:52:14,700 --> 00:52:12,700
has been a joy almost as equally as

1132
00:52:16,470 --> 00:52:14,710
enjoyable to share the experience with

1133
00:52:25,380 --> 00:52:16,480
others like we're doing today it's been

1134
00:52:27,030 --> 00:52:25,390
really really great you know there were

1135
00:52:28,620 --> 00:52:27,040
times in the mission when everyone's

1136
00:52:29,910 --> 00:52:28,630
busy running around doing things but

1137
00:52:32,520 --> 00:52:29,920
when you saw that part of the video

1138
00:52:34,230 --> 00:52:32,530

where we're all eating together that was

1139

00:52:36,120 --> 00:52:34,240

one of the best times because we had a

1140

00:52:37,560 --> 00:52:36,130

time to kind of fellowship and get

1141

00:52:39,510 --> 00:52:37,570

together and talk about our families

1142

00:52:42,150 --> 00:52:39,520

talk about the mission and talk about

1143

00:52:44,340 --> 00:52:42,160

the food so the eating part was a really

1144

00:52:54,780 --> 00:52:44,350

really good time we all got together and

1145

00:52:57,090 --> 00:52:54,790

it was just a great moment so after

1146

00:52:59,040 --> 00:52:57,100

being up in space for a while and then

1147

00:53:04,340 --> 00:52:59,050

coming back to earth was difficult

1148

00:53:07,980 --> 00:53:04,350

getting used to gravity again it was uh

1149

00:53:10,680 --> 00:53:07,990

it was pretty neat actually coming back

1150

00:53:11,850 --> 00:53:10,690

and kind of being in a known element

1151
00:53:13,290 --> 00:53:11,860
that you've been in your whole life

1152
00:53:15,390 --> 00:53:13,300
coming back to it and feeling a little

1153
00:53:17,130 --> 00:53:15,400
weird I think you know Bob and I were

1154
00:53:18,960 --> 00:53:17,140
talking about it is you saw us walk off

1155
00:53:20,700 --> 00:53:18,970
the crew transfer vehicle to go walk on

1156
00:53:23,100 --> 00:53:20,710
the space shuttle it felt kinda leaking

1157
00:53:25,350 --> 00:53:23,110
had ankle weights on and just you or

1158
00:53:28,200 --> 00:53:25,360
your shoes were full of sand or

1159
00:53:29,340 --> 00:53:28,210
something like he just gotten wet but so

1160
00:53:31,560 --> 00:53:29,350
you had little bit of a heavy feeling

1161
00:53:33,270 --> 00:53:31,570
and then your inner ear wasn't being

1162
00:53:34,620 --> 00:53:33,280
excited by gravity while you're up there

1163
00:53:37,110 --> 00:53:34,630

the whole time all the fluid in there

1164

00:53:38,730 --> 00:53:37,120

just kind of stopped and so now you can

1165

00:53:40,290 --> 00:53:38,740

start moving around and everything in

1166

00:53:42,300 --> 00:53:40,300

your inner starts moving again kind of

1167

00:53:44,310 --> 00:53:42,310

the would make your body feel a little

1168

00:53:47,760 --> 00:53:44,320

bit strange but that only lasted for a

1169

00:53:49,140 --> 00:53:47,770

few hours and so it was a surprising how

1170

00:53:51,930 --> 00:53:49,150

quickly because your battery already

1171

00:53:54,930 --> 00:53:51,940

knows what 1g is like how quickly your

1172

00:53:56,430 --> 00:53:54,940

body got back to you know basically back

1173

00:53:57,670 --> 00:53:56,440

to where you were before you left it's

1174

00:53:59,830 --> 00:53:57,680

some other funny

1175

00:54:01,750 --> 00:53:59,840

today I remember I remember my first

1176
00:54:05,320 --> 00:54:01,760
after my first flight the first thing I

1177
00:54:06,970 --> 00:54:05,330
remember that was unique was waking up

1178
00:54:09,370 --> 00:54:06,980
the next morning after going to bed not

1179
00:54:10,780 --> 00:54:09,380
really knowing how to get out because I

1180
00:54:12,340 --> 00:54:10,790
was a used to floating out of my

1181
00:54:13,960 --> 00:54:12,350
fleeting bag but I wasn't used to

1182
00:54:15,850 --> 00:54:13,970
getting out of a bed where I'm laying

1183
00:54:17,050 --> 00:54:15,860
down some I'm sitting here thinking at

1184
00:54:18,250 --> 00:54:17,060
least I was thinking about it because

1185
00:54:21,190 --> 00:54:18,260
otherwise it could have been really ugly

1186
00:54:23,350 --> 00:54:21,200
but I thought all right if I try to do

1187
00:54:24,700 --> 00:54:23,360
this I'm going to end up face plant and

1188
00:54:27,580 --> 00:54:24,710

that's not going to be a very good

1189

00:54:29,110 --> 00:54:27,590

dismount from the old bed so that ok I'm

1190

00:54:30,580 --> 00:54:29,120

going to move this leg around guard so I

1191

00:54:31,960 --> 00:54:30,590

had to think about it and other things

1192

00:54:34,240 --> 00:54:31,970

people come back as sometimes you'll

1193

00:54:35,980 --> 00:54:34,250

grab like a coffee cup and instead of

1194

00:54:37,270 --> 00:54:35,990

instead of setting it down on something

1195

00:54:39,100 --> 00:54:37,280

you'll just let go of it because you're

1196

00:54:41,860 --> 00:54:39,110

used to let go of things and instead of

1197

00:54:45,990 --> 00:54:41,870

it floating there just also ok I'm not

1198

00:54:53,050 --> 00:54:49,540

things that he brought up was with let

1199

00:54:55,090 --> 00:54:53,060

the your ballot stuff and nowadays they

1200

00:54:57,100 --> 00:54:55,100

actually do they test this as soon as we

1201

00:54:59,350 --> 00:54:57,110

get off of the shuttle to see our

1202

00:55:03,820 --> 00:54:59,360

balance is like to see if we're safe

1203

00:55:05,710 --> 00:55:03,830

driving or or whatnot because it take it

1204

00:55:08,290 --> 00:55:05,720

actually takes to you know probably a

1205

00:55:10,930 --> 00:55:08,300

total of about two days or so for it to

1206

00:55:13,480 --> 00:55:10,940

completely renormalize but you're

1207

00:55:15,280 --> 00:55:13,490

usually in good enough shape after a few

1208

00:55:18,730 --> 00:55:15,290

hours to where you can do most things

1209

00:55:20,590 --> 00:55:18,740

you normally do it someday we're going

1210

00:55:21,640 --> 00:55:20,600

to leave here we're going to go in geog

1211

00:55:23,470 --> 00:55:21,650

for quite a while go to other places

1212

00:55:24,820 --> 00:55:23,480

like the moon in Mars and other places

1213

00:55:26,410 --> 00:55:24,830

we need to know how to function when we

1214

00:55:27,940 --> 00:55:26,420

get there so if you've been on a

1215

00:55:29,950 --> 00:55:27,950

spaceship for two to three months in

1216

00:55:31,660 --> 00:55:29,960

zero gravity you got to go to Mars well

1217

00:55:33,010 --> 00:55:31,670

can't afford to have you be three days

1218

00:55:34,450 --> 00:55:33,020

for you get the rover start driving

1219

00:55:36,280 --> 00:55:34,460

around so if we can figure out ways to

1220

00:55:38,320 --> 00:55:36,290

combat that kind of stuff while we're in

1221

00:55:42,190 --> 00:55:38,330

zero gravity will be able to land on

1222

00:55:44,410 --> 00:55:42,200

Mars and get right to work I think that

1223

00:55:47,440 --> 00:55:44,420

was our last question and we really do

1224

00:55:50,230 --> 00:55:47,450

appreciate you all being so attentive

1225

00:55:55,450 --> 00:55:50,240

and alert and interesting to to talk

1226

00:55:57,760 --> 00:55:55,460

with it flying two spaces is truly been

1227

00:56:00,090 --> 00:55:57,770

a highlight of my career and I know it

1228

00:56:02,860 --> 00:56:00,100

has been for most people in our office

1229

00:56:09,430 --> 00:56:02,870

but you know the hard work and teamwork

1230

00:56:11,770 --> 00:56:09,440

is really the pinnacle of it all is it's

1231

00:56:14,320 --> 00:56:11,780

not what any one of us gets to

1232

00:56:17,950 --> 00:56:14,330

do or does that really matters it's what

1233

00:56:20,110 --> 00:56:17,960

we collectively do and the space program

1234

00:56:21,730 --> 00:56:20,120

is probably one of the biggest examples

1235

00:56:24,210 --> 00:56:21,740

of that because there's you know not

1236

00:56:26,560 --> 00:56:24,220

just astronauts there's not just mission

1237

00:56:27,910 --> 00:56:26,570

mission ops people in other words of

1238

00:56:30,700 --> 00:56:27,920

flight controllers and us to work

1239

00:56:32,470 --> 00:56:30,710

together it's it's all across the

1240

00:56:33,880 --> 00:56:32,480

country it's it's all the different

1241

00:56:36,640 --> 00:56:33,890

centers it's all the different

1242

00:56:39,220 --> 00:56:36,650

corporations that participate in making

1243

00:56:42,790 --> 00:56:39,230

an endeavor like this happen and is it

1244

00:56:45,340 --> 00:56:42,800

it's a unique experience in total a

1245

00:56:47,050 --> 00:56:45,350

totally unique event and it's a

1246

00:56:49,330 --> 00:56:47,060

extremely worthwhile endeavor and we're

1247

00:56:52,050 --> 00:56:49,340

just honored to be a part of it and help

1248

00:57:02,720 --> 00:56:52,060

them to represent NASA as best we can

1249

00:57:07,920 --> 00:57:04,830

thank you guys for sharing the

1250

00:57:09,900 --> 00:57:07,930

experience of sts-1 29 so for the

1251
00:57:12,740 --> 00:57:09,910
students in the room here who who here

1252
00:57:15,720 --> 00:57:12,750
would like to do a spacewalk and travel

1253
00:57:18,480 --> 00:57:15,730
17,500 miles per hour who would like to

1254
00:57:20,430 --> 00:57:18,490
perhaps command a spaceship to go back

1255
00:57:23,340 --> 00:57:20,440
to the moon or perhaps to Mars or maybe

1256
00:57:25,440 --> 00:57:23,350
be a scientist and analyze data from the

1257
00:57:28,470 --> 00:57:25,450
Hubble Space Telescope well we hope

1258
00:57:30,720 --> 00:57:28,480
you'll follow the activities of NASA we

1259
00:57:33,900 --> 00:57:30,730
have a busy year ahead of us as we speak

1260
00:57:35,460 --> 00:57:33,910
five crew members or from US Russia and

1261
00:57:39,510 --> 00:57:35,470
Japan or up on the International Space

1262
00:57:41,520 --> 00:57:39,520
Station the budget request for 2011 will

1263
00:57:43,230 --> 00:57:41,530

be released on february one for you

1264

00:57:45,930 --> 00:57:43,240

students that's like our allowance from

1265

00:57:48,210 --> 00:57:45,940

the president we are anxiously standing

1266

00:57:50,100 --> 00:57:48,220

by to hear what the president has in

1267

00:57:52,530 --> 00:57:50,110

mind for the future of NASA's human

1268

00:57:55,590 --> 00:57:52,540

spaceflight program we're getting ready

1269

00:57:56,910 --> 00:57:55,600

for the upcoming launch of sts-1 30 sets

1270

00:57:59,400 --> 00:57:56,920

going to go back to the space station

1271

00:58:02,070 --> 00:57:59,410

we're also preparing for the launch of

1272

00:58:04,620 --> 00:58:02,080

the Solar Dynamics Observatory that will

1273

00:58:06,450 --> 00:58:04,630

reveal how solar activity is generated

1274

00:58:11,400 --> 00:58:06,460

and how it impacts things here on earth

1275

00:58:14,130 --> 00:58:11,410

and a reminder to headquarters employees

1276

00:58:16,440 --> 00:58:14,140

on january 29th you'll have the

1277

00:58:18,630 --> 00:58:16,450

opportunity to participate in the annual

1278

00:58:21,660 --> 00:58:18,640

day of remembrance ceremony and

1279

00:58:23,580 --> 00:58:21,670

Arlington National Cemetery this is our

1280

00:58:25,590 --> 00:58:23,590

chance to pause and reflect and

1281

00:58:28,860 --> 00:58:25,600

recognize the sacrifices that the

1282

00:58:30,480 --> 00:58:28,870

astronauts from Apollo 1 the challenger

1283

00:58:32,340 --> 00:58:30,490

mission and the Columbia mission made

1284

00:58:34,500 --> 00:58:32,350

when they gave their lives for their

1285

00:58:36,980 --> 00:58:34,510

country so stay tuned to announcements

1286

00:58:39,660 --> 00:58:36,990

on NASA inc for further details on that

1287

00:58:40,890 --> 00:58:39,670

meanwhile thanks again to the teachers

1288

00:58:44,370 --> 00:58:40,900

and students from the Congressional

1289

00:58:48,180 --> 00:58:44,380

schools of Virginia from the Edmund

1290

00:58:49,980 --> 00:58:48,190

Burke school of Washington DC and from

1291

00:58:52,290 --> 00:58:49,990

the 1st district community outreach

1292

00:58:55,350 --> 00:58:52,300

youth program thank you all for coming

1293

00:58:57,600 --> 00:58:55,360

today please join us in the lobby to

1294

00:58:59,520 --> 00:58:57,610

meet the astronauts and be sure to pick

1295

00:59:02,130 --> 00:58:59,530

up materials on the table on your way

1296

00:59:04,320 --> 00:59:02,140

out you can learn more about our current

1297

00:59:08,760 --> 00:59:04,330

and future plans and programs by logging

1298

00:59:11,100 --> 00:59:08,770

on to ww mas a govt follow us on our web

1299

00:59:13,530 --> 00:59:11,110

our blogs Twitter accounts at a range of

1300

00:59:15,190 --> 00:59:13,540

traditional and social media thanks for

