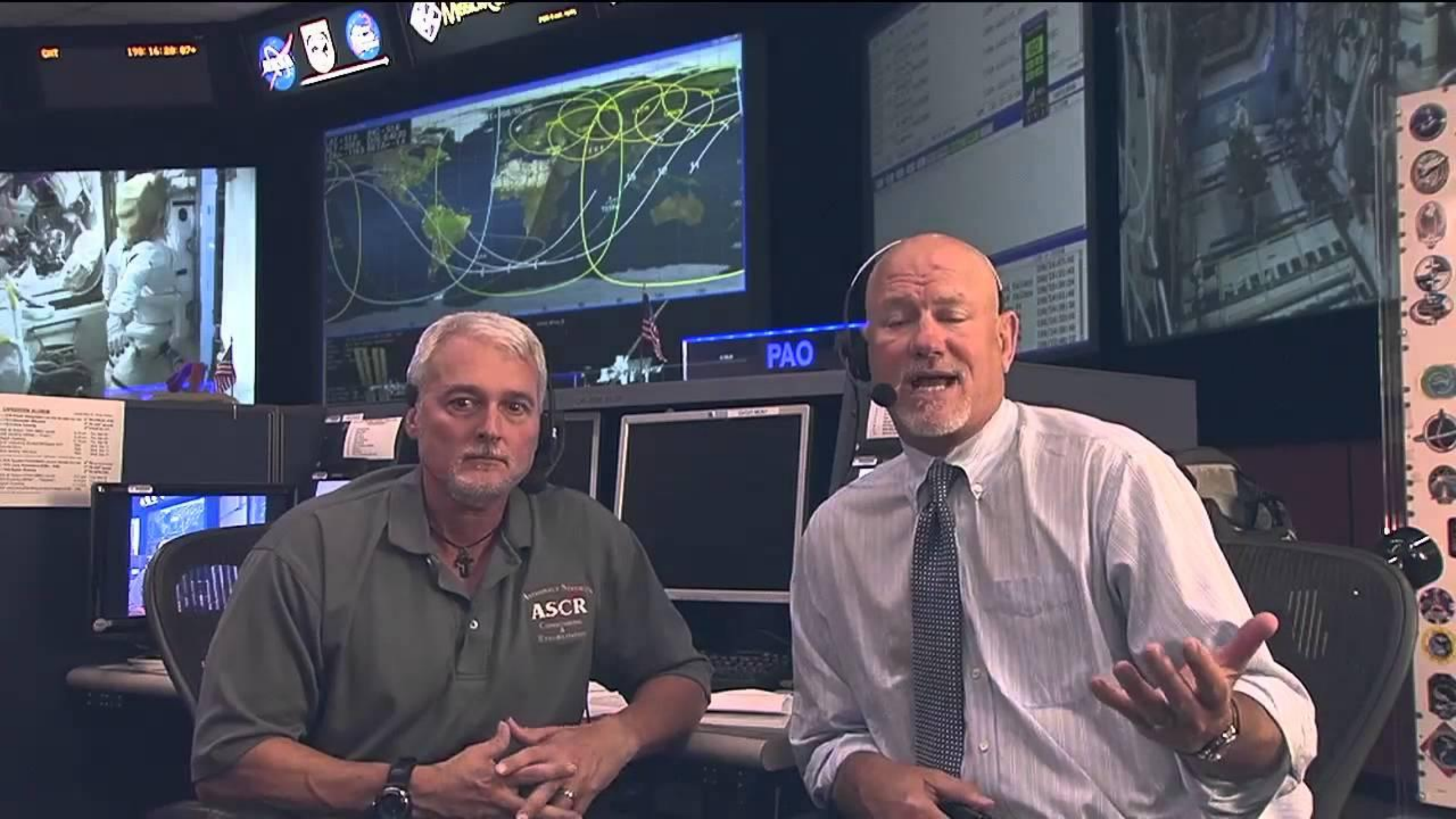
PAO
ASCR

1
00:00:05,510 --> 00:00:03,189
hey everybody and welcome to mission

2
00:00:08,230 --> 00:00:05,520
control houston i'm kelly humphries and

3
00:00:11,589 --> 00:00:08,240
with me is mark williams who is one of

4
00:00:13,990 --> 00:00:11,599
the lead astronaut strength trainers and

5
00:00:16,150 --> 00:00:14,000
he works with crews on to make them

6
00:00:18,070 --> 00:00:16,160
ready for space flights and also to keep

7
00:00:20,390 --> 00:00:18,080
them healthy on orbit and to get them

8
00:00:22,310 --> 00:00:20,400
used to coming back and living in

9
00:00:23,990 --> 00:00:22,320
gravity again

10
00:00:27,509 --> 00:00:24,000
um we're glad to be here with you and

11
00:00:38,790 --> 00:00:28,710
are we all set should we go ahead and

12
00:00:43,190 --> 00:00:40,790
yes you may begin please go ahead with

13
00:00:45,670 --> 00:00:43,200

your first question

14
00:00:47,830 --> 00:00:45,680
um my name is claire i live in tacoma

15
00:00:49,830 --> 00:00:47,840
how many jobs are there on the mission

16
00:00:55,590 --> 00:00:49,840
control

17
00:00:57,590 --> 00:00:55,600
different jobs uh there are right now uh

18
00:00:59,590 --> 00:00:57,600
there are probably about 30 people here

19
00:01:02,150 --> 00:00:59,600
in mission control

20
00:01:04,710 --> 00:01:02,160
they their team is led by a flight

21
00:01:06,710 --> 00:01:04,720
director and then that flight director

22
00:01:08,950 --> 00:01:06,720
is in charge of the entire team and then

23
00:01:11,350 --> 00:01:08,960
each of these folks has a specific area

24
00:01:13,510 --> 00:01:11,360
that they work in whether it's

25
00:01:15,670 --> 00:01:13,520
space walking or whether it's

26
00:01:17,590 --> 00:01:15,680
environmental control systems or

27
00:01:19,350 --> 00:01:17,600
communication systems

28
00:01:21,590 --> 00:01:19,360
and that whole team works together here

29
00:01:24,149 --> 00:01:21,600
and then in addition there are

30
00:01:26,230 --> 00:01:24,159
back rooms as we call them where they

31
00:01:28,789 --> 00:01:26,240
have additional specialists that may

32
00:01:31,350 --> 00:01:28,799
have a particular part of that system

33
00:01:33,990 --> 00:01:31,360
that they are really expert at and then

34
00:01:36,149 --> 00:01:34,000
those folks all work together to bring

35
00:01:37,590 --> 00:01:36,159
that into the full team and and make

36
00:01:39,429 --> 00:01:37,600
sure that we make the right decisions

37
00:01:41,510 --> 00:01:39,439
for the astronauts on orbit then of

38
00:01:43,749 --> 00:01:41,520

course we're also connecting

39
00:01:45,749 --> 00:01:43,759
with uh mission control centers around

40
00:01:47,270 --> 00:01:45,759
the world since we have five different

41
00:01:49,109 --> 00:01:47,280
space agencies working on the

42
00:01:51,270 --> 00:01:49,119
international space station

43
00:01:53,030 --> 00:01:51,280
representing 15 different countries and

44
00:01:55,350 --> 00:01:53,040
so these folks here in mission control

45
00:01:58,469 --> 00:01:55,360
have similar counterparts

46
00:02:00,230 --> 00:01:58,479
in munich in moscow in

47
00:02:02,870 --> 00:02:00,240
scuba japan

48
00:02:04,630 --> 00:02:02,880
in century beer canada

49
00:02:05,670 --> 00:02:04,640
and also

50
00:02:07,830 --> 00:02:05,680
in

51
00:02:09,830 --> 00:02:07,840
other areas of the country that help

52
00:02:11,510 --> 00:02:09,840
support their work here

53
00:02:13,750 --> 00:02:11,520
areas like marshall space flight center

54
00:02:15,270 --> 00:02:13,760
in huntsville alabama where they help

55
00:02:17,270 --> 00:02:15,280
coordinate all the research on the space

56
00:02:18,869 --> 00:02:17,280
station so a really big team i couldn't

57
00:02:20,229 --> 00:02:18,879
give you an exact number but here in

58
00:02:25,750 --> 00:02:20,239
mission control right now there's about

59
00:02:31,030 --> 00:02:29,190
my name is emma and i live in seattle

60
00:02:33,110 --> 00:02:31,040
and

61
00:02:34,790 --> 00:02:33,120
my question is do

62
00:02:37,030 --> 00:02:34,800
do you always work that

63
00:02:39,350 --> 00:02:37,040

at the same job and do the same thing in

64
00:02:41,910 --> 00:02:39,360
mission control

65
00:02:43,350 --> 00:02:41,920
um you know i'm going to bring mark in

66
00:02:46,949 --> 00:02:43,360
on this a little bit

67
00:02:49,509 --> 00:02:46,959
most people work in a particular area

68
00:02:51,910 --> 00:02:49,519
and focus on that area at least for a

69
00:02:54,630 --> 00:02:51,920
portion of their time in mission control

70
00:02:56,229 --> 00:02:54,640
however a lot of people move around into

71
00:02:58,390 --> 00:02:56,239
different areas because you've got

72
00:02:59,750 --> 00:02:58,400
basically engineers and scientists for

73
00:03:02,309 --> 00:02:59,760
the most part that work in mission

74
00:03:04,630 --> 00:03:02,319
control and they have a broad background

75
00:03:06,790 --> 00:03:04,640
in whatever area they're in and so they

76
00:03:08,550 --> 00:03:06,800
can sometimes translate those over in

77
00:03:10,949 --> 00:03:08,560
different areas

78
00:03:13,110 --> 00:03:10,959
and they like to do that to expand their

79
00:03:14,949 --> 00:03:13,120
careers because a lot of these folks

80
00:03:16,630 --> 00:03:14,959
would like to in addition just working

81
00:03:18,149 --> 00:03:16,640
in mission control they'd like to

82
00:03:20,149 --> 00:03:18,159
someday maybe be a flight director and

83
00:03:22,630 --> 00:03:20,159
be in charge and so in order to get

84
00:03:24,070 --> 00:03:22,640
experience in different areas they do

85
00:03:25,990 --> 00:03:24,080
that kind of thing

86
00:03:27,910 --> 00:03:26,000
we also have people like mark who work

87
00:03:29,910 --> 00:03:27,920
with the crews and help prepare them and

88
00:03:31,350 --> 00:03:29,920

maybe you can talk about the all the

89
00:03:33,830 --> 00:03:31,360
other support work

90
00:03:36,390 --> 00:03:33,840
well yeah i mean i've been here about 20

91
00:03:38,630 --> 00:03:36,400
years i started off i worked in the

92
00:03:40,550 --> 00:03:38,640
exercise physiology lab doing research

93
00:03:42,309 --> 00:03:40,560
for about four or five years

94
00:03:43,830 --> 00:03:42,319
and i've been currently in my job that i

95
00:03:47,750 --> 00:03:43,840
have now as the strength and

96
00:03:51,990 --> 00:03:47,760
conditioning coach for about 16 years

97
00:03:57,270 --> 00:03:54,149
yeah

98
00:03:59,670 --> 00:03:57,280
hello my name is nadia i live in burnaby

99
00:04:01,750 --> 00:03:59,680
bc and my question is what kind of

100
00:04:03,910 --> 00:04:01,760
education do you need to work in mission

101
00:04:06,149 --> 00:04:03,920
control

102
00:04:08,149 --> 00:04:06,159
well again most the folks that work in

103
00:04:09,350 --> 00:04:08,159
mission control are scientists or

104
00:04:10,869 --> 00:04:09,360
engineers

105
00:04:12,470 --> 00:04:10,879
there are a lot of different engineering

106
00:04:13,670 --> 00:04:12,480
backgrounds there's electrical

107
00:04:15,830 --> 00:04:13,680
engineering there's mechanical

108
00:04:17,110 --> 00:04:15,840
engineering there is aeronautical

109
00:04:19,030 --> 00:04:17,120
engineering

110
00:04:20,870 --> 00:04:19,040
there's physics math

111
00:04:24,070 --> 00:04:20,880
essentially for education you want to

112
00:04:26,390 --> 00:04:24,080
get a broad education in science

113
00:04:28,070 --> 00:04:26,400

technology and engineering

114
00:04:29,909 --> 00:04:28,080
but what's really key is to find

115
00:04:33,189 --> 00:04:29,919
something that you love to do

116
00:04:34,629 --> 00:04:33,199
because whenever you are trying to

117
00:04:36,629 --> 00:04:34,639
improve yourself

118
00:04:38,070 --> 00:04:36,639
and get ready for a career it's

119
00:04:40,150 --> 00:04:38,080
important to be doing something that you

120
00:04:41,909 --> 00:04:40,160
like to do because that's going to help

121
00:04:43,670 --> 00:04:41,919
you do it better and it's going to help

122
00:04:44,790 --> 00:04:43,680
you focus on learning what you need to

123
00:04:48,469 --> 00:04:44,800
know

124
00:04:49,590 --> 00:04:48,479
and then continuing as you get older and

125
00:04:51,189 --> 00:04:49,600
mature

126
00:04:52,950 --> 00:04:51,199
to learn more all the time and it's

127
00:04:55,030 --> 00:04:52,960
going to inspire in you the idea of

128
00:04:57,430 --> 00:04:55,040
continuing to learn throughout your life

129
00:04:59,909 --> 00:04:57,440
which everybody here in this room is is

130
00:05:01,189 --> 00:04:59,919
definitely focused on doing that because

131
00:05:02,469 --> 00:05:01,199
every time

132
00:05:04,950 --> 00:05:02,479
we do something

133
00:05:07,029 --> 00:05:04,960
in space on the space station or on a

134
00:05:09,189 --> 00:05:07,039
spacecraft we learn something new

135
00:05:10,629 --> 00:05:09,199
yesterday we had a problem on the space

136
00:05:13,189 --> 00:05:10,639
walk and

137
00:05:15,189 --> 00:05:13,199
we had a brand new problem that we'd

138
00:05:17,510 --> 00:05:15,199

never had before we had a bunch of water

139
00:05:18,790 --> 00:05:17,520
collected inside luca parmitano's helmet

140
00:05:20,870 --> 00:05:18,800
and they had to come home early on the

141
00:05:22,070 --> 00:05:20,880
spacewalk that's a new thing we're

142
00:05:25,029 --> 00:05:22,080
learning from that we're trying to

143
00:05:26,790 --> 00:05:25,039
figure out now what exactly happened

144
00:05:28,790 --> 00:05:26,800
and it's that kind of learning attitude

145
00:05:31,350 --> 00:05:28,800
that you need to develop as much as

146
00:05:37,110 --> 00:05:31,360
anything as you're studying to try to

147
00:05:41,590 --> 00:05:39,590
my name is jamie and i live in seattle

148
00:05:43,110 --> 00:05:41,600
and this is my question can people who

149
00:05:46,070 --> 00:05:43,120
work in mission control become

150
00:05:48,150 --> 00:05:46,080
astronauts and vice versa

151
00:05:50,710 --> 00:05:48,160
uh as a matter of fact yes uh there are

152
00:05:54,230 --> 00:05:50,720
a number of astronauts who started out

153
00:05:55,590 --> 00:05:54,240
as uh as flight controllers um mark

154
00:05:57,350 --> 00:05:55,600
you've worked with some of them maybe

155
00:05:59,189 --> 00:05:57,360
you can uh remember somebody who did

156
00:06:01,189 --> 00:05:59,199
that you know like off the top of my

157
00:06:02,469 --> 00:06:01,199
head i can't remember actually somebody

158
00:06:04,469 --> 00:06:02,479
well i know just off the top of my head

159
00:06:06,710 --> 00:06:04,479
i know that shannon walker one of the

160
00:06:09,189 --> 00:06:06,720
houston native and and mark's a houston

161
00:06:10,790 --> 00:06:09,199
native too she started out as a flight

162
00:06:13,029 --> 00:06:10,800
controller and worked a variety of

163
00:06:14,309 --> 00:06:13,039

different jobs uh here before she became

164
00:06:16,550 --> 00:06:14,319
an astronaut

165
00:06:19,029 --> 00:06:16,560
um i'm trying to think of others off the

166
00:06:21,749 --> 00:06:19,039
top my head but there have been five or

167
00:06:23,110 --> 00:06:21,759
six different astronauts you also have

168
00:06:24,550 --> 00:06:23,120
in here in mission control you have

169
00:06:26,150 --> 00:06:24,560
flight surgeons and there's been a few

170
00:06:27,749 --> 00:06:26,160
flight surgeons that have also moved

171
00:06:29,670 --> 00:06:27,759
from being a flight surgeon into the

172
00:06:31,830 --> 00:06:29,680
astronaut office as well mike barrett

173
00:06:33,510 --> 00:06:31,840
was a flight surgeon and he moved into

174
00:06:36,309 --> 00:06:33,520
being an astronaut spent six months on

175
00:06:37,990 --> 00:06:36,319
the space station uh tom marsh tom

176
00:06:39,749 --> 00:06:38,000
marshburn who just got back from a

177
00:06:42,230 --> 00:06:39,759
six-month stay on the space station as a

178
00:06:44,629 --> 00:06:42,240
doctor and was also a flight surgeon

179
00:06:45,749 --> 00:06:44,639
so yes definitely a lot of people work

180
00:06:47,430 --> 00:06:45,759
in mission control and then become

181
00:06:49,110 --> 00:06:47,440
astronauts and then once you're an

182
00:06:51,430 --> 00:06:49,120
astronaut you work in mission control

183
00:06:53,909 --> 00:06:51,440
often because you serve as a spacecraft

184
00:06:56,469 --> 00:06:53,919
communicator talking with the team on

185
00:06:58,309 --> 00:06:56,479
orbit and in a way becoming a translator

186
00:07:00,629 --> 00:06:58,319
since you're an astronaut you understand

187
00:07:02,150 --> 00:07:00,639
how an astronaut thinks uh and the kind

188
00:07:03,189 --> 00:07:02,160

of questions that an astronaut might

189
00:07:05,029 --> 00:07:03,199
have

190
00:07:06,469 --> 00:07:05,039
and how best to present uh the

191
00:07:08,790 --> 00:07:06,479
information that needs to go to the

192
00:07:10,950 --> 00:07:08,800
astronaut and so we utilize them a lot

193
00:07:14,230 --> 00:07:10,960
to help relay information back and forth

194
00:07:18,390 --> 00:07:15,589
thank you

195
00:07:19,589 --> 00:07:18,400
hi my name is eula i live on roster

196
00:07:22,150 --> 00:07:19,599
island

197
00:07:24,629 --> 00:07:22,160
can you eat or drink or nap inside the

198
00:07:27,990 --> 00:07:24,639
mission control

199
00:07:29,830 --> 00:07:28,000
yes you can uh not so much napping

200
00:07:32,230 --> 00:07:29,840
but people do have to eat and drink

201
00:07:34,070 --> 00:07:32,240
throughout their day uh and a lot of

202
00:07:35,670 --> 00:07:34,080
times when you see the pictures of us

203
00:07:37,830 --> 00:07:35,680
here in mission control on nasa

204
00:07:39,990 --> 00:07:37,840
television you'll see folks that have

205
00:07:41,670 --> 00:07:40,000
cookies up on the back deck of their

206
00:07:42,790 --> 00:07:41,680
consoles or they'll be eating their

207
00:07:45,270 --> 00:07:42,800
lunch

208
00:07:47,749 --> 00:07:45,280
and it's kind of a catches catch can

209
00:07:50,710 --> 00:07:47,759
kind of a thing everybody needs to eat

210
00:07:52,629 --> 00:07:50,720
mission control teams generally work

211
00:07:54,869 --> 00:07:52,639
about a 10-hour shift

212
00:07:56,950 --> 00:07:54,879
they've got eight hours worth of work

213
00:07:59,189 --> 00:07:56,960

that they do in the middle of the shift

214
00:08:01,510 --> 00:07:59,199
where they're the main person uh but

215
00:08:04,550 --> 00:08:01,520
then they've got an hour before and

216
00:08:06,629 --> 00:08:04,560
after when they are handing off uh from

217
00:08:09,350 --> 00:08:06,639
their off coming and ongoing team

218
00:08:12,070 --> 00:08:09,360
members because this is a 24 7 operation

219
00:08:13,670 --> 00:08:12,080
over here and you have to be able to

220
00:08:15,189 --> 00:08:13,680
share what happened on the previous

221
00:08:17,110 --> 00:08:15,199
shift so that you're ready to begin your

222
00:08:18,950 --> 00:08:17,120
next shift and then when you go off

223
00:08:20,550 --> 00:08:18,960
you've got to make sure that your relief

224
00:08:22,629 --> 00:08:20,560
has all the information they need to do

225
00:08:24,790 --> 00:08:22,639
their jobs and so we all bring our

226
00:08:27,110 --> 00:08:24,800
lunches here and uh

227
00:08:28,869 --> 00:08:27,120
we usually eat them on console we have

228
00:08:31,110 --> 00:08:28,879
very brief breaks here and there where

229
00:08:32,550 --> 00:08:31,120
we can leave the control room but most

230
00:08:34,790 --> 00:08:32,560
the time we have good communication with

231
00:08:35,829 --> 00:08:34,800
the space station and so

232
00:08:38,630 --> 00:08:35,839
it's only

233
00:08:40,709 --> 00:08:38,640
you only get about five or ten minutes

234
00:08:42,790 --> 00:08:40,719
per orbit it takes 90 minutes for the

235
00:08:44,550 --> 00:08:42,800
space station to go around the world and

236
00:08:46,550 --> 00:08:44,560
so about five or ten minutes of that

237
00:08:48,630 --> 00:08:46,560
each orbit is your chance to go take a

238
00:08:50,710 --> 00:08:48,640

restroom break or grab something to

239
00:08:53,030 --> 00:08:50,720
drink so you do have to kind of measure

240
00:08:54,070 --> 00:08:53,040
what you what you consume because you

241
00:08:58,550 --> 00:08:54,080
don't want to have to run to the

242
00:09:02,949 --> 00:09:00,470
thank you

243
00:09:04,870 --> 00:09:02,959
i'm sierra and i live in seattle and my

244
00:09:07,190 --> 00:09:04,880
question is what has been the most

245
00:09:10,790 --> 00:09:07,200
exciting event that you have had to deal

246
00:09:13,590 --> 00:09:10,800
with while in mission control

247
00:09:16,949 --> 00:09:13,600
wow i have been working in mission

248
00:09:20,310 --> 00:09:16,959
control myself for more than 20 years

249
00:09:23,190 --> 00:09:20,320
uh and i've i've been involved in a lot

250
00:09:24,870 --> 00:09:23,200
of different events uh some interesting

251
00:09:26,630 --> 00:09:24,880
space walks you know yesterday's

252
00:09:29,110 --> 00:09:26,640
spacewalk

253
00:09:30,949 --> 00:09:29,120
that got cut short was the second

254
00:09:33,110 --> 00:09:30,959
shortest spacewalk ever it was an hour

255
00:09:35,670 --> 00:09:33,120
and 32 minutes long

256
00:09:37,509 --> 00:09:35,680
i actually was here doing the voice of

257
00:09:39,670 --> 00:09:37,519
mission control work

258
00:09:41,829 --> 00:09:39,680
when mike fink did the shortest

259
00:09:45,509 --> 00:09:41,839
spacewalk ever that was actually a

260
00:09:47,509 --> 00:09:45,519
russian spacewalk it was on expedition 9

261
00:09:50,550 --> 00:09:47,519
a number of years ago

262
00:09:52,230 --> 00:09:50,560
and he got outside and his

263
00:09:54,710 --> 00:09:52,240

life support system was not properly

264
00:09:57,350 --> 00:09:54,720
connected and so he had to come back in

265
00:09:59,430 --> 00:09:57,360
after only about 10 minutes outside

266
00:10:01,269 --> 00:09:59,440
that has to be one of the most

267
00:10:07,829 --> 00:10:01,279
exciting and interesting times i had

268
00:10:11,750 --> 00:10:09,030
my name is brian lunder i live in

269
00:10:13,829 --> 00:10:11,760
covington washington my question is is

270
00:10:16,630 --> 00:10:13,839
there a common language that that all

271
00:10:17,590 --> 00:10:16,640
the space agencies use like

272
00:10:19,750 --> 00:10:17,600
do the

273
00:10:21,110 --> 00:10:19,760
russian cosmonauts talk to the russian

274
00:10:22,470 --> 00:10:21,120
mission control in russian or do they

275
00:10:24,870 --> 00:10:22,480
talk to the russian mission control in

276
00:10:26,230 --> 00:10:24,880
english and vice versa is is everything

277
00:10:28,550 --> 00:10:26,240
on the space station written in english

278
00:10:29,910 --> 00:10:28,560
or is some of it still written in

279
00:10:32,790 --> 00:10:29,920
russian

280
00:10:35,509 --> 00:10:32,800
um the the common language we use aboard

281
00:10:38,470 --> 00:10:35,519
the space station uh for everybody is

282
00:10:41,190 --> 00:10:38,480
english uh and uh for mission control we

283
00:10:43,590 --> 00:10:41,200
always deal in english uh uh when we go

284
00:10:46,470 --> 00:10:43,600
back and forth in terms of conversations

285
00:10:49,269 --> 00:10:46,480
uh each uh control center though from

286
00:10:50,870 --> 00:10:49,279
around the world in in japan and russia

287
00:10:55,670 --> 00:10:50,880
and

288
00:10:56,949 --> 00:10:55,680

their own native language when they're

289
00:10:58,710 --> 00:10:56,959
talking to the crews through their

290
00:11:01,110 --> 00:10:58,720
communication systems and so there's

291
00:11:02,790 --> 00:11:01,120
some of that but when we all need to get

292
00:11:06,470 --> 00:11:02,800
together and work an issue we generally

293
00:11:08,310 --> 00:11:06,480
work it in english uh the the majority

294
00:11:10,630 --> 00:11:08,320
of uh things that are printed on board

295
00:11:12,870 --> 00:11:10,640
the space station are printed in english

296
00:11:15,030 --> 00:11:12,880
or on the computer screens in english

297
00:11:16,550 --> 00:11:15,040
but there's a lot of cyrillic as well uh

298
00:11:17,829 --> 00:11:16,560
in in russian

299
00:11:19,110 --> 00:11:17,839
because it's a totally different

300
00:11:20,550 --> 00:11:19,120
alphabet

301
00:11:22,150 --> 00:11:20,560
there are also things that go up in

302
00:11:23,829 --> 00:11:22,160
japanese which has another different

303
00:11:26,150 --> 00:11:23,839
alphabet and

304
00:11:28,870 --> 00:11:26,160
there's things for example for canadian

305
00:11:30,630 --> 00:11:28,880
astronauts that go up bilingual in both

306
00:11:31,910 --> 00:11:30,640
the english and

307
00:11:34,230 --> 00:11:31,920
french

308
00:11:36,630 --> 00:11:34,240
and when we try to to help each of the

309
00:11:38,790 --> 00:11:36,640
crew members from their countries have a

310
00:11:41,269 --> 00:11:38,800
little bit of their home flavor in

311
00:11:42,790 --> 00:11:41,279
whatever we do and we allow their

312
00:11:44,790 --> 00:11:42,800
their control centers to talk with them

313
00:11:50,790 --> 00:11:44,800

in whatever language is natural for them

314
00:11:54,069 --> 00:11:52,470
uh hello my name is nick mallett i'm

315
00:11:56,870 --> 00:11:54,079
from olympia washington and

316
00:11:59,350 --> 00:11:56,880
hypothetically speaking if a team of 16

317
00:12:00,870 --> 00:11:59,360
is sent to mars how large of a support

318
00:12:02,710 --> 00:12:00,880
crew would be needed to

319
00:12:05,509 --> 00:12:02,720
need to be provided back on earth at

320
00:12:07,190 --> 00:12:05,519
mission control to support them

321
00:12:10,470 --> 00:12:07,200
boy that'd be a pretty big team to go to

322
00:12:14,470 --> 00:12:10,480
mars 16. that's that's a lot of mass to

323
00:12:16,069 --> 00:12:14,480
get into orbit and to get to mars

324
00:12:17,670 --> 00:12:16,079
one thing you need to remember about

325
00:12:20,069 --> 00:12:17,680
going there is it's going to take about

326
00:12:23,030 --> 00:12:20,079
six months and if you can stop and think

327
00:12:26,069 --> 00:12:23,040
about how much food water

328
00:12:27,750 --> 00:12:26,079
air and electricity we need to generate

329
00:12:29,750 --> 00:12:27,760
to do a mission that long you're

330
00:12:30,949 --> 00:12:29,760
probably going to be looking at smaller

331
00:12:33,190 --> 00:12:30,959
crews

332
00:12:35,269 --> 00:12:33,200
especially early on

333
00:12:37,430 --> 00:12:35,279
on a trip to mars

334
00:12:39,829 --> 00:12:37,440
we're working all the time here to

335
00:12:43,110 --> 00:12:39,839
minimize the number of people

336
00:12:45,269 --> 00:12:43,120
that we have in mission control because

337
00:12:46,790 --> 00:12:45,279
it having an efficient team work

338
00:12:47,990 --> 00:12:46,800

together doesn't always mean you have

339
00:12:50,389 --> 00:12:48,000
more people

340
00:12:52,550 --> 00:12:50,399
we want to be able to access a lot of

341
00:12:55,030 --> 00:12:52,560
people who are experts in the different

342
00:12:56,870 --> 00:12:55,040
fields that are necessary to support the

343
00:13:01,269 --> 00:12:56,880
thing but you don't necessarily want to

344
00:13:03,190 --> 00:13:01,279
have them on duty 24 7 all the time so

345
00:13:05,030 --> 00:13:03,200
i would say probably you'd have a team

346
00:13:07,030 --> 00:13:05,040
similar to this kind of size that we

347
00:13:09,670 --> 00:13:07,040
have here in mission control with 20 or

348
00:13:12,230 --> 00:13:09,680
30 people when there's a lot of activity

349
00:13:13,829 --> 00:13:12,240
going on uh and the crew is awake but

350
00:13:15,350 --> 00:13:13,839
then on weekends and when the crew's

351
00:13:16,310 --> 00:13:15,360
sleeping

352
00:13:18,069 --> 00:13:16,320
just like we do here for the

353
00:13:19,990 --> 00:13:18,079
international space station we staff

354
00:13:22,069 --> 00:13:20,000
down and there's just two or three

355
00:13:23,670 --> 00:13:22,079
people a flight director and a couple of

356
00:13:24,710 --> 00:13:23,680
people that monitor a lot of different

357
00:13:26,550 --> 00:13:24,720
systems

358
00:13:27,750 --> 00:13:26,560
so that we can minimize the support

359
00:13:29,110 --> 00:13:27,760
requirements

360
00:13:31,350 --> 00:13:29,120
both because you don't need them and

361
00:13:33,829 --> 00:13:31,360
also because it's expensive to have

362
00:13:38,949 --> 00:13:33,839
people working 24 7.

363
00:13:43,189 --> 00:13:41,110

hi my name is amanda chalfont and i'm

364
00:13:44,629 --> 00:13:43,199
from issaquah washington

365
00:13:46,790 --> 00:13:44,639
my question is space travel is

366
00:13:48,629 --> 00:13:46,800
inherently risky and how do you cope

367
00:13:50,310 --> 00:13:48,639
with those risks and assess what is or

368
00:13:52,550 --> 00:13:50,320
is not necessary for the ultimate goal

369
00:13:53,829 --> 00:13:52,560
of the mission

370
00:13:54,710 --> 00:13:53,839
um

371
00:13:57,269 --> 00:13:54,720
the

372
00:14:00,470 --> 00:13:57,279
main thing i would say is that what we

373
00:14:02,470 --> 00:14:00,480
we talk a lot about mitigating risk

374
00:14:04,550 --> 00:14:02,480
we know that there is risk that as you

375
00:14:06,389 --> 00:14:04,560
say is inherent in space flight and all

376
00:14:08,470 --> 00:14:06,399
the activities uh that are required to

377
00:14:09,990 --> 00:14:08,480
do that there's there's risk in in

378
00:14:11,990 --> 00:14:10,000
launching people on the top of our

379
00:14:14,550 --> 00:14:12,000
rockets there's this risk in having

380
00:14:16,629 --> 00:14:14,560
people live in a pressurized environment

381
00:14:18,230 --> 00:14:16,639
that could be damaged by orbital debris

382
00:14:20,389 --> 00:14:18,240
or a meteorite

383
00:14:22,870 --> 00:14:20,399
there's risk in having people depend on

384
00:14:24,069 --> 00:14:22,880
systems to recycle their water and their

385
00:14:26,710 --> 00:14:24,079
air

386
00:14:28,710 --> 00:14:26,720
and to generate their electricity

387
00:14:30,069 --> 00:14:28,720
and there's risk in in doing maintenance

388
00:14:32,550 --> 00:14:30,079

activities when you have to go outside

389
00:14:34,710 --> 00:14:32,560
the space station like we saw yesterday

390
00:14:36,389 --> 00:14:34,720
things don't always work right

391
00:14:39,590 --> 00:14:36,399
the key word is mitigating and what we

392
00:14:42,069 --> 00:14:39,600
do is we have a very complex and

393
00:14:45,670 --> 00:14:42,079
mathematically based system

394
00:14:48,310 --> 00:14:45,680
for establishing probabilities of risk

395
00:14:51,990 --> 00:14:48,320
and we try to manage and make sure that

396
00:14:54,230 --> 00:14:52,000
the probability of a problem that is

397
00:14:57,350 --> 00:14:54,240
a danger to the

398
00:14:59,910 --> 00:14:57,360
safety and well-being of the crew

399
00:15:02,470 --> 00:14:59,920
and to the accomplishment of the mission

400
00:15:05,189 --> 00:15:02,480
are managed at a level where

401
00:15:07,110 --> 00:15:05,199
we think that that we can take care of

402
00:15:09,350 --> 00:15:07,120
anything that might come up out of the

403
00:15:10,790 --> 00:15:09,360
ordinary that we don't expect

404
00:15:12,949 --> 00:15:10,800
because we know that those risks are

405
00:15:14,550 --> 00:15:12,959
there and we also know that

406
00:15:16,470 --> 00:15:14,560
no matter how much you train no matter

407
00:15:18,870 --> 00:15:16,480
how much you prepare there's always

408
00:15:20,470 --> 00:15:18,880
something that you haven't thought of

409
00:15:21,670 --> 00:15:20,480
that is going to come up and you're

410
00:15:24,310 --> 00:15:21,680
going to need to be ready to deal with

411
00:15:25,990 --> 00:15:24,320
it and for that we do training

412
00:15:28,949 --> 00:15:26,000
of the team here in mission control of

413
00:15:30,790 --> 00:15:28,959

the astronauts that are on orbit uh and

414
00:15:32,790 --> 00:15:30,800
uh you know mark i'm going to bring you

415
00:15:34,870 --> 00:15:32,800
in because physical training is a part

416
00:15:36,550 --> 00:15:34,880
of that too for the astronauts you want

417
00:15:37,749 --> 00:15:36,560
to keep them healthy and maybe you could

418
00:15:39,590 --> 00:15:37,759
talk a little bit about that since

419
00:15:42,710 --> 00:15:39,600
you're here well one of the things that

420
00:15:44,790 --> 00:15:42,720
we look at is that we look at worst case

421
00:15:47,269 --> 00:15:44,800
scenarios a lot so we're looking at

422
00:15:49,509 --> 00:15:47,279
emergency egress situations emergency

423
00:15:51,590 --> 00:15:49,519
eva situations things like that so we

424
00:15:53,590 --> 00:15:51,600
always have to have them in a state of

425
00:15:55,269 --> 00:15:53,600
preparedness from a physical fitness

426
00:15:57,509 --> 00:15:55,279
standpoint on a functional standpoint to

427
00:15:59,749 --> 00:15:57,519
be able to do their job for whatever re

428
00:16:01,110 --> 00:15:59,759
whatever that may be even on landing you

429
00:16:03,350 --> 00:16:01,120
know if they land

430
00:16:05,350 --> 00:16:03,360
off course four or five hours you know

431
00:16:07,829 --> 00:16:05,360
off course and they have to get out of

432
00:16:09,990 --> 00:16:07,839
capsule and on their own without help

433
00:16:11,829 --> 00:16:10,000
and set up a camp to get the beacon set

434
00:16:13,430 --> 00:16:11,839
up so they can find out where they are

435
00:16:15,269 --> 00:16:13,440
anything like that i mean they have to

436
00:16:16,790 --> 00:16:15,279
be physically able to do those things so

437
00:16:19,749 --> 00:16:16,800
part of my job is to make sure they can

438
00:16:21,670 --> 00:16:19,759

do those things okay and so essentially

439
00:16:24,389 --> 00:16:21,680
it's it's kind of like being in the

440
00:16:26,870 --> 00:16:24,399
scouts uh preparedness is is the main

441
00:16:29,829 --> 00:16:26,880
thing and you want to train for for

442
00:16:33,509 --> 00:16:29,839
any potential thing that could go wrong

443
00:16:34,949 --> 00:16:33,519
uh and and and then you know you you you

444
00:16:37,430 --> 00:16:34,959
prepare for the worst and hope for the

445
00:16:42,150 --> 00:16:37,440
best and try to manage that risk as best

446
00:16:45,749 --> 00:16:43,590
hi my name is adrian wang i'm from

447
00:16:47,110 --> 00:16:45,759
bellevue washington my question is can

448
00:16:48,629 --> 00:16:47,120
you share more information about the

449
00:16:52,150 --> 00:16:48,639
recent helmet leak and how mission

450
00:16:55,670 --> 00:16:52,160
controls responded to the emergency

451
00:16:58,310 --> 00:16:55,680
you know uh that's a really good example

452
00:17:01,670 --> 00:16:58,320
of how this team comes together

453
00:17:04,230 --> 00:17:01,680
when there is an unexpected problem

454
00:17:06,949 --> 00:17:04,240
yesterday everything was going just

455
00:17:10,710 --> 00:17:06,959
exactly as we had expected it and to

456
00:17:13,350 --> 00:17:10,720
prepare preparations for the space walk

457
00:17:15,990 --> 00:17:13,360
chris cassie and luca parmitano had

458
00:17:17,990 --> 00:17:16,000
checked out their spacesuits and because

459
00:17:20,470 --> 00:17:18,000
they had just done a spacewalk a week

460
00:17:22,789 --> 00:17:20,480
ago and it all went fine accomplished

461
00:17:24,230 --> 00:17:22,799
all the objectives and then some so the

462
00:17:25,909 --> 00:17:24,240
team here had already been doing a lot

463
00:17:27,189 --> 00:17:25,919

of work to replan

464
00:17:28,789 --> 00:17:27,199
uh for this

465
00:17:30,470 --> 00:17:28,799
spacewalk that was planned yesterday

466
00:17:31,750 --> 00:17:30,480
because they had taken care of so many

467
00:17:34,070 --> 00:17:31,760
of the get-ahead tasks that they were

468
00:17:35,990 --> 00:17:34,080
able to add some new tasks into what was

469
00:17:37,270 --> 00:17:36,000
planned for yesterday

470
00:17:38,470 --> 00:17:37,280
and then when

471
00:17:40,070 --> 00:17:38,480
they stepped out the door everything

472
00:17:42,230 --> 00:17:40,080
seemed to be going fine and then luca

473
00:17:44,150 --> 00:17:42,240
mentioned that he had some water inside

474
00:17:45,110 --> 00:17:44,160
of his helmet

475
00:17:46,310 --> 00:17:45,120
and

476
00:17:48,630 --> 00:17:46,320
that he didn't think it was gonna be a

477
00:17:52,230 --> 00:17:48,640
problem they finished their first job uh

478
00:17:54,070 --> 00:17:52,240
both chris and luca did uh and then uh

479
00:17:56,470 --> 00:17:54,080
because your buddy system kind of like

480
00:17:58,150 --> 00:17:56,480
when you're diving under sea uh chris

481
00:17:59,909 --> 00:17:58,160
went over to check on luca because he

482
00:18:02,390 --> 00:17:59,919
was reporting this water problem and he

483
00:18:04,710 --> 00:18:02,400
started having some problems with his

484
00:18:06,950 --> 00:18:04,720
ability to communicate

485
00:18:09,270 --> 00:18:06,960
and that there was a sensor that showed

486
00:18:10,870 --> 00:18:09,280
that that tracks carbon dioxide levels

487
00:18:12,789 --> 00:18:10,880
inside the space station the folks here

488
00:18:14,630 --> 00:18:12,799

in mission control saw that that wasn't

489
00:18:16,710 --> 00:18:14,640
working properly

490
00:18:18,870 --> 00:18:16,720
and so chris took a look inside lucas

491
00:18:21,190 --> 00:18:18,880
helmet and he saw a lot more water than

492
00:18:22,630 --> 00:18:21,200
luca even knew was in there at that

493
00:18:25,510 --> 00:18:22,640
point they reported that to mission

494
00:18:27,590 --> 00:18:25,520
control and the the eva team

495
00:18:28,549 --> 00:18:27,600
told that the flight director dave korth

496
00:18:31,830 --> 00:18:28,559
that

497
00:18:33,669 --> 00:18:31,840
we're not going to be able to continue

498
00:18:35,750 --> 00:18:33,679
doing the space walk

499
00:18:37,990 --> 00:18:35,760
and so we recommend that you guys bring

500
00:18:39,510 --> 00:18:38,000
them in early and and dave korth

501
00:18:41,590 --> 00:18:39,520
said yeah you're right let's go ahead

502
00:18:43,190 --> 00:18:41,600
and get them in before this gets to be a

503
00:18:44,230 --> 00:18:43,200
serious problem

504
00:18:49,590 --> 00:18:44,240
and

505
00:18:50,789 --> 00:18:49,600
well in procedures to get them in

506
00:18:52,549 --> 00:18:50,799
quickly

507
00:18:55,190 --> 00:18:52,559
they had luca come right into the

508
00:18:56,870 --> 00:18:55,200
airlock immediately and get him started

509
00:18:58,310 --> 00:18:56,880
they had chris do a couple of cleanup

510
00:19:00,310 --> 00:18:58,320
tasks because you can't put two people

511
00:19:02,870 --> 00:19:00,320
through a door that small at the same

512
00:19:05,510 --> 00:19:02,880
time and so he did the cleanup and and

513
00:19:07,510 --> 00:19:05,520

lashed things down temporarily and then

514
00:19:08,950 --> 00:19:07,520
he came back in so he could help luca

515
00:19:10,470 --> 00:19:08,960
and they could close the hatch and get

516
00:19:12,150 --> 00:19:10,480
back inside

517
00:19:14,470 --> 00:19:12,160
and then this team worked together

518
00:19:16,789 --> 00:19:14,480
through established procedures a plan

519
00:19:19,510 --> 00:19:16,799
that had been

520
00:19:21,510 --> 00:19:19,520
discussed at length and practiced both

521
00:19:23,430 --> 00:19:21,520
by the crew and by the team here in

522
00:19:25,510 --> 00:19:23,440
mission control and so they're all

523
00:19:27,190 --> 00:19:25,520
working from the same page in the same

524
00:19:29,190 --> 00:19:27,200
book and

525
00:19:31,510 --> 00:19:29,200
we're able to get those guys back in and

526
00:19:33,430 --> 00:19:31,520
here's some video of uh

527
00:19:35,750 --> 00:19:33,440
the team working together you got karen

528
00:19:37,830 --> 00:19:35,760
nyberg and fioda your chicken also

529
00:19:41,110 --> 00:19:37,840
helping

530
00:19:45,190 --> 00:19:41,120
alexander misurkin and paul de gradoff

531
00:19:49,029 --> 00:19:47,830
luca out of his spacesuit and they kind

532
00:19:50,470 --> 00:19:49,039
of got in the way of the camera you

533
00:19:51,830 --> 00:19:50,480
can't really see him too well right here

534
00:19:53,909 --> 00:19:51,840
but in just a second i think you're

535
00:19:56,070 --> 00:19:53,919
going to see luca's face and you're

536
00:19:59,190 --> 00:19:56,080
going to see him able to wipe that water

537
00:20:02,310 --> 00:19:59,200
off of his face and and that was the

538
00:20:04,950 --> 00:20:02,320

success that's why that was a successful

539
00:20:07,990 --> 00:20:04,960
spacewalk because even though we had a

540
00:20:11,029 --> 00:20:08,000
problem we were able to get luca and

541
00:20:12,950 --> 00:20:11,039
chris back in safely and here you can

542
00:20:14,950 --> 00:20:12,960
start to see luca they're having a wipe

543
00:20:17,350 --> 00:20:14,960
he's getting a lot of water he had water

544
00:20:18,710 --> 00:20:17,360
in his ears and water in his nose

545
00:20:21,830 --> 00:20:18,720
and that's one of the things about water

546
00:20:24,390 --> 00:20:21,840
it tends to to coalesce into

547
00:20:26,470 --> 00:20:24,400
a globule because because of the way

548
00:20:28,390 --> 00:20:26,480
water acts in space

549
00:20:30,149 --> 00:20:28,400
through surface tension

550
00:20:31,990 --> 00:20:30,159
and it can collect in areas that you

551
00:20:34,230 --> 00:20:32,000
wouldn't want it to collect in and be a

552
00:20:36,710 --> 00:20:34,240
be a serious problem so that's an

553
00:20:39,270 --> 00:20:36,720
example of teamwork in action and

554
00:20:40,710 --> 00:20:39,280
preparation in action uh mark yeah

555
00:20:48,149 --> 00:20:40,720
no i don't have anything to add to that

556
00:20:52,789 --> 00:20:50,630
uh hi my name is clay

557
00:20:55,430 --> 00:20:52,799
excuse me uh i live in edmonds and my

558
00:20:57,669 --> 00:20:55,440
question is what do you think um

559
00:21:02,390 --> 00:20:57,679
my opinion was the scariest moment in

560
00:21:07,270 --> 00:21:04,950
uh you know i got to be honest we don't

561
00:21:09,909 --> 00:21:07,280
get scared in mission control much

562
00:21:12,950 --> 00:21:09,919
there's there are scary things happen uh

563
00:21:15,270 --> 00:21:12,960

but but we train so much and we practice

564
00:21:17,590 --> 00:21:15,280
so much and we study so much all of the

565
00:21:20,070 --> 00:21:17,600
systems that we work with

566
00:21:23,029 --> 00:21:20,080
that that fear doesn't enter into it a

567
00:21:24,870 --> 00:21:23,039
whole lot uh you have those moments when

568
00:21:27,909 --> 00:21:24,880
you say uh oh

569
00:21:28,630 --> 00:21:27,919
uh but then your training kicks in and

570
00:21:37,190 --> 00:21:28,640
you

571
00:21:39,669 --> 00:21:37,200
to do it in

572
00:21:42,149 --> 00:21:39,679
uh what other potential problems could

573
00:21:44,230 --> 00:21:42,159
be associated with what's going on

574
00:21:46,549 --> 00:21:44,240
and how you keep the entire crew safe

575
00:21:48,230 --> 00:21:46,559
and how you make sure that you try to

576
00:21:49,510 --> 00:21:48,240
accomplish the mission that you're doing

577
00:21:51,830 --> 00:21:49,520
so

578
00:21:53,750 --> 00:21:51,840
i i don't think there really is a whole

579
00:21:55,590 --> 00:21:53,760
lot of fear here in mission control

580
00:21:57,750 --> 00:21:55,600
there's there's there's some trepidation

581
00:21:59,190 --> 00:21:57,760
and there's some immediate uh

582
00:22:01,029 --> 00:21:59,200
being startled when you have a problem

583
00:22:02,710 --> 00:22:01,039
like that but but training kind of kicks

584
00:22:04,310 --> 00:22:02,720
in and you don't and you don't worry so

585
00:22:06,470 --> 00:22:04,320
much about it you work to get the job

586
00:22:08,070 --> 00:22:06,480
done uh mark anything to add there you

587
00:22:10,549 --> 00:22:08,080
work with these astronauts and training

588
00:22:12,870 --> 00:22:10,559

all the time yeah but i'm not in mission

589
00:22:15,510 --> 00:22:12,880
control so it's very different for me

590
00:22:16,470 --> 00:22:15,520
from from you guys so i don't really see

591
00:22:18,230 --> 00:22:16,480
anything in

592
00:22:19,750 --> 00:22:18,240
in my normal day that

593
00:22:21,190 --> 00:22:19,760
startles me you know a piece of hardware

594
00:22:22,549 --> 00:22:21,200
breaks we just figure out how to fix the

595
00:22:25,190 --> 00:22:22,559
hardware and go back to doing what we

596
00:22:27,510 --> 00:22:25,200
need to do so you know that's about it

597
00:22:29,190 --> 00:22:27,520
okay i'm sorry i'm not not a really

598
00:22:29,990 --> 00:22:29,200
exciting answer about fear because

599
00:22:34,230 --> 00:22:30,000
because

600
00:22:38,390 --> 00:22:35,990
hello my name is josh i'm from geek

601
00:22:39,909 --> 00:22:38,400
harbor washington and my question is

602
00:22:41,909 --> 00:22:39,919
we have recently learned that one of the

603
00:22:44,149 --> 00:22:41,919
dangers of the mars mission would be

604
00:22:46,149 --> 00:22:44,159
boredom for the astronauts and so what

605
00:22:48,549 --> 00:22:46,159
do astronauts on the international space

606
00:22:50,230 --> 00:22:48,559
station do to keep themselves busy and

607
00:22:52,230 --> 00:22:50,240
entertained when they have like some

608
00:22:55,029 --> 00:22:52,240
sort of free time

609
00:22:56,630 --> 00:22:55,039
well the favorite thing when they have

610
00:22:58,470 --> 00:22:56,640
free time is to look out the window at

611
00:23:00,549 --> 00:22:58,480
the earth below uh there's no doubt

612
00:23:02,870 --> 00:23:00,559
about that uh we have a special uh

613
00:23:06,870 --> 00:23:02,880

module called the cupola which is

614
00:23:08,470 --> 00:23:06,880
basically a 360 degree bay window

615
00:23:10,230 --> 00:23:08,480
and there are seven different windows a

616
00:23:12,630 --> 00:23:10,240
big round one in the middle and then six

617
00:23:15,029 --> 00:23:12,640
rounds six trapezoidal windows around it

618
00:23:16,950 --> 00:23:15,039
and it gives you a 360 degree view of

619
00:23:18,710 --> 00:23:16,960
the earth and any astronaut i've ever

620
00:23:20,549 --> 00:23:18,720
talked to says whenever they get spare

621
00:23:22,870 --> 00:23:20,559
time the number one thing they want to

622
00:23:24,630 --> 00:23:22,880
go do is is go out and look at the earth

623
00:23:25,909 --> 00:23:24,640
now you got to remember that half the

624
00:23:27,590 --> 00:23:25,919
time they're going around the planet

625
00:23:29,350 --> 00:23:27,600
it's dark and so if you're over the

626
00:23:30,870 --> 00:23:29,360
pacific ocean there may not be a lot to

627
00:23:33,430 --> 00:23:30,880
look at and so they do have other things

628
00:23:36,390 --> 00:23:33,440
they like to do they can watch movies uh

629
00:23:38,070 --> 00:23:36,400
on on orbit they can read books

630
00:23:40,390 --> 00:23:38,080
they have

631
00:23:41,750 --> 00:23:40,400
multiple different ways of communicating

632
00:23:44,310 --> 00:23:41,760
with their friends and family on the

633
00:23:46,230 --> 00:23:44,320
ground they have an ip

634
00:23:47,590 --> 00:23:46,240
internet protocol telephone

635
00:23:49,430 --> 00:23:47,600
that they can call down and talk to

636
00:23:51,350 --> 00:23:49,440
their friends and family

637
00:23:52,789 --> 00:23:51,360
they have email that they can share

638
00:23:55,750 --> 00:23:52,799

messages with

639
00:23:57,350 --> 00:23:55,760
they have a crew support internet

640
00:23:59,430 --> 00:23:57,360
local area network that they can

641
00:24:01,590 --> 00:23:59,440
actually access the

642
00:24:02,549 --> 00:24:01,600
the network here the internet here on

643
00:24:05,190 --> 00:24:02,559
earth

644
00:24:07,909 --> 00:24:05,200
somewhat directly and go off and and

645
00:24:09,830 --> 00:24:07,919
they can post tweets and uh and facebook

646
00:24:13,029 --> 00:24:09,840
things and do that it's a little slower

647
00:24:14,870 --> 00:24:13,039
than your regular network is but uh

648
00:24:16,549 --> 00:24:14,880
because of the limitations of the of the

649
00:24:18,789 --> 00:24:16,559
download capability on the space station

650
00:24:21,590 --> 00:24:18,799
but it does allow them to have a lot of

651
00:24:23,269 --> 00:24:21,600
interaction with folks on the ground

652
00:24:25,029 --> 00:24:23,279
and they enjoy each other's company they

653
00:24:26,149 --> 00:24:25,039
enjoy learning about different cultures

654
00:24:27,590 --> 00:24:26,159
because

655
00:24:29,110 --> 00:24:27,600
there are so many different cultures

656
00:24:30,149 --> 00:24:29,120
involved in the space station the

657
00:24:31,590 --> 00:24:30,159
different crew members and their

658
00:24:33,510 --> 00:24:31,600
backgrounds

659
00:24:35,350 --> 00:24:33,520
and so i would say probably enjoying

660
00:24:37,430 --> 00:24:35,360
each other's company and becoming a team

661
00:24:38,789 --> 00:24:37,440
and and continuing to work as a team and

662
00:24:42,630 --> 00:24:38,799
looking out the window are the most

663
00:24:48,390 --> 00:24:44,789

hi i'm hans martin i'm from yakima

664
00:24:49,269 --> 00:24:48,400
washington and uh where is the iss right

665
00:24:50,870 --> 00:24:49,279
now

666
00:24:53,669 --> 00:24:50,880
i'm gonna look over my shoulder right

667
00:24:55,269 --> 00:24:53,679
now the international space station is

668
00:24:56,630 --> 00:24:55,279
orbiting

669
00:24:57,750 --> 00:24:56,640
over

670
00:25:04,870 --> 00:24:57,760
the

671
00:25:07,590 --> 00:25:06,470
one quick question

672
00:25:09,029 --> 00:25:07,600
how do you wake the crew up in the

673
00:25:11,669 --> 00:25:09,039
morning is there a special protocol for

674
00:25:13,269 --> 00:25:11,679
that is there an alarm clock

675
00:25:14,630 --> 00:25:13,279
uh you know different crews do that

676
00:25:16,710 --> 00:25:14,640
differently it's kind of a personal

677
00:25:19,269 --> 00:25:16,720
preference thing in the shuttle days we

678
00:25:21,430 --> 00:25:19,279
used to wake the crews up with uh

679
00:25:23,830 --> 00:25:21,440
morning wake-up music uh but on the

680
00:25:25,590 --> 00:25:23,840
space station we generally don't do that

681
00:25:27,430 --> 00:25:25,600
they have alarms that they can set on

682
00:25:28,630 --> 00:25:27,440
board for themselves

683
00:25:31,029 --> 00:25:28,640
but

684
00:25:32,549 --> 00:25:31,039
no special notes we do have a daily

685
00:25:33,830 --> 00:25:32,559
planning conference that starts the day

686
00:25:35,990 --> 00:25:33,840
but that's about an hour and a half

687
00:25:37,430 --> 00:25:36,000
after the crew wakes up

688
00:25:39,029 --> 00:25:37,440

but that's always something they want to

689
00:25:40,950 --> 00:25:39,039
make sure that they're ready for and in

690
00:25:42,390 --> 00:25:40,960
talking to different astronauts some of

691
00:25:47,510 --> 00:25:42,400
them wake up

692
00:25:49,190 --> 00:25:47,520
before the daily planning conference

693
00:25:51,029 --> 00:25:49,200
but they've got an hour and a half worth

694
00:25:52,630 --> 00:25:51,039
of time where they can

695
00:25:54,310 --> 00:25:52,640
have a morning meal and talk about

696
00:25:56,549 --> 00:25:54,320
themselves and

697
00:25:58,070 --> 00:25:56,559
amongst themselves i should say and they

698
00:25:59,350 --> 00:25:58,080
do a preliminary inspection of the

699
00:26:02,149 --> 00:25:59,360
different areas of the space station

700
00:26:04,310 --> 00:26:02,159
making sure everything's good but uh no

701
00:26:05,669 --> 00:26:04,320
no no main wake-up call that kind of

702
00:26:09,350 --> 00:26:05,679
depends on the crew and how they want to

703
00:26:12,390 --> 00:26:10,630
all right so i understand that's all the

704
00:26:14,149 --> 00:26:12,400
time we have for today i want to thank

705
00:26:15,990 --> 00:26:14,159
mark gilliam for being here with us

706
00:26:17,750 --> 00:26:16,000
today and i want to thank you all for

707
00:26:20,310 --> 00:26:17,760
your great questions i understand you've

708
00:26:21,909 --> 00:26:20,320
got a great exhibit there uh with the

709
00:26:23,590 --> 00:26:21,919
full fuselage trainer from the space

710
00:26:25,269 --> 00:26:23,600
shuttle and destination station i

711
00:26:27,190 --> 00:26:25,279
believe is at your museum i hope you