
GOLD
AWARD
JAXA

1
00:00:05,829 --> 00:00:03,750
station this is houston are you ready

2
00:00:09,750 --> 00:00:05,839
for the event this is houston are you

3
00:00:15,509 --> 00:00:13,190
and houston station ready for the event

4
00:00:17,670 --> 00:00:15,519
united states coast guard academy this

5
00:00:20,310 --> 00:00:17,680
is mission control houston please call

6
00:00:22,070 --> 00:00:20,320
station for a voice check

7
00:00:25,349 --> 00:00:22,080
this is the united states coast guard

8
00:00:27,269 --> 00:00:25,359
academy how do you hear me

9
00:00:28,710 --> 00:00:27,279
how did you hear me

10
00:00:30,710 --> 00:00:28,720
in coast guard academy this is the

11
00:00:42,950 --> 00:00:30,720
international space station ron we've

12
00:00:42,960 --> 00:00:46,790
how cool is that

13
00:00:51,110 --> 00:00:49,190

uh dan i'd like to uh introduce you to

14
00:00:53,750 --> 00:00:51,120
our superintendent admiral those who

15
00:00:55,830 --> 00:00:53,760
will say a few words to you

16
00:00:58,709 --> 00:00:55,840
hello dan it's great to see you captain

17
00:01:00,790 --> 00:00:58,719
burbank it's just wonderful to see a

18
00:01:04,149 --> 00:01:00,800
coast guard presence not just in the

19
00:01:06,950 --> 00:01:04,159
waterways on the seas international but

20
00:01:09,030 --> 00:01:06,960
now in space and thank you so much for

21
00:01:10,630 --> 00:01:09,040
influencing a generation of young

22
00:01:12,789 --> 00:01:10,640
students not those in this room but the

23
00:01:14,070 --> 00:01:12,799
young elementary school students around

24
00:01:16,550 --> 00:01:14,080
the country in the world that you're

25
00:01:18,070 --> 00:01:16,560
influencing and encouraging to uh be

26
00:01:22,870 --> 00:01:18,080
interested in science engineering

27
00:01:26,070 --> 00:01:24,710
admiral it's great to talk with you and

28
00:01:28,630 --> 00:01:26,080
welcome aboard the international space

29
00:01:30,390 --> 00:01:28,640
station and uh and it's a real pleasure

30
00:01:32,950 --> 00:01:30,400
i can't tell you how delighted i am that

31
00:01:35,350 --> 00:01:32,960
uh that we gotta got a chance to uh to

32
00:01:37,270 --> 00:01:35,360
come on board in london there and uh and

33
00:01:39,429 --> 00:01:37,280
spend some time with cadets it's been a

34
00:01:41,590 --> 00:01:39,439
couple years since i logged a few years

35
00:01:44,310 --> 00:01:41,600
on the faculty there and i really

36
00:01:46,950 --> 00:01:44,320
enjoyed the time i absolutely enjoyed my

37
00:01:48,950 --> 00:01:46,960
my time in the service and uh in the

38
00:01:50,710 --> 00:01:48,960

whole time i've been up here i've been

39
00:01:53,270 --> 00:01:50,720
able to feel very very connected i

40
00:01:55,350 --> 00:01:53,280
constantly reminded the coast guard

41
00:01:57,350 --> 00:01:55,360
by the various places that we fly over

42
00:01:59,510 --> 00:01:57,360
the uh the earth

43
00:02:00,709 --> 00:01:59,520
and uh by the opportunity to talk to my

44
00:02:03,030 --> 00:02:00,719
friends uh

45
00:02:05,030 --> 00:02:03,040
over the the phones uh we've got

46
00:02:06,870 --> 00:02:05,040
essentially an internet protocol way

47
00:02:07,749 --> 00:02:06,880
that we can call people uh in our spare

48
00:02:15,430 --> 00:02:07,759
time

49
00:02:32,309 --> 00:02:17,030
daniel i thought i thought what i do is

50
00:02:35,350 --> 00:02:33,589
it takes some getting used to and i

51
00:02:37,589 --> 00:02:35,360
still can't say that i've gotten there

52
00:02:39,350 --> 00:02:37,599
we've got a couple second lag in the

53
00:02:41,509 --> 00:02:39,360
communications but i'm

54
00:02:44,309 --> 00:02:41,519
it's uh it's probably an egregious

55
00:02:46,470 --> 00:02:44,319
violation of some protocol to uh to step

56
00:02:57,430 --> 00:02:46,480
on an admiral's uh communications like

57
00:03:00,790 --> 00:02:59,190
having you have some questions from them

58
00:03:05,670 --> 00:03:00,800
i'm going to turn this over to them who

59
00:03:08,949 --> 00:03:07,670
all right then uh go ahead and share

60
00:03:15,670 --> 00:03:08,959
with us

61
00:03:19,589 --> 00:03:17,830
well i've been here since uh since the

62
00:03:21,430 --> 00:03:19,599
16th of november we had a little bit of

63
00:03:23,110 --> 00:03:21,440

a delay in our launch and i don't know

64
00:03:24,149 --> 00:03:23,120
if folks were able to follow we had to

65
00:03:26,789 --> 00:03:24,159
kind of a

66
00:03:30,229 --> 00:03:26,799
snowy start from baikonur in kazakhstan

67
00:03:31,750 --> 00:03:30,239
it was it was sort of a classic classic

68
00:03:34,229 --> 00:03:31,760
coast guard weather kind of night that

69
00:03:36,149 --> 00:03:34,239
we launched on but uh the the soyuz

70
00:03:39,270 --> 00:03:36,159
rocket did a wonderful job had a great

71
00:03:40,710 --> 00:03:39,280
ride uphill had a couple of days

72
00:03:43,110 --> 00:03:40,720
in the relatively

73
00:03:45,110 --> 00:03:43,120
tight quarters of the the soyuz and then

74
00:03:47,190 --> 00:03:45,120
we arrived here on board space station

75
00:03:48,550 --> 00:03:47,200
on the 16th of november uh we had a

76
00:03:51,910 --> 00:03:48,560
little bit of a delay getting here

77
00:03:54,390 --> 00:03:51,920
because uh of uh an issue with a cargo

78
00:03:56,070 --> 00:03:54,400
ship a couple of months prior to that so

79
00:03:58,309 --> 00:03:56,080
we've been kind of operating on space

80
00:03:59,589 --> 00:03:58,319
station at a reduced manning level for

81
00:04:00,789 --> 00:03:59,599
at least a couple of months during the

82
00:04:03,190 --> 00:04:00,799
late fall

83
00:04:05,270 --> 00:04:03,200
and the time that we've had up here has

84
00:04:07,589 --> 00:04:05,280
been incredibly busy

85
00:04:09,990 --> 00:04:07,599
all of us are a little bit of we have to

86
00:04:11,670 --> 00:04:10,000
be a jack of all trades every day

87
00:04:13,509 --> 00:04:11,680
you'll run into

88
00:04:15,910 --> 00:04:13,519

a various different little hiccups or

89
00:04:17,749 --> 00:04:15,920
wrinkles that you have to deal with

90
00:04:19,430 --> 00:04:17,759
the science is going great uh the

91
00:04:21,030 --> 00:04:19,440
hardware it's very very challenging

92
00:04:22,629 --> 00:04:21,040
sometimes to get to keep all the

93
00:04:25,110 --> 00:04:22,639
hardware working and working well up

94
00:04:27,110 --> 00:04:25,120
here and uh and we always get a chance

95
00:04:28,390 --> 00:04:27,120
to kind of practice our uh

96
00:04:31,270 --> 00:04:28,400
our uh

97
00:04:33,430 --> 00:04:31,280
jury rigging repair uh techniques uh

98
00:04:35,270 --> 00:04:33,440
sometimes in fact i even i don't know if

99
00:04:38,150 --> 00:04:35,280
i call it marlin spike seamanship i got

100
00:04:40,070 --> 00:04:38,160
a chance to uh use a uh a sail makers

101
00:04:42,469 --> 00:04:40,080
palm and some big

102
00:04:43,590 --> 00:04:42,479
sail makers hooks and sew up a light

103
00:04:46,310 --> 00:04:43,600
shield for

104
00:04:48,230 --> 00:04:46,320
uh microgravity science glovebox we had

105
00:04:50,870 --> 00:04:48,240
got to tie a couple bowlines lashing up

106
00:04:53,590 --> 00:04:50,880
the exercise equipment we have

107
00:04:55,350 --> 00:04:53,600
and uh it's

108
00:04:57,030 --> 00:04:55,360
it's amazing where some of the skills

109
00:04:58,629 --> 00:04:57,040
that you've picked up over the years can

110
00:05:00,629 --> 00:04:58,639
be applied but

111
00:05:03,270 --> 00:05:00,639
but the time appears absolutely

112
00:05:05,270 --> 00:05:03,280
delightful every day you wake up and you

113
00:05:07,189 --> 00:05:05,280

you can't believe that you're actually

114
00:05:09,270 --> 00:05:07,199
living on board the international space

115
00:05:10,469 --> 00:05:09,280
station flying in space floating over to

116
00:05:13,110 --> 00:05:10,479
these windows

117
00:05:21,510 --> 00:05:13,120
and looking at this breathtaking planet

118
00:05:26,870 --> 00:05:23,430
thank you dan we have our first uh

119
00:05:28,870 --> 00:05:26,880
question from one of our cadets

120
00:05:31,430 --> 00:05:28,880
meeting captain first class cadet tyler

121
00:05:33,029 --> 00:05:31,440
dwecker my question is this regarding

122
00:05:33,909 --> 00:05:33,039
the asteroid exploration with the

123
00:05:35,909 --> 00:05:33,919
increased

124
00:05:38,469 --> 00:05:35,919
interest in asteroid exploration as well

125
00:05:39,990 --> 00:05:38,479
as defense do you foresee an increasing

126
00:05:42,790 --> 00:05:40,000
amount of astronauts that are accepted

127
00:05:45,029 --> 00:05:42,800
to nasa additionally with the increased

128
00:05:47,029 --> 00:05:45,039
productivity of private space travel do

129
00:05:48,790 --> 00:05:47,039
you foresee an increase in nasa

130
00:05:50,870 --> 00:05:48,800
astronauts going to be the pilots for

131
00:05:52,070 --> 00:05:50,880
private space travel or do you believe

132
00:05:55,909 --> 00:05:52,080
that they'll be privately trained

133
00:05:59,270 --> 00:05:57,350
tyler it's great to talk to you again

134
00:06:01,110 --> 00:05:59,280
and uh and thanks again for doing such a

135
00:06:02,870 --> 00:06:01,120
great job in houston when you came down

136
00:06:05,430 --> 00:06:02,880
and and spend time with us at the

137
00:06:07,990 --> 00:06:05,440
johnson space center um a lot of

138
00:06:10,390 --> 00:06:08,000

questions there um i guess in general i

139
00:06:12,790 --> 00:06:10,400
would say that the future for me looks

140
00:06:14,070 --> 00:06:12,800
very bright for space exploration uh i

141
00:06:15,189 --> 00:06:14,080
know a lot of folks are a little bit

142
00:06:16,550 --> 00:06:15,199
concerned with the retiring of the

143
00:06:18,950 --> 00:06:16,560
shuttle all of us who had a chance to

144
00:06:20,710 --> 00:06:18,960
fly on it it's a it's

145
00:06:23,830 --> 00:06:20,720
a bit of a bittersweet moment to see

146
00:06:26,309 --> 00:06:23,840
that great vehicle be retired uh and

147
00:06:27,990 --> 00:06:26,319
placed in museums by the same token

148
00:06:30,469 --> 00:06:28,000
though the shuttle did exactly what it

149
00:06:33,270 --> 00:06:30,479
was designed for and had a wonderful

150
00:06:35,029 --> 00:06:33,280
many decades of launching satellites

151
00:06:37,510 --> 00:06:35,039
like the hubble space telescope and

152
00:06:39,110 --> 00:06:37,520
chandra x-ray observatory and most

153
00:06:39,990 --> 00:06:39,120
importantly i think in my opinion

154
00:06:41,990 --> 00:06:40,000
building

155
00:06:43,830 --> 00:06:42,000
a nearly million pound space station

156
00:06:45,270 --> 00:06:43,840
that we're living and working on so

157
00:06:46,469 --> 00:06:45,280
right now the work we're doing on space

158
00:06:48,070 --> 00:06:46,479
station is trying to figure out how to

159
00:06:49,909 --> 00:06:48,080
keep you know for the the american

160
00:06:52,150 --> 00:06:49,919
research primarily centered and how to

161
00:06:53,670 --> 00:06:52,160
keep humans safe and healthy in space

162
00:06:55,670 --> 00:06:53,680
long enough so that we can leave low

163
00:06:58,390 --> 00:06:55,680

earth orbit go back to the moon to stay

164
00:07:01,110 --> 00:06:58,400
on mars visit asteroids and so forth i

165
00:07:02,950 --> 00:07:01,120
think that is humans humanity's destiny

166
00:07:05,670 --> 00:07:02,960
we're going to do those things in the

167
00:07:07,749 --> 00:07:05,680
meantime the time is ripe i think for

168
00:07:09,350 --> 00:07:07,759
commercial companies to step up and

169
00:07:11,830 --> 00:07:09,360
actually be able to do the things that

170
00:07:14,550 --> 00:07:11,840
up until now only whole countries could

171
00:07:16,230 --> 00:07:14,560
do and that is to cover the peace from

172
00:07:18,710 --> 00:07:16,240
the surface of planet earth to low earth

173
00:07:20,390 --> 00:07:18,720
orbit so i think it is a good thing a

174
00:07:22,790 --> 00:07:20,400
healthy thing for us to have commercial

175
00:07:24,950 --> 00:07:22,800
vehicles initially doing this um

176
00:07:26,950 --> 00:07:24,960
supplying cargo to space station but

177
00:07:28,629 --> 00:07:26,960
then down the road supplying a human

178
00:07:30,550 --> 00:07:28,639
capability to get to and from space

179
00:07:32,070 --> 00:07:30,560
station and to other destinations at the

180
00:07:33,909 --> 00:07:32,080
same time that's going on nasa's

181
00:07:35,670 --> 00:07:33,919
building are designing new vehicles

182
00:07:38,150 --> 00:07:35,680
rockets that'll have a very very big

183
00:07:40,150 --> 00:07:38,160
heavy lift capability and a capsule that

184
00:07:41,990 --> 00:07:40,160
allow us to leave low earth orbit all

185
00:07:43,430 --> 00:07:42,000
these things have to be done we have to

186
00:07:45,589 --> 00:07:43,440
do this at the same time we're doing the

187
00:07:47,670 --> 00:07:45,599
research on station to make sure that we

188
00:07:49,110 --> 00:07:47,680

understand how to keep people safe if

189
00:07:51,270 --> 00:07:49,120
we're going to leave low earth orbit

190
00:07:53,029 --> 00:07:51,280
that's a very very big step and the

191
00:07:54,790 --> 00:07:53,039
research we're doing right here i think

192
00:07:56,150 --> 00:07:54,800
is going to help us to be able to answer

193
00:07:58,230 --> 00:07:56,160
those questions but the bottom line the

194
00:08:00,309 --> 00:07:58,240
near term for you guys when you graduate

195
00:08:01,510 --> 00:08:00,319
when other service members graduate when

196
00:08:03,350 --> 00:08:01,520
folks in engineering and science

197
00:08:05,189 --> 00:08:03,360
programs all around the country graduate

198
00:08:06,869 --> 00:08:05,199
and are looking at jobs whether it is

199
00:08:08,790 --> 00:08:06,879
joining the space program helping us

200
00:08:10,869 --> 00:08:08,800
build vehicles or whether it's joining

201
00:08:12,309 --> 00:08:10,879
the astronaut core to fly i think the

202
00:08:17,270 --> 00:08:12,319
future is bright it's better than it was

203
00:08:17,280 --> 00:08:23,110
thank you katherine

204
00:08:27,270 --> 00:08:25,110
good evening captain burbank uh second

205
00:08:29,430 --> 00:08:27,280
class rachel cathrell my question for

206
00:08:31,510 --> 00:08:29,440
you is with using so little energy

207
00:08:33,110 --> 00:08:31,520
throughout the day do you find it more

208
00:08:34,949 --> 00:08:33,120
difficult to sleep at night or have you

209
00:08:37,430 --> 00:08:34,959
noticed any change in your sleeping

210
00:08:39,029 --> 00:08:37,440
patterns and additionally how do you

211
00:08:44,470 --> 00:08:39,039
continue to keep your muscles strong

212
00:08:46,630 --> 00:08:45,350
okay

213
00:08:48,470 --> 00:08:46,640

well the first thing is we get a lot of

214
00:08:50,230 --> 00:08:48,480
our energy electrical power from the sun

215
00:08:51,269 --> 00:08:50,240
so we have about an acre worth of solar

216
00:08:52,949 --> 00:08:51,279
rays that

217
00:08:54,790 --> 00:08:52,959
that gather and convert photons

218
00:08:56,630 --> 00:08:54,800
basically to electrons that does a lot

219
00:08:58,630 --> 00:08:56,640
of the electrical power generation that

220
00:09:00,070 --> 00:08:58,640
we need on board space station on the

221
00:09:03,590 --> 00:09:00,080
russian segment we have the capability

222
00:09:05,030 --> 00:09:03,600
of taking water making oxygen we use the

223
00:09:06,870 --> 00:09:05,040
sun's power to actually do the

224
00:09:08,150 --> 00:09:06,880
electrolysis to make that work we're

225
00:09:10,389 --> 00:09:08,160
working really hard on board space

226
00:09:12,790 --> 00:09:10,399
station right now to close the water

227
00:09:15,110 --> 00:09:12,800
loop if you will to basically reduce our

228
00:09:17,269 --> 00:09:15,120
dependence on resupply ships to supply

229
00:09:19,430 --> 00:09:17,279
us with water that we use to drink to

230
00:09:21,590 --> 00:09:19,440
make to rehydrate food and we use to

231
00:09:23,110 --> 00:09:21,600
break down to make oxygen

232
00:09:24,790 --> 00:09:23,120
that's kind of the engineering piece of

233
00:09:27,430 --> 00:09:24,800
all this

234
00:09:29,030 --> 00:09:27,440
from the standpoint of sleep cycles and

235
00:09:30,949 --> 00:09:29,040
so forth we have a lot of challenges in

236
00:09:33,829 --> 00:09:30,959
that all of us

237
00:09:36,230 --> 00:09:33,839
depend on the day night cycle to kind of

238
00:09:37,190 --> 00:09:36,240

regulate serotonin melatonin levels to

239
00:09:39,829 --> 00:09:37,200
help us

240
00:09:40,949 --> 00:09:39,839
sleep or be awake as appropriate on

241
00:09:42,710 --> 00:09:40,959
board space station we kind of

242
00:09:45,030 --> 00:09:42,720
artificially regulate that by the

243
00:09:48,310 --> 00:09:45,040
lighting and so forth so we

244
00:09:51,350 --> 00:09:48,320
basically have 15 to 16 sunrises and

245
00:09:53,110 --> 00:09:51,360
sunsets every day so every 90 minutes

246
00:09:55,030 --> 00:09:53,120
we're going from day to night or like a

247
00:09:57,030 --> 00:09:55,040
couple of weeks ago we may be in

248
00:09:58,550 --> 00:09:57,040
daylight because of the orientation of

249
00:10:00,710 --> 00:09:58,560
the of the space station's orbit

250
00:10:02,790 --> 00:10:00,720
relative to the sun angle we may be in

251
00:10:04,230 --> 00:10:02,800
daylight continuously so if the windows

252
00:10:06,389 --> 00:10:04,240
were open all the time it would be i

253
00:10:08,949 --> 00:10:06,399
think very very hard to sleep so we kind

254
00:10:10,630 --> 00:10:08,959
of regulate that artificially um what

255
00:10:12,470 --> 00:10:10,640
else about that we would like and i

256
00:10:14,790 --> 00:10:12,480
think it's a good thing down the road to

257
00:10:16,470 --> 00:10:14,800
consider having more natural light than

258
00:10:18,150 --> 00:10:16,480
the um than the fluorescent lights that

259
00:10:20,069 --> 00:10:18,160
we have right now that'll basically give

260
00:10:21,509 --> 00:10:20,079
you the right mix of blue light to

261
00:10:23,430 --> 00:10:21,519
actually be able to regulate it and make

262
00:10:26,389 --> 00:10:23,440
it more like natural conditions on

263
00:10:27,829 --> 00:10:26,399

planet earth a pretty long-winded

264
00:10:29,509 --> 00:10:27,839
discussion but

265
00:10:31,110 --> 00:10:29,519
that kind of covers a little bit of the

266
00:10:33,670 --> 00:10:31,120
engineering side a little bit of the

267
00:10:34,870 --> 00:10:33,680
sleep side the exercise is a key piece

268
00:10:37,750 --> 00:10:34,880
that's one of the biggest threats to

269
00:10:39,829 --> 00:10:37,760
going to mars for example so a couple

270
00:10:41,110 --> 00:10:39,839
years ago maybe 10 years ago or so when

271
00:10:43,190 --> 00:10:41,120
we were flying on the shuttle mirror

272
00:10:45,269 --> 00:10:43,200
program and in programs before that

273
00:10:47,350 --> 00:10:45,279
crews that would be on orbit for a long

274
00:10:49,190 --> 00:10:47,360
period of time would lose a pretty

275
00:10:50,630 --> 00:10:49,200
significant amount of bone material

276
00:10:52,230 --> 00:10:50,640
while they're on orbit basically you

277
00:10:54,470 --> 00:10:52,240
adapt to the conditions you're in the

278
00:10:56,710 --> 00:10:54,480
use it or lose it philosophy is in in

279
00:10:58,230 --> 00:10:56,720
strong effect so if you don't need if

280
00:10:59,670 --> 00:10:58,240
your bones aren't being stressed then

281
00:11:01,269 --> 00:10:59,680
you don't need those minerals your body

282
00:11:03,750 --> 00:11:01,279
uses those resources and puts them

283
00:11:05,750 --> 00:11:03,760
elsewhere we got a really good exercise

284
00:11:08,550 --> 00:11:05,760
machine right now advanced resistive

285
00:11:09,269 --> 00:11:08,560
exercise device a red we call it if we

286
00:11:10,870 --> 00:11:09,279
can

287
00:11:13,190 --> 00:11:10,880
ever think of the acronym that's usually

288
00:11:15,269 --> 00:11:13,200

by exception that device allows us to

289
00:11:18,470 --> 00:11:15,279
get up to 600 pounds worth of load so we

290
00:11:20,230 --> 00:11:18,480
can do not that i can squat 600 pounds

291
00:11:22,150 --> 00:11:20,240
but we can get very very high loads

292
00:11:23,910 --> 00:11:22,160
relative to what you might get in a gym

293
00:11:25,910 --> 00:11:23,920
on the ground that we think is key to

294
00:11:28,150 --> 00:11:25,920
keep your bones strong loading the big

295
00:11:29,829 --> 00:11:28,160
joints is really really important that's

296
00:11:31,590 --> 00:11:29,839
part of it cardiovascular conditioning

297
00:11:33,110 --> 00:11:31,600
is another major part of it as well we

298
00:11:35,350 --> 00:11:33,120
have to exercise about two and a half

299
00:11:38,069 --> 00:11:35,360
hours a day when we get behind because

300
00:11:39,670 --> 00:11:38,079
we're real busy and we let that slide

301
00:11:41,829 --> 00:11:39,680
that's kind of a big hit to us we need

302
00:11:43,110 --> 00:11:41,839
to make up that time because we're if

303
00:11:44,550 --> 00:11:43,120
we're going to live in space forever it

304
00:11:46,310 --> 00:11:44,560
would be no big deal we want to come

305
00:11:48,230 --> 00:11:46,320
back to earth or we'd like to maybe at

306
00:11:49,829 --> 00:11:48,240
some point land on mars and we want to

307
00:11:53,990 --> 00:11:49,839
be and be able to function in either

308
00:11:54,000 --> 00:11:59,190
thank you captain

309
00:12:03,350 --> 00:12:01,110
good evening captain this is first class

310
00:12:05,990 --> 00:12:03,360
joe dillier i had the privilege to take

311
00:12:08,470 --> 00:12:06,000
sed from you uh back in 2008 when i was

312
00:12:09,190 --> 00:12:08,480
a fourth class and um my question to you

313
00:12:10,870 --> 00:12:09,200

is

314
00:12:13,269 --> 00:12:10,880
kind of i've got two questions one's

315
00:12:15,190 --> 00:12:13,279
real practical is uh are all the bolts

316
00:12:17,590 --> 00:12:15,200
on the space station are they english

317
00:12:19,350 --> 00:12:17,600
units or metric units or they some sort

318
00:12:21,269 --> 00:12:19,360
of mix and then also you mentioned it

319
00:12:22,949 --> 00:12:21,279
was like a million pound space station

320
00:12:24,870 --> 00:12:22,959
what kind of structural challenges were

321
00:12:26,629 --> 00:12:24,880
there and designing it and keeping it

322
00:12:28,949 --> 00:12:26,639
together because i mean i know there's

323
00:12:31,430 --> 00:12:28,959
it's a zero gravity environment but

324
00:12:32,870 --> 00:12:31,440
if it's zero gravity then i mean

325
00:12:34,310 --> 00:12:32,880
i just

326
00:12:37,990 --> 00:12:34,320
question that's been bothering me for a

327
00:12:42,150 --> 00:12:39,670
the the great questions uh all those let

328
00:12:44,389 --> 00:12:42,160
me see the the second part of that was

329
00:12:46,069 --> 00:12:44,399
um okay actually the first part was easy

330
00:12:47,829 --> 00:12:46,079
we have a mixture of units so we all

331
00:12:49,430 --> 00:12:47,839
have to either do the conversions in our

332
00:12:50,949 --> 00:12:49,440
head or get relatively comfortable with

333
00:12:52,550 --> 00:12:50,959
metric and

334
00:12:53,910 --> 00:12:52,560
english units and that's just the way

335
00:12:56,230 --> 00:12:53,920
the station is and it's kind of a

336
00:12:57,829 --> 00:12:56,240
reflection of the heritage of the space

337
00:13:00,949 --> 00:12:57,839
station throughout its design so dating

338
00:13:02,790 --> 00:13:00,959

back to the 80s this was um basically an

339
00:13:04,550 --> 00:13:02,800
effort space station freedom back in

340
00:13:07,110 --> 00:13:04,560
those days it was a nasa effort a

341
00:13:10,710 --> 00:13:07,120
european space agency european space

342
00:13:12,069 --> 00:13:10,720
agency effort canada and the japanese

343
00:13:14,389 --> 00:13:12,079
jackson the japanese aerospace

344
00:13:16,710 --> 00:13:14,399
exploration agency so and for a long

345
00:13:18,710 --> 00:13:16,720
long time this has been under design and

346
00:13:20,870 --> 00:13:18,720
it had gradually evolved over to over

347
00:13:22,949 --> 00:13:20,880
years and years fairly late in the game

348
00:13:25,190 --> 00:13:22,959
the russians joined this program and

349
00:13:27,110 --> 00:13:25,200
they had already

350
00:13:28,629 --> 00:13:27,120
a design philosophy for a lot of their

351
00:13:31,750 --> 00:13:28,639
modules they have their heritage back

352
00:13:33,670 --> 00:13:31,760
with the the mir modules for example and

353
00:13:35,430 --> 00:13:33,680
those were integrated to the rest of the

354
00:13:38,150 --> 00:13:35,440
space station it's really actually a

355
00:13:39,829 --> 00:13:38,160
very intriguing design from an engineer

356
00:13:41,189 --> 00:13:39,839
issue from an engineering standpoint

357
00:13:43,829 --> 00:13:41,199
you're basically having to figure out a

358
00:13:45,269 --> 00:13:43,839
way to build the space station and build

359
00:13:47,189 --> 00:13:45,279
it on the fly like you're flying an

360
00:13:49,269 --> 00:13:47,199
airplane adding a wing adding landing

361
00:13:50,550 --> 00:13:49,279
gear what have you so the the space

362
00:13:52,470 --> 00:13:50,560
station had to be able to take care of

363
00:13:54,389 --> 00:13:52,480

itself motion control electrical power

364
00:13:56,150 --> 00:13:54,399
thermal control environmental control

365
00:13:58,470 --> 00:13:56,160
command data handling all these systems

366
00:14:00,310 --> 00:13:58,480
had to all work gradually as you evolved

367
00:14:02,550 --> 00:14:00,320
it from a very very small handful of

368
00:14:04,550 --> 00:14:02,560
modules early on to what it is currently

369
00:14:05,910 --> 00:14:04,560
and that was an incredible challenge for

370
00:14:07,509 --> 00:14:05,920
the people that were designing it some

371
00:14:09,509 --> 00:14:07,519
of the modules some of the the

372
00:14:11,910 --> 00:14:09,519
mechanisms were basically going to

373
00:14:13,590 --> 00:14:11,920
attach to modules and mechanisms that

374
00:14:15,189 --> 00:14:13,600
they would never see we would never

375
00:14:16,470 --> 00:14:15,199
attach them ahead of time we would

376
00:14:18,310 --> 00:14:16,480
basically

377
00:14:19,829 --> 00:14:18,320
would get do all our homework ahead of

378
00:14:22,230 --> 00:14:19,839
time make sure that all the drawings

379
00:14:23,990 --> 00:14:22,240
match make sure all the the

380
00:14:25,350 --> 00:14:24,000
communication protocols for the command

381
00:14:27,990 --> 00:14:25,360
and data handling systems would

382
00:14:30,069 --> 00:14:28,000
hopefully all lash up launch it you know

383
00:14:32,069 --> 00:14:30,079
attach the stuff and then if the issues

384
00:14:34,069 --> 00:14:32,079
that came up as it as things were

385
00:14:35,829 --> 00:14:34,079
assembled deal with those and those were

386
00:14:37,990 --> 00:14:35,839
successfully dealt you know dealt with

387
00:14:41,269 --> 00:14:38,000
throughout the entire assembly it is a

388
00:14:43,829 --> 00:14:41,279

real testament to the people that put

389
00:14:45,430 --> 00:14:43,839
together uh that actually conceived of

390
00:14:46,790 --> 00:14:45,440
and adapted the design of the space

391
00:14:48,069 --> 00:14:46,800
station over the years we've never done

392
00:14:49,910 --> 00:14:48,079
this before in the united states for

393
00:14:51,509 --> 00:14:49,920
example we have always built

394
00:14:53,110 --> 00:14:51,519
design spaceships

395
00:14:55,110 --> 00:14:53,120
built them essentially in a hangar

396
00:14:56,310 --> 00:14:55,120
attached test gear to them and been able

397
00:14:58,470 --> 00:14:56,320
to ring them out

398
00:15:00,310 --> 00:14:58,480
basically evaluate them through all

399
00:15:02,790 --> 00:15:00,320
different kinds of conditions and almost

400
00:15:05,030 --> 00:15:02,800
always make changes to that design and

401
00:15:07,350 --> 00:15:05,040
essentially have an entire spacecraft

402
00:15:08,629 --> 00:15:07,360
ready to mount on a rocket and launch it

403
00:15:10,230 --> 00:15:08,639
here we are building some you could

404
00:15:12,230 --> 00:15:10,240
never do that with space station it's so

405
00:15:14,629 --> 00:15:12,240
large so you essentially have to figure

406
00:15:16,870 --> 00:15:14,639
out how to do all those things and do it

407
00:15:18,790 --> 00:15:16,880
ahead of time and then anticipate and be

408
00:15:20,629 --> 00:15:18,800
ready to adapt to all the issues that

409
00:15:22,550 --> 00:15:20,639
might come up over the years that's the

410
00:15:24,230 --> 00:15:22,560
kind of thing you really have to be able

411
00:15:25,430 --> 00:15:24,240
to do if you're going to go to mars

412
00:15:27,269 --> 00:15:25,440
because we're not going to be able to

413
00:15:28,790 --> 00:15:27,279

launch hardware anticipate all the

414
00:15:30,230 --> 00:15:28,800
things are going to break launch all the

415
00:15:32,550 --> 00:15:30,240
spare parts that you need for all of

416
00:15:33,910 --> 00:15:32,560
that and uh and expect everything to

417
00:15:36,230 --> 00:15:33,920
work and expect everything to work and

418
00:15:38,230 --> 00:15:36,240
be reliable for 10 or 15 years it just

419
00:15:40,230 --> 00:15:38,240
doesn't happen so figuring out how to

420
00:15:42,230 --> 00:15:40,240
fix and maintain things as they go

421
00:15:44,629 --> 00:15:42,240
that's key for space station the loading

422
00:15:46,550 --> 00:15:44,639
on the hardware that's up here it's not

423
00:15:48,230 --> 00:15:46,560
the constant steady-state gravitational

424
00:15:50,790 --> 00:15:48,240
loads that structures have on planet

425
00:15:53,030 --> 00:15:50,800
earth but it's impulse loads it's high

426
00:15:55,030 --> 00:15:53,040
cycle fatigue loads it's crews moving

427
00:15:57,430 --> 00:15:55,040
around in in the space station pushing

428
00:15:59,509 --> 00:15:57,440
off of of handrails that are offset by

429
00:16:01,590 --> 00:15:59,519
150 or 200 feet from the center of

430
00:16:04,069 --> 00:16:01,600
massive space station and potentially

431
00:16:07,030 --> 00:16:04,079
exciting a mode on that structure and we

432
00:16:09,590 --> 00:16:07,040
want space station to last out to 2028

433
00:16:12,629 --> 00:16:09,600
maybe longer and to to do that we need

434
00:16:14,230 --> 00:16:12,639
to make sure that we understand um the

435
00:16:16,389 --> 00:16:14,240
how the mechanisms are how they're going

436
00:16:18,550 --> 00:16:16,399
to deal with high cycle fatigue issues

437
00:16:20,470 --> 00:16:18,560
uh make sure we don't have corrosion

438
00:16:21,430 --> 00:16:20,480

issues as well so it's a big challenge

439
00:16:23,350 --> 00:16:21,440
and it's kind of thing we need to be

440
00:16:26,230 --> 00:16:23,360
able to monitor it as it goes and adapt

441
00:16:33,509 --> 00:16:26,240
and fix it as it goes

442
00:16:36,470 --> 00:16:35,030
good evening captain burbank this is

443
00:16:37,749 --> 00:16:36,480
first class erin nolan and i was

444
00:16:39,269 --> 00:16:37,759
wondering if you could tell us a little

445
00:16:40,629 --> 00:16:39,279
bit about one of the most interesting

446
00:16:42,150 --> 00:16:40,639
research projects that you're currently

447
00:16:46,069 --> 00:16:42,160
working on on the international space

448
00:16:50,470 --> 00:16:48,069
okay and and one of the ones that that

449
00:16:52,389 --> 00:16:50,480
i'm doing right now that all of us that

450
00:16:53,829 --> 00:16:52,399
are crew members right now are either

451
00:16:55,590 --> 00:16:53,839
subjects and i think probably in all

452
00:16:58,069 --> 00:16:55,600
cases subjects but but certainly

453
00:16:59,590 --> 00:16:58,079
operators as well for is a is a study

454
00:17:02,310 --> 00:16:59,600
called integrated cardiovascular and

455
00:17:04,390 --> 00:17:02,320
this is a study that basically takes a

456
00:17:06,870 --> 00:17:04,400
qualitative in it and a quantitative

457
00:17:08,870 --> 00:17:06,880
look at how the heart changes how the

458
00:17:10,230 --> 00:17:08,880
heart muscle changes uh over the

459
00:17:12,069 --> 00:17:10,240
conditions of space flight for the

460
00:17:15,110 --> 00:17:12,079
duration of the mission we do that

461
00:17:16,789 --> 00:17:15,120
basically by using ultrasound to image

462
00:17:18,789 --> 00:17:16,799
the heart all of us basically had to

463
00:17:20,789 --> 00:17:18,799

become pretty decent ultrasonic

464
00:17:23,829 --> 00:17:20,799
ultrasound technicians before we launch

465
00:17:25,429 --> 00:17:23,839
so that we can uh under some supervision

466
00:17:27,750 --> 00:17:25,439
and guidance by the ground be able to

467
00:17:29,110 --> 00:17:27,760
get good imagery that can get

468
00:17:30,950 --> 00:17:29,120
that can help scientists on the ground

469
00:17:32,630 --> 00:17:30,960
understand how the heart muscle changes

470
00:17:34,789 --> 00:17:32,640
and that coupled with

471
00:17:36,230 --> 00:17:34,799
studying uh the vascular systems we do

472
00:17:37,669 --> 00:17:36,240
the same kinds of studies understanding

473
00:17:39,510 --> 00:17:37,679
how the blood vessels all change they

474
00:17:41,909 --> 00:17:39,520
are actually a key part of our

475
00:17:44,549 --> 00:17:41,919
cardiovascular system and they are

476
00:17:46,390 --> 00:17:44,559
holistically viewed they're actually

477
00:17:48,070 --> 00:17:46,400
a huge contribution to

478
00:17:50,470 --> 00:17:48,080
doing the effort of pumping blood around

479
00:17:53,110 --> 00:17:50,480
your body and uh when you're on planet

480
00:17:55,430 --> 00:17:53,120
earth uh through the gravitational force

481
00:17:57,510 --> 00:17:55,440
that you're constantly undergoing those

482
00:17:59,190 --> 00:17:57,520
muscles the the muscles that are in the

483
00:18:01,669 --> 00:17:59,200
walls of the arteries in your in your

484
00:18:03,430 --> 00:18:01,679
blood vessels basically help maintain

485
00:18:05,510 --> 00:18:03,440
the blood pressure help push the blood

486
00:18:07,270 --> 00:18:05,520
help fight the force of gravity and once

487
00:18:10,390 --> 00:18:07,280
you get up here that no longer is a

488
00:18:11,190 --> 00:18:10,400

factor those muscles lose their strength

489
00:18:16,630 --> 00:18:11,200
you

490
00:18:17,990 --> 00:18:16,640
called orthostatic orthostatic

491
00:18:19,510 --> 00:18:18,000
intolerance when you get back to the

492
00:18:21,669 --> 00:18:19,520
ground and you can

493
00:18:23,190 --> 00:18:21,679
in an immediate near term it can because

494
00:18:26,070 --> 00:18:23,200
fainting and things like that but it has

495
00:18:27,510 --> 00:18:26,080
grave implications for long-term health

496
00:18:30,150 --> 00:18:27,520
if you're sending people you know long

497
00:18:31,270 --> 00:18:30,160
duration out to mars for example so

498
00:18:32,630 --> 00:18:31,280
we're doing

499
00:18:34,549 --> 00:18:32,640
those kind of studies at the same time

500
00:18:36,789 --> 00:18:34,559
we're doing exercise studies and trying

501
00:18:38,470 --> 00:18:36,799
to understand just how the body adapts

502
00:18:42,070 --> 00:18:38,480
and changes uh in

503
00:18:48,549 --> 00:18:42,080
in spaceflight conditions

504
00:18:52,870 --> 00:18:51,110
even kevin burbank this is cadet first

505
00:18:54,950 --> 00:18:52,880
class ryan webb i also remember the

506
00:18:57,590 --> 00:18:54,960
glory days of std that we had a few

507
00:19:01,750 --> 00:18:57,600
years back i was reading recently of

508
00:19:05,669 --> 00:19:03,669
here for me captain i was reading about

509
00:19:07,430 --> 00:19:05,679
your involvement with the epic mission

510
00:19:09,190 --> 00:19:07,440
and the implementation of such drastic

511
00:19:11,270 --> 00:19:09,200
new competing software that you've been

512
00:19:13,909 --> 00:19:11,280
doing i was wondering if you wouldn't

513
00:19:15,270 --> 00:19:13,919

mind speaking more to the challenges

514
00:19:16,950 --> 00:19:15,280
that you've faced

515
00:19:18,470 --> 00:19:16,960
while upgrading the space station and

516
00:19:19,510 --> 00:19:18,480
also

517
00:19:23,590 --> 00:19:19,520
ways that you've overcome those

518
00:19:26,789 --> 00:19:25,029
okay i'll just give you got to keep the

519
00:19:28,549 --> 00:19:26,799
answers short so i get to everybody ryan

520
00:19:30,390 --> 00:19:28,559
but but uh i think one of the biggest

521
00:19:33,190 --> 00:19:30,400
challenges here operating on space

522
00:19:35,350 --> 00:19:33,200
station is managing tools and equipment

523
00:19:37,510 --> 00:19:35,360
in a waitlist environment and everybody

524
00:19:39,350 --> 00:19:37,520
works in their garage or or works in the

525
00:19:41,029 --> 00:19:39,360
lab on the first deck of mack hall for

526
00:19:43,430 --> 00:19:41,039
example

527
00:19:45,590 --> 00:19:43,440
gravity is a great organizer uh

528
00:19:47,750 --> 00:19:45,600
basically all if you drop a tool if you

529
00:19:49,909 --> 00:19:47,760
lose a tool it's essentially limited by

530
00:19:51,590 --> 00:19:49,919
the xy plane of the floor so maybe it's

531
00:19:52,789 --> 00:19:51,600
a socket it rolls under a workbench but

532
00:19:55,750 --> 00:19:52,799
at least

533
00:19:58,310 --> 00:19:55,760
it's at z equals zero in space that's

534
00:20:00,150 --> 00:19:58,320
not the case at all so here if you're

535
00:20:02,549 --> 00:20:00,160
putting together some delicate equipment

536
00:20:04,230 --> 00:20:02,559
for example and you've got a whole a

537
00:20:06,870 --> 00:20:04,240
ziplock bag full of fasteners and a

538
00:20:08,950 --> 00:20:06,880

whole and full of washers and you've got

539
00:20:11,190 --> 00:20:08,960
torches and you've got you know a

540
00:20:13,110 --> 00:20:11,200
flashlight on your head and you've got

541
00:20:15,590 --> 00:20:13,120
uh you know all these other equipment

542
00:20:17,190 --> 00:20:15,600
and accoutrements that go with that um

543
00:20:18,710 --> 00:20:17,200
keeping track of all those things if

544
00:20:21,190 --> 00:20:18,720
anything were to slip and get away from

545
00:20:23,270 --> 00:20:21,200
you that is a big deal because that

546
00:20:25,270 --> 00:20:23,280
potentially is going to float into

547
00:20:26,230 --> 00:20:25,280
some of the high voltage wiring wiring

548
00:20:28,070 --> 00:20:26,240
we have

549
00:20:30,470 --> 00:20:28,080
in the u.s segment for example within

550
00:20:33,029 --> 00:20:30,480
the rack so all things that are metal

551
00:20:35,190 --> 00:20:33,039
all little fasteners and so forth are a

552
00:20:37,350 --> 00:20:35,200
big issue keeping track of it so for for

553
00:20:39,510 --> 00:20:37,360
us getting good at that figuring out how

554
00:20:41,510 --> 00:20:39,520
to maintain things how to place a tool

555
00:20:42,630 --> 00:20:41,520
for example that may be a delicate piece

556
00:20:44,310 --> 00:20:42,640
of equipment

557
00:20:46,230 --> 00:20:44,320
and just let it float in front of you

558
00:20:47,990 --> 00:20:46,240
keeping one eye or being aware of where

559
00:20:49,669 --> 00:20:48,000
its presence is at the same time that

560
00:20:52,070 --> 00:20:49,679
you're you know stretching out a piece

561
00:20:53,830 --> 00:20:52,080
of duct tape and very carefully you know

562
00:20:55,270 --> 00:20:53,840
putting washer by you know washers and

563
00:20:56,870 --> 00:20:55,280

fasteners and organizing them so that

564
00:20:58,230 --> 00:20:56,880
you can do a task efficiently without

565
00:21:00,070 --> 00:20:58,240
losing anything

566
00:21:02,149 --> 00:21:00,080
that's key and it's something we don't

567
00:21:04,470 --> 00:21:02,159
necessarily deal with on a regular basis

568
00:21:06,470 --> 00:21:04,480
but it's uh it's one of the survival

569
00:21:09,510 --> 00:21:06,480
skills of being able to work well on

570
00:21:14,230 --> 00:21:11,830
thank you kevin

571
00:21:17,029 --> 00:21:14,240
yeah we have one final question for you

572
00:21:19,270 --> 00:21:17,039
go ahead

573
00:21:20,870 --> 00:21:19,280
third class carter schlink um

574
00:21:22,950 --> 00:21:20,880
i heard that you were a helo pilot while

575
00:21:24,390 --> 00:21:22,960
you were in the coast guard and i've

576
00:21:26,230 --> 00:21:24,400
also read that you have some time in a

577
00:21:27,669 --> 00:21:26,240
t-38 i was wondering if you could tell

578
00:21:28,950 --> 00:21:27,679
us a little bit about your transition

579
00:21:34,870 --> 00:21:28,960
and was that on your own time or was

580
00:21:39,590 --> 00:21:37,750
now actually it was on nasa's time so uh

581
00:21:41,669 --> 00:21:39,600
all government time

582
00:21:42,950 --> 00:21:41,679
when you come to nasa uh regardless of

583
00:21:44,630 --> 00:21:42,960
whether you're a military test pilot

584
00:21:46,950 --> 00:21:44,640
before you came here

585
00:21:49,110 --> 00:21:46,960
nasa is going to train you to fly t-38s

586
00:21:50,870 --> 00:21:49,120
and we're looking down the road perhaps

587
00:21:52,390 --> 00:21:50,880
getting other aircraft added to the

588
00:21:53,750 --> 00:21:52,400

suite or the fleet of airplanes that we

589
00:21:56,630 --> 00:21:53,760
have

590
00:21:58,149 --> 00:21:56,640
i think it's a very valuable thing for

591
00:21:59,430 --> 00:21:58,159
people that come with an aviation

592
00:22:00,630 --> 00:21:59,440
background or very operational

593
00:22:03,430 --> 00:22:00,640
background

594
00:22:05,830 --> 00:22:03,440
you've got a certain skill set that is

595
00:22:07,510 --> 00:22:05,840
applicable to flight to space flight

596
00:22:09,270 --> 00:22:07,520
even though you may not be flying

597
00:22:11,110 --> 00:22:09,280
vehicles or

598
00:22:12,549 --> 00:22:11,120
operating vehicles that bear strong

599
00:22:14,310 --> 00:22:12,559
resemblance to whatever it was you did

600
00:22:16,710 --> 00:22:14,320
before but the way you think the way you

601
00:22:18,710 --> 00:22:16,720
think about a task whether whether it's

602
00:22:21,029 --> 00:22:18,720
uh you know hovering a helicopter over a

603
00:22:23,430 --> 00:22:21,039
boat on a dark stormy night

604
00:22:25,190 --> 00:22:23,440
that is similar enough to how you would

605
00:22:27,510 --> 00:22:25,200
fly the space station robot arm for

606
00:22:29,270 --> 00:22:27,520
example grappling a spacex dragon

607
00:22:31,669 --> 00:22:29,280
capsule

608
00:22:33,669 --> 00:22:31,679
that that those skills map very very

609
00:22:35,909 --> 00:22:33,679
nicely you know from one

610
00:22:37,669 --> 00:22:35,919
from one arena to the next for people

611
00:22:39,430 --> 00:22:37,679
that come with engineering backgrounds

612
00:22:42,149 --> 00:22:39,440
and science backgrounds and that are

613
00:22:43,830 --> 00:22:42,159

physicians and so forth all those those

614
00:22:45,430 --> 00:22:43,840
all those backgrounds are critical the

615
00:22:49,590 --> 00:22:45,440
kinds of things that we do onboard space

616
00:22:51,190 --> 00:22:49,600
station but they may not necessarily um

617
00:22:52,789 --> 00:22:51,200
give you the same kind of monkey skills

618
00:22:54,630 --> 00:22:52,799
the same kind of what we would say crew

619
00:22:56,630 --> 00:22:54,640
resource management or cockpit resource

620
00:22:59,350 --> 00:22:56,640
management kinds of skills that are real

621
00:23:01,510 --> 00:22:59,360
important in flying in space so

622
00:23:03,669 --> 00:23:01,520
flying in t38s helps us a lot for

623
00:23:06,149 --> 00:23:03,679
critical decision making helps us a lot

624
00:23:08,390 --> 00:23:06,159
for just hand-eye coordination and it

625
00:23:10,470 --> 00:23:08,400
helps us i think also for just having a

626
00:23:12,789 --> 00:23:10,480
very good general awareness for the

627
00:23:15,110 --> 00:23:12,799
criticality of flying

628
00:23:16,710 --> 00:23:15,120
operational hardware in

629
00:23:17,990 --> 00:23:16,720
in potentially dangerous kinds of

630
00:23:19,909 --> 00:23:18,000
situations

631
00:23:22,230 --> 00:23:19,919
now with all that said

632
00:23:24,470 --> 00:23:22,240
the coast guard flying is not all that

633
00:23:27,350 --> 00:23:24,480
different from in my experience from the

634
00:23:28,870 --> 00:23:27,360
t-38 flying that we do and i think one

635
00:23:30,230 --> 00:23:28,880
of the most important things about the

636
00:23:32,630 --> 00:23:30,240
experience i had in the coast guard

637
00:23:34,470 --> 00:23:32,640
relative to flying in space that i think

638
00:23:37,590 --> 00:23:34,480

maps very very well and this is doesn't

639
00:23:39,669 --> 00:23:37,600
necessarily apply to helicopters but um

640
00:23:40,950 --> 00:23:39,679
any any operational coast guard unit or

641
00:23:42,710 --> 00:23:40,960
any kind of setting like that we

642
00:23:44,390 --> 00:23:42,720
generally operate with small teams small

643
00:23:46,230 --> 00:23:44,400
teams that have

644
00:23:48,149 --> 00:23:46,240
a mixture of people all with different

645
00:23:50,470 --> 00:23:48,159
skills that all have to come together to

646
00:23:52,390 --> 00:23:50,480
do potentially a very critical mission

647
00:23:54,070 --> 00:23:52,400
that is exactly the way you fly

648
00:23:56,230 --> 00:23:54,080
spaceships that's exactly the way you

649
00:23:58,390 --> 00:23:56,240
fly robotic arms in space that's exactly

650
00:23:59,990 --> 00:23:58,400
exactly how you do spacewalks when

651
00:24:02,070 --> 00:24:00,000
you're operating in an emu outside the

652
00:24:03,430 --> 00:24:02,080
space station so all of those kinds of

653
00:24:04,710 --> 00:24:03,440
things the way you think the way you

654
00:24:07,269 --> 00:24:04,720
work with people in those kinds of

655
00:24:08,789 --> 00:24:07,279
situations is great training ground for

656
00:24:10,310 --> 00:24:08,799
this kind of business and i think it

657
00:24:12,230 --> 00:24:10,320
benefits the coast guard to have people

658
00:24:13,830 --> 00:24:12,240
doing this and i think it also benefits

659
00:24:16,950 --> 00:24:13,840
nasa to have people with our kinds of

660
00:24:19,110 --> 00:24:16,960
background doing this this business

661
00:24:20,950 --> 00:24:19,120
thank you captain uh dan on behalf of

662
00:24:37,669 --> 00:24:20,960
the coast guard academy thank you thank

663
00:24:41,430 --> 00:24:39,430

just like old home week thank you it was

664
00:24:43,510 --> 00:24:41,440
a real pleasure i'm i'm so delighted

665
00:24:45,110 --> 00:24:43,520
that we're able to do this and uh fair

666
00:24:46,870 --> 00:24:45,120
winds following seas to you all for all

667
00:24:48,789 --> 00:24:46,880
the firsties i'm not sure i've lost

668
00:24:51,029 --> 00:24:48,799
track but if billet night's coming up i

669
00:24:52,870 --> 00:24:51,039
hope all that goes well

670
00:24:54,710 --> 00:24:52,880
if you're thinking about just going

671
00:24:56,390 --> 00:24:54,720
aviation because you're in the aero club

672
00:24:57,990 --> 00:24:56,400
and all the rest of it it's not

673
00:24:59,750 --> 00:24:58,000
necessarily a bad eye this is from an

674
00:25:01,990 --> 00:24:59,760
old guy saying this i don't think it's

675
00:25:03,669 --> 00:25:02,000
necessarily a bad idea to consider going

676
00:25:05,750 --> 00:25:03,679
to a ship first it's also a really good

677
00:25:08,310 --> 00:25:05,760
experience but anyways best wishes to

678
00:25:10,149 --> 00:25:08,320
you all and we got a great service and

679
00:25:12,230 --> 00:25:10,159
i'm proud of you all and i and i can't

680
00:25:13,430 --> 00:25:12,240
wait to see you see and hear about your

681
00:25:15,110 --> 00:25:13,440
futures as

682
00:25:21,029 --> 00:25:15,120
as you leave the cav academy and go on

683
00:25:28,070 --> 00:25:23,830
station this is houston acr thank you

684
00:25:32,789 --> 00:25:30,230
united states coast guard academy