



1
00:00:07,190 --> 00:00:03,830
good morning michael i'm here with hal

2
00:00:10,070 --> 00:00:07,200
gutzelman the lead capcom

3
00:00:12,150 --> 00:00:10,080
and we're excited to join you today

4
00:00:14,629 --> 00:00:12,160
oh thank you very much we've got uh

5
00:00:17,189 --> 00:00:14,639
clark creek stem academy in acworth

6
00:00:18,870 --> 00:00:17,199
georgia so they would love to speak with

7
00:00:20,310 --> 00:00:18,880
you and ask you lots of awesome

8
00:00:22,870 --> 00:00:20,320
questions

9
00:00:32,870 --> 00:00:22,880
great we're ready

10
00:00:37,830 --> 00:00:35,590
so go ahead with your first question

11
00:00:40,709 --> 00:00:37,840
go ahead ross daris um how did the

12
00:00:45,029 --> 00:00:40,719
actual stay in touch with their families

13
00:00:48,229 --> 00:00:46,549

can you help me with that one i didn't

14

00:00:50,630 --> 00:00:48,239

hear mike i'm sorry can we have her

15

00:00:52,869 --> 00:00:50,640

repeat that

16

00:00:55,750 --> 00:00:52,879

um how did the astronauts stay in touch

17

00:00:57,910 --> 00:00:55,760

with their families while on iss

18

00:01:00,069 --> 00:00:57,920

families on i think your question was

19

00:01:01,670 --> 00:01:00,079

how do the crew stay in touch with their

20

00:01:04,390 --> 00:01:01,680

families in space

21

00:01:06,550 --> 00:01:04,400

and they have several ways to do that

22

00:01:08,950 --> 00:01:06,560

first they have email and they're able

23

00:01:11,030 --> 00:01:08,960

to send and receive email the second

24

00:01:13,990 --> 00:01:11,040

method they use is they actually have

25

00:01:16,310 --> 00:01:14,000

conferences set up on a weekly basis

26

00:01:17,350 --> 00:01:16,320

and those are

27

00:02:19,589 --> 00:01:17,360

a

28

00:02:22,070 --> 00:02:19,599

the uh

29

00:02:24,070 --> 00:02:22,080

tdrs satellites and then connects to the

30

00:02:24,869 --> 00:02:24,080

station

31

00:02:27,750 --> 00:02:24,879

so

32

00:02:29,190 --> 00:02:27,760

when we're in sight of those satellites

33

00:02:31,509 --> 00:02:29,200

and when the station is able to

34

00:02:33,830 --> 00:02:31,519

communicate through those satellites so

35

00:02:36,150 --> 00:02:33,840

we just a moment ago we had a 10-minute

36

00:02:38,470 --> 00:02:36,160

loss of signal and we lose both our

37

00:02:40,630 --> 00:02:38,480

telemetry and our ability to communicate

38

00:02:43,430 --> 00:02:40,640

with the space station for that time

39

00:02:47,030 --> 00:02:43,440

period on a typical orbit of 90 minutes

40

00:02:49,190 --> 00:02:47,040

you can expect that we will have about

41

00:02:51,110 --> 00:02:49,200

oh say 80 minutes or

42

00:02:54,869 --> 00:02:51,120

50 minutes 50 to 80 minutes of

43

00:02:59,030 --> 00:02:57,910

okay good we're still not seeing mission

44

00:03:01,430 --> 00:02:59,040

control

45

00:03:03,509 --> 00:03:01,440

i don't know if uh

46

00:03:06,149 --> 00:03:03,519

there's something on your end that you

47

00:03:07,589 --> 00:03:06,159

need to switch the screen

48

00:03:09,430 --> 00:03:07,599

okay we'll check into it what are you

49

00:03:10,630 --> 00:03:09,440

currently seeing at the moment

50

00:03:12,309 --> 00:03:10,640

uh you

51

00:03:14,470 --> 00:03:12,319

still okay

52

00:03:16,149 --> 00:03:14,480

okay well we will switch it over um so

53

00:03:17,589 --> 00:03:16,159

that you can see a live view inside

54

00:03:20,229 --> 00:03:17,599

mission control so go ahead with your

55

00:03:24,470 --> 00:03:20,239

third question okay go ahead describe

56

00:03:28,949 --> 00:03:26,149

okay well um

57

00:03:30,789 --> 00:03:28,959

like most of you uh started out in grade

58

00:03:32,470 --> 00:03:30,799

school and went to high school i studied

59

00:03:33,830 --> 00:03:32,480

a lot of math and science i was pretty

60

00:03:34,949 --> 00:03:33,840

good in those

61

00:03:37,190 --> 00:03:34,959

subjects

62

00:03:39,750 --> 00:03:37,200

after graduation from high school i went

63

00:03:41,110 --> 00:03:39,760

on to the air force academy in colorado

64

00:03:43,190 --> 00:03:41,120

springs

65

00:03:46,390 --> 00:03:43,200

from there i received a bachelor of

66

00:03:48,550 --> 00:03:46,400

science in mechanical engineering

67

00:03:50,229 --> 00:03:48,560

i went on to pilot training and flew in

68

00:03:52,149 --> 00:03:50,239

the air force for about

69

00:03:57,270 --> 00:03:52,159

20 years

70

00:03:59,509 --> 00:03:57,280

the air force institute of technology

71

00:04:01,589 --> 00:03:59,519

and got a graduate degree in space

72

00:04:03,910 --> 00:04:01,599

operations so that's my academic

73

00:04:05,670 --> 00:04:03,920

credentials plus a lot of training along

74

00:04:13,990 --> 00:04:05,680

the way in the air force and here at

75

00:04:14,000 --> 00:04:18,949

why were you awarded the bear award

76
00:04:24,469 --> 00:04:21,590
well the bear award is an award from the

77
00:04:26,790 --> 00:04:24,479
barrios corporation one of our private

78
00:04:28,390 --> 00:04:26,800
contractors that supports the space

79
00:04:29,670 --> 00:04:28,400
program down here

80
00:04:31,909 --> 00:04:29,680
and

81
00:04:33,189 --> 00:04:31,919
that was their top employee for that

82
00:04:36,070 --> 00:04:33,199
year so

83
00:04:51,909 --> 00:04:36,080
that was the award that was

84
00:04:57,510 --> 00:04:53,510
mike can we get them to repeat that last

85
00:05:00,469 --> 00:04:57,520
question i just got parts of it

86
00:05:01,350 --> 00:05:00,479
how did barriers technology get selected

87
00:05:03,430 --> 00:05:01,360
with

88
00:05:08,710 --> 00:05:03,440

selected to work

89

00:05:11,510 --> 00:05:10,070

okay i'm still having trouble

90

00:05:13,510 --> 00:05:11,520

understanding the thrust of your

91

00:05:16,230 --> 00:05:13,520

question uh i i heard the word

92

00:05:18,629 --> 00:05:16,240

technology but uh i didn't hear the rest

93

00:05:21,350 --> 00:05:18,639

of the question

94

00:05:25,029 --> 00:05:21,360

how did barrios technology get selected

95

00:05:25,909 --> 00:05:25,039

to work with nasa ah thank you very much

96

00:05:28,469 --> 00:05:25,919

um

97

00:05:31,270 --> 00:05:28,479

barrios technology like many of our

98

00:05:34,070 --> 00:05:31,280

private contractors competes

99

00:05:36,230 --> 00:05:34,080

so nasa will announce a certain amount

100

00:05:38,390 --> 00:05:36,240

of work that they want uh private

101
00:05:41,189 --> 00:05:38,400
contractors to perform

102
00:05:43,430 --> 00:05:41,199
and then barriers technology will go

103
00:05:45,909 --> 00:05:43,440
ahead and submit a proposal

104
00:05:47,270 --> 00:05:45,919
with costs and number of people

105
00:05:49,430 --> 00:05:47,280
and then

106
00:05:52,310 --> 00:05:49,440
nasa will have a review panel to look at

107
00:05:55,189 --> 00:05:52,320
all the proposals and select the best

108
00:05:56,950 --> 00:05:55,199
qualified corporation sometimes barriers

109
00:05:59,830 --> 00:05:56,960
wins these contracts sometimes they

110
00:06:03,110 --> 00:05:59,840
don't uh our main contractor here is

111
00:06:06,710 --> 00:06:03,120
united space alliance and they as well

112
00:06:11,830 --> 00:06:06,720
as lockheed martin and a few others that

113
00:06:17,749 --> 00:06:14,309

might the iss be open to privatize

114

00:06:20,550 --> 00:06:17,759

commercial space travel if so how do you

115

00:06:23,350 --> 00:06:20,560

feel about this

116

00:06:26,710 --> 00:06:23,360

well i think it's a it's a big plus for

117

00:06:30,150 --> 00:06:26,720

america and the reason i say this is uh

118

00:06:33,189 --> 00:06:30,160

at one time nasa uh did a lot of

119

00:06:36,469 --> 00:06:33,199

aeronautics development and research

120

00:06:39,270 --> 00:06:36,479

and actual building airplanes and now we

121

00:06:41,510 --> 00:06:39,280

see that nasa in the aeronautics still

122

00:06:43,990 --> 00:06:41,520

does a lot of technology demonstrations

123

00:06:45,670 --> 00:06:44,000

and prototypes but the work of actually

124

00:06:48,629 --> 00:06:45,680

developing commercial

125

00:06:51,990 --> 00:06:48,639

airplanes or military aircraft is turned

126
00:06:54,629 --> 00:06:52,000
over to private manufacturers under

127
00:06:57,430 --> 00:06:54,639
the auspices of

128
00:06:59,830 --> 00:06:57,440
the federal government so in a similar

129
00:07:01,990 --> 00:06:59,840
vein in the space business we're seeing

130
00:07:04,870 --> 00:07:02,000
more and more of the space business

131
00:07:08,629 --> 00:07:04,880
being a solely government operation into

132
00:07:14,870 --> 00:07:08,639
being a government and private uh

133
00:07:19,589 --> 00:07:17,110
what was the situation that you recall

134
00:07:25,749 --> 00:07:19,599
that required was problem solving on the

135
00:07:29,189 --> 00:07:27,510
okay well um

136
00:07:32,150 --> 00:07:29,199
we have a lot of equipment on the space

137
00:07:36,150 --> 00:07:32,160
station and a lot of things

138
00:07:38,309 --> 00:07:36,160

break from time to time and we form

139

00:07:41,510 --> 00:07:38,319

investigation teams

140

00:07:42,469 --> 00:07:41,520

that help solve those problems

141

00:07:45,830 --> 00:07:42,479

so

142

00:07:48,869 --> 00:07:45,840

you know in our business here it's a lot

143

00:07:50,550 --> 00:07:48,879

of collaboration so it's not typically

144

00:07:53,990 --> 00:07:50,560

where one person comes up with the

145

00:07:56,070 --> 00:07:54,000

brilliant insight uh to fix something or

146

00:07:58,309 --> 00:07:56,080

to work around something but rather a

147

00:08:00,950 --> 00:07:58,319

group of individuals that work together

148

00:08:02,230 --> 00:08:00,960

as a team that know different aspects of

149

00:08:04,629 --> 00:08:02,240

the problem and they put that all

150

00:08:07,110 --> 00:08:04,639

together to come up with a solution so

151

00:08:09,189 --> 00:08:07,120

if you say the best one i think the the

152

00:08:11,749 --> 00:08:09,199

best part was i got to be on the

153

00:08:14,710 --> 00:08:11,759

execution team where we got to repair a

154

00:08:16,550 --> 00:08:14,720

torn solar array which involved a very

155

00:08:18,790 --> 00:08:16,560

dramatic eva

156

00:08:20,790 --> 00:08:18,800

and some unique hardware that was

157

00:08:25,430 --> 00:08:20,800

designed pretty much on the fly and that

158

00:08:31,110 --> 00:08:28,230

what are fun situations that have

159

00:08:34,389 --> 00:08:31,120

emergency procedures

160

00:08:36,230 --> 00:08:34,399

well that's a great question um you know

161

00:08:38,949 --> 00:08:36,240

probably in school there today you'll

162

00:08:41,750 --> 00:08:38,959

have you have fire drills right and so

163

00:08:43,990 --> 00:08:41,760

you practice going outside and getting

164

00:08:45,910 --> 00:08:44,000

away from a burning building

165

00:08:47,750 --> 00:08:45,920

and making sure everybody gets out

166

00:08:51,030 --> 00:08:47,760

safely well we do the same thing on

167

00:08:54,150 --> 00:08:51,040

space station we have a possibility of

168

00:08:56,949 --> 00:08:54,160

fire hopefully we've worked to minimize

169

00:08:59,030 --> 00:08:56,959

that we also have we work with chemicals

170

00:09:03,030 --> 00:08:59,040

and research things where it may produce

171

00:09:05,190 --> 00:09:03,040

some toxic vapors and also we have a

172

00:09:08,389 --> 00:09:05,200

problem you don't have on the ground and

173

00:09:10,790 --> 00:09:08,399

that is we live inside a pressurized can

174

00:09:13,430 --> 00:09:10,800

and if that can should spring a leak

175

00:09:15,110 --> 00:09:13,440

that module will go to vacuum so our

176

00:09:16,630 --> 00:09:15,120

three big worries are rapid

177

00:09:22,070 --> 00:09:16,640

depressurization

178

00:09:27,350 --> 00:09:23,430

how can students submit their

179

00:09:32,070 --> 00:09:30,230

well that's one of the areas i'm not as

180

00:09:36,070 --> 00:09:32,080

familiar with as probably i should but

181

00:09:38,389 --> 00:09:36,080

we do have a payloads operations center

182

00:09:41,269 --> 00:09:38,399

in huntsville alabama they reach out to

183

00:09:43,910 --> 00:09:41,279

universities and to students around the

184

00:09:46,070 --> 00:09:43,920

world to help them

185

00:09:47,750 --> 00:09:46,080

in the process of getting their payloads

186

00:09:49,990 --> 00:09:47,760

on orbit but a very good question

187

00:09:55,110 --> 00:09:50,000

because that's what the space station is

188

00:10:01,990 --> 00:09:58,070

what advice can you give me if i wanted

189

00:10:04,630 --> 00:10:02,000

to become a nasa engineer

190

00:10:06,310 --> 00:10:04,640

well the advice i would give you um and

191

00:10:07,990 --> 00:10:06,320

that's a good question because i was

192

00:10:10,550 --> 00:10:08,000

faced with that same challenge when i

193

00:10:13,430 --> 00:10:10,560

was your age what do i need to do

194

00:10:15,670 --> 00:10:13,440

um i think the most important thing is

195

00:10:18,630 --> 00:10:15,680

to do the best job you can in your

196

00:10:20,310 --> 00:10:18,640

academics today give it your best effort

197

00:10:22,790 --> 00:10:20,320

you know your teachers aren't there just

198

00:10:25,590 --> 00:10:22,800

to spoon feed you information there to

199

00:10:28,230 --> 00:10:25,600

help you in your education journey so

200

00:10:30,949 --> 00:10:28,240

it's mostly on your shoulders to study

201
00:10:33,509 --> 00:10:30,959
hard to do your homework and to find

202
00:10:35,750 --> 00:10:33,519
those areas that you really like doing

203
00:10:37,110 --> 00:10:35,760
because if you really enjoy doing

204
00:10:38,949 --> 00:10:37,120
something you're going to do a very good

205
00:10:40,550 --> 00:10:38,959
job at it so

206
00:10:43,350 --> 00:10:40,560
i think in the space business those

207
00:10:47,910 --> 00:10:43,360
areas that are most important are math

208
00:10:53,110 --> 00:10:50,310
how did you work your way up to be the

209
00:10:54,550 --> 00:10:53,120
chief engineer

210
00:10:55,990 --> 00:10:54,560
well um

211
00:10:58,150 --> 00:10:56,000
kind of continuing on that's a good

212
00:11:00,790 --> 00:10:58,160
question you know continuing on a lot of

213
00:11:02,870 --> 00:11:00,800

people look at the jobs that i've done

214

00:11:05,509 --> 00:11:02,880

and said well you know if i do those

215

00:11:07,910 --> 00:11:05,519

same things i will get to the same place

216

00:11:10,470 --> 00:11:07,920

and that's not necessarily so because we

217

00:11:12,150 --> 00:11:10,480

like a lot of different people and what

218

00:11:13,509 --> 00:11:12,160

they bring to the

219

00:11:16,150 --> 00:11:13,519

equation

220

00:11:18,550 --> 00:11:16,160

i think the key thing is to whatever job

221

00:11:20,230 --> 00:11:18,560

you're given do the best you can at it

222

00:11:22,069 --> 00:11:20,240

in my case

223

00:11:24,550 --> 00:11:22,079

i took a path through the air force and

224

00:11:26,069 --> 00:11:24,560

flying airplanes and eventually after i

225

00:11:28,870 --> 00:11:26,079

retired

226

00:11:31,590 --> 00:11:28,880

my background was very useful down here

227

00:11:34,230 --> 00:11:31,600

working with procedures and working with

228

00:11:39,829 --> 00:11:34,240

displays and aerospace machinery those

229

00:11:45,829 --> 00:11:41,269

does anything in space cause

230

00:11:51,750 --> 00:11:48,630

well yes there are certain interference

231

00:11:54,389 --> 00:11:51,760

uh problems you know we we do have a lot

232

00:11:57,509 --> 00:11:54,399

of electronic equipment on board and

233

00:12:01,350 --> 00:11:57,519

we're constantly trying to minimize and

234

00:12:03,350 --> 00:12:01,360

control what kind of uh problems that uh

235

00:12:06,870 --> 00:12:03,360

that might uh cause

236

00:12:10,470 --> 00:12:06,880

in space we have radiation and uh we

237

00:12:13,350 --> 00:12:10,480

have solar flares and we have a a

238

00:12:15,430 --> 00:12:13,360

van allen radiation belt and sometimes

239

00:12:18,310 --> 00:12:15,440

those charged particles cause problems

240

00:12:20,790 --> 00:12:18,320

for our electronics

241

00:12:23,350 --> 00:12:20,800

okay great i am going to hang up i've

242

00:12:25,590 --> 00:12:23,360

been advised to hang up and dial in so

243

00:12:27,750 --> 00:12:25,600

that we can maybe uh actually see

244

00:12:30,150 --> 00:12:27,760

mission control so i'm going to hang up

245

00:12:31,590 --> 00:12:30,160

now and dial back in

246

00:12:34,310 --> 00:12:31,600

sounds great

247

00:12:35,910 --> 00:12:34,320

we'll wait for you when you come back

248

00:12:37,350 --> 00:12:35,920

okay thank you

249

00:12:39,030 --> 00:12:37,360

oh yes

250

00:12:41,430 --> 00:12:39,040

and this is michael here at the digital

251
00:12:42,629 --> 00:12:41,440
learning network uh mr getzelman i hope

252
00:12:44,710 --> 00:12:42,639
you don't mind but i actually have a

253
00:12:47,030 --> 00:12:44,720
question for you

254
00:12:48,629 --> 00:12:47,040
yeah go ahead

255
00:12:50,230 --> 00:12:48,639
i was just wondering uh normally

256
00:12:52,230 --> 00:12:50,240
throughout the history of human space

257
00:12:54,870 --> 00:12:52,240
flight it's normally been astronauts

258
00:12:57,030 --> 00:12:54,880
that actually get um the responsibility

259
00:12:58,629 --> 00:12:57,040
of being a capcom or a capsule

260
00:13:00,150 --> 00:12:58,639
communicator

261
00:13:02,230 --> 00:13:00,160
i understand with the international

262
00:13:06,069 --> 00:13:02,240
space station your

263
00:13:08,069 --> 00:13:06,079

seven operations uh 365 days a year and

264

00:13:10,150 --> 00:13:08,079

we've been doing it since the year 2000

265

00:13:11,990 --> 00:13:10,160

so i could see how it opens up but how

266

00:13:14,150 --> 00:13:12,000

did you get the opportunity to actually

267

00:13:15,750 --> 00:13:14,160

be a capcom amongst those elite

268

00:13:16,949 --> 00:13:15,760

astronauts

269

00:13:20,069 --> 00:13:16,959

well i

270

00:13:20,870 --> 00:13:20,079

like you i saw the scheduling challenge

271

00:13:25,269 --> 00:13:20,880

that

272

00:13:28,110 --> 00:13:25,279

actually have enough astronauts to

273

00:13:32,470 --> 00:13:28,120

conduct capcom duties

274

00:13:34,629 --> 00:13:32,480

365 days a year and three shifts we now

275

00:13:36,550 --> 00:13:34,639

have scaled back to smaller shifts so i

276

00:13:38,949 --> 00:13:36,560

knew they were going to have to

277

00:13:42,230 --> 00:13:38,959

change their policy and i tried to make

278

00:13:45,110 --> 00:13:42,240

myself as qualified as possible and then

279

00:13:47,189 --> 00:13:45,120

we had a gal named ginger carrick who is

280

00:13:49,670 --> 00:13:47,199

one of our senior flight directors now

281

00:13:51,990 --> 00:13:49,680

but she had spent a lot of time training

282

00:13:54,949 --> 00:13:52,000

with the first expedition crew

283

00:13:56,870 --> 00:13:54,959

and she demonstrated that uh with the

284

00:13:59,829 --> 00:13:56,880

right training and the white background

285

00:14:02,389 --> 00:13:59,839

uh you could be very effective uh as a

286

00:14:05,189 --> 00:14:02,399

capcom even though you weren't a uh

287

00:14:06,870 --> 00:14:05,199

a uh astronaut

288

00:14:09,509 --> 00:14:06,880

all right excellent looks like clark

289

00:14:11,110 --> 00:14:09,519

creek stem academy is back and i think

290

00:14:12,949 --> 00:14:11,120

they're able to see you so let's go

291

00:14:13,990 --> 00:14:12,959

ahead with your next question

292

00:14:16,230 --> 00:14:14,000

go ahead

293

00:14:19,269 --> 00:14:16,240

do you have security measures to protect

294

00:14:21,430 --> 00:14:19,279

secret information

295

00:14:22,949 --> 00:14:21,440

you know that that's a uh interesting

296

00:14:25,269 --> 00:14:22,959

question i know we're all concerned

297

00:14:27,189 --> 00:14:25,279

about secrets but uh in my case i don't

298

00:14:29,590 --> 00:14:27,199

deal a lot with secret information

299

00:14:32,069 --> 00:14:29,600

there's other people on console who have

300

00:14:34,310 --> 00:14:32,079

to that responsibility but i really

301
00:14:36,710 --> 00:14:34,320
don't you have to understand everything

302
00:14:39,189 --> 00:14:36,720
i say that goes on the radio is

303
00:14:40,150 --> 00:14:39,199
transmitted worldwide so it's probably

304
00:14:45,910 --> 00:14:40,160
best

305
00:14:51,829 --> 00:14:48,389
what does it take to be an effective

306
00:14:55,990 --> 00:14:53,110
well

307
00:14:58,470 --> 00:14:56,000
i think the first thing is competency

308
00:14:59,990 --> 00:14:58,480
knowing your job and being very good at

309
00:15:02,710 --> 00:15:00,000
it because people are going to look up

310
00:15:05,750 --> 00:15:02,720
to you as a role model so the first

311
00:15:07,670 --> 00:15:05,760
thing is knowing what you want to do and

312
00:15:10,230 --> 00:15:07,680
then the second thing is to know the

313
00:15:12,550 --> 00:15:10,240

people that are working for you and to

314

00:15:14,310 --> 00:15:12,560

know their strengths and weaknesses and

315

00:15:16,269 --> 00:15:14,320

figure out how to use those to best

316

00:15:19,910 --> 00:15:16,279

advantage to your

317

00:15:22,150 --> 00:15:19,920

organization's objectives so

318

00:15:23,990 --> 00:15:22,160

i think that's the two aspects being

319

00:15:26,069 --> 00:15:24,000

very competent and

320

00:15:29,509 --> 00:15:26,079

knowing how to interact with other

321

00:15:35,670 --> 00:15:32,150

do you ever share jokes or humorous

322

00:15:36,870 --> 00:15:35,680

stories with the iss astronauts

323

00:15:39,509 --> 00:15:36,880

yes i do

324

00:15:41,910 --> 00:15:39,519

especially if i know them personally

325

00:15:43,910 --> 00:15:41,920

you know we do some gentle

326

00:15:46,389 --> 00:15:43,920

ribbing or ridicule

327

00:15:49,189 --> 00:15:46,399

maybe a little joke but i try to keep it

328

00:15:52,710 --> 00:15:49,199

under control because you know everybody

329

00:15:54,949 --> 00:15:52,720

else who listens in on the open space to

330

00:15:56,550 --> 00:15:54,959

groups they may not understand the jokes

331

00:15:59,910 --> 00:15:56,560

and they may not think they're quite as

332

00:16:01,749 --> 00:15:59,920

funny as i do or the crew does so i have

333

00:16:07,430 --> 00:16:01,759

to make sure that i do it in a

334

00:16:13,749 --> 00:16:09,749

what kind of software does capcom use to

335

00:16:17,910 --> 00:16:16,310

okay well we use several means obviously

336

00:16:19,509 --> 00:16:17,920

we use the voice

337

00:16:22,949 --> 00:16:19,519

through our satellite links to

338

00:16:23,990 --> 00:16:22,959

communicate we also have email

339

00:16:26,790 --> 00:16:24,000

and

340

00:16:28,629 --> 00:16:26,800

we process the email we kind of are a

341

00:16:30,870 --> 00:16:28,639

filter to make sure the crew doesn't get

342

00:16:32,389 --> 00:16:30,880

too much junk email like we all hate at

343

00:16:35,110 --> 00:16:32,399

home

344

00:16:37,269 --> 00:16:35,120

we also have video so we can watch the

345

00:16:39,829 --> 00:16:37,279

crew as they're performing their work

346

00:16:41,990 --> 00:16:39,839

and it's it's really amazing if you can

347

00:16:44,150 --> 00:16:42,000

actually see what's going on

348

00:16:45,829 --> 00:16:44,160

um how much that helps you understand

349

00:16:51,030 --> 00:16:45,839

where the crew is in their days

350

00:16:56,389 --> 00:16:54,790

you are noted to be a cheerful leader

351

00:17:01,990 --> 00:16:56,399

for iss

352

00:17:07,270 --> 00:17:04,710

i think you said cheerful leader so i

353

00:17:08,710 --> 00:17:07,280

think if you're have a smile on your

354

00:17:10,710 --> 00:17:08,720

face while you're working and you're

355

00:17:11,510 --> 00:17:10,720

happy to do that work i think that comes

356

00:17:12,870 --> 00:17:11,520

through

357

00:17:16,150 --> 00:17:12,880

on the radio

358

00:17:18,789 --> 00:17:16,160

and i'm very happy to be doing this job

359

00:17:20,549 --> 00:17:18,799

you know i think everyone wants a job

360

00:17:23,270 --> 00:17:20,559

where they feel that they make a

361

00:17:25,350 --> 00:17:23,280

difference and uh i think when i'm

362

00:17:27,189 --> 00:17:25,360

working here as a capcom i'm making a

363

00:17:30,710 --> 00:17:27,199

difference to space exploration so

364

00:17:38,070 --> 00:17:32,630

how do you make sure the astronauts have

365

00:17:43,350 --> 00:17:39,909

oh okay i think you're asking about

366

00:17:45,990 --> 00:17:43,360

supplies and as a capcom i don't really

367

00:17:47,350 --> 00:17:46,000

play a primary role in that we do have

368

00:17:50,630 --> 00:17:47,360

an inventory

369

00:17:53,270 --> 00:17:50,640

stowage officer and they have a computer

370

00:17:56,070 --> 00:17:53,280

database that keeps track of all the

371

00:17:59,510 --> 00:17:56,080

equipment and all of the

372

00:18:02,710 --> 00:17:59,520

items on board and they see how the food

373

00:18:05,990 --> 00:18:02,720

is going and and how much water we have

374

00:18:08,630 --> 00:18:06,000

stockpiled and they make sure that

375

00:18:10,230 --> 00:18:08,640

the next resupply mission that comes up

376

00:18:11,590 --> 00:18:10,240

brings more of the stuff we're getting

377

00:18:13,830 --> 00:18:11,600

low on

378

00:18:17,669 --> 00:18:13,840

but as a capcom i don't particularly

379

00:18:23,909 --> 00:18:20,549

what is your favorite academic subject

380

00:18:27,750 --> 00:18:24,710

well

381

00:18:30,789 --> 00:18:27,760

i like both math and science and i like

382

00:18:33,510 --> 00:18:30,799

math because there's always a right and

383

00:18:35,830 --> 00:18:33,520

a wrong answer and if you do your work

384

00:18:38,390 --> 00:18:35,840

hard you can find that right or wrong

385

00:18:39,909 --> 00:18:38,400

answer it's not a maybe kind of thing or

386

00:18:41,990 --> 00:18:39,919

it's how you feel

387

00:18:44,070 --> 00:18:42,000

so i like math because you you can

388

00:18:47,510 --> 00:18:44,080

finally feel like you accomplish

389

00:18:49,830 --> 00:18:47,520

something science i like that because

390

00:18:52,310 --> 00:18:49,840

it's pushing out the boundaries you

391

00:18:53,830 --> 00:18:52,320

think of the struggle of man throughout

392

00:18:56,470 --> 00:18:53,840

the centuries

393

00:18:59,029 --> 00:18:56,480

what a fortunate time we live in with

394

00:19:01,750 --> 00:18:59,039

the access to the internet and

395

00:19:04,549 --> 00:19:01,760

our textbooks and our teachers to learn

396

00:19:07,510 --> 00:19:04,559

so much more than people did say even 50

397

00:19:09,270 --> 00:19:07,520

or 100 years ago so science is very

398

00:19:12,230 --> 00:19:09,280

exciting because we're constantly

399

00:19:15,990 --> 00:19:12,240

pushing out the knowledge the frontier

400

00:19:21,350 --> 00:19:18,310

what do you recall as the most difficult

401
00:19:23,430 --> 00:19:21,360
episode while acting as the liaison

402
00:19:29,270 --> 00:19:23,440
between the mission patrol and the iss

403
00:19:32,230 --> 00:19:30,549
well i think

404
00:19:34,390 --> 00:19:32,240
you know i talked earlier about

405
00:19:37,110 --> 00:19:34,400
repairing the solar array

406
00:19:38,710 --> 00:19:37,120
that tore while it was being relocated

407
00:19:41,270 --> 00:19:38,720
and then deployed

408
00:19:43,350 --> 00:19:41,280
and without that solar array

409
00:19:44,549 --> 00:19:43,360
being if you will

410
00:19:46,549 --> 00:19:44,559
secured

411
00:19:48,950 --> 00:19:46,559
it would affect whether we could rotate

412
00:19:51,510 --> 00:19:48,960
the solar arrays or not and that would

413
00:19:54,950 --> 00:19:51,520

compromise some of our power generation

414

00:19:57,750 --> 00:19:54,960

so i think uh being able to as a team

415

00:19:59,909 --> 00:19:57,760

pull together a plan and then executing

416

00:20:02,390 --> 00:19:59,919

that plan on orbit was

417

00:20:04,710 --> 00:20:02,400

probably one of the most amazing things

418

00:20:07,830 --> 00:20:04,720

we were able to do here in the recent

419

00:20:11,350 --> 00:20:07,840

past of the space station

420

00:20:11,360 --> 00:20:17,270

might you visit the iss why or why not

421

00:20:19,669 --> 00:20:18,310

well

422

00:20:21,110 --> 00:20:19,679

unfortunately i think i'm getting a

423

00:20:22,390 --> 00:20:21,120

little too old to be picked to be an

424

00:20:25,909 --> 00:20:22,400

astronaut

425

00:20:28,950 --> 00:20:25,919

and so like you i'd like to go i think

426

00:20:31,110 --> 00:20:28,960

uh but right now i i'm thinking i have

427

00:20:34,070 --> 00:20:31,120

to win the lottery so

428

00:20:36,149 --> 00:20:34,080

um when the lottery gets up above 30

429

00:20:39,430 --> 00:20:36,159

million i buy a few tickets and hope for

430

00:20:45,830 --> 00:20:40,549

that's good

431

00:20:49,270 --> 00:20:47,190

i'm sorry can you repeat the last part

432

00:20:53,190 --> 00:20:49,280

of that question

433

00:20:55,669 --> 00:20:53,200

what do you see as the iss legacy

434

00:20:57,750 --> 00:20:55,679

well i think the legacy of iss is going

435

00:20:59,669 --> 00:20:57,760

to be one

436

00:21:01,669 --> 00:20:59,679

the difficulty of assembling it and

437

00:21:04,470 --> 00:21:01,679

building it and designing it and i think

438

00:21:07,350 --> 00:21:04,480

those lessons will be used again as we

439

00:21:08,870 --> 00:21:07,360

go further out into the solar system

440

00:21:11,350 --> 00:21:08,880

the second lesson i think is the

441

00:21:13,029 --> 00:21:11,360

research on human adaptation to

442

00:21:15,590 --> 00:21:13,039

weightlessness and the environment of

443

00:21:18,149 --> 00:21:15,600

space so that when we do go to the moon

444

00:21:20,230 --> 00:21:18,159

or mars again or even to an asteroid

445

00:21:22,390 --> 00:21:20,240

we'll have a lot of data to work with a

446

00:21:25,510 --> 00:21:22,400

lot of understanding of what happens to

447

00:21:28,470 --> 00:21:25,520

folks who are inside a small

448

00:21:30,310 --> 00:21:28,480

enclosed environment for a long time and

449

00:21:33,430 --> 00:21:30,320

then i think the third thing is going to

450

00:21:36,470 --> 00:21:33,440

be the research that we do and that

451
00:21:38,950 --> 00:21:36,480
research as it gets reapplied to

452
00:21:41,190 --> 00:21:38,960
products and and services on the ground

453
00:21:43,430 --> 00:21:41,200
so i think those are three areas i'm

454
00:21:46,950 --> 00:21:43,440
looking forward to as we move forward in

455
00:21:51,350 --> 00:21:48,470
what is the role of the huntsville

456
00:21:52,870 --> 00:21:51,360
alabama counterpart and capcom iss

457
00:21:55,270 --> 00:21:52,880
events

458
00:21:57,430 --> 00:21:55,280
yeah huntsville is our payload

459
00:21:58,549 --> 00:21:57,440
operations control center

460
00:22:01,190 --> 00:21:58,559
and

461
00:22:03,110 --> 00:22:01,200
they have a pacom as well who

462
00:22:05,750 --> 00:22:03,120
communicates with the crew

463
00:22:08,390 --> 00:22:05,760

and talks to them about the science and

464

00:22:10,390 --> 00:22:08,400

the payloads they're

465

00:22:13,909 --> 00:22:10,400

doing on orbit

466

00:22:16,149 --> 00:22:13,919

so we primarily in houston worry about

467

00:22:17,510 --> 00:22:16,159

the actual systems and hardware of the

468

00:22:19,909 --> 00:22:17,520

space station

469

00:22:22,230 --> 00:22:19,919

and provide the services to the payloads

470

00:22:24,710 --> 00:22:22,240

folks so they worry about uh the

471

00:22:26,710 --> 00:22:24,720

payloads the experiments the science and

472

00:22:28,390 --> 00:22:26,720

we worry about more about the vehicle

473

00:22:30,710 --> 00:22:28,400

and its operation

474

00:22:33,029 --> 00:22:30,720

visiting vehicles cargo ships those

475

00:22:36,149 --> 00:22:33,039

kinds of things we also have other

476
00:22:39,270 --> 00:22:36,159
control centers one in munich that works

477
00:22:42,230 --> 00:22:39,280
with the european space agency and their

478
00:22:44,310 --> 00:22:42,240
experiments and scuba japan

479
00:22:46,630 --> 00:22:44,320
their jaycom

480
00:22:48,630 --> 00:22:46,640
also works with their japanese science

481
00:22:51,270 --> 00:22:48,640
and experiments and finally we have the

482
00:22:53,909 --> 00:22:51,280
russian glovney who has a similar role

483
00:22:56,789 --> 00:22:53,919
of communicating with the space station

484
00:22:58,070 --> 00:22:56,799
about their people

485
00:23:00,230 --> 00:22:58,080
all right we have about a minute and a

486
00:23:01,430 --> 00:23:00,240
half so one final question from clark

487
00:23:04,149 --> 00:23:01,440
creek

488
00:23:05,350 --> 00:23:04,159

are we dependent upon the russians to

489

00:23:08,390 --> 00:23:05,360

deliver

490

00:23:11,029 --> 00:23:08,400

astronauts to the iss if so is this a

491

00:23:15,510 --> 00:23:12,789

at the current time our only way of

492

00:23:17,750 --> 00:23:15,520

getting astronauts on board is using the

493

00:23:20,230 --> 00:23:17,760

russian soyuz vehicle

494

00:23:22,549 --> 00:23:20,240

we are continuing to develop

495

00:23:26,310 --> 00:23:22,559

u.s both

496

00:23:28,149 --> 00:23:26,320

private companies and nasa government

497

00:23:31,029 --> 00:23:28,159

vehicles that will be able to reach the

498

00:23:34,230 --> 00:23:31,039

space station until those vehicles are

499

00:23:37,350 --> 00:23:34,240

operational we will rely on them

500

00:23:40,230 --> 00:23:37,360

now this is a partnership and so we have

501
00:23:42,310 --> 00:23:40,240
the luxury of relying on the russians

502
00:23:44,230 --> 00:23:42,320
for their transportation but i think

503
00:23:46,789 --> 00:23:44,240
everybody here at nasa would like

504
00:23:49,269 --> 00:23:46,799
eventually to have our own vehicle and

505
00:23:50,789 --> 00:23:49,279
also to open that business up to the

506
00:23:53,590 --> 00:23:50,799
private sector

507
00:23:55,269 --> 00:23:53,600
and we should mention um what hal was

508
00:23:56,870 --> 00:23:55,279
referring to was

509
00:23:59,029 --> 00:23:56,880
the spacecraft that can transport the

510
00:24:01,669 --> 00:23:59,039
crews but we do have other vehicles

511
00:24:03,990 --> 00:24:01,679
including the newly designed dragon that

512
00:24:06,310 --> 00:24:04,000
can bring up cargo so we don't have to

513
00:24:08,630 --> 00:24:06,320

rely on the russians for other supplies

514

00:24:10,630 --> 00:24:08,640

there's other vehicles including the atv

515

00:24:12,630 --> 00:24:10,640

and in the dragon spacecraft that's

516

00:24:14,710 --> 00:24:12,640

going to launch on march 1st so there

517

00:24:16,470 --> 00:24:14,720

are other vehicles as well

518

00:24:19,750 --> 00:24:16,480

thanks again mike for setting this up we

519

00:24:22,149 --> 00:24:19,760

really enjoyed talking to the students

520

00:24:23,590 --> 00:24:22,159

thank you so much