



1
00:00:05,110 --> 00:00:02,629
hello and welcome to the national air

2
00:00:07,110 --> 00:00:05,120
and space museum in washington dc my

3
00:00:08,549 --> 00:00:07,120
name is marty kelsey i host a television

4
00:00:10,390 --> 00:00:08,559
show for middle school students from

5
00:00:12,310 --> 00:00:10,400
here at the museum you might have

6
00:00:14,310 --> 00:00:12,320
noticed there's a rather large vehicle

7
00:00:18,310 --> 00:00:14,320
standing behind me this is the mars

8
00:00:21,590 --> 00:00:18,320
concept rover 5500 pounds 23 feet long

9
00:00:24,070 --> 00:00:21,600
almost 11 feet tall with a top speed of

10
00:00:26,070 --> 00:00:24,080
six miles an hour this thing is

11
00:00:28,150 --> 00:00:26,080
incredible and i'm really excited about

12
00:00:29,830 --> 00:00:28,160
having it in the museum today i taught

13
00:00:31,429 --> 00:00:29,840

for a long long time and we've got a lot

14

00:00:33,510 --> 00:00:31,439

of young people standing around waiting

15

00:00:35,670 --> 00:00:33,520

for the astronaut to come up and it's

16

00:00:38,549 --> 00:00:35,680

really exciting because these guys who

17

00:00:41,110 --> 00:00:38,559

are 10 11 12 years old are right in that

18

00:00:43,670 --> 00:00:41,120

window for the perfect age to maybe be

19

00:00:45,990 --> 00:00:43,680

the first person to step foot on mars to

20

00:00:47,990 --> 00:00:46,000

me that's incredibly exciting

21

00:00:50,630 --> 00:00:48,000

it is my honor today to introduce our

22

00:00:54,709 --> 00:00:50,640

our guest nasa astronaut john mcbride

23

00:00:56,790 --> 00:00:54,719

former naval aviator he flew on sts 41g

24

00:00:59,110 --> 00:00:56,800

piloted the space shuttle challenger

25

00:01:01,670 --> 00:00:59,120

spent over eight days in space please

26

00:01:04,549 --> 00:01:01,680

welcome astronaut john mcbride

27

00:01:08,950 --> 00:01:06,630

thank you

28

00:01:10,310 --> 00:01:08,960

let me add my words of welcome to you uh

29

00:01:12,710 --> 00:01:10,320

here at the national air and space

30

00:01:14,070 --> 00:01:12,720

museum one of the most iconic places on

31

00:01:16,230 --> 00:01:14,080

the globe

32

00:01:17,910 --> 00:01:16,240

you could spend days in here and i have

33

00:01:19,670 --> 00:01:17,920

literally over the last 30 or 40 years

34

00:01:21,429 --> 00:01:19,680

spent days in this

35

00:01:23,429 --> 00:01:21,439

beautiful facility at one time in my

36

00:01:26,230 --> 00:01:23,439

life i was an assistant administrator of

37

00:01:28,149 --> 00:01:26,240

nasa just across the street when we were

38

00:01:29,429 --> 00:01:28,159

in the building right across from us and

39

00:01:31,350 --> 00:01:29,439

got to spend three years here in

40

00:01:32,870 --> 00:01:31,360

washington dc and lots of nights were

41

00:01:35,109 --> 00:01:32,880

spent over here speaking in the air and

42

00:01:38,870 --> 00:01:35,119

space museum so it's a very

43

00:01:40,950 --> 00:01:38,880

special place in my life in my heart

44

00:01:42,550 --> 00:01:40,960

this thing behind me what a beautiful

45

00:01:45,109 --> 00:01:42,560

piece of equipment

46

00:01:46,469 --> 00:01:45,119

in less than one year we sat down we sat

47

00:01:48,469 --> 00:01:46,479

around the table we came up with a

48

00:01:50,069 --> 00:01:48,479

design concept and this is what you see

49

00:01:52,870 --> 00:01:50,079

in less than a year

50

00:01:55,510 --> 00:01:52,880

this is not designed to go to mars it

51
00:01:57,109 --> 00:01:55,520
won't make the trip this is a prototype

52
00:01:59,270 --> 00:01:57,119
i'd like to think that it'll go to mars

53
00:02:01,270 --> 00:01:59,280
but it was not designed with all the

54
00:02:03,109 --> 00:02:01,280
space capabilities to leave earth and

55
00:02:03,910 --> 00:02:03,119
travel that one year and land on mars

56
00:02:08,550 --> 00:02:03,920
and

57
00:02:10,389 --> 00:02:08,560
is a prototype it's our best guess

58
00:02:11,990 --> 00:02:10,399
and we used an educated guest we talked

59
00:02:14,229 --> 00:02:12,000
to everybody that we could talk to about

60
00:02:16,070 --> 00:02:14,239
what they thought the lunar or martian

61
00:02:19,190 --> 00:02:16,080
rover would look like what it would act

62
00:02:21,110 --> 00:02:19,200
like what its requirements would be so

63
00:02:22,390 --> 00:02:21,120

what you see behind me is not the one

64

00:02:24,630 --> 00:02:22,400

that will make the trip but i'll

65

00:02:27,510 --> 00:02:24,640

guarantee that a lot of the features

66

00:02:28,630 --> 00:02:27,520

that you see here are real and will be a

67

00:02:30,229 --> 00:02:28,640

part of the

68

00:02:31,190 --> 00:02:30,239

martian rover that actually makes that

69

00:02:33,110 --> 00:02:31,200

trip

70

00:02:34,790 --> 00:02:33,120

it was designed and built by the visitor

71

00:02:36,470 --> 00:02:34,800

center at the kennedy space center so

72

00:02:38,309 --> 00:02:36,480

there's no tax dollars by the way in

73

00:02:39,990 --> 00:02:38,319

this thing it's all comes from the

74

00:02:41,670 --> 00:02:40,000

proceeds of the gate receipts that we've

75

00:02:43,589 --> 00:02:41,680

taken down to kennedy when you come and

76

00:02:45,430 --> 00:02:43,599

visit us so come and see the

77

00:02:47,190 --> 00:02:45,440

kennedy space center and see the martian

78

00:02:49,030 --> 00:02:47,200

rover down there with about two days

79

00:02:50,869 --> 00:02:49,040

more of activities that you can visit to

80

00:02:52,470 --> 00:02:50,879

witness at the kennedy visitor complex

81

00:02:53,910 --> 00:02:52,480

in in florida so

82

00:02:56,150 --> 00:02:53,920

make sure you do that i'll be world

83

00:02:57,509 --> 00:02:56,160

worship well worth your time

84

00:02:59,190 --> 00:02:57,519

i uh

85

00:03:00,949 --> 00:02:59,200

started off in the great state of west

86

00:03:02,229 --> 00:03:00,959

virginia right next door born and raised

87

00:03:04,710 --> 00:03:02,239

over there and

88

00:03:07,110 --> 00:03:04,720

was a west virginia mountaineer got to

89

00:03:08,149 --> 00:03:07,120

yay got to go down to uh

90

00:03:10,149 --> 00:03:08,159

houston

91

00:03:12,550 --> 00:03:10,159

in the very first class

92

00:03:14,229 --> 00:03:12,560

of space shuttle astronauts now all the

93

00:03:16,550 --> 00:03:14,239

guys that came before me were those

94

00:03:19,190 --> 00:03:16,560

older guys look at me now

95

00:03:21,270 --> 00:03:19,200

but back in the 1978 when i came aboard

96

00:03:22,630 --> 00:03:21,280

in the very first class uh the only

97

00:03:26,070 --> 00:03:22,640

people had flown before us were the

98

00:03:27,990 --> 00:03:26,080

mercury gemini and apollo astronauts so

99

00:03:30,630 --> 00:03:28,000

we were the very first class

100

00:03:32,869 --> 00:03:30,640

of people picked and chosen to fly this

101
00:03:34,470 --> 00:03:32,879
brand new thing we called space shuttle

102
00:03:36,309 --> 00:03:34,480
not so brand new anymore they're all

103
00:03:38,070 --> 00:03:36,319
retired and one of them is out at the

104
00:03:40,710 --> 00:03:38,080
dulles airport at the national air space

105
00:03:42,470 --> 00:03:40,720
museum annex out there

106
00:03:44,869 --> 00:03:42,480
so it's been a wonderful career for me

107
00:03:46,789 --> 00:03:44,879
to be in that very first class and we

108
00:03:49,589 --> 00:03:46,799
had 35 of us

109
00:03:51,990 --> 00:03:49,599
there were 15 like myself who are pilots

110
00:03:53,350 --> 00:03:52,000
we're all test pilots and 10 of us came

111
00:03:55,350 --> 00:03:53,360
from the navy

112
00:03:56,949 --> 00:03:55,360
and 5 from the air force

113
00:03:58,869 --> 00:03:56,959

the other 20 in my class are a new

114

00:04:00,470 --> 00:03:58,879

category of astronauts that nasa had

115

00:04:03,190 --> 00:04:00,480

ever had before they're called

116

00:04:05,830 --> 00:04:03,200

mission specialists including sally ride

117

00:04:07,750 --> 00:04:05,840

was in my class our first american woman

118

00:04:10,710 --> 00:04:07,760

guy blueford our first african-american

119

00:04:12,949 --> 00:04:10,720

was in my class to fly in space ellison

120

00:04:15,030 --> 00:04:12,959

anizuka was our first

121

00:04:17,030 --> 00:04:15,040

american to fly in space so

122

00:04:19,270 --> 00:04:17,040

first mountaineer right here

123

00:04:21,830 --> 00:04:19,280

so it really was a unique group of

124

00:04:23,030 --> 00:04:21,840

people that nasa assembled in 1978 to be

125

00:04:25,749 --> 00:04:23,040

the first

126

00:04:28,310 --> 00:04:25,759

cadre i say of astronauts to fly that

127

00:04:29,510 --> 00:04:28,320

brand new vehicle vehicle called space

128

00:04:31,350 --> 00:04:29,520

shuttle

129

00:04:33,590 --> 00:04:31,360

and we built uh

130

00:04:35,990 --> 00:04:33,600

five space shuttles the first one we

131

00:04:37,350 --> 00:04:36,000

built was called enterprise

132

00:04:39,270 --> 00:04:37,360

it was on display out of the air and

133

00:04:41,110 --> 00:04:39,280

space museum for many years it's now on

134

00:04:42,790 --> 00:04:41,120

the intrepid up in the hudson river in

135

00:04:44,790 --> 00:04:42,800

new york city

136

00:04:46,230 --> 00:04:44,800

now the first shuttle we built to fly in

137

00:04:47,830 --> 00:04:46,240

space was called

138

00:04:49,590 --> 00:04:47,840

columbia

139

00:04:50,950 --> 00:04:49,600

and i was very fortunate on the first

140

00:04:53,350 --> 00:04:50,960

flight of columbia to be the little

141

00:04:54,870 --> 00:04:53,360

chase pilot to join high with him over

142

00:04:57,909 --> 00:04:54,880

edwards air force base and made the

143

00:05:02,230 --> 00:04:57,919

decent landing at the dry runway out at

144

00:05:03,670 --> 00:05:02,240

edwards air force base in april of 1981.

145

00:05:04,870 --> 00:05:03,680

the first crew to fly the shuttle was

146

00:05:06,790 --> 00:05:04,880

john young

147

00:05:09,189 --> 00:05:06,800

and bob crippen

148

00:05:10,950 --> 00:05:09,199

two navy naval aviators just like myself

149

00:05:12,469 --> 00:05:10,960

john young had walked on the moon he was

150

00:05:13,990 --> 00:05:12,479

chief of the astronaut office who

151
00:05:14,950 --> 00:05:14,000
obviously he got to be the commander

152
00:05:17,670 --> 00:05:14,960
right

153
00:05:19,830 --> 00:05:17,680
and bob crippen was his pilot so it was

154
00:05:21,990 --> 00:05:19,840
a only flew two people

155
00:05:23,510 --> 00:05:22,000
on the first four flights

156
00:05:24,790 --> 00:05:23,520
of the space shuttle that's because we

157
00:05:27,110 --> 00:05:24,800
wanted to make sure we could get the

158
00:05:29,430 --> 00:05:27,120
shuttle up into space safely and fly it

159
00:05:31,749 --> 00:05:29,440
around and do all the mission objectives

160
00:05:33,990 --> 00:05:31,759
and come back and make it a landing

161
00:05:35,909 --> 00:05:34,000
so i was there on the on the first one

162
00:05:38,710 --> 00:05:35,919
and we flew two people on the first

163
00:05:40,710 --> 00:05:38,720

floor then we uh got a little larger we

164

00:05:42,390 --> 00:05:40,720

flew four people

165

00:05:43,990 --> 00:05:42,400

then we flew five

166

00:05:46,150 --> 00:05:44,000

then we flew six

167

00:05:48,150 --> 00:05:46,160

and i took the first crew of seven on

168

00:05:50,150 --> 00:05:48,160

the 13th flight of the

169

00:05:51,990 --> 00:05:50,160

space shuttle we always wanted to get to

170

00:05:53,590 --> 00:05:52,000

seven people because we felt that was

171

00:05:55,990 --> 00:05:53,600

the maximum

172

00:05:57,590 --> 00:05:56,000

maximum most efficient crew size to have

173

00:05:59,590 --> 00:05:57,600

seven people on board the space shuttle

174

00:06:01,430 --> 00:05:59,600

to do all the experiments

175

00:06:03,029 --> 00:06:01,440

two of us were pilots

176

00:06:05,029 --> 00:06:03,039

we still needed nasa thought we still

177

00:06:07,270 --> 00:06:05,039

needed pilots right to get this thing up

178

00:06:09,189 --> 00:06:07,280

there and fly it around and take care of

179

00:06:11,350 --> 00:06:09,199

it and bring it back and landing land it

180

00:06:12,790 --> 00:06:11,360

but the other members of our crews up to

181

00:06:14,629 --> 00:06:12,800

five were what we call the mission

182

00:06:16,150 --> 00:06:14,639

specialists and they're the

183

00:06:17,029 --> 00:06:16,160

men and women who did all the space

184

00:06:19,189 --> 00:06:17,039

walks

185

00:06:21,909 --> 00:06:19,199

they launched the satellites they did

186

00:06:23,510 --> 00:06:21,919

all the experimentation in orbit

187

00:06:25,350 --> 00:06:23,520

took all the nice photographs and all

188

00:06:27,670 --> 00:06:25,360

that type of stuff so we needed a good

189

00:06:29,590 --> 00:06:27,680

mix and match of talent so we had pilots

190

00:06:31,749 --> 00:06:29,600

and mission specialists

191

00:06:33,189 --> 00:06:31,759

on board to do those missions so i was

192

00:06:37,670 --> 00:06:33,199

very proud to have the first crew of

193

00:06:39,510 --> 00:06:37,680

seven with two pilots and five missions

194

00:06:41,029 --> 00:06:39,520

and we had the canadian broadcasting

195

00:06:42,469 --> 00:06:41,039

service here

196

00:06:44,150 --> 00:06:42,479

mark garneau

197

00:06:45,110 --> 00:06:44,160

was the very first canadian to go into

198

00:06:46,870 --> 00:06:45,120

space

199

00:06:50,230 --> 00:06:46,880

and alongside him was the first

200

00:06:52,070 --> 00:06:50,240

australian any aussies here today

201
00:06:54,629 --> 00:06:52,080
well scully power was the very first

202
00:06:55,990 --> 00:06:54,639
australian and it was my joy to fly with

203
00:06:58,870 --> 00:06:56,000
the first australian and the first

204
00:07:01,270 --> 00:06:58,880
canadian into space on the we were the

205
00:07:03,110 --> 00:07:01,280
13th flight of the space shuttle on

206
00:07:05,189 --> 00:07:03,120
board the challenger we spent eight and

207
00:07:06,870 --> 00:07:05,199
a half days in orbit

208
00:07:08,710 --> 00:07:06,880
i don't know if you realize it or not

209
00:07:10,790 --> 00:07:08,720
but we do circle the earth every 90

210
00:07:12,309 --> 00:07:10,800
minutes in space

211
00:07:13,749 --> 00:07:12,319
every hour and a half we go completely

212
00:07:15,350 --> 00:07:13,759
around the globe

213
00:07:17,189 --> 00:07:15,360

and to do that you got to be traveling

214

00:07:19,430 --> 00:07:17,199

about 16

215

00:07:23,670 --> 00:07:19,440

000 miles per hour

216

00:07:27,110 --> 00:07:23,680

means i'm traveling over the earth at

217

00:07:28,950 --> 00:07:27,120

about six miles every time every second

218

00:07:31,350 --> 00:07:28,960

every second i travel six miles i'll

219

00:07:32,790 --> 00:07:31,360

travel across the united states in about

220

00:07:35,830 --> 00:07:32,800

12 minutes

221

00:07:38,950 --> 00:07:35,840

from

222

00:07:40,629 --> 00:07:38,960

london to mumbai in about 12 or 14

223

00:07:42,230 --> 00:07:40,639

minutes so totally around the earth

224

00:07:43,830 --> 00:07:42,240

every 90.

225

00:07:45,670 --> 00:07:43,840

and the beautiful thing that happens is

226
00:07:47,589 --> 00:07:45,680
while you're in space circling the earth

227
00:07:49,510 --> 00:07:47,599
in a fixed position you don't change

228
00:07:51,589 --> 00:07:49,520
anything in the shuttle what's changing

229
00:07:54,390 --> 00:07:51,599
as you go around

230
00:07:56,869 --> 00:07:54,400
earth is rotating underneath us right

231
00:07:58,469 --> 00:07:56,879
makes one rotation every day

232
00:08:00,869 --> 00:07:58,479
so as i circle the earth every 90

233
00:08:02,309 --> 00:08:00,879
minutes it's turned about 1500 degree

234
00:08:04,230 --> 00:08:02,319
miles

235
00:08:05,909 --> 00:08:04,240
underneath me so i don't see the same

236
00:08:07,189 --> 00:08:05,919
part of the earth every time i go around

237
00:08:09,589 --> 00:08:07,199
it i see a different part of the earth

238
00:08:11,589 --> 00:08:09,599

is just turning underneath me as i

239

00:08:13,189 --> 00:08:11,599

circle it so you put all these for you

240

00:08:15,110 --> 00:08:13,199

youngsters

241

00:08:16,790 --> 00:08:15,120

put all these things together

242

00:08:18,790 --> 00:08:16,800

the excitement of an eight-minute launch

243

00:08:20,469 --> 00:08:18,800

where from the time we start our engines

244

00:08:22,950 --> 00:08:20,479

on the pad in Kennedy until we're in

245

00:08:26,070 --> 00:08:22,960

space is only eight and a half minutes

246

00:08:27,510 --> 00:08:26,080

from zero miles per hour to almost 18

247

00:08:28,629 --> 00:08:27,520

000 miles an hour and eight and a half

248

00:08:30,070 --> 00:08:28,639

minutes

249

00:08:31,670 --> 00:08:30,080

then i'm traveling around the earth

250

00:08:33,829 --> 00:08:31,680

every hour and a half

251

00:08:36,870 --> 00:08:33,839

as i travel around the earth

252

00:08:38,550 --> 00:08:36,880

a wonderful phenomenon happens

253

00:08:40,149 --> 00:08:38,560

i'm traveling around the earth between

254

00:08:43,110 --> 00:08:40,159

the sun up here in the earth so i'm in

255

00:08:44,790 --> 00:08:43,120

daylight for 45 minutes

256

00:08:46,389 --> 00:08:44,800

then i have a sunset i go behind the

257

00:08:48,230 --> 00:08:46,399

earth into darkness

258

00:08:50,710 --> 00:08:48,240

for 45 minutes

259

00:08:53,190 --> 00:08:50,720

then i have another sunrise

260

00:08:54,630 --> 00:08:53,200

45 minutes a day light and

261

00:08:57,110 --> 00:08:54,640

sunset

262

00:08:59,750 --> 00:08:57,120

so as i circle here 16 times every 24

263

00:09:01,829 --> 00:08:59,760

hours i have 16 sunrises

264

00:09:03,670 --> 00:09:01,839

and 16 sunsets

265

00:09:05,829 --> 00:09:03,680

and the beauty of the earth at day and

266

00:09:07,590 --> 00:09:05,839

night is spectacular obviously in your

267

00:09:09,030 --> 00:09:07,600

daytime you can see all the land masses

268

00:09:10,310 --> 00:09:09,040

all the continents

269

00:09:11,990 --> 00:09:10,320

when i'm flying down the middle of the

270

00:09:14,070 --> 00:09:12,000

mississippi i can look west and see

271

00:09:16,710 --> 00:09:14,080

california in the pacific i can look

272

00:09:19,269 --> 00:09:16,720

east and see new york and the atlantic

273

00:09:22,389 --> 00:09:19,279

and the gulf of mexico straight ahead so

274

00:09:24,470 --> 00:09:22,399

you can see essentially 1500 miles in

275

00:09:26,790 --> 00:09:24,480

all directions at night

276

00:09:28,310 --> 00:09:26,800

it's a panoramic

277

00:09:29,509 --> 00:09:28,320

view of a different nature because when

278

00:09:31,190 --> 00:09:29,519

you're on the back side of the earth you

279

00:09:32,790 --> 00:09:31,200

can't see the sun you're in darkness but

280

00:09:34,310 --> 00:09:32,800

you can see the outline of all the

281

00:09:36,470 --> 00:09:34,320

countries and the shorelines with all

282

00:09:37,750 --> 00:09:36,480

the lights of the cities

283

00:09:39,190 --> 00:09:37,760

so when i'm flying over the middle of

284

00:09:41,030 --> 00:09:39,200

the united states i can see all the

285

00:09:42,630 --> 00:09:41,040

lights you can see the atlantic ocean

286

00:09:44,550 --> 00:09:42,640

because of the definition of the lights

287

00:09:46,389 --> 00:09:44,560

along the atlantic coast

288

00:09:47,590 --> 00:09:46,399

now you can see the pacific goes by the

289

00:09:50,470 --> 00:09:47,600

definition of all the lights in

290

00:09:52,150 --> 00:09:50,480

california oregon and new york when

291

00:09:54,550 --> 00:09:52,160

you're west east of the mississippi over

292

00:09:56,230 --> 00:09:54,560

this part of the of the world

293

00:09:57,910 --> 00:09:56,240

you can look down everything's lit up in

294

00:09:59,269 --> 00:09:57,920

the whole united states except one

295

00:10:01,829 --> 00:09:59,279

little dark place right here in the

296

00:10:02,829 --> 00:10:01,839

eastern part of the and what is that

297

00:10:05,269 --> 00:10:02,839

west

298

00:10:06,870 --> 00:10:05,279

virginia where i come from we were proud

299

00:10:09,030 --> 00:10:06,880

of that there's not many lights over

300

00:10:10,870 --> 00:10:09,040

there it's still kind of wilderness and

301

00:10:12,870 --> 00:10:10,880

uh we're very proud of the

302

00:10:14,630 --> 00:10:12,880

of our heritage over there so

303

00:10:15,990 --> 00:10:14,640

but any the bottom line is anytime

304

00:10:17,269 --> 00:10:16,000

you're in space

305

00:10:18,870 --> 00:10:17,279

you're traveling around the earth at

306

00:10:20,310 --> 00:10:18,880

every hour and a half

307

00:10:21,590 --> 00:10:20,320

get to see different parts of the earth

308

00:10:22,870 --> 00:10:21,600

each and every time you go around

309

00:10:24,150 --> 00:10:22,880

because you're not covering the same

310

00:10:25,750 --> 00:10:24,160

ground

311

00:10:27,910 --> 00:10:25,760

but more importantly

312

00:10:30,470 --> 00:10:27,920

you're doing some great science

313

00:10:32,790 --> 00:10:30,480

research studying the earth

314

00:10:34,870 --> 00:10:32,800

studying the universe launching things

315

00:10:36,550 --> 00:10:34,880

like the hubble telescope which are

316

00:10:38,710 --> 00:10:36,560

finding new things each and every day

317

00:10:40,870 --> 00:10:38,720

about this universe that we live in so

318

00:10:42,870 --> 00:10:40,880

you put all those things together

319

00:10:43,910 --> 00:10:42,880

it's probably the best job that a person

320

00:10:46,470 --> 00:10:43,920

could ever

321

00:10:48,949 --> 00:10:46,480

experience and i'm very fortunate

322

00:10:50,790 --> 00:10:48,959

very pleased that i had that opportunity

323

00:10:53,590 --> 00:10:50,800

to go into space

324

00:10:55,750 --> 00:10:53,600

to travel around the earth 133 times

325

00:10:56,870 --> 00:10:55,760

and do some great science while we were

326

00:10:58,150 --> 00:10:56,880

there

327

00:11:00,389 --> 00:10:58,160

and it's even more important to come

328

00:11:03,269 --> 00:11:00,399

back to earth and talk to folks like you

329

00:11:04,790 --> 00:11:03,279

and particularly the youngsters

330

00:11:06,389 --> 00:11:04,800

we've got some young people here and we

331

00:11:09,430 --> 00:11:06,399

think that the first man or woman that

332

00:11:11,509 --> 00:11:09,440

does walk on mars

333

00:11:13,430 --> 00:11:11,519

drives this explorer around the surface

334

00:11:16,310 --> 00:11:13,440

of mars of somewhere between eight and

335

00:11:19,030 --> 00:11:16,320

eighteen years old today

336

00:11:20,550 --> 00:11:19,040

maybe six and sixteen year old if we get

337

00:11:21,990 --> 00:11:20,560

the go-ahead

338

00:11:23,430 --> 00:11:22,000

depends on where we get the money from

339

00:11:25,430 --> 00:11:23,440

congress

340

00:11:27,750 --> 00:11:25,440

to decide when we will actually go to

341

00:11:30,150 --> 00:11:27,760

the surface of mars we haven't made that

342

00:11:31,910 --> 00:11:30,160

decision yet we just talk about it

343

00:11:33,829 --> 00:11:31,920

but until we translate the talk into

344

00:11:34,710 --> 00:11:33,839

words we're not going to actually get

345

00:11:35,990 --> 00:11:34,720

there

346

00:11:37,910 --> 00:11:36,000

so if you're knowing the congressman and

347

00:11:39,350 --> 00:11:37,920

the senators here in washington send

348

00:11:41,030 --> 00:11:39,360

them a note

349

00:11:41,990 --> 00:11:41,040

call them on the telephone tell them

350

00:11:43,350 --> 00:11:42,000

that you want to get this thing

351
00:11:45,670 --> 00:11:43,360
tomorrow's going off and running we

352
00:11:47,269 --> 00:11:45,680
already got the prototype vehicle

353
00:11:48,470 --> 00:11:47,279
that will carry you on the surface of

354
00:11:50,629 --> 00:11:48,480
mars

355
00:11:52,389 --> 00:11:50,639
this can be a wonderful trip

356
00:11:54,629 --> 00:11:52,399
it's not like the moon

357
00:11:56,710 --> 00:11:54,639
we can get to the moon in about two days

358
00:11:59,190 --> 00:11:56,720
and back to go to mars it's going to be

359
00:12:00,949 --> 00:11:59,200
more like a year

360
00:12:02,550 --> 00:12:00,959
a year one way

361
00:12:04,790 --> 00:12:02,560
and you can't just take off and go to

362
00:12:06,790 --> 00:12:04,800
mars anytime you want to do want to do

363
00:12:09,190 --> 00:12:06,800

that because we're not in the same

364

00:12:10,350 --> 00:12:09,200

orbit around the sun right

365

00:12:13,350 --> 00:12:10,360

it takes us

366

00:12:16,230 --> 00:12:13,360

365 days to go around the earth

367

00:12:17,750 --> 00:12:16,240

it takes mars about 780 days to go

368

00:12:18,629 --> 00:12:17,760

around the earth so we are not close

369

00:12:20,230 --> 00:12:18,639

enough

370

00:12:22,629 --> 00:12:20,240

in orbit around the sun where we can

371

00:12:23,350 --> 00:12:22,639

take off and go to mars any day we want

372

00:12:25,110 --> 00:12:23,360

to

373

00:12:26,629 --> 00:12:25,120

it's only happens about once every two

374

00:12:28,550 --> 00:12:26,639

years i think

375

00:12:30,069 --> 00:12:28,560

so we'll take off and it's gonna we take

376
00:12:31,990 --> 00:12:30,079
off when mars and earth are approaching

377
00:12:34,069 --> 00:12:32,000
their nearest proximity and it's gonna

378
00:12:35,670 --> 00:12:34,079
take us a year

379
00:12:37,590 --> 00:12:35,680
to get to mars even when we're at the

380
00:12:38,470 --> 00:12:37,600
closest proximity still going to be

381
00:12:40,629 --> 00:12:38,480
about

382
00:12:41,509 --> 00:12:40,639
40 million miles away or something like

383
00:12:43,030 --> 00:12:41,519
that

384
00:12:45,030 --> 00:12:43,040
we don't have the propulsion system to

385
00:12:46,629 --> 00:12:45,040
get there much quicker so some maybe

386
00:12:48,470 --> 00:12:46,639
some of the youngsters here can design

387
00:12:50,230 --> 00:12:48,480
iron propulsion

388
00:12:52,230 --> 00:12:50,240

thermal propulsion all these types of

389

00:12:53,829 --> 00:12:52,240

things that will expedite our travel to

390

00:12:55,509 --> 00:12:53,839

mars and back but right now with current

391

00:12:57,110 --> 00:12:55,519

propulsion systems it's going to take us

392

00:12:58,470 --> 00:12:57,120

a year

393

00:13:01,110 --> 00:12:58,480

and you can't just unless you want to

394

00:13:03,110 --> 00:13:01,120

just go over and come back the same day

395

00:13:04,870 --> 00:13:03,120

which we don't want to do that you'll

396

00:13:07,509 --> 00:13:04,880

probably have to spend one or two years

397

00:13:09,430 --> 00:13:07,519

on the surface of mars to wait for the

398

00:13:11,190 --> 00:13:09,440

planets to be realigned

399

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

so that you can make the voyage back to

400

00:13:14,870 --> 00:13:13,279

earth so all in all you're looking at a

401
00:13:17,110 --> 00:13:14,880
two or three year

402
00:13:18,550 --> 00:13:17,120
trip how many youngsters want to sign up

403
00:13:20,949 --> 00:13:18,560
anyway

404
00:13:22,389 --> 00:13:20,959
i see some hands i like that there's big

405
00:13:24,870 --> 00:13:22,399
people too

406
00:13:27,590 --> 00:13:24,880
so it's going to be a magnificent voyage

407
00:13:28,949 --> 00:13:27,600
just think how proud your family

408
00:13:31,750 --> 00:13:28,959
and your friends would be if you're the

409
00:13:34,870 --> 00:13:31,760
first man or woman that walks on mars

410
00:13:37,269 --> 00:13:34,880
who's the first man to walk on the moon

411
00:13:38,710 --> 00:13:37,279
neil armstrong right everybody remembers

412
00:13:40,470 --> 00:13:38,720
that name he's

413
00:13:41,990 --> 00:13:40,480

here in this museum

414

00:13:43,670 --> 00:13:42,000

so just think what it would be like for

415

00:13:45,430 --> 00:13:43,680

you your family your community your

416

00:13:46,389 --> 00:13:45,440

state to be the first man or woman that

417

00:13:48,949 --> 00:13:46,399

actually

418

00:13:51,189 --> 00:13:48,959

sets foot on mars and rides in this

419

00:13:53,430 --> 00:13:51,199

vehicle behind me

420

00:13:55,030 --> 00:13:53,440

couldn't be a greater thing to happen

421

00:13:57,509 --> 00:13:55,040

but to get there

422

00:14:00,829 --> 00:13:57,519

remember some of the things i said

423

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

your most important job is

424

00:14:04,069 --> 00:14:02,399

education

425

00:14:06,550 --> 00:14:04,079

stay in school

426

00:14:08,710 --> 00:14:06,560

fill your head with good stuff

427

00:14:10,870 --> 00:14:08,720

study each and every day

428

00:14:12,949 --> 00:14:10,880

listen to your teachers your parents

429

00:14:15,030 --> 00:14:12,959

your grandparents like me

430

00:14:17,590 --> 00:14:15,040

your counselors and the people that love

431

00:14:19,509 --> 00:14:17,600

you don't listen to the people that

432

00:14:22,069 --> 00:14:19,519

don't particularly care about you never

433

00:14:23,590 --> 00:14:22,079

get involved with drugs that can mess up

434

00:14:25,829 --> 00:14:23,600

your whole life

435

00:14:27,990 --> 00:14:25,839

so if you're willing to work very hard

436

00:14:30,629 --> 00:14:28,000

listen to the good people that love you

437

00:14:32,470 --> 00:14:30,639

study get a good education there's no

438

00:14:34,710 --> 00:14:32,480

reason why you could not be

439

00:14:36,470 --> 00:14:34,720

that man or woman that sets foot on mars

440

00:14:38,389 --> 00:14:36,480

for that very first time

441

00:14:39,750 --> 00:14:38,399

so think about that

442

00:14:42,310 --> 00:14:39,760

i'd love to think that i had the

443

00:14:45,509 --> 00:14:42,320

opportunity to talk to you today

444

00:14:47,910 --> 00:14:45,519

if you get that assignment to go to mars

445

00:14:49,269 --> 00:14:47,920

make sure you call me

446

00:14:51,910 --> 00:14:49,279

they'll find me just call the air and

447

00:14:53,910 --> 00:14:51,920

space museum they'll find where i am

448

00:14:55,670 --> 00:14:53,920

and tell them that you got selected to

449

00:14:58,389 --> 00:14:55,680

be that first person and make sure i get

450

00:15:00,069 --> 00:14:58,399

an invitation to your launch if i find

451
00:15:01,030 --> 00:15:00,079
out you went to mars and didn't invite

452
00:15:02,870 --> 00:15:01,040
me

453
00:15:05,509 --> 00:15:02,880
it'll break my heart

454
00:15:07,509 --> 00:15:05,519
don't do that to an old man so

455
00:15:08,470 --> 00:15:07,519
invite me to that launch

456
00:15:10,069 --> 00:15:08,480
so uh

457
00:15:12,870 --> 00:15:10,079
i guess the bottom line is that you

458
00:15:15,670 --> 00:15:12,880
really got to apply yourselves

459
00:15:17,590 --> 00:15:15,680
make sure you get that good education

460
00:15:19,670 --> 00:15:17,600
because that will determine not only

461
00:15:21,750 --> 00:15:19,680
whether you go down to houston to train

462
00:15:23,509 --> 00:15:21,760
to fly to mars but your education will

463
00:15:25,269 --> 00:15:23,519

determine how well you can do in your

464

00:15:26,470 --> 00:15:25,279

life no matter what it is you choose to

465

00:15:32,069 --> 00:15:26,480

do

466

00:15:34,710 --> 00:15:32,079

listen to your moms and dads and your

467

00:15:37,350 --> 00:15:34,720

grandparents and get that education

468

00:15:39,269 --> 00:15:37,360

to form the best party be the best you

469

00:15:41,749 --> 00:15:39,279

can there's nobody that can stop you

470

00:15:43,430 --> 00:15:41,759

from doing anything you want to do

471

00:15:44,949 --> 00:15:43,440

i can't stop you

472

00:15:46,949 --> 00:15:44,959

the only person that can get in your way

473

00:15:48,230 --> 00:15:46,959

and stop you from achieving your goals

474

00:15:49,590 --> 00:15:48,240

is

475

00:15:52,069 --> 00:15:49,600

yourself

476

00:15:53,990 --> 00:15:52,079

so you make those choices to

477

00:15:55,670 --> 00:15:54,000

i think i firmly believe that if you

478

00:15:57,350 --> 00:15:55,680

decide today one of your youngsters that

479

00:15:59,430 --> 00:15:57,360

you want to be that man or woman on mars

480

00:16:01,590 --> 00:15:59,440

that you can make it happen and nobody

481

00:16:03,110 --> 00:16:01,600

can stop you if you really want to make

482

00:16:04,550 --> 00:16:03,120

it happen don't tell me you can't do

483

00:16:06,230 --> 00:16:04,560

things i grew up in a little coal mining

484

00:16:09,590 --> 00:16:06,240

town in west virginia

485

00:16:11,350 --> 00:16:09,600

so if i can do that you can do that

486

00:16:13,350 --> 00:16:11,360

we've got a few minutes for a couple of

487

00:16:17,690 --> 00:16:13,360

quick questions if you'd like to do that

488

00:16:17,700 --> 00:16:21,430

[Music]

489

00:16:24,389 --> 00:16:22,389

um

490

00:16:27,189 --> 00:16:24,399

is

491

00:16:29,110 --> 00:16:27,199

the spacesuits kind of like armor not

492

00:16:34,629 --> 00:16:29,120

like

493

00:16:36,710 --> 00:16:34,639

solid or spacesuits solid

494

00:16:39,110 --> 00:16:36,720

spacer spacesuits are going to be very

495

00:16:41,030 --> 00:16:39,120

complicated for a mars mission they're

496

00:16:43,430 --> 00:16:41,040

probably going to have about eight or

497

00:16:45,509 --> 00:16:43,440

nine layers of material

498

00:16:47,430 --> 00:16:45,519

to protect you keep your pressurized

499

00:16:49,110 --> 00:16:47,440

keep you heated and cooled

500

00:16:50,629 --> 00:16:49,120

keep your breathing air circulating

501
00:16:52,550 --> 00:16:50,639
circulating a little water to heat you

502
00:16:54,629 --> 00:16:52,560
up and cool you down so that that suit

503
00:16:56,949 --> 00:16:54,639
is probably going to weigh maybe 300

504
00:16:59,749 --> 00:16:56,959
earth pounds

505
00:17:01,230 --> 00:16:59,759
on mars mars is one-third gravity

506
00:17:03,350 --> 00:17:01,240
if you weigh uh

507
00:17:06,309 --> 00:17:03,360
180 pounds here on earth you're going to

508
00:17:08,309 --> 00:17:06,319
weigh 60 pounds on mars so your

509
00:17:09,829 --> 00:17:08,319
spacesuit even though may weigh 90

510
00:17:11,029 --> 00:17:09,839
pounds will feel like it weighs 30

511
00:17:12,789 --> 00:17:11,039
pounds so

512
00:17:14,309 --> 00:17:12,799
it's not as cumbersome but you need to

513
00:17:16,069 --> 00:17:14,319

protect yourself

514

00:17:16,949 --> 00:17:16,079

so that spacesuit will be very thick

515

00:17:19,270 --> 00:17:16,959

with a

516

00:17:21,189 --> 00:17:19,280

helmet obviously to protect you

517

00:17:23,429 --> 00:17:21,199

provide you breathing air

518

00:17:25,110 --> 00:17:23,439

martian environment is not very friendly

519

00:17:26,789 --> 00:17:25,120

it's a beautiful planet but it's not

520

00:17:28,630 --> 00:17:26,799

very friendly most of the

521

00:17:31,510 --> 00:17:28,640

atmosphere is very thin and it's about

522

00:17:33,750 --> 00:17:31,520

97 percent carbon dioxide so you can't

523

00:17:35,190 --> 00:17:33,760

just jump out of your spacecraft and

524

00:17:37,110 --> 00:17:35,200

start breathing and living on the

525

00:17:38,470 --> 00:17:37,120

surface of mars without a suit to

526

00:17:39,990 --> 00:17:38,480

protect you or

527

00:17:42,070 --> 00:17:40,000

an environment like we have us behind

528

00:17:43,909 --> 00:17:42,080

here the martian rover so it's going to

529

00:17:45,350 --> 00:17:43,919

be quite a trip and

530

00:17:48,150 --> 00:17:45,360

i think it'd be well worth your time to

531

00:17:49,350 --> 00:17:48,160

study and prepare to go do it

532

00:17:50,950 --> 00:17:49,360

anything else

533

00:17:53,909 --> 00:17:50,960

john what was uh what were you doing

534

00:17:55,029 --> 00:17:53,919

before you became an astronaut i uh

535

00:17:56,630 --> 00:17:55,039

most of the astronauts were

536

00:17:59,190 --> 00:17:56,640

traditionally up until our class were

537

00:18:01,270 --> 00:17:59,200

all military pilots test pilots like

538

00:18:02,710 --> 00:18:01,280

myself i came from from the navy i was a

539

00:18:04,470 --> 00:18:02,720

test pilot in the

540

00:18:06,390 --> 00:18:04,480

united states navy

541

00:18:09,029 --> 00:18:06,400

there were 15 of us who were pilots with

542

00:18:11,669 --> 00:18:09,039

all the test pilot background

543

00:18:13,669 --> 00:18:11,679

i foresee maybe in the future of space

544

00:18:15,750 --> 00:18:13,679

travel that we may not need as many

545

00:18:17,990 --> 00:18:15,760

pilots as we're using today because most

546

00:18:19,270 --> 00:18:18,000

people will be operators

547

00:18:21,350 --> 00:18:19,280

we're not going to need flying

548

00:18:23,350 --> 00:18:21,360

capability to launch and land the

549

00:18:27,350 --> 00:18:23,360

futuristic spacecraft so you'll be more

550

00:18:29,029 --> 00:18:27,360

of an operator than you will be a pilot

551
00:18:30,150 --> 00:18:29,039
tell us about getting the phone call to

552
00:18:32,549 --> 00:18:30,160
find out that you had become an

553
00:18:33,990 --> 00:18:32,559
astronaut that's a good story

554
00:18:36,789 --> 00:18:34,000
no we uh

555
00:18:38,789 --> 00:18:36,799
nasa had about 8 000 serious candidates

556
00:18:40,630 --> 00:18:38,799
that they looked at to be selected for

557
00:18:42,070 --> 00:18:40,640
the astronaut program

558
00:18:44,150 --> 00:18:42,080
and then when they got down to the final

559
00:18:45,909 --> 00:18:44,160
8 000 they would uh

560
00:18:48,950 --> 00:18:45,919
they studied for about a year to thin

561
00:18:51,190 --> 00:18:48,960
them down to from 800 8 000 to 200 that

562
00:18:53,190 --> 00:18:51,200
they looked at pretty seriously

563
00:18:55,750 --> 00:18:53,200

and now that final 200 they would invite

564

00:18:58,310 --> 00:18:55,760

15 or 20 down to the kennedy i'm sorry

565

00:19:00,950 --> 00:18:58,320

the houston johnson space center

566

00:19:02,630 --> 00:19:00,960

for a week-long interview process

567

00:19:04,230 --> 00:19:02,640

they get into your head into your body

568

00:19:05,990 --> 00:19:04,240

they knew more about me physically and

569

00:19:09,510 --> 00:19:06,000

psycho psychology psychology

570

00:19:11,830 --> 00:19:09,520

psychologically than i knew about myself

571

00:19:13,830 --> 00:19:11,840

so after that one week with 10 or 15

572

00:19:16,470 --> 00:19:13,840

people each of that final 200 it took

573

00:19:18,310 --> 00:19:16,480

about six months for nasa to finally say

574

00:19:21,350 --> 00:19:18,320

here they are here's the 35 out of that

575

00:19:22,950 --> 00:19:21,360

final 200. so i felt good english word

576

00:19:24,630 --> 00:19:22,960

is blessed

577

00:19:26,630 --> 00:19:24,640

to have been chosen in that very first

578

00:19:28,710 --> 00:19:26,640

class with some super folks and like i

579

00:19:30,710 --> 00:19:28,720

said that all 35 of us got to fly at

580

00:19:33,110 --> 00:19:30,720

least one mission and most two or more

581

00:19:35,830 --> 00:19:33,120

so yeah obviously the selection process

582

00:19:37,590 --> 00:19:35,840

that we went through worked pretty well

583

00:19:39,510 --> 00:19:37,600

can you tell us what what it's like

584

00:19:41,750 --> 00:19:39,520

inside this rover

585

00:19:43,669 --> 00:19:41,760

this rover is very uh

586

00:19:45,909 --> 00:19:43,679

i bet you don't realize it but it comes

587

00:19:47,669 --> 00:19:45,919

apart it's two pieces

588

00:19:49,430 --> 00:19:47,679

these first front four wheels will

589

00:19:51,190 --> 00:19:49,440

separate from the back two wheels and

590

00:19:53,270 --> 00:19:51,200

that will go out and explore the surface

591

00:19:55,669 --> 00:19:53,280

of mars and bring back luna's martian

592

00:19:57,350 --> 00:19:55,679

samples back to the laboratory

593

00:19:58,710 --> 00:19:57,360

re-dock back in and join with the

594

00:20:01,270 --> 00:19:58,720

laboratory and then they can transfer

595

00:20:02,710 --> 00:20:01,280

the material from the front cockpit

596

00:20:04,870 --> 00:20:02,720

to the laboratory and once they're back

597

00:20:06,549 --> 00:20:04,880

together then they can live in the whole

598

00:20:08,789 --> 00:20:06,559

both parts of this

599

00:20:09,990 --> 00:20:08,799

martian rover so it's in two pieces i

600

00:20:12,549 --> 00:20:10,000

don't know whether you realize that or

601
00:20:14,470 --> 00:20:12,559
not so it separates so that you can go

602
00:20:16,230 --> 00:20:14,480
out and do the lunar martian exploration

603
00:20:18,310 --> 00:20:16,240
and come back and dock again

604
00:20:21,830 --> 00:20:18,320
there'll be probably four people

605
00:20:23,430 --> 00:20:21,840
that live and work and eat and sleep

606
00:20:29,830 --> 00:20:23,440
inside this vehicle when they're on the

607
00:20:34,950 --> 00:20:32,549
um do you think that mars could be

608
00:20:36,950 --> 00:20:34,960
habitable if we meddled

609
00:20:38,950 --> 00:20:36,960
well i think mars is habitable it's not

610
00:20:40,950 --> 00:20:38,960
habitable in the sense that we inhabit

611
00:20:42,710 --> 00:20:40,960
earth because the environment is much

612
00:20:45,510 --> 00:20:42,720
more

613
00:20:47,590 --> 00:20:45,520

maligned because it's uh like i say

614

00:20:49,590 --> 00:20:47,600

maybe gets up to the freezing level at

615

00:20:51,990 --> 00:20:49,600

the equator in the summertime but most

616

00:20:53,430 --> 00:20:52,000

of the time it's 40 or 50 degrees below

617

00:20:56,470 --> 00:20:53,440

zero

618

00:20:59,590 --> 00:20:56,480

so that in itself is a challenge

619

00:21:01,270 --> 00:20:59,600

the atmosphere is 97 carbon dioxide so

620

00:21:02,870 --> 00:21:01,280

you can't just if you could step out in

621

00:21:04,230 --> 00:21:02,880

the heat of the cold

622

00:21:07,190 --> 00:21:04,240

you can't breathe

623

00:21:08,630 --> 00:21:07,200

you could maybe take one big breath

624

00:21:09,750 --> 00:21:08,640

that'd be it

625

00:21:11,510 --> 00:21:09,760

bye bye

626
00:21:12,710 --> 00:21:11,520
you've got to have a lot of oxygen right

627
00:21:13,830 --> 00:21:12,720
to breathe and there's none on the

628
00:21:16,149 --> 00:21:13,840
surface it's

629
00:21:18,230 --> 00:21:16,159
i think one percent oxygen in the

630
00:21:20,310 --> 00:21:18,240
martian atmosphere so

631
00:21:22,230 --> 00:21:20,320
you can't live very it's not a very

632
00:21:24,549 --> 00:21:22,240
friendly planet so we have to live when

633
00:21:26,950 --> 00:21:24,559
we go outside of this vehicle

634
00:21:28,390 --> 00:21:26,960
to do excursions you know when we're

635
00:21:30,710 --> 00:21:28,400
walking like we did on the moon you're

636
00:21:32,710 --> 00:21:30,720
gonna have to have a suit

637
00:21:34,070 --> 00:21:32,720
to protect you and allow you to breathe

638
00:21:36,390 --> 00:21:34,080

and keep pressurized while you're

639

00:21:38,630 --> 00:21:36,400

outside doing your martian

640

00:21:40,710 --> 00:21:38,640

exploration

641

00:21:42,950 --> 00:21:40,720

okay

642

00:21:45,990 --> 00:21:42,960

is the vehicle air conditioned

643

00:21:47,590 --> 00:21:46,000

bet

644

00:21:48,789 --> 00:21:47,600

it's going to have a thermostat inside

645

00:21:50,230 --> 00:21:48,799

there just like we had in the space

646

00:21:53,029 --> 00:21:50,240

shuttle just like we had in the apollo

647

00:21:54,630 --> 00:21:53,039

just like you have at your home so

648

00:21:56,310 --> 00:21:54,640

if the commander says i want to turn

649

00:21:58,390 --> 00:21:56,320

down a couple more degrees you can turn

650

00:22:00,789 --> 00:21:58,400

the knob down it'll be a little two

651
00:22:02,390 --> 00:22:00,799
degrees cooler inside this vehicle

652
00:22:03,990 --> 00:22:02,400
if it gets a little cold in there you

653
00:22:05,510 --> 00:22:04,000
might want to turn the thermostat up but

654
00:22:06,870 --> 00:22:05,520
there's going to be a thermostat maybe

655
00:22:07,990 --> 00:22:06,880
two of them one in the front and the

656
00:22:09,750 --> 00:22:08,000
back

657
00:22:11,190 --> 00:22:09,760
so you can control the temperature in

658
00:22:13,510 --> 00:22:11,200
the front of the vehicle separately from

659
00:22:14,950 --> 00:22:13,520
the from the rear of the vehicle

660
00:22:16,789 --> 00:22:14,960
we have an online question wanting to

661
00:22:19,190 --> 00:22:16,799
know if the vehicle will be assembled on

662
00:22:19,990 --> 00:22:19,200
the surface or taken in one piece

663
00:22:21,110 --> 00:22:20,000

uh

664

00:22:23,270 --> 00:22:21,120

probably

665

00:22:25,270 --> 00:22:23,280

what you see here won't show up on mars

666

00:22:26,950 --> 00:22:25,280

in this condition it'll

667

00:22:28,870 --> 00:22:26,960

most of the things we sent to the moon

668

00:22:30,789 --> 00:22:28,880

were collapsible

669

00:22:32,230 --> 00:22:30,799

and you took the pieces and folded them

670

00:22:33,909 --> 00:22:32,240

out and put them together so i

671

00:22:36,710 --> 00:22:33,919

envisioned that this thing won't look

672

00:22:38,470 --> 00:22:36,720

very much like this as it leaves earth

673

00:22:40,870 --> 00:22:38,480

when it gets to mars and lands on the

674

00:22:42,710 --> 00:22:40,880

mars i think it will take the crew

675

00:22:44,470 --> 00:22:42,720

one or two days or maybe longer to

676

00:22:46,390 --> 00:22:44,480

assemble it into the

677

00:22:48,470 --> 00:22:46,400

what you see here today

678

00:22:50,390 --> 00:22:48,480

using their pressure suits probably to

679

00:22:52,950 --> 00:22:50,400

take the pieces and parts that are very

680

00:22:54,950 --> 00:22:52,960

you can't this is a very voluminous we

681

00:22:58,390 --> 00:22:54,960

say voluminous vehicle as you see it

682

00:23:00,470 --> 00:22:58,400

parked here today a lot of empty space

683

00:23:01,830 --> 00:23:00,480

we can't afford that on a vehicle to go

684

00:23:03,830 --> 00:23:01,840

to mars so everything's got to kind of

685

00:23:05,350 --> 00:23:03,840

be folded up and compressed

686

00:23:07,750 --> 00:23:05,360

and packaged into a way that it's

687

00:23:10,070 --> 00:23:07,760

minimal volume you still weigh the same

688

00:23:11,430 --> 00:23:10,080

thing but we want minimal volume

689

00:23:12,950 --> 00:23:11,440

and when you get to mars it's going to

690

00:23:14,950 --> 00:23:12,960

take crew like i say i don't know

691

00:23:15,990 --> 00:23:14,960

exactly how long to assemble all these

692

00:23:17,430 --> 00:23:16,000

pieces

693

00:23:19,510 --> 00:23:17,440

and made it look like what you see

694

00:23:21,430 --> 00:23:19,520

behind me but i only envisioned this

695

00:23:23,029 --> 00:23:21,440

thing showing up on mars looking exactly

696

00:23:26,390 --> 00:23:23,039

like you see it here

697

00:23:30,310 --> 00:23:28,630

hi my son asks

698

00:23:32,470 --> 00:23:30,320

either going to space or going back to

699

00:23:34,149 --> 00:23:32,480

space do you have experiences such as

700

00:23:35,510 --> 00:23:34,159

jet lag

701
00:23:37,510 --> 00:23:35,520
when you're going to space and coming

702
00:23:39,430 --> 00:23:37,520
back do you experience jet lag

703
00:23:41,029 --> 00:23:39,440
uh

704
00:23:42,789 --> 00:23:41,039
not really

705
00:23:45,190 --> 00:23:42,799
the thing you do experience is you have

706
00:23:47,830 --> 00:23:45,200
to adjust yourself to a sunrise and a

707
00:23:49,350 --> 00:23:47,840
sunset every 45 minutes

708
00:23:51,430 --> 00:23:49,360
you know we get accustomed to our

709
00:23:53,669 --> 00:23:51,440
circadian rhythms our sleeping cycle is

710
00:23:56,310 --> 00:23:53,679
set here on earth by sunrise and sunset

711
00:23:58,230 --> 00:23:56,320
so your head senses it's time for the

712
00:23:59,990 --> 00:23:58,240
sun to go down time for the sun to come

713
00:24:01,590 --> 00:24:00,000

up that helps you sleep

714

00:24:02,710 --> 00:24:01,600

but when you're in space particularly

715

00:24:04,470 --> 00:24:02,720

space shuttle you're going around the

716

00:24:05,830 --> 00:24:04,480

earth every 90 minutes and see a sunrise

717

00:24:07,750 --> 00:24:05,840

and a sunset

718

00:24:09,350 --> 00:24:07,760

that interferes tremendously with your

719

00:24:11,510 --> 00:24:09,360

circadian rhythm

720

00:24:13,029 --> 00:24:11,520

so to help that a little bit

721

00:24:15,190 --> 00:24:13,039

when we're in space in the shuttle we

722

00:24:17,269 --> 00:24:15,200

put blinds over all of our windows when

723

00:24:18,470 --> 00:24:17,279

we're trying to sleep so that no matter

724

00:24:20,470 --> 00:24:18,480

whether you're in the sunshine or

725

00:24:21,990 --> 00:24:20,480

darkness it's kind of dark inside the

726

00:24:23,990 --> 00:24:22,000

spacecraft

727

00:24:25,750 --> 00:24:24,000

and you can maybe get in a darker part

728

00:24:27,110 --> 00:24:25,760

of the space shuttle and sleep a little

729

00:24:28,390 --> 00:24:27,120

bit better i like to sleep in the

730

00:24:29,669 --> 00:24:28,400

airlock

731

00:24:31,590 --> 00:24:29,679

in the space shuttle it was kind of

732

00:24:33,430 --> 00:24:31,600

darker and quieter and cooler in there

733

00:24:35,750 --> 00:24:33,440

and i that was my favorite place to

734

00:24:37,990 --> 00:24:35,760

sleep my canadian friend liked to sleep

735

00:24:40,149 --> 00:24:38,000

right in the middle of the mid deck

736

00:24:42,470 --> 00:24:40,159

floating from one side to the other

737

00:24:44,070 --> 00:24:42,480

i i'd wake up and see his head going by

738

00:24:44,870 --> 00:24:44,080

headed toward that side of the mid deck

739

00:24:46,630 --> 00:24:44,880

and

740

00:24:48,149 --> 00:24:46,640

back asleep maybe two hours later i'd

741

00:24:49,909 --> 00:24:48,159

wake up his head had hit him over there

742

00:24:52,149 --> 00:24:49,919

stopped him start him in the other

743

00:24:53,510 --> 00:24:52,159

direction and i'd see his feet going by

744

00:24:55,909 --> 00:24:53,520

so he made about

745

00:24:57,909 --> 00:24:55,919

four trips across the mid deck during

746

00:24:59,430 --> 00:24:57,919

the eight hour sleeping period so a lot

747

00:25:00,870 --> 00:24:59,440

of people like to sleep in their mid

748

00:25:02,630 --> 00:25:00,880

their flight jack chairs up on the

749

00:25:05,669 --> 00:25:02,640

flight deck so you can actually sleep

750

00:25:08,630 --> 00:25:07,350

is there a particular region of mars

751
00:25:10,149 --> 00:25:08,640
that they're considering for the first

752
00:25:11,590 --> 00:25:10,159
landing site

753
00:25:13,190 --> 00:25:11,600
uh

754
00:25:14,789 --> 00:25:13,200
there probably are

755
00:25:16,710 --> 00:25:14,799
we want to kind of stay out of the

756
00:25:17,990 --> 00:25:16,720
mountainous areas obviously you don't

757
00:25:19,269 --> 00:25:18,000
want to try to land this thing in the

758
00:25:21,110 --> 00:25:19,279
mountains so

759
00:25:23,350 --> 00:25:21,120
there are probably three or four

760
00:25:25,750 --> 00:25:23,360
and once again i think it will depend on

761
00:25:27,909 --> 00:25:25,760
when when we leave and the orientation

762
00:25:29,190 --> 00:25:27,919
of the two planets at that time so yeah

763
00:25:30,390 --> 00:25:29,200

there's probably

764

00:25:32,549 --> 00:25:30,400

i don't know what they are but they

765

00:25:34,470 --> 00:25:32,559

probably have eight or ten or more

766

00:25:36,310 --> 00:25:34,480

designated potential landing sites and

767

00:25:38,870 --> 00:25:36,320

they'll probably as we get closer to

768

00:25:40,390 --> 00:25:38,880

launch finalize that choice

769

00:25:44,230 --> 00:25:40,400

did you have a least favorite job when

770

00:25:46,310 --> 00:25:44,240

you were in space a least favorite job

771

00:25:47,909 --> 00:25:46,320

i don't think there's any least favorite

772

00:25:50,310 --> 00:25:47,919

job i guess if you had to clean up the

773

00:25:51,830 --> 00:25:50,320

waste management system

774

00:25:53,909 --> 00:25:51,840

that's our toilet

775

00:25:55,430 --> 00:25:53,919

but we didn't have many pro many

776

00:25:57,029 --> 00:25:55,440

problems with that so if you had a

777

00:25:59,110 --> 00:25:57,039

problem with the waste management system

778

00:26:00,789 --> 00:25:59,120

that would probably be the worst one

779

00:26:02,950 --> 00:26:00,799

tell us about landing in the space

780

00:26:05,029 --> 00:26:02,960

shuttle what was that like

781

00:26:05,909 --> 00:26:05,039

well landing in the space shuttle as big

782

00:26:07,990 --> 00:26:05,919

and

783

00:26:10,710 --> 00:26:08,000

beautiful as it was when you came back

784

00:26:12,789 --> 00:26:10,720

to land it had no engines for landing so

785

00:26:15,269 --> 00:26:12,799

we were a glider

786

00:26:16,310 --> 00:26:15,279

so when we did our deorbit burn we came

787

00:26:17,830 --> 00:26:16,320

back

788

00:26:19,990 --> 00:26:17,840

we did our deorbit burn as a matter of

789

00:26:21,350 --> 00:26:20,000

fact over australia about one hour

790

00:26:23,350 --> 00:26:21,360

before landing

791

00:26:24,710 --> 00:26:23,360

so we traveled from australia to kennedy

792

00:26:26,789 --> 00:26:24,720

in one hour

793

00:26:28,549 --> 00:26:26,799

slowing down slowing down the whole way

794

00:26:30,789 --> 00:26:28,559

i had no engines

795

00:26:32,470 --> 00:26:30,799

when i decided to come home i turned my

796

00:26:35,190 --> 00:26:32,480

space shuttle around backward and start

797

00:26:36,830 --> 00:26:35,200

my jet engines to slow me down

798

00:26:40,390 --> 00:26:36,840

then i turned around forward and start

799

00:26:42,149 --> 00:26:40,400

falling i fall all the way to kennedy

800

00:26:43,510 --> 00:26:42,159

for one hour i'm falling back into the

801
00:26:45,029 --> 00:26:43,520
atmosphere

802
00:26:46,390 --> 00:26:45,039
and the deeper and deeper i get in the

803
00:26:48,230 --> 00:26:46,400
atmosphere the more and more air

804
00:26:50,630 --> 00:26:48,240
molecules i'm hitting

805
00:26:51,990 --> 00:26:50,640
which generate a lot of heat

806
00:26:54,630 --> 00:26:52,000
on the bottom of the space shuttle it

807
00:26:56,070 --> 00:26:54,640
gets up to maybe 3000 degrees on certain

808
00:26:57,830 --> 00:26:56,080
parts of the bottom of the shuttle so

809
00:26:59,269 --> 00:26:57,840
we're very concerned about that heat on

810
00:27:00,390 --> 00:26:59,279
the outside we want to keep it all out

811
00:27:01,830 --> 00:27:00,400
there

812
00:27:03,430 --> 00:27:01,840
because i get closer and closer to

813
00:27:05,350 --> 00:27:03,440

kennedy

814

00:27:06,870 --> 00:27:05,360

i'm i'm still a glider i don't have any

815

00:27:08,630 --> 00:27:06,880

engines i can't go around and try

816

00:27:09,750 --> 00:27:08,640

another landing again so i've got to get

817

00:27:12,310 --> 00:27:09,760

it right

818

00:27:14,070 --> 00:27:12,320

the very first and only time i do it so

819

00:27:17,110 --> 00:27:14,080

that's why we practice

820

00:27:19,110 --> 00:27:17,120

practice practice practice our landings

821

00:27:21,430 --> 00:27:19,120

because we only get one shot

822

00:27:23,510 --> 00:27:21,440

as i come back to kennedy i'm about 40

823

00:27:25,029 --> 00:27:23,520

000 feet eight miles above kennedy when

824

00:27:26,630 --> 00:27:25,039

i'm overhead

825

00:27:29,190 --> 00:27:26,640

so i manage my energy to make a

826

00:27:30,870 --> 00:27:29,200

spiraling glider-like approach

827

00:27:32,549 --> 00:27:30,880

to land on one of the runways at the

828

00:27:34,470 --> 00:27:32,559

kennedy space center it takes about four

829

00:27:36,630 --> 00:27:34,480

minutes to do that from forty thousand

830

00:27:38,470 --> 00:27:36,640

feet above the ground to landing you

831

00:27:39,830 --> 00:27:38,480

would not like it

832

00:27:40,789 --> 00:27:39,840

you feel like you're falling out of the

833

00:27:42,870 --> 00:27:40,799

sky

834

00:27:44,149 --> 00:27:42,880

my nose is down about twenty degrees as

835

00:27:45,990 --> 00:27:44,159

i'm coming in to

836

00:27:47,510 --> 00:27:46,000

land the spatial making circles around

837

00:27:49,110 --> 00:27:47,520

the kennedy to make sure i manage my

838

00:27:50,870 --> 00:27:49,120

energy perfectly

839

00:27:53,669 --> 00:27:50,880

to land on the runway

840

00:27:54,870 --> 00:27:53,679

we can't go around and try it again

841

00:27:56,149 --> 00:27:54,880

so when you come down to make that

842

00:27:58,389 --> 00:27:56,159

landing you've got to get it right the

843

00:28:01,110 --> 00:27:58,399

very first time so that's why we

844

00:28:02,950 --> 00:28:01,120

practice practice practice just like

845

00:28:04,470 --> 00:28:02,960

you'll do with your mathematics

846

00:28:06,070 --> 00:28:04,480

all right let's give joe mcbride a big

847

00:28:07,990 --> 00:28:06,080

round of applause thank you very much

848

00:28:09,350 --> 00:28:08,000

enjoy being with you we'd like to thank