



1
00:00:15,030 --> 00:00:13,110
dave this is amazing it really looks

2
00:00:16,470 --> 00:00:15,040
like a spaceship flying through space

3
00:00:18,790 --> 00:00:16,480
you guys film this kind of the same way

4
00:00:20,630 --> 00:00:18,800
they did the original no actually when

5
00:00:22,870 --> 00:00:20,640
they did the original they were actually

6
00:00:24,550 --> 00:00:22,880
able to go ahead and move the model we

7
00:00:27,589 --> 00:00:24,560
couldn't move the model so we just moved

8
00:00:29,589 --> 00:00:27,599
the camera so i built several rigs that

9
00:00:31,349 --> 00:00:29,599
would allow me to move the camera and

10
00:00:32,549 --> 00:00:31,359
make it look like it was flying through

11
00:00:34,470 --> 00:00:32,559
space

12
00:00:37,430 --> 00:00:34,480
hey john do we have the astronauts

13
00:00:39,750 --> 00:00:37,440

delivering the opening lines oh sure man

14

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

space the final frontier the final

15

00:00:44,389 --> 00:00:42,320

frontier these are the voyages of the

16

00:00:46,229 --> 00:00:44,399

starship enterprise

17

00:00:47,830 --> 00:00:46,239

that's really cool can you guys put the

18

00:00:51,990 --> 00:00:47,840

two of them together and see what that

19

00:00:55,029 --> 00:00:53,189

space

20

00:00:57,029 --> 00:00:55,039

the final frontier

21

00:00:59,029 --> 00:00:57,039

these are the voyages of the starship

22

00:01:01,110 --> 00:00:59,039

enterprise

23

00:01:03,270 --> 00:01:01,120

its five-year mission its five-year

24

00:01:06,149 --> 00:01:03,280

mission to explore a strange new world

25

00:01:08,550 --> 00:01:06,159

strange new world new life new life and

26

00:01:12,070 --> 00:01:08,560

new civilizations and to boldly go to

27

00:01:21,030 --> 00:01:12,080

boldly grow where no man no man no one

28

00:01:24,870 --> 00:01:23,190

you guys are a bunch of digital wizards

29

00:01:26,870 --> 00:01:24,880

it's pretty amazing to think of the

30

00:01:29,670 --> 00:01:26,880

stuff that was science fiction 50 years

31

00:01:31,670 --> 00:01:29,680

ago and has now become science reality

32

00:01:33,429 --> 00:01:31,680

i just wish we could teleport

33

00:01:36,149 --> 00:01:33,439

that's the thing

34

00:01:37,910 --> 00:01:36,159

that that's a thing that's a thing

35

00:01:39,350 --> 00:01:37,920

you've got to tell me about this sure do

36

00:01:40,469 --> 00:01:39,360

you have some time i got about 30

37

00:01:43,510 --> 00:01:40,479

minutes

38

00:01:47,429 --> 00:01:43,520

this is steven 30.

39

00:01:47,439 --> 00:01:49,910

what

40

00:01:49,920 --> 00:01:52,789

beam me up

41

00:02:22,309 --> 00:01:54,389

and she forgot her stuff

42

00:02:22,319 --> 00:02:46,470

this is 7 30.

43

00:02:52,070 --> 00:02:49,190

hi i'm beth wilson and welcome to our

44

00:02:54,070 --> 00:02:52,080

very first stem 30 of this season we are

45

00:02:56,390 --> 00:02:54,080

coming to you live from the boeing

46

00:02:58,390 --> 00:02:56,400

milestones flight hall at the national

47

00:03:01,190 --> 00:02:58,400

air and space museum in downtown

48

00:03:03,910 --> 00:03:01,200

washington d.c

49

00:03:06,229 --> 00:03:03,920

and i'm marty kelsey and you forgot your

50

00:03:07,589 --> 00:03:06,239

stuff you also forgot your costume i

51
00:03:10,149 --> 00:03:07,599
i've got mine

52
00:03:12,710 --> 00:03:10,159
listen marty i'm an educator not an

53
00:03:14,790 --> 00:03:12,720
actress and we decided not on costumes

54
00:03:16,550 --> 00:03:14,800
we have our nice red shirts yeah but the

55
00:03:17,990 --> 00:03:16,560
red shirts didn't turn out so well for

56
00:03:20,949 --> 00:03:18,000
the guys that were on the original

57
00:03:22,070 --> 00:03:20,959
series now anyway i'd like to welcome

58
00:03:24,470 --> 00:03:22,080
some students that we have in the

59
00:03:26,789 --> 00:03:24,480
audience today kelly middle middle kelly

60
00:03:28,149 --> 00:03:26,799
miller middle school who is joining us

61
00:03:29,589 --> 00:03:28,159
they've got some great questions that

62
00:03:30,869 --> 00:03:29,599
they're going to be asking our experts

63
00:03:33,589 --> 00:03:30,879

today welcome

64

00:03:36,309 --> 00:03:33,599

and we'd also like to remind you those

65

00:03:38,470 --> 00:03:36,319

of you watching online that on the right

66

00:03:40,390 --> 00:03:38,480

hand side you'll see a chat box if you

67

00:03:43,110 --> 00:03:40,400

put a question in there we might take

68

00:03:49,190 --> 00:03:43,120

one live on the air if not we have an

69

00:03:53,030 --> 00:03:50,309

well if you haven't figured it out

70

00:03:55,270 --> 00:03:53,040

today's show is all about star trek the

71

00:03:57,030 --> 00:03:55,280

show went on the air 50 years ago this

72

00:03:59,589 --> 00:03:57,040

month and many of the things that were

73

00:04:02,229 --> 00:03:59,599

fictional elements back then have become

74

00:04:04,390 --> 00:04:02,239

fact today as a matter of fact one of

75

00:04:05,990 --> 00:04:04,400

the things that they had was this box

76

00:04:07,990 --> 00:04:06,000

kind of tablet thing that they could

77

00:04:10,149 --> 00:04:08,000

read information off of or record

78

00:04:11,750 --> 00:04:10,159

information on and it looks eerily like

79

00:04:14,630 --> 00:04:11,760

an ipad that you might be watching the

80

00:04:17,030 --> 00:04:14,640

show on today but that was 40 years

81

00:04:20,710 --> 00:04:17,040

before the ipad was actually invented

82

00:04:23,430 --> 00:04:20,720

now marty our show is called stem 30.

83

00:04:25,670 --> 00:04:23,440

stem stands for science technology

84

00:04:27,590 --> 00:04:25,680

engineering and math what does that have

85

00:04:29,430 --> 00:04:27,600

to do with science fiction well there's

86

00:04:32,150 --> 00:04:29,440

another term that's gaining some steam

87

00:04:34,870 --> 00:04:32,160

and that is steam and that stands for

88

00:04:37,030 --> 00:04:34,880

science technology engineering the arts

89

00:04:40,070 --> 00:04:37,040

and math and star trek is a great

90

00:04:43,510 --> 00:04:40,080

example of steam because real science

91

00:04:45,350 --> 00:04:43,520

influenced the fiction and actually you

92

00:04:47,670 --> 00:04:45,360

got a chance to talk to someone who was

93

00:04:50,310 --> 00:04:47,680

very knowledgeable about this let's see

94

00:04:52,310 --> 00:04:50,320

what they had to say make it so

95

00:04:54,550 --> 00:04:52,320

i'm joined by rod roddenberry the son of

96

00:04:55,749 --> 00:04:54,560

gene roddenberry creator of star trek

97

00:04:57,350 --> 00:04:55,759

and you're a co-founder of the

98

00:04:58,710 --> 00:04:57,360

roddenberry foundation thank you so much

99

00:05:01,350 --> 00:04:58,720

for talking with us thank you for having

100

00:05:03,590 --> 00:05:01,360

me now a lot of the science fiction that

101
00:05:05,990 --> 00:05:03,600
your dad invented was actually ground in

102
00:05:08,230 --> 00:05:06,000
science fact yeah you know actually a

103
00:05:10,390 --> 00:05:08,240
lot of people give my father credit for

104
00:05:12,469 --> 00:05:10,400
for inventing these technologies but he

105
00:05:14,310 --> 00:05:12,479
he really didn't credit himself that way

106
00:05:15,990 --> 00:05:14,320
he was just a writer but he was an

107
00:05:17,670 --> 00:05:16,000
intelligent person who knew the right

108
00:05:19,350 --> 00:05:17,680
people to talk to so he would call up

109
00:05:20,710 --> 00:05:19,360
the agencies and the institutions that

110
00:05:22,150 --> 00:05:20,720
were working on these technologies for

111
00:05:23,430 --> 00:05:22,160
example there was a book

112
00:05:24,629 --> 00:05:23,440
called the making of star trek by

113
00:05:25,909 --> 00:05:24,639

stephen whitfield and in that book i

114

00:05:27,830 --> 00:05:25,919

believe there was a passage where my

115

00:05:30,070 --> 00:05:27,840

father uh wrote a letter to either

116

00:05:32,550 --> 00:05:30,080

caltech or jpl and he said we're looking

117

00:05:34,550 --> 00:05:32,560

for this you know non-lethal non-lethal

118

00:05:35,749 --> 00:05:34,560

weapon and you know what are you guys

119

00:05:37,670 --> 00:05:35,759

working on what would you suggest and

120

00:05:39,510 --> 00:05:37,680

they said well this is the early 60s and

121

00:05:40,790 --> 00:05:39,520

they were developing lasers but they

122

00:05:43,590 --> 00:05:40,800

said you know what's on the what's

123

00:05:46,150 --> 00:05:43,600

coming up is is the phasing laser and so

124

00:05:48,790 --> 00:05:46,160

that's where the phaser came from and so

125

00:05:50,870 --> 00:05:48,800

it really strikes me as is fantastic

126

00:05:53,110 --> 00:05:50,880

that that all these technologies that we

127

00:05:54,950 --> 00:05:53,120

we hear about in star trek and love

128

00:05:56,710 --> 00:05:54,960

they actually came from sources that

129

00:05:58,150 --> 00:05:56,720

that were already working on them that's

130

00:06:01,430 --> 00:05:58,160

incredible thank you so much for talking

131

00:06:06,469 --> 00:06:03,270

now not only was the fiction of star

132

00:06:09,430 --> 00:06:06,479

trek influenced by real science but a

133

00:06:11,670 --> 00:06:09,440

lot of um designers and engineers have a

134

00:06:13,029 --> 00:06:11,680

really strong background in the arts and

135

00:06:15,029 --> 00:06:13,039

music as a matter of fact there have

136

00:06:16,710 --> 00:06:15,039

been a lot of astronauts that have taken

137

00:06:18,629 --> 00:06:16,720

uh instruments with them into space and

138

00:06:20,629 --> 00:06:18,639

our friend chelle lindgren actually took

139

00:06:24,550 --> 00:06:20,639

a bagpipe with him now

140

00:06:27,670 --> 00:06:24,560

star trek is the perfect example of

141

00:06:30,070 --> 00:06:27,680

steam uh it is actually fiction it's

142

00:06:32,469 --> 00:06:30,080

literature it's science fiction but to

143

00:06:35,029 --> 00:06:32,479

have great science fiction you have to

144

00:06:37,270 --> 00:06:35,039

have great fiction and terrific science

145

00:06:39,590 --> 00:06:37,280

and that's what star trek did

146

00:06:42,309 --> 00:06:39,600

it combined the two and not only did it

147

00:06:44,309 --> 00:06:42,319

entertain but it also inspired yeah star

148

00:06:46,469 --> 00:06:44,319

trek created this world of imagination

149

00:06:48,629 --> 00:06:46,479

that portrayed a universe of unlimited

150

00:06:51,110 --> 00:06:48,639

possibilities and in the process it

151

00:06:52,950 --> 00:06:51,120

inspired an entire generation of

152

00:06:55,110 --> 00:06:52,960

scientists and engineers and even

153

00:06:56,629 --> 00:06:55,120

astronauts and we got a chance to talk

154

00:06:59,510 --> 00:06:56,639

to some of those people about how

155

00:07:02,070 --> 00:06:59,520

science fiction inspired them

156

00:07:04,309 --> 00:07:02,080

did science fiction influence your

157

00:07:06,309 --> 00:07:04,319

career path at all most definitely

158

00:07:07,990 --> 00:07:06,319

actually i mean i probably was always

159

00:07:09,749 --> 00:07:08,000

going to be an engineer of some sort but

160

00:07:11,110 --> 00:07:09,759

when i started really getting into

161

00:07:12,870 --> 00:07:11,120

science fiction

162

00:07:15,270 --> 00:07:12,880

star trek

163

00:07:16,870 --> 00:07:15,280

star wars i really started to understand

164

00:07:18,629 --> 00:07:16,880

oh i really want to work in the

165

00:07:20,950 --> 00:07:18,639

aerospace industry i want to build space

166

00:07:22,230 --> 00:07:20,960

vehicles and so that sort of changed me

167

00:07:23,990 --> 00:07:22,240

from just being a mechanical engineer

168

00:07:25,110 --> 00:07:24,000

into really wanting and focusing in what

169

00:07:27,029 --> 00:07:25,120

i wanted to do

170

00:07:29,270 --> 00:07:27,039

i really like the science fiction that

171

00:07:30,469 --> 00:07:29,280

has to do more with futuristic or with

172

00:07:32,469 --> 00:07:30,479

technology

173

00:07:35,350 --> 00:07:32,479

something like back to the future you

174

00:07:37,350 --> 00:07:35,360

know where you're testing technology and

175

00:07:39,189 --> 00:07:37,360

kind of pushing the edges of technology

176

00:07:40,629 --> 00:07:39,199

i believe that that's really important

177

00:07:42,469 --> 00:07:40,639

for the missions that nasa would like to

178

00:07:45,350 --> 00:07:42,479

do for deep space so anything that's

179

00:07:46,710 --> 00:07:45,360

futuristic or you know big techno i'm a

180

00:07:48,150 --> 00:07:46,720

big fan of

181

00:07:50,790 --> 00:07:48,160

i was a

182

00:07:52,230 --> 00:07:50,800

huge bookworm when i was uh little and

183

00:07:54,790 --> 00:07:52,240

read everything i could get my hands on

184

00:07:56,550 --> 00:07:54,800

but but science fiction was something

185

00:07:58,869 --> 00:07:56,560

that i was very interested in

186

00:08:02,230 --> 00:07:58,879

reading heinlein and clark orson scott

187

00:08:04,550 --> 00:08:02,240

card these uh had a huge influence on me

188

00:08:05,830 --> 00:08:04,560

as i got older i came to appreciate that

189

00:08:07,510 --> 00:08:05,840

science fiction

190

00:08:08,710 --> 00:08:07,520

drove a lot of the imagination that

191

00:08:11,430 --> 00:08:08,720

ultimately

192

00:08:12,869 --> 00:08:11,440

engineering was able to create so you

193

00:08:15,189 --> 00:08:12,879

had kind of the inspiration within

194

00:08:16,550 --> 00:08:15,199

science fiction these these big dreamers

195

00:08:18,390 --> 00:08:16,560

and thinkers of what could be the

196

00:08:19,749 --> 00:08:18,400

possibility followed up with the

197

00:08:21,350 --> 00:08:19,759

engineering who would take it and make

198

00:08:23,510 --> 00:08:21,360

it a reality

199

00:08:25,749 --> 00:08:23,520

i grew up

200

00:08:27,589 --> 00:08:25,759

loving star trek in fact i i do think

201

00:08:29,589 --> 00:08:27,599

it's one of the things that got me into

202

00:08:32,550 --> 00:08:29,599

wanting to become an astronaut i was

203

00:08:34,149 --> 00:08:32,560

definitely a big tracker in space

204

00:08:37,829 --> 00:08:34,159

is there anything out of science fiction

205

00:08:42,709 --> 00:08:37,839

that you'd like to see uh at nasa now

206

00:08:44,870 --> 00:08:42,719

wow if we could travel at light speed or

207

00:08:45,590 --> 00:08:44,880

teleport that would be pretty cool

208

00:08:48,230 --> 00:08:45,600

but

209

00:08:49,030 --> 00:08:48,240

honestly being in space

210

00:08:53,350 --> 00:08:49,040

it

211

00:08:55,110 --> 00:08:53,360

science fiction has sort of become

212

00:08:57,110 --> 00:08:55,120

science fact you know you start to look

213

00:08:58,550 --> 00:08:57,120

at cell phones and and what's happened

214

00:09:00,230 --> 00:08:58,560

it's like we almost have a tricorder

215

00:09:01,190 --> 00:09:00,240

right i mean it's not too long before

216

00:09:03,030 --> 00:09:01,200

you're going to be able to take out your

217

00:09:04,310 --> 00:09:03,040

cell phone and scan yourself and go okay

218

00:09:05,910 --> 00:09:04,320

well my ribs aren't broken and my

219

00:09:07,829 --> 00:09:05,920

heart's working i mean i get my heart

220

00:09:09,430 --> 00:09:07,839

rate from my you know my watch now so i

221

00:09:12,470 --> 00:09:09,440

mean um i think there's a lot of things

222

00:09:14,230 --> 00:09:12,480

that are definitely analogs and push uh

223

00:09:16,790 --> 00:09:14,240

what we're doing in terms of engineering

224

00:09:18,949 --> 00:09:16,800

and science from science fiction

225

00:09:21,430 --> 00:09:18,959

that's the mystery of exploration and

226

00:09:23,430 --> 00:09:21,440

wanted to go places you know that that

227

00:09:25,590 --> 00:09:23,440

famous line from star trek right to

228

00:09:27,750 --> 00:09:25,600

boldly go where no one has gone before

229

00:09:30,070 --> 00:09:27,760

that just spoke to me you know it was so

230

00:09:33,190 --> 00:09:30,080

appealing the sense of adventure the

231

00:09:36,150 --> 00:09:33,200

sense of journey of going places um the

232

00:09:38,230 --> 00:09:36,160

team the the this

233

00:09:40,310 --> 00:09:38,240

under current which is in the whole star

234

00:09:41,990 --> 00:09:40,320

trek story of being part of a of an

235

00:09:43,590 --> 00:09:42,000

amazing team where everybody contributes

236

00:09:45,269 --> 00:09:43,600

and everybody's motivated and everybody

237

00:09:48,389 --> 00:09:45,279

wants to do the best that they possibly

238

00:09:51,110 --> 00:09:48,399

can and of course this utopian vision of

239

00:09:52,949 --> 00:09:51,120

a world where you know we all get along

240

00:09:54,230 --> 00:09:52,959

as as human beings and we really take

241

00:09:56,389 --> 00:09:54,240

care of each other

242

00:09:57,990 --> 00:09:56,399

while we were in space it happened that

243

00:10:00,470 --> 00:09:58,000

unfortunately leonard nimoy passed away

244

00:10:02,870 --> 00:10:00,480

so we were able to do a tribute for him

245

00:10:04,630 --> 00:10:02,880

and so science fiction has had a

246

00:10:09,269 --> 00:10:04,640

an impact on me and my other crewmates

247

00:10:12,550 --> 00:10:10,870

well we're now joined by dr margaret

248

00:10:13,910 --> 00:10:12,560

whitakamp a curator here at the national

249

00:10:16,069 --> 00:10:13,920

air and space museum thanks for joining

250

00:10:17,990 --> 00:10:16,079

us today i'm delighted now margaret we

251
00:10:19,750 --> 00:10:18,000
are standing in the boeing milestones of

252
00:10:22,069 --> 00:10:19,760
flight hall surrounded by some of the

253
00:10:24,870 --> 00:10:22,079
most iconic artifacts in space and

254
00:10:27,509 --> 00:10:24,880
aviation history we've got spaceship one

255
00:10:29,670 --> 00:10:27,519
bell x1 the lunar module and the spirit

256
00:10:33,190 --> 00:10:29,680
of st louis but behind us

257
00:10:35,190 --> 00:10:33,200
is a fictional prop why is that here

258
00:10:36,790 --> 00:10:35,200
well it's actually been here uh since

259
00:10:39,430 --> 00:10:36,800
before this building was built the

260
00:10:41,190 --> 00:10:39,440
museum acquired the 11-foot studio model

261
00:10:43,829 --> 00:10:41,200
of the star trek starship enterprise

262
00:10:46,150 --> 00:10:43,839
used in all of the shows of the original

263
00:10:47,670 --> 00:10:46,160

series in 1974.

264

00:10:50,069 --> 00:10:47,680

and it's the museum has always been

265

00:10:52,310 --> 00:10:50,079

interested in these imagined visions of

266

00:10:54,230 --> 00:10:52,320

space flight and in visualizations of

267

00:10:55,670 --> 00:10:54,240

flight generally star trek is a

268

00:10:57,829 --> 00:10:55,680

wonderful example

269

00:11:01,190 --> 00:10:57,839

now we've been talking about fact and

270

00:11:03,750 --> 00:11:01,200

fiction and star trek inspired a lot of

271

00:11:05,670 --> 00:11:03,760

inventions that are now becoming reality

272

00:11:07,990 --> 00:11:05,680

can you tell us about that yes well very

273

00:11:09,750 --> 00:11:08,000

much as rod roddenberry said the writers

274

00:11:11,990 --> 00:11:09,760

and developers of the show were looking

275

00:11:13,350 --> 00:11:12,000

at what was perhaps on the drawing board

276

00:11:15,350 --> 00:11:13,360

and might come out

277

00:11:17,670 --> 00:11:15,360

and they also then just had a lot of fun

278

00:11:19,590 --> 00:11:17,680

dreaming up uh some ideas of what they

279

00:11:21,670 --> 00:11:19,600

would love to have you know something

280

00:11:23,670 --> 00:11:21,680

you could tap and communicate with

281

00:11:24,949 --> 00:11:23,680

being able to really work with computers

282

00:11:26,470 --> 00:11:24,959

and talk to them and get all the

283

00:11:27,990 --> 00:11:26,480

information you need

284

00:11:29,990 --> 00:11:28,000

and more and more we're seeing it come

285

00:11:31,269 --> 00:11:30,000

true now should we take a little bit

286

00:11:33,430 --> 00:11:31,279

more of a look at some of this

287

00:11:34,790 --> 00:11:33,440

technology that's come to be oh i think

288

00:11:36,389 --> 00:11:34,800

that would be a great idea are you ready

289

00:11:43,750 --> 00:11:36,399

to go i'm ready to go

290

00:11:48,230 --> 00:11:46,150

as marty said that there's a lot of

291

00:11:49,910 --> 00:11:48,240

technology out there now this stemmit to

292

00:11:52,230 --> 00:11:49,920

win it is a little different because you

293

00:11:53,910 --> 00:11:52,240

guys are going to have to choose

294

00:11:55,590 --> 00:11:53,920

i'm going to give you uh something that

295

00:11:58,069 --> 00:11:55,600

was used on star trek you're going to

296

00:12:01,030 --> 00:11:58,079

have to choose whether it was fact

297

00:12:03,269 --> 00:12:01,040

fiction or somewhere in between are you

298

00:12:05,110 --> 00:12:03,279

guys ready for our first piece of

299

00:12:06,150 --> 00:12:05,120

technology

300

00:12:09,110 --> 00:12:06,160

okay

301
00:12:11,430 --> 00:12:09,120
our first piece of technology introduced

302
00:12:14,150 --> 00:12:11,440
in star trek 50 years ago

303
00:12:16,230 --> 00:12:14,160
is the communicator all right they use

304
00:12:18,790 --> 00:12:16,240
this it looked like this

305
00:12:21,269 --> 00:12:18,800
and they used this to communicate over

306
00:12:23,670 --> 00:12:21,279
long distances

307
00:12:25,269 --> 00:12:23,680
do you think that today

308
00:12:27,509 --> 00:12:25,279
this is fact

309
00:12:37,030 --> 00:12:27,519
fiction or somewhere in between go stand

310
00:12:42,710 --> 00:12:40,230
okay all of you chose fact so why didn't

311
00:12:44,550 --> 00:12:42,720
you tell me why did you choose fact

312
00:12:46,870 --> 00:12:44,560
i chose fact because

313
00:12:49,190 --> 00:12:46,880

it because because they use

314

00:12:51,110 --> 00:12:49,200

communicators in the ship

315

00:12:53,750 --> 00:12:51,120

we use communicators now we use

316

00:12:56,629 --> 00:12:53,760

communicators now and to give us

317

00:12:58,790 --> 00:12:56,639

what is the right answer margaret is it

318

00:13:01,509 --> 00:12:58,800

fact or fiction they are all exactly

319

00:13:03,750 --> 00:13:01,519

right in fact it is fact many of you

320

00:13:05,829 --> 00:13:03,760

probably have a smartphone or a cell

321

00:13:08,629 --> 00:13:05,839

phone in your pocket or in your purse in

322

00:13:11,030 --> 00:13:08,639

your bag and we know that the inventor

323

00:13:13,350 --> 00:13:11,040

for motorola who came up with the flip

324

00:13:14,949 --> 00:13:13,360

phone was thinking very directly about

325

00:13:16,949 --> 00:13:14,959

the star trek communicator and that

326

00:13:17,910 --> 00:13:16,959

wonderful flip

327

00:13:19,990 --> 00:13:17,920

motion

328

00:13:21,829 --> 00:13:20,000

now we tend to use things where we're

329

00:13:24,230 --> 00:13:21,839

actually combining multiple devices into

330

00:13:26,389 --> 00:13:24,240

one okay so are you guys ready for the

331

00:13:29,750 --> 00:13:26,399

next piece of technology

332

00:13:32,790 --> 00:13:29,760

this is called a tricorder a tricorder

333

00:13:34,470 --> 00:13:32,800

was created for the star trek series and

334

00:13:36,790 --> 00:13:34,480

what it did was they would move the

335

00:13:39,990 --> 00:13:36,800

tricorder up and down over somebody's

336

00:13:42,470 --> 00:13:40,000

body to to get a medical diagnosis

337

00:13:44,230 --> 00:13:42,480

whether you had a broken bone

338

00:13:46,550 --> 00:13:44,240

or you had some sort of infection they

339

00:13:49,189 --> 00:13:46,560

could tell using the tri quarter now is

340

00:13:56,470 --> 00:13:49,199

that today is that fact fiction or

341

00:13:59,430 --> 00:13:57,670

okay

342

00:14:01,590 --> 00:13:59,440

it looks like they're all

343

00:14:03,269 --> 00:14:01,600

okay we've got one piece of fiction

344

00:14:04,629 --> 00:14:03,279

let's uh

345

00:14:06,150 --> 00:14:04,639

let's ask the fiction guy why do you

346

00:14:09,670 --> 00:14:06,160

think it's fiction

347

00:14:11,750 --> 00:14:09,680

i don't think that they use that now so

348

00:14:13,590 --> 00:14:11,760

you don't think they use it today no

349

00:14:14,629 --> 00:14:13,600

okay well why did you guys pick in

350

00:14:16,550 --> 00:14:14,639

between

351

00:14:18,870 --> 00:14:16,560

uh because

352

00:14:21,189 --> 00:14:18,880

it's like an x-ray it's like an x-ray

353

00:14:23,829 --> 00:14:21,199

okay margaret what do you think actually

354

00:14:26,790 --> 00:14:23,839

uh it's in between and it is moving from

355

00:14:28,949 --> 00:14:26,800

fiction to fact uh there is a qualcomm

356

00:14:30,389 --> 00:14:28,959

tricorder x prize right now and there's

357

00:14:32,870 --> 00:14:30,399

a whole series of teams that have been

358

00:14:34,870 --> 00:14:32,880

working on ways to create a device that

359

00:14:36,629 --> 00:14:34,880

without being invasive without a shot

360

00:14:38,949 --> 00:14:36,639

without cutting into you you'd be able

361

00:14:41,189 --> 00:14:38,959

to figure out how your body is doing uh

362

00:14:43,670 --> 00:14:41,199

the teams delivered their devices in san

363

00:14:45,110 --> 00:14:43,680

diego a few months ago and there are a

364

00:14:47,430 --> 00:14:45,120

number of teams that are working on

365

00:14:50,230 --> 00:14:47,440

trying to create a tricorder so it's

366

00:14:51,990 --> 00:14:50,240

coming it's coming okay the next one are

367

00:14:54,629 --> 00:14:52,000

you guys ready for the next one is

368

00:14:57,110 --> 00:14:54,639

called a tractor beam in star trek they

369

00:14:59,509 --> 00:14:57,120

use the tractor beam to capture one

370

00:15:02,629 --> 00:14:59,519

spaceship to pull it toward the next

371

00:15:13,910 --> 00:15:02,639

spaceship kind of like an invisible rope

372

00:15:17,350 --> 00:15:15,430

where are you going are you doing in

373

00:15:18,870 --> 00:15:17,360

between why do you think everyone

374

00:15:20,949 --> 00:15:18,880

thought it was fiction except you why do

375

00:15:23,269 --> 00:15:20,959

you think in between

376

00:15:24,870 --> 00:15:23,279

today we used like magnus to connect

377

00:15:26,230 --> 00:15:24,880

stuff like string

378

00:15:27,990 --> 00:15:26,240

sure but then back then they used to

379

00:15:30,230 --> 00:15:28,000

like use heavy stuff

380

00:15:32,150 --> 00:15:30,240

yep so i have to get between okay in

381

00:15:34,870 --> 00:15:32,160

between kind of like magnets margaret

382

00:15:37,110 --> 00:15:34,880

what what is it um actually you're right

383

00:15:40,150 --> 00:15:37,120

in between there's a group at new york

384

00:15:43,509 --> 00:15:40,160

university uh that is actually using a

385

00:15:45,670 --> 00:15:43,519

light wave to pull things towards you um

386

00:15:47,749 --> 00:15:45,680

those things are microscopic right now

387

00:15:50,230 --> 00:15:47,759

so it's not big enough to pull one

388

00:15:52,310 --> 00:15:50,240

spaceship towards another spaceship uh

389

00:15:54,150 --> 00:15:52,320

but as the gentleman there the

390

00:15:55,509 --> 00:15:54,160

researcher likes to say they're hundreds

391

00:15:57,509 --> 00:15:55,519

of years ahead of schedule for

392

00:15:59,189 --> 00:15:57,519

developing a tractor beam okay are we

393

00:16:00,670 --> 00:15:59,199

ready for our last one you guys ready

394

00:16:02,389 --> 00:16:00,680

for our last one

395

00:16:04,949 --> 00:16:02,399

teleportation

396

00:16:08,230 --> 00:16:04,959

in the original star trek series

397

00:16:10,710 --> 00:16:08,240

they used to be matter from one place to

398

00:16:12,790 --> 00:16:10,720

the next to get to a place

399

00:16:15,350 --> 00:16:12,800

far away is that fact fiction or

400

00:16:16,710 --> 00:16:15,360

somewhere in between

401
00:16:21,990 --> 00:16:16,720
go ahead and line up where you guys

402
00:16:22,000 --> 00:16:27,030
teleport

403
00:16:29,990 --> 00:16:28,389
okay

404
00:16:32,310 --> 00:16:30,000
all right it all looks like you guys all

405
00:16:35,030 --> 00:16:32,320
said fiction why did you say fiction

406
00:16:38,790 --> 00:16:35,040
you don't know why did you say fiction i

407
00:16:41,269 --> 00:16:38,800
said i said fiction because like

408
00:16:43,430 --> 00:16:41,279
we really really had teleporters in like

409
00:16:45,430 --> 00:16:43,440
real life i mean we have them in movies

410
00:16:47,670 --> 00:16:45,440
and video games but not in real life not

411
00:16:49,749 --> 00:16:47,680
in real life margaret factor fiction uh

412
00:16:52,310 --> 00:16:49,759
as much as we would love this to be so

413
00:16:54,870 --> 00:16:52,320

it is still very much a part of fiction

414

00:16:56,870 --> 00:16:54,880

um and i think anyone in the dc area

415

00:16:58,470 --> 00:16:56,880

would love to be able to

416

00:17:00,069 --> 00:16:58,480

beam from one place to the next and

417

00:17:02,310 --> 00:17:00,079

avoid the traffic

418

00:17:03,990 --> 00:17:02,320

but right now we're still waiting for a

419

00:17:05,990 --> 00:17:04,000

transporter okay should we take some

420

00:17:10,069 --> 00:17:06,000

questions i'd love to text okay let's

421

00:17:14,230 --> 00:17:11,510

uh

422

00:17:16,710 --> 00:17:14,240

what is the enterprise model made of

423

00:17:18,390 --> 00:17:16,720

actually it's mostly wood

424

00:17:20,549 --> 00:17:18,400

that is painted there's uh some

425

00:17:22,150 --> 00:17:20,559

vacuformed plastic on the top and bottom

426

00:17:23,669 --> 00:17:22,160

of the saucer sections and a little bit

427

00:17:26,230 --> 00:17:23,679

of rolled metal in the back of the

428

00:17:28,789 --> 00:17:26,240

engine pods or the nacelles um but

429

00:17:31,270 --> 00:17:28,799

actually the model was made of wood in

430

00:17:33,510 --> 00:17:31,280

the in 1964 because it was the least

431

00:17:35,110 --> 00:17:33,520

expensive way to make it uh and that

432

00:17:37,350 --> 00:17:35,120

works out beautifully for us because

433

00:17:39,750 --> 00:17:37,360

it's actually held up very nicely over

434

00:17:41,909 --> 00:17:39,760

50 years okay and we do have an audience

435

00:17:43,830 --> 00:17:41,919

question you have my first question what

436

00:17:45,510 --> 00:17:43,840

is your question

437

00:17:47,630 --> 00:17:45,520

it was

438

00:17:50,950 --> 00:17:47,640

what does

439

00:17:53,590 --> 00:17:50,960

ncc701 mean okay oh that's a great

440

00:17:56,190 --> 00:17:53,600

question so the call letters on the

441

00:17:58,470 --> 00:17:56,200

enterprise model what does

442

00:18:00,070 --> 00:17:58,480

ncc1701 mean

443

00:18:01,750 --> 00:18:00,080

and there's been a lot of debate about

444

00:18:03,909 --> 00:18:01,760

that about whether this was uh the

445

00:18:07,270 --> 00:18:03,919

designer matt jeffries tail number on

446

00:18:09,270 --> 00:18:07,280

his private airplane um generally

447

00:18:11,510 --> 00:18:09,280

was the idea of putting letters and

448

00:18:13,190 --> 00:18:11,520

numbers on to the uss enterprise that

449

00:18:15,270 --> 00:18:13,200

would identify it

450

00:18:16,630 --> 00:18:15,280

and see had been the letters and are the

451

00:18:19,750 --> 00:18:16,640

letters that are on tail numbers of

452

00:18:22,390 --> 00:18:19,760

private aircraft um and i'm told that he

453

00:18:24,470 --> 00:18:22,400

put the numbers uh in the font across

454

00:18:26,950 --> 00:18:24,480

the room from him and looked at them and

455

00:18:29,669 --> 00:18:26,960

one seven zero and one were the numbers

456

00:18:31,750 --> 00:18:29,679

that were the easiest to identify at a

457

00:18:33,990 --> 00:18:31,760

glance you know a eight can look like a

458

00:18:35,990 --> 00:18:34,000

three but um those were easily

459

00:18:38,150 --> 00:18:36,000

identified and the idea of creating a

460

00:18:40,470 --> 00:18:38,160

number that was somewhat big

461

00:18:42,549 --> 00:18:40,480

created the idea that there might have

462

00:18:44,710 --> 00:18:42,559

this might be part of a long series of

463

00:18:47,669 --> 00:18:44,720

spaceships although the one gives it a

464

00:18:50,870 --> 00:18:47,679

kind of uniqueness okay so let's take an

465

00:18:55,430 --> 00:18:53,430

are there other science fiction objects

466

00:18:56,870 --> 00:18:55,440

on display at the museum

467

00:19:00,710 --> 00:18:56,880

very much so

468

00:19:03,669 --> 00:19:00,720

the museum has a buck rogers

469

00:19:05,350 --> 00:19:03,679

toy that is in our moving beyond earth

470

00:19:08,150 --> 00:19:05,360

exhibit that's an illustration of the

471

00:19:10,710 --> 00:19:08,160

ways that people started thinking about

472

00:19:12,390 --> 00:19:10,720

a winged vehicle years before the space

473

00:19:14,310 --> 00:19:12,400

shuttle orbiters were created in the

474

00:19:17,110 --> 00:19:14,320

1970s

475

00:19:18,950 --> 00:19:17,120

we have toys up in the pioneers gallery

476
00:19:21,909 --> 00:19:18,960
that show the ways that people have

477
00:19:23,669 --> 00:19:21,919
imagined flight and space flight

478
00:19:25,830 --> 00:19:23,679
and then having the enterprise here we

479
00:19:28,390 --> 00:19:25,840
also have a wonderful case of uh space

480
00:19:30,549 --> 00:19:28,400
science fiction toys at the stephen f

481
00:19:32,230 --> 00:19:30,559
udvar-hazy center out by dulles airport

482
00:19:34,310 --> 00:19:32,240
now star trek just

483
00:19:35,430 --> 00:19:34,320
it was a television show but it's sort

484
00:19:39,990 --> 00:19:35,440
of

485
00:19:42,470 --> 00:19:40,000
do you want to talk to us a little bit

486
00:19:44,470 --> 00:19:42,480
about how that happened it has um it

487
00:19:48,549 --> 00:19:44,480
started as a three-season television

488
00:19:51,590 --> 00:19:48,559

show on nbc from 1966 to 1969 and the

489

00:19:53,190 --> 00:19:51,600

museum got this model in 1974 because i

490

00:19:54,870 --> 00:19:53,200

think the people at paramount really

491

00:19:57,190 --> 00:19:54,880

didn't think there would be anything

492

00:20:00,549 --> 00:19:57,200

else to it uh but they had created this

493

00:20:03,669 --> 00:20:00,559

rich world that had rules uh had a bit

494

00:20:05,750 --> 00:20:03,679

of a bible that governed it and um

495

00:20:08,950 --> 00:20:05,760

eventually it spawned six more

496

00:20:11,110 --> 00:20:08,960

television series 13 more major motion

497

00:20:13,270 --> 00:20:11,120

pictures a world of conventions and

498

00:20:15,750 --> 00:20:13,280

uniforms and languages

499

00:20:16,710 --> 00:20:15,760

and fans and what's fun about that is it

500

00:20:19,270 --> 00:20:16,720

all

501
00:20:22,390 --> 00:20:19,280
works together in kind of one universe

502
00:20:23,990 --> 00:20:22,400
defined by this bible by this canon um

503
00:20:25,750 --> 00:20:24,000
and so the cultures that have been

504
00:20:27,750 --> 00:20:25,760
created have been really rich and part

505
00:20:29,909 --> 00:20:27,760
of that is language and the klingon

506
00:20:32,310 --> 00:20:29,919
language was actually invented for these

507
00:20:35,190 --> 00:20:32,320
movies yes they uh it started out as

508
00:20:37,029 --> 00:20:35,200
somewhat gibberish that was created for

509
00:20:38,950 --> 00:20:37,039
some of the early movies but by star

510
00:20:41,909 --> 00:20:38,960
trek iii they actually brought in a

511
00:20:43,750 --> 00:20:41,919
linguist and he developed out not only

512
00:20:45,350 --> 00:20:43,760
the language but the culture of the

513
00:20:46,789 --> 00:20:45,360

klingsons and the vulcans two of the

514

00:20:49,110 --> 00:20:46,799

alien species

515

00:20:51,190 --> 00:20:49,120

and i actually had a chance to talk to

516

00:20:53,190 --> 00:20:51,200

the inventor mark o'grant let's see what

517

00:20:55,830 --> 00:20:53,200

he had to say

518

00:20:57,990 --> 00:20:55,840

now i'm joined by mark o'grand and you

519

00:20:59,909 --> 00:20:58,000

invented the klingon language is that

520

00:21:01,669 --> 00:20:59,919

correct correct and for what pro it

521

00:21:03,029 --> 00:21:01,679

wasn't the original program no in the

522

00:21:04,630 --> 00:21:03,039

original program they never spoke the

523

00:21:06,710 --> 00:21:04,640

klingon language and i came to it with

524

00:21:08,630 --> 00:21:06,720

star trek three

525

00:21:10,549 --> 00:21:08,640

uh and i started with the few lines that

526

00:21:11,590 --> 00:21:10,559

jimmy dune had created and expanded from

527

00:21:13,110 --> 00:21:11,600

there because there was a lot more

528

00:21:14,870 --> 00:21:13,120

dialogue in star trek three than there

529

00:21:17,029 --> 00:21:14,880

had been in anything in the past

530

00:21:18,870 --> 00:21:17,039

before you started on star trek you were

531

00:21:21,270 --> 00:21:18,880

a fellow here at the smithsonian and you

532

00:21:23,350 --> 00:21:21,280

studied languages right why is it

533

00:21:24,549 --> 00:21:23,360

important that we study language at all

534

00:21:26,149 --> 00:21:24,559

it's important to study language at all

535

00:21:28,310 --> 00:21:26,159

because that's what makes us human i

536

00:21:29,830 --> 00:21:28,320

think i think it's a

537

00:21:31,430 --> 00:21:29,840

great gives us great insight into the

538

00:21:33,350 --> 00:21:31,440

way we think the way we deal with each

539

00:21:35,029 --> 00:21:33,360

other um

540

00:21:37,590 --> 00:21:35,039

where we come from and hopefully where

541

00:21:39,270 --> 00:21:37,600

we're going and it's just it opens up

542

00:21:41,270 --> 00:21:39,280

the whole world and by studying

543

00:21:43,190 --> 00:21:41,280

different languages

544

00:21:44,630 --> 00:21:43,200

you learn different ways of looking at

545

00:21:47,430 --> 00:21:44,640

things there's not only one way to do

546

00:21:49,350 --> 00:21:47,440

things uh one one of the greatest

547

00:21:50,310 --> 00:21:49,360

excitements for someone who deals with a

548

00:21:51,990 --> 00:21:50,320

couple of different languages

549

00:21:53,830 --> 00:21:52,000

translating from one to the other

550

00:21:55,430 --> 00:21:53,840

because it's not word word word word you

551
00:21:58,470 --> 00:21:55,440
have to think about okay what is the

552
00:22:00,230 --> 00:21:58,480
original person trying to say using that

553
00:22:02,549 --> 00:22:00,240
language and how how am i going to

554
00:22:04,630 --> 00:22:02,559
change that into this other language

555
00:22:06,149 --> 00:22:04,640
given the cultural differences between

556
00:22:08,149 --> 00:22:06,159
the two and so on just thinking about

557
00:22:09,350 --> 00:22:08,159
all that is fascinating and insightful

558
00:22:11,590 --> 00:22:09,360
and helpful

559
00:22:15,669 --> 00:22:11,600
mark thank you so much for joining us

560
00:22:18,549 --> 00:22:16,870
now margaret the model that we're

561
00:22:20,630 --> 00:22:18,559
standing in front of was

562
00:22:22,149 --> 00:22:20,640
used for fiction science fiction but

563
00:22:23,750 --> 00:22:22,159

there's been some real science that's

564

00:22:26,149 --> 00:22:23,760

gone into the restoration of this can

565

00:22:28,789 --> 00:22:26,159

you tell us about it yes this model came

566

00:22:32,230 --> 00:22:28,799

into the museum's collection in 1974 and

567

00:22:34,950 --> 00:22:32,240

it's been worked on in 74 84 91 and then

568

00:22:37,110 --> 00:22:34,960

around 2010 we started to really notice

569

00:22:39,350 --> 00:22:37,120

that this model which was then

570

00:22:41,830 --> 00:22:39,360

about 40 years old was really starting

571

00:22:43,510 --> 00:22:41,840

to show some sagging and cracking and

572

00:22:45,510 --> 00:22:43,520

crazing in the paint

573

00:22:47,909 --> 00:22:45,520

and so we did what we do for all of the

574

00:22:49,830 --> 00:22:47,919

objects here at the museum we brought in

575

00:22:52,230 --> 00:22:49,840

our conservators who are really

576

00:22:56,070 --> 00:22:52,240

scientists to analyze it and then to

577

00:22:57,909 --> 00:22:56,080

help us to fix it and the

578

00:23:01,029 --> 00:22:57,919

the enterprise

579

00:23:03,110 --> 00:23:01,039

wasn't designed to last 50 years was it

580

00:23:05,110 --> 00:23:03,120

no the this was something that they

581

00:23:06,630 --> 00:23:05,120

thought would be taken apart and moved

582

00:23:07,990 --> 00:23:06,640

from place to place so that they could

583

00:23:10,630 --> 00:23:08,000

get the shots that they wanted at

584

00:23:11,909 --> 00:23:10,640

different special effects studios um but

585

00:23:15,190 --> 00:23:11,919

nobody thought it was going to be a

586

00:23:17,110 --> 00:23:15,200

museum piece uh 40 or 50 years later and

587

00:23:18,950 --> 00:23:17,120

so we really were able to do some

588

00:23:21,029 --> 00:23:18,960

wonderful analysis and try to bring it

589

00:23:24,070 --> 00:23:21,039

back to a specific point in time which

590

00:23:26,149 --> 00:23:24,080

is which is the end of shooting in the

591

00:23:28,630 --> 00:23:26,159

second season they reused the film in

592

00:23:30,549 --> 00:23:28,640

the third season to save money um and

593

00:23:32,870 --> 00:23:30,559

it's actually the trouble with tribbles

594

00:23:35,990 --> 00:23:32,880

episode which is an iconic episode from

595

00:23:37,909 --> 00:23:36,000

star trek um and also the last time that

596

00:23:40,310 --> 00:23:37,919

any physical changes were made to the

597

00:23:42,310 --> 00:23:40,320

model when it was being shot now star

598

00:23:44,310 --> 00:23:42,320

trek also used the narrative of the show

599

00:23:45,990 --> 00:23:44,320

to talk about larger issues

600

00:23:47,750 --> 00:23:46,000

very much so the

601
00:23:49,750 --> 00:23:47,760
creators and the writers were really

602
00:23:52,549 --> 00:23:49,760
thinking very creatively about the ways

603
00:23:55,350 --> 00:23:52,559
that space science fiction allows you to

604
00:23:57,990 --> 00:23:55,360
put contemporary things from the same

605
00:23:59,750 --> 00:23:58,000
time in a different space context and

606
00:24:01,510 --> 00:23:59,760
allow you to have a little bit of diff

607
00:24:03,510 --> 00:24:01,520
distance and think about them in new

608
00:24:05,110 --> 00:24:03,520
ways so they talked about race relations

609
00:24:07,269 --> 00:24:05,120
they talked about gender relations they

610
00:24:10,390 --> 00:24:07,279
talked about politics uh they talked

611
00:24:13,269 --> 00:24:10,400
about social issues but they did it by

612
00:24:15,510 --> 00:24:13,279
encountering aliens in a way that

613
00:24:16,710 --> 00:24:15,520

allowed you to see it with new eyes you

614

00:24:17,750 --> 00:24:16,720

ready to take some more questions i'd

615

00:24:20,470 --> 00:24:17,760

love to all right let's start with an

616

00:24:23,909 --> 00:24:22,070

why is the enterprise model a different

617

00:24:26,950 --> 00:24:23,919

color than what you see on the tv show

618

00:24:29,029 --> 00:24:26,960

ah this is a question that we get a lot

619

00:24:31,269 --> 00:24:29,039

in part because when a studio model was

620

00:24:33,909 --> 00:24:31,279

shot in the 1960s it would have been

621

00:24:34,789 --> 00:24:33,919

under very bright lights and then they

622

00:24:37,269 --> 00:24:34,799

would have

623

00:24:39,029 --> 00:24:37,279

masked out the background to put in the

624

00:24:40,549 --> 00:24:39,039

star fields or the planets or things

625

00:24:42,470 --> 00:24:40,559

like that

626
00:24:43,750 --> 00:24:42,480
and in fact i think from the beginning

627
00:24:45,830 --> 00:24:43,760
of this show

628
00:24:48,630 --> 00:24:45,840
that's film of this model and i was

629
00:24:50,870 --> 00:24:48,640
noticing how much more gray it shows up

630
00:24:52,549 --> 00:24:50,880
on screen that it looks a little more

631
00:24:53,909 --> 00:24:52,559
green when you see it in person and

632
00:24:55,590 --> 00:24:53,919
that's because they knew it would go

633
00:24:58,070 --> 00:24:55,600
through this post-production awesome all

634
00:25:00,070 --> 00:24:58,080
right how about an audience question

635
00:25:02,789 --> 00:25:00,080
um

636
00:25:04,630 --> 00:25:02,799
what interests you of what you do

637
00:25:05,830 --> 00:25:04,640
what made you interested you're doing

638
00:25:07,110 --> 00:25:05,840

margaret

639

00:25:07,990 --> 00:25:07,120

how did you get interested in what you

640

00:25:10,470 --> 00:25:08,000

do

641

00:25:13,830 --> 00:25:10,480

i have always been a space science

642

00:25:16,789 --> 00:25:13,840

fiction on fan on my own um and i got

643

00:25:19,190 --> 00:25:16,799

interested in space history when i was

644

00:25:21,029 --> 00:25:19,200

doing my doctoral work and researching a

645

00:25:22,710 --> 00:25:21,039

women's astronaut testing program from

646

00:25:24,710 --> 00:25:22,720

the 1950s

647

00:25:26,070 --> 00:25:24,720

and i just saw so many connections

648

00:25:28,950 --> 00:25:26,080

between

649

00:25:30,390 --> 00:25:28,960

space science fiction and real space

650

00:25:32,390 --> 00:25:30,400

awesome all right let's go to an online

651

00:25:33,990 --> 00:25:32,400

question next

652

00:25:35,990 --> 00:25:34,000

how long did it take for the original

653

00:25:38,549 --> 00:25:36,000

designers to build the enterprise studio

654

00:25:41,190 --> 00:25:38,559

model uh it was designed by a man named

655

00:25:43,909 --> 00:25:41,200

walter matthews jeffries who worked for

656

00:25:45,510 --> 00:25:43,919

star trek and then richard c dayton jr

657

00:25:47,350 --> 00:25:45,520

actually built it

658

00:25:49,190 --> 00:25:47,360

it took them a period of weeks to

659

00:25:50,950 --> 00:25:49,200

actually build this model

660

00:25:52,630 --> 00:25:50,960

and then it was actually changed a few

661

00:25:54,470 --> 00:25:52,640

times from when it was initially rolled

662

00:25:56,230 --> 00:25:54,480

out when they started production they

663

00:25:59,029 --> 00:25:56,240

added all of the wonderful lights and

664

00:26:00,310 --> 00:25:59,039

effects inside it awesome well um

665

00:26:02,070 --> 00:26:00,320

thank you so much for answering those

666

00:26:03,669 --> 00:26:02,080

questions those are great questions guys

667

00:26:06,310 --> 00:26:03,679

and those of you online

668

00:26:07,669 --> 00:26:06,320

our next show is coming up in just a few

669

00:26:09,590 --> 00:26:07,679

short weeks from the albuquerque

670

00:26:11,029 --> 00:26:09,600

international balloon fiesta here's a

671

00:26:14,149 --> 00:26:11,039

little preview

672

00:26:20,149 --> 00:26:17,590

in 1935 this balloon gondola traveled

673

00:26:23,830 --> 00:26:20,159

over 13 miles into the air to set a

674

00:26:25,830 --> 00:26:23,840

world record that lasted for 20 years

675

00:26:28,390 --> 00:26:25,840

gas balloons controlled their altitude

676
00:26:30,470 --> 00:26:28,400
by dropping weight called ballast

677
00:26:33,909 --> 00:26:30,480
each of these ballast bags weighed about

678
00:26:35,750 --> 00:26:33,919
70 pounds in order to control altitude

679
00:26:38,230 --> 00:26:35,760
the pilot would blow a hole in the

680
00:26:40,310 --> 00:26:38,240
bottom of the bag to release fine metal

681
00:26:43,110 --> 00:26:40,320
shavings so it wouldn't hurt anybody on

682
00:26:45,510 --> 00:26:43,120
the ground we still fly gas balloons

683
00:26:46,310 --> 00:26:45,520
today do you ever wonder how we control

684
00:26:48,470 --> 00:26:46,320
them

685
00:26:50,789 --> 00:26:48,480
if you think that's cool be sure to join

686
00:26:52,710 --> 00:26:50,799
us next month when we will be live from

687
00:26:58,230 --> 00:26:52,720
the albuquerque international balloon

688
00:27:01,269 --> 00:26:59,669

margaret thank you so much for joining

689

00:27:02,950 --> 00:27:01,279

us today we really appreciate it oh

690

00:27:04,789 --> 00:27:02,960

you're welcome i'd also like to thank

691

00:27:06,870 --> 00:27:04,799

the gertrude east skelly charitable

692

00:27:08,390 --> 00:27:06,880

foundation for sponsoring the show today

693

00:27:09,909 --> 00:27:08,400

and i want to point out that on our

694

00:27:12,070 --> 00:27:09,919

website we have some additional

695

00:27:14,470 --> 00:27:12,080

resources for teachers we're using

696

00:27:16,789 --> 00:27:14,480

smithsonian learning labs to add

697

00:27:19,110 --> 00:27:16,799

resources smithsonian learning labs is

698

00:27:21,190 --> 00:27:19,120

very similar to pinterest only with

699

00:27:23,350 --> 00:27:21,200

artifacts from all of the smithsonian

700

00:27:26,870 --> 00:27:23,360

museums we've added reading lists we've

701

00:27:29,750 --> 00:27:26,880

added images and we've added videos

702

00:27:36,149 --> 00:27:34,389

now you put on the mask the show is over

703

00:27:38,389 --> 00:27:36,159

well thank you so much for joining us

704

00:27:40,389 --> 00:27:38,399

today as we leave you take a look at

705

00:27:42,789 --> 00:27:40,399

some of the incredible costumes that we

706

00:27:44,789 --> 00:27:42,799

saw a week ago to celebrate star trek's

707

00:27:46,630 --> 00:27:44,799

50th anniversary here at the museum

708

00:28:23,510 --> 00:27:46,640

thanks for watching live long and