



1  
00:00:20,720 --> 00:00:51,189

so

2  
00:00:55,750 --> 00:00:53,670

hello i'm lynn bondurant and this is the

3  
00:00:58,389 --> 00:00:55,760

second show of our four-part moonwalk

4  
00:01:00,790 --> 00:00:58,399

series today's program is called

5  
00:01:03,670 --> 00:01:00,800

adapting to a space environment

6  
00:01:06,230 --> 00:01:03,680

as a title suggests this episode shows

7  
00:01:08,469 --> 00:01:06,240

procedures apollo operators used in

8  
00:01:11,030 --> 00:01:08,479

order to make sure the astronauts would

9  
00:01:12,950 --> 00:01:11,040

be able to survive in outer space

10  
00:01:15,190 --> 00:01:12,960

this show explains the function of the

11  
00:01:17,749 --> 00:01:15,200

different stages of the moon rocket how

12  
00:01:18,550 --> 00:01:17,759

the stages separate and what becomes of

13  
00:01:20,789 --> 00:01:18,560

them

14

00:01:23,190 --> 00:01:20,799

we pick up the moonwalk story by looking

15

00:01:25,350 --> 00:01:23,200

back at some old classic space films

16

00:01:27,910 --> 00:01:25,360

that were a hollywood perspective on

17

00:01:29,749 --> 00:01:27,920

future space travel

18

00:01:32,149 --> 00:01:29,759

for most people a trip to the planets

19

00:01:46,550 --> 00:01:32,159

was easy all you needed was a 10 cent

20

00:01:46,560 --> 00:01:52,310

charge your speed to one half

21

00:01:52,320 --> 00:01:56,550

what was that i don't know

22

00:02:25,910 --> 00:01:58,069

there's two killer kane's ships coming

23

00:02:25,920 --> 00:02:51,910

so

24

00:03:12,390 --> 00:02:52,949

oh

25

00:03:16,309 --> 00:03:14,790

what science fiction in the childhood of

26

00:03:19,430 --> 00:03:16,319

the space age

27

00:03:22,390 --> 00:03:19,440

could have guessed the shape of reality

28

00:03:23,750 --> 00:03:22,400

the saturn v rocket

29

00:03:26,149 --> 00:03:23,760

three stages

30

00:03:28,470 --> 00:03:26,159

28 stories tall

31

00:03:30,830 --> 00:03:28,480

with 11 engines as powerful as all the

32

00:03:33,430 --> 00:03:30,840

waterfalls in north america

33

00:03:35,670 --> 00:03:33,440

combined years in the planning months in

34

00:03:38,229 --> 00:03:35,680

the building and testing the saturn

35

00:03:46,149 --> 00:03:38,239

first stage lived but two minutes 41

36

00:03:50,309 --> 00:03:48,309

11 houston thrusters go all engines

37

00:03:52,390 --> 00:03:50,319

you're looking good

38

00:03:55,270 --> 00:03:52,400

all right you're loud and clear

39

00:03:58,869 --> 00:03:55,280

two minutes 41 seconds time to throw

40

00:04:00,390 --> 00:03:58,879

apollo 40 miles up into the sky and then

41

00:04:25,350 --> 00:04:00,400

an empty shell

42

00:04:29,510 --> 00:04:27,590

neil armstrong confirming both the

43

00:04:33,830 --> 00:04:29,520

engine skirt separation and the launch

44

00:04:39,189 --> 00:04:37,189

gave us a magnificent ride

45

00:04:40,870 --> 00:04:39,199

all right you're 11 we'll pass that on

46

00:04:44,469 --> 00:04:40,880

and it certainly looks like you're well

47

00:04:48,230 --> 00:04:46,629

11 houston uh your guidance is converged

48

00:04:52,070 --> 00:04:48,240

you're looking good

49

00:04:54,070 --> 00:04:52,080

downrange 140 miles altitude 62 miles

50

00:04:56,230 --> 00:04:54,080

velocity mission control in houston

51  
00:04:58,150 --> 00:04:56,240  
texas had taken over from launch control

52  
00:05:00,469 --> 00:04:58,160  
of cape kennedy for the duration of the

53  
00:05:02,629 --> 00:05:00,479  
eight day mission

54  
00:05:03,749 --> 00:05:02,639  
the complicated technology of apollo

55  
00:05:05,909 --> 00:05:03,759  
saturn

56  
00:05:07,110 --> 00:05:05,919  
evolved from an ingeniously simple

57  
00:05:09,430 --> 00:05:07,120  
concept

58  
00:05:11,270 --> 00:05:09,440  
lunar orbit rendezvous

59  
00:05:13,749 --> 00:05:11,280  
this requires a rocket made in many

60  
00:05:15,590 --> 00:05:13,759  
pieces that discards the useless weight

61  
00:05:17,830 --> 00:05:15,600  
of each piece when its function is

62  
00:05:19,510 --> 00:05:17,840  
completed the flight began with a

63  
00:05:22,390 --> 00:05:19,520

vertical lift through the heavy lower

64

00:05:24,629 --> 00:05:22,400

atmosphere and a tilt to the east at six

65

00:05:27,270 --> 00:05:24,639

thousand miles per hour the empty first

66

00:05:29,510 --> 00:05:27,280

stage is discarded to save weight so is

67

00:05:31,670 --> 00:05:29,520

an adapter ring and the unused escape

68

00:05:34,230 --> 00:05:31,680

tower with the second stage firing it

69

00:05:38,790 --> 00:05:34,240

reaches 15 000 miles per hour when it

70

00:05:45,350 --> 00:05:41,029

the third stage places apollo in earth

71

00:05:47,029 --> 00:05:45,360

orbit at 17 400 miles per hour

72

00:05:49,110 --> 00:05:47,039

when the spacecraft has been thoroughly

73

00:05:51,350 --> 00:05:49,120

checked out by the crew the third stage

74

00:05:55,990 --> 00:05:51,360

fires again its speed now tearing it

75

00:06:00,070 --> 00:05:57,670

while coasting outward the command

76  
00:06:02,150 --> 00:06:00,080  
service module separates and docks for

77  
00:06:09,430 --> 00:06:02,160  
access to the lunar module

78  
00:06:13,510 --> 00:06:11,350  
apollo loses speed throughout nine

79  
00:06:15,990 --> 00:06:13,520  
tenths of its journey until the moon's

80  
00:06:18,550 --> 00:06:16,000  
gravity overcomes the pull of earth

81  
00:06:20,390 --> 00:06:18,560  
apollo fires in reverse direction

82  
00:06:22,469 --> 00:06:20,400  
slowing down enough to be captured in

83  
00:06:24,309 --> 00:06:22,479  
orbit about the moon

84  
00:06:27,110 --> 00:06:24,319  
armstrong and aldrin enter the lunar

85  
00:06:28,710 --> 00:06:27,120  
module eagle which separates

86  
00:06:33,430 --> 00:06:28,720  
leaving collins in the command service

87  
00:06:42,629 --> 00:06:35,909  
eagle slows still more and breaks to a

88  
00:06:46,710 --> 00:06:45,029

after the moon walk the upper stage of

89

00:06:48,629 --> 00:06:46,720

the eagle lifts off

90

00:06:49,670 --> 00:06:48,639

leaving behind the now useless landing

91

00:06:51,430 --> 00:06:49,680

stage

92

00:06:56,070 --> 00:06:51,440

and swings into orbit to dock with

93

00:06:59,430 --> 00:06:57,909

when the crew and moon samples are

94

00:07:00,629 --> 00:06:59,440

transferred to the command service

95

00:07:08,550 --> 00:07:00,639

module

96

00:07:18,070 --> 00:07:08,560

out of lunar orbit and falls back to

97

00:07:22,790 --> 00:07:19,909

as it approaches the re-entry speed of

98

00:07:24,629 --> 00:07:22,800

nearly 25 000 miles per hour the service

99

00:07:26,469 --> 00:07:24,639

module drops away

100

00:07:29,430 --> 00:07:26,479

the command module plunges into the

101  
00:07:31,589 --> 00:07:29,440  
atmosphere protected by its heat shield

102  
00:07:35,589 --> 00:07:31,599  
slowed still more by the heavy lower

103  
00:07:37,909 --> 00:07:35,599  
atmosphere it parachutes into the sea

104  
00:07:40,390 --> 00:07:37,919  
the command module colombia is all that

105  
00:07:45,270 --> 00:07:40,400  
remains of the original 3000 tons of

106  
00:07:50,150 --> 00:07:47,749  
apollo 11 this is houston over

107  
00:07:51,990 --> 00:07:50,160  
while in earth orbit the apollo crew had

108  
00:07:54,070 --> 00:07:52,000  
less than two hours to check out all

109  
00:07:56,309 --> 00:07:54,080  
their spacecraft systems

110  
00:07:58,629 --> 00:07:56,319  
the last chance to discover and correct

111  
00:08:00,390 --> 00:07:58,639  
any malfunction before the third stage

112  
00:08:01,510 --> 00:08:00,400  
engine is restarted to break them free

113  
00:08:03,990 --> 00:08:01,520

of earth

114

00:08:06,309 --> 00:08:04,000

the translunar injection

115

00:08:08,629 --> 00:08:06,319

we're 10 minutes away from ignition on

116

00:08:11,589 --> 00:08:08,639

translunar injection

117

00:08:16,390 --> 00:08:11,599

apollo 11 this is houston you are go for

118

00:08:20,070 --> 00:08:18,390

11. thank you

119

00:08:22,790 --> 00:08:20,080

roger out

120

00:08:24,309 --> 00:08:22,800

all alone this is houston

121

00:08:27,189 --> 00:08:24,319

slightly less than one minute to

122

00:08:29,350 --> 00:08:27,199

ignition and everything is go

123

00:08:33,110 --> 00:08:29,360

roger

124

00:08:38,550 --> 00:08:36,469

we confirm ignition and the thrust is go

125

00:08:41,509 --> 00:08:38,560

follow

126  
00:08:44,949 --> 00:08:41,519  
guidance looking good velocity 26 000

127  
00:08:49,509 --> 00:08:47,590  
telemetry and radar tracking both solid

128  
00:08:51,990 --> 00:08:49,519  
velocity 27

129  
00:08:54,150 --> 00:08:52,000  
800 feet per second

130  
00:09:01,110 --> 00:08:54,160  
through the window of the command module

131  
00:09:06,550 --> 00:09:03,110  
this is houston thrust is good

132  
00:09:12,870 --> 00:09:09,509  
29 000 feet per second building up

133  
00:09:15,350 --> 00:09:12,880  
toward 30 000 feet per second

134  
00:09:17,110 --> 00:09:15,360  
apollo 11 this is houston around three

135  
00:09:19,750 --> 00:09:17,120  
and a half minutes you're still looking

136  
00:09:21,030 --> 00:09:19,760  
good your predicted cutoff is right on

137  
00:09:23,590 --> 00:09:21,040  
the nominal

138  
00:09:24,870 --> 00:09:23,600

deep space tracking antennas a third of

139

00:09:27,990 --> 00:09:24,880

a world apart

140

00:09:29,910 --> 00:09:28,000

listened to apollo and spoke to apollo

141

00:09:31,670 --> 00:09:29,920

as the earth turned at least one of them

142

00:09:33,590 --> 00:09:31,680

would have contact with apollo at all

143

00:09:35,269 --> 00:09:33,600

times except when it passed behind the

144

00:09:45,110 --> 00:09:35,279

moon

145

00:09:45,120 --> 00:09:48,829

35 000 feet per

146

00:09:48,839 --> 00:09:52,870

second cut off

147

00:09:58,389 --> 00:09:56,870

we're showing velocity 35 570 feet per

148

00:10:00,550 --> 00:09:58,399

second

149

00:10:04,550 --> 00:10:00,560

altitude 177

150

00:10:07,670 --> 00:10:06,630

at three hours 11 minutes into the

151  
00:10:09,550 --> 00:10:07,680  
mission

152  
00:10:13,430 --> 00:10:09,560  
distance from earth

153  
00:10:19,030 --> 00:10:16,230  
the s4b is reported in a stable attitude

154  
00:10:21,670 --> 00:10:19,040  
for this separation

155  
00:10:23,829 --> 00:10:21,680  
apollo 11 this is houston uh your goal

156  
00:10:25,590 --> 00:10:23,839  
for separation

157  
00:10:28,310 --> 00:10:25,600  
okay

158  
00:10:29,829 --> 00:10:28,320  
my intent is to use the bottle primary

159  
00:10:33,190 --> 00:10:29,839  
one is for the checklist therefore i

160  
00:10:42,150 --> 00:10:34,790  
we're awaiting confirmation of

161  
00:10:50,389 --> 00:10:43,829  
we confirm the separation here on the

162  
00:10:58,389 --> 00:10:52,710  
apollo 11 this is houston radio check

163  
00:11:02,949 --> 00:11:00,550

the goldstone station reports a very

164

00:11:05,030 --> 00:11:02,959

weak signal

165

00:11:07,829 --> 00:11:05,040

we believe that uh mike collins is now

166

00:11:09,430 --> 00:11:07,839

maneuvering with the spacecraft uh

167

00:11:12,150 --> 00:11:09,440

in the transposition and docking

168

00:11:14,790 --> 00:11:12,160

maneuver and the antenna patterns aren't

169

00:11:18,949 --> 00:11:14,800

too good at the moment so we have a weak

170

00:11:22,790 --> 00:11:21,030

the command service module separated and

171

00:11:26,310 --> 00:11:22,800

turned around to dock with eagle the

172

00:11:26,320 --> 00:11:34,150

houston how do you read

173

00:11:40,389 --> 00:11:36,470

apollo 11 this is houston radio check

174

00:11:45,670 --> 00:11:43,350

all right we're copying you about uh

175

00:11:58,710 --> 00:11:45,680

five by two very weak can you give us a

176

00:12:02,310 --> 00:12:00,389

loud and clear now mike and we

177

00:12:04,710 --> 00:12:02,320

understand that you are a doc that's

178

00:12:09,030 --> 00:12:06,389

apollo 11 houston we recommend you

179

00:12:11,350 --> 00:12:09,040

accept the 949 continue through your

180

00:12:13,750 --> 00:12:11,360

sequence of sightings and then we'll

181

00:12:15,350 --> 00:12:13,760

analyze the data afterwards over

182

00:12:17,670 --> 00:12:15,360

okay

183

00:12:19,990 --> 00:12:17,680

on board was a fourth brain a small

184

00:12:21,750 --> 00:12:20,000

computer called diskey which solved

185

00:12:23,910 --> 00:12:21,760

problems and helped with a long sequence

186

00:12:25,030 --> 00:12:23,920

of systems checks and data exchange with

187

00:12:27,910 --> 00:12:25,040

earth

188

00:12:30,470 --> 00:12:27,920

houston apollo 11 the star 40 has just

189

00:12:32,629 --> 00:12:30,480

disappeared down in the section could be

190

00:12:33,670 --> 00:12:32,639

trunnion angle 47 something a little

191

00:12:37,110 --> 00:12:33,680

high

192

00:12:42,629 --> 00:12:39,910

hello apollo 11 houston uh we'd like you

193

00:12:44,069 --> 00:12:42,639

to press on the star 44 over

194

00:12:45,990 --> 00:12:44,079

yeah

195

00:12:46,949 --> 00:12:46,000

they found their way across the sea of

196

00:12:49,190 --> 00:12:46,959

space

197

00:12:50,829 --> 00:12:49,200

navigating by the same stars that guided

198

00:12:53,110 --> 00:12:50,839

columbus to shores

199

00:12:54,629 --> 00:12:53,120

unknown eleven houston we copied two

200

00:12:57,670 --> 00:12:54,639

good marks over

201  
00:12:57,680 --> 00:13:02,790  
okay drug removal is coming next

202  
00:13:09,030 --> 00:13:06,069  
three days falling to the moon

203  
00:13:11,190 --> 00:13:09,040  
free of the gravity of earth

204  
00:13:13,670 --> 00:13:11,200  
no up or down

205  
00:13:15,750 --> 00:13:13,680  
no day or night

206  
00:13:20,069 --> 00:13:15,760  
a sense of stillness

207  
00:13:21,430 --> 00:13:20,079  
while traveling at the speed of a meteor

208  
00:13:22,310 --> 00:13:21,440  
about how long it will be before you

209  
00:13:25,110 --> 00:13:22,320  
start

210  
00:13:27,670 --> 00:13:25,120  
closing the limb back up over

211  
00:13:30,389 --> 00:13:27,680  
an invisible speck in the night

212  
00:13:35,509 --> 00:13:30,399  
somewhere between here and there

213  
00:13:39,829 --> 00:13:38,310

within this tiny spacecraft a temporary

214

00:13:42,629 --> 00:13:39,839

earth environment

215

00:13:46,389 --> 00:13:42,639

warmth air food water

216

00:13:50,389 --> 00:13:46,399

everything necessary to sustain life

217

00:13:54,470 --> 00:13:52,230

nothingness

218

00:14:01,189 --> 00:13:54,480

absolute cold

219

00:14:04,870 --> 00:14:02,629

the most important function of the

220

00:14:06,710 --> 00:14:04,880

spacecraft life

221

00:14:09,269 --> 00:14:06,720

was also monitored constantly through

222

00:14:11,269 --> 00:14:09,279

telemetry the heartbeat and breathing of

223

00:14:13,910 --> 00:14:11,279

each astronaut

224

00:14:15,189 --> 00:14:13,920

although each breath was 30 000 feet

225

00:14:17,509 --> 00:14:15,199

farther from earth than the breath

226

00:14:19,670 --> 00:14:17,519

before it

227

00:14:21,829 --> 00:14:19,680

should one heart flutter it would at

228

00:14:24,470 --> 00:14:21,839

once be a matter of concern to millions

229

00:14:26,550 --> 00:14:24,480

worlds away

230

00:14:27,670 --> 00:14:26,560

unlike any other place man had traveled

231

00:14:30,389 --> 00:14:27,680

before

232

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

space could provide him with nothing

233

00:14:34,949 --> 00:14:32,880

it is a vacuum devoid of every element

234

00:14:37,430 --> 00:14:34,959

needed for life

235

00:14:40,069 --> 00:14:37,440

to send man into this nothingness to

236

00:14:42,230 --> 00:14:40,079

protect him it was first necessary to

237

00:14:45,269 --> 00:14:42,240

define him

238

00:14:47,509 --> 00:14:45,279

what is the human machine

239

00:14:50,550 --> 00:14:47,519

how does it function

240

00:14:53,030 --> 00:14:50,560

what is the nature of its nervous system

241

00:14:54,870 --> 00:14:53,040

its respiration

242

00:14:58,710 --> 00:14:54,880

its circulation

243

00:15:01,990 --> 00:15:00,389

sight

244

00:15:05,430 --> 00:15:02,000

hearing

245

00:15:05,440 --> 00:15:23,990

its endurance

246

00:15:28,310 --> 00:15:25,910

what gases to breathe should he take

247

00:15:32,550 --> 00:15:28,320

with him from earth

248

00:15:35,910 --> 00:15:33,990

is it possible to give him a more

249

00:16:06,310 --> 00:15:35,920

efficient atmosphere for space travel

250

00:16:13,030 --> 00:16:09,990

the moon is 250 degrees hot in sunlight

251  
00:16:14,550 --> 00:16:13,040  
and 240 degrees below zero in the middle

252  
00:16:16,550 --> 00:16:14,560  
of its night

253  
00:16:18,150 --> 00:16:16,560  
how long can a man bake

254  
00:16:19,829 --> 00:16:18,160  
or freeze

255  
00:16:31,430 --> 00:16:19,839  
what protection will he need from this

256  
00:16:34,629 --> 00:16:33,030  
what strains will the heart take when

257  
00:16:53,509 --> 00:16:34,639  
the pressure of gravity is removed from

258  
00:16:57,110 --> 00:16:55,269  
what protection will the body need from

259  
00:17:16,390 --> 00:16:57,120  
sudden deceleration

260  
00:17:20,710 --> 00:17:18,390  
man's sense of direction speed and

261  
00:17:22,949 --> 00:17:20,720  
balance are easily fooled

262  
00:18:35,830 --> 00:17:22,959  
can his mind be trained to ignore false

263  
00:18:35,840 --> 00:19:00,390

so

264

00:19:15,270 --> 00:19:02,789

we were defining the physical man in

265

00:19:19,510 --> 00:19:17,750

once we knew man's limitations we could

266

00:19:24,950 --> 00:19:19,520

build him an artificial environment for

267

00:19:28,549 --> 00:19:27,029

colombia the command module

268

00:19:30,789 --> 00:19:28,559

was a supreme achievement of the

269

00:19:33,110 --> 00:19:30,799

technology of its age

270

00:19:34,950 --> 00:19:33,120

it was a mini planet

271

00:19:36,830 --> 00:19:34,960

complete with its own environmental

272

00:19:39,590 --> 00:19:36,840

control system

273

00:19:41,990 --> 00:19:39,600

telecommunications electrical power

274

00:19:43,750 --> 00:19:42,000

guidance navigation

275

00:19:45,190 --> 00:19:43,760

stabilization

276

00:19:47,350 --> 00:19:45,200

propulsion

277

00:19:50,070 --> 00:19:47,360

reaction control

278

00:19:53,270 --> 00:19:50,080

it provided hot and cold water

279

00:19:54,870 --> 00:19:53,280

and removed carbon dioxide from the air

280

00:19:55,830 --> 00:19:54,880

three men could live here for more than

281

00:19:59,190 --> 00:19:55,840

a week

282

00:20:00,789 --> 00:19:59,200

eat work sleep shave exercise and listen

283

00:20:02,710 --> 00:20:00,799

to music

284

00:20:05,590 --> 00:20:02,720

it was micro media proof

285

00:20:07,669 --> 00:20:05,600

burn proof and seaworthy and it could

286

00:20:09,830 --> 00:20:07,679

tilt itself in any direction

287

00:20:11,590 --> 00:20:09,840

in short it was the most intricate and

288

00:20:13,750 --> 00:20:11,600

sophisticated machine

289

00:20:15,510 --> 00:20:13,760

ever made by man

290

00:20:17,830 --> 00:20:15,520

as for man however

291

00:20:19,830 --> 00:20:17,840

we're stuck with the original model

292

00:20:22,870 --> 00:20:19,840

all we can do is add an outer layer of

293

00:20:24,789 --> 00:20:22,880

things he does not naturally have

294

00:20:26,549 --> 00:20:24,799

space medicine showed us where man is

295

00:20:27,909 --> 00:20:26,559

vulnerable and we learn to compensate

296

00:20:40,070 --> 00:20:27,919

for most of the weaknesses with

297

00:20:44,870 --> 00:20:41,590

i

298

00:20:47,430 --> 00:20:44,880

and

299

00:20:49,350 --> 00:20:47,440

the fact is i was an experienced sewer

300

00:20:52,390 --> 00:20:49,360

but i had to learn

301

00:20:54,549 --> 00:20:52,400

all over again because uh

302

00:20:56,870 --> 00:20:54,559

it was completely different from what i

303

00:21:00,070 --> 00:20:56,880

had so before this was getting right

304

00:21:01,909 --> 00:21:00,080

down to a 64th of an inch and where i'd

305

00:21:03,270 --> 00:21:01,919

say before you just sewed on a

306

00:21:05,750 --> 00:21:03,280

production line

307

00:21:07,909 --> 00:21:05,760

and this here is uh

308

00:21:10,390 --> 00:21:07,919

quality more than quantity like we

309

00:21:12,070 --> 00:21:10,400

always think our job is the hardest

310

00:21:14,149 --> 00:21:12,080

whatever we're doing we got the hardest

311

00:21:16,390 --> 00:21:14,159

job but when they say well go there and

312

00:21:18,549 --> 00:21:16,400

maybe do sell himself well you'll find

313

00:21:21,029 --> 00:21:18,559

out that job is harder than yours and

314

00:21:23,190 --> 00:21:21,039

then a lot of times we're sewing

315

00:21:24,789 --> 00:21:23,200

or making things and maybe the girl next

316

00:21:26,549 --> 00:21:24,799

to you she's doing the same thing but we

317

00:21:28,870 --> 00:21:26,559

never see the suit put together one

318

00:21:29,990 --> 00:21:28,880

don't know where the this part goes or

319

00:21:31,510 --> 00:21:30,000

the other one don't know where the other

320

00:21:33,750 --> 00:21:31,520

part goes

321

00:21:35,590 --> 00:21:33,760

like the gloves

322

00:21:37,430 --> 00:21:35,600

if they would give you a glove to sew

323

00:21:39,750 --> 00:21:37,440

you wouldn't know where to start

324

00:21:41,750 --> 00:21:39,760

well when they're up there in space you

325

00:21:43,909 --> 00:21:41,760

know what parts you've worked on and you

326

00:21:46,310 --> 00:21:43,919

just say well i hope that part don't

327

00:21:49,430 --> 00:21:46,320

fail because i feel it was my fault if

328

00:21:50,870 --> 00:21:49,440

it did my sentiment just what hazel said

329

00:21:53,270 --> 00:21:50,880

well i just wondered if my pair of

330

00:21:54,630 --> 00:21:53,280

gloves was what he had on if you make a

331

00:21:56,710 --> 00:21:54,640

mistake then

332

00:21:58,870 --> 00:21:56,720

if you don't admit it you have to think

333

00:22:00,310 --> 00:21:58,880

about the astronaut too

334

00:22:02,149 --> 00:22:00,320

if you make a

335

00:22:04,390 --> 00:22:02,159

uh like a

336

00:22:07,350 --> 00:22:04,400

needle hole in the flat or something

337

00:22:08,789 --> 00:22:07,360

like that well if you don't admit that

338

00:22:10,630 --> 00:22:08,799

that would be on your conscience all the

339

00:22:12,549 --> 00:22:10,640

time seems to me because remember

340

00:22:15,029 --> 00:22:12,559

armstrong all them used to come in

341

00:22:17,190 --> 00:22:15,039

and uh they would look around and see

342

00:22:19,750 --> 00:22:17,200

what we were doing and once while they

343

00:22:21,830 --> 00:22:19,760

talked to us and signed their own we'd

344

00:22:24,549 --> 00:22:21,840

get them to sign their autograph

345

00:22:26,149 --> 00:22:24,559

somehow i'm a real comical

346

00:22:28,549 --> 00:22:26,159

we got a kick out them

347

00:22:30,630 --> 00:22:28,559

we all want to talk to them again

348

00:22:32,230 --> 00:22:30,640

i mean when i'm going down the others

349

00:22:34,549 --> 00:22:32,240

everybody looked down looked down afraid

350

00:22:36,870 --> 00:22:34,559

to talk i was high buddy

351

00:22:39,270 --> 00:22:36,880

oh i'd love to go into space i think

352

00:22:41,750 --> 00:22:39,280

would be really thrilling just to get in

353

00:22:43,909 --> 00:22:41,760

there and just blast dog

354

00:22:44,789 --> 00:22:43,919

i love to go to space and just live

355

00:22:46,710 --> 00:22:44,799

there

356

00:22:48,549 --> 00:22:46,720

every day you get up you come to work

357

00:22:50,310 --> 00:22:48,559

you go home you clean house if we go out

358

00:22:51,750 --> 00:22:50,320

there there's no house no kids no

359

00:22:53,430 --> 00:22:51,760

problem

360

00:22:55,510 --> 00:22:53,440

i like to ride an airplane and i think

361

00:22:57,669 --> 00:22:55,520

i'd like to go into space and i'd like

362

00:23:12,549 --> 00:22:57,679

to wear our own suit that we make i

363

00:23:45,350 --> 00:23:33,750

so

364

00:23:49,430 --> 00:23:47,350  
after body electrodes have been attached

365

00:23:51,190 --> 00:23:49,440  
to monitor heartbeat and breathing the

366

00:23:56,310 --> 00:23:51,200  
first items of clothing are the water

367

00:24:01,029 --> 00:23:58,710  
a spacesuit is basically a sealed bag of

368

00:24:02,710 --> 00:24:01,039  
atmosphere a stiffened balloon

369

00:24:05,269 --> 00:24:02,720  
pumped up to counteract the vacuum of

370

00:24:06,870 --> 00:24:05,279  
space it might be called a one-man

371

00:24:08,390 --> 00:24:06,880  
spaceship of the smallest possible

372

00:24:10,070 --> 00:24:08,400  
dimensions

373

00:24:12,390 --> 00:24:10,080  
the pressure suit has to guard against

374

00:24:15,110 --> 00:24:12,400  
extreme temperatures hard radiation from

375

00:24:16,950 --> 00:24:15,120  
the sun and tiny meteorites

376

00:24:18,710 --> 00:24:16,960

yet it must have the flexibility to

377

00:24:33,590 --> 00:24:18,720

allow man to function as he would in his

378

00:25:17,750 --> 00:24:50,070

so

379

00:25:22,149 --> 00:25:19,830

the backpack cleans and cools the suits

380

00:25:24,149 --> 00:25:22,159

oxygen cools and circulates water

381

00:25:30,950 --> 00:25:24,159

through the water-cooled underwear and

382

00:25:33,510 --> 00:25:32,470

over the pressure helmet is a clear

383

00:25:37,029 --> 00:25:33,520

visor

384

00:25:40,149 --> 00:25:37,039

against micro meteors and solar

385

00:25:43,909 --> 00:25:41,750

the final test was

386

00:26:08,310 --> 00:25:43,919

how would the suit work in the silent

387

00:26:12,149 --> 00:26:09,750

weightlessness on earth can be

388

00:26:14,390 --> 00:26:12,159

experienced only underwater

389

00:26:37,510 --> 00:26:14,400

or in an airplane following a parabolic

390

00:26:37,520 --> 00:27:09,029

the only true test was in space itself

391

00:27:09,039 --> 00:27:33,269

so

392

00:27:36,870 --> 00:27:34,870

no up or down

393

00:27:39,110 --> 00:27:36,880

no day or night

394

00:27:41,190 --> 00:27:39,120

only the slow creeping of the harsh

395

00:27:43,350 --> 00:27:41,200

sunlight through the windows

396

00:27:45,990 --> 00:27:43,360

as the spacecraft rotates to keep from

397

00:27:54,230 --> 00:27:46,000

getting too hot on one side too cold on

398

00:27:58,870 --> 00:27:55,990

they carried with them the biological

399

00:28:04,149 --> 00:27:58,880

day of the earthling three meals a snack

400

00:28:08,630 --> 00:28:05,750

time to work

401  
00:28:13,269 --> 00:28:08,640  
time to relax

402  
00:28:16,389 --> 00:28:14,950  
three days

403  
00:28:20,070 --> 00:28:16,399  
falling upward

404  
00:28:23,350 --> 00:28:22,149  
now the stage is set for man to venture

405  
00:28:25,430 --> 00:28:23,360  
onto the moon

406  
00:28:26,870 --> 00:28:25,440  
the many space simulations prove to be

407  
00:28:28,630 --> 00:28:26,880  
most effective

408  
00:28:31,430 --> 00:28:28,640  
now it is time to take the knowledge

409  
00:28:33,430 --> 00:28:31,440  
gained from these tests out into space

410  
00:28:35,269 --> 00:28:33,440  
and this is exactly what happens in next

411  
00:28:37,269 --> 00:28:35,279  
week's program called