



1
00:00:30,650 --> 00:00:27,470
good afternoon and welcome to the STS 32

2
00:00:33,049 --> 00:00:30,660
post flight crew press conference I'm

3
00:00:35,000 --> 00:00:33,059
going to introduce mission commander Dan

4
00:00:36,740 --> 00:00:35,010
brandenstein here and let him introduce

5
00:00:39,500 --> 00:00:36,750
the rest of the members of his crew will

6
00:00:41,360 --> 00:00:39,510
talk a little bit about the activities

7
00:00:43,729 --> 00:00:41,370
of the flight will share some home

8
00:00:45,170 --> 00:00:43,739
movies and some slides and take some

9
00:00:48,170 --> 00:00:45,180
questions from here and the other NASA

10
00:00:50,780 --> 00:00:48,180
centers following that Dan thank you

11
00:00:53,810 --> 00:00:50,790
Jeff well welcome to the post alight

12
00:00:57,680 --> 00:00:53,820
press conference believe it or not we're

13
00:00:59,420 --> 00:00:57,690

on time and we we launched a day late a

14

00:01:01,849 --> 00:00:59,430

month late we landed a rev late a day

15

00:01:04,430 --> 00:01:01,859

late and finally we got it together and

16

00:01:07,310 --> 00:01:04,440

are doing something on time I'm sure you

17

00:01:10,310 --> 00:01:07,320

all remember the crew on my right is Jim

18

00:01:14,870 --> 00:01:10,320

Weatherby next to him is dr. Bonnie

19

00:01:17,660 --> 00:01:14,880

Dunbar next to her is smart Ivan's next

20

00:01:19,700 --> 00:01:17,670

to her is G David Lough today we'd like

21

00:01:22,700 --> 00:01:19,710

to share some of the things that we saw

22

00:01:28,670 --> 00:01:22,710

and did with you the most difficult part

23

00:01:32,630 --> 00:01:30,950

we figured we were well on our way here

24

00:01:34,430 --> 00:01:32,640

what launched morning getting suited up

25

00:01:35,870 --> 00:01:34,440

we're in the the suit-up room we run

26
00:01:41,140 --> 00:01:35,880
through a thorough check of the suits

27
00:01:43,969 --> 00:01:41,150
before we head out to the pad and it

28
00:01:45,560 --> 00:01:43,979
that way we preclude any problems with

29
00:01:48,530 --> 00:01:45,570
pressurization or anything when we get

30
00:01:49,880 --> 00:01:48,540
out in the vehicle as all crews we leave

31
00:01:53,770 --> 00:01:49,890
the same door and go to the same vehicle

32
00:01:59,200 --> 00:01:53,780
with the same folks with us and it's

33
00:02:03,530 --> 00:02:01,550
it's about six seconds prior to liftoff

34
00:02:05,359 --> 00:02:03,540
the main engines ignite you see all the

35
00:02:07,100 --> 00:02:05,369
steam from the water suppression system

36
00:02:08,870 --> 00:02:07,110
on the Left you'll see after the SRBs

37
00:02:11,780 --> 00:02:08,880
ignite the shock wave coming off to the

38
00:02:13,280 --> 00:02:11,790

left there it is liftoff I was

39

00:02:14,900 --> 00:02:13,290
pleasantly surprised that I really

40

00:02:16,490 --> 00:02:14,910
wasn't thinking of anything other than

41

00:02:17,930 --> 00:02:16,500
the systems and making sure the engines

42

00:02:20,660 --> 00:02:17,940
were working and all the systems were

43

00:02:24,080 --> 00:02:20,670
working properly written a whole lot of

44

00:02:26,180 --> 00:02:24,090
vibration I was again happy to see that

45

00:02:28,190 --> 00:02:26,190
and I was able to see all the screens I

46

00:02:30,440 --> 00:02:28,200
felt very well prepared by the training

47

00:02:31,670 --> 00:02:30,450
teams it kind of felt like the simulator

48

00:02:35,780 --> 00:02:31,680
with the exception of course the

49

00:02:37,100 --> 00:02:35,790
acceleration we had a you can see some

50

00:02:38,750 --> 00:02:37,110
of the condensation coming off of the

51
00:02:47,440 --> 00:02:38,760
vehicle as we fly uphill with a negative

52
00:02:51,759 --> 00:02:49,900
we had a camera under the belly of the

53
00:02:53,680 --> 00:02:51,769
vehicle looking towards the external

54
00:02:56,490 --> 00:02:53,690
tank and you can see from that very wide

55
00:02:59,680 --> 00:02:56,500
angle camera the solid rocket boosters

56
00:03:01,690 --> 00:02:59,690
leave from the stack after about two and

57
00:03:03,880 --> 00:03:01,700
a half minutes they have separation

58
00:03:06,460 --> 00:03:03,890
motors that looked to me like they were

59
00:03:07,960 --> 00:03:06,470
pointed right at my window so i looked

60
00:03:09,759 --> 00:03:07,970
back inside and looked at the rest of

61
00:03:12,910 --> 00:03:09,769
the screens on the way uphill I didn't

62
00:03:14,320 --> 00:03:12,920
want to see Rockets that big you see

63
00:03:17,710 --> 00:03:14,330

some of the ice floating around as the

64

00:03:19,839 --> 00:03:17,720

external tank comes off after the fuel

65

00:03:23,589 --> 00:03:19,849

is expended this is on orbit after eight

66

00:03:25,870 --> 00:03:23,599

and a half minutes again from that same

67

00:03:27,400 --> 00:03:25,880

camera in the belly of the vehicle kind

68

00:03:29,949 --> 00:03:27,410

of a unique view of the external tank

69

00:03:32,620 --> 00:03:29,959

going down this is the one part of the

70

00:03:35,410 --> 00:03:32,630

the whole system that is not recovered

71

00:03:41,140 --> 00:03:35,420

it breaks up in the atmosphere and lands

72

00:03:43,030 --> 00:03:41,150

in the Pacific Ocean in our case and

73

00:03:44,500 --> 00:03:43,040

it's the kind of view you have from the

74

00:03:45,940 --> 00:03:44,510

orbit that we finally got to about a

75

00:03:49,360 --> 00:03:45,950

hundred ninety miles above the earth I'm

76
00:03:50,259 --> 00:03:49,370
traveling about 18,000 miles an hour in

77
00:03:51,640 --> 00:03:50,269
fact that's pretty much the way we

78
00:03:53,229 --> 00:03:51,650
sought for most the time we're up there

79
00:03:55,750 --> 00:03:53,239
there was a lot of clouds for the entire

80
00:03:57,490 --> 00:03:55,760
11 days that we were up there first

81
00:03:59,199 --> 00:03:57,500
major event that we had was the sin calm

82
00:04:01,569 --> 00:03:59,209
deployed occurred about 25 hours into

83
00:04:03,300 --> 00:04:01,579
the mission that required some people in

84
00:04:05,500 --> 00:04:03,310
aft end and some people in the front end

85
00:04:06,849 --> 00:04:05,510
working that you can see simcom coming

86
00:04:08,500 --> 00:04:06,859
out it's translating away at about a

87
00:04:11,559 --> 00:04:08,510
foot and a half per second it's rotating

88
00:04:15,300 --> 00:04:11,569

at about 1.7 revolutions per minute it's

89

00:04:18,129 --> 00:04:15,310

14 feet in diameter about 15,000 pounds

90

00:04:20,710 --> 00:04:18,139

about 80 seconds after deploy there's an

91

00:04:23,680 --> 00:04:20,720

omni antenna that will come out on that

92

00:04:26,710 --> 00:04:23,690

and then about six minutes 35 seconds

93

00:04:28,570 --> 00:04:26,720

later the spacecraft will spin up to

94

00:04:30,460 --> 00:04:28,580

about 33 revolutions per minute you can

95

00:04:32,290 --> 00:04:30,470

see the omni antenna is out in this at

96

00:04:34,779 --> 00:04:32,300

this time it's not a solid rocket motor

97

00:04:36,339 --> 00:04:34,789

on it that 45 minutes after deploy will

98

00:04:38,860 --> 00:04:36,349

initiate its journey on up to a

99

00:04:40,360 --> 00:04:38,870

geosynchronous orbit it actually took

100

00:04:42,430 --> 00:04:40,370

several burns to get it all the way up

101
00:04:43,750 --> 00:04:42,440
there and as I said earlier CENTCOM is

102
00:04:44,950 --> 00:04:43,760
up on orbit right now it's being checked

103
00:04:48,460 --> 00:04:44,960
out and so far everything is looking

104
00:04:50,140 --> 00:04:48,470
looking good I-dub satellite of course

105
00:04:51,909 --> 00:04:50,150
had been at this time flying for five

106
00:04:54,070 --> 00:04:51,919
and a half years all alone gathering

107
00:04:56,170 --> 00:04:54,080
data we came along and disturbs its

108
00:04:59,170 --> 00:04:56,180
peace we tried not to disturb it too

109
00:05:00,070 --> 00:04:59,180
much we had been trained for the

110
00:05:02,260 --> 00:05:00,080
rendezvous for about

111
00:05:03,969 --> 00:05:02,270
year and I just didn't believe it was

112
00:05:05,890 --> 00:05:03,979
really going to be there and suddenly it

113
00:05:08,559 --> 00:05:05,900

appeared and it was in the correct

114

00:05:09,879 --> 00:05:08,569

position through the first part of the

115

00:05:13,629 --> 00:05:09,889

rendezvous from the forward part of the

116

00:05:15,939 --> 00:05:13,639

cockpit then we'll float back to the aft

117

00:05:17,439 --> 00:05:15,949

part to perform the final part of the

118

00:05:21,700 --> 00:05:17,449

rendezvous visually looking at the

119

00:05:23,290 --> 00:05:21,710

overhead windows what we're using in the

120

00:05:25,719 --> 00:05:23,300

ass station we have controls much like

121

00:05:27,399 --> 00:05:25,729

the forward station for the rendezvous

122

00:05:29,619 --> 00:05:27,409

essentially all we use as a translation

123

00:05:32,920 --> 00:05:29,629

hand controller which you may not be

124

00:05:33,820 --> 00:05:32,930

able to see in this view but it's under

125

00:05:37,899 --> 00:05:33,830

the left hand and it gives you

126
00:05:41,110 --> 00:05:37,909
translation in three axes and for for

127
00:05:42,939 --> 00:05:41,120
siding on it we have a co ads or a

128
00:05:44,709 --> 00:05:42,949
reticle that is placed in the overhead

129
00:05:46,719 --> 00:05:44,719
window and it's right above my head

130
00:05:49,300 --> 00:05:46,729
there and you'll see me peeking through

131
00:05:52,059 --> 00:05:49,310
it tree otic lee but that gives you the

132
00:05:53,830 --> 00:05:52,069
ability to fine-tune your alignment here

133
00:05:56,830 --> 00:05:53,840
we're past the velocity vector and

134
00:06:01,990 --> 00:05:56,840
coming up but towards the \bar{r} or the

135
00:06:03,550 --> 00:06:02,000
radius vector on top of the $d\mathbf{l}$ def we

136
00:06:04,930 --> 00:06:03,560
didn't really get any shots as we

137
00:06:07,240 --> 00:06:04,940
approached it during the night but here

138
00:06:11,439 --> 00:06:07,250

we're down reading pretty close during

139

00:06:13,300 --> 00:06:11,449

the daylight portion and trying to bring

140

00:06:14,950 --> 00:06:13,310

the arm and the end effector camera up

141

00:06:18,850 --> 00:06:14,960

in the position where we can see the

142

00:06:20,279 --> 00:06:18,860

grapple fixture and target I'm at the

143

00:06:21,909 --> 00:06:20,289

apt station on the right there

144

00:06:23,829 --> 00:06:21,919

controlling the remote manipulator

145

00:06:25,540 --> 00:06:23,839

system I have both the translational

146

00:06:27,339 --> 00:06:25,550

hand controller and a rotational hand

147

00:06:29,499 --> 00:06:27,349

controller and actually fly the arm very

148

00:06:31,119 --> 00:06:29,509

much like an airplane there's a camera

149

00:06:33,040 --> 00:06:31,129

on the end of the end effector and it

150

00:06:34,450 --> 00:06:33,050

displays its view to the monitor and I

151
00:06:36,909 --> 00:06:34,460
think some of you probably saw that on

152
00:06:38,499 --> 00:06:36,919
the down link again dan did an excellent

153
00:06:41,230 --> 00:06:38,509
job of getting me right there in the

154
00:06:43,390 --> 00:06:41,240
vicinity so all I had to do is rotate

155
00:06:46,149 --> 00:06:43,400
the end effector by 180 degrees so

156
00:06:48,279 --> 00:06:46,159
aligned to the target and using a

157
00:06:51,339 --> 00:06:48,289
vernier rate come in and make the

158
00:06:53,469 --> 00:06:51,349
grapple got over the pin pull the

159
00:06:56,290 --> 00:06:53,479
trigger trigger everything worked

160
00:06:58,119 --> 00:06:56,300
correctly with all the right indications

161
00:07:00,219 --> 00:06:58,129
that we had a good grapple and as soon

162
00:07:03,010 --> 00:07:00,229
as I we made contact their close the

163
00:07:05,950 --> 00:07:03,020

stairs and we put the brakes on

164

00:07:09,460 --> 00:07:05,960

you see it's a that's the target that we

165

00:07:12,659 --> 00:07:09,470

line through the camera and we've made a

166

00:07:14,950 --> 00:07:12,669

close contact that's the stairs closing

167

00:07:16,629 --> 00:07:14,960

it will eventually rigid eyes the

168

00:07:18,640 --> 00:07:16,639

payload against the end effector and

169

00:07:20,249 --> 00:07:18,650

then we have the brakes on from this

170

00:07:23,320 --> 00:07:20,259

point on then we went into the

171

00:07:25,119 --> 00:07:23,330

photographic survey first ayah started

172

00:07:27,730 --> 00:07:25,129

positioning the LDF over the center of

173

00:07:29,559 --> 00:07:27,740

the bay to protect it Jim went ahead and

174

00:07:31,029 --> 00:07:29,569

started his maneuver and Marcia started

175

00:07:33,939 --> 00:07:31,039

taking pictures of those individual

176

00:07:36,370 --> 00:07:33,949

trays the data that they wanted was our

177

00:07:38,230 --> 00:07:36,380

our perceptions of how this thing looked

178

00:07:40,659 --> 00:07:38,240

and also photographs of each one of the

179

00:07:43,240 --> 00:07:40,669

trays of the 57 experiments on there and

180

00:07:44,920 --> 00:07:43,250

so in about a three or four-hour period

181

00:07:47,850 --> 00:07:44,930

i figure i should probably shot seven

182

00:07:49,749 --> 00:07:47,860

hundred frames of 70 millimeter film

183

00:07:51,309 --> 00:07:49,759

documenting each one of these trays

184

00:07:53,499 --> 00:07:51,319

under different light levels is as

185

00:07:55,540 --> 00:07:53,509

bonnie rotated it on the arm around it's

186

00:07:58,029 --> 00:07:55,550

different positions and here you see the

187

00:08:00,879 --> 00:07:58,039

birthing sequence we took everything

188

00:08:03,369 --> 00:08:00,889

very slow very carefully the payload is

189

00:08:05,469 --> 00:08:03,379

14 feet diameter in the payload Bay's 15

190

00:08:07,600 --> 00:08:05,479

feet now we lined it with a payload bay

191

00:08:09,939 --> 00:08:07,610

rotated around and put it down in the

192

00:08:11,589 --> 00:08:09,949

latches and as the Sun sets we have it

193

00:08:13,959 --> 00:08:11,599

securely placed in the payload bay and

194

00:08:20,050 --> 00:08:13,969

we have recreated the arm it was the end

195

00:08:22,120 --> 00:08:20,060

of that day the one experiment that we

196

00:08:23,680 --> 00:08:22,130

did on everybody every day is this

197

00:08:26,230 --> 00:08:23,690

American flight echocardiographic

198

00:08:30,430 --> 00:08:26,240

spearmint and this looked at in an

199

00:08:32,949 --> 00:08:30,440

ultrasonic image of the heart the David

200

00:08:35,350 --> 00:08:32,959

and Bonnie and I were operators and so

201
00:08:38,230 --> 00:08:35,360
we did our own echoes and then we would

202
00:08:41,529 --> 00:08:38,240
operate on Dan and wax here's David

203
00:08:43,300 --> 00:08:41,539
doing himself here we sort of all had

204
00:08:44,800 --> 00:08:43,310
learned in training where the particular

205
00:08:46,540 --> 00:08:44,810
spot was where your heart ought to be

206
00:08:48,130 --> 00:08:46,550
and the heart shifts around a little bit

207
00:08:49,540 --> 00:08:48,140
in space so we had to go looking for it

208
00:08:51,519 --> 00:08:49,550
this is the image you get on the screen

209
00:08:54,699 --> 00:08:51,529
and then we bring this data back

210
00:08:56,350 --> 00:08:54,709
recorded for the investigator and he

211
00:09:04,630 --> 00:08:56,360
makes measurements of this to determine

212
00:09:10,160 --> 00:09:08,660
this is a me actually inside the lower

213
00:09:11,780 --> 00:09:10,170

body negative pressure device and again

214

00:09:13,910 --> 00:09:11,790

this is an expert medical experiment

215

00:09:15,710 --> 00:09:13,920

that took three people to to work on I

216

00:09:17,330 --> 00:09:15,720

was just the subject Bonnie did all the

217

00:09:20,690 --> 00:09:17,340

work with the pressure regulation and

218

00:09:23,740 --> 00:09:20,700

marches here's taking images of my heart

219

00:09:27,770 --> 00:09:23,750

this is a candidate protocol for

220

00:09:28,940 --> 00:09:27,780

orthostatic intolerance this is Dan

221

00:09:32,090 --> 00:09:28,950

doing something called delayed type

222

00:09:34,310 --> 00:09:32,100

hypersensitivity that's a something that

223

00:09:36,890 --> 00:09:34,320

is essentially like a TB test that you

224

00:09:40,010 --> 00:09:36,900

put on only there are 72 little needles

225

00:09:41,960 --> 00:09:40,020

in there I mean Stu determine if the

226

00:09:49,150 --> 00:09:41,970

human immune system has a different

227

00:09:53,180 --> 00:09:51,710

we tried to time this perfectly so that

228

00:09:54,560 --> 00:09:53,190

we would do this 48 hours prior to

229

00:09:57,380 --> 00:09:54,570

landing and then the principal

230

00:09:58,820 --> 00:09:57,390

investigator would read or actually

231

00:10:01,010 --> 00:09:58,830

analyze the results once we got back

232

00:10:04,490 --> 00:10:01,020

however we had a wave off of one day and

233

00:10:06,950 --> 00:10:04,500

so Dan had to be the investigator and

234

00:10:09,380 --> 00:10:06,960

analyze it the night before we actually

235

00:10:14,720 --> 00:10:09,390

did come home it really look much worse

236

00:10:20,970 --> 00:10:18,110

this is a inter ocular pressure

237

00:10:23,340 --> 00:10:20,980

measurement DSO we're measuring the

238

00:10:25,800 --> 00:10:23,350

intercooler pressure of Bonnie's eyeball

239

00:10:28,110 --> 00:10:25,810

right here this is again to test the

240

00:10:29,280 --> 00:10:28,120

fluid shift to see how the fluid shift

241

00:10:33,000 --> 00:10:29,290

affects the pressure in the inside of

242

00:10:36,360 --> 00:10:33,010

your eyeball this is a gym whether be

243

00:10:38,610 --> 00:10:36,370

doing the salivary pharmacokinetics of

244

00:10:41,610 --> 00:10:38,620

scopolamine and dextroamphetamine which

245

00:10:44,940 --> 00:10:41,620

is uh just trying to understand a little

246

00:10:46,740 --> 00:10:44,950

bit better how drugs are absorbed

247

00:10:48,960 --> 00:10:46,750

distributed and eliminated from the body

248

00:10:51,600 --> 00:10:48,970

he took some scope decks and then over a

249

00:10:54,240 --> 00:10:51,610

period of time over every 30 minutes or

250

00:10:56,730 --> 00:10:54,250

hour so he had to swab a cotton ball in

251
00:10:58,079 --> 00:10:56,740
his in his mouth and collect the saliva

252
00:11:08,760 --> 00:10:58,089
and put that in there and that's going

253
00:11:12,940 --> 00:11:10,690
we did have a little bit of in-flight

254
00:11:14,590 --> 00:11:12,950
maintenance to do we found some water

255
00:11:16,090 --> 00:11:14,600
down in the bilges one day we're using

256
00:11:19,240 --> 00:11:16,100
here we're using the free water disposal

257
00:11:20,800 --> 00:11:19,250
system to slurp up some of the water we

258
00:11:22,390 --> 00:11:20,810
put a fix on it then we'll show you this

259
00:11:24,790 --> 00:11:22,400
little bit better than a still

260
00:11:27,760 --> 00:11:24,800
photograph to keep the water from

261
00:11:29,050 --> 00:11:27,770
getting away in in future times and

262
00:11:34,150 --> 00:11:29,060
periodically throughout the mission we

263
00:11:37,840 --> 00:11:34,160

had to go down and do that this is the

264

00:11:39,670 --> 00:11:37,850

protein crystal growth experiment on day

265

00:11:41,500 --> 00:11:39,680

one we activated it and then looked at

266

00:11:43,300 --> 00:11:41,510

each of the droplets and this is this is

267

00:11:44,890 --> 00:11:43,310

how the crystals grow in each one of

268

00:11:50,470 --> 00:11:44,900

those droplets there there's nobody home

269

00:11:52,780 --> 00:11:50,480

there on day last when we deactivated it

270

00:11:54,730 --> 00:11:52,790

we go back to reef photograph what is

271

00:11:56,230 --> 00:11:54,740

growing in the crystals this is not the

272

00:11:57,550 --> 00:11:56,240

normal way one would take pictures of

273

00:11:58,930 --> 00:11:57,560

things but in space it worked fairly

274

00:12:01,270 --> 00:11:58,940

well and now you can see that there is

275

00:12:02,560 --> 00:12:01,280

some crystal growth in these droplets we

276

00:12:05,200 --> 00:12:02,570

don't know yet the results of their

277

00:12:07,090 --> 00:12:05,210

experiments the FAA experiment grew a

278

00:12:08,770 --> 00:12:07,100

different sort of crystal it's a fairly

279

00:12:10,720 --> 00:12:08,780

large one and again we looked at it for

280

00:12:12,700 --> 00:12:10,730

disturbances this is an indium crystal

281

00:12:14,770 --> 00:12:12,710

this whole tube here and that

282

00:12:17,920 --> 00:12:14,780

disturbances during an RCS burn during

283

00:12:19,810 --> 00:12:17,930

the rendezvous so we brought back a lot

284

00:12:22,660 --> 00:12:19,820

of good data about the disturbances in

285

00:12:35,060 --> 00:12:22,670

microg and this is an experiment we ran

286

00:12:40,880 --> 00:12:38,960

this is the bread mold there were some

287

00:12:42,560 --> 00:12:40,890

that he was looking at the effect of

288

00:12:45,050 --> 00:12:42,570

both gravity and light or lack of

289

00:12:48,650 --> 00:12:45,060

gravity and lack of light on the

290

00:12:50,210 --> 00:12:48,660

circadian rhythm of of his test subject

291

00:12:52,760 --> 00:12:50,220

here and so the ones wrapped in red

292

00:12:54,260 --> 00:12:52,770

didn't didn't see a light pulse than

293

00:13:00,380 --> 00:12:54,270

there were some clear tubes that did see

294

00:13:01,910 --> 00:13:00,390

a light pulse we marked the growth front

295

00:13:07,760 --> 00:13:01,920

basically in each of these tubes and

296

00:13:09,980 --> 00:13:07,770

then we photographed them up close since

297

00:13:11,900 --> 00:13:09,990

they continue to grow as as the days go

298

00:13:14,750 --> 00:13:11,910

by he wanted to see what would happen on

299

00:13:16,850 --> 00:13:14,760

day seven and a nine and a ten and this

300

00:13:19,460 --> 00:13:16,860

is basically what it looks like inside

301
00:13:21,050 --> 00:13:19,470
this is seven days and the life of bread

302
00:13:25,040 --> 00:13:21,060
mold here each one of those thick bands

303
00:13:33,980 --> 00:13:25,050
is is a day which is about 22 hours for

304
00:13:39,170 --> 00:13:36,740
the IMAX camera is is not your standard

305
00:13:42,740 --> 00:13:39,180
camera weighs 85 pounds when you're on

306
00:13:44,750 --> 00:13:42,750
earth and it's fairly large the film is

307
00:13:46,670 --> 00:13:44,760
three times wider than normal movie film

308
00:13:49,460 --> 00:13:46,680
took a little while to load and you can

309
00:13:52,550 --> 00:13:49,470
see it's fairly unwieldy to to hold but

310
00:13:54,440 --> 00:13:52,560
it takes an incredible picture we shot

311
00:13:57,710 --> 00:13:54,450
both indoor which you see here and then

312
00:13:59,990 --> 00:13:57,720
we shot we shot some outdoor movies this

313
00:14:02,570 --> 00:14:00,000

is an oblique view of the the knobby

314

00:14:07,610 --> 00:14:02,580

desert which was one of the places we

315

00:14:09,650 --> 00:14:07,620

saw frequently not covered by clouds we

316

00:14:12,010 --> 00:14:09,660

carried a number of other cameras and

317

00:14:14,600 --> 00:14:12,020

did a fairly extensive film test

318

00:14:16,150 --> 00:14:14,610

probably carried 16 different kinds of

319

00:14:19,639 --> 00:14:16,160

films that we have not flown before

320

00:14:21,410 --> 00:14:19,649

carried two additional long lenses an

321

00:14:23,870 --> 00:14:21,420

additional camera body looking at

322

00:14:26,449 --> 00:14:23,880

different camera types and shutter

323

00:14:27,800 --> 00:14:26,459

speeds and film speeds in trying to

324

00:14:29,840 --> 00:14:27,810

improve the product we bring back from

325

00:14:31,780 --> 00:14:29,850

space this is a 500 millimeter lens on

326

00:14:36,199 --> 00:14:31,790

the hasselblad that I'm shooting here

327

00:14:39,350 --> 00:14:36,209

and that wasn't as hard to use as it

328

00:14:42,860 --> 00:14:39,360

looks once you get the hang of it and

329

00:14:45,440 --> 00:14:42,870

again here's a native you of the same

330

00:14:47,569 --> 00:14:45,450

desert and you can sort of see what we

331

00:14:49,550 --> 00:14:47,579

looked at we'd get some good view of

332

00:14:53,630 --> 00:14:49,560

dirt and then there be clouds we saw

333

00:14:56,420 --> 00:14:53,640

clouds for 11 days Here I am that's my

334

00:14:59,329 --> 00:14:56,430

film table in the back with about half

335

00:15:01,790 --> 00:14:59,339

of my film vax and canisters and so on

336

00:15:07,519 --> 00:15:01,800

this is the Panama Canal under those

337

00:15:09,110 --> 00:15:07,529

clouds and again we were we felt

338

00:15:10,730 --> 00:15:09,120

fortunate to see that much dirt this is

339

00:15:13,940 --> 00:15:10,740

basically what we looked at this sort of

340

00:15:18,079 --> 00:15:13,950

picture for most of the flight but that

341

00:15:22,710 --> 00:15:21,329

part of our medical of objectives were

342

00:15:24,630 --> 00:15:22,720

to look at the effects of treadmill

343

00:15:27,210 --> 00:15:24,640

operations are actually exercise on

344

00:15:29,730 --> 00:15:27,220

orbit and we had three people who did

345

00:15:31,170 --> 00:15:29,740

routine exercise on orbit we also wanted

346

00:15:32,850 --> 00:15:31,180

to see how the treadmill affected the

347

00:15:35,040 --> 00:15:32,860

microgravity disturbance experiment and

348

00:15:36,900 --> 00:15:35,050

we didn't have transducers we had whacks

349

00:15:38,310 --> 00:15:36,910

here's free-floating so in order to find

350

00:15:40,079 --> 00:15:38,320

out what forces there where I grabbed

351

00:15:44,400 --> 00:15:40,089

ahold of it and I think we've got the

352

00:15:46,350 --> 00:15:44,410

directions pegged we wear of course the

353

00:15:49,800 --> 00:15:46,360

launch and entry suit for launch and

354

00:15:52,160 --> 00:15:49,810

entry it's a big giant rubber suit one

355

00:15:54,690 --> 00:15:52,170

of the concerns I had being so tall they

356

00:15:58,019 --> 00:15:54,700

tell me that you grow a couple of inches

357

00:15:59,759 --> 00:15:58,029

on orbit or a couple of percent I really

358

00:16:05,880 --> 00:15:59,769

had no difficulty getting into the suit

359

00:16:08,310 --> 00:16:05,890

as you can see I seem to fit pretty well

360

00:16:09,750 --> 00:16:08,320

once I got my hand at Marcia was making

361

00:16:16,380 --> 00:16:09,760

sure I didn't bump into anything while I

362

00:16:18,150 --> 00:16:16,390

still had my eyes inside the suit the

363

00:16:19,980 --> 00:16:18,160

neck damn that we we're kind of squishes

364

00:16:21,930 --> 00:16:19,990

in on your neck and so it's very

365

00:16:24,060 --> 00:16:21,940

difficult to get your head through the

366

00:16:30,309 --> 00:16:24,070

neck damn and then it finally comes and

367

00:16:37,699 --> 00:16:33,590

we didn't get any footage during actual

368

00:16:40,610 --> 00:16:37,709

reentry but he as we crossed the coast

369

00:16:43,429 --> 00:16:40,620

of California they had some high-powered

370

00:16:46,569 --> 00:16:43,439

cameras on us that apparently got a

371

00:16:49,639 --> 00:16:46,579

couple shots of some RCS Jets firing and

372

00:16:52,699 --> 00:16:49,649

then as we got into the Edwards complex

373

00:16:54,470 --> 00:16:52,709

they had an infrared camera that here is

374

00:16:56,900 --> 00:16:54,480

picked us up on outer glide slope and

375

00:16:59,150 --> 00:16:56,910

it's you're probably all familiar with

376

00:17:03,110 --> 00:16:59,160

infrared but it just it senses the heat

377

00:17:05,569 --> 00:17:03,120

and not the visual spectrum so anything

378

00:17:06,980 --> 00:17:05,579

that's real white is real hot and as you

379

00:17:08,449 --> 00:17:06,990

see the wheels touch down you see the

380

00:17:11,269 --> 00:17:08,459

instant they touch down the heat up and

381

00:17:13,490 --> 00:17:11,279

they'll turn quite white you can see

382

00:17:15,620 --> 00:17:13,500

here that there in fact down the PLT did

383

00:17:21,980 --> 00:17:15,630

his primary job and got the gear down

384

00:17:23,480 --> 00:17:21,990

and through obvious thirdly gear just

385

00:17:25,069 --> 00:17:23,490

touched down then they co-op Aloha

386

00:17:26,480 --> 00:17:25,079

apparently as they roll out and then

387

00:17:29,810 --> 00:17:26,490

they heat up again as you apply the

388

00:17:32,539 --> 00:17:29,820

brakes from this you can see the wing

389

00:17:34,399 --> 00:17:32,549

leading edge the nose and the windows

390

00:17:38,659 --> 00:17:34,409

have probably retained to heat the

391

00:17:42,289 --> 00:17:38,669

longest of reentry the flashes you see

392

00:17:46,730 --> 00:17:42,299

on top are the exhaust from the AP use

393

00:17:48,230 --> 00:17:46,740

and you can kind of pick out the side of

394

00:17:50,470 --> 00:17:48,240

the vehicle the hinges from the payload

395

00:17:52,460 --> 00:17:50,480

bay doors which are metal and that tile

396

00:17:53,930 --> 00:17:52,470

stay hot longer and you can see the

397

00:17:59,840 --> 00:17:53,940

little white spots down the hinge line

398

00:18:03,049 --> 00:17:59,850

and various other materials that retain

399

00:18:06,919 --> 00:18:03,059

or transmit the heat away faster is the

400

00:18:08,779 --> 00:18:06,929

kind of interesting view it was we

401
00:18:12,169 --> 00:18:08,789
double back and I'll show you also the

402
00:18:13,430 --> 00:18:12,179
landing in the visual spectrum only

403
00:18:15,620 --> 00:18:13,440
because you don't see it very long but

404
00:18:19,299 --> 00:18:15,630
Edwards usually is the desert and quite

405
00:18:24,230 --> 00:18:19,309
dry however the night before we'd had

406
00:18:25,700 --> 00:18:24,240
fog this particular night there was the

407
00:18:27,080 --> 00:18:25,710
possibility of fog later in the evening

408
00:18:29,090 --> 00:18:27,090
so there was quite a bit of humidity in

409
00:18:32,450 --> 00:18:29,100
the air and that's obvious as you see

410
00:18:34,190 --> 00:18:32,460
the condensation on the on the wings are

411
00:18:37,450 --> 00:18:34,200
not coming off the wingtip vortices as

412
00:18:40,409 --> 00:18:37,460
you come in to land so it's kind of a

413
00:18:42,810 --> 00:18:40,419

interesting and eerie sight

414

00:18:44,220 --> 00:18:42,820

it's watching apparently watching a

415

00:18:46,470 --> 00:18:44,230

shuttle land at night is not a great

416

00:18:50,190 --> 00:18:46,480

spectator sport because you don't see

417

00:18:52,229 --> 00:18:50,200

anything until the last couple a couple

418

00:18:53,999 --> 00:18:52,239

seconds as you pop out of the other

419

00:18:55,999 --> 00:18:54,009

darkness into the light however the

420

00:18:58,440 --> 00:18:56,009

spectators in the immediate vicinity

421

00:19:00,779 --> 00:18:58,450

report that from about 30,000 feet to

422

00:19:04,379 --> 00:19:00,789

touchdown you can hear it the apparently

423

00:19:05,580 --> 00:19:04,389

the air coming across the the wings it's

424

00:19:08,129 --> 00:19:05,590

rough enough that it causes some

425

00:19:10,830 --> 00:19:08,139

turbulence and verbal that that gives an

426

00:19:13,200 --> 00:19:10,840

audio signature and here we are all

427

00:19:14,879 --> 00:19:13,210

still kind of warm well we elected to

428

00:19:16,320 --> 00:19:14,889

stay in the suits because it was 32

429

00:19:17,700 --> 00:19:16,330

degrees out and we didn't figure we

430

00:19:18,989 --> 00:19:17,710

needed the hassle of trying to get out