1
00:00:33,030 --> 00:00:30,870
good afternoon this is the sts 29 post

2
00:00:34,870 --> 00:00:33,040
flight crew press conference

3
00:00:37,430 --> 00:00:34,880
we're going to look at some home movies

4
00:00:39,030 --> 00:00:37,440
slides video film and

5
00:00:40,470 --> 00:00:39,040
listen to the crew tell us

6
00:00:44,069 --> 00:00:40,480
their tales of

7
00:00:45,990 --> 00:00:44,079
sts-29 i'm happy to introduce the sts 29

8
00:00:48,069 --> 00:00:46,000
crew commander michael coats

9
00:00:49,750 --> 00:00:48,079
thank you jeff

10
00:00:52,229 --> 00:00:49,760
i have the distinct pleasure and i'm

11
00:00:54,869 --> 00:00:52,239
very proud to introduce

12
00:00:57,510 --> 00:00:54,879
the crew of sts-29

13
00:01:00,869 --> 00:00:57,520

john blaha to my right

14
00:01:05,030 --> 00:01:00,879
to his right is jim buckley

15
00:01:11,350 --> 00:01:08,390
and to his right is jim vagin

16
00:01:13,910 --> 00:01:11,360
and i'd like to start off by

17
00:01:15,910 --> 00:01:13,920
expressing my thanks and gratitude to

18
00:01:17,670 --> 00:01:15,920
everybody that worked so hard to get us

19
00:01:19,350 --> 00:01:17,680
ready to fly and to get the discovery

20
00:01:20,550 --> 00:01:19,360
ready to fly

21
00:01:23,109 --> 00:01:20,560
we have a

22
00:01:24,710 --> 00:01:23,119
movie a home movie we put together

23
00:01:26,310 --> 00:01:24,720
we'd like to show you

24
00:01:28,710 --> 00:01:26,320
and then some slides we'd like to talk

25
00:01:31,109 --> 00:01:28,720
to a little bit after that

26
00:01:45,350 --> 00:01:31,119
so jeff if we're ready to

27
00:01:48,710 --> 00:01:46,550
there's a discovery sitting in the

28
00:01:53,350 --> 00:01:48,720
launch pad we hope to see that quite

29
00:01:56,870 --> 00:01:55,030
we had a hard time getting uh jim

30
00:01:59,350 --> 00:01:56,880
beijing to wear coat and tie and our

31
00:02:00,950 --> 00:01:59,360
last chance was launch morning so we all

32
00:02:02,469 --> 00:02:00,960
got dressed up and he finally agreed to

33
00:02:07,350 --> 00:02:02,479
do that so

34
00:02:11,510 --> 00:02:09,990
here we are in the suit room

35
00:02:13,910 --> 00:02:11,520
getting those uh

36
00:02:15,350 --> 00:02:13,920
launch and entry suits on

37
00:02:29,270 --> 00:02:15,360
if they look uncomfortable that's

38
00:02:32,790 --> 00:02:30,550

and we're walking out of the crew

39
00:02:37,589 --> 00:02:32,800
quarters into the astronaut van looking

40
00:02:39,190 --> 00:02:37,599
like five orange doughboys here

41
00:02:40,630 --> 00:02:39,200
if we ever end up in the water we'll be

42
00:02:43,990 --> 00:02:40,640
glad we have those suits on but they

43
00:02:45,190 --> 00:02:44,000
sure are uncomfortable to wear

44
00:02:48,830 --> 00:02:45,200
especially if you're used to the old

45
00:02:53,589 --> 00:02:51,509
years of course most of you realize we

46
00:02:55,030 --> 00:02:53,599
had a a couple hour launch delay waiting

47
00:02:58,149 --> 00:02:55,040
for the fog to burn off and the upper

48
00:03:02,390 --> 00:03:00,070
exceedences to go away

49
00:03:04,550 --> 00:03:02,400
so we're really uh

50
00:03:05,830 --> 00:03:04,560
pleased when they started

51
00:03:09,430 --> 00:03:05,840
the countdown out of the nine-minute

52
00:03:11,350 --> 00:03:09,440
hole after four hours on our back it was

53
00:03:14,869 --> 00:03:11,360
a relief to start counting down again

54
00:03:23,350 --> 00:03:16,309
turned out to be a beautiful day once

55
00:03:27,350 --> 00:03:24,789
one of the things we did during this

56
00:03:29,110 --> 00:03:27,360
flight was uh activate a camera to

57
00:03:30,309 --> 00:03:29,120
recording debris striking the windows

58
00:03:32,390 --> 00:03:30,319
during the first couple minutes while

59
00:03:34,390 --> 00:03:32,400
the sidewalk boosters are

60
00:03:35,750 --> 00:03:34,400
are firing john the camera was on john's

61
00:03:37,670 --> 00:03:35,760
side over there

62
00:03:39,830 --> 00:03:37,680
and we got down to 10 seconds before

63
00:03:42,550 --> 00:03:39,840

liftoff and all five of us in unison

64
00:03:48,470 --> 00:03:42,560
said get the camera john

65
00:03:52,789 --> 00:03:50,309
and of course after two minutes uh the

66
00:03:58,309 --> 00:03:52,799
solid rocket boosters come off and

67
00:04:02,390 --> 00:04:00,550
now here we have a shot of uh

68
00:04:03,589 --> 00:04:02,400
the indian ocean the southern tip of

69
00:04:05,589 --> 00:04:03,599
india with

70
00:04:07,429 --> 00:04:05,599
the island of sri lanka

71
00:04:09,110 --> 00:04:07,439
used to be a salon

72
00:04:10,470 --> 00:04:09,120
called salon

73
00:04:15,190 --> 00:04:10,480
down there i think that's a beautiful

74
00:04:19,430 --> 00:04:17,590
once we got past the uh the launch and

75
00:04:21,590 --> 00:04:19,440
into fully into the orbit phase we

76
00:04:23,830 --> 00:04:21,600
started reconfiguring the cockpit to try

77
00:04:25,189 --> 00:04:23,840
and get things ready for the ios deploy

78
00:04:27,350 --> 00:04:25,199
i think one of the more difficult things

79
00:04:29,909 --> 00:04:27,360
about this particular mission is the uh

80
00:04:31,670 --> 00:04:29,919
the post insertion timeline and getting

81
00:04:32,950 --> 00:04:31,680
ready for the deploy operations uh

82
00:04:33,990 --> 00:04:32,960
you've got to get

83
00:04:36,310 --> 00:04:34,000
configured from your launch

84
00:04:38,870 --> 00:04:36,320
configuration reconfigure the entire

85
00:04:41,670 --> 00:04:38,880
orbiter for the deploy operations for

86
00:04:43,590 --> 00:04:41,680
the on-orbit operations we facilitated

87
00:04:46,070 --> 00:04:43,600
this to some extent as soon as we got on

88
00:04:48,310 --> 00:04:46,080

orbit by going ahead getting out of the

89
00:04:50,550 --> 00:04:48,320
launch entry suits and getting into our

90
00:04:51,990 --> 00:04:50,560
uh are more comfortable on orbit

91
00:04:54,230 --> 00:04:52,000
clothing which you can see varied

92
00:04:57,189 --> 00:04:54,240
somewhat getting ready for the tdrs and

93
00:04:59,350 --> 00:04:57,199
ius deploy once we got everything

94
00:05:01,029 --> 00:04:59,360
started uh six hours and 12 minutes into

95
00:05:02,950 --> 00:05:01,039
the mission we went ahead and deployed

96
00:05:05,590 --> 00:05:02,960
the ius tdrs

97
00:05:07,590 --> 00:05:05,600
it was a successful deploy we had a

98
00:05:09,510 --> 00:05:07,600
hearts almost stopped about two minutes

99
00:05:11,830 --> 00:05:09,520
before deploy we got a series of

100
00:05:13,510 --> 00:05:11,840
anomalies and warnings that looked like

101
00:05:15,110 --> 00:05:13,520
everything had failed and it turns out

102
00:05:17,670 --> 00:05:15,120
it was just a data drop on the

103
00:05:21,029 --> 00:05:17,680
communication link between the ius and

104
00:05:22,550 --> 00:05:21,039
the orbiter we got a quick go for the

105
00:05:24,070 --> 00:05:22,560
deploy from the ground when they saw

106
00:05:26,310 --> 00:05:24,080
that the their telemetry was all right

107
00:05:28,950 --> 00:05:26,320
so we proceeded with the deploy

108
00:05:30,870 --> 00:05:28,960
uh and got it off uh on time

109
00:05:33,590 --> 00:05:30,880
we were very delighted uh shortly

110
00:05:35,270 --> 00:05:33,600
thereafter uh the had the two uh burns

111
00:05:36,870 --> 00:05:35,280
that it took to get the ius up to its

112
00:05:38,550 --> 00:05:36,880
geosynchronous orbit

113
00:05:41,350 --> 00:05:38,560

and we found out that those two burns uh

114
00:05:43,749 --> 00:05:41,360
went on schedule and as programmed

115
00:05:44,710 --> 00:05:43,759
the tdrs was put into its uh initial

116
00:05:46,469 --> 00:05:44,720
orbit

117
00:05:48,469 --> 00:05:46,479
i think it had initially had a 40 foot

118
00:05:51,350 --> 00:05:48,479
per second under speed as far as getting

119
00:05:53,430 --> 00:05:51,360
to its uh its geosynchronous altitude

120
00:05:55,430 --> 00:05:53,440
but it turns out that uh that was not

121
00:05:56,790 --> 00:05:55,440
all bad it was a slight underburn and it

122
00:05:58,309 --> 00:05:56,800
was on

123
00:05:59,749 --> 00:05:58,319
the right side of things as the orbital

124
00:06:01,670 --> 00:05:59,759
mechanics of it go and was actually

125
00:06:04,469 --> 00:06:01,680
started to drift already toward its uh

126
00:06:07,110 --> 00:06:05,909
right after we got done with the tdrs

127
00:06:08,870 --> 00:06:07,120
deploy

128
00:06:10,550 --> 00:06:08,880
i had to get into uh experiment

129
00:06:12,710 --> 00:06:10,560
activation this is the protein crystal

130
00:06:13,990 --> 00:06:12,720
growth experiment uh fascinating

131
00:06:15,110 --> 00:06:14,000
experiment because it's one of the

132
00:06:17,270 --> 00:06:15,120
things we've learned to do in the

133
00:06:20,150 --> 00:06:17,280
microgravity environment of space is to

134
00:06:21,590 --> 00:06:20,160
be able to grow crystals in this case

135
00:06:24,230 --> 00:06:21,600
protein crystals that are used in a

136
00:06:25,909 --> 00:06:24,240
variety of applications in pharmacology

137
00:06:28,230 --> 00:06:25,919
from our standpoint on

138
00:06:29,909 --> 00:06:28,240

on the orbiter

139
00:06:31,510 --> 00:06:29,919
our biggest job after activating the

140
00:06:33,350 --> 00:06:31,520
experiment going ahead and mixing the

141
00:06:35,670 --> 00:06:33,360
ingredients the precipitates that would

142
00:06:37,350 --> 00:06:35,680
help to form the crystals was to do some

143
00:06:39,670 --> 00:06:37,360
photography of it we did a activation

144
00:06:43,430 --> 00:06:39,680
photography to capture what the

145
00:06:47,189 --> 00:06:44,950
this is the chromex experiment it's a

146
00:06:49,670 --> 00:06:47,199
plant growth experiment we flew to see

147
00:06:51,189 --> 00:06:49,680
how plant roots that would just start to

148
00:06:53,189 --> 00:06:51,199
germinate would develop one orbit

149
00:06:54,629 --> 00:06:53,199
without the influence of gravity and

150
00:06:56,230 --> 00:06:54,639
that way to see if the chromosome

151
00:06:58,150 --> 00:06:56,240
divisions that normally take place would

152
00:07:00,790 --> 00:06:58,160
proceed as you'd expect

153
00:07:02,790 --> 00:07:00,800
and allow the growth of the plant this

154
00:07:04,150 --> 00:07:02,800
is particularly useful for future ops

155
00:07:06,070 --> 00:07:04,160
and space station

156
00:07:07,990 --> 00:07:06,080
where people worry about both food

157
00:07:10,309 --> 00:07:08,000
growth and closed environmental control

158
00:07:13,830 --> 00:07:10,319
systems where you can not only scrub co2

159
00:07:17,589 --> 00:07:15,110
this is one of the life sciences

160
00:07:19,830 --> 00:07:17,599
experiments it's a transcranial doppler

161
00:07:21,350 --> 00:07:19,840
it's one of the dsos and here we're

162
00:07:23,670 --> 00:07:21,360
looking at some blood flow in the middle

163
00:07:26,550 --> 00:07:23,680

cerebral artery and that's the velocity

164
00:07:28,150 --> 00:07:26,560
waveform look in there on mike

165
00:07:29,270 --> 00:07:28,160
and we hope to try to carry light

166
00:07:31,189 --> 00:07:29,280
changes in

167
00:07:33,909 --> 00:07:31,199
blood flow in the brain with possible

168
00:07:35,830 --> 00:07:33,919
symptoms of space adaptation syndrome

169
00:07:37,510 --> 00:07:35,840
and in that way maybe get a little bit

170
00:07:38,469 --> 00:07:37,520
better handle on what the cause of that

171
00:07:40,070 --> 00:07:38,479
is

172
00:07:41,909 --> 00:07:40,080
so we

173
00:07:45,830 --> 00:07:41,919
we did a fair amount of studies on that

174
00:07:47,270 --> 00:07:45,840
to try to get that wrapped up

175
00:07:48,790 --> 00:07:47,280
here's a little thing we did on the side

176
00:07:50,390 --> 00:07:48,800
there was concerns for space station

177
00:07:52,710 --> 00:07:50,400
about how to because we'll be there for

178
00:07:54,469 --> 00:07:52,720
a longer period of time how to deliver

179
00:07:56,469 --> 00:07:54,479
normal type health care how to care for

180
00:07:58,150 --> 00:07:56,479
people and this is an iv bag intravenous

181
00:07:59,510 --> 00:07:58,160
fluid you have bubbles in it well on

182
00:08:01,510 --> 00:07:59,520
earth they just drift to the top and you

183
00:08:02,950 --> 00:08:01,520
get them out zero g they just kind of

184
00:08:04,390 --> 00:08:02,960
look like effervescence just bubble

185
00:08:06,550 --> 00:08:04,400
suspended in the fluid well by just

186
00:08:07,909 --> 00:08:06,560
centrifuging it by hand like that you're

187
00:08:09,270 --> 00:08:07,919
able to have all the bubbles migrate to

188
00:08:11,430 --> 00:08:09,280

the one end and just bleed it right off

189
00:08:13,189 --> 00:08:11,440
with any extra equipment on board just

190
00:08:14,469 --> 00:08:13,199
use a blood pressure cuff in the iv bag

191
00:08:16,550 --> 00:08:14,479
just as you would here on earth so it

192
00:08:18,550 --> 00:08:16,560
works real well

193
00:08:20,629 --> 00:08:18,560
uh here's bob doing a central venous

194
00:08:22,950 --> 00:08:20,639
pressure measurement and by blowing in

195
00:08:25,589 --> 00:08:22,960
that mouthpiece he raises his pressure

196
00:08:27,909 --> 00:08:25,599
in his lungs to the same pressure as the

197
00:08:29,510 --> 00:08:27,919
uh as a central venous pressure and then

198
00:08:30,790 --> 00:08:29,520
when that happens there's no longer any

199
00:08:32,389 --> 00:08:30,800
flow and he was measuring the flow in

200
00:08:33,990 --> 00:08:32,399
the external jugular vein there with the

201
00:08:35,909 --> 00:08:34,000
flow probe

202
00:08:37,750 --> 00:08:35,919
also we thought that there was a study

203
00:08:39,670 --> 00:08:37,760
to look at changes in intraocular

204
00:08:41,430 --> 00:08:39,680
pressure just as you measure intraocular

205
00:08:43,350 --> 00:08:41,440
pressure for glaucoma

206
00:08:45,110 --> 00:08:43,360
we're using what's called a tonopen and

207
00:08:46,310 --> 00:08:45,120
here you have to anesthetize your cornea

208
00:08:48,150 --> 00:08:46,320
which i just did with those little drops

209
00:08:49,509 --> 00:08:48,160
and now i shove this pen and tap it off

210
00:08:51,670 --> 00:08:49,519
my cornea

211
00:08:53,110 --> 00:08:51,680
continue to tap it and you got to get

212
00:08:54,389 --> 00:08:53,120
used to that just staring in the eye as

213
00:08:55,750 --> 00:08:54,399

you bounce it off your corner you can

214
00:08:56,630 --> 00:08:55,760
tell when you touch it not because you

215
00:08:58,310 --> 00:08:56,640
feel it

216
00:09:00,230 --> 00:08:58,320
but it changes your refractive area you

217
00:09:03,030 --> 00:09:00,240
can see everything get blurry

218
00:09:04,470 --> 00:09:03,040
this is uh john vellinger's experiment

219
00:09:06,310 --> 00:09:04,480
you know he's a

220
00:09:09,110 --> 00:09:06,320
senior at purdue university now he

221
00:09:11,509 --> 00:09:09,120
started this experiment many years ago

222
00:09:13,430 --> 00:09:11,519
he really did a great job with this i

223
00:09:15,509 --> 00:09:13,440
really congratulate him

224
00:09:18,150 --> 00:09:15,519
we saw him last friday he told us

225
00:09:20,550 --> 00:09:18,160
preliminary results so far

226
00:09:23,350 --> 00:09:20,560
as it turns out the embryos that

227
00:09:24,550 --> 00:09:23,360
launched that were two days old were all

228
00:09:26,550 --> 00:09:24,560
had died

229
00:09:28,949 --> 00:09:26,560
on landing for some reason up in orbit

230
00:09:32,710 --> 00:09:28,959
and they have to figure that out yet

231
00:09:34,470 --> 00:09:32,720
also on easter saturday all 16 of 16

232
00:09:36,310 --> 00:09:34,480
that launched that were nine days old

233
00:09:38,230 --> 00:09:36,320
hatched so

234
00:09:40,389 --> 00:09:38,240
maybe some very significant results and

235
00:09:42,389 --> 00:09:40,399
a lot of unanswered questions from that

236
00:09:44,070 --> 00:09:42,399
experiment

237
00:09:45,350 --> 00:09:44,080
this is a another thing for space

238
00:09:46,790 --> 00:09:45,360

station we were looking at they were

239
00:09:48,389 --> 00:09:46,800
concerned could you use standard type

240
00:09:50,790 --> 00:09:48,399
medical equipment like for suturing

241
00:09:53,430 --> 00:09:50,800
wounds stitching up wounds as you would

242
00:09:55,030 --> 00:09:53,440
in 1g so we just had a little little

243
00:09:57,670 --> 00:09:55,040
block with some basic like artificial

244
00:09:58,870 --> 00:09:57,680
skin with various lacerations made in it

245
00:10:00,310 --> 00:09:58,880
since they didn't want us to lacerate

246
00:10:02,389 --> 00:10:00,320
ourselves plus it's a little tougher to

247
00:10:05,590 --> 00:10:02,399
get volunteers for that

248
00:10:07,509 --> 00:10:05,600
uh we're gonna first though anyway

249
00:10:09,590 --> 00:10:07,519
uh we got the suture material out and

250
00:10:11,110 --> 00:10:09,600
just see to see if you could stitch up a

251
00:10:11,990 --> 00:10:11,120
wound in the same way you would here on

252
00:10:13,670 --> 00:10:12,000
earth

253
00:10:15,030 --> 00:10:13,680
and bob did a good job focusing on the

254
00:10:17,030 --> 00:10:15,040
suture you can see it right there it

255
00:10:18,870 --> 00:10:17,040
doesn't tangle up the normal links like

256
00:10:22,310 --> 00:10:18,880
you used in the operating room here will

257
00:10:26,230 --> 00:10:24,550
what you see on the laundry on here is a

258
00:10:29,269 --> 00:10:26,240
share experiment which is a space

259
00:10:31,110 --> 00:10:29,279
station radiator assembly

260
00:10:34,790 --> 00:10:31,120
though it didn't perform as we had

261
00:10:36,790 --> 00:10:34,800
predicted the nasa engineers and mission

262
00:10:39,670 --> 00:10:36,800
control team were able to get an awful

263
00:10:40,790 --> 00:10:39,680

lot of very very good data from this

264
00:10:41,910 --> 00:10:40,800
experiment

265
00:10:44,949 --> 00:10:41,920
and it really

266
00:10:46,550 --> 00:10:44,959
tells us why it's so important to fly

267
00:10:48,710 --> 00:10:46,560
pieces of the space station and

268
00:10:50,710 --> 00:10:48,720
equipment on early shuttle flight so we

269
00:10:52,630 --> 00:10:50,720
can get a good engineering basis for

270
00:10:54,389 --> 00:10:52,640
station

271
00:10:55,670 --> 00:10:54,399
here we are in the mid deck mike's

272
00:10:57,350 --> 00:10:55,680
looking at a

273
00:10:59,750 --> 00:10:57,360
tags picture

274
00:11:03,509 --> 00:10:59,760
tags is texan graphics

275
00:11:04,630 --> 00:11:03,519
which allows us to send up high fidelity

276
00:11:07,829 --> 00:11:04,640
almost like

277
00:11:09,350 --> 00:11:07,839
thermo graph type pictures

278
00:11:11,430 --> 00:11:09,360
we use these

279
00:11:13,670 --> 00:11:11,440
during our imax

280
00:11:15,430 --> 00:11:13,680
filming to look ahead at weather

281
00:11:16,870 --> 00:11:15,440
satellite photographs so we could tell

282
00:11:18,470 --> 00:11:16,880
what areas

283
00:11:22,310 --> 00:11:18,480
were going to be clear around the world

284
00:11:27,350 --> 00:11:24,310
on the flight deck we did several

285
00:11:29,269 --> 00:11:27,360
experiments this one happens to be a

286
00:11:31,670 --> 00:11:29,279
coast

287
00:11:34,949 --> 00:11:31,680
which is an optical device allowing the

288
00:11:36,550 --> 00:11:34,959

crew to realign their inertial platforms

289
00:11:38,389 --> 00:11:36,560
in the event that they should

290
00:11:40,389 --> 00:11:38,399
malfunction and

291
00:11:42,069 --> 00:11:40,399
lose their nav base

292
00:11:43,670 --> 00:11:42,079
mike was able to do that sighting on the

293
00:11:45,750 --> 00:11:43,680
sun

294
00:11:49,910 --> 00:11:45,760
this is the imax camera and

295
00:11:51,590 --> 00:11:49,920
you see jim here uh loading the magazine

296
00:11:54,230 --> 00:11:51,600
putting the film into the camera i might

297
00:11:56,069 --> 00:11:54,240
compliment the imax people

298
00:11:59,030 --> 00:11:56,079
excellent support and training they gave

299
00:12:01,110 --> 00:11:59,040
us throughout the lead-up to the mission

300
00:12:03,509 --> 00:12:01,120
which really enabled us to be very

301
00:12:06,710 --> 00:12:03,519
successful uh we found operating with

302
00:12:09,110 --> 00:12:06,720
the camera in xero g to be

303
00:12:13,269 --> 00:12:09,120
quite similar to 1g and had no

304
00:12:17,430 --> 00:12:15,110
here's a scene on the flight deck uh

305
00:12:19,350 --> 00:12:17,440
jim's holding the camera here and i'm

306
00:12:20,870 --> 00:12:19,360
trying to put a 100 millimeter lens on

307
00:12:22,629 --> 00:12:20,880
in this case

308
00:12:24,550 --> 00:12:22,639
and you see mike up front talking to

309
00:12:26,310 --> 00:12:24,560
mission control this is usually the

310
00:12:27,350 --> 00:12:26,320
sequence mike was trying to maneuver the

311
00:12:29,350 --> 00:12:27,360
orbiter

312
00:12:31,910 --> 00:12:29,360
here's a shot of me

313
00:12:33,670 --> 00:12:31,920

taking a picture of this case

314
00:12:35,990 --> 00:12:33,680
florida

315
00:12:37,190 --> 00:12:36,000
and coming into the bahamas here i

316
00:12:38,790 --> 00:12:37,200
believe

317
00:12:41,030 --> 00:12:38,800
but basically the way we worked with

318
00:12:43,670 --> 00:12:41,040
imax is we had somebody filming we had

319
00:12:45,509 --> 00:12:43,680
somebody as a spotter looking out the

320
00:12:47,829 --> 00:12:45,519
window because when you look through the

321
00:12:49,430 --> 00:12:47,839
viewfinder of the imax it really shrinks

322
00:12:51,750 --> 00:12:49,440
your field of view

323
00:12:54,150 --> 00:12:51,760
and so you need a spotter and somebody

324
00:12:56,470 --> 00:12:54,160
maneuvering the orbiter and of course

325
00:12:58,230 --> 00:12:56,480
jim was working

326
00:13:00,310 --> 00:12:58,240
changing out the magazines in the black

327
00:13:01,110 --> 00:13:00,320
bag usually and i was loading the camera

328
00:13:02,790 --> 00:13:01,120
so

329
00:13:06,710 --> 00:13:02,800
quite a team effort to pull off the

330
00:13:10,470 --> 00:13:08,069
some of the other cameras we had on

331
00:13:13,110 --> 00:13:10,480
board that we use for earth observations

332
00:13:16,230 --> 00:13:13,120
are 70 millimeter hasselblad this

333
00:13:18,870 --> 00:13:16,240
happens to be a shot over cuba

334
00:13:20,629 --> 00:13:18,880
of note is all of the active

335
00:13:22,389 --> 00:13:20,639
coral reefs just to the south side of

336
00:13:23,670 --> 00:13:22,399
cuba we added some very very good shots

337
00:13:26,310 --> 00:13:23,680
of that

338
00:13:28,150 --> 00:13:26,320

and showed some live coral

339
00:13:32,310 --> 00:13:28,160
and reformation just south of that

340
00:13:35,030 --> 00:13:34,069
as you can see the whole east coast was

341
00:13:37,350 --> 00:13:35,040
uh

342
00:13:39,030 --> 00:13:37,360
was very clear for most of our mission

343
00:13:40,470 --> 00:13:39,040
including the caribbean so we got some

344
00:13:45,030 --> 00:13:40,480
footage that

345
00:13:49,509 --> 00:13:47,590
another camera that we used extensively

346
00:13:51,350 --> 00:13:49,519
was the errol linhoff

347
00:13:54,150 --> 00:13:51,360
it's a handheld aerial photography

348
00:13:56,150 --> 00:13:54,160
camera a little bit larger film format

349
00:13:58,550 --> 00:13:56,160
and as a result the resolution is is

350
00:13:59,910 --> 00:13:58,560
somewhat better than

351
00:14:00,829 --> 00:13:59,920
some of the smaller

352
00:14:03,509 --> 00:14:00,839
film

353
00:14:05,269 --> 00:14:03,519
cameras this shot is coming over central

354
00:14:07,030 --> 00:14:05,279
america

355
00:14:08,550 --> 00:14:07,040
looking down a chain of volcanoes you

356
00:14:13,910 --> 00:14:08,560
can see the volcano sticking up in the

357
00:14:18,150 --> 00:14:16,150
and again john using another hasselblad

358
00:14:19,990 --> 00:14:18,160
camera we're able to use with the

359
00:14:21,670 --> 00:14:20,000
attitude we were in use just about all

360
00:14:23,750 --> 00:14:21,680
of the windows

361
00:14:26,069 --> 00:14:23,760
the side windows for black shots

362
00:14:27,670 --> 00:14:26,079
overhead windows for directly down

363
00:14:32,069 --> 00:14:27,680

and it worked out very very well for our

364
00:14:41,910 --> 00:14:33,829
we have four good windows and five

365
00:14:44,790 --> 00:14:43,829
this is a shot of the himalayas uh it

366
00:14:46,069 --> 00:14:44,800
shows a

367
00:14:47,829 --> 00:14:46,079
view looking north you can see the

368
00:14:49,829 --> 00:14:47,839
orbiter tail at the top

369
00:14:51,910 --> 00:14:49,839
and the brownish area in the background

370
00:14:54,949 --> 00:14:51,920
is the tibetan plateau and it gives you

371
00:14:56,389 --> 00:14:54,959
a a nice feel for it

372
00:14:57,750 --> 00:14:56,399
look in the north looking view you see

373
00:14:59,350 --> 00:14:57,760
it more in profile it really gives you a

374
00:15:00,629 --> 00:14:59,360
feeling of the relief the elevation of

375
00:15:03,030 --> 00:15:00,639
the himalayas there because in the

376
00:15:04,310 --> 00:15:03,040
foreground the ganges river basin is

377
00:15:06,949 --> 00:15:04,320
basically sea level so you're seeing a

378
00:15:08,389 --> 00:15:06,959
29 000 foot rise down with 13 000 foot

379
00:15:10,150 --> 00:15:08,399
plateau behind

380
00:15:12,069 --> 00:15:10,160
and it's uh even more impressive in

381
00:15:13,430 --> 00:15:12,079
person

382
00:15:14,949 --> 00:15:13,440
that's the problem of having your

383
00:15:16,790 --> 00:15:14,959
satellite deploy on the first day is

384
00:15:18,470 --> 00:15:16,800
that after that uh somebody has to get

385
00:15:19,910 --> 00:15:18,480
stuck with the housekeeping chores so uh

386
00:15:23,030 --> 00:15:19,920
here's a shot of

387
00:15:25,430 --> 00:15:23,040
of the food preparation process uh

388
00:15:27,030 --> 00:15:25,440

actually uh what i would note is that uh

389
00:15:28,629 --> 00:15:27,040
number one the galley worked very very

390
00:15:29,990 --> 00:15:28,639
well for us i was

391
00:15:31,670 --> 00:15:30,000
since this is my first flight i was very

392
00:15:33,350 --> 00:15:31,680
pleasantly surprised at

393
00:15:34,790 --> 00:15:33,360
how palatable the food was the cold

394
00:15:36,389 --> 00:15:34,800
water was cold the hot water was hot

395
00:15:38,470 --> 00:15:36,399
just the way it's supposed to be and and

396
00:15:39,829 --> 00:15:38,480
that was actually a bit of a surprise we

397
00:15:41,990 --> 00:15:39,839
actually have an oven on board that we

398
00:15:43,749 --> 00:15:42,000
can use to heat up the food

399
00:15:45,509 --> 00:15:43,759
and it's a bit like a camping trip in a

400
00:15:47,110 --> 00:15:45,519
way that there's a lot of overhead that

401
00:15:48,870 --> 00:15:47,120
goes into

402
00:15:50,470 --> 00:15:48,880
maintaining the shuttle and the food

403
00:15:52,710 --> 00:15:50,480
preparations part of it

404
00:15:54,629 --> 00:15:52,720
we did finally get together for a crew

405
00:15:56,470 --> 00:15:54,639
dinner although that was a rarity

406
00:15:58,310 --> 00:15:56,480
actually on this flight we we stayed

407
00:15:59,990 --> 00:15:58,320
busy enough that uh for most of the

408
00:16:02,550 --> 00:16:00,000
meals we just worked right through the

409
00:16:04,150 --> 00:16:02,560
meal and and somebody that was available

410
00:16:05,590 --> 00:16:04,160
would do the food prep down on the mid

411
00:16:07,110 --> 00:16:05,600
deck and then as you had a couple

412
00:16:08,790 --> 00:16:07,120
minutes you'd

413
00:16:10,790 --> 00:16:08,800

float by and grab something and have

414
00:16:13,430 --> 00:16:10,800
your dinner on the run so to speak or on

415
00:16:15,269 --> 00:16:13,440
the fly i guess it's more appropriate

416
00:16:17,990 --> 00:16:15,279
but we did sit down i think on the

417
00:16:20,150 --> 00:16:18,000
fourth night or fifth night and have a

418
00:16:22,230 --> 00:16:20,160
a dinner all together and it was a it

419
00:16:23,990 --> 00:16:22,240
was the one family meal that we had on

420
00:16:26,790 --> 00:16:24,000
board the shuttle on this this

421
00:16:30,710 --> 00:16:28,629
we wanted a shot of the

422
00:16:32,310 --> 00:16:30,720
sleeping bags you can see i'm getting

423
00:16:34,150 --> 00:16:32,320
into one sleeping bag and jim buckley's

424
00:16:35,910 --> 00:16:34,160
getting in the other uh

425
00:16:37,910 --> 00:16:35,920
he's more or less heads down and i'm

426
00:16:39,910 --> 00:16:37,920
somewhat heads up here

427
00:16:42,389 --> 00:16:39,920
you can obviously sleep any way you want

428
00:16:46,389 --> 00:16:43,749
you don't need to sleep in a sleeping

429
00:16:49,189 --> 00:16:47,749
i like it because it keeps the

430
00:16:51,350 --> 00:16:49,199
temperature pretty constant it keeps you

431
00:16:53,269 --> 00:16:51,360
from floating off and bumping into

432
00:16:54,790 --> 00:16:53,279
things in the middle of night

433
00:16:56,150 --> 00:16:54,800
and i found that very comfortable just

434
00:16:58,310 --> 00:16:56,160
to put the sleeping bag up against the

435
00:17:06,230 --> 00:16:58,320
lockers and

436
00:17:11,029 --> 00:17:09,270
this is uh jim and bob actually one time

437
00:17:13,189 --> 00:17:11,039
i came to the mid deck and i saw them

438
00:17:14,630 --> 00:17:13,199

doing this so i grabbed the 16

439
00:17:15,750 --> 00:17:14,640
millimeter and started taking this

440
00:17:17,189 --> 00:17:15,760
footage

441
00:17:18,789 --> 00:17:17,199
i couldn't figure out what was quite

442
00:17:20,549 --> 00:17:18,799
going on here

443
00:17:22,309 --> 00:17:20,559
here we had a doctor and a marine trying

444
00:17:23,909 --> 00:17:22,319
to prove prove who could do the most

445
00:17:32,150 --> 00:17:23,919
pull-ups so i

446
00:17:35,669 --> 00:17:34,230
one the next time i came

447
00:17:38,310 --> 00:17:35,679
the next time i came through the mid

448
00:17:40,630 --> 00:17:38,320
deck uh jim happened to have this set up

449
00:17:41,750 --> 00:17:40,640
the our treadmill so i jumped on there

450
00:17:43,990 --> 00:17:41,760
they looked like they were doing real

451
00:17:45,909 --> 00:17:44,000
good i thought i'd try it and uh

452
00:17:48,789 --> 00:17:45,919
unfortunately that was a lot tougher

453
00:17:52,549 --> 00:17:50,789
well despite the fact that uh we were

454
00:17:53,990 --> 00:17:52,559
working very hard there's always the the

455
00:17:55,990 --> 00:17:54,000
ever-present uh

456
00:17:58,549 --> 00:17:56,000
fluid experiments that uh that we wanted

457
00:18:00,470 --> 00:17:58,559
to do uh and and while on one hand it's

458
00:18:02,230 --> 00:18:00,480
a it's a bit of fun doing this it's also

459
00:18:04,150 --> 00:18:02,240
very useful when we're talking to school

460
00:18:06,150 --> 00:18:04,160
children uh it allows you to see what

461
00:18:07,830 --> 00:18:06,160
happens to a fluid when it's released in

462
00:18:10,950 --> 00:18:07,840
the microgravity of space and of course

463
00:18:12,950 --> 00:18:10,960

a food will tend to assume it's a

464
00:18:13,909 --> 00:18:12,960
minimal energy level which is a sphere

465
00:18:16,070 --> 00:18:13,919
and

466
00:18:18,310 --> 00:18:16,080
that's the science part of it uh the fun

467
00:18:20,230 --> 00:18:18,320
part of it is watching a bunch of grown

468
00:18:22,630 --> 00:18:20,240
men trying to play with uh bubbles of

469
00:18:25,190 --> 00:18:22,640
fluid and zero gravity

470
00:18:26,710 --> 00:18:25,200
you try very hard to get two bubbles

471
00:18:28,870 --> 00:18:26,720
two spheres to float together to see

472
00:18:30,630 --> 00:18:28,880
what they do that may be impossible i

473
00:18:32,789 --> 00:18:30,640
don't we couldn't do it in

474
00:18:36,789 --> 00:18:32,799
an hour or so trying

475
00:18:40,950 --> 00:18:38,870
this is a remarkable shot because we had

476
00:18:43,270 --> 00:18:40,960
this is just the the morning before

477
00:18:45,190 --> 00:18:43,280
our press conference on board the

478
00:18:46,870 --> 00:18:45,200
shuttle and we had all changed into

479
00:18:48,150 --> 00:18:46,880
clean clothes mike had gotten cleaned up

480
00:18:50,710 --> 00:18:48,160
put on a clean white shirt and then

481
00:18:52,710 --> 00:18:50,720
proceeded to play with drops of

482
00:18:54,390 --> 00:18:52,720
strawberry juice which he managed to

483
00:18:56,310 --> 00:18:54,400
splatter across his white shirt just

484
00:18:58,789 --> 00:18:56,320
before the press conference well this

485
00:19:00,150 --> 00:18:58,799
tells the truth we uh we said we won the

486
00:19:01,830 --> 00:19:00,160
fly tortillas and we're more interested

487
00:19:03,350 --> 00:19:01,840
in that than fresh bread but i think it

488
00:19:05,830 --> 00:19:03,360

was probably more for the aerodynamic

489
00:19:08,390 --> 00:19:05,840
qualities of the tortillas than

490
00:19:09,590 --> 00:19:08,400
their actual flavor

491
00:19:11,430 --> 00:19:09,600
interestingly enough though that that

492
00:19:13,350 --> 00:19:11,440
proved the tortillas proved a very very

493
00:19:14,549 --> 00:19:13,360
good uh bread substitute didn't crumble

494
00:19:15,669 --> 00:19:14,559
as well the uh

495
00:19:17,350 --> 00:19:15,679
the suits

496
00:19:19,190 --> 00:19:17,360
we normally stored in the airlock except

497
00:19:21,029 --> 00:19:19,200
when we first got on orbit when you're

498
00:19:22,789 --> 00:19:21,039
not in them there's no weight they just

499
00:19:24,150 --> 00:19:22,799
kind of take on a life of their own and

500
00:19:25,270 --> 00:19:24,160
they're you know they take a lot of room

501
00:19:27,270 --> 00:19:25,280
here we are just kind of playing around

502
00:19:29,190 --> 00:19:27,280
the night before we pulled the suits out

503
00:19:30,470 --> 00:19:29,200
to check them out to make sure

504
00:19:32,870 --> 00:19:30,480
everything was set up the way we thought

505
00:19:34,470 --> 00:19:32,880
they should be and if there's any repair

506
00:19:35,590 --> 00:19:34,480
or servicing they needed we could do

507
00:19:36,870 --> 00:19:35,600
that and

508
00:19:37,990 --> 00:19:36,880
it just shows you know there's only two

509
00:19:38,950 --> 00:19:38,000
or three suits in the picture and

510
00:19:40,549 --> 00:19:38,960
there's actually five from there it

511
00:19:42,470 --> 00:19:40,559
takes a lot of room

512
00:19:44,870 --> 00:19:42,480
here's uh we're just going through a

513
00:19:46,870 --> 00:19:44,880

suit donna here uh bob and i jim just

514
00:19:49,190 --> 00:19:46,880
helping us a little bit to get in

515
00:19:50,630 --> 00:19:49,200
and you find you just kind of float and

516
00:19:53,270 --> 00:19:50,640
just kind of

517
00:19:54,630 --> 00:19:53,280
with more or less effort pop on through

518
00:19:55,990 --> 00:19:54,640
i don't have to worry about catching my

519
00:19:57,110 --> 00:19:56,000
hair on the neck seal when i come

520
00:19:58,310 --> 00:19:57,120
through

521
00:20:02,630 --> 00:19:58,320
so it's probably a little easier for me

522
00:20:05,669 --> 00:20:04,630
but they're fairly fairly quick dining

523
00:20:08,149 --> 00:20:05,679
the biggest trouble is getting the

524
00:20:09,669 --> 00:20:08,159
zipper you have to pull around

525
00:20:13,750 --> 00:20:09,679
and you always can most of us need a

526
00:20:18,149 --> 00:20:16,390
it's the shot of a sunset again we

527
00:20:19,990 --> 00:20:18,159
really enjoyed the sunsets and sunrises

528
00:20:20,710 --> 00:20:20,000
as you've always heard whenever we have

529
00:20:43,350 --> 00:20:20,720
a

530
00:20:44,950 --> 00:20:43,360
slope

531
00:20:46,789 --> 00:20:44,960
getting ready to land on the runway

532
00:20:48,149 --> 00:20:46,799
edwards 2-2

533
00:20:50,230 --> 00:20:48,159
we do so much training in the shuttle

534
00:20:52,789 --> 00:20:50,240
training airplane that uh once you get

535
00:20:53,909 --> 00:20:52,799
down below about 15 000 feet you feel

536
00:20:55,830 --> 00:20:53,919
like you've been there a hundred times

537
00:20:57,510 --> 00:20:55,840
before it's very comfortable

538
00:20:58,870 --> 00:20:57,520

situation the only difference is the

539
00:21:00,630 --> 00:20:58,880
wind noise of course in the shuttle

540
00:21:02,870 --> 00:21:00,640
training airplane you have the engines

541
00:21:03,990 --> 00:21:02,880
running all the time even in reverse and

542
00:21:05,909 --> 00:21:04,000
it's a little bit noisy and you don't

543
00:21:09,029 --> 00:21:05,919
have that of course with a shuttle

544
00:21:11,430 --> 00:21:09,039
so you can hear the wind noise

545
00:21:13,190 --> 00:21:11,440
we're very interested in doing a braking

546
00:21:16,310 --> 00:21:13,200
evaluation

547
00:21:18,710 --> 00:21:16,320
which is why we landed on the runway

548
00:21:19,830 --> 00:21:18,720
and we wanted to follow

549
00:21:22,070 --> 00:21:19,840
our normal

550
00:21:24,470 --> 00:21:22,080
braking profile and put about 25 million

551
00:21:26,230 --> 00:21:24,480
foot-pounds into each of the

552
00:21:27,669 --> 00:21:26,240
main brakes

553
00:21:29,510 --> 00:21:27,679
main gear brakes

554
00:21:31,590 --> 00:21:29,520
and we hit that very close i think we

555
00:21:33,350 --> 00:21:31,600
had 22 million in

556
00:21:35,190 --> 00:21:33,360
the left side and 29 million foot pounds

557
00:21:37,590 --> 00:21:35,200
on the right side so it was a very

558
00:21:39,190 --> 00:21:37,600
successful test and it had responded

559
00:21:40,630 --> 00:21:39,200
quite well we were very pleased with the

560
00:21:42,310 --> 00:21:40,640
brakes

561
00:21:45,029 --> 00:21:42,320
since it was so cool outside about 40

562
00:21:47,190 --> 00:21:45,039
degrees we elected to keep the

563
00:21:48,390 --> 00:21:47,200

launch and entry suits on instead of

564
00:21:52,470 --> 00:21:48,400
trying to struggle at them down in the

565
00:21:55,830 --> 00:21:53,909
it's really crew preference what they