1
00:00:28,120 --> 00:00:25,600
thank you all for coming and we're going

2
00:00:30,130 --> 00:00:28,130
to present you with the film that takes

3
00:00:31,870 --> 00:00:30,140
about 15 minutes and it recaps the

4
00:00:35,170 --> 00:00:31,880
highlights of the mission and then we'll

5
00:00:37,150 --> 00:00:35,180
go through about 20 of the slides that

6
00:00:38,500 --> 00:00:37,160
summarize some of our earth observations

7
00:00:41,080 --> 00:00:38,510
and some of our living in space

8
00:00:42,369 --> 00:00:41,090
experiences and then as mentioned will

9
00:00:43,930 --> 00:00:42,379
open up for questions so without any

10
00:00:56,110 --> 00:00:43,940
further ado let's go ahead and roll the

11
00:01:00,160 --> 00:00:58,420
it starts off with our crew patch I

12
00:01:02,530 --> 00:01:00,170
helped with some charge of design nip

13
00:01:05,020 --> 00:01:02,540

the whole crew put in their efforts and

14
00:01:06,190 --> 00:01:05,030
you have the the earth and the space

15
00:01:09,010 --> 00:01:06,200
shuttle and we've got the little

16
00:01:12,399 --> 00:01:09,020
triangle there that represents the

17
00:01:14,889 --> 00:01:12,409
teachers satellite the shuttle and the

18
00:01:17,859 --> 00:01:14,899
MCC here on the ground and it has a red

19
00:01:19,990 --> 00:01:17,869
white and blue of our flag and also for

20
00:01:21,430 --> 00:01:20,000
people from Ohio you look around the

21
00:01:24,180 --> 00:01:21,440
edge of it it's in the shape of a no

22
00:01:26,380 --> 00:01:24,190
because this was the old Buckeye crew I

23
00:01:29,380 --> 00:01:26,390
think most you aware we were delayed

24
00:01:31,870 --> 00:01:29,390
from our first launch do this pesky

25
00:01:33,999 --> 00:01:31,880
rascal down at the Cape however our hats

26
00:01:37,710 --> 00:01:34,009
were off to the technicians there at the

27
00:01:39,850 --> 00:01:37,720
Cape who repaired the ET and

28
00:01:42,399 --> 00:01:39,860
successfully rolled back out for an

29
00:01:44,710 --> 00:01:42,409
on-time launch jun 22nd here we are

30
00:01:51,760 --> 00:01:44,720
suiting up in the room that's Kevin

31
00:01:56,139 --> 00:01:51,770
kriegel the pilot dr. don thomas mission

32
00:01:58,960 --> 00:01:56,149
specialist one army major nancy curry

33
00:02:00,729 --> 00:01:58,970
mission specialist number two and dr.

34
00:02:06,100 --> 00:02:00,739
Mary Ellen Webber mission specialist

35
00:02:08,139 --> 00:02:06,110
number three of course it was a glorious

36
00:02:10,389 --> 00:02:08,149
morning as most mornings are to Kennedy

37
00:02:12,610 --> 00:02:10,399
Space Center as you know we wake up

38
00:02:15,580 --> 00:02:12,620

about six hours before launch have our

39
00:02:18,369 --> 00:02:15,590
breakfast put the suits on and then go

40
00:02:20,170 --> 00:02:18,379
out for a final chance to wave goodbye

41
00:02:22,540 --> 00:02:20,180
to all the folks who supported us up to

42
00:02:25,270 --> 00:02:22,550
this point as we walk out to the astro

43
00:02:27,400 --> 00:02:25,280
van and that was the buckeye that fool

44
00:02:29,530 --> 00:02:27,410
along with us that i showed to the press

45
00:02:31,330 --> 00:02:29,540
at that point and we would like to thank

46
00:02:33,070 --> 00:02:31,340
all the support around the country and

47
00:02:36,460 --> 00:02:33,080
especially that from ohio which was

48
00:02:38,140 --> 00:02:36,470
outstanding getting ready to get to

49
00:02:40,240 --> 00:02:38,150
launch on the pad this is also the first

50
00:02:42,040 --> 00:02:40,250
flight of the block one engine the block

51
00:02:44,589 --> 00:02:42,050
one engine takes a number of wells are

52
00:02:47,740 --> 00:02:44,599
the oxidizer turbo pump from a little

53
00:02:49,479 --> 00:02:47,750
over 200 to about a dozen so it really

54
00:02:52,170 --> 00:02:49,489
helps with the reliability from inside

55
00:02:54,880 --> 00:02:52,180
the cockpit and our engine parameters it

56
00:02:56,440 --> 00:02:54,890
was absolutely no difference and it

57
00:02:59,410 --> 00:02:56,450
worked flawlessly we're getting ready

58
00:03:02,440 --> 00:02:59,420
for the fire suppression and the water

59
00:03:03,729 --> 00:03:02,450
suppression to light and off we go they

60
00:03:06,759 --> 00:03:03,739
always have the rookie say well it was

61
00:03:10,090 --> 00:03:06,769
like for your first launch and of course

62
00:03:11,680 --> 00:03:10,100
once those solids light it's really

63
00:03:13,420 --> 00:03:11,690

is a kick in the pants and you know that

64
00:03:15,640 --> 00:03:13,430
you're going to go someplace and it's

65
00:03:17,140 --> 00:03:15,650
it's shaking a bunch but it really

66
00:03:19,300 --> 00:03:17,150
wasn't too bad and thanks to all the

67
00:03:22,510 --> 00:03:19,310
people around here is except for the

68
00:03:24,370 --> 00:03:22,520
g-forces it felt like I was back in the

69
00:03:26,130 --> 00:03:24,380
simulator and I was back in the

70
00:03:29,590 --> 00:03:26,140
simulator looking at all the switches

71
00:03:31,210 --> 00:03:29,600
except I you could feel the g-forces and

72
00:03:34,270 --> 00:03:31,220
as most of you know it goes up to around

73
00:03:36,430 --> 00:03:34,280
3 g's for the last two minutes of launch

74
00:03:38,140 --> 00:03:36,440
and that's really the the only

75
00:03:41,410 --> 00:03:38,150
difference you'll see as we go through

76
00:03:43,270 --> 00:03:41,420
the supersonic today on the day of

77
00:03:46,150 --> 00:03:43,280
launch we had the right atmospheric

78
00:03:48,190 --> 00:03:46,160
conditions to show the shock wave coming

79
00:03:50,590 --> 00:03:48,200
over the orbiter and it really made it

80
00:03:58,600 --> 00:03:50,600
for a spectacular launch just come right

81
00:04:00,130 --> 00:03:58,610
over the SRBs and across the shuttle and

82
00:04:02,520 --> 00:04:00,140
of course after about eight and a half

83
00:04:04,990 --> 00:04:02,530
minutes everything worked just fine

84
00:04:07,330 --> 00:04:05,000
beautiful day and we're getting ready to

85
00:04:22,160 --> 00:04:07,340
do it we're sent up there and that's to

86
00:04:26,570 --> 00:04:25,160
it's a busy first day for us on orbit as

87
00:04:27,800 --> 00:04:26,580
soon as we get up to orbit after eight

88
00:04:29,570 --> 00:04:27,810

and a half minutes we start getting out

89
00:04:31,870 --> 00:04:29,580
of our suits taking our seats down and

90
00:04:34,040 --> 00:04:31,880
getting ready for the satellite deploy

91
00:04:35,510 --> 00:04:34,050
about two hours into the mission is

92
00:04:37,910 --> 00:04:35,520
actually when we start checking out the

93
00:04:39,500 --> 00:04:37,920
teedra satellite here this is the sixth

94
00:04:40,880 --> 00:04:39,510
and final tracking and data relay

95
00:04:43,400 --> 00:04:40,890
satellite that'll be launched from the

96
00:04:45,920 --> 00:04:43,410
shuttle the very first one was on sts 6

97
00:04:47,870 --> 00:04:45,930
and this is quite a tradition it shows

98
00:04:49,970 --> 00:04:47,880
all the crew members here at the eff

99
00:04:52,130 --> 00:04:49,980
panel we're looking up towards the back

100
00:04:53,750 --> 00:04:52,140
of the payload bay and watching the tea

101
00:04:57,170 --> 00:04:53,760
dresses it raises up and here we're

102
00:04:58,940 --> 00:04:57,180
about ready to punch it out it moves out

103
00:05:01,820 --> 00:04:58,950
very slowly here just a few feet a

104
00:05:04,250 --> 00:05:01,830
minute and it went so smoothly and

105
00:05:05,930 --> 00:05:04,260
nominally on orbit it was unlike any of

106
00:05:08,060 --> 00:05:05,940
our simulations where our training team

107
00:05:09,770 --> 00:05:08,070
throws all the malfunctions at us and it

108
00:05:11,930 --> 00:05:09,780
just went so perfectly like clockwork

109
00:05:14,690 --> 00:05:11,940
this is six hours into the mission as

110
00:05:16,220 --> 00:05:14,700
it's moving out the top half of the

111
00:05:18,140 --> 00:05:16,230
satellite that you see is the tracking

112
00:05:20,630 --> 00:05:18,150
and data relay satellite itself when the

113
00:05:22,790 --> 00:05:20,640

bottom half is the inertial upper stage

114
00:05:25,070 --> 00:05:22,800
which is a two-stage solid rocket motor

115
00:05:26,960 --> 00:05:25,080
that will take the satellite from 160

116
00:05:31,610 --> 00:05:26,970
miles he route to geosynchronous orbit

117
00:05:32,960 --> 00:05:31,620
about 22,000 miles out and as you can

118
00:05:35,360 --> 00:05:32,970
imagine our noses we're pressed up

119
00:05:37,070 --> 00:05:35,370
against the windows pretty much looking

120
00:05:46,330 --> 00:05:37,080
at this except for Nancy trying to get a

121
00:05:49,570 --> 00:05:48,100
and that was just a great feeling to

122
00:05:52,750 --> 00:05:49,580
have it go out right on time nice and

123
00:05:54,790 --> 00:05:52,760
smooth it shows the satellite there in

124
00:05:56,379 --> 00:05:54,800
distances it's moving off and we started

125
00:05:58,390 --> 00:05:56,389
to back away from from it with the

126
00:06:00,490 --> 00:05:58,400
orbiter and it's currently out of

127
00:06:01,629 --> 00:06:00,500
geosynchronous orbit they're continuing

128
00:06:03,390 --> 00:06:01,639
the check out of satellite and

129
00:06:06,100 --> 00:06:03,400
everything's going great with it so far

130
00:06:07,930 --> 00:06:06,110
this is a dedication of the plaque for

131
00:06:09,760 --> 00:06:07,940
the new mission control center as you

132
00:06:11,439 --> 00:06:09,770
all probably know here that we were the

133
00:06:14,320 --> 00:06:11,449
first flight that was controlled that is

134
00:06:16,810 --> 00:06:14,330
a new CCC or combined control center

135
00:06:19,150 --> 00:06:16,820
which will be used for combined shuttle

136
00:06:22,240 --> 00:06:19,160
to mirror and shuttle station missions

137
00:06:24,460 --> 00:06:22,250
and from the cruise perspective it was

138
00:06:26,890 --> 00:06:24,470

totally transparent which which was just

139
00:06:28,870 --> 00:06:26,900
exceptional this is the morning a flight

140
00:06:30,520 --> 00:06:28,880
day two we start picking up with the

141
00:06:33,159 --> 00:06:30,530
meat of our flight plan after the

142
00:06:35,110 --> 00:06:33,169
successful deployment of tea dress for

143
00:06:36,790 --> 00:06:35,120
all the principal investigators you can

144
00:06:38,590 --> 00:06:36,800
see that we diligently reviewed our

145
00:06:42,100 --> 00:06:38,600
messages in the morning coming off the

146
00:06:44,409 --> 00:06:42,110
tips and this kind of shows a little bit

147
00:06:46,600 --> 00:06:44,419
about our daily routine this is Donna

148
00:06:48,909 --> 00:06:46,610
taking his equivalent of a shower in the

149
00:06:50,500 --> 00:06:48,919
morning you can't ever escape the

150
00:06:57,100 --> 00:06:50,510
watchful eye of other crew members or

151
00:07:01,120 --> 00:06:57,110
the camera and this is floating over to

152
00:07:03,730 --> 00:07:01,130
the galley you know all of us like to do

153
00:07:07,690 --> 00:07:03,740
stupid astronaut tricks and and so forth

154
00:07:09,490 --> 00:07:07,700
on orbit and you'll see our equivalent

155
00:07:11,230 --> 00:07:09,500
of that here shortly we really didn't

156
00:07:14,500 --> 00:07:11,240
play too much Kevin's trying his hardest

157
00:07:16,000 --> 00:07:14,510
to form a ball of juice here but he

158
00:07:21,300 --> 00:07:16,010
found out very quickly he better have a

159
00:07:25,000 --> 00:07:21,310
towel handy when he's trying this and

160
00:07:27,129 --> 00:07:25,010
this displays come my unique eating

161
00:07:28,810 --> 00:07:27,139
habits this is a creamed spinach which I

162
00:07:30,040 --> 00:07:28,820
eat for breakfast every morning so they

163
00:07:34,330 --> 00:07:30,050

felt like they needed to get that on

164
00:07:35,890 --> 00:07:34,340
film this is dawn in their gamma you can

165
00:07:40,029 --> 00:07:35,900
see kind of hamming it up a little bit

166
00:07:41,800 --> 00:07:40,039
here although he was working pretty hard

167
00:07:43,060 --> 00:07:41,810
I can assure you and we all had the time

168
00:07:45,940 --> 00:07:43,070
to exercise we were all in really good

169
00:07:48,219 --> 00:07:45,950
shape at the end of the flight this is

170
00:07:50,680 --> 00:07:48,229
the bioreactor experiment it's one of

171
00:07:53,379 --> 00:07:50,690
the I think most exciting experiments on

172
00:07:55,870 --> 00:07:53,389
our flight what they're trying to do is

173
00:07:58,330 --> 00:07:55,880
actually grow three-dimensional body

174
00:07:58,629 --> 00:07:58,340
like tissues outside the human body it's

175
00:08:00,999 --> 00:07:58,639
some

176
00:08:03,390 --> 00:08:01,009
it's very difficult to do here on the

177
00:08:06,010 --> 00:08:03,400
ground under the influence of gravity

178
00:08:10,119 --> 00:08:06,020
the experiment worked extremely well

179
00:08:12,159 --> 00:08:10,129
they got very large size tissues you can

180
00:08:14,170 --> 00:08:12,169
see inside the chamber right there and

181
00:08:17,050 --> 00:08:14,180
this was the first flight of this

182
00:08:18,999 --> 00:08:17,060
configuration and the hope here is that

183
00:08:22,390 --> 00:08:19,009
one day we might be growing replacement

184
00:08:25,450 --> 00:08:22,400
organs and really understand how tissues

185
00:08:27,279 --> 00:08:25,460
actually grow this is an experiment

186
00:08:30,309 --> 00:08:27,289
connected with the national institutes

187
00:08:32,980 --> 00:08:30,319
of health nih are we flow flew 10

188
00:08:35,620 --> 00:08:32,990

pregnant rodents and we were looking at

189
00:08:38,680 --> 00:08:35,630
muscular skeletal development changes in

190
00:08:40,659 --> 00:08:38,690
microgravity this is an amateur radio

191
00:08:42,279 --> 00:08:40,669
experiment called Surak that we flew on

192
00:08:44,290 --> 00:08:42,289
board we talked to a total of eight

193
00:08:46,540 --> 00:08:44,300
schools mostly in the United States but

194
00:08:48,100 --> 00:08:46,550
we did talk to one in Argentina and that

195
00:08:49,720 --> 00:08:48,110
was a great thrill for these eight

196
00:08:52,000 --> 00:08:49,730
minute passes to be able to talk and

197
00:08:58,120 --> 00:08:52,010
share the excitement of spaceflight with

198
00:09:00,310 --> 00:08:58,130
the many students around the world this

199
00:09:02,079 --> 00:09:00,320
is an experiment called the space tissue

200
00:09:04,900 --> 00:09:02,089
loss experiment looking at the

201
00:09:06,130 --> 00:09:04,910
development of medaka fish embryos again

202
00:09:08,710 --> 00:09:06,140
we're looking at embryonic development

203
00:09:10,540 --> 00:09:08,720
and microgravity this is an interior

204
00:09:12,340 --> 00:09:10,550
views near the end of the flight you can

205
00:09:15,280 --> 00:09:12,350
actually see the blood flow through the

206
00:09:16,660 --> 00:09:15,290
embryo and actually they saw quite a

207
00:09:18,579 --> 00:09:16,670
significant difference between our

208
00:09:20,199 --> 00:09:18,589
downlink video of those developed in

209
00:09:24,069 --> 00:09:20,209
microgravity versus the ground

210
00:09:25,810 --> 00:09:24,079
controlled studies let's say one of the

211
00:09:28,500 --> 00:09:25,820
cameras that we flew it's a

212
00:09:31,389 --> 00:09:28,510
multispectral imaging camera it's a

213
00:09:33,490 --> 00:09:31,399

looking at thruster plumes and also

214
00:09:35,259 --> 00:09:33,500
water dumps this is an example looking

215
00:09:38,380 --> 00:09:35,269
out the side hatch but water dump with

216
00:09:41,710 --> 00:09:38,390
the windex camera and next you'll see a

217
00:09:43,750 --> 00:09:41,720
thruster firing that was filmed out the

218
00:09:46,000 --> 00:09:43,760
app window we did a series of primary

219
00:09:48,130 --> 00:09:46,010
jet thruster firings and they're looking

220
00:09:49,810 --> 00:09:48,140
at the chemistry and physics of the

221
00:09:51,790 --> 00:09:49,820
emissions from the shuttle on not only

222
00:09:54,430 --> 00:09:51,800
the shuttle but also other orbiting

223
00:09:57,400 --> 00:09:54,440
structures another experiment we flew

224
00:09:59,500 --> 00:09:57,410
was again using a multispectral camera

225
00:10:02,590 --> 00:09:59,510
this is called Hercules it's a pretty

226
00:10:04,210 --> 00:10:02,600
big beast it weighs around 70 80 pounds

227
00:10:07,660 --> 00:10:04,220
and here on earth we had actually rig up

228
00:10:09,550 --> 00:10:07,670
a tripod to practice using it at all we

229
00:10:11,350 --> 00:10:09,560
actually had two of us using it to aim

230
00:10:12,040 --> 00:10:11,360
because it's like looking through a soda

231
00:10:14,769 --> 00:10:12,050
straw and we

232
00:10:17,350 --> 00:10:14,779
and have targets on the ground and the

233
00:10:18,790 --> 00:10:17,360
the big bump on the top of the camera is

234
00:10:21,579 --> 00:10:18,800
an inertial measurement unit and the

235
00:10:23,380 --> 00:10:21,589
hope is that we can accurately look at

236
00:10:26,079 --> 00:10:23,390
places on the ground and also be able to

237
00:10:28,600 --> 00:10:26,089
look at the latitude and longitude there

238
00:10:30,790 --> 00:10:28,610

you see a picture of autonomy Bay Cuba

239
00:10:32,530 --> 00:10:30,800
you can see pretty good resolution it's

240
00:10:34,000 --> 00:10:32,540
jumping around there so real time it's a

241
00:10:36,280 --> 00:10:34,010
little bit tough but it's going 30

242
00:10:38,710 --> 00:10:36,290
frames a second so post flight people on

243
00:10:40,660 --> 00:10:38,720
the ground can really look at it pretty

244
00:10:42,370 --> 00:10:40,670
well miss a picture of a city at night

245
00:10:44,980 --> 00:10:42,380
it's totally dark out for us in

246
00:10:48,250 --> 00:10:44,990
Australia so the Hercules has a lot of

247
00:10:49,449 --> 00:10:48,260
potential and had a lot of a couple of

248
00:10:51,040 --> 00:10:49,459
problems in the beginning but through

249
00:10:54,340 --> 00:10:51,050
the hard work people here on the ground

250
00:10:56,019 --> 00:10:54,350
we got it to work and this is an

251
00:10:58,090 --> 00:10:56,029
experiment called the visual function

252
00:11:00,310 --> 00:10:58,100
tester as you know when you take away

253
00:11:02,019 --> 00:11:00,320
gravity some pretty dramatic changes

254
00:11:04,329 --> 00:11:02,029
happen in the human body and one of

255
00:11:06,940 --> 00:11:04,339
those changes is that the eyeball shape

256
00:11:09,730 --> 00:11:06,950
actually changes and the vision has

257
00:11:11,440 --> 00:11:09,740
affected this is a picture of Hurricane

258
00:11:13,420 --> 00:11:11,450
chantalle which is forming in the

259
00:11:15,190 --> 00:11:13,430
Atlantic luckily it didn't hit land and

260
00:11:17,530 --> 00:11:15,200
turn north but we got a good view of

261
00:11:20,139 --> 00:11:17,540
this on flight date two and three passed

262
00:11:22,510 --> 00:11:20,149
almost directly over top of it this is

263
00:11:24,220 --> 00:11:22,520

passing over Egypt you can see the Nile

264
00:11:26,110 --> 00:11:24,230
River that there in the lower left and

265
00:11:28,360 --> 00:11:26,120
coming up on the Red Sea this is a

266
00:11:30,430 --> 00:11:28,370
beautiful pass always because you have

267
00:11:33,040 --> 00:11:30,440
the very light brown soil and the blue

268
00:11:35,710 --> 00:11:33,050
blue water there and one morning shortly

269
00:11:36,699 --> 00:11:35,720
after a wakeup music somebody peeked out

270
00:11:38,769 --> 00:11:36,709
and said hey we're going right over

271
00:11:40,360 --> 00:11:38,779
Egypt and the Nile River and you should

272
00:11:41,769 --> 00:11:40,370
see us all scrambling getting up as as

273
00:11:43,990 --> 00:11:41,779
fast as possible and getting our noses

274
00:11:45,760 --> 00:11:44,000
up to the window there but it's a

275
00:11:49,840 --> 00:11:45,770
spectacular pass and this is one of our

276
00:11:51,370 --> 00:11:49,850
great entertainment mechanisms up on

277
00:11:54,100 --> 00:11:51,380
orbit is just to look out the window and

278
00:11:57,120 --> 00:11:54,110
watch the world go around we were prior

279
00:11:59,920 --> 00:11:57,130
to this shot it was actually three

280
00:12:01,990 --> 00:11:59,930
planets in this view and of course you

281
00:12:04,780 --> 00:12:02,000
can see something similar this right

282
00:12:06,850 --> 00:12:04,790
before sunrise on earth this is Venus

283
00:12:09,069 --> 00:12:06,860
and Mars coming up just before sunrise

284
00:12:10,509 --> 00:12:09,079
the advantage we had being in the

285
00:12:12,819 --> 00:12:10,519
orbiter was that we could set the

286
00:12:15,930 --> 00:12:12,829
cameras up on one rev and an hour and a

287
00:12:18,970 --> 00:12:15,940
half later actually take the scene

288
00:12:20,590 --> 00:12:18,980

happened very quickly but again we

289
00:12:22,840 --> 00:12:20,600
thought it was a spectacular shot and

290
00:12:27,410 --> 00:12:22,850
took the time to to capture it on

291
00:12:34,049 --> 00:12:29,489
you never get tired of looking out the

292
00:12:35,489 --> 00:12:34,059
window it's don's emphasize you can see

293
00:12:39,059 --> 00:12:35,499
the orbiter tail and omens pods in the

294
00:12:40,590 --> 00:12:39,069
upper right-hand corner this is again

295
00:12:43,139 --> 00:12:40,600
looking out the window even at night is

296
00:12:45,540 --> 00:12:43,149
spectacular this is over Asia in a

297
00:12:47,189 --> 00:12:45,550
Pacific and you can see the earth glow

298
00:12:49,439 --> 00:12:47,199
which I've never really noticed some

299
00:12:51,299 --> 00:12:49,449
pictures before and it's real evident on

300
00:12:52,980 --> 00:12:51,309
how tenuous our atmosphere is and

301
00:12:54,840 --> 00:12:52,990
looking at the lightning storms

302
00:12:56,939 --> 00:12:54,850
literally for hundreds and a thousand

303
00:12:58,889 --> 00:12:56,949
miles you can see the lightning going

304
00:13:01,949 --> 00:12:58,899
off and you can see how it propagates

305
00:13:05,629 --> 00:13:01,959
all across the continent all across the

306
00:13:08,759 --> 00:13:05,639
ocean it's really a real pretty view and

307
00:13:10,949 --> 00:13:08,769
unfortunately the day before supposed to

308
00:13:13,170 --> 00:13:10,959
come back they tell us it's time quit

309
00:13:14,639 --> 00:13:13,180
having fun and so we do all the the

310
00:13:16,259 --> 00:13:14,649
checkouts were checking out the reaction

311
00:13:18,929 --> 00:13:16,269
control jets were checking out the

312
00:13:20,780 --> 00:13:18,939
auxiliary power unit getting ready to

313
00:13:23,069 --> 00:13:20,790

come back home and this flight was

314
00:13:25,259 --> 00:13:23,079
really was flawless they say flawless

315
00:13:26,809 --> 00:13:25,269
for all the missions but our biggest

316
00:13:29,850 --> 00:13:26,819
problem we had was a cut in a vacuum

317
00:13:32,129 --> 00:13:29,860
cleaner cord it was really a very clean

318
00:13:35,009 --> 00:13:32,139
orbiter and all the experiments were in

319
00:13:36,299 --> 00:13:35,019
really smooth we're closing the the

320
00:13:38,730 --> 00:13:36,309
payload bay getting ready to come back

321
00:13:40,169 --> 00:13:38,740
home it was kind of nice actually that

322
00:13:41,460 --> 00:13:40,179
we got to close the payload Bay twice

323
00:13:43,290 --> 00:13:41,470
because it meant we had a couple more

324
00:13:47,429 --> 00:13:43,300
hours on orbit when we got waived off

325
00:13:49,379 --> 00:13:47,439
the first day here we are an entry again

326
00:13:51,960 --> 00:13:49,389
as Kevin mentioned we waved off the

327
00:13:54,749 --> 00:13:51,970
first day's attempt and here we are on

328
00:13:57,509 --> 00:13:54,759
July morning in july twenty second at

329
00:13:59,400 --> 00:13:57,519
the entry interface there we're going

330
00:14:02,189 --> 00:13:59,410
approximately Mach 25 and you saw the

331
00:14:05,309 --> 00:14:02,199
plasma jet at the overhead window we

332
00:14:07,110 --> 00:14:05,319
came across the southern Texas coast and

333
00:14:09,960 --> 00:14:07,120
some folks have mentioned hearing us and

334
00:14:13,439 --> 00:14:09,970
seeing us go by that morning here we are

335
00:14:16,439 --> 00:14:13,449
making the heading alignment cone turn

336
00:14:18,809 --> 00:14:16,449
and rolling out on final again I think

337
00:14:21,059 --> 00:14:18,819
most of you where we're diving at 220

338
00:14:23,309 --> 00:14:21,069

degrees 300 knots we had light winds

339
00:14:25,499 --> 00:14:23,319
that day lots of moisture in the air so

340
00:14:28,499 --> 00:14:25,509
you see the condensation coming off the

341
00:14:31,699 --> 00:14:28,509
wingtip vortices there Kevin put the

342
00:14:34,379 --> 00:14:31,709
gear down at 300 feet again very

343
00:14:36,310 --> 00:14:34,389
responsive machine the shell training

344
00:14:38,500 --> 00:14:36,320
aircraft was an excellent train

345
00:14:40,570 --> 00:14:38,510
we followed our guidance and all our

346
00:14:42,490 --> 00:14:40,580
training procedures and ended up with

347
00:14:46,180 --> 00:14:42,500
some excellent touchdown numbers on this

348
00:14:48,730 --> 00:14:46,190
flight kevin deploys the drag chute just

349
00:14:50,710 --> 00:14:48,740
after main gear touchdown we d rotate

350
00:14:53,080 --> 00:14:50,720
using what we call the beep trim method

351
00:14:55,150 --> 00:14:53,090
now and then the drag chute blossom is

352
00:14:58,600 --> 00:14:55,160
about nose gear touchdown we apply the

353
00:15:01,570 --> 00:14:58,610
brakes very smooth and positive breaking

354
00:15:03,430 --> 00:15:01,580
and come to a stop about 11,000 feet

355
00:15:07,030 --> 00:15:03,440
down the runway at the Kennedy Space

356
00:15:09,490 --> 00:15:07,040
Center and the story wasn't over at this

357
00:15:11,440 --> 00:15:09,500
point we mentioned that we thought we

358
00:15:13,840 --> 00:15:11,450
were exercising right we're eating right

359
00:15:16,990 --> 00:15:13,850
we also slept very well so we had an

360
00:15:18,550 --> 00:15:17,000
excellent crew status and we'll stop we

361
00:15:21,490 --> 00:15:18,560
step through our post flight activities

362
00:15:23,800 --> 00:15:21,500
very quickly in the orbiter and set a

363
00:15:25,780 --> 00:15:23,810

record 30 some minutes for getting out

364
00:15:28,450 --> 00:15:25,790
of the vehicle and everyone was so

365
00:15:30,220 --> 00:15:28,460
healthy that they were willing to walk

366
00:15:31,810 --> 00:15:30,230
around the vehicle and we all felt great

367
00:15:33,370 --> 00:15:31,820
after the flight and that's a compliment

368
00:15:36,220 --> 00:15:33,380
to all the folks here that have worked

369
00:15:40,510 --> 00:15:36,230
so hard on all the countermeasures for

370
00:15:42,220 --> 00:15:40,520
reup tation to 1g that completes the

371
00:15:48,730 --> 00:15:42,230
film let's go ahead and go right into

372
00:15:51,820 --> 00:15:48,740
the slides of course everyone has to put

373
00:15:53,740 --> 00:15:51,830
up their fantastic launch picture and

374
00:15:56,520 --> 00:15:53,750
again everyone is spectacular we thought

375
00:15:58,710 --> 00:15:56,530
this one was exceptional because of the

376
00:16:01,990 --> 00:15:58,720
condensation in the air which made the

377
00:16:07,360 --> 00:16:02,000
transition to the Mach spectacular as

378
00:16:09,400 --> 00:16:07,370
you saw in the movie and I launched on

379
00:16:12,460 --> 00:16:09,410
the mid-deck in one of my first duties

380
00:16:14,170 --> 00:16:12,470
once we have main engine cutoff was to

381
00:16:16,720 --> 00:16:14,180
come up to the flight deck and take

382
00:16:19,840 --> 00:16:16,730
photos of the external tank as it fell

383
00:16:22,150 --> 00:16:19,850
back to earth and that will always be

384
00:16:24,580 --> 00:16:22,160
burned in my mind as the most

385
00:16:26,800 --> 00:16:24,590
spectacular view that I saw when I first

386
00:16:29,890 --> 00:16:26,810
looked out the windows and saw the earth

387
00:16:32,620 --> 00:16:29,900
against the blackness of space as we

388
00:16:35,050 --> 00:16:32,630

finally saw the external tank we began

389
00:16:37,180 --> 00:16:35,060
taking pictures and an interesting thing

390
00:16:40,330 --> 00:16:37,190
about this hopefully you can see it

391
00:16:43,060 --> 00:16:40,340
there are some light colored specs on

392
00:16:45,250 --> 00:16:43,070
the external tank and that those are the

393
00:16:47,740 --> 00:16:45,260
places that the woodpecker's made their

394
00:16:48,519 --> 00:16:47,750
try to make their nests and those are

395
00:16:53,050 --> 00:16:48,529
the repairs

396
00:16:58,389 --> 00:16:53,060
held up perfectly and that was an

397
00:17:02,110 --> 00:16:58,399
excellent job by KSC I mentioned that we

398
00:17:04,299 --> 00:17:02,120
had a healthy crew on entry this is just

399
00:17:07,510 --> 00:17:04,309
after a main engine cutoff we've

400
00:17:09,189 --> 00:17:07,520
completed the homes to burn and we're

401
00:17:11,169 --> 00:17:09,199
waiting for the go to open the payload

402
00:17:13,120 --> 00:17:11,179
bay doors so on the flight deck we

403
00:17:15,100 --> 00:17:13,130
remain in the launch and entry erases

404
00:17:16,720 --> 00:17:15,110
suit whatever we choose to war but we

405
00:17:19,740 --> 00:17:16,730
included this slot because we want this

406
00:17:21,340 --> 00:17:19,750
slide because we wanted to emphasize the

407
00:17:24,189 --> 00:17:21,350
improvements that have been made in

408
00:17:28,059 --> 00:17:24,199
these systems the launch and entry suits

409
00:17:30,159 --> 00:17:28,069
are comfortable the cooling garments are

410
00:17:31,870 --> 00:17:30,169
allowing us to stay comfortable both

411
00:17:33,159 --> 00:17:31,880
during the asset in the entry phase and

412
00:17:36,100 --> 00:17:33,169
that's extremely important when you're

413
00:17:38,649 --> 00:17:36,110

at readapting to 1g to have a strong

414
00:17:40,480 --> 00:17:38,659
cardiovascular system and again our hats

415
00:17:45,130 --> 00:17:40,490
are off to all the folks that work crew

416
00:17:47,440 --> 00:17:45,140
systems and crew equipment this shows

417
00:17:50,169 --> 00:17:47,450
our teacher satellite raised up to 58

418
00:17:52,240 --> 00:17:50,179
degrees right prior to deployment and as

419
00:17:54,580 --> 00:17:52,250
you saw in the movie it popped out nice

420
00:17:56,289 --> 00:17:54,590
and smooth right on time and was just a

421
00:18:02,919 --> 00:17:56,299
beautiful sight watching a goal with the

422
00:18:07,120 --> 00:18:02,929
earth in the background this is a few

423
00:18:08,380 --> 00:18:07,130
seconds later we saw a little rim we

424
00:18:10,810 --> 00:18:08,390
weren't sure what it was it look like at

425
00:18:13,149 --> 00:18:10,820
first like a piece of metal but there

426
00:18:14,770 --> 00:18:13,159
was a little circular rim coming off and

427
00:18:16,419 --> 00:18:14,780
as we were watching it we saw it break

428
00:18:18,039 --> 00:18:16,429
up so we realized this is a little piece

429
00:18:20,380 --> 00:18:18,049
of ice there that you can see that was

430
00:18:24,340 --> 00:18:20,390
attached to the solid rocket motor

431
00:18:26,260 --> 00:18:24,350
somewhere on the EIU S&T dress and it

432
00:18:28,270 --> 00:18:26,270
broke off and broken a few pieces and we

433
00:18:30,039 --> 00:18:28,280
watch it float away and it was kind of

434
00:18:31,510 --> 00:18:30,049
sad we had spent so much of our life in

435
00:18:33,310 --> 00:18:31,520
the last year with our training team

436
00:18:35,680 --> 00:18:33,320
getting ready to deploy the satellite

437
00:18:40,080 --> 00:18:35,690
and moved off so quickly and soon it was

438
00:18:47,980 --> 00:18:45,029

and this is me with the bioreactor again

439
00:18:49,779 --> 00:18:47,990
as I said before it was one of the one

440
00:18:53,529 --> 00:18:49,789
of the very exciting experiments that we

441
00:18:55,750 --> 00:18:53,539
had on board and I just wanted to say a

442
00:18:57,629 --> 00:18:55,760
little bit more about what they were

443
00:19:00,989 --> 00:18:57,639
doing here we were growing some human

444
00:19:04,680 --> 00:19:00,999
colon cancer cells and the objective

445
00:19:06,509 --> 00:19:04,690
here was to find out how complex the

446
00:19:09,680 --> 00:19:06,519
tissues became and if they actually

447
00:19:12,509 --> 00:19:09,690
started releasing some chemicals that

448
00:19:14,879 --> 00:19:12,519
people scientists are theorizing are the

449
00:19:17,430 --> 00:19:14,889
main ingredient for having cancer moved

450
00:19:20,729 --> 00:19:17,440
throughout the body so not only will we

451
00:19:23,430 --> 00:19:20,739
be able to grow replacement tissues or

452
00:19:25,139 --> 00:19:23,440
replacement organs eventually but as I

453
00:19:27,629 --> 00:19:25,149
said we can actually find out some very

454
00:19:33,719 --> 00:19:27,639
detailed information about how tissues

455
00:19:36,810 --> 00:19:33,729
grow including cancer this again is the

456
00:19:38,669 --> 00:19:36,820
nihr rodent experiment this is the

457
00:19:42,989 --> 00:19:38,679
animal enclosure module there were five

458
00:19:44,819 --> 00:19:42,999
rodents in each of the two aemz and they

459
00:19:47,099 --> 00:19:44,829
were also looking at circadian rhythm

460
00:19:48,569 --> 00:19:47,109
they were looking at the mammalian

461
00:19:52,079 --> 00:19:48,579
development and muscular skeletal

462
00:19:55,379 --> 00:19:52,089
changes not only in the dams but also in

463
00:19:57,419 --> 00:19:55,389

the pups post-flight and doing a quite a

464
00:19:59,879 --> 00:19:57,429
lot of testing post-flight on the

465
00:20:02,690 --> 00:19:59,889
animals and so every day we took some

466
00:20:05,609 --> 00:20:02,700
camcorder footage took some still photos

467
00:20:07,709 --> 00:20:05,619
an interesting thing to me was when we

468
00:20:10,529 --> 00:20:07,719
refilled the water in the units the

469
00:20:12,959 --> 00:20:10,539
activity level creased about tenfold so

470
00:20:15,479 --> 00:20:12,969
and it was a very interesting to see the

471
00:20:17,519 --> 00:20:15,489
activity level within the animal

472
00:20:20,430 --> 00:20:17,529
enclosure modules on day one versus a

473
00:20:25,949 --> 00:20:20,440
day five or six and their adaptation to

474
00:20:28,190 --> 00:20:25,959
microgravity also this is Tom again

475
00:20:31,560 --> 00:20:28,200
looking out the window with the Hercules

476
00:20:34,019 --> 00:20:31,570
experiment as I said it was a joint

477
00:20:37,349 --> 00:20:34,029
effort it's a DoD payload Department of

478
00:20:39,629 --> 00:20:37,359
Defense payload and we had several

479
00:20:41,549 --> 00:20:39,639
different problems with it you see we

480
00:20:43,019 --> 00:20:41,559
had a makeshift little site on the

481
00:20:45,659 --> 00:20:43,029
bottom with it some of the things with

482
00:20:49,349 --> 00:20:45,669
computer didn't actually work but

483
00:20:50,789 --> 00:20:49,359
through working on orbit and working

484
00:20:52,739 --> 00:20:50,799
with the people on the ground that's one

485
00:20:54,629 --> 00:20:52,749
of the biggest benefits of having humans

486
00:20:56,969 --> 00:20:54,639
and spaces you can put experiments up

487
00:20:59,190 --> 00:20:56,979
there that if they have a problem you

488
00:21:00,930 --> 00:20:59,200

can work a plan and get together some

489
00:21:06,570 --> 00:21:00,940
good data and through the work of all

490
00:21:11,770 --> 00:21:09,820
this is this rx experiment or amateur

491
00:21:13,810 --> 00:21:11,780
radio and I'm talking to a group of

492
00:21:17,020 --> 00:21:13,820
students in Argentina here and I

493
00:21:18,640 --> 00:21:17,030
actually had their picture and a little

494
00:21:20,320 --> 00:21:18,650
notebook with me there there are a group

495
00:21:22,660 --> 00:21:20,330
of fourth and fifth graders down in

496
00:21:24,280 --> 00:21:22,670
Argentina and they were studying English

497
00:21:26,050 --> 00:21:24,290
as a Second Language and that was a

498
00:21:28,900 --> 00:21:26,060
great thrill for me and I know they had

499
00:21:30,940 --> 00:21:28,910
a fun time to asking questions we get

500
00:21:33,100 --> 00:21:30,950
about 8 minutes as we pass over each

501
00:21:34,090 --> 00:21:33,110
ground site to talk to the students

502
00:21:36,040 --> 00:21:34,100
there and it's amazing how many

503
00:21:38,470 --> 00:21:36,050
questions of fire out at you in an eight

504
00:21:40,450 --> 00:21:38,480
minute span of time we talked to schools

505
00:21:41,830 --> 00:21:40,460
around the United States I mentioned we

506
00:21:44,080 --> 00:21:41,840
talked to one in Cleveland Ohio where

507
00:21:46,360 --> 00:21:44,090
Muriel and her mother teaches in euclid

508
00:21:48,340 --> 00:21:46,370
ohio we also talked to a school in Troy

509
00:21:50,710 --> 00:21:48,350
Ohio where Nancy's from one of the

510
00:21:52,120 --> 00:21:50,720
elementary schools there so we had a lot

511
00:21:53,680 --> 00:21:52,130
of personal interaction with these

512
00:21:56,140 --> 00:21:53,690
schools both before the mission and

513
00:21:59,020 --> 00:21:56,150

afterwards and it is amazing to me how

514
00:22:01,030 --> 00:21:59,030
many people we impact on a single eight

515
00:22:03,430 --> 00:22:01,040
minute pass you know talking to mine

516
00:22:05,350 --> 00:22:03,440
amateur radio because they'll have you

517
00:22:07,180 --> 00:22:05,360
know hundreds of students they're asking

518
00:22:09,250 --> 00:22:07,190
questions and then have a few other

519
00:22:10,840 --> 00:22:09,260
hundred watching the program and there's

520
00:22:12,790 --> 00:22:10,850
a lot of press that's involved they get

521
00:22:14,440 --> 00:22:12,800
the community's really involved in the

522
00:22:16,080 --> 00:22:14,450
program and the whole goal is to get

523
00:22:18,310 --> 00:22:16,090
them interested in science and math and

524
00:22:19,630 --> 00:22:18,320
hopefully we've stimulated interest and

525
00:22:21,340 --> 00:22:19,640
have some future engineers and

526
00:22:22,480 --> 00:22:21,350
astronauts and scientists here they'll

527
00:22:27,070 --> 00:22:22,490
be working with the Johnson Space Center

528
00:22:29,050 --> 00:22:27,080
someday one of the things that we're

529
00:22:31,030 --> 00:22:29,060
taught is again to deal with

530
00:22:32,800 --> 00:22:31,040
contingencies and as I said we had a

531
00:22:34,900 --> 00:22:32,810
vacuum cleaner than had to cut on it and

532
00:22:37,110 --> 00:22:34,910
it causes short and actually pop one of

533
00:22:40,120 --> 00:22:37,120
the circuit breakers Nancy and I are

534
00:22:43,240 --> 00:22:40,130
fixing it as part of our training is to

535
00:22:45,370 --> 00:22:43,250
have in-flight maintenance to to go

536
00:22:47,020 --> 00:22:45,380
ahead and we and fix things that break

537
00:22:48,760 --> 00:22:47,030
and it's been done in the past we did on

538
00:22:50,740 --> 00:22:48,770

this missionary and although we didn't

539
00:22:55,240 --> 00:22:50,750
have to use the vacuum cleaner again it

540
00:22:56,890 --> 00:22:55,250
did test out and we got it to work and

541
00:22:58,960 --> 00:22:56,900
we also do in-flight maintenance on

542
00:23:02,410 --> 00:22:58,970
other folks we didn't have any medical

543
00:23:04,270 --> 00:23:02,420
doctors on crew so Mary Ellen and myself

544
00:23:06,550 --> 00:23:04,280
were trained as the medical doctors just

545
00:23:08,350 --> 00:23:06,560
do very simple type of seizures and I'm

546
00:23:13,810 --> 00:23:08,360
just checking out from arione for

547
00:23:15,160 --> 00:23:13,820
possible dust in there I want to point

548
00:23:17,290 --> 00:23:15,170
out here you have to have a sleep in

549
00:23:18,820 --> 00:23:17,300
shop but i really want to point out with

550
00:23:20,680 --> 00:23:18,830
this is this is the new bags if you're

551
00:23:22,660 --> 00:23:20,690
familiar with the old ones of the

552
00:23:24,700 --> 00:23:22,670
Lou bags and as Tom mentioned we're in

553
00:23:27,400 --> 00:23:24,710
real good health coming down a lot of

554
00:23:29,740 --> 00:23:27,410
that is due to the rest were given this

555
00:23:31,240 --> 00:23:29,750
Bank has straps right here that can keep

556
00:23:32,470 --> 00:23:31,250
you nice and snug a lot of people have

557
00:23:33,970 --> 00:23:32,480
complained in the past when you're

558
00:23:37,180 --> 00:23:33,980
you're floating in the natural body

559
00:23:39,820 --> 00:23:37,190
position in zero gravity can cause some

560
00:23:43,120 --> 00:23:39,830
muscle fatigue there's also a strap

561
00:23:44,380 --> 00:23:43,130
right here that most of the time I would

562
00:23:46,440 --> 00:23:44,390
have in the beginning to sleep put that

563
00:23:49,150 --> 00:23:46,450

over my head to put your head against a

564
00:23:51,370 --> 00:23:49,160
pillow and gives you a little bit of

565
00:23:53,170 --> 00:23:51,380
pressure makes you feeling like 1g and

566
00:23:55,030 --> 00:23:53,180
behind what you can't say are some

567
00:23:56,650 --> 00:23:55,040
spring so that you can stretch it out

568
00:23:59,350 --> 00:23:56,660
and it's so it has a little bit of

569
00:24:01,030 --> 00:23:59,360
firmness and I think that development of

570
00:24:03,100 --> 00:24:01,040
that sleeping bag has really helped out

571
00:24:09,670 --> 00:24:03,110
with our sleep and contribute us he and

572
00:24:12,010 --> 00:24:09,680
so well after landing moving on to earth

573
00:24:14,440 --> 00:24:12,020
observations this is the last car

574
00:24:17,020 --> 00:24:14,450
volcano on the Argentine Chilean border

575
00:24:20,350 --> 00:24:17,030
and we first saw this on my previous

576
00:24:22,510 --> 00:24:20,360
flight in 1993 on st s55 it had erupted

577
00:24:25,330 --> 00:24:22,520
about a week before that launched and

578
00:24:27,670 --> 00:24:25,340
it's been active ever since and I was

579
00:24:30,340 --> 00:24:27,680
very pleased to see last car was still

580
00:24:35,310 --> 00:24:30,350
providing some plume for us to observe

581
00:24:39,040 --> 00:24:35,320
and you can also see the the line of

582
00:24:42,280 --> 00:24:39,050
volcanoes that are formed as the ridges

583
00:24:43,570 --> 00:24:42,290
or a tectonic plate plates are pushed

584
00:24:50,940 --> 00:24:43,580
together and this is a very dramatic

585
00:24:58,180 --> 00:24:55,330
this is a shot of Buenos Aires and you

586
00:25:00,910 --> 00:24:58,190
can see the majority of the city is down

587
00:25:05,590 --> 00:25:00,920
near the bottom of the frame the

588
00:25:08,800 --> 00:25:05,600

beautiful bay the Copacabana beach the

589
00:25:12,220 --> 00:25:08,810
Ipanema beach sugarloaf mountain and

590
00:25:14,940 --> 00:25:12,230
this is an infrared shot so the

591
00:25:18,010 --> 00:25:14,950
vegetation that you would see green on a

592
00:25:19,660 --> 00:25:18,020
visual scene shows up red here so you

593
00:25:22,630 --> 00:25:19,670
can see the vast amounts of green

594
00:25:25,090 --> 00:25:22,640
vegetation on north of the city again

595
00:25:30,730 --> 00:25:25,100
the population that is in that field of

596
00:25:38,420 --> 00:25:33,650
this is a dust storm that's over the Red

597
00:25:41,930 --> 00:25:38,430
Sea theres a river valley off to the sea

598
00:25:44,210 --> 00:25:41,940
the lower right here and it's bringing a

599
00:25:45,740 --> 00:25:44,220
lot of sand in from the desert area the

600
00:25:47,750 --> 00:25:45,750
winds are picking it up and you can see

601
00:25:50,540 --> 00:25:47,760
these plumes going off for 70 to 100

602
00:25:52,220 --> 00:25:50,550
miles we saw dust storms like this over

603
00:25:54,290 --> 00:25:52,230
the Red Sea we also saw a pretty large

604
00:25:55,910 --> 00:25:54,300
one not over the west coast of Africa

605
00:25:58,340 --> 00:25:55,920
heading out over the Atlantic Ocean and

606
00:26:00,260 --> 00:25:58,350
it's just amazing how much dust is

607
00:26:03,010 --> 00:26:00,270
picked up and put in the atmosphere and

608
00:26:06,440 --> 00:26:03,020
actually transported over vast distances

609
00:26:08,840 --> 00:26:06,450
some of the dust from the western Africa

610
00:26:10,100 --> 00:26:08,850
actually reaches over to Florida and you

611
00:26:15,440 --> 00:26:10,110
know some of it makes it into my house

612
00:26:18,020 --> 00:26:15,450
in Texas I know this is a picture from

613
00:26:20,090 --> 00:26:18,030

the southern mozambique showing some of

614
00:26:22,580 --> 00:26:20,100
the fires that are burning there it's

615
00:26:24,080 --> 00:26:22,590
wintertime in southern Africa and this

616
00:26:25,760 --> 00:26:24,090
is their dry season so they're doing

617
00:26:28,130 --> 00:26:25,770
some agricultural clearing of the land

618
00:26:30,170 --> 00:26:28,140
here just burning down crops and

619
00:26:32,600 --> 00:26:30,180
clearing the land for next feat next

620
00:26:33,890 --> 00:26:32,610
season's crops but it's such an

621
00:26:35,600 --> 00:26:33,900
impressive sight going around the earth

622
00:26:37,730 --> 00:26:35,610
this is one of the most memorable

623
00:26:39,320 --> 00:26:37,740
impressions for myself is just the fires

624
00:26:41,660 --> 00:26:39,330
that are burning around the planet and

625
00:26:43,340 --> 00:26:41,670
to pass over an area such as this at

626
00:26:45,980 --> 00:26:43,350
night is really spectacular where you'll

627
00:26:47,960 --> 00:26:45,990
see just dots of bright orange lights

628
00:26:49,610 --> 00:26:47,970
you wonder who is shining this bright

629
00:26:51,110 --> 00:26:49,620
orange light up at me and then you

630
00:26:52,460 --> 00:26:51,120
realize all these little dots that

631
00:26:58,010 --> 00:26:52,470
you're looking at or fire is burning

632
00:27:01,060 --> 00:26:58,020
down on the planet this is a shot of the

633
00:27:04,490 --> 00:27:01,070
Tiffany dunes which are in Algeria and

634
00:27:07,280 --> 00:27:04,500
not only is it a very striking visual

635
00:27:10,280 --> 00:27:07,290
but there is also some very interesting

636
00:27:14,480 --> 00:27:10,290
geological information in here this is

637
00:27:17,540 --> 00:27:14,490
in a desert zone in Africa however only

638
00:27:19,520 --> 00:27:17,550

about 5,000 years ago which is really

639
00:27:23,060 --> 00:27:19,530
just a blink of the eye in geological

640
00:27:25,100 --> 00:27:23,070
terms this used to be very wet area and

641
00:27:29,540 --> 00:27:25,110
this rock that you see around here

642
00:27:32,090 --> 00:27:29,550
actually has channels that used to be

643
00:27:34,940 --> 00:27:32,100
rivers flowing into this so this region

644
00:27:37,670 --> 00:27:34,950
here at one time was a lake in these

645
00:27:40,190 --> 00:27:37,680
times it's actually filled with dust and

646
00:27:42,259 --> 00:27:40,200
sand which has blown over these ridges

647
00:27:44,180 --> 00:27:42,269
and filled up this area

648
00:27:46,699 --> 00:27:44,190
and all of the different patterns in

649
00:27:54,469 --> 00:27:46,709
here are made by various wind directions

650
00:27:57,199 --> 00:27:54,479
blowing through there this is the Betsy

651
00:27:59,649 --> 00:27:57,209
Boca River which is in Madagascar this

652
00:28:04,190 --> 00:27:59,659
is on the southern eastern side of

653
00:28:06,859 --> 00:28:04,200
Africa and this is an infrared shot so

654
00:28:08,599 --> 00:28:06,869
again vegetation shows up as red and

655
00:28:11,690 --> 00:28:08,609
you'll see there isn't there isn't a

656
00:28:13,339 --> 00:28:11,700
whole lot of red in this shot they've

657
00:28:16,729 --> 00:28:13,349
had a great deal of clearing in

658
00:28:19,789 --> 00:28:16,739
Madagascar and not only do you not see a

659
00:28:24,919 --> 00:28:19,799
lot of vegetation but also as the river

660
00:28:26,899 --> 00:28:24,929
flows into the ocean it has developed a

661
00:28:30,829 --> 00:28:26,909
great deal of sedimentation at the mouth

662
00:28:33,079 --> 00:28:30,839
of this river and in World War two times

663
00:28:34,789 --> 00:28:33,089

there were actually no islands in this

664
00:28:37,519 --> 00:28:34,799
region here and you can see there are a

665
00:28:43,209 --> 00:28:37,529
number of islands these days which is a

666
00:28:48,190 --> 00:28:46,099
this is a shot of the Bahamas this is

667
00:28:50,539 --> 00:28:48,200
the ackland islands in the Bahamas and

668
00:28:52,129 --> 00:28:50,549
although it is a great shot of one of

669
00:28:53,419 --> 00:28:52,139
the great scuba diving areas of the

670
00:28:55,009 --> 00:28:53,429
world which will give you a difference

671
00:28:56,719 --> 00:28:55,019
in why the crew member took the picture

672
00:29:00,109 --> 00:28:56,729
and what it's used for when we get back

673
00:29:01,999 --> 00:29:00,119
but also over here you can see just a

674
00:29:03,769 --> 00:29:02,009
little bit of some of the Whiting's

675
00:29:05,149 --> 00:29:03,779
around the Bahamas this one doesn't

676
00:29:07,129 --> 00:29:05,159
really do it justice some of our other

677
00:29:08,719 --> 00:29:07,139
shots show it a little bit better but

678
00:29:10,579 --> 00:29:08,729
the Whiting's are areas of the water it

679
00:29:12,499 --> 00:29:10,589
actually looks like white milky streaks

680
00:29:14,599 --> 00:29:12,509
where the calcium carbonate has gone to

681
00:29:16,849 --> 00:29:14,609
the surface and by looking at the areas

682
00:29:19,489 --> 00:29:16,859
of Whiting's they can tell the amount of

683
00:29:22,669 --> 00:29:19,499
Pico plankton in the water so

684
00:29:23,869 --> 00:29:22,679
oceanographers and biologists can can

685
00:29:29,959 --> 00:29:23,879
both get a lot of data out of those

686
00:29:33,139 --> 00:29:29,969
those types of shots this is a

687
00:29:35,899 --> 00:29:33,149
photograph using high-speed film taken

688
00:29:38,479 --> 00:29:35,909

during one of the windex data takes when

689
00:29:41,149 --> 00:29:38,489
we were firing the primary thrusters on

690
00:29:42,739 --> 00:29:41,159
the orbiter and what you see here is not

691
00:29:44,839 --> 00:29:42,749
only the thruster firing but you can

692
00:29:46,789 --> 00:29:44,849
very very clearly see the phenomenon

693
00:29:49,399 --> 00:29:46,799
known as shuttle glow around the tail of

694
00:29:52,430 --> 00:29:49,409
the orbiter caused by the chemical

695
00:29:54,169 --> 00:29:52,440
makeup of the thruster plume hitting the

696
00:29:55,340 --> 00:29:54,179
orbiter structure that's been a

697
00:29:56,990 --> 00:29:55,350
phenomena that's

698
00:29:59,029 --> 00:29:57,000
continually been investigated and will

699
00:30:04,120 --> 00:29:59,039
continue to do so and hopefully a Windex

700
00:30:10,850 --> 00:30:07,760
right here this is Windows 6 the right

701
00:30:12,860 --> 00:30:10,860
side our PLT side of the window during

702
00:30:15,320 --> 00:30:12,870
the sleep period the starboard wing was

703
00:30:17,210 --> 00:30:15,330
into the velocity vector and we presume

704
00:30:19,789 --> 00:30:17,220
it was sometime during the night period

705
00:30:22,430 --> 00:30:19,799
during our sleeping period that we took

706
00:30:26,240 --> 00:30:22,440
a hit on that window it's only about one

707
00:30:28,250 --> 00:30:26,250
sixteenth of an inch in the depth right

708
00:30:30,200 --> 00:30:28,260
up in the corner of the window we

709
00:30:32,210 --> 00:30:30,210
downlink some of the video we also took

710
00:30:34,880 --> 00:30:32,220
some still pictures to make sure that

711
00:30:37,940 --> 00:30:34,890
that area did not change at all during

712
00:30:40,310 --> 00:30:37,950
the entry profile and I guess it got

713
00:30:43,460 --> 00:30:40,320

quite a bit of press here on earth it

714
00:30:46,010 --> 00:30:43,470
was really not a significant impact to

715
00:30:47,659 --> 00:30:46,020
the flight and many many times during

716
00:30:52,909 --> 00:30:47,669
flights you do have a little bit of

717
00:30:55,820 --> 00:30:52,919
window damage that completes our slides

718
00:30:58,789 --> 00:30:55,830
we were the quote unquote all-ohio crew

719
00:31:00,620 --> 00:30:58,799
and that was just by coincidence that so

720
00:31:04,549 --> 00:31:00,630
many of us were from the great state of

721
00:31:08,270 --> 00:31:04,559
Ohio but Kevin was a good sport about

722
00:31:09,799 --> 00:31:08,280
the fact that the Ohio Governor made him

723
00:31:13,010 --> 00:31:09,809
an honorary Buckeye and we appreciated

724
00:31:15,020 --> 00:31:13,020
him going along with that but each and

725
00:31:17,600 --> 00:31:15,030
every state in the Union is represented

726
00:31:19,669 --> 00:31:17,610
throughout the workforce in NASA and

727
00:31:21,590 --> 00:31:19,679
here at the Johnson Space Center we

728
00:31:23,120 --> 00:31:21,600
appreciate all that help and if we could

729
00:31:24,710 --> 00:31:23,130
bring the lights up one more time

730
00:31:27,289 --> 00:31:24,720
there's one thing that I'd like to

731
00:31:28,640 --> 00:31:27,299
include in this presentation and it's a

732
00:31:30,260 --> 00:31:28,650
bit of a surprise for to the crew

733
00:31:32,840 --> 00:31:30,270
members because we normally do this in

734
00:31:34,789 --> 00:31:32,850
front of the astronaut office but we had

735
00:31:36,200 --> 00:31:34,799
our party so soon after landing that we

736
00:31:38,779 --> 00:31:36,210
didn't have the items that we flew in

737
00:31:41,450 --> 00:31:38,789
space back yet one of the things that we

738
00:31:43,640 --> 00:31:41,460

do after our first year of training is

739
00:31:47,600 --> 00:31:43,650
completed as an astronaut candidate is

740
00:31:50,210 --> 00:31:47,610
award the new astronaut with a silver

741
00:31:52,760 --> 00:31:50,220
pen and that indicates they are

742
00:31:54,770 --> 00:31:52,770
qualified to fly in space however they

743
00:31:56,779 --> 00:31:54,780
are not a real astronaut until they make

744
00:31:59,779 --> 00:31:56,789
that first flight and after that flight

745
00:32:02,870 --> 00:31:59,789
the commander traditionally awards him

746
00:32:06,250 --> 00:32:02,880
or her with a gold astronaut pin and

747
00:32:08,659 --> 00:32:06,260
that's what I'd like to do today Kevin

748
00:32:14,420 --> 00:32:08,669
congratulations and I hope we get to do

749
00:32:21,270 --> 00:32:19,080
very own congratulations again and I'll