1
00:00:05,670 --> 00:00:03,270
hi i'm michelle savoie lawrence baitland

2
00:00:08,070 --> 00:00:05,680
i'm faith knudsen i'm taylor rasca i'm

3
00:00:09,669 --> 00:00:08,080
julie bracefield i'm erica halsey and

4
00:00:12,070 --> 00:00:09,679
we're the biomedical flight controllers

5
00:00:21,349 --> 00:00:12,080
on the final shuttle mission and you're

6
00:00:21,359 --> 00:00:42,470
so

7
00:00:42,480 --> 00:00:53,270
i used

8
00:00:53,280 --> 00:01:10,230
sweep the streets

9
00:01:37,190 --> 00:01:12,630
i used to roll

10
00:02:03,030 --> 00:01:44,870
is

11
00:02:03,040 --> 00:02:14,550
that was

12
00:02:26,790 --> 00:02:17,510
we wish you a successful mission and a

13
00:02:31,430 --> 00:02:28,630

good morning uh marshall space flight

14
00:02:34,830 --> 00:02:31,440
center thanks for that uh great message

15
00:02:37,750 --> 00:02:34,840
and uh awesome ride to orbit and

16
00:02:39,830 --> 00:02:37,760
134 before that

17
00:02:42,390 --> 00:02:39,840
with this tremendous space shuttle

18
00:02:44,309 --> 00:02:42,400
program we really look forward to having

19
00:02:48,710 --> 00:02:44,319
a visit with you all after we finish the

20
00:02:52,869 --> 00:02:50,790
good day for mission control in houston

21
00:02:54,309 --> 00:02:52,879
from the shuttle flight control room the

22
00:02:56,869 --> 00:02:54,319
beginning of the first full day of

23
00:02:58,869 --> 00:02:56,879
operations for atlantis astronauts on

24
00:02:59,910 --> 00:02:58,879
this final shuttle flight in program

25
00:03:01,110 --> 00:02:59,920
history

26
00:03:03,350 --> 00:03:01,120
a day uh

27
00:03:04,710 --> 00:03:03,360
that will convert yesterday's activities

28
00:03:06,550 --> 00:03:04,720
that were steeped in pomp and

29
00:03:08,309 --> 00:03:06,560
circumstance and emotion with the launch

30
00:03:10,309 --> 00:03:08,319
of atlantis on its final flight in

31
00:03:12,869 --> 00:03:10,319
shuttle program history to the blue

32
00:03:15,030 --> 00:03:12,879
collar work that will be undertaken in

33
00:03:17,589 --> 00:03:15,040
the inspection of the shuttle's thermal

34
00:03:19,670 --> 00:03:17,599
protection system today standard flight

35
00:03:21,990 --> 00:03:19,680
day two activity for the four astronauts

36
00:03:24,149 --> 00:03:22,000
on board the orbiter as they prepare for

37
00:03:27,670 --> 00:03:24,159
their arrival at the international space

38
00:03:32,630 --> 00:03:30,149

so now uh more than 19 hours following

39
00:03:34,630 --> 00:03:32,640
the launch of atlantis commander chris

40
00:03:36,309 --> 00:03:34,640
ferguson pilot doug hurley at the aft

41
00:03:38,710 --> 00:03:36,319
flight deck of the orbiter ready to pick

42
00:03:40,390 --> 00:03:38,720
up work as they will maneuver the

43
00:03:43,030 --> 00:03:40,400
shuttle's robotic arm that you see in

44
00:03:46,390 --> 00:03:43,040
the upper right hand corner of this view

45
00:03:47,750 --> 00:03:46,400
from payload bay cameras uh aboard

46
00:03:49,589 --> 00:03:47,760
atlantis

47
00:03:51,509 --> 00:03:49,599
it will be extended over to the

48
00:03:53,190 --> 00:03:51,519
starboard sill to grapple the orbiter

49
00:03:54,869 --> 00:03:53,200
boom sensor system

50
00:03:57,270 --> 00:03:54,879
payload retention latches will be

51
00:03:59,830 --> 00:03:57,280
commanded open and the boom will be

52
00:04:01,750 --> 00:03:59,840
lifted out of its sill on the starboard

53
00:04:04,229 --> 00:04:01,760
side of the payload bay

54
00:04:06,470 --> 00:04:04,239
its cameras and lasers

55
00:04:09,030 --> 00:04:06,480
will be activated its sensors will be

56
00:04:10,869 --> 00:04:09,040
activated and calibrated for the start

57
00:04:12,630 --> 00:04:10,879
of the inspection of the leading edge of

58
00:04:16,789 --> 00:04:12,640
the starboard wing and the reinforced

59
00:04:19,509 --> 00:04:16,799
carbon carbon along the wing itself

60
00:04:21,270 --> 00:04:19,519
the shuttle robotic arm now in motion

61
00:04:23,110 --> 00:04:21,280
that confirmed by the payload deployment

62
00:04:28,629 --> 00:04:23,120
and retrieval systems officer here in

63
00:04:32,629 --> 00:04:30,629

there are two grapple fixtures on the

64
00:04:34,710 --> 00:04:32,639
orbiter boom sensor system

65
00:04:37,030 --> 00:04:34,720
the grapple fixture to which the

66
00:04:39,110 --> 00:04:37,040
shuttle's robotic arm will affix itself

67
00:04:41,590 --> 00:04:39,120
to momentarily

68
00:04:43,909 --> 00:04:41,600
is also used to power up the intensified

69
00:04:47,510 --> 00:04:43,919
video camera and the

70
00:04:49,670 --> 00:04:47,520
laser range imagery equipment

71
00:04:51,430 --> 00:04:49,680
that is uh basically at the forward end

72
00:04:53,909 --> 00:04:51,440
of the boom there is also a midpoint

73
00:04:55,830 --> 00:04:53,919
grapple fixture that is used by the

74
00:04:58,469 --> 00:04:55,840
station's robotic arm

75
00:05:00,150 --> 00:04:58,479
that will be used to grapple the boom

76
00:05:01,590 --> 00:05:00,160
and hand it off to the shuttle's arm

77
00:05:03,990 --> 00:05:01,600
after docking

78
00:05:06,710 --> 00:05:04,000
because of the shuttle arm cannot reach

79
00:05:08,070 --> 00:05:06,720
around the orbiter docking system once

80
00:05:09,350 --> 00:05:08,080
the shuttle is linked up to the

81
00:05:15,510 --> 00:05:09,360
international space station's

82
00:05:19,110 --> 00:05:17,110
and this view from an end effector

83
00:05:22,310 --> 00:05:19,120
camera on the shuttle's robotic arm as

84
00:05:25,430 --> 00:05:22,320
it now hovers above the grapple fixture

85
00:05:27,830 --> 00:05:25,440
this electrically fixed grapple fixture

86
00:05:30,070 --> 00:05:27,840
at the end of the orbiter boom sensor

87
00:05:31,909 --> 00:05:30,080
system

88
00:05:34,390 --> 00:05:31,919

a short time from now the shuttle's

89
00:05:36,550 --> 00:05:34,400
robotic arm will be maneuvered down to

90
00:05:38,469 --> 00:05:36,560
grapple on to that fixture

91
00:05:40,629 --> 00:05:38,479
after which payload retention latches

92
00:05:48,230 --> 00:05:40,639
will be released to enable the boom to

93
00:05:53,189 --> 00:05:50,550
a good view from a camera at the rear of

94
00:05:54,070 --> 00:05:53,199
atlantis cargo bay looking down the

95
00:05:56,469 --> 00:05:54,080
length

96
00:05:58,230 --> 00:05:56,479
of the orbiter boom sensor system

97
00:06:01,830 --> 00:05:58,240
and a good look at the business end of

98
00:06:03,590 --> 00:06:01,840
the obss as it is known where the

99
00:06:06,230 --> 00:06:03,600
intensified television camera and the

100
00:06:08,629 --> 00:06:06,240
laser sensors are located and now the

101
00:06:10,309 --> 00:06:08,639
process of beginning to lift the boom

102
00:07:16,550 --> 00:06:10,319
out of its moorings on the starboard

103
00:07:21,510 --> 00:07:19,589
this survey of the leading edge of the

104
00:07:23,830 --> 00:07:21,520
starboard wing of atlantis will be

105
00:07:26,150 --> 00:07:23,840
followed by a survey of the nose cap of

106
00:07:27,430 --> 00:07:26,160
the orbiter and then the port wing of

107
00:07:29,510 --> 00:07:27,440
atlantis

108
00:07:31,270 --> 00:07:29,520
the leading edge of the reinforced

109
00:07:33,270 --> 00:07:31,280
carbon carbon along the leading edge of

110
00:07:36,150 --> 00:07:33,280
the wing to be surveyed along with other

111
00:07:39,430 --> 00:07:36,160
areas of interest all of this imagery

112
00:07:41,430 --> 00:07:39,440
being processed by laser dynamic imaging

113
00:07:44,629 --> 00:07:41,440

equipment lasers and

114
00:07:46,790 --> 00:07:44,639
3d sensors as well as intensified tv

115
00:07:49,430 --> 00:07:46,800
cameras on board the

116
00:07:52,070 --> 00:07:49,440
orbiter boom sensor system the 51 foot

117
00:07:54,629 --> 00:07:52,080
long boom extension

118
00:07:57,029 --> 00:07:54,639
once the survey is complete the boom

119
00:07:58,550 --> 00:07:57,039
will be stowed back in its moorings on

120
00:08:01,670 --> 00:07:58,560
the starboard sill

121
00:08:04,550 --> 00:08:01,680
it will be at the ready if needed

122
00:08:06,629 --> 00:08:04,560
for a focused inspection of the

123
00:08:09,909 --> 00:08:06,639
orbiter's thermal protection system

124
00:08:11,670 --> 00:08:09,919
should that become necessary

125
00:08:13,589 --> 00:08:11,680
in the unlikely event that that would be

126
00:08:16,150 --> 00:08:13,599
needed

127
00:08:17,270 --> 00:08:16,160
there is time that has been set aside on

128
00:08:21,830 --> 00:08:17,280
the

129
00:08:22,710 --> 00:08:21,840
operations for that to take place

130
00:08:24,790 --> 00:08:22,720
although

131
00:08:27,350 --> 00:08:24,800
the early indications are that atlantis

132
00:08:29,029 --> 00:08:27,360
heat shield is in excellent shape and

133
00:08:30,869 --> 00:08:29,039
that a focused survey would not be

134
00:08:34,149 --> 00:08:30,879
required however the mission management

135
00:08:37,190 --> 00:08:34,159
team will be the final authority on that

136
00:08:39,750 --> 00:08:37,200
uh based on all of the imagery that will

137
00:08:41,670 --> 00:08:39,760
be analyzed from this survey from the

138
00:08:43,750 --> 00:08:41,680

ascent imagery that is being processed

139
00:08:46,630 --> 00:08:43,760
back here at the johnson space center as

140
00:08:49,190 --> 00:08:46,640
well as high resolution digital still

141
00:08:51,030 --> 00:08:49,200
imagery that will be taken tomorrow

142
00:08:52,310 --> 00:08:51,040
during atlantis final approach for

143
00:08:53,269 --> 00:08:52,320
docking

144
00:08:54,949 --> 00:08:53,279
as

145
00:08:57,509 --> 00:08:54,959
three of the crew members aboard the

146
00:09:00,949 --> 00:08:57,519
international space station uh russian

147
00:09:03,350 --> 00:09:00,959
cosmonaut sergey volkov along with uh

148
00:09:04,550 --> 00:09:03,360
nasa astronauts ron garan and mike

149
00:09:05,750 --> 00:09:04,560
fossum

150
00:09:08,550 --> 00:09:05,760
will be

151
00:09:11,590 --> 00:09:08,560
in the zvezda service module using a

152
00:09:14,790 --> 00:09:11,600
variety of high resolution lenses volkov

153
00:09:16,470 --> 00:09:14,800
will be using a 1 000 millimeter lens

154
00:09:18,630 --> 00:09:16,480
mike fossum will be using an 800

155
00:09:21,509 --> 00:09:18,640
millimeter lens and uh japanese

156
00:09:23,590 --> 00:09:21,519
astronaut satoshi furukawa will be using

157
00:09:26,630 --> 00:09:23,600
a 400 millimeter lens

158
00:09:28,710 --> 00:09:26,640
to take hundreds of images of atlantis

159
00:09:31,430 --> 00:09:28,720
as it executes the final rendezvous

160
00:09:34,150 --> 00:09:31,440
pitch maneuver the rotational backflip

161
00:09:38,230 --> 00:09:34,160
that the orbiters have been conducting

162
00:09:40,710 --> 00:09:38,240
since return to flight back in 2005

163
00:09:42,470 --> 00:09:40,720

at a point at about 600 feet directly

164
00:09:45,350 --> 00:09:42,480
below the international space station

165
00:09:47,750 --> 00:09:45,360
when commander chris ferguson initiates

166
00:09:51,269 --> 00:09:47,760
uh about a nine minute maneuver for

167
00:09:53,110 --> 00:09:51,279
about 90 seconds of usable photography

168
00:09:54,710 --> 00:09:53,120
of all of the key surfaces of the

169
00:09:57,829 --> 00:09:54,720
orbiter's

170
00:10:01,829 --> 00:09:57,839
belly and all of its key areas of its

171
00:10:01,839 --> 00:10:09,350
good copyrights thanks

172
00:10:11,829 --> 00:10:10,310
hey

173
00:10:12,949 --> 00:10:11,839
if you don't see a reason why we

174
00:10:15,110 --> 00:10:12,959
shouldn't do otherwise we're just going

175
00:10:18,550 --> 00:10:15,120
to get centerline camera checkout done

176
00:10:22,949 --> 00:10:20,150
and fergie we're good with that it may

177
00:10:24,790 --> 00:10:22,959
be easier um config wise if you do the

178
00:10:26,470 --> 00:10:24,800
docking mechanic first that'll get power

179
00:10:28,389 --> 00:10:26,480
to the lights that you may use during

180
00:10:30,310 --> 00:10:28,399
that camera checkout

181
00:10:31,750 --> 00:10:30,320
that's a real good point uh thanks very

182
00:10:33,350 --> 00:10:31,760
much and how you doing megan it's good

183
00:10:34,870 --> 00:10:33,360
to hear your voice again

184
00:10:36,630 --> 00:10:34,880
doing great fergie happy to be here

185
00:10:38,150 --> 00:10:36,640
working with your team and you guys look

186
00:10:39,590 --> 00:10:38,160
great launching yesterday it was fun to

187
00:10:41,750 --> 00:10:39,600
be there

188
00:10:45,030 --> 00:10:41,760

it was exciting for us too

189
00:10:49,910 --> 00:10:46,790
so megan now that we're talking about it

190
00:10:52,710 --> 00:10:49,920
can we get into uh stocking mechanic

191
00:10:52,720 --> 00:11:51,750
absolutely

192
00:11:51,760 --> 00:11:54,230
go ahead

193
00:11:56,629 --> 00:11:55,110
megan

194
00:11:58,790 --> 00:11:56,639
if you want to you guys are welcome on

195
00:12:00,310 --> 00:11:58,800
board the flight deck

196
00:12:02,470 --> 00:12:00,320
thanks very much uh we are there with

197
00:12:04,389 --> 00:12:02,480
you now you guys look great

198
00:12:06,069 --> 00:12:04,399
yeah we're all crammed into the aft part

199
00:12:08,069 --> 00:12:06,079
of the place flight deck you would think

200
00:12:10,629 --> 00:12:08,079
with just four of us we would be

201
00:12:14,150 --> 00:12:10,639
downstairs or something else but

202
00:12:14,160 --> 00:12:17,829
well that's where the view is i take it

203
00:12:17,839 --> 00:13:28,550
yeah that's where the windows are

204
00:13:31,509 --> 00:13:30,150
this is mission control houston the crew

205
00:13:33,350 --> 00:13:31,519
of atlanta is now playing back their

206
00:13:35,190 --> 00:13:33,360
on-board launch video that was taken

207
00:13:37,350 --> 00:13:35,200
yesterday during atlantis ride up into

208
00:13:39,509 --> 00:13:37,360
space that is uh doug hurley there on

209
00:13:41,189 --> 00:13:39,519
the far left the pilot of sts-135 back

210
00:13:43,430 --> 00:13:41,199
behind him sandy magnus sitting beside

211
00:13:45,430 --> 00:13:43,440
her is rex walheim you see the uh

212
00:14:04,949 --> 00:13:45,440
solid rocket boosters ignite there just

213
00:14:09,750 --> 00:14:06,790

and houston uh advanced when you're

214
00:14:13,110 --> 00:14:09,760
ready i'll be uh glad to do the ml86

215
00:14:13,120 --> 00:15:34,710
rex we are ready

216
00:15:37,990 --> 00:15:36,230
the crew atlantis continuing to play

217
00:15:39,590 --> 00:15:38,000
back this video on board the shuttle

218
00:15:43,509 --> 00:15:39,600
yesterday as it lifted off and headed

219
00:15:46,790 --> 00:15:45,030
it's giving you a sense of exactly what

220
00:15:48,870 --> 00:15:46,800
it's like to be on board the shuttle as

221
00:15:51,749 --> 00:15:48,880
it

222
00:15:53,990 --> 00:15:51,759
the solid rocket boosters there

223
00:17:09,590 --> 00:15:54,000
separating from

224
00:17:11,990 --> 00:17:10,870
you can see the sunlight the shadows are

225
00:17:15,189 --> 00:17:12,000
beginning to rotate around as the

226
00:17:16,630 --> 00:17:15,199
shuttle rode to a heads up position

227
00:17:18,309 --> 00:17:16,640
the shuttle does this during its launch

228
00:17:19,990 --> 00:17:18,319
in order to gain more favorable

229
00:17:23,990 --> 00:17:20,000
communications with nasa's tracking and

230
00:17:28,549 --> 00:17:26,789
this is done during the final moments

231
00:17:30,950 --> 00:17:28,559
of powered flight the shuttle at this

232
00:17:32,950 --> 00:17:30,960
point was still flying under its three

233
00:18:13,750 --> 00:17:32,960
main engines

234
00:18:13,760 --> 00:18:19,590
and there goes main engine cutoff

235
00:18:24,150 --> 00:18:21,590
houston coming down right now if you see

236
00:18:27,270 --> 00:18:24,160
it is just part of our nc2 burn this

237
00:18:31,510 --> 00:18:28,630
hey you'll see our take coming up here

238
00:18:31,520 --> 00:18:34,950

and we see that

239
00:18:34,960 --> 00:18:47,669
this is a short burn

240
00:18:51,190 --> 00:18:49,350
this is mission control houston out of

241
00:18:52,630 --> 00:18:51,200
all the traditions in history inside the

242
00:18:54,710 --> 00:18:52,640
space shuttle flight control room one of

243
00:18:57,029 --> 00:18:54,720
the more important ones to the team here

244
00:18:58,710 --> 00:18:57,039
are these roses that arrive during every

245
00:19:01,110 --> 00:18:58,720
single mission the shelton family up

246
00:19:02,710 --> 00:19:01,120
near the dallas fort worth metroplex has

247
00:19:04,870 --> 00:19:02,720
sent these roses to the team here in

248
00:19:06,950 --> 00:19:04,880
mission control uh during every single

249
00:19:09,110 --> 00:19:06,960
flight since sts-26

250
00:19:11,830 --> 00:19:09,120
which was back in 1988

251
00:19:13,830 --> 00:19:11,840
so for 110 missions these roses have

252
00:19:14,950 --> 00:19:13,840
been a part of the team here it is

253
00:19:17,590 --> 00:19:14,960
something that they look forward to

254
00:19:18,710 --> 00:19:17,600
every single time it would not be a

255
00:19:20,150 --> 00:19:18,720
space shuttle mission without these

256
00:19:21,669 --> 00:19:20,160
roses arriving

257
00:19:23,510 --> 00:19:21,679
we were surprised a bit yesterday

258
00:19:25,430 --> 00:19:23,520
whenever they arrived on launch day that

259
00:19:27,430 --> 00:19:25,440
is the first time that that has ever

260
00:19:29,350 --> 00:19:27,440
happened but the family the sheltons

261
00:19:31,750 --> 00:19:29,360
they sent us a very nice note we're

262
00:19:33,190 --> 00:19:31,760
going to read it to you now

263
00:19:36,230 --> 00:19:33,200

the note says to our good friends at

264
00:19:38,870 --> 00:19:36,240
mission control and the crews of sts-135

265
00:19:40,870 --> 00:19:38,880
and expedition 28. what a warm sight

266
00:19:43,270 --> 00:19:40,880
atlantis the first orbiter seen in

267
00:19:44,789 --> 00:19:43,280
person by the sheltons during a surprise

268
00:19:46,390 --> 00:19:44,799
visit to the dallas fort worth

269
00:19:48,390 --> 00:19:46,400
international airport

270
00:19:52,070 --> 00:19:48,400
every second of this mission is exciting

271
00:19:53,990 --> 00:19:52,080
thrilling sad and poignant

272
00:19:56,870 --> 00:19:54,000
the handprints and heart prints of so

273
00:19:58,390 --> 00:19:56,880
many touch every surface every moment

274
00:20:00,310 --> 00:19:58,400
thank you all for sharing it all the

275
00:20:02,470 --> 00:20:00,320
glory and unspeakable pain with a

276
00:20:05,350 --> 00:20:02,480
grateful nation a grateful planet

277
00:20:07,270 --> 00:20:05,360
godspeed god speed god speed the

278
00:20:08,710 --> 00:20:07,280
sheltons and the murphys

279
00:20:10,149 --> 00:20:08,720
on behalf of mission control and the

280
00:20:11,510 --> 00:20:10,159
entire team here in houston and the

281
00:20:13,110 --> 00:20:11,520
entire space shuttle program we want to

282
00:20:14,230 --> 00:20:13,120
thank those families for supporting us

283
00:20:15,510 --> 00:20:14,240
all these years

284
00:20:17,669 --> 00:20:15,520
we look forward to this tradition