



1
00:00:46,389 --> 00:00:03,429
hi i'm sts-131 astronaut rick

2
00:00:46,399 --> 00:01:21,749
so

3
00:01:26,070 --> 00:01:23,350
good morning discovery and a special

4
00:01:27,830 --> 00:01:26,080
good morning to you rick

5
00:01:29,830 --> 00:01:27,840
good morning houston

6
00:01:32,230 --> 00:01:29,840
thanks for that song and uh thanks to my

7
00:01:34,230 --> 00:01:32,240
wife candy and michael and david and

8
00:01:35,670 --> 00:01:34,240
lisa and ann

9
00:01:36,950 --> 00:01:35,680
we got a lot of work accomplished up

10
00:01:38,310 --> 00:01:36,960
here and we still got a little more and

11
00:01:45,190 --> 00:01:38,320
we're looking forward to coming home

12
00:01:49,990 --> 00:01:46,630
eastern discovery on the big loop for

13
00:01:54,870 --> 00:01:52,870

go ahead discovery for robo

14

00:01:56,630 --> 00:01:54,880

good morning

15

00:02:00,550 --> 00:01:56,640

steph and nelko are up and at them

16

00:02:01,990 --> 00:02:00,560

pretty early and um we're wondering uh

17

00:02:04,709 --> 00:02:02,000

if you're ready

18

00:02:08,710 --> 00:02:04,719

uh we can uh

19

00:02:11,270 --> 00:02:08,720

begin with the uh mplm operations

20

00:02:18,070 --> 00:02:11,280

and discovery houston we have dsets

21

00:02:28,229 --> 00:02:20,470

roadblocks for station discovery uh

22

00:02:31,589 --> 00:02:29,670

teams here on the ground reporting that

23

00:02:34,070 --> 00:02:31,599

the space station's robotic arm is now

24

00:02:36,070 --> 00:02:34,080

in motion getting ready to pack the

25

00:02:37,830 --> 00:02:36,080

leonardo multipurpose logistics module

26
00:02:39,910 --> 00:02:37,840
into the shuttle's cargo bay for return

27
00:02:41,910 --> 00:02:39,920
to earth

28
00:02:44,630 --> 00:02:41,920
arms being controlled from the station's

29
00:02:46,630 --> 00:02:44,640
destiny laboratory robotic workstation

30
00:02:51,030 --> 00:02:46,640
by mission specialist stephanie wilson

31
00:02:56,470 --> 00:02:54,949
getting a leonardo birth then

32
00:02:59,509 --> 00:02:56,480
letting go of it with the station arm

33
00:03:00,869 --> 00:02:59,519
and maneuvering the station arm to a

34
00:03:02,790 --> 00:03:00,879
position that won't get in the way of

35
00:03:04,470 --> 00:03:02,800
the dock late inspection

36
00:03:07,990 --> 00:03:04,480
will take about an hour

37
00:03:11,430 --> 00:03:09,589
and then

38
00:03:13,270 --> 00:03:11,440

wilson will move

39

00:03:14,390 --> 00:03:13,280

straight over to the shuttle's robotic

40

00:03:16,390 --> 00:03:14,400

workstation

41

00:03:18,149 --> 00:03:16,400

where she'll be working with pilot jim

42

00:03:19,990 --> 00:03:18,159

dutton and mission specialist dottie

43

00:03:21,750 --> 00:03:20,000

metcalf lindenberger to begin the

44

00:03:22,630 --> 00:03:21,760

inspection of the shuttle's starboard

45

00:03:36,710 --> 00:03:22,640

wing

46

00:03:44,470 --> 00:03:39,430

the payload is in the bay fully latched

47

00:03:50,390 --> 00:03:47,589

and uh will you proceed for undrafted

48

00:03:53,670 --> 00:03:51,910

stand by where'd you actually do the

49

00:03:54,789 --> 00:03:53,680

kill cam

50

00:03:57,429 --> 00:03:54,799

okay

51
00:03:59,110 --> 00:03:57,439
but the key camera standing by

52
00:04:00,869 --> 00:03:59,120
lindenberger there reporting that

53
00:04:02,390 --> 00:04:00,879
leonardo is now safely inside the

54
00:04:05,350 --> 00:04:02,400
shuttle's cargo bay

55
00:04:07,990 --> 00:04:05,360
the next step will be for the

56
00:04:11,030 --> 00:04:08,000
robotics operators in destiny's

57
00:04:12,869 --> 00:04:11,040
laboratory to let go of the

58
00:04:14,390 --> 00:04:12,879
module so that it can move away and make

59
00:04:16,550 --> 00:04:14,400
way for the next set of erotic

60
00:04:21,349 --> 00:04:16,560
operations scheduled for the day the

61
00:04:25,590 --> 00:04:23,270
staff you've got to go for mplm on

62
00:04:33,670 --> 00:04:25,600
grapple

63
00:04:37,430 --> 00:04:35,430

split screen view here from cameras

64

00:04:39,590 --> 00:04:37,440

aboard the international space station

65

00:04:41,909 --> 00:04:39,600

of the robotics work

66

00:04:43,670 --> 00:04:41,919

preparing to release the leonardo

67

00:04:45,670 --> 00:04:43,680

multipurpose logistics module which you

68

00:04:47,110 --> 00:04:45,680

can see the shuttle station robotic arm

69

00:04:48,710 --> 00:04:47,120

has in the

70

00:04:51,030 --> 00:04:48,720

both of these views and how about

71

00:04:53,430 --> 00:04:51,040

yourself then move the arm out of the

72

00:05:14,469 --> 00:04:53,440

way for the next robotic operation the

73

00:06:59,909 --> 00:05:16,870

space station robotic arm slowly moving

74

00:07:04,070 --> 00:07:01,430

robotics officers here on the ground

75

00:07:05,749 --> 00:07:04,080

report that the space station robotic

76

00:07:07,990 --> 00:07:05,759

arm has reached its

77

00:07:10,230 --> 00:07:08,000

back off point for the work that it's

78

00:07:11,909 --> 00:07:10,240

been doing to get the leonardo module

79

00:07:14,150 --> 00:07:11,919

installed inside the shuttle's cargo bay

80

00:07:17,909 --> 00:07:14,160

that means that portion of its work for

81

00:07:19,749 --> 00:07:17,919

the day is done it just now has to

82

00:07:21,830 --> 00:07:19,759

maneuver into a position that gets sent

83

00:07:24,230 --> 00:07:21,840

well out of the way of the

84

00:07:25,909 --> 00:07:24,240

state the shuttle's robotic arm as that

85

00:07:27,430 --> 00:07:25,919

arm will be performing the late

86

00:07:28,870 --> 00:07:27,440

inspection of the shuttle's heat shield

87

00:07:31,909 --> 00:07:28,880

today

88

00:07:33,670 --> 00:07:31,919

so the leonardo module now back in full

89

00:07:35,589 --> 00:07:33,680

possession of the space shuttle for the

90

00:07:48,070 --> 00:07:35,599

first time since flight day four when it

91

00:08:21,749 --> 00:07:51,589

discovery recording is on

92

00:08:25,430 --> 00:08:24,070

space shuttle discovery here orbiting

93

00:08:27,510 --> 00:08:25,440

along with the international space

94

00:08:29,990 --> 00:08:27,520

station getting a view we don't normally

95

00:08:32,310 --> 00:08:30,000

get to see of the uh inspection of the

96

00:08:34,149 --> 00:08:32,320

shuttle's heat shield

97

00:08:36,870 --> 00:08:34,159

it's being performed before the shuttle

98

00:08:39,110 --> 00:08:36,880

undocks due to the fact that uh the

99

00:08:41,670 --> 00:08:39,120

shuttle's own ku band and tuna

100

00:08:43,110 --> 00:08:41,680

is uh not working this mission so

101
00:08:45,350 --> 00:08:43,120
they're taking advantage of the

102
00:08:46,710 --> 00:08:45,360
station's ku band antenna which allows

103
00:08:49,269 --> 00:08:46,720
them to send large packets of

104
00:08:50,790 --> 00:08:49,279
information down to the ground and also

105
00:08:52,230 --> 00:08:50,800
video

106
00:08:54,630 --> 00:08:52,240
and that's necessary to get the

107
00:08:56,710 --> 00:08:54,640
information from the

108
00:08:58,550 --> 00:08:56,720
heat heat shield inspection down to the

109
00:09:00,710 --> 00:08:58,560
experts on the ground to then study it

110
00:09:03,030 --> 00:09:00,720
for any sign that discovery's heat

111
00:09:08,710 --> 00:09:03,040
shield might have been damaged while

112
00:09:13,829 --> 00:09:10,710
crew is working on the inspection of the

113
00:09:15,509 --> 00:09:13,839

starboard wing at the moment and

114

00:09:18,150 --> 00:09:15,519

commander alan poindexter has been

115

00:09:20,630 --> 00:09:18,160

working simultaneously to get the

116

00:09:25,110 --> 00:09:20,640

video and data files

117

00:09:28,790 --> 00:09:26,470

perform it and

118

00:09:31,190 --> 00:09:28,800

transfer that or convert that rather

119

00:09:33,110 --> 00:09:31,200

into files that can be transferred to

120

00:09:34,470 --> 00:09:33,120

the station

121

00:09:36,630 --> 00:09:34,480

via a

122

00:09:38,630 --> 00:09:36,640

hard affordable hard drive

123

00:10:00,870 --> 00:09:38,640

for downlink to the teams here on the

124

00:10:04,389 --> 00:10:02,630

view there of the orbiter boom sensor

125

00:10:05,910 --> 00:10:04,399

system moving

126
00:10:08,069 --> 00:10:05,920
through the field of view on the end of

127
00:10:09,590 --> 00:10:08,079
the space shuttle robotic arm that's a

128
00:10:11,590 --> 00:10:09,600
50 foot long

129
00:10:14,470 --> 00:10:11,600
extension to the robotic arm that gives

130
00:10:16,550 --> 00:10:14,480
it a 50 foot closer view of the heat

131
00:10:19,509 --> 00:10:16,560
shield that it's surveying

132
00:10:21,829 --> 00:10:19,519
also a suite of sensors on the end for

133
00:10:24,389 --> 00:10:21,839
use in in that survey

134
00:10:26,389 --> 00:10:24,399
those sensors include a laser dynamic

135
00:10:28,710 --> 00:10:26,399
range imager which combat combines an

136
00:10:30,790 --> 00:10:28,720
infrared laser illuminator with an

137
00:10:33,190 --> 00:10:30,800
infrared camera receiver

138
00:10:35,590 --> 00:10:33,200

to provide 3d video views of the heat

139

00:10:38,550 --> 00:10:35,600

shield although in this case uh the team

140

00:10:40,550 --> 00:10:38,560

here on the ground to expedite the

141

00:10:42,550 --> 00:10:40,560

down linking to the ground

142

00:10:44,949 --> 00:10:42,560

through the space station's ku band

143

00:10:47,350 --> 00:10:44,959

antenna they're actually performing that

144

00:10:49,430 --> 00:10:47,360

part of the inspection in 2d

145

00:10:50,710 --> 00:10:49,440

just two dimensional video

146

00:10:52,630 --> 00:10:50,720

that uh

147

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

was the case also for the

148

00:10:56,630 --> 00:10:54,399

flight day 2 inspection of the shuttle's

149

00:11:00,069 --> 00:10:56,640

heat shield and

150

00:11:01,430 --> 00:11:00,079

team here on the ground

151
00:11:04,150 --> 00:11:01,440
reported early in the mission that they

152
00:11:05,829 --> 00:11:04,160
actually had not needed the 3d video

153
00:11:06,949 --> 00:11:05,839
views of the heat shield for the past

154
00:11:08,550 --> 00:11:06,959
few missions so they thought they could

155
00:11:09,269 --> 00:11:08,560
get along without them this time as well

156
00:11:11,750 --> 00:11:09,279
and

157
00:11:15,030 --> 00:11:11,760
that turned out to be the case so uh is

158
00:11:16,710 --> 00:11:15,040
the method being used again today

159
00:11:19,910 --> 00:11:16,720
other sensors on the end of the orbiter

160
00:11:21,750 --> 00:11:19,920
boom sensor system include

161
00:11:23,750 --> 00:11:21,760
an intensified television camera which

162
00:11:25,269 --> 00:11:23,760
provides the same standard video views

163
00:11:28,550 --> 00:11:25,279

that the other cameras on the robotic

164

00:11:30,310 --> 00:11:28,560

arm provide but 50 feet closer and then

165

00:11:32,310 --> 00:11:30,320

there's also the

166

00:11:34,150 --> 00:11:32,320

laser camera system which can generate

167

00:11:36,710 --> 00:11:34,160

3d models of the heat shield that are

168

00:12:53,110 --> 00:11:36,720

accurate to within a few millimeters

169

00:13:01,110 --> 00:12:55,430

here's a discovery on two at the bottom

170

00:13:01,120 --> 00:13:05,990

discovery houston copies

171

00:13:12,470 --> 00:13:07,750

discovery houston air to ground 2 for

172

00:13:15,590 --> 00:13:14,629

i want to just let you you and the crew

173

00:13:18,470 --> 00:13:15,600

know that you guys are doing an

174

00:13:19,269 --> 00:13:18,480

outstanding job working this inspection

175

00:13:21,110 --> 00:13:19,279

and

176

00:13:23,190 --> 00:13:21,120

i want to give you some good news you we

177

00:13:26,389 --> 00:13:23,200

show you guys presently about the two

178

00:13:28,470 --> 00:13:26,399

hours ahead of the schedule and um we

179

00:13:30,069 --> 00:13:28,480

know that you're complete with the nose

180

00:13:31,269 --> 00:13:30,079

cap survey and on your way over to the

181

00:13:33,829 --> 00:13:31,279

port side

182

00:13:35,670 --> 00:13:33,839

so we're gonna let it be your call as to

183

00:13:37,750 --> 00:13:35,680

whether or not you guys want to take a

184

00:13:43,350 --> 00:13:37,760

break at this time or if you want to go

185

00:13:46,310 --> 00:13:44,949

thanks for the offer we'd like to get

186

00:13:48,069 --> 00:13:46,320

get through this and get the data down

187

00:13:51,189 --> 00:13:48,079

to the ground as quickly as we can so

188

00:13:52,710 --> 00:13:51,199

we're all taking breaks periodically and

189

00:13:54,629 --> 00:13:52,720

we're in good shape so we'll continue

190

00:13:56,150 --> 00:13:54,639

with the port survey

191

00:13:58,230 --> 00:13:56,160

okay very good we'll meet you over in

192

00:14:01,990 --> 00:13:58,240

page 48 when you guys get there

193

00:14:07,430 --> 00:14:04,629

and houston discovery for page 51 in the

194

00:14:09,189 --> 00:14:07,440

survey how do you like the view

195

00:14:12,230 --> 00:14:09,199

discover houston we like to view your go

196

00:14:12,240 --> 00:14:17,269

pleasure

197

00:14:22,629 --> 00:14:19,189

and houston discovery for the bottom of

198

00:14:26,629 --> 00:14:22,639

51 recording is on

199

00:14:29,990 --> 00:14:28,310

discovery screw now beginning the port

200

00:14:33,750 --> 00:14:30,000

wing section of their survey of the

201
00:14:38,150 --> 00:14:35,509
this section

202
00:14:40,550 --> 00:14:38,160
being performed by mission specialist

203
00:14:58,629 --> 00:14:40,560
naoka yamazaki and pilot jim dutton as

204
00:15:03,350 --> 00:15:01,590
and discovery houston for the team

205
00:15:05,509 --> 00:15:03,360
just wanted to let you guys know that uh

206
00:15:07,590 --> 00:15:05,519
you're presently about uh three plus

207
00:15:10,389 --> 00:15:07,600
hours ahead of schedule we know you have

208
00:15:12,470 --> 00:15:10,399
a meal coming up but on behalf of the

209
00:15:13,590 --> 00:15:12,480
ground control team here in houston we

210
00:15:15,750 --> 00:15:13,600
want to let you know that or we

211
00:15:17,189 --> 00:15:15,760
certainly sit later sincerely appreciate

212
00:15:19,430 --> 00:15:17,199
all the hard work that you've given us

213
00:15:21,350 --> 00:15:19,440

here today and i've done an outstanding

214

00:15:23,990 --> 00:15:21,360

job and uh

215

00:15:32,949 --> 00:15:24,000

when uh dex has an opportunity if he

216

00:15:37,269 --> 00:15:34,470

hey danny

217

00:15:39,030 --> 00:15:37,279

and please also thank the team they just

218

00:15:40,389 --> 00:15:39,040

did an incredible job by getting us the

219

00:15:43,030 --> 00:15:40,399

procedure early

220

00:15:45,110 --> 00:15:43,040

and for all the people who tv did work

221

00:15:46,710 --> 00:15:45,120

through it and uh helped us to get ready

222

00:15:51,670 --> 00:15:46,720

with the conference yesterday it really

223

00:15:51,680 --> 00:16:28,470

we got y'all

224

00:16:31,910 --> 00:16:29,990

there you see discovery coming into view

225

00:16:36,629 --> 00:16:31,920

the cargo carrier sitting down into its

226
00:16:40,069 --> 00:16:38,150
as the camera spins around you can see

227
00:16:41,030 --> 00:16:40,079
the quest airlock and uh entering into

228
00:16:42,629 --> 00:16:41,040
the uh

229
00:16:45,670 --> 00:16:42,639
russian segment of the station that is

230
00:16:48,230 --> 00:16:45,680
the soyuz tma-17 there on the left that

231
00:17:25,110 --> 00:16:48,240
is the progress 35 there docked with the

232
00:17:28,870 --> 00:17:26,870
that's a progress 35 that is just

233
00:17:31,669 --> 00:17:28,880
exiting to the right of the screen

234
00:17:34,070 --> 00:17:31,679
will be undocked here shortly

235
00:17:35,350 --> 00:17:34,080
additionally the soyuz tma17 will be

236
00:17:36,870 --> 00:17:35,360
relocated

237
00:17:40,150 --> 00:17:36,880
as well in the coming weeks it'll move

238
00:17:41,990 --> 00:17:40,160

over to zvezda after the progress 36

239

00:17:44,390 --> 00:17:42,000

which is currently attached there will

240

00:17:46,950 --> 00:17:44,400

be deorbited as well

241

00:17:50,470 --> 00:17:46,960

once the soyuz team a17 moves off of the

242

00:17:52,549 --> 00:17:50,480

zarya module that will make way for mrm1

243

00:17:54,070 --> 00:17:52,559

which is a new russian segment that's

244

00:17:54,990 --> 00:17:54,080

coming up on the very next shuttle

245

00:17:57,430 --> 00:17:55,000

mission

246

00:18:01,350 --> 00:17:57,440

sts-132 which is currently scheduled for

247

00:18:05,029 --> 00:18:03,430

you can also see the big ammonia tank uh

248

00:18:06,630 --> 00:18:05,039

sitting at the very back of discovery's

249

00:18:08,470 --> 00:18:06,640

payload bay

250

00:18:11,430 --> 00:18:08,480

it's an ammonia tank even though it is

251

00:18:13,270 --> 00:18:11,440

uh considered old and spent still has