1
00:00:00,000 --> 00:00:22,710
I

2
00:00:25,920 --> 00:00:24,509
good morning and welcome to the Johnson

3
00:00:27,870 --> 00:00:25,930
Space Center thank you for joining us

4
00:00:29,849 --> 00:00:27,880
here this morning for the joint

5
00:00:32,819 --> 00:00:29,859
post-fight press conference for the STS

6
00:00:34,350 --> 00:00:32,829
71 and mere 18 crew members now to start

7
00:00:35,910 --> 00:00:34,360
the conference and to introduce the rest

8
00:00:39,360 --> 00:00:35,920
of the crew members is the commander of

9
00:00:42,299 --> 00:00:39,370
STS 71 Navy captain robert goot gibson

10
00:00:43,860 --> 00:00:42,309
hoot Thank You Arlene and welcome to the

11
00:00:46,530 --> 00:00:43,870
post-fight press conference for mere 18

12
00:00:48,329 --> 00:00:46,540
and sto 71 it was a bit of a complex

13
00:00:49,439 --> 00:00:48,339

mission and so I'm sure the debriefing

14
00:00:51,869 --> 00:00:49,449
will be done in a little bit of a

15
00:00:53,970 --> 00:00:51,879
complex way but first let me start off

16
00:00:56,399 --> 00:00:53,980
and introduce the the two crews that we

17
00:00:58,439 --> 00:00:56,409
have here in Houston today seated

18
00:01:02,549 --> 00:00:58,449
immediately to my right our mission

19
00:01:04,140 --> 00:01:02,559
pilot for SDS 71 Charlie Precourt next

20
00:01:06,149 --> 00:01:04,150
to Charlie our payload commander and

21
00:01:10,230 --> 00:01:06,159
mission specialists number one dr. Ellen

22
00:01:12,690 --> 00:01:10,240
Baker next to Ellen our flight engineer

23
00:01:16,649 --> 00:01:12,700
mission specialist number two dr. Greg

24
00:01:19,800 --> 00:01:16,659
Harbaugh seated next to Greg our mission

25
00:01:23,670 --> 00:01:19,810
specialist number three and the mere 18

26
00:01:27,050 --> 00:01:23,680
backup crew member dr. Bonnie Dunbar and

27
00:01:30,450 --> 00:01:27,060
then we have the crew of mere 18

28
00:01:33,720 --> 00:01:30,460
starting with the board engineer mr.

29
00:01:38,520 --> 00:01:33,730
guna district olive the commander of

30
00:01:40,710 --> 00:01:38,530
mere 18 Vladimir does Europe and our

31
00:01:44,399 --> 00:01:40,720
very own cosmonaut researcher aboard

32
00:01:46,530 --> 00:01:44,409
Mary Jane dr. norm thagard and if we

33
00:01:51,270 --> 00:01:46,540
could start right in with the slides the

34
00:01:53,670 --> 00:01:51,280
SDS 71 slides we had a crew patch that

35
00:01:59,070 --> 00:01:53,680
was designed by famous aviation artist

36
00:02:01,590 --> 00:01:59,080
Bob McCall designed the the crew emblem

37
00:02:03,930 --> 00:02:01,600
for the apollo-soyuz docking which of

38
00:02:05,250 --> 00:02:03,940

course took place back in 1975 so it was

39
00:02:07,800 --> 00:02:05,260
a real pleasure for us to have Bob

40
00:02:10,949 --> 00:02:07,810
involved once again with the design of

41
00:02:14,100 --> 00:02:10,959
ours we lift it off three months and

42
00:02:16,020 --> 00:02:14,110
about two weeks after the launch of mere

43
00:02:18,509 --> 00:02:16,030
18 and we're finally on our way after a

44
00:02:19,800 --> 00:02:18,519
lot of a lot of preparations we of

45
00:02:23,070 --> 00:02:19,810
course launched into a ground-up

46
00:02:24,570 --> 00:02:23,080
rendezvous aimed at intercepting and

47
00:02:26,190 --> 00:02:24,580
Rhonda booing with the mirror so we did

48
00:02:29,009 --> 00:02:26,200
a number of rendezvous burns with the

49
00:02:31,830 --> 00:02:29,019
OMB's engines to put us on the right

50
00:02:34,350 --> 00:02:31,840
flight path to to intercept and actually

51
00:02:36,930 --> 00:02:34,360
doc and this is one of those ohms burns

52
00:02:38,580 --> 00:02:36,940
performed in the dark and I think this

53
00:02:40,230 --> 00:02:38,590
was our major height adjust burn that we

54
00:02:44,490 --> 00:02:40,240
did on the first day to raise our orbit

55
00:02:47,550 --> 00:02:44,500
up very close to the mirror here's a

56
00:02:50,490 --> 00:02:47,560
photo of anatolian Nick and a total of

57
00:02:54,110 --> 00:02:50,500
the commander of course of mere 19 who's

58
00:02:56,910 --> 00:02:54,120
now on board and Nick Nikolai boo Darin

59
00:02:58,170 --> 00:02:56,920
the the four Russians actually all four

60
00:03:00,510 --> 00:02:58,180
of them I can't take a for finer

61
00:03:02,580 --> 00:03:00,520
gentleman to represent Russia as well as

62
00:03:04,350 --> 00:03:02,590
for finer friends that we've come to

63
00:03:05,610 --> 00:03:04,360

know them as will really be looking

64
00:03:07,710 --> 00:03:05,620
forward to getting back together with

65
00:03:10,620 --> 00:03:07,720
Anatolian Nick after their landing in

66
00:03:12,420 --> 00:03:10,630
kazakhstan and back in Russia when we

67
00:03:17,160 --> 00:03:12,430
can visit them after their missions over

68
00:03:19,890 --> 00:03:17,170
the in the next month this is a shot of

69
00:03:22,050 --> 00:03:19,900
the activity during rendezvous from the

70
00:03:24,030 --> 00:03:22,060
flight deck you can see Greg working

71
00:03:26,010 --> 00:03:24,040
away with the handheld laser taking

72
00:03:29,400 --> 00:03:26,020
range and range rate marks on the mirror

73
00:03:32,820 --> 00:03:29,410
and in the photo in the lower right-hand

74
00:03:36,210 --> 00:03:32,830
corner operating a hand or laptop

75
00:03:38,220 --> 00:03:36,220
computer to control the trajectory

76
00:03:40,410 --> 00:03:38,230
control system lasers that were also

77
00:03:45,259 --> 00:03:40,420
used from the payload Bay to get that

78
00:03:50,160 --> 00:03:47,699
Greg and Charlie and hoot we're

79
00:03:52,710 --> 00:03:50,170
operating the a flight deck I was up in

80
00:03:55,140 --> 00:03:52,720
the front with the VHF radio and and my

81
00:03:57,600 --> 00:03:55,150
job was to conduct communications with a

82
00:04:00,390 --> 00:03:57,610
mirror we were able to make contact on

83
00:04:03,330 --> 00:04:00,400
time and then to exchange various calls

84
00:04:05,430 --> 00:04:03,340
on distance range rate and one

85
00:04:07,440 --> 00:04:05,440
particularly important call at 55 feet

86
00:04:09,960 --> 00:04:07,450
when I called out our range at 55 feet

87
00:04:12,360 --> 00:04:09,970
so that the mere could desaturate their

88
00:04:17,219 --> 00:04:12,370

gyre dines and then disable their

89
00:04:19,409 --> 00:04:17,229
attitude control we had a very

90
00:04:21,840 --> 00:04:19,419
spectacular view of the MIR space

91
00:04:24,800 --> 00:04:21,850
station as we were closing in gradually

92
00:04:27,900 --> 00:04:24,810
decreasing the range on flight day three

93
00:04:29,219 --> 00:04:27,910
leading into the rendezvous that's an

94
00:04:30,840 --> 00:04:29,229
early shot of it here's a little bit

95
00:04:32,550 --> 00:04:30,850
later shot after the mirror has

96
00:04:34,140 --> 00:04:32,560
maneuvered to attitude and feathered the

97
00:04:36,810 --> 00:04:34,150
solar arrays getting ready for us to

98
00:04:41,640 --> 00:04:39,030
this kind of an interesting view and the

99
00:04:44,610 --> 00:04:41,650
lower viewport there is Volodya taking

100
00:04:46,830 --> 00:04:44,620
that video of us approaching and then

101
00:04:50,400 --> 00:04:46,840
the smaller upper window is norm with

102
00:04:52,200 --> 00:04:50,410
another camera I guess it was around

103
00:04:54,210 --> 00:04:52,210
this point where who was thinking about

104
00:04:58,380 --> 00:04:54,220
maybe negotiating a price for the final

105
00:05:01,080 --> 00:04:58,390
closure and then this is a view from the

106
00:05:02,670 --> 00:05:01,090
app flight deck showing the hard mate

107
00:05:04,800 --> 00:05:02,680
what it looked like cut the window and

108
00:05:07,530 --> 00:05:04,810
this picture doesn't do it justice in

109
00:05:08,940 --> 00:05:07,540
the sense that that whole big space

110
00:05:13,680 --> 00:05:08,950
station was just right outside that

111
00:05:15,780 --> 00:05:13,690
window it was real close by you may have

112
00:05:17,040 --> 00:05:15,790
seen and we're about to show a video in

113
00:05:21,180 --> 00:05:17,050

just a minute that will show a lot of

114
00:05:23,580 --> 00:05:21,190
this we got to recreate an event that

115
00:05:26,700 --> 00:05:23,590
took place 20 years ago almost of the

116
00:05:29,670 --> 00:05:26,710
day the handshake between Tom Stafford

117
00:05:31,110 --> 00:05:29,680
and Alexei Leonov in the public soyuz

118
00:05:34,820 --> 00:05:31,120
docking and of course we were able to

119
00:05:37,560 --> 00:05:34,830
recreate this on flight day 3 of STS 71

120
00:05:39,480 --> 00:05:37,570
the earlier slide should be a view out

121
00:05:41,910 --> 00:05:39,490
the eft window this one gets a little

122
00:05:44,700 --> 00:05:41,920
bit of three out of the four windows the

123
00:05:46,590 --> 00:05:44,710
mirror of course is huge and just filled

124
00:05:53,580 --> 00:05:46,600
up their view as we looked at the flight

125
00:05:54,930 --> 00:05:53,590
deck so we took a couple different

126
00:05:56,580 --> 00:05:54,940
camera angles with a few different

127
00:05:59,370 --> 00:05:56,590
lenses but I'll tell you none of them

128
00:06:01,740 --> 00:05:59,380
really can convey what it did look like

129
00:06:06,840 --> 00:06:01,750
you could just catch little clips of it

130
00:06:09,180 --> 00:06:06,850
with the camera we also said about

131
00:06:11,280 --> 00:06:09,190
trying to get some different views of

132
00:06:13,200 --> 00:06:11,290
the orbiter than what you normally see

133
00:06:15,690 --> 00:06:13,210
you this is a picture that i took out of

134
00:06:18,300 --> 00:06:15,700
the k'vin to mod you lata that large

135
00:06:24,470 --> 00:06:18,310
viewport that veligit been taking the

136
00:06:28,590 --> 00:06:24,480
movies from earlier and this view is

137
00:06:32,370 --> 00:06:28,600
over the Crimea and the Dnieper River is

138
00:06:41,130 --> 00:06:37,200

and then here's a shot of hoot that we

139
00:06:42,810 --> 00:06:41,140
took also from the same window nice

140
00:06:47,850 --> 00:06:42,820
close-up he could see he's got a big

141
00:06:49,980 --> 00:06:47,860
smile on his face sir this is a view of

142
00:06:52,170 --> 00:06:49,990
the orbiter tale of course in the top of

143
00:06:54,060 --> 00:06:52,180
the pictures starburst view of the Sun

144
00:06:57,020 --> 00:06:54,070
gleaming through some of the equipment

145
00:07:00,300 --> 00:06:57,030
you see the dark docking targets they're

146
00:07:02,610 --> 00:07:00,310
located on the MIR structure and this is

147
00:07:05,430 --> 00:07:02,620
from a port in the crystal module as you

148
00:07:07,530 --> 00:07:05,440
transfer immediately leaving the ods or

149
00:07:09,360 --> 00:07:07,540
the orbiter docking system headed into

150
00:07:10,680 --> 00:07:09,370
the mirror as you float by there you

151
00:07:12,840 --> 00:07:10,690
have this porthole that gives you this

152
00:07:14,400 --> 00:07:12,850
view and every time you float by there

153
00:07:17,970 --> 00:07:14,410
you think yourself you just got to

154
00:07:19,560 --> 00:07:17,980
capture this photo some Helen it the

155
00:07:21,030 --> 00:07:19,570
colors are so brilliant and the size of

156
00:07:23,220 --> 00:07:21,040
the vehicle is so impressive sitting

157
00:07:28,350 --> 00:07:23,230
there right next to you that it's a

158
00:07:30,630 --> 00:07:28,360
really inspiring view and on the inside

159
00:07:33,570 --> 00:07:30,640
coming from where I took the picture

160
00:07:35,460 --> 00:07:33,580
forward towards the module the base

161
00:07:37,800 --> 00:07:35,470
block part of the module this is in the

162
00:07:40,800 --> 00:07:37,810
crystal and it gives you a great

163
00:07:42,960 --> 00:07:40,810

perspective on how Titus squeeze it was

164
00:07:44,700 --> 00:07:42,970
to get through from the orbiter into the

165
00:07:47,340 --> 00:07:44,710
crystal and a lot of the equipment

166
00:07:52,700 --> 00:07:47,350
that's located in the modules as we head

167
00:07:56,690 --> 00:07:52,710
towards the base block well immediately

168
00:07:58,860 --> 00:07:56,700
after opening the hatch we exchanged

169
00:08:01,110 --> 00:07:58,870
positions and various modules this

170
00:08:03,600 --> 00:08:01,120
happens to be after one of the

171
00:08:05,340 --> 00:08:03,610
ceremonies in which we presented Anatoly

172
00:08:06,540 --> 00:08:05,350
with his houston's rockets shared it was

173
00:08:09,150 --> 00:08:06,550
a little hard for him to I think to

174
00:08:11,820 --> 00:08:09,160
remove it this is in the base block and

175
00:08:15,180 --> 00:08:11,830
it's in front of the table I had to

176
00:08:17,700 --> 00:08:15,190
mention that Anatoly became a fan in

177
00:08:19,920 --> 00:08:17,710
Russia one Sunday there was a houston

178
00:08:22,470 --> 00:08:19,930
rockets game broadcast over to russia

179
00:08:23,970 --> 00:08:22,480
they won by one point we were in class

180
00:08:28,450 --> 00:08:23,980
the next day and all he could talk about

181
00:08:32,960 --> 00:08:31,160
and of course that immediately after

182
00:08:35,659 --> 00:08:32,970
opening the hatch it was like coming to

183
00:08:37,760 --> 00:08:35,669
the home of a bold friends because the

184
00:08:40,700 --> 00:08:37,770
mere 18 crew invited us into the base

185
00:08:43,130 --> 00:08:40,710
block and I got to say hi to the people

186
00:08:45,320 --> 00:08:43,140
we'd watch launched in march and it was

187
00:08:51,680 --> 00:08:45,330
a real nice experience to be greeted by

188
00:08:54,790 --> 00:08:51,690

a Gennady well we had a lot to do of

189
00:08:57,710 --> 00:08:54,800
course once the ships were connected and

190
00:09:00,410 --> 00:08:57,720
part of their main objective was to

191
00:09:03,410 --> 00:09:00,420
gather some physiologic data on norm and

192
00:09:05,270 --> 00:09:03,420
naughty and Volodya after their three

193
00:09:07,250 --> 00:09:05,280
months stay and so we got busy in the

194
00:09:10,040 --> 00:09:07,260
lab right away in fact we got the lab up

195
00:09:12,320 --> 00:09:10,050
and running prior to docking and the day

196
00:09:20,690 --> 00:09:12,330
after docking got busy with a lot of our

197
00:09:23,530 --> 00:09:20,700
activities in this photo i'm working

198
00:09:25,730 --> 00:09:23,540
with gennady on the barrel experiment

199
00:09:26,990 --> 00:09:25,740
will be a lot of discussion has been a

200
00:09:28,610 --> 00:09:27,000
lot of discussion about the various

201
00:09:30,830 --> 00:09:28,620
physiological experiments that we've

202
00:09:32,570 --> 00:09:30,840
conducted but the baroreceptors of the

203
00:09:34,310 --> 00:09:32,580
neck are partially responsible for

204
00:09:36,500 --> 00:09:34,320
making sure that you keep blood in your

205
00:09:38,240 --> 00:09:36,510
head when you stand up very rapidly or

206
00:09:40,220 --> 00:09:38,250
for people who come back from long space

207
00:09:42,710 --> 00:09:40,230
flights are able to walk around it's

208
00:09:44,210 --> 00:09:42,720
involved in cardiovascular system it's

209
00:09:45,920 --> 00:09:44,220
an experiment that's flown before on

210
00:09:48,470 --> 00:09:45,930
space and life science of space lab

211
00:09:50,600 --> 00:09:48,480
flights and gennady what Gennady was not

212
00:09:52,070 --> 00:09:50,610
only a real trouper when it came to

213
00:09:53,720 --> 00:09:52,080

taking the measurements he was really an

214
00:09:59,090 --> 00:09:53,730
active participant and making sure we

215
00:10:01,130 --> 00:09:59,100
got good data as well and there was a

216
00:10:03,740 --> 00:10:01,140
bit of transition for the mere 18 crew

217
00:10:06,380 --> 00:10:03,750
to transition to be STS 71 crew members

218
00:10:08,690 --> 00:10:06,390
so I had to go rope the loggia into

219
00:10:11,300 --> 00:10:08,700
getting into the lab occasionally he had

220
00:10:13,430 --> 00:10:11,310
a lot to do in the mirror to to get

221
00:10:15,200 --> 00:10:13,440
ready for his departure and we of course

222
00:10:15,900 --> 00:10:15,210
had a lot going on in the spacelab

223
00:10:19,620 --> 00:10:15,910
getting

224
00:10:22,410 --> 00:10:19,630
for our return one of our big activities

225
00:10:24,630 --> 00:10:22,420
during the duckface for those of us who

226
00:10:28,230 --> 00:10:24,640
were not doctors or scientists was

227
00:10:31,320 --> 00:10:28,240
transferring equipment and here I'm

228
00:10:34,110 --> 00:10:31,330
filling a water tank we actually

229
00:10:36,180 --> 00:10:34,120
transferred roughly two and a half times

230
00:10:39,690 --> 00:10:36,190
the amount of water that was originally

231
00:10:43,110 --> 00:10:39,700
targeted and we transferred from the

232
00:10:45,300 --> 00:10:43,120
orbiter to mirror I think 250 pieces of

233
00:10:49,260 --> 00:10:45,310
hardware and returned 200 pieces of

234
00:10:51,960 --> 00:10:49,270
hardware with a success rate of about

235
00:10:53,910 --> 00:10:51,970
ninety nine percent there were just a

236
00:10:56,040 --> 00:10:53,920
couple of things that evidently were not

237
00:10:57,390 --> 00:10:56,050
accounted for who actually came back

238
00:11:00,600 --> 00:10:57,400

with a couple things we didn't plan on

239
00:11:05,250 --> 00:11:00,610
coming back for silly we did better than

240
00:11:07,170 --> 00:11:05,260
one hundred percent all told this is a

241
00:11:09,530 --> 00:11:07,180
photo taken from inside the Soyuz

242
00:11:11,580 --> 00:11:09,540
descent module while we were doing a

243
00:11:13,590 --> 00:11:11,590
communications check out the day prior

244
00:11:14,910 --> 00:11:13,600
done docking I had the distinct

245
00:11:16,530 --> 00:11:14,920
privilege of being able to climb in

246
00:11:18,840 --> 00:11:16,540
there with anatolian Nick well we did

247
00:11:21,060 --> 00:11:18,850
this check out and snapped this photo

248
00:11:22,860 --> 00:11:21,070
while we were talking through the real a

249
00:11:25,470 --> 00:11:22,870
communication system with Houston and

250
00:11:27,240 --> 00:11:25,480
with Moscow was a real enchanted moment

251
00:11:30,660 --> 00:11:27,250
for me and here's Nick with his two

252
00:11:32,130 --> 00:11:30,670
buddies getting ready for the the next

253
00:11:34,740 --> 00:11:32,140
day's activities they were doing suit

254
00:11:38,310 --> 00:11:34,750
checkouts of course to prepare for the

255
00:11:41,120 --> 00:11:38,320
Soyuz on Duncan one of the cornerstones

256
00:11:43,590 --> 00:11:41,130
of this program from the very start with

257
00:11:46,200 --> 00:11:43,600
adaptability and flexibility both on the

258
00:11:48,150 --> 00:11:46,210
ground and in flight and this is the

259
00:11:54,060 --> 00:11:48,160
small update to the undock procedure we

260
00:12:02,760 --> 00:11:57,710
and here's a shot this was taken of

261
00:12:06,540 --> 00:12:02,770
Anatole and Nikolai just before closing

262
00:12:08,250 --> 00:12:06,550
the hatch prior to prior to undocking

263
00:12:10,620 --> 00:12:08,260

the night before undocking and this was

264
00:12:12,180 --> 00:12:10,630
our our last chance to shake their hands

265
00:12:16,920 --> 00:12:12,190
and tell them farewell until we get to

266
00:12:19,950 --> 00:12:16,930
see them again when they come back this

267
00:12:22,440 --> 00:12:19,960
is a shot of the Soyuz after and had

268
00:12:25,230 --> 00:12:22,450
undocked and prior to our undocking

269
00:12:27,000 --> 00:12:25,240
actually during it Nikolai was up in a

270
00:12:29,760 --> 00:12:27,010
window in the front called the blister

271
00:12:33,240 --> 00:12:29,770
taking pictures of video of our

272
00:12:36,750 --> 00:12:33,250
undocking we could see the whole soy use

273
00:12:41,940 --> 00:12:36,760
out the commander's window on the port

274
00:12:44,490 --> 00:12:41,950
side of the shuttle was a busy time the

275
00:12:46,800 --> 00:12:44,500
docking undocking and fly around time we

276
00:12:49,800 --> 00:12:46,810
were lucky that we could get the camera

277
00:12:51,300 --> 00:12:49,810
out the window every now and then we

278
00:12:53,460 --> 00:12:51,310
intended to take a lot more pictures

279
00:12:55,200 --> 00:12:53,470
than we did but it was just so busy on

280
00:12:57,180 --> 00:12:55,210
the flight deck doing the real work that

281
00:13:01,710 --> 00:12:57,190
we didn't have the opportunities that we

282
00:13:04,920 --> 00:13:01,720
thought we would prior to flight and as

283
00:13:07,890 --> 00:13:04,930
we left the Soyuz you can see it in the

284
00:13:10,320 --> 00:13:07,900
horizon eventually receded into darkness

285
00:13:14,940 --> 00:13:10,330
and became a star which we saw for

286
00:13:21,390 --> 00:13:19,680
and of course as Bonnie said we once the

287
00:13:23,730 --> 00:13:21,400
fly around was done in the separation

288
00:13:25,980 --> 00:13:23,740

was done it sort of disappeared into the

289
00:13:28,050 --> 00:13:25,990
distance and we could kick catch a

290
00:13:31,020 --> 00:13:28,060
glimpse of it on some of the night

291
00:13:33,150 --> 00:13:31,030
passes it was hard saying goodbye to our

292
00:13:37,050 --> 00:13:33,160
friends and we do look forward to seeing

293
00:13:39,960 --> 00:13:37,060
them again we did get a few shots not

294
00:13:41,670 --> 00:13:39,970
many of for Earth Observation this shot

295
00:13:44,310 --> 00:13:41,680
actually it's the coast of California

296
00:13:46,530 --> 00:13:44,320
gives a look at the weather stopping at

297
00:13:49,580 --> 00:13:46,540
the coast and some of the topography and

298
00:13:52,110 --> 00:13:49,590
in some of the fault lines in that area

299
00:13:53,520 --> 00:13:52,120
we shot a couple of interesting photos

300
00:13:54,960 --> 00:13:53,530
like like Bonnie said we didn't get a

301
00:13:56,940 --> 00:13:54,970
lot of time to look at the earth but

302
00:13:59,910 --> 00:13:56,950
this was one of the shots and once in a

303
00:14:02,130 --> 00:13:59,920
while over cold water over the ocean

304
00:14:04,260 --> 00:14:02,140
you'll have cold water clouds above them

305
00:14:05,910 --> 00:14:04,270
and when a ship goes through underneath

306
00:14:07,380 --> 00:14:05,920
it will precipitate a change in the

307
00:14:09,360 --> 00:14:07,390
clouds and you're able to see a ship

308
00:14:11,010 --> 00:14:09,370
wake reflected in the actual clouds up

309
00:14:14,910 --> 00:14:11,020
over the water and that's what we see in

310
00:14:17,580 --> 00:14:14,920
this picture here had some nice passes

311
00:14:20,540 --> 00:14:17,590
over South America this is a pass over

312
00:14:24,769 --> 00:14:23,329
my crewmates reluctantly reluctantly

313
00:14:27,170 --> 00:14:24,779

allowed me to put this photo in here

314
00:14:29,600 --> 00:14:27,180
since i'm from this area it's one of the

315
00:14:31,100 --> 00:14:29,610
more recognizable features of land on

316
00:14:32,930 --> 00:14:31,110
the planet at least for those who are

317
00:14:35,180 --> 00:14:32,940
from there you can see clearly Boston

318
00:14:37,670 --> 00:14:35,190
Cape Cod at the bottom of the picture

319
00:14:39,920 --> 00:14:37,680
Martha's Vineyard my hometown is up

320
00:14:41,780 --> 00:14:39,930
under the clouds that are in the upper

321
00:14:43,699 --> 00:14:41,790
left corner there Hudson Massachusetts

322
00:14:48,610 --> 00:14:43,709
thanks to my crewmates were let me share

323
00:14:51,170 --> 00:14:48,620
that with you it's always cloudy person

324
00:14:53,360 --> 00:14:51,180
as you probably saw we came back and

325
00:14:57,440 --> 00:14:53,370
landed at the end of a of a 10-day

326
00:15:00,050 --> 00:14:57,450
mission and for the first time in space

327
00:15:01,720 --> 00:15:00,060
we had together a 10-person crew and so

328
00:15:05,389 --> 00:15:01,730
we were able to make one of the largest

329
00:15:07,790 --> 00:15:05,399
starburst pictures on orbit that anyone

330
00:15:10,280 --> 00:15:07,800
has ever has ever been able to put

331
00:15:13,130 --> 00:15:10,290
together we had an 11th person taking

332
00:15:15,500 --> 00:15:13,140
the photo for us here with that why

333
00:15:17,480 --> 00:15:15,510
don't we move right into the video we've

334
00:15:22,280 --> 00:15:17,490
put together a film clip of the

335
00:15:26,139 --> 00:15:22,290
activities of SDS 71 and again the the

336
00:15:30,290 --> 00:15:26,149
crew emblem designed by by Bob McCall

337
00:15:32,329 --> 00:15:30,300
the breakfast in this case was a lunch

338
00:15:34,400 --> 00:15:32,339

and of course the crew members again the

339
00:15:37,910 --> 00:15:34,410
pilot Charlie Precourt Nikolai butiran

340
00:15:41,810 --> 00:15:37,920
who's aboard the MIR still the mere 19

341
00:15:45,590 --> 00:15:41,820
commander anatoly solovyev boot gibson

342
00:15:47,700 --> 00:15:45,600
of course our payload commander Ellen

343
00:15:51,680 --> 00:15:47,710
Baker

344
00:15:55,380 --> 00:15:51,690
and dr. Bonnie Dunbar and Greg Harbaugh

345
00:15:57,090 --> 00:15:55,390
we walked out at early afternoon this

346
00:15:58,910 --> 00:15:57,100
was a whole lot nicer day to be walking

347
00:16:01,620 --> 00:15:58,920
out to the orbiter than the previous

348
00:16:03,240 --> 00:16:01,630
attempt had been when they had to

349
00:16:04,860 --> 00:16:03,250
actually put the crew van under the

350
00:16:08,010 --> 00:16:04,870
awning because the rain was coming down

351
00:16:10,100 --> 00:16:08,020
too hard and so we had to make a quick

352
00:16:12,810 --> 00:16:10,110
ingress into the end of the vehicle

353
00:16:15,420 --> 00:16:12,820
there's a good shot of hoot when we

354
00:16:17,610 --> 00:16:15,430
finally got to go for launch two minutes

355
00:16:20,820 --> 00:16:17,620
visors down pseudo to on and have a good

356
00:16:22,590 --> 00:16:20,830
flight we were off and running most

357
00:16:24,600 --> 00:16:22,600
folks maybe don't realize that

358
00:16:27,420 --> 00:16:24,610
rendezvous started right here we had a

359
00:16:29,280 --> 00:16:27,430
five minute launch window and we had to

360
00:16:31,980 --> 00:16:29,290
wait for the moment in time when Mears

361
00:16:34,080 --> 00:16:31,990
orbit was right directly overhead of us

362
00:16:38,250 --> 00:16:34,090
and we could insert ourselves into the

363
00:16:40,590 --> 00:16:38,260

same plane that they were in and we hit

364
00:16:44,010 --> 00:16:40,600
that right on time on this particular

365
00:16:47,430 --> 00:16:44,020
day the weather cooperated and it was a

366
00:16:51,360 --> 00:16:47,440
magnificent launch Anatoly and Nick were

367
00:16:52,800 --> 00:16:51,370
very impressed with the vehicle and we

368
00:16:58,380 --> 00:16:52,810
were off and running with a great start

369
00:17:00,090 --> 00:16:58,390
here ok once we got on orbit we had an

370
00:17:02,220 --> 00:17:00,100
awful lot of work to do to get ready for

371
00:17:04,290 --> 00:17:02,230
the rendezvous we opened the payload bay

372
00:17:07,430 --> 00:17:04,300
doors you can see the docking mechanism

373
00:17:11,220 --> 00:17:07,440
sitting there with the six black dots on

374
00:17:13,800 --> 00:17:11,230
the forward end of it we had just a

375
00:17:15,690 --> 00:17:13,810
tremendous amount of activity at the end

376
00:17:18,320 --> 00:17:15,700
of flight day one and then all a flight

377
00:17:21,300 --> 00:17:18,330
day to getting our computers ready to go

378
00:17:24,660 --> 00:17:21,310
getting a rendezvous tools set up we had

379
00:17:27,210 --> 00:17:24,670
one or two unexpected events including

380
00:17:28,950 --> 00:17:27,220
the little work that had to be done on

381
00:17:32,160 --> 00:17:28,960
the handheld laser but we got ready to

382
00:17:35,310 --> 00:17:32,170
go on time we flew an intercept on the

383
00:17:37,380 --> 00:17:35,320
mirror that had us pick up the radius

384
00:17:39,480 --> 00:17:37,390
vector or essentially come in right

385
00:17:42,090 --> 00:17:39,490
underneath the mirror and fly up below

386
00:17:44,550 --> 00:17:42,100
them all the way into docking this was a

387
00:17:46,400 --> 00:17:44,560
pretty intensive period as Bonnie and

388
00:17:50,280 --> 00:17:46,410

Greg have alluded to on the flight deck

389
00:17:52,230 --> 00:17:50,290
with the the three of us flying and

390
00:17:54,420 --> 00:17:52,240
everyone else helping as we come in this

391
00:17:56,970 --> 00:17:54,430
is a shot that you saw earlier from the

392
00:17:59,490 --> 00:17:56,980
from the mirror of the orbiter over the

393
00:18:00,060 --> 00:17:59,500
Red Sea we had a very narrow corridor

394
00:18:02,880 --> 00:18:00,070
that we had

395
00:18:05,160 --> 00:18:02,890
intercept and fly up so as not to

396
00:18:07,380 --> 00:18:05,170
disturb any of the solar arrays on the

397
00:18:09,810 --> 00:18:07,390
mirror with our plumes and as we got

398
00:18:11,700 --> 00:18:09,820
into about 500 feet or so the mirror

399
00:18:15,120 --> 00:18:11,710
started its maneuver to the final

400
00:18:17,280 --> 00:18:15,130
attitude for docking and as it did that

401
00:18:20,430 --> 00:18:17,290
we were able to start locking on with

402
00:18:21,600 --> 00:18:20,440
the TCS laser system because on the end

403
00:18:23,370 --> 00:18:21,610
of the docking module where the

404
00:18:25,560 --> 00:18:23,380
reflectors at that system could lock

405
00:18:27,420 --> 00:18:25,570
onto so I'm coordinating that activity

406
00:18:30,330 --> 00:18:27,430
here with the ground controllers and

407
00:18:32,010 --> 00:18:30,340
you'll see a shot here briefly of that

408
00:18:33,960 --> 00:18:32,020
final maneuver you can see the docking

409
00:18:36,360 --> 00:18:33,970
node in the center they're starting to

410
00:18:38,070 --> 00:18:36,370
come more in alignment with our axis and

411
00:18:39,630 --> 00:18:38,080
you can also see them the relative

412
00:18:44,190 --> 00:18:39,640
motion of the solar arrays in this

413
00:18:45,930 --> 00:18:44,200

particular view and we were pretty much

414
00:18:47,310 --> 00:18:45,940
at the end of this event when the mirror

415
00:18:50,970 --> 00:18:47,320
was in attitude we were ready to go on

416
00:18:53,910 --> 00:18:50,980
with it been diluted it was a very busy

417
00:18:55,920 --> 00:18:53,920
time we had to again several calls going

418
00:18:58,710 --> 00:18:55,930
back and forth between the mirin and the

419
00:19:02,160 --> 00:18:58,720
shuttle is docking occurred we brought a

420
00:19:04,650 --> 00:19:02,170
little bit of video from the american

421
00:19:07,050 --> 00:19:04,660
crew on that sequence as you may recall

422
00:19:08,820 --> 00:19:07,060
we moved into 30 feet and held for five

423
00:19:12,150 --> 00:19:08,830
minutes waiting for the timing to get

424
00:19:14,610 --> 00:19:12,160
exactly right it was our objective in

425
00:19:16,800 --> 00:19:14,620
the course of the rendezvous not to have

426
00:19:19,680 --> 00:19:16,810
to fire any breaking pulses towards the

427
00:19:21,780 --> 00:19:19,690
mirror and we were able to work the the

428
00:19:23,400 --> 00:19:21,790
timeliness the closure rates and the

429
00:19:25,320 --> 00:19:23,410
distance is such that that worked out

430
00:19:27,630 --> 00:19:25,330
just fine we're able to utilize natural

431
00:19:29,340 --> 00:19:27,640
orbital breaking to bring us all the way

432
00:19:31,770 --> 00:19:29,350
into docking and never did have to fire

433
00:19:33,420 --> 00:19:31,780
a breaking pulse all the way in this is

434
00:19:36,690 --> 00:19:33,430
the actual moment of docking as seen

435
00:19:38,520 --> 00:19:36,700
from the aft flight deck from the one of

436
00:19:42,150 --> 00:19:38,530
the payload bay cameras looking out and

437
00:19:43,830 --> 00:19:42,160
this is a shot that came down to the

438
00:19:45,720 --> 00:19:43,840

ground that showed both the centerline

439
00:19:48,360 --> 00:19:45,730
camera view as well as the view out the

440
00:19:50,100 --> 00:19:48,370
out the a flight deck as you probably

441
00:19:53,910 --> 00:19:50,110
recall we had a very tight window on the

442
00:19:55,890 --> 00:19:53,920
actual ducking well this was the hard

443
00:19:58,260 --> 00:19:55,900
part we had six people with cameras on

444
00:19:59,760 --> 00:19:58,270
one side of the hatch and two people

445
00:20:01,770 --> 00:19:59,770
with cameras on the other side of the

446
00:20:03,880 --> 00:20:01,780
hatch and of course everybody wanted to

447
00:20:06,190 --> 00:20:03,890
get a good picture

448
00:20:10,170 --> 00:20:06,200
we had a variety of different cameras

449
00:20:13,480 --> 00:20:10,180
stills videos imax you name it we had it

450
00:20:14,920 --> 00:20:13,490
we didn't want to miss the hatch opening

451
00:20:16,960 --> 00:20:14,930
in the handshake and you'll see we're

452
00:20:20,290 --> 00:20:16,970
flashing lights in each other's faces

453
00:20:21,550 --> 00:20:20,300
here but it was an awfully exciting time

454
00:20:25,090 --> 00:20:21,560
and we just couldn't wait to get that

455
00:20:27,460 --> 00:20:25,100
hatch open and and greet our Comment we

456
00:20:30,100 --> 00:20:27,470
had been training and preparing for this

457
00:20:32,920 --> 00:20:30,110
moment for so long over the preceding

458
00:20:36,160 --> 00:20:32,930
year working together with the mere 18

459
00:20:37,930 --> 00:20:36,170
in the mere 19 crews when the actual

460
00:20:39,820 --> 00:20:37,940
moment came we found ourselves looking

461
00:20:41,350 --> 00:20:39,830
around and saying are we really here and

462
00:20:56,390 --> 00:20:41,360
if we really have we really made this

463
00:21:01,430 --> 00:20:58,910

we had just a very brief greeting in a

464
00:21:03,950 --> 00:21:01,440
very brief ceremony if you will at the

465
00:21:06,470 --> 00:21:03,960
actual hatch and of course this was the

466
00:21:09,440 --> 00:21:06,480
first time that we had seen norm and

467
00:21:11,510 --> 00:21:09,450
Volusia and gennady i guess in the

468
00:21:14,870 --> 00:21:11,520
previous what eight months i guess it

469
00:21:18,970 --> 00:21:14,880
had been since we had seen and the

470
00:21:22,130 --> 00:21:18,980
course going a little that a plan we had

471
00:21:23,750 --> 00:21:22,140
we had a plan prior to this and first

472
00:21:30,050 --> 00:21:23,760
thing we did was take that plan i'm toss

473
00:21:32,600 --> 00:21:30,060
it and we all lined up and and went into

474
00:21:34,310 --> 00:21:32,610
the mirror at that time all all ten of

475
00:21:38,360 --> 00:21:34,320
us i guess we're in there at that time

476
00:21:40,700 --> 00:21:38,370
and i kept the camera running as we went

477
00:21:42,460 --> 00:21:40,710
through the crystal module and arrived

478
00:21:51,170 --> 00:21:42,470
in the base block where we did our

479
00:21:55,970 --> 00:21:53,840
so there we were all accumulating

480
00:21:59,840 --> 00:21:55,980
ourselves in the base block or the core

481
00:22:03,950 --> 00:21:59,850
module obviously elated really happy to

482
00:22:07,340 --> 00:22:03,960
see Gennady and Volodya and norm and

483
00:22:08,960 --> 00:22:07,350
they were I think happy to see us I

484
00:22:11,120 --> 00:22:08,970
think it's the first time there have

485
00:22:15,830 --> 00:22:11,130
been ten human beings in one spacecraft

486
00:22:18,770 --> 00:22:15,840
and to commemorate the occasion Bonnie

487
00:22:23,870 --> 00:22:18,780
put a STS 71 crew patch up in one of

488
00:22:26,210 --> 00:22:23,880

their come pieces of equipment the

489
00:22:29,000 --> 00:22:26,220
following day then we congregated back

490
00:22:31,310 --> 00:22:29,010
in the space lab and we performed a gift

491
00:22:34,220 --> 00:22:31,320
exchange and we also made it a model of

492
00:22:43,950 --> 00:22:34,230
the MIR space station with the Space

493
00:22:49,090 --> 00:22:46,390
there's also a tour of the space shuttle

494
00:22:51,610 --> 00:22:49,100
that was conducted for Russian audiences

495
00:22:53,560 --> 00:22:51,620
norm did this and in these sequences

496
00:22:56,020 --> 00:22:53,570
he's taking Gennady around the shuttle

497
00:22:58,120 --> 00:22:56,030
and he later narrate this for a Russian

498
00:23:00,370 --> 00:22:58,130
audience first in the commander's seat

499
00:23:02,920 --> 00:23:00,380
and now back in the a flight deck where

500
00:23:07,450 --> 00:23:02,930
charlie is showing him the controls for

501
00:23:09,580 --> 00:23:07,460
the docking adaptor once we got all the

502
00:23:11,200 --> 00:23:09,590
PA o events out of the way we could get

503
00:23:14,500 --> 00:23:11,210
to work on some of the science

504
00:23:17,080 --> 00:23:14,510
objectives of the of the flight and the

505
00:23:19,150 --> 00:23:17,090
day after docking we did start on some

506
00:23:21,700 --> 00:23:19,160
of the experiments we had a small series

507
00:23:23,710 --> 00:23:21,710
of experiments to do on this flight that

508
00:23:28,570 --> 00:23:23,720
looked primarily at the cardiovascular

509
00:23:30,340 --> 00:23:28,580
system exercise fitness endurance those

510
00:23:33,310 --> 00:23:30,350
sorts of things and also some metabolic

511
00:23:35,500 --> 00:23:33,320
studies to look at biochemical hormonal

512
00:23:38,520 --> 00:23:35,510
changes in the blood changes in the

513
00:23:41,280 --> 00:23:38,530

blood chemistry things like that and

514
00:23:43,510 --> 00:23:41,290
Bonnie and I orchestrated most of this

515
00:23:46,360 --> 00:23:43,520
couldn't have done it obviously without

516
00:23:49,450 --> 00:23:46,370
our subjects participation in full

517
00:23:52,060 --> 00:23:49,460
cooperation and it was a pretty long day

518
00:23:54,160 --> 00:23:52,070
as Ellen mentioned we had had rehearsed

519
00:23:55,960 --> 00:23:54,170
this before and with our payload

520
00:23:58,120 --> 00:23:55,970
operations control center down here on

521
00:24:01,930 --> 00:23:58,130
the ground the POC I'd all went as

522
00:24:04,240 --> 00:24:01,940
planned as was previously performed

523
00:24:05,710 --> 00:24:04,250
several barrel experiments on all three

524
00:24:08,610 --> 00:24:05,720
of the subjects that's an excellent

525
00:24:11,290 --> 00:24:08,620
quality data we're very happy with it

526
00:24:13,930 --> 00:24:11,300
Ellen also performed a number of

527
00:24:16,900 --> 00:24:13,940
metabolic experiments called em gas here

528
00:24:19,930 --> 00:24:16,910
she's connecting up re breathing bag to

529
00:24:25,460 --> 00:24:23,210
and we also flew the lower body negative

530
00:24:26,570 --> 00:24:25,470
pressure device as a joint experiment

531
00:24:29,600 --> 00:24:26,580
between the Russians and the Americans

532
00:24:32,630 --> 00:24:29,610
we had principal investigators from both

533
00:24:33,980 --> 00:24:32,640
countries on all of our studies the

534
00:24:35,870 --> 00:24:33,990
Russians use lower body negative

535
00:24:37,759 --> 00:24:35,880
pressure as a countermeasure we use it

536
00:24:40,070 --> 00:24:37,769
as a research tool and we used it as a

537
00:24:42,049 --> 00:24:40,080
little of both on this plane Greg is

538
00:24:44,060 --> 00:24:42,059

wincing because he's having his blood

539
00:24:51,590 --> 00:24:44,070
taken there and he'd rather be jogging

540
00:24:53,690 --> 00:24:51,600
like I am here I think okay we as

541
00:24:57,940 --> 00:24:53,700
mentioned earlier we did an awful lot of

542
00:25:01,100 --> 00:24:57,950
transferring of equipment scientific and

543
00:25:05,200 --> 00:25:01,110
material here who'd is transferring

544
00:25:09,590 --> 00:25:05,210
something called the PCG and it's just

545
00:25:12,110 --> 00:25:09,600
one example of the the tremendous amount

546
00:25:14,240 --> 00:25:12,120
of effort we put into those five days

547
00:25:19,070 --> 00:25:14,250
and moving stuff back and forth between

548
00:25:20,629 --> 00:25:19,080
the two vehicles one unsung tremendous

549
00:25:23,210 --> 00:25:20,639
capability of the shuttle is its ability

550
00:25:29,029 --> 00:25:23,220
to return Hardware back to earth and we

551
00:25:32,850 --> 00:25:31,500
one of the more pleasant things we had

552
00:25:35,279 --> 00:25:32,860
the opportunity was talked to school

553
00:25:37,680 --> 00:25:35,289
kids around the world we had sorry X

554
00:25:40,169 --> 00:25:37,690
context in California Texas New Jersey

555
00:25:42,240 --> 00:25:40,179
Massachusetts and over in Russia we used

556
00:25:46,230 --> 00:25:42,250
dis Oryx radios on board both the

557
00:25:47,760 --> 00:25:46,240
station Mir and the shuttle and as we

558
00:25:50,159 --> 00:25:47,770
showed in our slide where the big

559
00:25:52,230 --> 00:25:50,169
moments for us was to be able to show

560
00:25:56,159 --> 00:25:52,240
the new rockets inland and present the

561
00:25:58,200 --> 00:25:56,169
shirt to Anatoly who promptly put it on

562
00:26:00,360 --> 00:25:58,210
and decided to demonstrate his

563
00:26:01,980 --> 00:26:00,370

basketball style which I'm sure that

564
00:26:07,169 --> 00:26:01,990
it's the envy of anyone who's been in

565
00:26:12,889 --> 00:26:07,179
zero-g here we are closing the hatch and

566
00:26:16,110 --> 00:26:12,899
we've already set our last goodbye there

567
00:26:19,049 --> 00:26:16,120
and then there's Anatoly saying goodbye

568
00:26:25,169 --> 00:26:19,059
to us eating a tortilla through the one

569
00:26:27,379 --> 00:26:25,179
of the viewports on cloth crystal I

570
00:26:29,419 --> 00:26:27,389
guess

571
00:26:31,669 --> 00:26:29,429
Greg and Bonnie were talking there about

572
00:26:33,979 --> 00:26:31,679
getting pressure checks done as we

573
00:26:35,690 --> 00:26:33,989
prepared for this moment the Soyuz

574
00:26:38,239 --> 00:26:35,700
undocks from the mirror on the opposite

575
00:26:42,440 --> 00:26:38,249
end of the station and begins its fly

576
00:26:45,319 --> 00:26:42,450
around we watched it with amazement at

577
00:26:47,629 --> 00:26:45,329
how well controlled it was and how

578
00:26:49,909 --> 00:26:47,639
stable and ellen's in the process of

579
00:26:51,229 --> 00:26:49,919
snapping it on the imax here which came

580
00:26:53,930 --> 00:26:51,239
out quite well we got to review that the

581
00:26:55,549 --> 00:26:53,940
other day but anatoly flew out of plane

582
00:26:59,199 --> 00:26:55,559
here as you see him moving between the

583
00:27:01,879 --> 00:26:59,209
panels to a position about 60 80 meters

584
00:27:04,909 --> 00:27:01,889
to the commander's side of the orbiter I

585
00:27:06,169 --> 00:27:04,919
guess the port side and station kept

586
00:27:10,129 --> 00:27:06,179
there while we prepared to do our

587
00:27:11,989 --> 00:27:10,139
undocking these scenes make the Soyuz

588
00:27:13,879 --> 00:27:11,999

look pretty small and look pretty far

589
00:27:16,129 --> 00:27:13,889
away let me tell you how close he loved

590
00:27:17,839 --> 00:27:16,139
when he was sitting out there is s he

591
00:27:19,159 --> 00:27:17,849
had a laser rangefinder you can see some

592
00:27:21,589 --> 00:27:19,169
of the jet firings here as he was

593
00:27:23,060 --> 00:27:21,599
holding attitude just right out the

594
00:27:25,430 --> 00:27:23,070
window we felt like we could reach out

595
00:27:27,979 --> 00:27:25,440
and touch him because he was that close

596
00:27:30,589 --> 00:27:27,989
to us his range i think was about 65

597
00:27:33,259 --> 00:27:30,599
meters but again he looked very very

598
00:27:38,140 --> 00:27:33,269
close at the as the actual time for

599
00:27:44,380 --> 00:27:41,350
at about three minutes prior to the

600
00:27:47,170 --> 00:27:44,390
actual separation i sent the command to

601
00:27:49,000 --> 00:27:47,180
open the hooks and everything worked

602
00:27:51,910 --> 00:27:49,010
just like clockwork that mechanism

603
00:27:53,800 --> 00:27:51,920
worked superbly and there was a set of

604
00:27:55,780 --> 00:27:53,810
push off springs that separated the two

605
00:27:58,360 --> 00:27:55,790
vehicles initially and then at about two

606
00:28:01,870 --> 00:27:58,370
feet who'd initiate a separation

607
00:28:05,500 --> 00:28:01,880
maneuver for pulses to complete the set

608
00:28:08,320 --> 00:28:05,510
sequence this is a view I guess from the

609
00:28:15,570 --> 00:28:08,330
Soyuz looking at us as we do that

610
00:28:21,810 --> 00:28:18,750
of course when finally separated the

611
00:28:24,480 --> 00:28:21,820
Emir 18 crew came up wave goodbye we had

612
00:28:27,390 --> 00:28:24,490
some exchanges on the VHF radio as well

613
00:28:29,730 --> 00:28:27,400

as we said sayonara you're also seeing

614
00:28:32,880 --> 00:28:29,740
on the left there the Soyuz read aki it

615
00:28:37,020 --> 00:28:32,890
was a little departure from our plan to

616
00:28:38,820 --> 00:28:37,030
Dhaka an orbit later but you just see it

617
00:28:41,490 --> 00:28:38,830
start to close in there and it totally

618
00:28:43,590 --> 00:28:41,500
did an excellent job he I was in the

619
00:28:45,330 --> 00:28:43,600
commander's seat he flew from the port

620
00:28:50,240 --> 00:28:45,340
side of the starboard pok aside the

621
00:28:55,110 --> 00:28:53,340
as we come completed that part of the

622
00:28:57,720 --> 00:28:55,120
fly around and got the photo there we

623
00:28:59,490 --> 00:28:57,730
started a complete revolution around the

624
00:29:03,780 --> 00:28:59,500
mirror and got these real pretty views

625
00:29:09,240 --> 00:29:03,790
of the station and here you can see it

626
00:29:10,920 --> 00:29:09,250
rotating the folks on the ground very

627
00:29:12,330 --> 00:29:10,930
interest to see views of the different

628
00:29:13,740 --> 00:29:12,340
sides of the mirror to see what kind of

629
00:29:18,510 --> 00:29:13,750
condition it's been in after a long

630
00:29:19,970 --> 00:29:18,520
exposure to space as Charlie mentioned

631
00:29:23,130 --> 00:29:19,980
we flew all the way around the mirror

632
00:29:26,370 --> 00:29:23,140
doing more than a 360 degree fly around

633
00:29:28,470 --> 00:29:26,380
and finally got to a point overhead the

634
00:29:30,090 --> 00:29:28,480
mirror on what we call the minus R Bar

635
00:29:32,820 --> 00:29:30,100
and in our final separation burns

636
00:29:40,549 --> 00:29:32,830
started translating away from the MIR

637
00:29:46,220 --> 00:29:43,580
well shortly after that we continued our

638
00:29:47,899 --> 00:29:46,230

work in the lab which one of the things

639
00:29:49,460 --> 00:29:47,909
that would be important for Norman and

640
00:29:52,039 --> 00:29:49,470
his crew members to do is to maintain

641
00:29:55,820 --> 00:29:52,049
their conditioning and anticipation of

642
00:29:57,499 --> 00:29:55,830
entry the intent was to exercise twice a

643
00:29:59,600 --> 00:29:57,509
day I think we missed that a few times

644
00:30:01,700 --> 00:29:59,610
for for those guys but they did manage

645
00:30:04,009 --> 00:30:01,710
to get some of their exercise in and

646
00:30:06,470 --> 00:30:04,019
another modification we did was to use

647
00:30:07,879 --> 00:30:06,480
the recumbent seats at the shuttle so

648
00:30:09,710 --> 00:30:07,889
that they would have the gravity vector

649
00:30:11,480 --> 00:30:09,720
going through the chest rather than from

650
00:30:15,249 --> 00:30:11,490
the head to the toes and make the

651
00:30:17,889 --> 00:30:15,259
g-forces of reentry a lot easier on them

652
00:30:20,989 --> 00:30:17,899
this of course shows the shuttle as we

653
00:30:28,970 --> 00:30:20,999
re-entered flew around the heck and came

654
00:30:34,140 --> 00:30:32,340
the one little surprise we got on file

655
00:30:37,830 --> 00:30:34,150
was a master alarm which proved to be a

656
00:30:40,290 --> 00:30:37,840
false sensor indication but we just

657
00:30:43,080 --> 00:30:40,300
pressed right on at 300 feet i lowered

658
00:30:44,850 --> 00:30:43,090
the gear here and who set up on the

659
00:30:48,720 --> 00:30:44,860
outer glide path just nice and solid and

660
00:30:50,580 --> 00:30:48,730
brought it on in we were a relatively

661
00:30:53,040 --> 00:30:50,590
lightweight orbiter about two hundred

662
00:30:55,500 --> 00:30:53,050
and nineteen thousand pounds coming in

663
00:30:57,750 --> 00:30:55,510

for landing so we were shooting at a 195

664
00:30:59,130 --> 00:30:57,760
not touched down as opposed to the

665
00:31:02,100 --> 00:30:59,140
heavyweight flights where we shoot at

666
00:31:04,800 --> 00:31:02,110
205 knots and this is us touching down

667
00:31:09,240 --> 00:31:04,810
on runaway 15 at the Kennedy Space

668
00:31:18,880 --> 00:31:09,250
Center on july the seventh ending a very

669
00:31:23,380 --> 00:31:21,130
we of course use the drag chute we had a

670
00:31:24,970 --> 00:31:23,390
normal drag chute deploy for this

671
00:31:26,710 --> 00:31:24,980
landing we had a little bit of crosswind

672
00:31:30,250 --> 00:31:26,720
not enough to cause us any real

673
00:31:31,660 --> 00:31:30,260
difficulty and were able to fly a normal

674
00:31:33,850 --> 00:31:31,670
approach and landing all the way through