1
00:00:05,059 --> 00:00:03,439
we're talking today with the first

2
00:00:07,070 --> 00:00:05,069
commander of the International Space

3
00:00:10,400 --> 00:00:07,080
Station expedition one commander bill

4
00:00:11,990 --> 00:00:10,410
Shepard Shep it hardly seems that 10

5
00:00:14,720 --> 00:00:12,000
years have passed since you launched on

6
00:00:17,000 --> 00:00:14,730
the Soyuz TMA one spacecraft from the

7
00:00:18,950 --> 00:00:17,010
baikonur cosmodrome in kazakhstan to

8
00:00:21,010 --> 00:00:18,960
begin that first expeditionary mission

9
00:00:24,380 --> 00:00:21,020
to the International Space Station

10
00:00:27,740 --> 00:00:24,390
October 31st 2000 think back for a

11
00:00:28,939 --> 00:00:27,750
second very cold day very foggy what

12
00:00:31,339 --> 00:00:28,949
were your thoughts as you and your

13
00:00:33,410 --> 00:00:31,349

crewmates were about to embark on what

14
00:00:37,190 --> 00:00:33,420
amounted to a new era in human space

15
00:00:38,660 --> 00:00:37,200
flight the day went by really fast we

16
00:00:40,639 --> 00:00:38,670
get up early in the morning kind of same

17
00:00:45,560 --> 00:00:40,649
process that we used to do a shuttle

18
00:00:48,229 --> 00:00:45,570
flight it was foggy kind of due on all

19
00:00:50,720 --> 00:00:48,239
the windows I waved goodbye to my wife

20
00:00:53,330 --> 00:00:50,730
got on the bus went down to the launch

21
00:00:55,549 --> 00:00:53,340
assembly area got our spacesuits on then

22
00:00:56,840 --> 00:00:55,559
out of nowhere my wife came up when we

23
00:00:58,670 --> 00:00:56,850
were suited up and gave me a big hug

24
00:01:01,790 --> 00:00:58,680
which was something that we just don't

25
00:01:05,030 --> 00:01:01,800
do that in our program I went out to the

26
00:01:07,039 --> 00:01:05,040
launch pad we had probably 400 people I

27
00:01:09,500 --> 00:01:07,049
think you were in the crowd at the base

28
00:01:11,780 --> 00:01:09,510
of the vehicle this is a couple million

29
00:01:13,609 --> 00:01:11,790
pounds of rocket all ready to go fly in

30
00:01:15,590 --> 00:01:13,619
space all sitting there steaming and

31
00:01:18,160 --> 00:01:15,600
smoking and you've got 400 people right

32
00:01:20,420 --> 00:01:18,170
there it was it was very very exciting

33
00:01:22,039 --> 00:01:20,430
get in the vehicle and after that

34
00:01:23,450 --> 00:01:22,049
everything was on automatic I mean we

35
00:01:26,570 --> 00:01:23,460
stayed really busy

36
00:01:28,190 --> 00:01:26,580
it was probably a day that a u.s.

37
00:01:30,770 --> 00:01:28,200
vehicle wouldn't have flown in just

38
00:01:32,899 --> 00:01:30,780

because of the weather but the launch

39
00:01:37,219 --> 00:01:32,909
countdown was flawless and the ascend

40
00:01:39,499 --> 00:01:37,229
was good as you lift it off the onboard

41
00:01:41,889 --> 00:01:39,509
cameras inside the Soyuz capsule showed

42
00:01:43,880 --> 00:01:41,899
you pumping your fist in celebration as

43
00:01:46,910 --> 00:01:43,890
you and your crewmates were heading

44
00:01:48,230 --> 00:01:46,920
uphill once you reached orbit it's

45
00:01:50,389 --> 00:01:48,240
always fascinating to me what this

46
00:01:52,999 --> 00:01:50,399
two-day transit and the Soyuz is like to

47
00:01:56,330 --> 00:01:53,009
go to its destination were your thoughts

48
00:01:59,030 --> 00:01:56,340
squarely on the procedures the two-day

49
00:02:02,149 --> 00:01:59,040
trip to the station or what would life

50
00:02:04,760 --> 00:02:02,159
be as you entered what at that time was

51
00:02:07,730 --> 00:02:04,770
a very neophyte vehicle well it was a

52
00:02:11,270 --> 00:02:07,740
kind of a strange day for me because

53
00:02:13,910 --> 00:02:11,280
Sergei Yuri were very experienced I was

54
00:02:16,940 --> 00:02:13,920
I was pumping my fist mostly because as

55
00:02:18,740 --> 00:02:16,950
we had waited a long time to get to that

56
00:02:21,339 --> 00:02:18,750
point in life where this was actually

57
00:02:23,870 --> 00:02:21,349
happening and I was very keen to

58
00:02:27,620 --> 00:02:23,880
emphasize you know let's let's go get

59
00:02:29,960 --> 00:02:27,630
this done when we're up on orbit we were

60
00:02:33,140 --> 00:02:29,970
pre relieved to have all the risk of

61
00:02:35,180 --> 00:02:33,150
launch behind us the process to get the

62
00:02:37,729 --> 00:02:35,190
pressure integrity of the Soyuz checked

63
00:02:40,820 --> 00:02:37,739

out is very lengthy the Russians are

64
00:02:42,830 --> 00:02:40,830
very keen on really low leak rates and

65
00:02:44,300 --> 00:02:42,840
so you have a lot of sitting in your

66
00:02:46,550 --> 00:02:44,310
catch while they sort that out and then

67
00:02:49,610 --> 00:02:46,560
after that it was just sort of

68
00:02:51,920 --> 00:02:49,620
contemplating what the docking would be

69
00:02:56,000 --> 00:02:51,930
like and when you got onboard the

70
00:02:57,949 --> 00:02:56,010
station was it gonna be as expected or

71
00:03:01,600 --> 00:02:57,959
was it something really different that

72
00:03:10,340 --> 00:03:05,080
fast forward two days November 2nd a

73
00:03:12,350 --> 00:03:10,350
very historic day you dock and you and

74
00:03:14,059 --> 00:03:12,360
Sergei and Yuri opened the hatch to the

75
00:03:17,210 --> 00:03:14,069
station for the first time you float in

76
00:03:18,770 --> 00:03:17,220
and you grasped hands and jubilation was

77
00:03:22,250 --> 00:03:18,780
there a sense of history for you and

78
00:03:25,190 --> 00:03:22,260
them at that time that you had basically

79
00:03:26,539 --> 00:03:25,200
opened up a new frontier set a stage for

80
00:03:29,870 --> 00:03:26,549
a new way of living and working in space

81
00:03:33,289 --> 00:03:29,880
I don't think at that time we we had

82
00:03:36,770 --> 00:03:33,299
that perspective my focus was that some

83
00:03:38,599 --> 00:03:36,780
things I had to do pre opening pre hatch

84
00:03:40,789 --> 00:03:38,609
opening to get ready to sample the

85
00:03:44,210 --> 00:03:40,799
atmosphere and bring gas samples back

86
00:03:46,430 --> 00:03:44,220
the next time a shuttle went back to

87
00:03:48,020 --> 00:03:46,440
earth so I had a bunch of stuff to do to

88
00:03:50,420 --> 00:03:48,030

get that D etre for the hatch opening I

89
00:03:51,920 --> 00:03:50,430
really wanted either sergei yuri to open

90
00:03:54,890 --> 00:03:51,930
the hatch and go in first and I think

91
00:03:59,569 --> 00:03:54,900
Sergei was the first guy in but then

92
00:04:02,030 --> 00:03:59,579
there was have a a very busy scramble to

93
00:04:04,940 --> 00:04:02,040
do the initial things that we had to do

94
00:04:06,740 --> 00:04:04,950
and particularly to find the TV hookup

95
00:04:10,550 --> 00:04:06,750
and the TV cable so we could give you

96
00:04:12,349 --> 00:04:10,560
that downlink and we were we were really

97
00:04:14,569 --> 00:04:12,359
close to the wire getting that all

98
00:04:18,170 --> 00:04:14,579
rigged and happy and we almost missed it

99
00:04:21,080 --> 00:04:18,180
so it was and after the downlink was

100
00:04:24,380 --> 00:04:21,090
done we just can all sat back and said

101
00:04:26,630 --> 00:04:24,390
okay we'll call it a day because it was

102
00:04:29,100 --> 00:04:26,640
it was very hectic

103
00:04:32,880 --> 00:04:29,110
the station of course at that time was a

104
00:04:34,320 --> 00:04:32,890
primitive complex ten years ago just a

105
00:04:36,150 --> 00:04:34,330
few modules no significant

106
00:04:38,790 --> 00:04:36,160
infrastructure in there

107
00:04:40,500 --> 00:04:38,800
how was day-to-day life you know it's

108
00:04:43,020 --> 00:04:40,510
not the complex we see today which is

109
00:04:45,660 --> 00:04:43,030
sort of like a city in the sky was it

110
00:04:48,720 --> 00:04:45,670
was primitive how did you go about your

111
00:04:53,190 --> 00:04:48,730
business day-to-day well it was kind of

112
00:04:56,850 --> 00:04:53,200
like camping out we didn't have the the

113
00:04:58,080 --> 00:04:56,860

co2 scrubbing wasn't wasn't we didn't

114
00:04:59,850 --> 00:04:58,090
have the air conditioning and the co2

115
00:05:03,150 --> 00:04:59,860
scrubbing up the way that we needed to

116
00:05:05,520 --> 00:05:03,160
there was some concern about that our Oh

117
00:05:07,710 --> 00:05:05,530
to production wasn't online there were a

118
00:05:09,930 --> 00:05:07,720
lot of things that were very limited in

119
00:05:15,470 --> 00:05:09,940
terms of their robustness a lot a really

120
00:05:18,960 --> 00:05:15,480
single string or almost just make do

121
00:05:21,660 --> 00:05:18,970
life support systems that we had we had

122
00:05:24,560 --> 00:05:21,670
to bring up more capability so the first

123
00:05:26,700 --> 00:05:24,570
week was really living in a sleeping bag

124
00:05:28,530 --> 00:05:26,710
running around with a checklist and a

125
00:05:30,570 --> 00:05:28,540
bunch of tools trying to get this stuff

126
00:05:33,540 --> 00:05:30,580
all to get cranking we did have some

127
00:05:36,350 --> 00:05:33,550
issues I think with both the electron

128
00:05:39,450 --> 00:05:36,360
and the co2 scrubber but we got by them

129
00:05:41,700 --> 00:05:39,460
did you feel like pioneers driving that

130
00:05:43,620 --> 00:05:41,710
spike like the Intercontinental railroad

131
00:05:45,870 --> 00:05:43,630
I think at the end of the Finland

132
00:05:48,270 --> 00:05:45,880
expedition when it was clear that the

133
00:05:50,670 --> 00:05:48,280
the the time and space was fine and we

134
00:05:52,980 --> 00:05:50,680
had to come home and how did we do and

135
00:05:54,600 --> 00:05:52,990
what would people think of our time on

136
00:05:58,380 --> 00:05:54,610
orbit I think we had that sense but not

137
00:05:59,670 --> 00:05:58,390
upfront we're just really busy Shep you

138
00:06:02,690 --> 00:05:59,680

commented on your first space shuttle

139
00:06:07,260 --> 00:06:02,700
flight in 1988 when you were orbiting

140
00:06:09,150 --> 00:06:07,270
over a land mass near the Arctic that

141
00:06:10,590 --> 00:06:09,160
was desolate that you felt like you

142
00:06:14,730 --> 00:06:10,600
might be viewing the surface of another

143
00:06:20,100 --> 00:06:14,740
planet did you have any similar emotion

144
00:06:21,990 --> 00:06:20,110
on your expedition in a sense in 1988

145
00:06:24,900 --> 00:06:22,000
we're on Atlantis early the morning

146
00:06:28,350 --> 00:06:24,910
upside down second flight day over

147
00:06:31,710 --> 00:06:28,360
Siberia winter you could look out see

148
00:06:32,910 --> 00:06:31,720
the surface of a large body you could

149
00:06:35,070 --> 00:06:32,920
look a thousand miles in any direction

150
00:06:37,260 --> 00:06:35,080
and there was no contrail no railroad

151
00:06:40,320 --> 00:06:37,270
track no road

152
00:06:42,089 --> 00:06:40,330
nose smokestack plume I'm looking and

153
00:06:43,860 --> 00:06:42,099
thinking you know there isn't a good

154
00:06:47,870 --> 00:06:43,870
reason why I'm not looking at some

155
00:06:51,029 --> 00:06:47,880
foreign body some some other planet I

156
00:06:53,339 --> 00:06:51,039
felt something similar when I when I get

157
00:06:56,279 --> 00:06:53,349
back from expedition one I made it a

158
00:06:57,270 --> 00:06:56,289
point shortly after landing we got back

159
00:07:01,710 --> 00:06:57,280
to the crew quarters

160
00:07:03,540 --> 00:07:01,720
I talked our flight surgeon into letting

161
00:07:05,969 --> 00:07:03,550
me in a vehicle and just driving around

162
00:07:07,320 --> 00:07:05,979
the parking lot and I was I was feeling

163
00:07:09,379 --> 00:07:07,330

really good I was able to walk around

164
00:07:12,360 --> 00:07:09,389
stand-up I didn't have any problems with

165
00:07:15,330 --> 00:07:12,370
with getting around and I said you know

166
00:07:18,149 --> 00:07:15,340
I if if I could get in a vehicle and

167
00:07:21,149 --> 00:07:18,159
drive it without hazarding myself or

168
00:07:23,309 --> 00:07:21,159
anybody else we could probably go to

169
00:07:25,830 --> 00:07:23,319
Mars where there would be months of

170
00:07:29,999 --> 00:07:25,840
weightlessness land and be productive

171
00:07:32,640 --> 00:07:30,009
and I very strongly had that sense I

172
00:07:34,740 --> 00:07:32,650
mean I drove the van around the parking

173
00:07:38,730 --> 00:07:34,750
lot a little bit got out shut the door

174
00:07:41,520 --> 00:07:38,740
and I said to myself we can do this and

175
00:07:44,010 --> 00:07:41,530
you've talked in other interviews and

176
00:07:45,839 --> 00:07:44,020
forums about the technical culture of

177
00:07:49,260 --> 00:07:45,849
how you do spaceflight how we do

178
00:07:51,810 --> 00:07:49,270
spaceflight what does all that mean is

179
00:07:53,850 --> 00:07:51,820
this something that you experienced

180
00:07:56,249 --> 00:07:53,860
yourself during expedition one during

181
00:07:58,529 --> 00:07:56,259
the time you were up there yes very much

182
00:08:01,140 --> 00:07:58,539
I think that's personally one of the

183
00:08:04,080 --> 00:08:01,150
biggest takeaways for me from having

184
00:08:09,689 --> 00:08:04,090
worked on ISS and with the Russians and

185
00:08:13,350 --> 00:08:09,699
the other partners here at Johnson we we

186
00:08:16,890 --> 00:08:13,360
have a lot of legacy from mercury apollo

187
00:08:18,659 --> 00:08:16,900
gemini the shuttle program and we do

188
00:08:20,129 --> 00:08:18,669

things a certain way because that's how

189
00:08:23,189 --> 00:08:20,139
we know how to do them i think one of

190
00:08:25,170 --> 00:08:23,199
the biggest things that i learned having

191
00:08:28,140 --> 00:08:25,180
lived and worked and trained in russia

192
00:08:30,779 --> 00:08:28,150
was there are other approaches to the

193
00:08:34,860 --> 00:08:30,789
same problem and it's it's it's a great

194
00:08:38,250 --> 00:08:34,870
strength to see somebody else attack an

195
00:08:41,610 --> 00:08:38,260
operational issue a certain way and the

196
00:08:42,899 --> 00:08:41,620
the the difficulty is when you sit back

197
00:08:45,510 --> 00:08:42,909
and say you know maybe the russians have

198
00:08:48,689 --> 00:08:45,520
a better way to do this you would get a

199
00:08:50,700 --> 00:08:48,699
lot of pushback on the american side and

200
00:08:52,410 --> 00:08:50,710
vice versa well we tried to in

201
00:08:54,180 --> 00:08:52,420
still some operational technique or

202
00:08:57,870 --> 00:08:54,190
procedure on the Russians it was it was

203
00:09:00,540 --> 00:08:57,880
the same rebound I'm going really the

204
00:09:03,180 --> 00:09:00,550
strength of a program like ISS is we

205
00:09:05,550 --> 00:09:03,190
should take the best of both of these

206
00:09:08,520 --> 00:09:05,560
cultures but we're we are somewhat

207
00:09:11,820 --> 00:09:08,530
locked in the past about how we did

208
00:09:14,760 --> 00:09:11,830
things 10 20 30 years ago we've got to

209
00:09:16,940 --> 00:09:14,770
get out of that mindset and Shep in that

210
00:09:19,500 --> 00:09:16,950
vein almost two decades have passed

211
00:09:22,950 --> 00:09:19,510
since the ISS program as we know it

212
00:09:24,960 --> 00:09:22,960
today was conceived back in 1993 through

213
00:09:27,630 --> 00:09:24,970

cooperative agreements but there were

214
00:09:30,630 --> 00:09:27,640
there were questions and in some camps

215
00:09:32,340 --> 00:09:30,640
some controversy about how well the

216
00:09:34,860 --> 00:09:32,350
cooperative effort with the Russians

217
00:09:36,810 --> 00:09:34,870
would unfold how how all this was going

218
00:09:38,790 --> 00:09:36,820
to work different languages different

219
00:09:41,700 --> 00:09:38,800
cultures different ways of doing

220
00:09:45,330 --> 00:09:41,710
business from a technical standpoint in

221
00:09:47,220 --> 00:09:45,340
the end as of today how well did the

222
00:09:50,100 --> 00:09:47,230
United States and Russian space

223
00:09:53,580 --> 00:09:50,110
engineers officials managers get along

224
00:09:55,680 --> 00:09:53,590
back then in the formula of days to get

225
00:09:57,510 --> 00:09:55,690
this program underway in and in that

226
00:10:01,050 --> 00:09:57,520
sense how did you and your crewmates get

227
00:10:02,940 --> 00:10:01,060
along well it's you probably have to

228
00:10:04,040 --> 00:10:02,950
talk about how well we got along on

229
00:10:06,390 --> 00:10:04,050
different levels

230
00:10:11,070 --> 00:10:06,400
initially programmatically there was

231
00:10:12,630 --> 00:10:11,080
wild enthusiasm this simmer down a

232
00:10:15,840 --> 00:10:12,640
little bit when it got down to really

233
00:10:18,600 --> 00:10:15,850
how hard it was to integrate all the

234
00:10:21,150 --> 00:10:18,610
procedures specification tolerances

235
00:10:23,850 --> 00:10:21,160
standards literally thousands of things

236
00:10:25,650 --> 00:10:23,860
that have to be meshed between what the

237
00:10:28,530 --> 00:10:25,660
US does and what Russia and the other

238
00:10:30,690 --> 00:10:28,540

partners bring to the table that got to

239
00:10:32,670 --> 00:10:30,700
be very difficult but from an

240
00:10:33,720 --> 00:10:32,680
engineering manager standpoint people

241
00:10:36,450 --> 00:10:33,730
worked their way through that

242
00:10:40,110 --> 00:10:36,460
sure we had disagreements I often was

243
00:10:42,150 --> 00:10:40,120
asked by media Shep

244
00:10:44,460 --> 00:10:42,160
we understand that you guys are having

245
00:10:46,680 --> 00:10:44,470
some difficulties negotiating this with

246
00:10:48,750 --> 00:10:46,690
the Russians and I would say yeah we

247
00:10:50,370 --> 00:10:48,760
have we have huge difficulties and

248
00:10:51,570 --> 00:10:50,380
everybody get really you know excited

249
00:10:54,120 --> 00:10:51,580
about that but I said at the end of the

250
00:10:56,070 --> 00:10:54,130
day we draw the line we make we make

251
00:10:57,150 --> 00:10:56,080
some compromise or somebody puts their

252
00:11:00,360 --> 00:10:57,160
foot down so we're going to do it this

253
00:11:03,390 --> 00:11:00,370
way we move on and the program got to

254
00:11:05,340 --> 00:11:03,400
the launch pad by those means I can't

255
00:11:09,590 --> 00:11:05,350
say enough about the crew

256
00:11:13,770 --> 00:11:09,600
Sergey and I we were extremely tight I

257
00:11:15,690 --> 00:11:13,780
don't think I'm a little bit biased but

258
00:11:18,000 --> 00:11:15,700
I don't think I've seen a better crew at

259
00:11:21,000 --> 00:11:18,010
least in in the modern era on station

260
00:11:23,730 --> 00:11:21,010
than what we had we had some significant

261
00:11:26,190 --> 00:11:23,740
challenges but our our synergy our

262
00:11:28,470 --> 00:11:26,200
cooperation was was really exceptional

263
00:11:31,410 --> 00:11:28,480

the thing that did surprise me about the

264
00:11:33,300 --> 00:11:31,420
crew and how we got along was that we

265
00:11:36,180 --> 00:11:33,310
knew we were very compatible people on

266
00:11:38,910 --> 00:11:36,190
the ground but our experiences and our

267
00:11:41,480 --> 00:11:38,920
sense of being a team on orbit just got

268
00:11:43,410 --> 00:11:41,490
stronger the whole time we flew and

269
00:11:45,750 --> 00:11:43,420
everybody's glad to have a mission

270
00:11:47,940 --> 00:11:45,760
conclude and go home to friends and

271
00:11:50,700 --> 00:11:47,950
family but I was really kind of sad to

272
00:11:53,100 --> 00:11:50,710
see that that was over and you know I

273
00:11:54,510 --> 00:11:53,110
think most astronauts and Kosmos look

274
00:11:58,110 --> 00:11:54,520
back to the day where they can get back

275
00:12:01,170 --> 00:11:58,120
in that kind of a team you guys were

276
00:12:03,210 --> 00:12:01,180
very much hands-on as a crew you helped

277
00:12:07,590 --> 00:12:03,220
develop many elements of station

278
00:12:09,540 --> 00:12:07,600
operations something as as germane is

279
00:12:11,130 --> 00:12:09,550
the formats for computer interfaces

280
00:12:13,260 --> 00:12:11,140
onboard those types of things

281
00:12:15,750 --> 00:12:13,270
technical reference materials that the

282
00:12:18,300 --> 00:12:15,760
ground would use to help you out talk a

283
00:12:21,560 --> 00:12:18,310
little bit about the impact of what that

284
00:12:24,840 --> 00:12:21,570
meant to have sort of technical hands-on

285
00:12:29,960 --> 00:12:24,850
capability to develop this new child

286
00:12:34,050 --> 00:12:29,970
called the ISS it was a very interesting

287
00:12:37,140 --> 00:12:34,060
area of work I started out going to

288
00:12:39,810 --> 00:12:37,150

Russia I started my formal training over

289
00:12:42,500 --> 00:12:39,820
there in 1996 and it was there for

290
00:12:45,740 --> 00:12:42,510
almost five years I thought initially

291
00:12:48,000 --> 00:12:45,750
with our work with the Russians that

292
00:12:50,610 --> 00:12:48,010
because the United States was carrying

293
00:12:54,960 --> 00:12:50,620
most of the financial load for putting

294
00:12:57,930 --> 00:12:54,970
the station together and making it

295
00:13:00,660 --> 00:12:57,940
happen that we could create a standard

296
00:13:04,170 --> 00:13:00,670
where we would have English as a unified

297
00:13:07,350 --> 00:13:04,180
language the reality of working in

298
00:13:11,070 --> 00:13:07,360
Russia I was with engineers and

299
00:13:15,000 --> 00:13:11,080
technicians who built stuff for Sputnik

300
00:13:17,030 --> 00:13:15,010
and Gagarin's capsule and I decided that

301
00:13:20,070 --> 00:13:17,040
the only way I was going to understand

302
00:13:21,900 --> 00:13:20,080
how these guys thought and why they did

303
00:13:23,880 --> 00:13:21,910
what they did a certain way was it if I

304
00:13:27,510 --> 00:13:23,890
could talk to them so it was clear to me

305
00:13:30,690 --> 00:13:27,520
that Russian language we're going to

306
00:13:33,600 --> 00:13:30,700
change the Russian approach to how they

307
00:13:37,620 --> 00:13:33,610
thought about doing space and then the

308
00:13:39,510 --> 00:13:37,630
way to to work with that was to get more

309
00:13:42,449 --> 00:13:39,520
involved with you know their language

310
00:13:44,610 --> 00:13:42,459
and their culture which we did but it

311
00:13:47,790 --> 00:13:44,620
made me appreciate how difficult it was

312
00:13:49,530 --> 00:13:47,800
to deal with space and space operations

313
00:13:54,540 --> 00:13:49,540

as a second language and we said right

314
00:13:57,480 --> 00:13:54,550
there we've got to have a highly

315
00:13:59,370 --> 00:13:57,490
graphical world that we operate we

316
00:14:01,650 --> 00:13:59,380
understand the space station we operate

317
00:14:03,449 --> 00:14:01,660
with so that people from all the

318
00:14:05,550 --> 00:14:03,459
different partner countries who come to

319
00:14:08,460 --> 00:14:05,560
station not having English as a primary

320
00:14:10,800 --> 00:14:08,470
language our first language can deal

321
00:14:12,810 --> 00:14:10,810
with the operational environment so

322
00:14:17,400 --> 00:14:12,820
you'll find on ISS today

323
00:14:20,570 --> 00:14:17,410
a lot of this graphical basis and that's

324
00:14:23,360 --> 00:14:20,580
why it got put in there and in that vein

325
00:14:26,010 --> 00:14:23,370
where we are today with a multinational

326
00:14:27,480 --> 00:14:26,020
capability and responsibility many

327
00:14:30,690 --> 00:14:27,490
centers around the world a global

328
00:14:33,019 --> 00:14:30,700
village if you will it really was your

329
00:14:35,880 --> 00:14:33,029
expedition was it not that helped set an

330
00:14:38,640 --> 00:14:35,890
international cooperative tone for ISS

331
00:14:42,420 --> 00:14:38,650
operations in the sense that you you

332
00:14:45,210 --> 00:14:42,430
sort of defined the command role for ISS

333
00:14:48,090 --> 00:14:45,220
and how that would work between those

334
00:14:50,820 --> 00:14:48,100
on-orbit and those supporting you on the

335
00:14:52,440 --> 00:14:50,830
ground we tried to make a couple big

336
00:14:55,949 --> 00:14:52,450
steps in that direction again it goes

337
00:14:58,850 --> 00:14:55,959
back to the the technical culture and

338
00:15:03,360 --> 00:14:58,860

the legacy that we have in both programs

339
00:15:05,160 --> 00:15:03,370
flight control and spaceflight are is

340
00:15:07,050 --> 00:15:05,170
we're very dependent on the ground to

341
00:15:09,329 --> 00:15:07,060
assist us and tell us what we need to do

342
00:15:11,819 --> 00:15:09,339
particularly in emergencies but the

343
00:15:14,610 --> 00:15:11,829
station and its early life had long

344
00:15:16,530 --> 00:15:14,620
periods of time or we did not have any

345
00:15:18,630 --> 00:15:16,540
ground communications because we didn't

346
00:15:21,660 --> 00:15:18,640
have our satellite links up so the

347
00:15:22,920 --> 00:15:21,670
question became were the authorities of

348
00:15:26,280 --> 00:15:22,930
the commander and what the crew is

349
00:15:28,079 --> 00:15:26,290
responsible for was that the same as the

350
00:15:29,980 --> 00:15:28,089
way that we would operate the space

351
00:15:33,100 --> 00:15:29,990
shuttle in our sense of it was no

352
00:15:35,740 --> 00:15:33,110
the commander and the crew had to have

353
00:15:37,510 --> 00:15:35,750
the authority on board to make the calls

354
00:15:40,960 --> 00:15:37,520
in real time when they thought it was

355
00:15:44,740 --> 00:15:40,970
necessary and that's still a little bit

356
00:15:46,570 --> 00:15:44,750
of the thinking today we had several

357
00:15:49,120 --> 00:15:46,580
instances in our expedition where

358
00:15:50,530 --> 00:15:49,130
Houston weed weed flora Houston first

359
00:15:54,490 --> 00:15:50,540
thing in the morning and Houston would

360
00:15:56,530 --> 00:15:54,500
say okay you guys the flight plan for

361
00:15:59,550 --> 00:15:56,540
the day we have a quick-change 1400 we

362
00:16:01,540 --> 00:15:59,560
want to do something else and then we

363
00:16:03,400 --> 00:16:01,550

twenty-five minutes later we'd be over

364
00:16:05,140 --> 00:16:03,410
menthe we'd be over Europe and we'd be

365
00:16:07,120 --> 00:16:05,150
talking to Moscow Moscow it would undo

366
00:16:09,460 --> 00:16:07,130
that and insert something else in that

367
00:16:11,680 --> 00:16:09,470
block of time and this happened a few

368
00:16:13,420 --> 00:16:11,690
instances and I got on the horn one day

369
00:16:16,180 --> 00:16:13,430
and I said look you we are the

370
00:16:18,370 --> 00:16:16,190
International Space Station you two guys

371
00:16:20,350 --> 00:16:18,380
got to get together on the ground get

372
00:16:21,820 --> 00:16:20,360
your act together then call us because

373
00:16:24,550 --> 00:16:21,830
we're gonna we're going to execute one

374
00:16:26,920 --> 00:16:24,560
plan not one for Moscow and one for

375
00:16:31,180 --> 00:16:26,930
Houston and that's another aspect of

376
00:16:33,700 --> 00:16:31,190
this that we helped to push the most

377
00:16:37,320 --> 00:16:33,710
important point as if we if we look at

378
00:16:40,320 --> 00:16:37,330
what we've got to do in expeditions

379
00:16:42,790 --> 00:16:40,330
voyages a long way from planet Earth

380
00:16:43,690 --> 00:16:42,800
certainly to the moon but but beyond

381
00:16:46,150 --> 00:16:43,700
that as well

382
00:16:49,690 --> 00:16:46,160
we're gonna have comm outages that'll be

383
00:16:51,460 --> 00:16:49,700
substantial so our relationship of what

384
00:16:55,030 --> 00:16:51,470
the crews are doing on board and what

385
00:16:57,070 --> 00:16:55,040
the people are trying to make happen on

386
00:16:58,750 --> 00:16:57,080
the ground this is all part of the

387
00:17:00,370 --> 00:16:58,760
command structure that's got to be

388
00:17:03,730 --> 00:17:00,380

worked out and that's why stations so

389
00:17:06,790 --> 00:17:03,740
important and to its credit the station

390
00:17:11,350 --> 00:17:06,800
as it is today in its matured expansive

391
00:17:13,270 --> 00:17:11,360
state ISS crews have commented that

392
00:17:16,900 --> 00:17:13,280
living on the station astronauts and

393
00:17:19,600 --> 00:17:16,910
cosmonauts feel as if they're in a place

394
00:17:21,100 --> 00:17:19,610
that's well away from the earth even

395
00:17:24,190 --> 00:17:21,110
though they're fairly close to the earth

396
00:17:27,130 --> 00:17:24,200
mileage wise did your crew have the

397
00:17:31,530 --> 00:17:27,140
sense especially in such a rudimentary

398
00:17:34,810 --> 00:17:31,540
vehicle as it was at that time we did

399
00:17:37,690 --> 00:17:34,820
particularly when destiny the u.s. lab

400
00:17:40,030 --> 00:17:37,700
came up and we started having big

401
00:17:41,800 --> 00:17:40,040
optical windows and Sergey Yuri and I

402
00:17:42,820 --> 00:17:41,810
would look at the window and you know

403
00:17:45,970 --> 00:17:42,830
watch the

404
00:17:48,000 --> 00:17:45,980
go bye it was really funny because Yuri

405
00:17:51,149 --> 00:17:48,010
would point to the places where he was

406
00:17:53,830 --> 00:17:51,159
mig-21 fighter pilot on strip alert

407
00:17:55,810 --> 00:17:53,840
ready for the cold war and I would talk

408
00:17:58,509 --> 00:17:55,820
about places I had been in the Navy and

409
00:18:00,549 --> 00:17:58,519
we realized in that moment that not only

410
00:18:03,190 --> 00:18:00,559
were we part of something way bigger

411
00:18:05,500 --> 00:18:03,200
than what's happening on the surface of

412
00:18:08,289 --> 00:18:05,510
the earth but the earth was there and we

413
00:18:12,090 --> 00:18:08,299

were here and when you're a couple

414
00:18:16,690 --> 00:18:12,100
hundred miles up in space there are no

415
00:18:18,820 --> 00:18:16,700
convenient paths home you are there with

416
00:18:20,620 --> 00:18:18,830
some pretty strong constraints about

417
00:18:24,129 --> 00:18:20,630
where you can go and what you can do and

418
00:18:26,560 --> 00:18:24,139
and you really have to act and live as

419
00:18:28,710 --> 00:18:26,570
though you're in a separate world and

420
00:18:31,570 --> 00:18:28,720
this is a big step I think

421
00:18:34,330 --> 00:18:31,580
philosophically in terms of how

422
00:18:36,399 --> 00:18:34,340
astronauts and cosmonauts see themselves

423
00:18:39,940 --> 00:18:36,409
in space we haven't really had that

424
00:18:43,509 --> 00:18:39,950
before traditions it wasn't all just

425
00:18:45,490 --> 00:18:43,519
work but you as the pathfinding crew for

426
00:18:48,279 --> 00:18:45,500
this new vehicle this new way of doing

427
00:18:50,169 --> 00:18:48,289
business in space you set traditions for

428
00:18:52,149 --> 00:18:50,179
yourself tell us a little bit about the

429
00:18:56,230 --> 00:18:52,159
ceremony that pomp and circumstance the

430
00:18:57,730 --> 00:18:56,240
traditions the Russian protocol they

431
00:19:00,009 --> 00:18:57,740
have Russians have a lot of space

432
00:19:04,289 --> 00:19:00,019
tradition it's mostly on the ground a

433
00:19:06,940 --> 00:19:04,299
pre-launch they are very adamant about

434
00:19:09,370 --> 00:19:06,950
many of the things they do as ceremony

435
00:19:12,549 --> 00:19:09,380
to get to the launch pad on orbit it's

436
00:19:16,149 --> 00:19:12,559
not the same and I wanted to try and

437
00:19:19,120 --> 00:19:16,159
extract a couple pieces of tradition

438
00:19:21,730 --> 00:19:19,130

mostly from ships because I wanted to do

439
00:19:28,720 --> 00:19:21,740
two things one is to give the crew a

440
00:19:31,600 --> 00:19:28,730
sense of that our expedition had a time

441
00:19:35,320 --> 00:19:31,610
to it and when we were done I wanted to

442
00:19:36,909 --> 00:19:35,330
make it clear to the crews onboard and

443
00:19:39,210 --> 00:19:36,919
the control centers on the ground that

444
00:19:40,899 --> 00:19:39,220
expedition 1 had finished our

445
00:19:43,360 --> 00:19:40,909
responsibilities and we were handing

446
00:19:45,909 --> 00:19:43,370
over to your usage ship so part of what

447
00:19:48,279 --> 00:19:45,919
we did was to institute a change of

448
00:19:49,860 --> 00:19:48,289
command which they still do today this

449
00:19:52,690 --> 00:19:49,870
is something that Russians really didn't

450
00:19:53,919 --> 00:19:52,700
understand this but and certainly part

451
00:19:56,080 --> 00:19:53,929
of the Russian Navy and this is

452
00:19:56,580 --> 00:19:56,090
something that's done in Russia just not

453
00:19:58,230 --> 00:19:56,590
in the space

454
00:19:59,970 --> 00:19:58,240
program but I believe today they really

455
00:20:01,769 --> 00:19:59,980
embrace this and they like it because

456
00:20:04,019 --> 00:20:01,779
it's a clear distinction of okay

457
00:20:06,570 --> 00:20:04,029
expedition ones time is done and now

458
00:20:08,730 --> 00:20:06,580
it's expedition two on deck and they

459
00:20:11,340 --> 00:20:08,740
they understand that and to give it a

460
00:20:12,930 --> 00:20:11,350
little bit of emphasis on ships we have

461
00:20:15,690 --> 00:20:12,940
a little bell and it's a ceremonial

462
00:20:17,039 --> 00:20:15,700
thing when crews come aboard or depart

463
00:20:19,350 --> 00:20:17,049

from another ship and so we had a little

464
00:20:21,510 --> 00:20:19,360
bell up there and they the ISS still

465
00:20:26,100 --> 00:20:21,520
rings the bell so I thought those were

466
00:20:27,990 --> 00:20:26,110
important markers for how ISS and the

467
00:20:30,149 --> 00:20:28,000
expeditions paced themselves

468
00:20:33,389 --> 00:20:30,159
Shep as you've watched this decade

469
00:20:36,090 --> 00:20:33,399
unfold and the assembly missions and

470
00:20:37,760 --> 00:20:36,100
some of this work that is considered by

471
00:20:40,320 --> 00:20:37,770
many to be some of the most complex

472
00:20:42,169 --> 00:20:40,330
stuff that's ever been done in human

473
00:20:44,930 --> 00:20:42,179
spaceflight history including Apollo

474
00:20:48,149 --> 00:20:44,940
have you been impressed at how well

475
00:20:51,480 --> 00:20:48,159
together the station has come together

476
00:20:53,820 --> 00:20:51,490
has been formulated when you look on a

477
00:20:55,440 --> 00:20:53,830
day to day basis the amount of technical

478
00:20:58,139 --> 00:20:55,450
problems that have been incurred by this

479
00:21:02,700 --> 00:20:58,149
mammoth structure are pretty few and far

480
00:21:05,039 --> 00:21:02,710
between I think by any parameter and I

481
00:21:07,860 --> 00:21:05,049
can't take much credit for this but by

482
00:21:09,810 --> 00:21:07,870
any parameter the station's performance

483
00:21:12,779 --> 00:21:09,820
in terms of how its flown and how its

484
00:21:16,200 --> 00:21:12,789
been built have been exceptional I think

485
00:21:17,580 --> 00:21:16,210
far better than the designers could have

486
00:21:22,230 --> 00:21:17,590
hoped for

487
00:21:24,990 --> 00:21:22,240
I think it's a great sign for what our

488
00:21:28,409 --> 00:21:25,000

capabilities are for the future I'm

489
00:21:31,860 --> 00:21:28,419
thinking about what well when we when we

490
00:21:33,180 --> 00:21:31,870
were first getting into what ISS was

491
00:21:34,889 --> 00:21:33,190
going to look like how big it was going

492
00:21:37,590 --> 00:21:34,899
to be how much work it was going to take

493
00:21:39,810 --> 00:21:37,600
to assemble it I always had in the back

494
00:21:41,760 --> 00:21:39,820
of my mind that if we're going to do

495
00:21:45,630 --> 00:21:41,770
things that are really expansive in

496
00:21:47,669 --> 00:21:45,640
space leaving the planet and going

497
00:21:49,649 --> 00:21:47,679
somewhere else in the solar system the

498
00:21:51,149 --> 00:21:49,659
vehicles that we're going to build are

499
00:21:52,909 --> 00:21:51,159
going to have several characteristics

500
00:21:55,409 --> 00:21:52,919
one is they're going to be very big

501
00:21:58,529 --> 00:21:55,419
there are going to be too big to be

502
00:22:00,480 --> 00:21:58,539
launched on a single lift with a large

503
00:22:02,820 --> 00:22:00,490
beam and a large booster they're going

504
00:22:05,100 --> 00:22:02,830
to have to be assembled in orbit they're

505
00:22:07,919 --> 00:22:05,110
going to have to draw on the capacities

506
00:22:09,320 --> 00:22:07,929
of several different countries and space

507
00:22:14,580 --> 00:22:09,330
station is all that

508
00:22:16,200 --> 00:22:14,590
and so I think today that that those

509
00:22:19,529 --> 00:22:16,210
questions are behind us I mean this is

510
00:22:22,680 --> 00:22:19,539
this is all a blueprint for how we need

511
00:22:24,749 --> 00:22:22,690
to do things in the future last year for

512
00:22:28,919 --> 00:22:24,759
the first time hopefully not the last

513
00:22:33,719 --> 00:22:28,929

all of the partner nations agencies were

514
00:22:35,369 --> 00:22:33,729
represented on board at a single time it

515
00:22:37,289 --> 00:22:35,379
really was a testament I think it struck

516
00:22:39,060 --> 00:22:37,299
many people at that time to what this

517
00:22:42,659 --> 00:22:39,070
complex was designed to be in an

518
00:22:45,749 --> 00:22:42,669
international sense are you impressed by

519
00:22:47,190 --> 00:22:45,759
the way the manner at how the station

520
00:22:50,389 --> 00:22:47,200
has been able to operate through

521
00:22:52,589 --> 00:22:50,399
linguistic cultural and technical

522
00:22:56,460 --> 00:22:52,599
differences just by nature of the way

523
00:22:59,129 --> 00:22:56,470
people around the globe operate it's

524
00:23:01,469 --> 00:22:59,139
been exceptional in terms of the

525
00:23:05,039 --> 00:23:01,479
cooperation on the ground and how tight

526
00:23:07,469 --> 00:23:05,049
the crews are when they fly I can think

527
00:23:10,649 --> 00:23:07,479
of any number of foreign astronauts who

528
00:23:14,159 --> 00:23:10,659
have joined us at JSC and head training

529
00:23:16,889 --> 00:23:14,169
here who become very Americanized and

530
00:23:18,779 --> 00:23:16,899
this is maybe part of what happens and I

531
00:23:22,259 --> 00:23:18,789
can also say myself when I lived in

532
00:23:24,149 --> 00:23:22,269
Russia Sergey came up to me one day not

533
00:23:26,879 --> 00:23:24,159
too far from our launch and he said you

534
00:23:32,219 --> 00:23:26,889
know Shep you came here and you had

535
00:23:34,589 --> 00:23:32,229
certain kind of angles to how you saw

536
00:23:37,560 --> 00:23:34,599
things but you've changed my look I said

537
00:23:39,389 --> 00:23:37,570
wow you're right I have changed and I

538
00:23:42,680 --> 00:23:39,399

think this is one of the real strengths

539
00:23:46,469 --> 00:23:42,690
of this program that we have shown that

540
00:23:48,269 --> 00:23:46,479
humans can do really substantial

541
00:23:50,549 --> 00:23:48,279
endeavors that we are flexible and

542
00:23:55,129 --> 00:23:50,559
adaptable in the space station and how

543
00:23:57,989 --> 00:23:55,139
this has proceeded as an example of this

544
00:24:02,190 --> 00:23:57,999
from those first baby steps a decade ago

545
00:24:04,279 --> 00:24:02,200
to what it constitutes today with six

546
00:24:08,279 --> 00:24:04,289
people living and working on board and

547
00:24:10,259 --> 00:24:08,289
and all of the incredible technical

548
00:24:13,739 --> 00:24:10,269
achievement that the Space Station has

549
00:24:15,779 --> 00:24:13,749
has drawn to this point what do you

550
00:24:19,019 --> 00:24:15,789
think the Space Station represents today

551
00:24:21,710 --> 00:24:19,029
and what ultimately a decade from now

552
00:24:25,220 --> 00:24:21,720
perhaps will its legacy be

553
00:24:28,970 --> 00:24:25,230
it has to have some short-term and

554
00:24:32,720 --> 00:24:28,980
long-term results in the short-term we

555
00:24:37,490 --> 00:24:32,730
have a fantastic orbital laboratory to

556
00:24:39,950 --> 00:24:37,500
do research in six or eight basic areas

557
00:24:42,650 --> 00:24:39,960
that we've never really had before and

558
00:24:45,380 --> 00:24:42,660
I'm hoping that the crews now and

559
00:24:47,990 --> 00:24:45,390
subsequent will make great use of that

560
00:24:51,380 --> 00:24:48,000
and that's that's its fundamental value

561
00:24:53,960 --> 00:24:51,390
to the nation and to the partnership

562
00:24:58,520 --> 00:24:53,970
beyond that Space Station has really

563
00:25:02,240 --> 00:24:58,530

laid the foundation for how and where we

564
00:25:05,990 --> 00:25:02,250
might go further in space and III think

565
00:25:08,450 --> 00:25:06,000
it's legacy will be this was an episode

566
00:25:11,840 --> 00:25:08,460
where we we got our act together and

567
00:25:14,420 --> 00:25:11,850
figured out how to do this you and

568
00:25:16,850 --> 00:25:14,430
Sergei and Yuri launched from the same

569
00:25:20,600 --> 00:25:16,860
launch pad that Yuri Gagarin launched

570
00:25:25,340 --> 00:25:20,610
from on April 12 1961 that every Soyuz

571
00:25:28,250 --> 00:25:25,350
has launched from next April 12th half a

572
00:25:30,710 --> 00:25:28,260
century the 50th anniversary of Yuri

573
00:25:33,200 --> 00:25:30,720
Gagarin's launch this is a pretty epic

574
00:25:35,210 --> 00:25:33,210
moment it's also the 30th anniversary of

575
00:25:37,850 --> 00:25:35,220
the first space shuttle flight and it

576
00:25:40,070 --> 00:25:37,860
count it came just weeks before the 50th

577
00:25:41,990 --> 00:25:40,080
anniversary of alan shepard launching is

578
00:25:45,140 --> 00:25:42,000
the first american in space so this is a

579
00:25:47,870 --> 00:25:45,150
rich spring in terms of anniversaries

580
00:25:49,910 --> 00:25:47,880
coming up but you stood on that launch

581
00:25:51,560 --> 00:25:49,920
pad Yuri Gagarin left the planet from

582
00:25:52,990 --> 00:25:51,570
that launch pad as the first human in

583
00:25:55,940 --> 00:25:53,000
space

584
00:25:58,310 --> 00:25:55,950
what did Gagarin achieve in a

585
00:26:01,460 --> 00:25:58,320
big-picture sense when he took off on in

586
00:26:04,250 --> 00:26:01,470
Vostok 1 and what did leaving the planet

587
00:26:07,640 --> 00:26:04,260
mean at that time and today for us as a

588
00:26:12,410 --> 00:26:07,650

species well that's a big question I

589
00:26:18,470 --> 00:26:12,420
think clearly Yuri had just tremendous

590
00:26:22,490 --> 00:26:18,480
courage to do that very few people have

591
00:26:25,550 --> 00:26:22,500
the the the ability or the the

592
00:26:30,350 --> 00:26:25,560
willingness to take a risk like that

593
00:26:33,350 --> 00:26:30,360
and to have it be successful and you

594
00:26:37,220 --> 00:26:33,360
raise a world icon because of that but

595
00:26:39,140 --> 00:26:37,230
he showed that humans had a place other

596
00:26:42,680 --> 00:26:39,150
than on the surface of the planet I

597
00:26:44,420 --> 00:26:42,690
think part of his legacy and what the

598
00:26:48,050 --> 00:26:44,430
Space Station is about we have six

599
00:26:50,660 --> 00:26:48,060
people now on in the crew who as you as

600
00:26:54,760 --> 00:26:50,670
you said see themselves living apart

601
00:26:58,820 --> 00:26:54,770
from Earth space station is really about

602
00:27:02,600 --> 00:26:58,830
having humans see themselves with a

603
00:27:04,400 --> 00:27:02,610
place in the solar system not on the

604
00:27:08,450 --> 00:27:04,410
earth and the question is really how far

605
00:27:10,700 --> 00:27:08,460
can that go now where where else can we

606
00:27:12,890 --> 00:27:10,710
live and work and be productive and

607
00:27:15,320 --> 00:27:12,900
space station has has asked that

608
00:27:18,340 --> 00:27:15,330
question it's up to us to figure out in

609
00:27:20,900 --> 00:27:18,350
the future what's the answer

610
00:27:21,800 --> 00:27:20,910
bill Shepard expedition one commander