



1
00:00:02,010 --> 00:00:16,070
Okay, here we are at the back of the ATV.

2
00:00:16,070 --> 00:00:18,470
We're at the very back end of the space station.

3
00:00:18,470 --> 00:00:23,370
We're going 18,000 miles an hour in this direction,
so I'm going to kick off and we'll do a quick

4
00:00:23,370 --> 00:00:26,050
fly through of the staff at the International
Space Station.

5
00:00:26,050 --> 00:00:30,630
We'll pass some fun things on the way.

6
00:00:30,630 --> 00:00:34,830
Dinner table again.

7
00:00:34,830 --> 00:00:37,629
Got Max!

8
00:00:37,629 --> 00:00:39,030
Ahh!

9
00:00:39,030 --> 00:00:54,449
[Laughter] Very difficult to squeeze throughout
here, especially with Max's here.

10
00:00:54,449 --> 00:01:01,940
And now we're going through the FGB.

11
00:01:01,940 --> 00:01:06,290
It looks like we got a nice, nice flight path
here.

12
00:01:06,290 --> 00:01:09,830

Should be able to make it.

13

00:01:09,830 --> 00:01:17,620

Alright, down in the node 1, station's going to open up!

14

00:01:17,620 --> 00:01:19,140

Butch, go high!

15

00:01:19,140 --> 00:01:27,990

Foot tag, quick aileron roll, through the lab, into the ball form.

16

00:01:27,990 --> 00:01:39,750

A little spin into node 2, over Alex's crew porters, and here we are at the very front

17

00:01:39,750 --> 00:01:41,530

end of the International Space Station.

18

00:01:41,530 --> 00:01:54,610

Still going 18,000 miles an hour.

19

00:01:54,610 --> 00:02:00,200

Now.

20

00:02:00,200 --> 00:02:19,969

Eli Richardson; ok he asks, "Do they plan to deorbit Space Station?"

21

00:02:19,969 --> 00:02:21,329

Yeah, what are you going to do about that?

22

00:02:21,329 --> 00:02:22,329

Tell him.

23

00:02:22,329 --> 00:02:27,900

They're going to deorbit Space Station at the end of its life whenever that is.

24

00:02:27,900 --> 00:02:31,670

And in concept, we can keep up flying for a long, long time.

25

00:02:31,670 --> 00:02:35,499

We have airplanes that were designed and built in the mid-1950s...

26

00:02:35,499 --> 00:02:36,859

The T-38s that we...

27

00:02:36,859 --> 00:02:39,019

The T-38s that we fly, yeah.

28

00:02:39,019 --> 00:02:40,269

late 1950s, early 1960s.

29

00:02:40,269 --> 00:02:44,769

They were designed in the 1950s, built in the 1960s and you just keep rebuilding the

30

00:02:44,769 --> 00:02:48,870

airframe, rebuilding the engines, upgrading the avionics; you could fly these things basically

31

00:02:48,870 --> 00:02:51,659

till you run out of gas.

32

00:02:51,659 --> 00:02:56,510

In concept we could do that with Station and we could keep the Station running for as long

33

00:02:56,510 --> 00:03:04,000

as we like basically up until we reach the endpoint of the structural elements on Station.

34

00:03:04,000 --> 00:03:07,999

And when that time does come, we will have

to deorbit it.

35

00:03:07,999 --> 00:03:10,080

Well we're going at least until 2024.

36

00:03:10,080 --> 00:03:11,080

Yeah, we're going to 2024.

37

00:03:11,080 --> 00:03:14,459

Ok, so like with Hubble what we did on our mission is we put a docking ring on the bottom

38

00:03:14,459 --> 00:03:15,510

of the telescope.

39

00:03:15,510 --> 00:03:16,510

Yeah.

40

00:03:16,510 --> 00:03:18,520

Because we want to ensure a guided entry.

41

00:03:18,520 --> 00:03:23,330

When the thing is done, we're going to say maybe 20-30 years from now.

42

00:03:23,330 --> 00:03:26,999

The science may be done; hopefully we have a lot more science with Hubble but even if

43

00:03:26,999 --> 00:03:29,812

the science stops, the spaceship can still continue to orbit, right...

44

00:03:29,812 --> 00:03:30,812

Yeah, yeah.

45

00:03:30,812 --> 00:03:33,379

just by orbital mechanics; they're just going to come in.

46
00:03:33,379 --> 00:03:36,579
So we have a docking ring on the bottom of Hubble for a rocket motor -- you know one

47
00:03:36,579 --> 00:03:40,459
of them has to be there, it could be an automated thing -- dock with it and guide it so it doesn't

48
00:03:40,459 --> 00:03:42,269
hit anything on the way down.

49
00:03:42,269 --> 00:03:45,400
So do they have anything like that for Space Station because that's a big thing?

50
00:03:45,400 --> 00:03:46,400
Yeah, yeah.

51
00:03:46,400 --> 00:03:49,000
So when it deorbits, it's going to be a controlled deorbit I would think?

52
00:03:49,000 --> 00:03:50,209
It will be a controlled deorbit.

53
00:03:50,209 --> 00:03:57,040
We'll use a Russian progress vehicle and instead of reboosting Station, you'll point the rocket

54
00:03:57,040 --> 00:03:58,129
thrusters the other way...

55
00:03:58,129 --> 00:03:59,129
To slow down.

56
00:03:59,129 --> 00:04:00,129
You'll slow down...

57

00:04:00,129 --> 00:04:01,129

It's like putting the brakes on when you're going to come in.

58

00:04:01,129 --> 00:04:03,150

...and then the atmospheric drag will take it in.

59

00:04:03,150 --> 00:04:08,419

And they'll probably...so they'll probably do that so that the major part of reentry

60

00:04:08,419 --> 00:04:09,430

is over the ocean?

61

00:04:09,430 --> 00:04:10,430

Yeah, probably the Pacific.

62

00:04:10,430 --> 00:04:11,430

It'll probably shoot for the Pacific

63

00:04:11,430 --> 00:04:12,430

The Pacific is a really big ocean.

64

00:04:12,430 --> 00:04:13,430

Yeah.

65

00:04:13,430 --> 00:04:16,310

That would be the right place to put it so in case anything survives coming in.

66

00:04:16,310 --> 00:04:17,310

Yeah.

67

00:04:17,310 --> 00:04:40,280

So, this is the

68

00:04:40,280 --> 00:04:41,280

Nile coming up right?

69

00:04:41,280 --> 00:04:42,280

Yeah.

70

00:04:42,280 --> 00:04:43,280

This is Nile.

71

00:04:43,280 --> 00:04:44,290

This is the, green one.

72

00:04:44,290 --> 00:04:47,870

So, you got a great shot of the Nile.

73

00:04:47,870 --> 00:04:50,980

It's very clear over...

74

00:04:50,980 --> 00:04:52,040

Beautiful day today.

75

00:04:52,040 --> 00:04:53,040

Yeah.

76

00:04:53,040 --> 00:04:56,630

So, there we got, we got coming up on the,
the Red Sea.

77

00:04:56,630 --> 00:04:58,960

Yeah, this is the Red Sea.

78

00:04:58,960 --> 00:04:59,960

Yeah.

79

00:04:59,960 --> 00:05:01,260

And that's Suez Canal over there.

80

00:05:01,260 --> 00:05:02,780

You can probably point that.

81

00:05:02,780 --> 00:05:03,780

Oh yeah.

82

00:05:03,780 --> 00:05:04,780

Yeah.

83

00:05:04,780 --> 00:05:05,780

There you go.

84

00:05:05,780 --> 00:05:06,780

So, Red Sea and just.

85

00:05:09,780 --> 00:05:07,780

Suez Canal.

86

00:05:09,780 --> 00:05:16,080

Very thin as you can see there.

87

00:05:16,080 --> 00:05:24,530

We're passing just across the southern coast of Ireland into the Bristol Channel and then

88

00:05:24,530 --> 00:05:26,530

east to right over London.

89

00:05:26,530 --> 00:05:32,970

It's supposed to be pretty cloudy, so the channel may be clear, and London itself might

90

00:05:32,970 --> 00:05:35,220

be clear, so we'll see.

91

00:05:35,220 --> 00:05:37,880

Here's the Strait of Dover.

92

00:05:37,880 --> 00:05:45,300

You can see all the run off.

93
00:05:45,300 --> 00:05:49,990
Let's go overhead.

94
00:05:49,990 --> 00:05:50,990
It's coming in view.

95
00:05:50,990 --> 00:05:52,490
And see London is in that, see that area right
there kind of.

96
00:05:52,490 --> 00:05:53,490
Where that bay is?

97
00:05:53,490 --> 00:05:55,270
The bay is, yeah.

98
00:05:55,270 --> 00:05:56,600
That's London.

99
00:05:56,600 --> 00:06:02,220
Let's see if we can actually see anything
in London.

100
00:06:02,220 --> 00:06:03,960
There it is.

101
00:06:03,960 --> 00:06:06,590
So, we're almost directly overhead.

102
00:06:06,590 --> 00:06:07,590
Yeah.

103
00:06:07,590 --> 00:06:11,170
Finally catching a break through, from the
rain.

104
00:06:11,170 --> 00:06:15,110

Look closely.

105

00:06:15,110 --> 00:06:25,110

See Sicily and Italy, coming over the horizon.

106

00:06:25,110 --> 00:06:32,990

Give you a close -- zoom in on the volcano.

107

00:06:32,990 --> 00:06:41,760

Beautiful; and then the easily recognizable boot of Italy coming into view.

108

00:06:41,760 --> 00:06:48,220

Looks quite a bit different than it does on maps from up here but there it is.

109

00:06:48,220 --> 00:06:50,090

There's the boot of Italy.

110

00:06:50,090 --> 00:06:55,430

I've been to Italy just one time but I plan on going back there soon.

111

00:06:55,430 --> 00:07:05,680

My family emigrated from Italy about a hundred years ago, my grandparents and great grandparents.

112

00:07:05,680 --> 00:07:14,110

Hang off our left side, we're going to be losing it behind the structure pretty soon.

113

00:07:14,110 --> 00:07:24,420

There's Greece, had a good friend from Greece, growing up; excellent food.

114

00:07:24,420 --> 00:07:30,670

And most of Europe has excellent food.

115

00:07:30,670 --> 00:07:39,030

Yep, that'll be the Bay Area and then if you come just, San Francisco is right of trajectory

116

00:07:39,030 --> 00:07:40,870

-- lots of trajectory.

117

00:07:40,870 --> 00:07:54,320

Has a great shot of San Francisco.

118

00:07:54,320 --> 00:08:00,000

So interesting enough, right there is Edwards Air Force Base; that's another place where

119

00:08:00,000 --> 00:08:01,120

I lived.

120

00:08:01,120 --> 00:08:08,620

You can see here, those big, dry lakebeds; that's also where Palmdale and Lancaster are

121

00:08:08,620 --> 00:08:12,120

which, where the space shuttle was built.

122

00:08:12,120 --> 00:08:14,540

Built down there.

123

00:08:14,540 --> 00:08:15,540

Yeah.

124

00:08:15,540 --> 00:08:19,380

Okay, that should be Houston.

125

00:08:19,380 --> 00:08:23,950

Should give them the camera.

126

00:08:23,950 --> 00:08:27,750

Looks like a beautiful day.

127

00:08:27,750 --> 00:08:30,460

I just talked to my wife at home, just 15 minutes ago.

128

00:08:30,460 --> 00:08:31,682

She said the weather's beautiful down there.

129

00:08:31,682 --> 00:08:32,682

There it is, Houston, Texas.

130

00:08:32,682 --> 00:08:33,682

Chicago?

131

00:08:33,682 --> 00:08:52,230

Yeah, we got the bottom of Lake Michigan.

132

00:08:52,230 --> 00:08:59,840

Did you get it?

133

00:08:59,840 --> 00:09:05,750

Here's Chicago, kind of swinging off to our left.

134

00:09:05,750 --> 00:09:08,260

All right, so you got -- there's Long Island.

135

00:09:08,260 --> 00:09:12,470

There's New York City, looks a little snowy down there.

136

00:09:12,470 --> 00:09:15,279

It does look snowy, looks like a lot of snow down there.

137

00:09:15,279 --> 00:09:18,890

Nice, clear day, probably very cold.

138

00:09:18,890 --> 00:09:24,740

Long Island and there's Connecticut, my home

state, my hometown of Waterbury.

139

00:09:24,740 --> 00:09:26,560

That little, that?

140

00:09:26,560 --> 00:09:31,710

It's not even -- you can't even see it it's so small.

141

00:09:31,710 --> 00:09:37,080

Let's give New York City one more close-up of New York City.

142

00:09:37,080 --> 00:09:40,560

New York, are you ready for your close-up from the International Space Station?

143

00:09:40,560 --> 00:09:42,180

Looking good.

144

00:09:42,180 --> 00:09:43,631

Enjoy your Friday night.

145

00:09:43,631 --> 00:09:54,740

Friday night in New York.

146

00:09:54,740 --> 00:09:58,190

It's the end of January, and soon I'll be getting ready to leave.

147

00:09:58,190 --> 00:10:02,590

I came up here last September, six weeks before Rich and Koichi.

148

00:10:02,590 --> 00:10:05,510

So my time is nearly up.

149

00:10:05,510 --> 00:10:14,290

It's going to be good to see my wife, Julie,

and the boys -- Ryan and Lucas.

150

00:10:14,290 --> 00:10:20,130

We are exactly six weeks away from when Mike will be landing here back in Houston, not

151

00:10:20,130 --> 00:10:22,440

that I'm counting.

152

00:10:22,440 --> 00:10:25,779

Starting to become real Mike's going to be home soon.

153

00:10:25,779 --> 00:10:27,529

So pretty excited about that.

154

00:10:27,529 --> 00:10:29,630

I can't believe it's almost here.

155

00:10:29,630 --> 00:10:31,570

Before launch I coached the men Lacrosse and hockey.

156

00:10:31,570 --> 00:10:32,860

Can you see?

157

00:10:32,860 --> 00:10:34,210

Yep, sure can.

158

00:10:34,210 --> 00:10:35,210

Where's Lucas playing now?

159

00:10:35,210 --> 00:10:36,210

I can't tell.

160

00:10:36,210 --> 00:10:37,210

He's center.

161

00:10:37,210 --> 00:10:39,480
He's racing down Mike right now.

162
00:10:39,480 --> 00:10:41,339
Fortunately, we have a video link.

163
00:10:41,339 --> 00:10:47,890
So I've been able to keep track of their games
and be there in spirit if not in person.

164
00:10:47,890 --> 00:10:51,190
Oh, no.

165
00:10:51,190 --> 00:10:52,190
That's all right.

166
00:10:52,190 --> 00:10:53,190
Keep fighting back.

167
00:10:53,190 --> 00:10:56,260
It was really fun because Mike's son had to
to take a penalty shot and actually scored.

168
00:10:56,260 --> 00:10:59,000
So that was fun for Mike to see.

169
00:10:59,000 --> 00:11:03,580
It was really exciting for him.

170
00:11:03,580 --> 00:11:09,310
He feels a little bit more connected to the
kids.

171
00:11:09,310 --> 00:11:10,310
It's hard.

172
00:11:10,310 --> 00:11:16,670
I know he misses that stuff a lot.

173

00:11:16,670 --> 00:11:21,230

Oh, yeah.

174

00:11:21,230 --> 00:11:28,070

About that time.

175

00:11:28,070 --> 00:11:30,590

Here we go.

176

00:11:30,590 --> 00:11:36,580

We're not sure if we're going to make it out today, but looks like we're a go.

177

00:11:36,580 --> 00:11:38,220

We're going to rent down your place real soon.

178

00:11:38,220 --> 00:11:39,220

Don't worry about it.

179

00:11:39,220 --> 00:11:40,220

Yeah?

180

00:11:40,220 --> 00:11:53,910

I cleaned it, so it should be ready to go.

181

00:11:53,910 --> 00:12:00,860

You getting excited, Greg?

182

00:12:00,860 --> 00:12:06,070

I'm getting excited.

183

00:12:06,070 --> 00:12:16,230

Mike Hopkins, NASA astronaut, giving a quick wave farewell there.

184

00:12:16,230 --> 00:12:17,230

And physical separation confirmed.

185
00:12:17,230 --> 00:12:18,230
Okay.

186
00:12:18,230 --> 00:12:19,230
Thanks, Oleg.

187
00:12:19,230 --> 00:12:33,850
Thanks for getting me home.

188
00:12:33,850 --> 00:12:50,220
That's so wild.

189
00:12:50,220 --> 00:13:02,899
Kinda push it in.

190
00:13:02,899 --> 00:13:03,899
Three.

191
00:13:03,899 --> 00:13:04,899
Two.

192
00:13:04,899 --> 00:13:05,899
One.

193
00:13:05,899 --> 00:13:06,899
Oh no!

194
00:13:06,899 --> 00:13:27,290
Made it out the other side.

195
00:13:27,290 --> 00:13:58,570
...Little too hard

196
00:13:58,570 --> 00:14:00,110
That is wild.

197
00:14:00,110 --> 00:14:06,310

I think it's going to stay in now...

198

00:14:06,310 --> 00:14:35,120

Yeah, yeah got to get it from going back down now.

199

00:14:35,120 --> 00:15:02,220

Ha ha, you are being assimilated by this...

200

00:15:02,220 --> 00:15:04,390

Pull out quickly, ah dude!

201

00:15:04,390 --> 00:15:07,520

It's just gonna get worse.

202

00:15:07,520 --> 00:15:09,400

This is amazing!

203

00:15:09,400 --> 00:15:17,330

Look at that, whoa!

204

00:15:17,330 --> 00:15:35,590

Holy Smokes, oh my gosh!

205

00:15:35,590 --> 00:15:42,900

Absolutely fascinating!

206

00:15:42,900 --> 00:15:57,510

Let's see another one.

207

00:15:57,510 --> 00:16:03,630

Oh, here's one from Peter Manley.

208

00:16:03,630 --> 00:16:10,000

"Would a balloon pop in space?"

209

00:16:10,000 --> 00:16:12,810

So this is interesting because if you had...a

balloon would pop if you blow it enough.

210

00:16:12,810 --> 00:16:14,450

Well a balloon will pop inside the Station...

211

00:16:14,450 --> 00:16:15,450

Right.

212

00:16:15,450 --> 00:16:20,020

because I've done that, right, because I brought some balloons for my kid's birthday celebration

213

00:16:20,020 --> 00:16:21,020

and...

214

00:16:21,020 --> 00:16:22,020

I didn't know that.

215

00:16:22,020 --> 00:16:23,720

I accidently popped one and they go "BANG!"

216

00:16:23,720 --> 00:16:25,240

Did you get in trouble for it?

217

00:16:25,240 --> 00:16:26,720

Did your kids complain about that?

218

00:16:26,720 --> 00:16:28,110

Did they know about it [laughs]?

219

00:16:28,110 --> 00:16:29,110

No, they didn't see it.

220

00:16:29,110 --> 00:16:30,110

They didn't know about it.

221

00:16:30,110 --> 00:16:31,110

But anyway, so...

222

00:16:31,110 --> 00:16:35,010

Here's dad doing his best to have a birthday party in space and by mistake one balloon

223

00:16:35,010 --> 00:16:36,010

goes and...

224

00:16:36,010 --> 00:16:37,010

Yeah.

225

00:16:37,010 --> 00:16:38,010

it ruined the whole party.

226

00:16:38,010 --> 00:16:39,010

Yeah.

227

00:16:39,010 --> 00:16:43,806

Oh, but it's neat to blow a balloon up and then let go of it and it goes [inaudible sound]...

228

00:16:43,806 --> 00:16:44,806

Oh, cool.

229

00:16:44,806 --> 00:16:45,806

Yeah.

230

00:16:45,806 --> 00:16:46,806

But that's all your...that's propulsion there.

231

00:16:46,806 --> 00:16:47,806

Yeah.

232

00:16:47,806 --> 00:16:48,806

It behaves differently than what you have on the ground?

233

00:16:48,806 --> 00:16:50,242

Yeah because it doesn't have the effects of gravity.

234

00:16:50,242 --> 00:16:51,242

So the only thing that's...

235

00:16:51,242 --> 00:16:52,242

It doesn't go in a parabolic arch...

236

00:16:52,242 --> 00:16:53,242

So it just...?

237

00:16:53,242 --> 00:16:54,242

it just goes and then it just stops.

238

00:16:54,242 --> 00:16:55,242

That's great!

239

00:16:55,242 --> 00:16:56,242

So you know it doesn't fall to the ground?

240

00:16:56,242 --> 00:16:57,970

Yeah, it doesn't fall to the ground.

241

00:16:57,970 --> 00:16:58,970

Alright, cool.

242

00:16:58,970 --> 00:17:01,220

But in the vacuum of space, like out of sight.

243

00:17:01,220 --> 00:17:04,891

I'm wondering yeah if that's what he means that because you have less...you have less

244

00:17:04,891 --> 00:17:05,900

pressure because it will expand.

245

00:17:05,900 --> 00:17:09,890

Yeah, well I think what will happen would be it would just keep expanding and expanding

246

00:17:09,890 --> 00:17:11,459

and expanding and then it would rupture on its own.

247

00:17:11,459 --> 00:17:12,459

Right.

248

00:17:12,459 --> 00:17:14,400

I think similar to like a bag of potato chips in an airplane.

249

00:17:14,400 --> 00:17:15,400

Yeah.

250

00:17:15,400 --> 00:17:17,980

When you go up on an airplane, you're at less pressure and the bag becomes inflated.

251

00:17:17,980 --> 00:17:18,980

Yeah, yeah.

252

00:17:18,980 --> 00:17:20,500

I wonder how...how quick do you think it would happen?

253

00:17:20,500 --> 00:17:21,500

I think it would happen pretty quick.

254

00:17:21,500 --> 00:17:22,500

I think it will happen real quick.

255

00:17:22,500 --> 00:17:23,500

Yeah, you would get an airlock.