
SPACEHAB

1
00:01:11,090 --> 00:01:13,290
Oh

2
00:01:13,300 --> 00:01:49,649
you

3
00:02:05,840 --> 00:01:57,219
good morning Atlantis sure came early

4
00:02:05,850 --> 00:03:08,650
Lisa seems early came early for us to

5
00:03:22,070 --> 00:03:19,240
excellent murn Atlantis nice after birth

6
00:03:44,820 --> 00:03:22,080
yeah we appreciated the K you peek into

7
00:03:48,490 --> 00:03:46,990
floating into view in this live

8
00:03:50,830 --> 00:03:48,500
television picture from the flight deck

9
00:03:52,830 --> 00:03:50,840
of Atlanta's commander Jim Weatherby now

10
00:03:55,030 --> 00:03:52,840
in his fourth flight into space

11
00:03:58,450 --> 00:03:55,040
Weatherbys last mission more than two

12
00:04:00,880 --> 00:03:58,460
years ago aboard discovery on the STS 63

13
00:04:02,860 --> 00:04:00,890

mission was the first to rendezvous a

14
00:04:05,500 --> 00:04:02,870
wid the MIR space station in which

15
00:04:07,750 --> 00:04:05,510
weather be guided discovery to within

16
00:04:09,670 --> 00:04:07,760
thirty seven feet of the mirror and a

17
00:04:12,430 --> 00:04:09,680
practice a dress rehearsal if you will

18
00:04:15,250 --> 00:04:12,440
for the eventual initial docking of the

19
00:04:17,920 --> 00:04:15,260
shuttle to the mirror two months or

20
00:04:21,069 --> 00:04:17,930
several months later by a commander

21
00:04:22,930 --> 00:04:21,079
who'd gibson he there is pilot Mike

22
00:04:24,640 --> 00:04:22,940
bloomfield about to make his way down

23
00:04:26,230 --> 00:04:24,650
into the mid deck of Atlantis as the

24
00:04:29,700 --> 00:04:26,240
astronauts continue to set up equipment

25
00:04:31,960 --> 00:04:29,710
in preparation for the day's activities

26
00:04:33,610 --> 00:04:31,970
ok it's tough to figure out how to get

27
00:04:36,640 --> 00:04:33,620
all seven of us up here on the App

28
00:04:38,230 --> 00:04:36,650
flight deck but it was even tougher to

29
00:04:40,270 --> 00:04:38,240
get all seven of us down the mid-deck

30
00:04:42,120 --> 00:04:40,280
after launch yesterday when we had all

31
00:04:45,040 --> 00:04:42,130
the equipment down there trying to

32
00:04:47,350 --> 00:04:45,050
recover after a great launch in a very

33
00:04:49,240 --> 00:04:47,360
short flight they want to stow

34
00:04:51,280 --> 00:04:49,250
everything it was amazing the troops

35
00:04:55,240 --> 00:04:51,290
here did a great job o is very impressed

36
00:04:57,700 --> 00:04:55,250
with bloomer our rookie on a cent it was

37
00:05:00,880 --> 00:04:57,710
an incredible ride he did a great job he

38
00:05:03,909 --> 00:05:00,890

had a couple of minor failures right off

39
00:05:07,750 --> 00:05:03,919
the launch pad which spits them out too

40
00:05:09,820 --> 00:05:07,760
much but it does cause us to really get

41
00:05:11,409 --> 00:05:09,830
our brains blown if they weren't flowing

42
00:05:14,020 --> 00:05:11,419
right hand lift up and he did a great

43
00:05:16,120 --> 00:05:14,030
job identifying the failures and

44
00:05:18,670 --> 00:05:16,130
deciding what to do about it which was

45
00:05:20,200 --> 00:05:18,680
basically nothing because Atlantis is

46
00:05:22,750 --> 00:05:20,210
such a great ship it turned out there

47
00:05:26,610 --> 00:05:22,760
were just do sir problems and mine are

48
00:05:29,080 --> 00:05:26,620
anomalies but it was a great ride I

49
00:05:31,330 --> 00:05:29,090
didn't look out by the window very much

50
00:05:33,010 --> 00:05:31,340
on my fourth wife Wilma looked at only a

51
00:05:35,020 --> 00:05:33,020
couple of times because he was really

52
00:05:39,400 --> 00:05:35,030
doing his systems work he saw a couple

53
00:05:44,290 --> 00:05:39,410
of interesting things around SRB Sep it

54
00:05:46,120 --> 00:05:44,300
really pushes you it's unbelievable that

55
00:05:51,790 --> 00:05:46,130
we're not halfway to Mars after this

56
00:05:53,500 --> 00:05:51,800
plane engines quit you know as a thanks

57
00:05:55,800 --> 00:05:53,510
to all the people who worked on the flow

58
00:05:57,960 --> 00:05:55,810
for Atlantis it is a great vehicle

59
00:06:00,240 --> 00:05:57,970
we got right to the orbit that we wanted

60
00:06:04,170 --> 00:06:00,250
to so we're on our way to mirror which

61
00:06:06,870 --> 00:06:04,180
we should be there by tomorrow a couple

62
00:06:10,200 --> 00:06:06,880
of burns today to improve our orbits and

63
00:06:12,240 --> 00:06:10,210

get closer and basically today we're

64
00:06:15,450 --> 00:06:12,250
just in the catch-up mode trying to pack

65
00:06:20,870 --> 00:06:15,460
everything that was out for launch and

66
00:06:25,290 --> 00:06:23,070
I'll say that all of the crew members

67
00:06:27,060 --> 00:06:25,300
i'm very happy was very impressed with

68
00:06:29,820 --> 00:06:27,070
their just charging around doing things

69
00:06:32,129 --> 00:06:29,830
and get anything sorted out everyone

70
00:06:34,379 --> 00:06:32,139
pretty much working standalone today

71
00:06:37,740 --> 00:06:34,389
will work as a team tomorrow everyone

72
00:06:41,219 --> 00:06:37,750
coordinated today we're all relatively

73
00:06:42,540 --> 00:06:41,229
separate once again thanks to the ascent

74
00:06:44,909 --> 00:06:42,550
team and the folks who worked on the

75
00:06:49,290 --> 00:06:44,919
processing of the vehicle and I'll turn

76
00:06:51,930 --> 00:06:49,300
it over to Scott now why just like to

77
00:06:53,820 --> 00:06:51,940
echo what Jim said thanks all the great

78
00:06:56,280 --> 00:06:53,830
troops that made all this possible it

79
00:07:00,390 --> 00:06:56,290
was really the greatest ride of my life

80
00:07:03,000 --> 00:07:00,400
real a ticket ride and we're all very

81
00:07:04,409 --> 00:07:03,010
busy on our first flight day but things

82
00:07:06,840 --> 00:07:04,419
are really coming together for the crew

83
00:07:09,510 --> 00:07:06,850
I just like to point out in this picture

84
00:07:19,440 --> 00:07:09,520
that too short Lawrence is really taller

85
00:07:20,969 --> 00:07:19,450
than I am in space yes everybody always

86
00:07:25,110 --> 00:07:20,979
wants to know are you nervous on the

87
00:07:26,550 --> 00:07:25,120
launch pad and I've been up we're busy

88
00:07:29,040 --> 00:07:26,560

enough or thinking about enough that

89
00:07:30,990 --> 00:07:29,050
we're not usually but in the last 15 30

90
00:07:35,219 --> 00:07:31,000
seconds you start start thinking about

91
00:07:38,850 --> 00:07:35,229
it and both wax bloomer Scott and Bob

92
00:07:40,020 --> 00:07:38,860
bloody up here literally I just thought

93
00:07:42,480 --> 00:07:40,030
about these guys that are just

94
00:07:44,100 --> 00:07:42,490
incredibly all pro at this and this is

95
00:07:46,969 --> 00:07:44,110
what professional astronauts are all

96
00:07:50,400 --> 00:07:46,979
about is pulling this off safely because

97
00:07:51,960 --> 00:07:50,410
those solids go really when the engines

98
00:07:53,850 --> 00:07:51,970
start Embling on the ground and the

99
00:07:56,060 --> 00:07:53,860
vehicle starts shaking around and you

100
00:07:58,950 --> 00:07:56,070
know there's a lot of moving parts here

101
00:08:01,200 --> 00:07:58,960
under G in a suit and I just thought

102
00:08:03,290 --> 00:08:01,210
about those guys up then you really feel

103
00:08:05,180 --> 00:08:03,300
safe so

104
00:08:08,300 --> 00:08:05,190
guys are just the best darn you should

105
00:08:20,149 --> 00:08:08,310
see him up here moving also it's it's

106
00:08:23,210 --> 00:08:20,159
impressive so thanks as the rookie it

107
00:08:25,369 --> 00:08:23,220
was a pretty impressive deal launched

108
00:08:27,230 --> 00:08:25,379
the most impressive thing is it started

109
00:08:29,659 --> 00:08:27,240
out dark as we're sitting on the pad but

110
00:08:33,139 --> 00:08:29,669
all the way uphill it was basically

111
00:08:36,079 --> 00:08:33,149
daylight in the fire behind us push this

112
00:08:38,120 --> 00:08:36,089
up in and right at SRB Sep you can see

113
00:08:40,490 --> 00:08:38,130

the SRBs come off and it's a very very

114
00:08:42,380 --> 00:08:40,500
impressive show I hope that looked just

115
00:08:43,940 --> 00:08:42,390
as neat on the ground and it's great to

116
00:08:48,410 --> 00:08:43,950
be up here with the great crew they're

117
00:08:50,030 --> 00:08:48,420
making life easy for me one new

118
00:08:51,410 --> 00:08:50,040
experience for me and my first flight

119
00:08:53,750 --> 00:08:51,420
this is the first time I've had to

120
00:08:57,170 --> 00:08:53,760
double space hab module and I did get to

121
00:08:58,940 --> 00:08:57,180
float down the tunnel past the volumes

122
00:09:00,769 --> 00:08:58,950
that we're going to dock with mere and

123
00:09:03,980 --> 00:09:00,779
it's a pretty long way so it was awfully

124
00:09:07,329 --> 00:09:03,990
fun floating down there the length of

125
00:09:09,650 --> 00:09:07,339
the tunnel we hope that more of these

126
00:09:11,569 --> 00:09:09,660
short visits with you where we get

127
00:09:28,400 --> 00:09:11,579
everybody up on camera and thanks a lot

128
00:09:33,360 --> 00:09:30,960
dr. David Wolfe I think it would be an

129
00:09:35,520 --> 00:09:33,370
understatement to say that the the whole

130
00:09:38,790 --> 00:09:35,530
world is watching and is very concerned

131
00:09:40,710 --> 00:09:38,800
about you going aboard the MIR are you

132
00:09:45,450 --> 00:09:40,720
the least bit concerned about going on

133
00:09:49,140 --> 00:09:45,460
here well you have to always take space

134
00:09:51,380 --> 00:09:49,150
flight seriously and where I'm concerned

135
00:09:54,090 --> 00:09:51,390
as I would be in any other space flight

136
00:09:57,000 --> 00:09:54,100
but the mirrors in excellent condition

137
00:10:00,530 --> 00:09:57,010
to my mind and I'm looking forward to

138
00:10:03,990 --> 00:10:00,540

being over there I noticed from your

139
00:10:05,820 --> 00:10:04,000
résumé tijera stunt pilot how would this

140
00:10:11,370 --> 00:10:05,830
mission compare being a mere with your

141
00:10:15,990 --> 00:10:11,380
stunt piloting experiences well I don't

142
00:10:17,940 --> 00:10:16,000
this stuff I do aerobatics and which are

143
00:10:19,620 --> 00:10:17,950
I don't consider that particularly

144
00:10:22,500 --> 00:10:19,630
dangerous as long as you do it carefully

145
00:10:24,840 --> 00:10:22,510
and don't cross the line and that's how

146
00:10:28,140 --> 00:10:24,850
I plan to conduct this mission also in a

147
00:10:31,860 --> 00:10:28,150
conservative fashion and will do it very

148
00:10:33,600 --> 00:10:31,870
safely commander Lawrence besides

149
00:10:36,180 --> 00:10:33,610
dropping off David Wolfe and picking up

150
00:10:37,740 --> 00:10:36,190
Michael Pfohl you're delivering some

151
00:10:40,440 --> 00:10:37,750
much-needed supplies to the mere

152
00:10:43,440 --> 00:10:40,450
including a new computer and drinking

153
00:10:45,030 --> 00:10:43,450
water Atlantis is supposed to dock with

154
00:10:46,829 --> 00:10:45,040
me or tomorrow what happens if the

155
00:10:54,420 --> 00:10:46,839
Amir's computer goes out before the

156
00:10:55,829 --> 00:10:54,430
shuttle docks with it I'm gonna pass

157
00:10:57,600 --> 00:10:55,839
that went off to the commander since

158
00:11:01,530 --> 00:10:57,610
he's been training for that scenario

159
00:11:03,390 --> 00:11:01,540
right up until launch okay good also say

160
00:11:05,430 --> 00:11:03,400
that we do have a long tunnel between

161
00:11:07,770 --> 00:11:05,440
our living quarters here and the

162
00:11:09,329 --> 00:11:07,780
Spacehab and I do stunts going down

163
00:11:10,770 --> 00:11:09,339

there and beaten when i'm trying to get

164
00:11:12,840 --> 00:11:10,780
from one place or another we left the

165
00:11:14,700 --> 00:11:12,850
new roles and flip sets or translating

166
00:11:17,700 --> 00:11:14,710
that's where we do our stunts in between

167
00:11:21,630 --> 00:11:17,710
modules if they lose their computer

168
00:11:24,120 --> 00:11:21,640
before we dock we will separate it for a

169
00:11:25,440 --> 00:11:24,130
safe distance away and allow them to

170
00:11:27,240 --> 00:11:25,450
reboot the computer they've been

171
00:11:28,950 --> 00:11:27,250
successful in doing that they practice

172
00:11:30,570 --> 00:11:28,960
that technique over the past couple of

173
00:11:31,710 --> 00:11:30,580
weeks and they are very good at

174
00:11:33,960 --> 00:11:31,720
rebooting it now

175
00:11:35,999 --> 00:11:33,970
getting it back up to speed here will

176
00:11:39,150 --> 00:11:36,009
regain control capability and then we

177
00:11:42,720 --> 00:11:39,160
will back maybe the next day if they

178
00:11:46,230 --> 00:11:42,730
lose it in close we can continue the one

179
00:11:50,730 --> 00:11:46,240
rule and the docking manually and Scott

180
00:11:53,490 --> 00:11:50,740
and Mike just matched the rates that we

181
00:11:55,650 --> 00:11:53,500
have with the mere and I continue to

182
00:11:58,679 --> 00:11:55,660
dock in village it continues to take

183
00:12:01,350 --> 00:11:58,689
ranging measurements with a laser gun

184
00:12:04,050 --> 00:12:01,360
that's similar to a police laser for

185
00:12:06,210 --> 00:12:04,060
ranging information so either way if it

186
00:12:08,189 --> 00:12:06,220
doesn't fail we'll have a successful

187
00:12:11,699 --> 00:12:08,199
docking hopefully if it does then they

188
00:12:13,050 --> 00:12:11,709

can reboot it commander Lawrence give us

189
00:12:19,319 --> 00:12:13,060
an idea of some of the supplies that

190
00:12:21,960 --> 00:12:19,329
you're going to be carrying up Tamir in

191
00:12:23,759 --> 00:12:21,970
addition to computer for the air and

192
00:12:26,790 --> 00:12:23,769
water for the near we're taking over a

193
00:12:29,790 --> 00:12:26,800
gyrodyne which will also improve the

194
00:12:31,740 --> 00:12:29,800
motion control system we're also taking

195
00:12:33,749 --> 00:12:31,750
over a great deal of scientific hardware

196
00:12:36,480 --> 00:12:33,759
that David will need to complete his

197
00:12:38,970 --> 00:12:36,490
mission the experiments are in a wide

198
00:12:41,730 --> 00:12:38,980
range of disciplines you will be doing

199
00:12:43,379 --> 00:12:41,740
some experiments that will help us

200
00:12:45,119 --> 00:12:43,389
better understand how the human body

201
00:12:48,030 --> 00:12:45,129
functions in weightlessness over long

202
00:12:49,949 --> 00:12:48,040
periods of time specifically studying

203
00:12:51,900 --> 00:12:49,959
the loss of calcium which is very

204
00:12:54,269 --> 00:12:51,910
important because it's very applicable

205
00:12:56,790 --> 00:12:54,279
to patients who are bedridden for a long

206
00:12:58,920 --> 00:12:56,800
period of time we're also going to

207
00:13:01,309 --> 00:12:58,930
continue a series of protein crystal

208
00:13:03,360 --> 00:13:01,319
growth experiments we have a handful

209
00:13:05,549 --> 00:13:03,370
experiments that we will be transferring

210
00:13:08,910 --> 00:13:05,559
once we docked and then we also have a

211
00:13:10,559 --> 00:13:08,920
very interesting experiment fact david

212
00:13:11,939 --> 00:13:10,569
has participated in this field for many

213
00:13:14,040 --> 00:13:11,949

years we're going to be growing some

214
00:13:16,530 --> 00:13:14,050
tissues on board some cancer tissues

215
00:13:18,530 --> 00:13:16,540
that we hope in the long run will help

216
00:13:22,799 --> 00:13:18,540
us better understand that disease and

217
00:13:25,799 --> 00:13:22,809
find a cure for it so there's a great

218
00:13:27,900 --> 00:13:25,809
great number of experiments that are

219
00:13:29,769 --> 00:13:27,910
going or an even larger amount of

220
00:13:34,119 --> 00:13:29,779
hardware for mere

221
00:13:35,530 --> 00:13:34,129
others of course good then personal

222
00:13:37,900 --> 00:13:35,540
equipment for day but we're gonna be

223
00:13:41,949 --> 00:13:37,910
very very busy transferring about 7,000

224
00:13:44,530 --> 00:13:41,959
pounds of equipment david wolfe a-- do

225
00:13:47,350 --> 00:13:44,540
you anticipate doing space walks while

226
00:13:53,970 --> 00:13:47,360
you're there trying to find the leak in

227
00:13:57,790 --> 00:13:53,980
the mirror I sure would like to we have

228
00:14:01,569 --> 00:13:57,800
trained extensively for both say a group

229
00:14:03,579 --> 00:14:01,579
of scientific space walks and two to

230
00:14:05,230 --> 00:14:03,589
repair to repair work in various

231
00:14:07,989 --> 00:14:05,240
scenarios but we'll have to watch that

232
00:14:10,269 --> 00:14:07,999
as it unfolds of course we have Pablo

233
00:14:12,639 --> 00:14:10,279
and anatoly who are up there extremely

234
00:14:15,100 --> 00:14:12,649
capable cosmonauts so I'll be happy to

235
00:14:16,929 --> 00:14:15,110
help them from inside also do you think

236
00:14:19,989 --> 00:14:16,939
that the problems with the mere have

237
00:14:22,900 --> 00:14:19,999
been blown out of proportion David well

238
00:14:24,850 --> 00:14:22,910

not in the minds of those of us working

239
00:14:27,129 --> 00:14:24,860
in the space program both the Americans

240
00:14:28,150 --> 00:14:27,139
and the Russians because we don't tend

241
00:14:30,009 --> 00:14:28,160
to think that they're out of proportion

242
00:14:33,179 --> 00:14:30,019
we don't think that they're big failures

243
00:14:36,670 --> 00:14:33,189
some of them of course were the fire was

244
00:14:38,799 --> 00:14:36,680
very dangerous for about several minutes

245
00:14:41,230 --> 00:14:38,809
but once it was taken care of then there

246
00:14:43,360 --> 00:14:41,240
there is no more danger in the and the

247
00:14:46,600 --> 00:14:43,370
decompression of course was a short time

248
00:14:49,389 --> 00:14:46,610
event but after they isolated the leak

249
00:14:52,780 --> 00:14:49,399
within about three minutes doing a great

250
00:14:55,059 --> 00:14:52,790
job as a crew then the danger has passed

251
00:14:57,460 --> 00:14:55,069
and so we go about our business to try

252
00:14:59,710 --> 00:14:57,470
to fix problems and ensure that they

253
00:15:02,439 --> 00:14:59,720
don't happen again we don't dwell on the

254
00:15:04,629 --> 00:15:02,449
failures other than to make sure that we

255
00:15:05,949 --> 00:15:04,639
do everything we can to make sure that

256
00:15:07,900 --> 00:15:05,959
they don't happen again and we improve

257
00:15:09,999 --> 00:15:07,910
our redundancy in the future design of

258
00:15:11,470 --> 00:15:10,009
the International Space Station they may

259
00:15:13,030 --> 00:15:11,480
be blown out of proportion other

260
00:15:15,669 --> 00:15:13,040
people's minds but those of us working

261
00:15:20,679 --> 00:15:15,679
in the program don't really see it that

262
00:15:21,910 --> 00:15:20,689
way okay bill already and in fact in

263
00:15:23,650 --> 00:15:21,920

case you guys are wondering what these

264
00:15:26,019 --> 00:15:23,660
big blocks are floating around here

265
00:15:27,999 --> 00:15:26,029
these are pieces of the odometer which

266
00:15:31,269 --> 00:15:28,009
we're having the process of setting up

267
00:15:33,460 --> 00:15:31,279
while we're doing other things a copy

268
00:15:37,119 --> 00:15:33,470
Dave we're two minutes to the z OE and

269
00:15:39,900 --> 00:15:37,129
we'll pick you back up at 1833 now

270
00:15:42,579 --> 00:15:39,910
having gotten that out of the way let's

271
00:15:43,269 --> 00:15:42,589
see what we see looks like you have is

272
00:15:45,699 --> 00:15:43,279
the

273
00:15:48,489 --> 00:15:45,709
Alice unbalanced you got a free-floating

274
00:15:51,280 --> 00:15:48,499
cable coming out of one end now is one

275
00:15:56,379 --> 00:15:51,290
of the ends at the other end of the

276
00:16:03,249 --> 00:15:56,389
cable connected to the PDF yes they can

277
00:16:06,610 --> 00:16:03,259
connected these two join together and go

278
00:16:11,309 --> 00:16:06,620
back to a white cable to the P dip one

279
00:16:14,619 --> 00:16:11,319
says the open one says TV IP video cable

280
00:16:24,309 --> 00:16:14,629
and the other one is a downlink balanced

281
00:16:27,100 --> 00:16:24,319
unbalanced TV video cable and David do

282
00:16:33,069 --> 00:16:27,110
you know if you are located the actual

283
00:16:35,350 --> 00:16:33,079
ssv box itself they'll have it yeah

284
00:16:38,530 --> 00:16:35,360
that's a completely separate box it's

285
00:16:41,799 --> 00:16:38,540
got a number of LEDs on it it should be

286
00:16:44,619 --> 00:16:41,809
powered it's got a DC utility power

287
00:16:50,049 --> 00:16:44,629
cable or PG SC power cable that goes

288
00:16:53,559 --> 00:16:50,059

into it the other cable to that box also

289
00:17:00,329 --> 00:16:53,569
comes out of the PD panel out of the J

290
00:17:06,520 --> 00:17:00,339
107 port we found it bill got it here

291
00:17:11,350 --> 00:17:06,530
Thanks and here's and roll cipa to you

292
00:17:18,520 --> 00:17:11,360
now let us know see Adam and we've got

293
00:17:20,559 --> 00:17:18,530
it ok what you see of course is my

294
00:17:23,199 --> 00:17:20,569
navigator Scott Berezovsky on the left

295
00:17:25,659 --> 00:17:23,209
side in the foreground of the camera

296
00:17:28,230 --> 00:17:25,669
closest to the camera and would the

297
00:17:30,700 --> 00:17:28,240
vanity top sitting on the light side

298
00:17:34,120 --> 00:17:30,710
cast in the cockpit closest to the

299
00:17:36,250 --> 00:17:34,130
camera Mike will fields in the pilot

300
00:17:40,240 --> 00:17:36,260
seat up on the right and I'm in the left

301
00:17:42,760 --> 00:17:40,250
side you can see the checklists and fun

302
00:17:44,620 --> 00:17:42,770
with the xenos lamps illuminating a

303
00:17:46,110 --> 00:17:44,630
portion of Mike's checklist across the

304
00:17:50,580 --> 00:17:46,120
three CRT's

305
00:17:52,380 --> 00:17:50,590
I think we've already had the access arm

306
00:17:54,600 --> 00:17:52,390
retract and here comes main engine

307
00:17:58,560 --> 00:17:54,610
ignition and in six seconds later you'll

308
00:18:00,600 --> 00:17:58,570
see SRB ignition notice the light show

309
00:18:03,480 --> 00:18:00,610
and the violence as we go uphill I don't

310
00:18:05,910 --> 00:18:03,490
recall I don't remember it being this

311
00:18:07,980 --> 00:18:05,920
much vibration because we're

312
00:18:11,870 --> 00:18:07,990
concentrating a course on

313
00:18:18,180 --> 00:18:14,610

in other systems things you see is gone

314
00:18:24,060 --> 00:18:18,190
through two displays looking at the high

315
00:18:27,330 --> 00:18:24,070
sensor that we had on the fuel cell of

316
00:18:29,430 --> 00:18:27,340
course muttering for stage steering

317
00:18:30,930 --> 00:18:29,440
performance which was a new thing on

318
00:18:38,190 --> 00:18:30,940
this way where we had first stage

319
00:18:40,799 --> 00:18:38,200
guidance first hearing which of course

320
00:18:43,470 --> 00:18:40,809
worked as advertised he can see a light

321
00:18:48,480 --> 00:18:43,480
show out the front windows as we get

322
00:18:51,330 --> 00:18:48,490
higher into the thinner atmosphere the

323
00:18:53,970 --> 00:18:51,340
plume expands and we're still chowing

324
00:18:55,950 --> 00:18:53,980
around in a cloud of stuff that gets

325
00:18:57,360 --> 00:18:55,960
eliminated in front of us and you see

326
00:19:01,110 --> 00:18:57,370
that out the window it pretty much is

327
00:19:06,510 --> 00:19:01,120
like daytime even though of course we

328
00:19:09,290 --> 00:19:06,520
lost at ten thirty four in the night you

329
00:19:11,580 --> 00:19:09,300
see the seats vibrating as we do a pill

330
00:19:14,880 --> 00:19:11,590
starts at about one g vertical

331
00:19:26,530 --> 00:19:14,890
acceleration and liftoff bill to about 3

332
00:19:31,090 --> 00:19:28,450
and he can see Mike pointing at

333
00:19:32,910 --> 00:19:31,100
analyzing the assayer that we had with

334
00:19:35,470 --> 00:19:32,920
the scissor and we also had the other

335
00:19:41,710 --> 00:19:35,480
anomalous water spray boiler sensor

336
00:19:43,990 --> 00:19:41,720
indication we look at that briefly and

337
00:19:49,750 --> 00:19:44,000
of course Mary isn't pelvis on gog to

338
00:19:51,280 --> 00:19:49,760

the upper right cathode ray tubes and

339
00:19:53,020 --> 00:19:51,290
here we are getting ready for SRB

340
00:19:56,580 --> 00:19:53,030
separation and notice the light show

341
00:20:01,300 --> 00:19:56,590
that you see here it's pretty incredible

342
00:20:04,060 --> 00:20:01,310
the solids are separated with rockets on

343
00:20:05,590 --> 00:20:04,070
the side of each salad that pushes the

344
00:20:07,180 --> 00:20:05,600
solid rocket boosters away from the

345
00:20:10,090 --> 00:20:07,190
vehicle so that we can continue to

346
00:20:13,020 --> 00:20:10,100
accelerate uphill using the fuel in the

347
00:20:17,040 --> 00:20:13,030
external tank and the three main engines

348
00:20:19,150 --> 00:20:17,050
the fellows are separated jettisoned and

349
00:20:22,170 --> 00:20:19,160
parachutes open in their jobs into the

350
00:20:29,680 --> 00:20:22,180
Atlantic Ocean picked up with ships and

351
00:20:35,830 --> 00:20:29,690
refurbished yes SRB Sep we talked to

352
00:20:38,950 --> 00:20:35,840
them raise our visors as we approach my

353
00:20:41,110 --> 00:20:38,960
25 mike is concentrating more and more

354
00:20:42,700 --> 00:20:41,120
on the engines and there's main engine

355
00:20:45,730 --> 00:20:42,710
cutoff and you see we instantly

356
00:20:51,100 --> 00:20:45,740
decelerate 20 times the force of gravity

357
00:20:53,890 --> 00:20:51,110
and we're immediately weightless within

358
00:20:55,870 --> 00:20:53,900
a few seconds the external tank tops off

359
00:20:58,270 --> 00:20:55,880
of the vehicle and it chops into the

360
00:21:00,250 --> 00:20:58,280
ocean and there are the Jets firing and

361
00:21:03,490 --> 00:21:00,260
the pyrotechnics that separate the

362
00:21:09,340 --> 00:21:03,500
external tank we are traveling in

363
00:21:11,590 --> 00:21:09,350

orbital speed in a cloud of residue from

364
00:21:15,100 --> 00:21:11,600
the Jets and as the Jets fire for

365
00:21:17,320 --> 00:21:15,110
attitude control you can see them the

366
00:21:22,120 --> 00:21:17,330
light bouncing off of the haze that's

367
00:21:25,370 --> 00:21:22,130
around us in it it flashes like

368
00:21:27,350 --> 00:21:25,380
had a pretty good initiation into the

369
00:21:29,150 --> 00:21:27,360
spaceflight business on his first flight

370
00:21:31,700 --> 00:21:29,160
with the two tires right off the launch

371
00:21:34,040 --> 00:21:31,710
pad which were relatively minor but yet

372
00:21:36,080 --> 00:21:34,050
to mess no alarm rings and and it gets

373
00:21:38,860 --> 00:21:36,090
your attention right a textile tank

374
00:21:43,730 --> 00:21:38,870
separation he had his third failure

375
00:21:46,400 --> 00:21:43,740
manifold left 3d a jet on the left side

376
00:21:48,560 --> 00:21:46,410
of the vehicle the third manifold that

377
00:21:51,910 --> 00:21:48,570
is pointed in the down direction that

378
00:21:57,500 --> 00:21:51,920
helps the tail go up if we find that jet

379
00:22:00,320 --> 00:21:57,510
failed and that rings the caution and

380
00:22:04,970 --> 00:22:00,330
warning system and he analyzed that

381
00:22:07,720 --> 00:22:04,980
correctly and one of the things the

382
00:22:10,010 --> 00:22:07,730
vehicle does is dump the residual

383
00:22:12,350 --> 00:22:10,020
propellant from the vehicle out through

384
00:22:16,040 --> 00:22:12,360
the main engines and that takes a couple

385
00:22:17,810 --> 00:22:16,050
of minutes after main engine cutoff and

386
00:22:20,750 --> 00:22:17,820
it is slightly propulsive even though

387
00:22:23,540 --> 00:22:20,760
the propellant is not ignited or on fire

388
00:22:25,820 --> 00:22:23,550

that comes out of the vehicle it is mass

389
00:22:29,570 --> 00:22:25,830
flow and so it does accelerate us a

390
00:22:32,240 --> 00:22:29,580
little bit faster it also cut wants to

391
00:22:34,070 --> 00:22:32,250
cause the vehicle to change its attitude

392
00:22:35,900 --> 00:22:34,080
or pitch a little bit and so the Jets

393
00:22:39,290 --> 00:22:35,910
are firing here and you see them again

394
00:22:41,990 --> 00:22:39,300
flashing every time to jet fires to

395
00:22:43,850 --> 00:22:42,000
maintain proper attitude of the vehicle

396
00:22:47,600 --> 00:22:43,860
which by the way is upside down relative

397
00:22:49,130 --> 00:22:47,610
to the earth but we don't think about