
OVHD
FWD
DECK

1
00:00:41,030 --> 00:00:39,990
engine start six

2
00:00:41,990 --> 00:00:41,040
five

3
00:00:43,030 --> 00:00:42,000
four

4
00:00:45,430 --> 00:00:43,040
three

5
00:00:47,750 --> 00:00:45,440
two one

6
00:00:49,990 --> 00:00:47,760
booster ignition and liftoff of the

7
00:00:52,549 --> 00:00:50,000
maiden voyage of endeavor on a satellite

8
00:00:55,189 --> 00:00:52,559
rescue mission

9
00:00:57,590 --> 00:00:55,199
for the past two decades space shuttle

10
00:00:59,910 --> 00:00:57,600
endeavour the youngest vehicle in nasa's

11
00:01:02,229 --> 00:00:59,920
shuttle fleet has symbolically carried

12
00:01:24,630 --> 00:01:02,239
the torch for challenger the orbiter it

13
00:01:28,950 --> 00:01:26,630

nasa is preparing for the final flight

14
00:01:30,870 --> 00:01:28,960
of endeavour a trip to the international

15
00:01:32,870 --> 00:01:30,880
space station during a time frame in

16
00:01:35,270 --> 00:01:32,880
which astronauts and cosmonauts are

17
00:01:37,270 --> 00:01:35,280
celebrating the 50th anniversaries of

18
00:01:40,069 --> 00:01:37,280
the first human space flight by yuri

19
00:01:42,550 --> 00:01:40,079
gagarin and the first american space

20
00:01:44,630 --> 00:01:42,560
flight by alan shepard as well as the

21
00:01:48,950 --> 00:01:44,640
30th anniversary of the first space

22
00:01:51,590 --> 00:01:48,960
shuttle flight sts-1 columbia

23
00:01:53,350 --> 00:01:51,600
this historic 25th flight of endeavour

24
00:01:55,830 --> 00:01:53,360
will include delivery of the alpha

25
00:01:57,990 --> 00:01:55,840
magnetic spectrometer a unique

26
00:02:00,310 --> 00:01:58,000
instrument that is hoped to unveil clues

27
00:02:02,950 --> 00:02:00,320
to the origin of our universe as it

28
00:02:05,350 --> 00:02:02,960
searches for antimatter dark matter and

29
00:02:14,390 --> 00:02:05,360
exotic cosmic particles from the space

30
00:02:19,110 --> 00:02:17,110
when endeavor launches on nasa's 36th

31
00:02:22,470 --> 00:02:19,120
mission to the iss

32
00:02:24,309 --> 00:02:22,480
the sts-134 crew of six astronauts will

33
00:02:26,309 --> 00:02:24,319
begin a mission to stock the station

34
00:02:28,790 --> 00:02:26,319
with spare parts and a world-class

35
00:02:30,790 --> 00:02:28,800
stellar research instrument just months

36
00:02:31,830 --> 00:02:30,800
before the shuttle program comes to an

37
00:02:36,229 --> 00:02:31,840
end

38
00:02:39,190 --> 00:02:36,239

magnetic spectrometer 2 and the express

39
00:02:40,949 --> 00:02:39,200
logistics carrier 3 to the station

40
00:02:43,509 --> 00:02:40,959
this will also be the first shuttle

41
00:02:45,910 --> 00:02:43,519
flight to conduct a re-rendezvous but

42
00:02:47,750 --> 00:02:45,920
not docked to the space station to test

43
00:02:49,589 --> 00:02:47,760
the performance of new navigation

44
00:02:52,229 --> 00:02:49,599
sensors designed for the orion

45
00:02:54,470 --> 00:02:52,239
spacecraft

46
00:02:56,550 --> 00:02:54,480
during four scheduled space walks

47
00:02:58,869 --> 00:02:56,560
endeavour's crew will conduct the last

48
00:03:01,589 --> 00:02:58,879
spacewalks by shuttle crew members to

49
00:03:11,350 --> 00:03:01,599
prepare the iss for its next decade of

50
00:03:14,790 --> 00:03:12,949
i've flown on endeavor before so i'm

51
00:03:16,790 --> 00:03:14,800
excited to fly on it again and my

52
00:03:18,630 --> 00:03:16,800
brother's flown on endeavor navy captain

53
00:03:21,670 --> 00:03:18,640
mark kelly is the commander of

54
00:03:23,750 --> 00:03:21,680
endeavour's crew of six astronauts

55
00:03:27,910 --> 00:03:23,760
he flew on endeavour as the pilot of his

56
00:03:30,789 --> 00:03:27,920
first space flight sts-108 in 2001.

57
00:03:33,030 --> 00:03:30,799
in january 2011 kelly's wife

58
00:03:34,949 --> 00:03:33,040
congresswoman gabrielle giffords was

59
00:03:37,589 --> 00:03:34,959
critically wounded during a community

60
00:03:40,309 --> 00:03:37,599
outreach event in tucson arizona

61
00:03:42,070 --> 00:03:40,319
kelly took a brief leave from the agency

62
00:03:44,070 --> 00:03:42,080
but returned to mission training a few

63
00:03:46,149 --> 00:03:44,080

weeks later

64
00:03:48,949 --> 00:03:46,159
the pilot of endeavour is retired air

65
00:03:51,190 --> 00:03:48,959
force colonel greg h johnson making his

66
00:03:53,509 --> 00:03:51,200
second space flight he will be at the

67
00:03:54,869 --> 00:03:53,519
controls as endeavour undocks from the

68
00:03:56,789 --> 00:03:54,879
station

69
00:03:58,550 --> 00:03:56,799
he flew on endeavor as the pilot of

70
00:04:00,710 --> 00:03:58,560
sts-123

71
00:04:02,949 --> 00:04:00,720
in 2008.

72
00:04:04,470 --> 00:04:02,959
air force colonel mike fink is mission

73
00:04:06,710 --> 00:04:04,480
specialist one

74
00:04:08,869 --> 00:04:06,720
a veteran of two long duration missions

75
00:04:10,710 --> 00:04:08,879
on the international space station he

76
00:04:12,470 --> 00:04:10,720
commanded the station complex on

77
00:04:14,550 --> 00:04:12,480
expedition 18.

78
00:04:18,150 --> 00:04:14,560
during this mission is first aboard the

79
00:04:20,390 --> 00:04:18,160
shuttle he will conduct three spacewalks

80
00:04:22,950 --> 00:04:20,400
mission specialist two is italian air

81
00:04:25,670 --> 00:04:22,960
force colonel roberto vittori twice

82
00:04:27,670 --> 00:04:25,680
flown aboard a russian soyuz as an iss

83
00:04:30,070 --> 00:04:27,680
visitor and part of the crew that

84
00:04:31,590 --> 00:04:30,080
delivered fresh soyuz spacecraft to the

85
00:04:33,749 --> 00:04:31,600
outpost

86
00:04:36,150 --> 00:04:33,759
as the last non-american astronaut

87
00:04:38,150 --> 00:04:36,160
scheduled to fly on the shuttle vittori

88
00:04:41,350 --> 00:04:38,160

will meet up with paolo nespoli on the

89
00:04:43,430 --> 00:04:41,360
iss for two italian astronauts on orbit

90
00:04:46,469 --> 00:04:43,440
at the same time

91
00:04:49,590 --> 00:04:46,479
dr drew feustel mission specialist 3 is

92
00:04:51,510 --> 00:04:49,600
making his first voyage to the iss after

93
00:04:53,270 --> 00:04:51,520
performing three spacewalks during

94
00:04:55,110 --> 00:04:53,280
sts-125

95
00:04:56,790 --> 00:04:55,120
the final hubble space telescope

96
00:04:58,710 --> 00:04:56,800
servicing mission

97
00:05:02,550 --> 00:04:58,720
on this flight he will serve as lead

98
00:05:04,870 --> 00:05:02,560
space walker for three additional evas

99
00:05:07,749 --> 00:05:04,880
mission specialist four is dr greg

100
00:05:09,510 --> 00:05:07,759
shamatoff he served as an iss flight

101
00:05:12,710 --> 00:05:09,520
engineer for six months during

102
00:05:14,950 --> 00:05:12,720
expeditions 17 and 18 returning to earth

103
00:05:22,070 --> 00:05:14,960
on endeavor he will perform two

104
00:05:25,590 --> 00:05:23,590
we've got a whole list of mission

105
00:05:26,550 --> 00:05:25,600
objectives probably 30 things on the

106
00:05:28,629 --> 00:05:26,560
list

107
00:05:31,510 --> 00:05:28,639
but the big objectives is to get the

108
00:05:33,110 --> 00:05:31,520
alpha magnetic spectrometer installed on

109
00:05:35,590 --> 00:05:33,120
the outside of the space station the

110
00:05:38,350 --> 00:05:35,600
alpha magnetic spectrometer 1 a

111
00:05:41,670 --> 00:05:38,360
simplified cosmic ray detector flew on

112
00:05:44,390 --> 00:05:41,680
sts-91 in june 1998.

113
00:05:45,990 --> 00:05:44,400

the ams 2 is a first of its kind

114
00:05:48,230 --> 00:05:46,000
instrument designed to study the

115
00:05:50,230 --> 00:05:48,240
fundamental nature of the universe and

116
00:05:52,469 --> 00:05:50,240
will allow us for the first time to

117
00:05:54,310 --> 00:05:52,479
search for antimatter and dark matter

118
00:05:57,270 --> 00:05:54,320
theorized to exist

119
00:06:00,309 --> 00:05:57,280
nobel physicist dr samuel ting leads the

120
00:06:01,430 --> 00:06:00,319
team of over 500 scientists from 16

121
00:06:05,510 --> 00:06:01,440
countries

122
00:06:07,909 --> 00:06:05,520
i started studying physics soon after i

123
00:06:11,350 --> 00:06:07,919
achieved my degree as a test pilot i

124
00:06:12,870 --> 00:06:11,360
went back and complete my degree and

125
00:06:14,790 --> 00:06:12,880
ironically

126
00:06:16,710 --> 00:06:14,800
my teacher was

127
00:06:19,350 --> 00:06:16,720
a professor batista

128
00:06:22,710 --> 00:06:19,360
that is the deputy chief of the ims

129
00:06:25,270 --> 00:06:22,720
experiment it may appear as a

130
00:06:27,749 --> 00:06:25,280
very strange coincidence that today i

131
00:06:29,990 --> 00:06:27,759
will be the one to take this unique

132
00:06:33,350 --> 00:06:30,000
piece of hardware take it from the bay

133
00:06:36,469 --> 00:06:33,360
of the shuttle and give it to install on

134
00:06:38,870 --> 00:06:36,479
the station on flight day four victorian

135
00:06:41,670 --> 00:06:38,880
feustel operating the shuttle arm will

136
00:06:44,469 --> 00:06:41,680
grapple the ams2 and hand it off to the

137
00:06:46,790 --> 00:06:44,479
greggs johnson and shamatoff operating

138
00:06:49,749 --> 00:06:46,800

the station arm for robotic installation

139
00:06:51,430 --> 00:06:49,759
onto the station's s3 truss

140
00:06:54,070 --> 00:06:51,440
the second of two components that

141
00:06:57,110 --> 00:06:54,080
endeavors crew will attach to the iss is

142
00:06:59,189 --> 00:06:57,120
the elc3 pallet the express logistics

143
00:07:02,950 --> 00:06:59,199
carrier three

144
00:07:03,629 --> 00:07:02,960
elc-3 similar to elc's 1 and 2 delivered

145
00:07:10,710 --> 00:07:03,639
on

146
00:07:13,430 --> 00:07:10,720
assembly 2 sasses s band antenna support

147
00:07:16,870 --> 00:07:13,440
assemblies and a spare arm for dexter

148
00:07:19,670 --> 00:07:16,880
the special purpose dextrous manipulator

149
00:07:22,230 --> 00:07:19,680
on flight day three victorian fink will

150
00:07:24,469 --> 00:07:22,240
unberth the elc-3 with the shuttle arm

151
00:07:26,950 --> 00:07:24,479
and hand it off to station arm operators

152
00:07:30,830 --> 00:07:26,960
shamatoff and johnson for installation

153
00:07:33,350 --> 00:07:30,840
on the station's p3 truss

154
00:07:36,629 --> 00:07:33,360
sts-134 will be the first shuttle flight

155
00:07:39,110 --> 00:07:36,639
to re-rendezvous with the iss and to fly

156
00:07:41,110 --> 00:07:39,120
a rendezvous trajectory to mimic orion's

157
00:07:43,510 --> 00:07:41,120
trajectory

158
00:07:46,309 --> 00:07:43,520
the purpose of storm sensor test for

159
00:07:48,309 --> 00:07:46,319
orion relnav risk mitigation is to

160
00:07:50,629 --> 00:07:48,319
evaluate the performance of orion

161
00:07:52,550 --> 00:07:50,639
relative navigation sensors for future

162
00:07:55,110 --> 00:07:52,560
spacecraft

163
00:07:57,589 --> 00:07:55,120

while kelly is flying endeavor feustel

164
00:07:59,990 --> 00:07:57,599
will monitor storm sensors from a laptop

165
00:08:02,469 --> 00:08:00,000
on the flight deck during rendezvous

166
00:08:05,589 --> 00:08:02,479
undocking and the re-rendezvous after

167
00:08:07,589 --> 00:08:05,599
the traditional iss fly around

168
00:08:09,589 --> 00:08:07,599
endeavour will pull away from station

169
00:08:11,909 --> 00:08:09,599
and execute several maneuvers before

170
00:08:13,749 --> 00:08:11,919
approaching on a different trajectory to

171
00:08:16,550 --> 00:08:13,759
allow the storm vision navigation

172
00:08:18,469 --> 00:08:16,560
sensors to gather data

173
00:08:21,749 --> 00:08:18,479
although endeavour will not actually

174
00:08:25,909 --> 00:08:21,759
re-dock with iss it will fly to a close

175
00:08:28,469 --> 00:08:25,919
approach of 1044 feet below and 300 feet

176
00:08:30,629 --> 00:08:28,479
behind the station before executing a

177
00:08:33,190 --> 00:08:30,639
third separation burn and departing

178
00:08:34,709 --> 00:08:33,200
station for the final time when we come

179
00:08:36,389 --> 00:08:34,719
up back in front of the space station

180
00:08:37,750 --> 00:08:36,399
again we're then going to do these

181
00:08:40,790 --> 00:08:37,760
series of burns where we're going to

182
00:08:43,909 --> 00:08:40,800
fall behind the space station you know a

183
00:08:46,870 --> 00:08:43,919
couple hundred thousand feet

184
00:08:48,870 --> 00:08:46,880
and then we're going to come back in

185
00:08:50,710 --> 00:08:48,880
doing a profile that's actually quite

186
00:08:57,590 --> 00:08:50,720
similar to what apollo used for

187
00:09:01,750 --> 00:08:58,430
during

188
00:09:03,910 --> 00:09:01,760

sts-134 feistel fink and shamatov will

189
00:09:06,150 --> 00:09:03,920
take turns stepping outside the hatch

190
00:09:09,030 --> 00:09:06,160
for four scheduled spacewalks

191
00:09:11,590 --> 00:09:09,040
eva one on flight day five focuses on

192
00:09:13,350 --> 00:09:11,600
missy's materials international space

193
00:09:15,350 --> 00:09:13,360
station experiments

194
00:09:19,190 --> 00:09:15,360
feustel and shamatof will return the

195
00:09:21,190 --> 00:09:19,200
missy 7a and 7b pallets from the elc-2

196
00:09:22,790 --> 00:09:21,200
and transfer missy 8 to the same

197
00:09:24,310 --> 00:09:22,800
location

198
00:09:25,269 --> 00:09:24,320
the idea is to expose these things to

199
00:09:26,790 --> 00:09:25,279
the

200
00:09:29,990 --> 00:09:26,800
harsh environment of space for a long

201
00:09:32,389 --> 00:09:30,000
period and see what happens for eva 2 on

202
00:09:34,150 --> 00:09:32,399
flight day 7 fink and feustel will

203
00:09:36,790 --> 00:09:34,160
refill one of the station's port

204
00:09:38,790 --> 00:09:36,800
radiators with ammonia they will also

205
00:09:42,230 --> 00:09:38,800
clean and lubricate the station's port

206
00:09:45,590 --> 00:09:42,240
sarge the solar array rotary joint

207
00:09:47,750 --> 00:09:45,600
prior to eva3 voystel and fink will test

208
00:09:50,070 --> 00:09:47,760
a new protocol combining the airlock

209
00:09:52,870 --> 00:09:50,080
campout pre-breathe the exercise

210
00:09:56,550 --> 00:09:52,880
pre-breathe and the spacesuit itself

211
00:09:59,750 --> 00:09:56,560
we were introduced to a pre-breathe

212
00:10:01,910 --> 00:09:59,760
option uh by mike earnhardt uh

213
00:10:04,389 --> 00:10:01,920

an astronaut in the core and it's called

214
00:10:08,550 --> 00:10:04,399
the in-suit light exercise pre-breathe

215
00:10:11,190 --> 00:10:08,560
protocol we call it aisle isle for eva3

216
00:10:13,509 --> 00:10:11,200
on flight day nine feustel and fink will

217
00:10:16,550 --> 00:10:13,519
install a power and data grapple fixture

218
00:10:18,710 --> 00:10:16,560
for the station arm on the zaria module

219
00:10:20,790 --> 00:10:18,720
they will also run two y cables for

220
00:10:23,990 --> 00:10:20,800
redundant power supply to the russian

221
00:10:26,949 --> 00:10:24,000
portion of the station

222
00:10:29,750 --> 00:10:26,959
during eva four shamitof and fink will

223
00:10:31,750 --> 00:10:29,760
transfer and install the obss the

224
00:10:34,470 --> 00:10:31,760
shuttle arms extension boom to the

225
00:10:43,590 --> 00:10:34,480
station's s-1 truss for potential future

226
00:10:46,949 --> 00:10:45,509
we have come very far in the last 50

227
00:10:49,430 --> 00:10:46,959
years from not being able to fly in

228
00:10:51,110 --> 00:10:49,440
space to landing on the moon and

229
00:10:53,430 --> 00:10:51,120
building this incredible facility in

230
00:10:55,350 --> 00:10:53,440
orbit and routinely flying

231
00:10:56,949 --> 00:10:55,360
you know people up and down into low

232
00:10:58,870 --> 00:10:56,959
earth orbit it is amazing how much we've

233
00:11:01,269 --> 00:10:58,880
accomplished in 50 years and it took so

234
00:11:02,790 --> 00:11:01,279
many people to make all that possible

235
00:11:04,710 --> 00:11:02,800
it's an unbelievable honor to kind of be

236
00:11:08,710 --> 00:11:04,720
the representative of that generation of

237
00:11:11,829 --> 00:11:08,720
dreamers for me we have a huge honor and

238
00:11:14,550 --> 00:11:11,839

responsibility to make this the best

239
00:11:16,829 --> 00:11:14,560
mission that we can to honor all of the

240
00:11:19,110 --> 00:11:16,839
engineers all the way from the

241
00:11:21,910 --> 00:11:19,120
pre-sts-1 uh

242
00:11:23,829 --> 00:11:21,920
the very beginning in the 1970s when we

243
00:11:26,150 --> 00:11:23,839
started to design the space shuttle all

244
00:11:27,590 --> 00:11:26,160
the effort the blood the sweat the tears

245
00:11:29,590 --> 00:11:27,600
that have gone into

246
00:11:31,190 --> 00:11:29,600
making the space shuttle program as

247
00:11:34,069 --> 00:11:31,200
wonderful as it has

248
00:11:36,870 --> 00:11:34,079
to to fly on the penultimate mission and