



1
00:00:42,760 --> 00:00:40,450
we are now in the final four hours of

2
00:00:45,869 --> 00:00:42,770
the countdown for the launch of space

3
00:00:49,420 --> 00:00:45,879
shuttle discovery on the sts 70 mission

4
00:00:59,500 --> 00:00:49,430
with launch occurring from pad B at

5
00:01:02,079 --> 00:00:59,510
launch complex 39 here we see a replay

6
00:01:06,359 --> 00:01:02,089
of the astronaut crew breakfast this

7
00:01:08,230 --> 00:01:06,369
morning which occurred about 5:15

8
00:01:12,440 --> 00:01:08,240
mission specialists

9
00:01:17,890 --> 00:01:14,570
she will be working with the deployment

10
00:01:21,020 --> 00:01:17,900
of the tracking and data relay satellite

11
00:01:28,880 --> 00:01:21,030
and our flight engineer mission

12
00:01:34,969 --> 00:01:28,890
specialist Nancy curry our commander for

13
00:01:39,429 --> 00:01:34,979

STS 70 Tom Hendricks and next to him his

14

00:01:45,639 --> 00:01:41,980

and mission specialist dr. Don Thomas

15

00:01:48,459 --> 00:01:45,649

who together with dr. Mary Ellen Weber

16

00:01:51,309 --> 00:01:48,469

will be working later today about six

17

00:01:56,139 --> 00:01:51,319

hours after launch to deploy the tigress

18

00:02:00,429 --> 00:01:56,149

ji tracking and data relay satellite and

19

00:02:16,110 --> 00:02:00,439

our STS 70 cake with the emblem there on

20

00:02:23,020 --> 00:02:20,949

meanwhile out a launch pad 39b the final

21

00:02:25,720 --> 00:02:23,030

inspection team has been going through

22

00:02:29,500 --> 00:02:25,730

their routine inspections looking for

23

00:02:32,080 --> 00:02:29,510

any buildup of ice on the external tank

24

00:02:34,150 --> 00:02:32,090

or any of the flight surfaces that could

25

00:02:39,100 --> 00:02:34,160

break off and strike space shuttle

26
00:02:41,559 --> 00:02:39,110
discovery during launch the ice team has

27
00:02:43,449 --> 00:02:41,569
a number of tools which includes a

28
00:02:44,949 --> 00:02:43,459
portable infrared scanner to obtain

29
00:02:47,080 --> 00:02:44,959
temperature measurements on the surface

30
00:02:50,970 --> 00:02:47,090
of the vehicle and it can spot any leaks

31
00:02:54,130 --> 00:02:50,980
in the external tank or the umbilicals

32
00:02:55,780 --> 00:02:54,140
and the team also takes this as a last

33
00:02:57,339 --> 00:02:55,790
opportunity to look at the pad to assure

34
00:02:59,650 --> 00:02:57,349
that there's no loose debris around

35
00:03:07,300 --> 00:02:59,660
which could also strike the orbiter at

36
00:03:18,840 --> 00:03:10,770
there we see our commander Tom Hendricks

37
00:03:29,229 --> 00:03:23,440
and pilot Kevin Kregel it's also ready

38
00:03:33,660 --> 00:03:29,239

to go Adam pleaded a fit check of the

39

00:03:38,040 --> 00:03:36,750

Kevin's first light and we'll be hear

40

00:03:46,140 --> 00:03:38,050

from him later on on what he's

41

00:03:50,699 --> 00:03:46,150

anticipating there his first mission and

42

00:03:53,210 --> 00:03:50,709

mission specialist dr. Don Thomas you

43

00:03:55,380 --> 00:03:53,220

will be busy later this afternoon

44

00:03:57,870 --> 00:03:55,390

working with the deployment of the

45

00:04:01,580 --> 00:03:57,880

tracking and data relay satellite which

46

00:04:06,680 --> 00:04:01,590

is main order of business for today

47

00:04:09,180 --> 00:04:06,690

there is dr. Mary Ellen Weber we'll be

48

00:04:11,280 --> 00:04:09,190

working with dr. Thomas later this

49

00:04:20,320 --> 00:04:11,290

afternoon on the deployment of the iust

50

00:04:25,960 --> 00:04:23,570

and our flight engineer mission

51

00:04:29,540 --> 00:04:25,970

specialist Nancy curry

52

00:04:38,500 --> 00:04:29,550

she'll be seated in the aft center seat

53

00:04:43,990 --> 00:04:40,940

and the suit up activities are about

54

00:04:46,070 --> 00:04:44,000

completed so that the crew will be

55

00:04:51,350 --> 00:04:46,080

headed out for the pad here in about

56

00:05:00,680 --> 00:04:55,350

now we can see the crew somewhat better

57

00:05:04,710 --> 00:05:02,940

this is shuttle launch control at

58

00:05:06,150 --> 00:05:04,720

t-minus three hours and holding we're

59

00:05:11,490 --> 00:05:06,160

preparing now to come out of the

60

00:05:14,100 --> 00:05:11,500

built-in hold in three two one and the

61

00:05:17,700 --> 00:05:14,110

clock is now at t-minus three hours and

62

00:05:19,380 --> 00:05:17,710

Counting all of our activities continue

63

00:05:21,090 --> 00:05:19,390

to be on schedule this morning we're not

64

00:05:26,010 --> 00:05:21,100

working any technical problems and the

65

00:05:27,870 --> 00:05:26,020

weather appears favorable and as we

66

00:05:30,240 --> 00:05:27,880

mentioned just a few moments ago the

67

00:05:31,530 --> 00:05:30,250

astronauts are just about to leave for

68

00:05:35,400 --> 00:05:31,540

the launch pad and will begin boarding

69

00:05:38,040 --> 00:05:35,410

discovery on time now at t-minus two

70

00:05:45,870 --> 00:05:38,050

hours 59 minutes 35 seconds and counting

71

00:05:47,640 --> 00:05:45,880

this is shuttle launch control this is

72

00:05:50,130 --> 00:05:47,650

shuttle launch control at t-minus two

73

00:05:53,040 --> 00:05:50,140

hours 56 minutes two seconds and

74

00:05:56,190 --> 00:05:53,050

counting and we see the astronauts have

75

00:05:58,820 --> 00:05:56,200

just left the suit up room our pilot

76
00:06:03,550 --> 00:05:58,830
Kevin Freegal with a good luck sign and

77
00:06:03,560 --> 00:06:14,680
astronaut support personnel

78
00:06:18,520 --> 00:06:16,750
and our activities right now are

79
00:06:20,350 --> 00:06:18,530
proceeding right to the managers our

80
00:06:23,800 --> 00:06:20,360
pilot or our commander Tom Hendricks

81
00:07:00,959 --> 00:06:23,810
pilot Kevin Kregel wishes specialist Don

82
00:07:00,969 --> 00:07:04,480
and there they go

83
00:07:10,130 --> 00:07:07,490
white room technicians are

84
00:07:11,960 --> 00:07:10,140
being advised now that the astronauts

85
00:07:43,530 --> 00:07:11,970
are leaving the crew quarters and to

86
00:07:51,550 --> 00:07:46,630
and here we see the astronauts now

87
00:07:53,740 --> 00:07:51,560
arriving at the 195-foot level the fixed

88
00:08:01,450 --> 00:07:53,750

service structure at had be walking over

89

00:08:08,530 --> 00:08:04,420

and some of the wait wait out on the

90

00:08:11,310 --> 00:08:08,540

orbiter access arm while other crew

91

00:08:14,140 --> 00:08:11,320

members are being assisted with their

92

00:08:16,570 --> 00:08:14,150

helmets and other attire so that it

93

00:08:21,850 --> 00:08:16,580

doesn't get too crowded the white room

94

00:08:54,440 --> 00:08:21,860

is not very large and of course Tom

95

00:09:00,210 --> 00:08:56,670

this is shuttle launch control at

96

00:09:02,190 --> 00:09:00,220

t-minus 2 hours 27 minutes 27 seconds

97

00:09:04,680 --> 00:09:02,200

and counting as we see Commander Tom

98

00:09:06,660 --> 00:09:04,690

Hendricks boarding space shuttle

99

00:09:35,949 --> 00:09:06,670

Discovery this is his third flight into

100

00:09:35,959 --> 00:09:50,760

and we see dr. Mary Ellen Webber

101
00:09:55,950 --> 00:09:53,830
and like Kevin Kregel she's also making

102
00:10:10,700 --> 00:09:55,960
her first

103
00:10:20,570 --> 00:10:13,650
pilot Kevin Kregel now preparing to

104
00:10:20,580 --> 00:10:35,380
come on Tom

105
00:10:42,750 --> 00:10:38,410
and we're seeing now mission specialists

106
00:10:42,760 --> 00:10:56,530
preparing for for boarding

107
00:11:02,960 --> 00:10:58,760
just in front here we see mission

108
00:11:05,570 --> 00:11:02,970
specialist Nancy curry being assistant

109
00:11:23,670 --> 00:11:05,580
with her flight crew equipment and she

110
00:11:30,460 --> 00:11:28,660
mr. MS one contract discovery Houston

111
00:11:36,639 --> 00:11:30,470
Donnelly have you loud and clear

112
00:12:12,670 --> 00:11:36,649
tell me you're the same and welcome

113
00:12:18,110 --> 00:12:15,950

copy that ass and in the meantime if you

114

00:12:21,800 --> 00:12:18,120

could perform your clothes out for

115

00:12:36,620 --> 00:12:21,810

flight pull your checklist please yes

116

00:12:39,320 --> 00:12:36,630

copies discovery Houston for to CDR and

117

00:12:46,910 --> 00:12:39,330

P ot boys check on air-to-ground - how

118

00:12:50,150 --> 00:12:46,920

do you read discovery Houston read you

119

00:13:24,269 --> 00:12:50,160

both loud and clear configured for air -

120

00:13:40,550 --> 00:13:37,810

you see CVP copy that and the hatch is

121

00:14:14,230 --> 00:13:40,560

being closed and sealed

122

00:14:21,119 --> 00:14:17,819

and here is Bob Cabana returning in the

123

00:14:24,369 --> 00:14:21,129

shuttle training aircraft

124

00:14:25,840 --> 00:14:24,379

he has been doing approaches to runway

125

00:14:28,239 --> 00:14:25,850

one-five at the Shuttle Landing Facility

126
00:14:36,100 --> 00:14:28,249
assessing those conditions and will be

127
00:14:37,929 --> 00:14:36,110
going up for another pass runway

128
00:14:39,790 --> 00:14:37,939
one-five has been designated as the

129
00:14:43,410 --> 00:14:39,800
runway we would use in the event of an

130
00:15:09,470 --> 00:14:43,420
emergency today which is a basically a

131
00:15:30,120 --> 00:15:12,929
Elte OTC particular fuel cell essential

132
00:15:39,980 --> 00:15:32,290
special buses are connected to fuel

133
00:15:39,990 --> 00:15:51,290
he lets us go for a repress

134
00:15:55,710 --> 00:15:54,030
and the orbiter access arm can be moved

135
00:15:57,750 --> 00:15:55,720
back into position around the hatch in

136
00:16:08,390 --> 00:15:57,760
about 30 seconds should an emergency

137
00:16:08,400 --> 00:16:23,240
t-minus seven minutes and Counting

138
00:16:29,180 --> 00:16:25,460

next milestone is the start of the

139

00:16:33,050 --> 00:16:29,190

auxiliary power units by pilot Kevin

140

00:16:35,210 --> 00:16:33,060

Kregel you'll flip three switches on the

141

00:16:58,580 --> 00:16:35,220

cockpit to start each of the three AP

142

00:17:14,510 --> 00:16:58,590

use and then work that's complete if you

143

00:17:32,270 --> 00:17:17,470

we may flight controls through their

144

00:17:37,250 --> 00:17:34,760

three main engines now being gibble all

145

00:18:01,160 --> 00:17:37,260

of these steering checks to assure that

146

00:18:01,170 --> 00:18:10,210

hurry now to attract the GOx beanie cap

147

00:18:20,330 --> 00:18:13,520

Elte clear caution and warning memory

148

00:18:30,510 --> 00:18:20,340

verify no unexpected errors t-minus two

149

00:18:38,590 --> 00:18:32,860

Carson whatever he's cleared no one

150

00:18:38,600 --> 00:18:52,889

and the gaseous oxygen vent hood which

151

00:19:20,680 --> 00:18:54,999

been our attraction under way on

152

00:19:20,690 --> 00:19:33,960

- 90 seconds

153

00:19:39,330 --> 00:19:36,090

sound suppression water system now being

154

00:19:44,489 --> 00:19:42,330

that's quantity of 300,000 gallons of

155

00:19:46,619 --> 00:19:44,499

water and the water tank at the pad

156

00:19:48,659 --> 00:19:46,629

which will flow at a rate of 900,000

157

00:19:56,890 --> 00:19:48,669

gallons a minute starting at t minus 16

158

00:20:01,240 --> 00:19:58,860

standing by for the handoff to

159

00:20:48,659 --> 00:20:01,250

Discovery's onboard flight computers at

160

00:21:04,240 --> 00:21:01,389

okay the result of the topic SP thank

161

00:21:19,960 --> 00:21:04,250

you our personnel at that clock will

162

00:21:29,180 --> 00:21:19,970

begin momentarily and we've had the

163

00:21:36,370 --> 00:21:33,240

sound suppression water system activated

164

00:21:47,450 --> 00:21:41,930

nine eight seven six five main engine

165

00:21:49,789 --> 00:21:47,460

ignition four three two one and liftoff

166

00:21:51,620 --> 00:21:49,799

of space shuttle discovery to complete

167

00:21:55,040 --> 00:21:51,630

NASA's constellation of tracking

168

00:22:01,560 --> 00:21:57,180

Houston now controlling the flight of

169

00:22:03,300 --> 00:22:01,570

discovery Roger roll discovery discovery

170

00:22:05,220 --> 00:22:03,310

completes the roll to place the shuttle

171

00:22:06,480 --> 00:22:05,230

and a heads down wings level position

172

00:22:12,710 --> 00:22:06,490

but he needn't have the net mind a

173

00:22:16,760 --> 00:22:15,200

27 seconds into the flight discoveries

174

00:22:18,590 --> 00:22:16,770

three liquid fuel main engines now

175

00:22:19,940 --> 00:22:18,600

throttling back in a three-step fashion

176

00:22:21,700 --> 00:22:19,950
to sixty-seven percent of rated

177

00:22:35,560 --> 00:22:21,710
performance to lessen the stress on the

178

00:22:39,190 --> 00:22:37,629
50 seconds into the flight the main

179

00:22:40,869 --> 00:22:39,200
engines now beginning to rev up once

180

00:22:42,580 --> 00:22:40,879
again to 104 percent of rated

181

00:22:44,710 --> 00:22:42,590
performance including the new block one

182

00:22:46,570 --> 00:22:44,720
engine all three main engines performing

183

00:22:48,219 --> 00:22:46,580
normally as are the three power

184

00:23:00,420 --> 00:22:48,229
producing fuel cells and Discovery's

185

00:23:00,430 --> 00:23:08,630
discovery Houston go at throttle up

186

00:23:12,440 --> 00:23:11,220
discovery now sixty-three thousand feet

187

00:23:15,090 --> 00:23:12,450
and altitude

188

00:23:16,590 --> 00:23:15,100

eight miles downrange all systems

189

00:23:18,330 --> 00:23:16,600

continue to function normally in the

190

00:23:31,730 --> 00:23:18,340

early stage of the fourth shuttle flight

191

00:23:41,299 --> 00:23:33,960

20 seconds left in first stage

192

00:23:46,410 --> 00:23:44,460

discovery approaching the 155 thousand

193

00:23:57,870 --> 00:23:46,420

foot mark and altitude some 26 miles

194

00:24:03,400 --> 00:24:00,280

booster officer confirms solid rocket

195

00:24:16,680 --> 00:24:03,410

booster separation discovery Houston

196

00:24:16,690 --> 00:24:34,390

Roger discovery we have a good picture

197

00:24:38,510 --> 00:24:36,380

discovery Houston the folks of Sunnyvale

198

00:24:44,620 --> 00:24:38,520

would like to know where that ice came

199

00:24:48,950 --> 00:24:47,030

it was difficult for us to tell her

200

00:24:52,160 --> 00:24:48,960

originated from the first time we saw it

201
00:24:55,750 --> 00:24:52,170
was just after the IUS cleared the bay

202
00:25:00,500 --> 00:24:55,760
and it could have come from around the

203
00:25:05,350 --> 00:25:00,510
back of the ASD understand that sounds

204
00:25:11,060 --> 00:25:08,480
yeah the circumference appeared to be

205
00:25:16,000 --> 00:25:11,070
very similar to the I us the cumference

206
00:25:35,909 --> 00:25:16,010
oh I see now the shape of the curve

207
00:25:39,940 --> 00:25:38,140
discovery we're about 90 seconds from

208
00:25:43,899 --> 00:25:39,950
teachers hand over we may lose the

209
00:25:47,529 --> 00:25:43,909
picture here shortly okay it looks like

210
00:25:52,659 --> 00:25:47,539
this shows about over it now we'd love

211
00:26:04,140 --> 00:25:52,669
more well we'll keep it coming

212
00:26:09,390 --> 00:26:06,570
tell me over here we all get may for

213
00:26:10,290 --> 00:26:09,400

your deploy Thompson and the commander's

214

00:26:12,930 --> 00:26:10,300

seat up front

215

00:26:16,170 --> 00:26:12,940

watching the ogre system stops in the

216

00:26:17,780 --> 00:26:16,180

back getting ready to do the step

217

00:26:21,810 --> 00:26:17,790

maneuver

218

00:26:24,660 --> 00:26:21,820

Nancy is Brittany the cameras and Dawn

219

00:26:26,880 --> 00:26:24,670

is over on the left-hand side control

220

00:26:29,100 --> 00:26:26,890

the IUS controls and Mary Ellen is over

221

00:26:34,140 --> 00:26:29,110

on the right-hand side my turn the iun

222

00:26:50,720 --> 00:26:34,150

system you could tell today that was a

223

00:26:56,270 --> 00:26:54,049

they come these are some shots with the

224

00:26:58,370 --> 00:26:56,280

camcorder of the deploy that you'll see

225

00:27:00,549 --> 00:26:58,380

this is a real team effort up here

226

00:27:03,260 --> 00:27:00,559

everybody was busy operating cameras

227

00:27:05,930 --> 00:27:03,270

flying the orbiter and deploying the

228

00:27:08,000 --> 00:27:05,940

satellite up up here so let's team up in

229

00:27:08,600 --> 00:27:08,010

another part and also big team effort on

230

00:27:10,310 --> 00:27:08,610

the ground

231

00:27:12,200 --> 00:27:10,320

we had people at white sands Sunnyvale

232

00:27:14,690 --> 00:27:12,210

all around the world helping to support

233

00:27:16,190 --> 00:27:14,700

the satellite deployed and we really

234

00:27:20,299 --> 00:27:16,200

appreciate the great help and support

235

00:27:23,450 --> 00:27:20,309

that made it possible today that's a

236

00:27:24,620 --> 00:27:23,460

gorgeous picture a discovery and all of

237

00:27:26,150 --> 00:27:24,630

you working together have put another

238

00:27:32,870 --> 00:27:26,160

big building block in the space

239

00:27:35,810 --> 00:27:32,880

infrastructure there you can see it's on

240

00:27:39,020 --> 00:27:35,820

its way it's just leaving the support

241

00:27:40,610 --> 00:27:39,030

equipment here and on its way out the

242

00:27:43,460 --> 00:27:40,620

geosynchronous orbit where we'll be

243

00:27:45,980 --> 00:27:43,470

supporting future mission space station

244

00:27:51,250 --> 00:27:45,990

freedom and the Hubble Space Telescope

245

00:28:00,740 --> 00:27:59,210

that's a beautiful deploy discovery so

246

00:28:06,730 --> 00:28:00,750

we're not nice and smooth we didn't see

247

00:28:11,870 --> 00:28:09,770

copy discovery that's interesting six

248

00:28:13,159 --> 00:28:11,880

years ago the I us put Galileo on the

249

00:28:15,680 --> 00:28:13,169

way to Jupiter and they just released

250

00:28:23,180 --> 00:28:15,690

their probe towards that planet last

251
00:28:25,039 --> 00:28:23,190
night and they only have a couple of

252
00:28:29,510 --> 00:28:25,049
shots but payload bay cameras of deploy

253
00:28:45,810 --> 00:28:29,520
there tom and discovery we see that very

254
00:29:01,399 --> 00:28:48,070
discovery we can see five phases and the

255
00:29:05,970 --> 00:29:04,529
Eustis WC a piece of debris there next

256
00:29:07,470 --> 00:29:05,980
to the satellite that was actually a

257
00:29:09,539 --> 00:29:07,480
piece of ice that are prepared to be

258
00:29:11,879 --> 00:29:09,549
about three foot long it went by the

259
00:29:14,460 --> 00:29:11,889
window previous to this view and we

260
00:29:18,749 --> 00:29:14,470
verified it was ice and it did break in

261
00:29:19,649 --> 00:29:18,759
a couple of pieces okay thanks discovery