
NASA

1
00:00:06,470 --> 00:00:04,390
t minus 16 seconds sound suppression

2
00:00:08,150 --> 00:00:06,480
water system has been activated

3
00:00:11,270 --> 00:00:08,160
protecting discovery in the launch pad

4
00:00:13,190 --> 00:00:11,280
from acoustical energy

5
00:00:14,549 --> 00:00:13,200
we have a go for main engine start t

6
00:00:15,509 --> 00:00:14,559
minus five

7
00:00:17,510 --> 00:00:15,519
four

8
00:00:19,109 --> 00:00:17,520
three two

9
00:00:21,349 --> 00:00:19,119
one

10
00:00:23,910 --> 00:00:21,359
booster ignition and liftoff of

11
00:00:26,390 --> 00:00:23,920
discovery hoisting harmony to the

12
00:00:28,710 --> 00:00:26,400
heavens and opening new gateways for

13
00:00:31,750 --> 00:00:28,720

international science discovery has

14
00:00:35,190 --> 00:00:31,760
cleared the tower

15
00:00:35,200 --> 00:00:38,389
roger roll discovery

16
00:00:42,069 --> 00:00:40,229
discovery's role maneuver is complete is

17
00:00:43,510 --> 00:00:42,079
now in a heads-down position on track

18
00:00:54,709 --> 00:00:43,520
for its flight to the international

19
00:00:59,750 --> 00:00:56,950
discovery seven miles downrange and

20
00:01:02,389 --> 00:00:59,760
altitude two statute miles

21
00:01:03,910 --> 00:01:02,399
flying at 600 miles per hour discovery's

22
00:01:05,509 --> 00:01:03,920
engines are throttling down as the

23
00:01:08,310 --> 00:01:05,519
orbiter passes through the area of

24
00:01:15,109 --> 00:01:08,320
maximum pressure on the vehicle

25
00:01:18,550 --> 00:01:16,789
discovery eight miles downrange from the

26
00:01:20,950 --> 00:01:18,560
kennedy space center an altitude of six

27
00:01:23,670 --> 00:01:20,960
statute miles flying at 900 miles per

28
00:01:23,680 --> 00:01:28,390
discovery houston go with throttle up

29
00:01:32,149 --> 00:01:30,710
throttle

30
00:01:34,950 --> 00:01:32,159
the three engines on board are

31
00:01:37,190 --> 00:01:34,960
throttling back up at liftoff the fully

32
00:01:39,350 --> 00:01:37,200
fueled shuttle boosters an external tank

33
00:01:41,350 --> 00:01:39,360
weighed four and a half million pounds

34
00:01:42,870 --> 00:01:41,360
the total thrust at launch was six

35
00:01:45,429 --> 00:01:42,880
million four hundred and twenty five

36
00:01:47,350 --> 00:01:45,439
thousand thousand pounds

37
00:01:49,670 --> 00:01:47,360
discovery now thirteen miles downrange

38
00:01:51,270 --> 00:01:49,680

at an altitude of thirteen statute miles

39
00:01:56,230 --> 00:01:51,280
flying at one thousand seven hundred

40
00:02:00,389 --> 00:01:58,149
all systems continue to function well

41
00:02:02,230 --> 00:02:00,399
three good main engines three good power

42
00:02:04,230 --> 00:02:02,240
generating fuel cells

43
00:02:08,229 --> 00:02:04,240
and three good auxiliary power units for

44
00:02:13,750 --> 00:02:10,630
now 24 miles downrange and an altitude

45
00:02:16,150 --> 00:02:13,760
23 statute miles flying at 2 700 miles

46
00:02:18,070 --> 00:02:16,160
per hour

47
00:02:20,070 --> 00:02:18,080
one minute 58 seconds into the flight

48
00:02:22,390 --> 00:02:20,080
standing by for burnout and separation

49
00:02:24,790 --> 00:02:22,400
of the solid rocket boosters

50
00:02:26,470 --> 00:02:24,800
combined the twin boosters provide 5.3

51
00:02:30,309 --> 00:02:26,480
million pounds of thrust to propel the

52
00:02:43,990 --> 00:02:31,830
booster officer here in mission control

53
00:02:49,430 --> 00:02:47,670
two minutes 25 seconds into the flight

54
00:02:50,869 --> 00:02:49,440
the propulsion officer here confirms

55
00:02:52,869 --> 00:02:50,879
that the orbital maneuvering system

56
00:02:55,910 --> 00:02:52,879
engines are firing providing discovery

57
00:02:58,229 --> 00:02:55,920
with an extra boost to orbit

58
00:03:00,949 --> 00:02:58,239
discovery now 58 miles downrange at an

59
00:03:04,630 --> 00:03:00,959
altitude of 40 statute miles flying at 3

60
00:03:12,229 --> 00:03:04,640
300 miles per hour

61
00:03:16,309 --> 00:03:14,229
discovery can reach in the event

62
00:03:17,910 --> 00:03:16,319
of a single engine failure however all

63
00:03:22,149 --> 00:03:17,920

three main engines are still operating

64
00:03:26,229 --> 00:03:23,750
three minutes five seconds into the

65
00:03:28,470 --> 00:03:26,239
flight discovered an altitude of 47

66
00:03:31,430 --> 00:03:28,480
statute miles 85 miles downrange from

67
00:03:42,869 --> 00:03:31,440
the kennedy space center flying at 3 800

68
00:03:46,869 --> 00:03:44,390
while continuing to go smoothly on

69
00:03:48,710 --> 00:03:46,879
discovery's climbed orbit on track for

70
00:03:58,470 --> 00:03:48,720
its link up with the international space

71
00:04:03,110 --> 00:04:00,149
three minutes and 40 seconds into the

72
00:04:06,149 --> 00:04:03,120
flight discovery now 124 miles downrange

73
00:04:14,309 --> 00:04:06,159
at an altitude 57 statute miles flying

74
00:04:14,319 --> 00:04:19,590
discovery houston negative return

75
00:04:19,600 --> 00:04:22,710
negative return

76
00:04:26,469 --> 00:04:24,790
discovery is now flying too high and too

77
00:04:28,710 --> 00:04:26,479
fast to return to the kennedy space

78
00:04:30,310 --> 00:04:28,720
center and the shuttle landing facility

79
00:04:31,909 --> 00:04:30,320
in the event of an engine failure

80
00:04:34,070 --> 00:04:31,919
however all three main engines still

81
00:04:36,670 --> 00:04:34,080
continuing to function well discovery at

82
00:04:39,110 --> 00:04:36,680
an altitude of 62 statute miles flying

83
00:04:41,110 --> 00:04:39,120
172 miles downrange from the kennedy

84
00:04:47,510 --> 00:04:41,120
space center at 5

85
00:04:51,030 --> 00:04:49,590
the orbital maneuvering system engines

86
00:04:52,950 --> 00:04:51,040
are continuing to function well with

87
00:05:03,270 --> 00:04:52,960
about four minutes left and that extra

88
00:05:07,270 --> 00:05:05,350

now four minutes and 45 seconds into the

89
00:05:08,950 --> 00:05:07,280
flight the environmental systems officer

90
00:05:10,790 --> 00:05:08,960
confirms that the flash evaporator

91
00:05:12,950 --> 00:05:10,800
system has been activated to provide

92
00:05:40,310 --> 00:05:12,960
cooling before the payload bay doors are

93
00:05:45,029 --> 00:05:42,230
five minutes 22 seconds in the flight

94
00:05:46,550 --> 00:05:45,039
discovery now 281 miles downrange from

95
00:05:49,270 --> 00:05:46,560
the kennedy space center

96
00:05:52,150 --> 00:05:49,280
discovery houston press to ato select

97
00:05:56,550 --> 00:05:52,160
estrus

98
00:06:03,189 --> 00:05:58,870
discovery can now reach a lower than

99
00:06:07,670 --> 00:06:06,230
copy single engine ops 3.

100
00:06:09,590 --> 00:06:07,680
discovery could now reach a lower than

101
00:06:11,270 --> 00:06:09,600
plan but a safe orbit on two engines

102
00:06:12,710 --> 00:06:11,280
should one fail but all three continuing

103
00:06:14,230 --> 00:06:12,720
to perform well

104
00:06:16,390 --> 00:06:14,240
the vehicle could also conduct a

105
00:06:28,230 --> 00:06:16,400
transatlantic abort landing on one

106
00:06:31,749 --> 00:06:30,150
six minutes and 10 seconds into the

107
00:06:34,230 --> 00:06:31,759
flight discovery's engines have been

108
00:06:35,510 --> 00:06:34,240
commanded to swivel single engine estrus

109
00:06:37,909 --> 00:06:35,520
104

110
00:06:39,350 --> 00:06:37,919
your shutdown plan is nominal your go

111
00:06:46,070 --> 00:06:39,360
for the plus x

112
00:06:46,080 --> 00:06:50,390
discovery houston press tomiko

113
00:06:54,390 --> 00:06:52,309

that's tamiko

114
00:06:56,230 --> 00:06:54,400
discovery is now in a heads-up position

115
00:06:57,990 --> 00:06:56,240
and can reach the planned orbit on two

116
00:07:00,629 --> 00:06:58,000
engines all three engines continue to

117
00:07:02,790 --> 00:07:00,639
operate well

118
00:07:03,909 --> 00:07:02,800
now six minutes and 43 seconds into the

119
00:07:06,070 --> 00:07:03,919
flight

120
00:07:25,990 --> 00:07:06,080
discovering an altitude of 66 miles

121
00:07:34,550 --> 00:07:28,309
discovery houston single engine press

122
00:07:37,990 --> 00:07:36,309
seven minutes and 15 seconds in the

123
00:07:39,909 --> 00:07:38,000
flight discovery can reach its planned

124
00:07:44,469 --> 00:07:39,919
orbit on one engine should two fell

125
00:07:46,390 --> 00:07:44,479
however all three still performing well

126
00:07:47,749 --> 00:07:46,400
the flow of fuel from the external tank

127
00:07:49,670 --> 00:07:47,759
into the three space shuttle main

128
00:08:06,629 --> 00:07:49,680
engines is equal to that of draining an

129
00:08:10,390 --> 00:08:08,390
discoveries engines are now throttling

130
00:08:12,390 --> 00:08:10,400
back to maintain structural limits on

131
00:08:13,990 --> 00:08:12,400
the orbiter as it approaches loads near

132
00:08:16,309 --> 00:08:14,000
three times gravity

133
00:08:51,030 --> 00:08:16,319
now seven minutes 57 seconds into the

134
00:09:09,750 --> 00:08:53,030
main engine cutoff confirmed now 8

135
00:09:18,870 --> 00:09:11,590
external tank separation is also

136
00:09:23,509 --> 00:09:20,550
nine minutes into the flight discovery

137
00:09:27,110 --> 00:09:23,519
and her crew now in orbit

138
00:09:32,630 --> 00:09:29,350

pilot george zamka

139
00:09:34,829 --> 00:09:32,640
flight engineer stephanie wilson

140
00:09:37,190 --> 00:09:34,839
mission specialist doug

141
00:09:40,389 --> 00:09:37,200
wheelock discovery houston that was a