



1
00:00:06,470 --> 00:00:03,350
t-minus 31 seconds

2
00:00:10,150 --> 00:00:06,480
the handoff has occurred

3
00:00:10,160 --> 00:00:14,150
solid rocket booster nozzle gimbal check

4
00:00:17,990 --> 00:00:15,910
firing chain is armed sound suppression

5
00:00:21,510 --> 00:00:18,000
water system activated

6
00:00:22,310 --> 00:00:21,520
t-minus 13 12 11

7
00:00:25,990 --> 00:00:22,320
10

8
00:00:27,750 --> 00:00:26,000
9 8 go for main engine start six

9
00:00:28,710 --> 00:00:27,760
five four

10
00:00:29,750 --> 00:00:28,720
three

11
00:00:31,509 --> 00:00:29,760
two

12
00:00:32,389 --> 00:00:31,519
one

13
00:00:37,590 --> 00:00:32,399

and

14

00:00:47,590 --> 00:00:37,600

atlantis reaching the rest of its

15

00:00:52,470 --> 00:00:50,549

houston is now controlling

16

00:00:54,470 --> 00:00:52,480

the role maneuver is complete atlantis

17

00:00:59,029 --> 00:00:54,480

is in a headstand position on course for

18

00:01:08,870 --> 00:00:59,039

a 51.6 degree 136 by 36 statute mile

19

00:01:12,630 --> 00:01:10,789

and the three main engines on atlantis

20

00:01:15,109 --> 00:01:12,640

have now been throttled down to 72

21

00:01:17,109 --> 00:01:15,119

percent of rated thrust as the orbiter

22

00:01:19,190 --> 00:01:17,119

prepares to pass through the area of

23

00:01:27,990 --> 00:01:19,200

maximum dynamic pressure on the vehicle

24

00:01:31,350 --> 00:01:29,670

the engine's now beginning to throttle

25

00:01:48,149 --> 00:01:31,360

back up

26

00:01:52,789 --> 00:01:50,149

all three engines looking really good

27

00:01:54,469 --> 00:01:52,799

back at full throttle now at liftoff the

28

00:01:56,709 --> 00:01:54,479

fully fueled shuttle boosters and

29

00:01:59,749 --> 00:01:56,719

external tank weighed four and a half

30

00:02:03,429 --> 00:01:59,759

million pounds it now has burned half of

31

00:02:04,950 --> 00:02:03,439

that lift off weight and propellant

32

00:02:06,950 --> 00:02:04,960

one minute thirty seconds into the

33

00:02:08,790 --> 00:02:06,960

flight all three auxiliary power units

34

00:02:11,029 --> 00:02:08,800

that provide hydraulic power to the

35

00:02:14,150 --> 00:02:11,039

orbiter's systems in good shape as are

36

00:02:16,150 --> 00:02:14,160

the fuel cells providing electricity to

37

00:02:19,110 --> 00:02:16,160

all of the systems on board atlantis is

38

00:02:21,350 --> 00:02:19,120

already 19 miles in altitude downrange

39

00:02:27,270 --> 00:02:21,360

from the kennedy space center 20 miles

40

00:02:31,670 --> 00:02:29,430

coming up on staging the point at which

41

00:02:45,670 --> 00:02:31,680

the twin solid rocket boosters burn out

42

00:02:51,190 --> 00:02:49,190

booster separation confirmed

43

00:02:53,270 --> 00:02:51,200

the onboard guidance system has done its

44

00:02:55,430 --> 00:02:53,280

job of settling out any of the

45

00:02:57,589 --> 00:02:55,440

dispersions that have been introduced at

46

00:03:00,550 --> 00:02:57,599

the booster separation

47

00:03:03,670 --> 00:03:00,560

atlantis performance thus far is uh

48

00:03:06,470 --> 00:03:03,680

exactly as planned as atlantis heads

49

00:03:09,430 --> 00:03:06,480

into orbit uh flying heads down wings

50

00:03:10,630 --> 00:03:09,440

level into a historic sunset on its 32nd

51
00:03:18,790 --> 00:03:10,640
mission

52
00:03:24,149 --> 00:03:21,910
atlantis can now reach zaragoza in spain

53
00:03:26,070 --> 00:03:24,159
in the event of a single engine failure

54
00:03:28,630 --> 00:03:26,080
however all three main engines are still

55
00:03:30,830 --> 00:03:28,640
operating at full throttle 104 percent

56
00:03:33,350 --> 00:03:30,840
of rated

57
00:03:35,190 --> 00:03:33,360
thrust the auxiliary power unit's still

58
00:03:37,110 --> 00:03:35,200
in great shape as are the fuel cells

59
00:03:40,149 --> 00:03:37,120
atlantis is traveling 3

60
00:03:41,030 --> 00:03:40,159
700 miles per hour at an altitude of 47

61
00:03:42,710 --> 00:03:41,040
miles

62
00:04:06,229 --> 00:03:42,720
downrange from the kennedy space center

63
00:04:10,070 --> 00:04:08,390

atlantis is getting a boost from the

64

00:04:12,550 --> 00:04:10,080

orbital maneuvering system engines on

65

00:04:14,309 --> 00:04:12,560

the tail of the vehicle those

66

00:04:31,749 --> 00:04:14,319

have been burning now for about one and

67

00:04:38,550 --> 00:04:35,350

atlantis your negative return

68

00:04:40,550 --> 00:04:38,560

copy scorch negative return

69

00:04:42,310 --> 00:04:40,560

negative return means atlantis can no

70

00:04:44,150 --> 00:04:42,320

longer return to the kennedy space

71

00:04:46,469 --> 00:04:44,160

center in the event of an engine failure

72

00:04:48,950 --> 00:04:46,479

it's already traveling too far too far

73

00:04:51,350 --> 00:04:48,960

high and too fast to return to the

74

00:04:54,469 --> 00:04:51,360

launch site

75

00:04:56,150 --> 00:04:54,479

now traveling 6 000 miles per hour 180

76
00:04:59,510 --> 00:04:56,160
miles from the kennedy space center at

77
00:05:00,950 --> 00:04:59,520
an altitude of 62 miles or about 330

78
00:05:03,270 --> 00:05:00,960
thousand feet

79
00:05:04,950 --> 00:05:03,280
this view from a camera on the external

80
00:05:06,150 --> 00:05:04,960
tank looking down the length of the

81
00:05:09,749 --> 00:05:06,160
orbiter

82
00:05:29,909 --> 00:05:09,759
as atlantis heads into orbit on its 32nd

83
00:05:29,919 --> 00:05:36,070
atlantis you are presta ato

84
00:05:39,909 --> 00:05:37,990
atlantis can reach orbit on two engines

85
00:05:42,550 --> 00:05:39,919
should one fail at this point however

86
00:05:44,710 --> 00:05:42,560
all three are still in great shape i've

87
00:05:46,870 --> 00:05:44,720
got a report that the flash evaporator

88
00:05:49,749 --> 00:05:46,880

system providing cooling to all of the

89

00:05:50,550 --> 00:05:49,759

systems is also operating normally as

90

00:05:53,670 --> 00:05:50,560

well

91

00:05:56,950 --> 00:05:53,680

atlantis is traveling 7 700 miles per

92

00:06:12,550 --> 00:05:56,960

hour 278 miles downrange

93

00:06:23,270 --> 00:06:16,790

atlantis you are single engine ops three

94

00:06:28,230 --> 00:06:25,590

standing by for the guidance system to

95

00:06:30,230 --> 00:06:28,240

take over control of atlantis and roll

96

00:06:32,390 --> 00:06:30,240

the vehicle to a heads up position this

97

00:06:35,749 --> 00:06:32,400

roll to heads up

98

00:06:38,390 --> 00:06:35,759

allows for

99

00:06:42,629 --> 00:06:38,400

atlantis you are press to mikko and

100

00:06:45,990 --> 00:06:42,639

single engine zaragoza 104.

101
00:06:48,070 --> 00:06:46,000
copy press single engines for 104.

102
00:06:50,390 --> 00:06:48,080
atlantis can reach a safe orbit on two

103
00:06:59,589 --> 00:06:50,400
engines now

104
00:07:05,270 --> 00:07:02,070
that reference to the guidance system's

105
00:07:07,430 --> 00:07:05,280
choice of the role maneuver uh nominal

106
00:07:11,350 --> 00:07:07,440
shutdown on all three you will be go for

107
00:07:17,350 --> 00:07:14,150
atlantis got these nominal shutdowns go

108
00:07:19,350 --> 00:07:17,360
for the plus x go for the pitch

109
00:07:21,830 --> 00:07:19,360
good read back and that rolled heads up

110
00:07:25,029 --> 00:07:21,840
provides a good satellite communications

111
00:07:27,510 --> 00:07:25,039
link with atlantis continuing its uh

112
00:07:29,749 --> 00:07:27,520
travel into space approaching seven

113
00:07:35,029 --> 00:07:29,759

seven minutes into the flight atlantis

114

00:07:38,150 --> 00:07:36,150

104.

115

00:07:40,150 --> 00:07:38,160

atlantis can reach orbit on one engine

116

00:07:43,430 --> 00:07:40,160

now should two fail however all three

117

00:07:48,390 --> 00:07:46,550

atlantis is now traveling 13 000 miles

118

00:07:50,710 --> 00:07:48,400

per hour

119

00:07:53,430 --> 00:07:50,720

580 miles away from the kennedy space

120

00:07:56,950 --> 00:07:53,440

center at an altitude of 340 000 feet or

121

00:08:01,670 --> 00:07:58,629

shortly the three main engines will

122

00:08:03,670 --> 00:08:01,680

begin throttling back to maintain the

123

00:08:05,589 --> 00:08:03,680

structural limits on the orbiter as it

124

00:08:19,830 --> 00:08:05,599

approaches loads near three times

125

00:08:24,629 --> 00:08:22,150

all quiet here in mission control with

126

00:08:26,869 --> 00:08:24,639

all systems in great shape atlantis is

127

00:08:28,469 --> 00:08:26,879

traveling fifteen thousand five hundred

128

00:08:29,909 --> 00:08:28,479

miles per hour

129

00:08:33,269 --> 00:08:29,919

approaching eight minutes into the

130

00:08:35,589 --> 00:08:33,279

flight downrange 740 miles at an

131

00:08:49,910 --> 00:08:35,599

altitude of 64 miles

132

00:08:54,949 --> 00:08:52,070

standing by for main engine cutoff

133

00:09:07,670 --> 00:08:54,959

confirmation as atlantis is in excellent

134

00:09:12,389 --> 00:09:09,829

main engine cutoff confirm standing by

135

00:09:27,509 --> 00:09:12,399

for separation from the external fuel

136

00:09:38,389 --> 00:09:29,910

atlantis now flying away from the

137

00:09:43,350 --> 00:09:41,430

plus x uh burn maneuver being performed

138

00:09:45,670 --> 00:09:43,360

by commander ken ham

139

00:09:48,630 --> 00:09:45,680

nominal miko almost one night not

140

00:09:51,750 --> 00:09:48,640

required preliminary ohms 2 tig will be

141

00:09:54,150 --> 00:09:51,760

37 colon 30. we'll meet you in the post