



1
00:01:00,650 --> 00:00:57,200
this is shuttle launch control at

2
00:01:03,979 --> 00:01:00,660
t-minus 3 hours 29 minutes 45 seconds

3
00:01:06,590 --> 00:01:03,989
and counting from launch complex 39 at

4
00:01:08,840 --> 00:01:06,600
the Kennedy Space Center we are now in

5
00:01:10,060 --> 00:01:08,850
the final six hours of the countdown for

6
00:01:15,440 --> 00:01:10,070
the launch of the space shuttle Columbia

7
00:01:17,090 --> 00:01:15,450
on mission STS 94 the countdown is being

8
00:01:19,520 --> 00:01:17,100
controlled from firing room 1 at the

9
00:01:22,400 --> 00:01:19,530
launch control center and we are on

10
00:01:25,730 --> 00:01:22,410
schedule for a liftoff have 1:50 p.m.

11
00:01:30,590 --> 00:01:25,740
Eastern time this afternoon and here now

12
00:01:34,040 --> 00:01:30,600
is the sts 94 flight crew all assembled

13
00:01:41,090 --> 00:01:34,050

for breakfast on the end payload

14

00:01:46,910 --> 00:01:41,100

specialist Greatland Terrace followed by

15

00:01:53,230 --> 00:01:46,920

mission specialist Don Thomas mission

16

00:01:59,750 --> 00:01:53,240

specialist Mike Bernhardt in s3 our

17

00:01:59,760 --> 00:02:07,230

our pilot Susan still

18

00:02:36,140 --> 00:02:10,940

our payload commander Janice Foss and

19

00:02:42,830 --> 00:02:39,500

there's our commander Jim hull cell

20

00:02:50,120 --> 00:02:42,840

being assisted with his launch and entry

21

00:03:01,530 --> 00:02:56,250

and our pilot Susan still with her

22

00:03:03,810 --> 00:03:01,540

helmet on as if she's ready to go and

23

00:03:10,110 --> 00:03:03,820

our payload commander mission specialist

24

00:03:11,940 --> 00:03:10,120

number one Janice Voss crew will be

25

00:03:14,970 --> 00:03:11,950

heading out for the launch pad in about

26

00:03:21,570 --> 00:03:14,980

another 15 minutes and then payload

27

00:03:23,960 --> 00:03:21,580

specialist Roger crouch mission

28

00:03:26,820 --> 00:03:23,970

specialist number three Mike Bernhardt

29

00:03:31,740 --> 00:03:26,830

I'm sorry number two ms number two Mike

30

00:03:41,280 --> 00:03:31,750

Bernhardt and here is mission specialist

31

00:03:41,290 --> 00:04:07,010

payload specialist Greg Lynn Terrace

32

00:04:14,750 --> 00:04:12,200

and here we see our STS 94 astronauts

33

00:04:52,570 --> 00:04:14,760

now leaving the suit-up room headed for

34

00:04:56,680 --> 00:04:54,940

on every space flight I've ever been on

35

00:04:58,960 --> 00:04:56,690

I've always come back with the idea of

36

00:05:00,790 --> 00:04:58,970

well you know if I could do that again I

37

00:05:02,320 --> 00:05:00,800

would do it differently and this this is

38

00:05:04,630 --> 00:05:02,330

what I should have done or now that I

39

00:05:06,460 --> 00:05:04,640

know now that I'm experienced I'll do it

40

00:05:07,960 --> 00:05:06,470

differently next time but instead of

41

00:05:09,670 --> 00:05:07,970

waiting years perhaps for the next

42

00:05:12,460 --> 00:05:09,680

flight opportunity to put those lessons

43

00:05:14,020 --> 00:05:12,470

into effect my crew will get the

44

00:05:16,810 --> 00:05:14,030

opportunity to do it in just a matter of

45

00:05:48,479 --> 00:05:16,820

months so it is just it's a fantastic

46

00:05:54,070 --> 00:05:50,859

this is shuttle launch control at

47

00:05:57,100 --> 00:05:54,080

t-minus two hours 19 minutes 55 seconds

48

00:06:00,929 --> 00:05:57,110

in County where we see in this number

49

00:06:07,340 --> 00:06:00,939

two Don Thomas being assisted with his

50

00:06:13,820 --> 00:06:09,800

and he will be sitting in the aft Center

51
00:06:24,960 --> 00:06:13,830
seat on the flight deck as our mission

52
00:06:29,500 --> 00:06:27,580
this is shuttle launch control at T at

53
00:06:32,470 --> 00:06:29,510
t-minus two hours 12 minutes and

54
00:07:43,149 --> 00:06:32,480
Counting where we see payload commander

55
00:08:19,130 --> 00:07:47,969
you're on a PC for conflicts I really

56
00:08:24,120 --> 00:08:21,720
thank you used to fight on two one two

57
00:08:26,400 --> 00:08:24,130
we have just gotten a go forecast for

58
00:08:29,190 --> 00:08:26,410
our TLS and also go observation so we

59
00:08:31,110 --> 00:08:29,200
are go for launch at this time

60
00:08:33,420 --> 00:08:31,120
copy flight thank you have already for a

61
00:08:39,540 --> 00:08:33,430
recorder activation and we'll put that

62
00:08:41,550 --> 00:08:39,550
mark manager say it Jim the LMP has no

63
00:08:45,570 --> 00:08:41,560

other issues you now clear the launches

64

00:08:47,790 --> 00:08:45,580

copy that and Columbia it looks like

65

00:08:50,670 --> 00:08:47,800

we've got the weather wanna put a little

66

00:08:52,800 --> 00:08:50,680

thank-you to guys out of here so how do

67

00:08:54,540 --> 00:08:52,810

their plight and entity your clear long

68

00:09:13,560 --> 00:08:54,550

I copy

69

00:09:35,960 --> 00:09:16,720

main engines are kindling now steering

70

00:09:35,970 --> 00:09:47,280

okay I built it

71

00:10:03,750 --> 00:10:01,320

t-minus two minutes 15 seconds here at

72

00:10:06,150 --> 00:10:03,760

this mega baby-making turnaround

73

00:10:10,580 --> 00:10:06,160

possible we'll take it goes ship in 60

74

00:10:22,070 --> 00:10:16,760

at t minus ten nine eight seven six main

75

00:10:25,130 --> 00:10:22,080

engine start three two one zero and

76

00:10:27,590 --> 00:10:25,140

liftoff of Columbia with a microgravity

77

00:10:34,520 --> 00:10:27,600

science laboratory a research bridge to

78

00:10:37,750 --> 00:10:34,530

the International Space Station Roger

79

00:10:40,430 --> 00:10:37,760

roll Columbia Houston is now controlling

80

00:10:42,110 --> 00:10:40,440

roll maneuver is complete aboard

81

00:10:44,120 --> 00:10:42,120

Columbia the orbiter is now in a

82

00:10:46,340 --> 00:10:44,130

heads-down position on course for a

83

00:10:54,460 --> 00:10:46,350

twenty eight and a half degree 160

84

00:11:00,220 --> 00:10:57,310

now at 30 seconds the three engines

85

00:11:01,930 --> 00:11:00,230

aboard the orbiter will begin throttling

86

00:11:03,220 --> 00:11:01,940

down as the vehicle prepares to pass

87

00:11:17,910 --> 00:11:03,230

through the area of maximum dynamic

88

00:11:21,599 --> 00:11:19,919

having just passed through that area of

89

00:11:23,069 --> 00:11:21,609

maximum dynamic pressure the three

90

00:11:34,730 --> 00:11:23,079

engines are preparing to begin a

91

00:11:42,120 --> 00:11:40,320

Columbia go at throttle up one minute 20

92

00:11:49,290 --> 00:11:42,130

seconds the three liquid-fueled engines

93

00:11:51,450 --> 00:11:49,300

are back at full throttle good fuel

94

00:11:53,730 --> 00:11:51,460

cells electrical producing fuel sales

95

00:11:56,490 --> 00:11:53,740

aboard the orbiter and hydraulic systems

96

00:11:58,950 --> 00:11:56,500

all in good shape Columbia is now

97

00:12:00,810 --> 00:11:58,960

traveling 1,900 miles per hour already

98

00:12:04,230 --> 00:12:00,820

downrange from the launch site eleven

99

00:12:18,240 --> 00:12:04,240

and a half miles at an altitude of 18

100

00:12:19,800 --> 00:12:18,250

miles standing by for a burnout and

101
00:12:21,960 --> 00:12:19,810
separation of the twin solid rocket

102
00:12:31,530 --> 00:12:21,970
boosters which signals the end of first

103
00:12:36,720 --> 00:12:34,230
SRB separation is confirmed two minutes

104
00:12:38,819 --> 00:12:36,730
15 seconds into the flight Columbia is

105
00:12:42,030 --> 00:12:38,829
now at an altitude of 31 miles downrange

106
00:12:45,720 --> 00:12:42,040
from the launch site 35 miles will be a

107
00:12:54,720 --> 00:12:45,730
performance is nominal performance

108
00:12:56,910 --> 00:12:54,730
problem you guys take a flight deck I'll

109
00:12:58,949 --> 00:12:56,920
give you downlink flight deck and let me

110
00:13:03,749 --> 00:12:58,959
know if you have an image okay we're

111
00:13:05,430 --> 00:13:03,759
looking at it now okay this is GB about

112
00:13:08,009 --> 00:13:05,440
30 seconds prior to liftoff

113
00:13:09,990 --> 00:13:08,019

I've got it queued up correctly we know

114

00:13:11,610 --> 00:13:10,000

that the Bob Cabana in the empty again

115

00:13:14,490 --> 00:13:11,620

at the weather Capcom and the weather

116

00:13:15,720 --> 00:13:14,500

flight director everybody had this I've

117

00:13:19,439 --> 00:13:15,730

been working the weather real hard for

118

00:13:22,410 --> 00:13:19,449

rtln weather and in fact will be passed

119

00:13:25,129 --> 00:13:22,420

over Florida the first rail we saw here

120

00:13:27,300 --> 00:13:25,139

in the launch and their barrage is just

121

00:13:29,160 --> 00:13:27,310

incredible we always try to describe

122

00:13:30,840 --> 00:13:29,170

that it is just lawyer being nation

123

00:13:33,059 --> 00:13:30,850

right there

124

00:13:35,790 --> 00:13:33,069

it's just a real kick of the pants from

125

00:13:38,220 --> 00:13:35,800

the solid rocket boosters ignite he

126
00:13:40,710 --> 00:13:38,230
could see a magnet in the foreground

127
00:13:42,689 --> 00:13:40,720
there from one of the checklist we've

128
00:13:44,220 --> 00:13:42,699
tried to skew the camera slightly over

129
00:13:56,420 --> 00:13:44,230
to give a better view of Susan and Emma

130
00:14:04,199 --> 00:13:58,680
before no your headache you're going

131
00:14:16,199 --> 00:14:04,209
supersonic at about 35 40 seconds apt an

132
00:14:17,579 --> 00:14:16,209
altitude about 23,000 feet the wind

133
00:14:20,430 --> 00:14:17,589
noise right now is just better this

134
00:14:23,040 --> 00:14:20,440
maximum you can hear the width is 450

135
00:14:26,430 --> 00:14:23,050
pounds or so equivalent airspeed then

136
00:14:27,930 --> 00:14:26,440
you get back you miss kind of a it's

137
00:14:29,370 --> 00:14:27,940
kind of a whining sound but you don't

138
00:14:31,410 --> 00:14:29,380

get up a simulator that's a little bit

139

00:14:32,670 --> 00:14:31,420

different here the real vehicle and then

140

00:14:34,590 --> 00:14:32,680

as you go through back you on the other

141

00:14:36,809 --> 00:14:34,600

side via the wind noise starts to die

142

00:14:40,050 --> 00:14:36,819

down you might be able to see that

143

00:15:08,830 --> 00:14:40,060

lighting is diminishing as we get up

144

00:15:15,550 --> 00:15:12,730

a little bit here just before solid

145

00:15:17,320 --> 00:15:15,560

rocket booster separation you could

146

00:15:19,510 --> 00:15:17,330

stoke the double sexes are cranking but

147

00:15:29,610 --> 00:15:19,520

it's not nearly as rough as it was when

148

00:15:33,670 --> 00:15:31,900

there you go the flash with the solid

149

00:15:35,830 --> 00:15:33,680

rocket booster separation you can see

150

00:15:37,780 --> 00:15:35,840

from the lack of vibration of all the

151
00:15:50,650 --> 00:15:37,790
body should have smoothly get the second

152
00:15:58,430 --> 00:15:56,360
see Mike took Susan's new car that she

153
00:16:00,890 --> 00:15:58,440
had placed over her hood to prevent the

154
00:16:09,530 --> 00:16:00,900
fit for coming into her eyes like it was

155
00:16:19,290 --> 00:16:09,540
I jump a launch pad and its second stage

156
00:16:25,480 --> 00:16:22,000
right there you saw a Pico the g-forces

157
00:16:28,150 --> 00:16:25,490
came off the body and then three Jesus

158
00:16:30,760 --> 00:16:28,160
till three Jesus LG is still GOG it

159
00:16:32,020 --> 00:16:30,770
still feels great to be up here and we

160
00:16:33,370 --> 00:16:32,030
should appreciate all the hard work the

161
00:16:35,080 --> 00:16:33,380
way it does a quick turnaround at that

162
00:17:42,910 --> 00:16:35,090
the word about the end game to get is