



S = 0.0 deg
A = 58.4 km
V = 2.04 km/s



1
00:00:07,510 --> 00:00:05,910
all right we're into the final 60

2
00:00:08,710 --> 00:00:07,520
seconds of the first launch of the year

3
00:00:10,870 --> 00:00:08,720
remember you can follow all the action

4
00:00:12,709 --> 00:00:10,880
on the website you have the uh address

5
00:00:14,310 --> 00:00:12,719
right there the ignition sequence tell

6
00:00:17,269 --> 00:00:14,320
us about that alex you'll hear the ddo

7
00:00:19,269 --> 00:00:17,279
call out alimaj

8
00:00:21,590 --> 00:00:19,279
you'll see the flame under the main

9
00:00:23,269 --> 00:00:21,600
engine vulcan so we shall ignite the uh

10
00:00:24,870 --> 00:00:23,279
the engine and check it for seven

11
00:00:26,230 --> 00:00:24,880
seconds that's the main engine that's

12
00:00:28,470 --> 00:00:26,240
the main engine and when it's

13
00:00:30,470 --> 00:00:28,480

everything's fine and with the the check

14

00:00:33,350 --> 00:00:30,480

is okay then the ignition of the

15

00:00:35,030 --> 00:00:33,360

boosters and the actual liftoff

16

00:00:36,790 --> 00:00:35,040

okay so you get main engine lights up

17

00:00:38,470 --> 00:00:36,800

first computers check out for seven

18

00:00:41,110 --> 00:00:38,480

seconds all the pressure testing on the

19

00:00:43,670 --> 00:00:41,120

ground and then the boosters go we'll

20

00:00:45,270 --> 00:00:43,680

let the ddo call out the final countdown

21

00:01:10,789 --> 00:00:45,280

and be back after aryan has cleared the

22

00:01:10,799 --> 00:01:35,190

decollege

23

00:01:40,230 --> 00:01:37,749

beautiful area off on our way with just

24

00:01:42,630 --> 00:01:40,240

a 24-hour delay leaving a trail of gold

25

00:01:45,749 --> 00:01:42,640

as she rises into the sky over a french

26
00:01:47,749 --> 00:01:45,759
vienna at 1851 local time and right on

27
00:01:50,069 --> 00:01:47,759
time marianne began her mission and

28
00:01:51,310 --> 00:01:50,079
right on time so we had a mass at

29
00:01:55,670 --> 00:01:51,320
liftoff of

30
00:01:56,709 --> 00:01:55,680
773 tons including 554 tons for the soul

31
00:02:00,950 --> 00:01:56,719
boosters

32
00:02:03,830 --> 00:02:00,960
initial acceleration that will increase

33
00:02:07,030 --> 00:02:03,840
velocity from zero to seven thousand two

34
00:02:09,270 --> 00:02:07,040
hundred kilometers per hour in about two

35
00:02:11,350 --> 00:02:09,280
point three minutes that's four thousand

36
00:02:13,350 --> 00:02:11,360
thousand miles per hour

37
00:02:15,350 --> 00:02:13,360
so after booster separation which will

38
00:02:17,910 --> 00:02:15,360

occur in about two minutes uh the

39

00:02:20,790 --> 00:02:17,920

launcher will have lost about 75 percent

40

00:02:23,750 --> 00:02:20,800

of its lift of mass the boosters will

41

00:02:25,830 --> 00:02:23,760

fall down into the atlantic ocean

42

00:02:28,150 --> 00:02:25,840

in a zone which has been secured by an

43

00:02:29,430 --> 00:02:28,160

international advice to american

44

00:02:32,150 --> 00:02:29,440

navigation

45

00:02:34,309 --> 00:02:32,160

arian burning now five tons of fuel per

46

00:02:37,190 --> 00:02:34,319

second that's two and a half tons in

47

00:02:38,949 --> 00:02:37,200

each booster per second the epc also the

48

00:02:41,670 --> 00:02:38,959

core stage as it's called is burning

49

00:02:43,830 --> 00:02:41,680

another 300 kilos of fuel per second all

50

00:02:46,869 --> 00:02:43,840

that adds up to roughly the equivalent

51
00:02:49,030 --> 00:02:46,879
of a dozen airbuses she's now following

52
00:02:50,390 --> 00:02:49,040
the program in the onboard computer

53
00:02:53,509 --> 00:02:50,400
which gives all the orders including

54
00:02:55,670 --> 00:02:53,519
stage separations which we will soon see

55
00:02:57,509 --> 00:02:55,680
four powered flight phases tonight we're

56
00:02:59,110 --> 00:02:57,519
in the first one the main engine and the

57
00:03:01,030 --> 00:02:59,120
boosters and the boosters as alex said

58
00:03:03,270 --> 00:03:01,040
they're going to burn for another maybe

59
00:03:04,710 --> 00:03:03,280
20 seconds

60
00:03:05,990 --> 00:03:04,720
alex take a look on the left the upper

61
00:03:08,869 --> 00:03:06,000
left screen can you give us a

62
00:03:09,990 --> 00:03:08,879
description of the curve please

63
00:03:12,390 --> 00:03:10,000

we see the

64

00:03:14,550 --> 00:03:12,400

simulated flight trajectory which is

65

00:03:16,550 --> 00:03:14,560

computed by using very accurate

66

00:03:19,750 --> 00:03:16,560

mathematical models of the launcher and

67

00:03:21,750 --> 00:03:19,760

the atv and by application of course of

68

00:03:23,190 --> 00:03:21,760

the keplerian laws for the ballistic

69

00:03:29,270 --> 00:03:23,200

phase which we're going to hear about a

70

00:03:32,869 --> 00:03:31,750

ddo has just called out the separation

71

00:03:33,990 --> 00:03:32,879

of the boosters you can see what that

72

00:03:36,070 --> 00:03:34,000

looks like there's another one at a

73

00:03:38,470 --> 00:03:36,080

camera range on the left but they fall

74

00:03:42,070 --> 00:03:38,480

back down right on time at about 64

75

00:03:45,589 --> 00:03:43,830

they fall away from the shore people

76
00:03:47,589 --> 00:03:45,599
streaming back in from the terrace as

77
00:03:49,990 --> 00:03:47,599
you can see in the background there

78
00:03:51,270 --> 00:03:50,000
that's not to follow the the actual

79
00:03:53,509 --> 00:03:51,280
flight

80
00:03:55,990 --> 00:03:53,519
and now we're expecting the uh fairing

81
00:03:57,429 --> 00:03:56,000
separation that's the next milestone

82
00:03:58,949 --> 00:03:57,439
you can see the cursor crawling up on

83
00:04:01,910 --> 00:03:58,959
the upper left i don't know if you can

84
00:04:03,830 --> 00:04:01,920
read it says separation of the fairing

85
00:04:06,550 --> 00:04:03,840
on the lower left alex can you uh

86
00:04:08,550 --> 00:04:06,560
describe what the bottom line is

87
00:04:10,869 --> 00:04:08,560
yes we have the real-time information

88
00:04:13,750 --> 00:04:10,879

from the launcher of the uh

89

00:04:14,869 --> 00:04:13,760

velocity and the altitude and also the

90

00:04:17,030 --> 00:04:14,879

uh

91

00:04:19,189 --> 00:04:17,040

angle of the telemetry antenna with

92

00:04:20,870 --> 00:04:19,199

respect to horizontal

93

00:04:23,430 --> 00:04:20,880

so you see the altitude

94

00:04:24,870 --> 00:04:23,440

the the altitude is 102 kilometers

95

00:04:26,629 --> 00:04:24,880

that's the second line so we're above

96

00:04:28,950 --> 00:04:26,639

the atmosphere which is where we can

97

00:04:32,390 --> 00:04:28,960

separate the fairing and the ddo will

98

00:04:34,310 --> 00:04:32,400

call out that milestone in a moment

99

00:04:35,270 --> 00:04:34,320

we are in this second

100

00:04:38,710 --> 00:04:35,280

there it is

101
00:04:40,870 --> 00:04:38,720
we don't need the the protection of the

102
00:04:43,510 --> 00:04:40,880
fairing anymore we have

103
00:04:46,150 --> 00:04:43,520
crossed the atmospheric layers and then

104
00:04:47,590 --> 00:04:46,160
now we don't need these uh two tons

105
00:04:49,030 --> 00:04:47,600
weight anymore

106
00:04:50,469 --> 00:04:49,040
they're actually two halves one half

107
00:04:52,150 --> 00:04:50,479
like one of the boosters before was on

108
00:04:54,550 --> 00:04:52,160
yeah it's cut vertically

109
00:04:56,150 --> 00:04:54,560
horizontally

110
00:04:58,469 --> 00:04:56,160
everything is perfect on board says the

111
00:04:59,830 --> 00:04:58,479
do the atv now under the fairing