1
00:00:09,190 --> 00:00:07,430
t minus 45 seconds the ground umbilical

2
00:00:15,030 --> 00:00:09,200
to the third straight stage has been

3
00:00:19,750 --> 00:00:17,029
the launch command will be issued at t

4
00:00:30,470 --> 00:00:19,760
minus 19 seconds it's about 10 seconds

5
00:00:35,910 --> 00:00:32,950
t-minus 15 seconds the second umbilical

6
00:00:38,069 --> 00:00:35,920
tower is now separating

7
00:00:39,030 --> 00:00:38,079
10 seconds 9

8
00:00:40,150 --> 00:00:39,040
8

9
00:00:41,030 --> 00:00:40,160
7

10
00:00:42,150 --> 00:00:41,040
6

11
00:00:43,110 --> 00:00:42,160
5

12
00:00:44,150 --> 00:00:43,120
4

13
00:00:45,110 --> 00:00:44,160

three

14
00:00:46,069 --> 00:00:45,120
two

15
00:00:47,110 --> 00:00:46,079
one

16
00:00:48,790 --> 00:00:47,120
zero

17
00:00:51,750 --> 00:00:48,800
and liftoff

18
00:00:54,069 --> 00:00:51,760
liftoff of karen nyberg fyodor yoshikin

19
00:01:04,710 --> 00:00:54,079
and luca parmitano on a six-hour ride to

20
00:01:08,950 --> 00:01:06,710
good first stage performance the soyuz

21
00:01:11,270 --> 00:01:08,960
delivering 102 tons of thrust from its

22
00:01:13,590 --> 00:01:11,280
four boosters in single engine the first

23
00:01:16,230 --> 00:01:13,600
stage of the soyuz measures 68 feet in

24
00:01:17,910 --> 00:01:16,240
length 24 feet in diameter burning

25
00:01:28,710 --> 00:01:17,920
liquid fuel for the first two minutes

26
00:01:47,830 --> 00:01:30,950
after 30 seconds all parameters for the

27
00:01:52,230 --> 00:01:49,670
we're now about one minute into the

28
00:02:07,350 --> 00:01:52,240
launch velocity should be eleven down

29
00:02:26,150 --> 00:02:09,510
soyuz blazing into the night sky over

30
00:02:26,160 --> 00:02:37,830
so

31
00:02:44,070 --> 00:02:39,910
100 seconds into the flight and all

32
00:02:44,080 --> 00:02:51,110
the escape tower has been jettisoned

33
00:02:54,470 --> 00:02:52,630
the four uh

34
00:02:56,949 --> 00:02:54,480
strap-on boosters have been jettisoned

35
00:02:58,710 --> 00:02:56,959
and these have completed their job

36
00:03:01,670 --> 00:02:58,720
and are going to be dropping away to an

37
00:03:03,589 --> 00:03:01,680
altitude of 28 statute miles the soyuz

38
00:03:22,149 --> 00:03:03,599

traveling at

39
00:03:26,309 --> 00:03:24,789
now receiving live views from inside the

40
00:03:28,149 --> 00:03:26,319
soyuz capsule

41
00:03:30,470 --> 00:03:28,159
at the bottom is field of your chicken

42
00:03:32,550 --> 00:03:30,480
at the top luca parmitano as they

43
00:03:38,390 --> 00:03:32,560
monitor the controls of the soyuz as it

44
00:03:38,400 --> 00:03:42,869
shroud jettison has been confirmed

45
00:03:57,750 --> 00:03:44,710
the rocket's altitude now approximately

46
00:04:07,270 --> 00:04:00,869
soyuz traveling at approximately 4 700

47
00:04:17,990 --> 00:04:09,030
mission control moscow reports all

48
00:04:22,469 --> 00:04:19,990
second stage engines are in

49
00:04:24,390 --> 00:04:22,479
normal operation

50
00:04:25,990 --> 00:04:24,400
the soyuz core stage performing as

51
00:04:28,629 --> 00:04:26,000
expected

52
00:04:30,469 --> 00:04:28,639
the core stage is 56 feet in length 13

53
00:04:32,950 --> 00:04:30,479
and a half feet in diameter and a single

54
00:04:35,110 --> 00:04:32,960
engine with four fuel chambers providing

55
00:04:37,990 --> 00:04:35,120
96 tons of thrust for its three minutes

56
00:04:40,150 --> 00:04:38,000
and 28 seconds of operation

57
00:04:42,710 --> 00:04:40,160
the stage continues to burn until a four

58
00:04:44,710 --> 00:04:42,720
minute 43 second mark

59
00:04:46,469 --> 00:04:44,720
the soyuz uses what's called a hot stage

60
00:04:48,390 --> 00:04:46,479
technique the third stage will ignite

61
00:04:50,469 --> 00:04:48,400
while the second is still burning that's

62
00:04:56,870 --> 00:04:50,479
why the soyuz has an open area in

63
00:05:01,189 --> 00:04:59,030

second stage engine continuing to

64
00:05:03,029 --> 00:05:01,199
function normally and we have a good

65
00:05:09,029 --> 00:05:03,039
look at karen nyberg inside the

66
00:05:14,469 --> 00:05:11,749
at 4 minutes and 43 seconds the third

67
00:05:16,070 --> 00:05:14,479
stage will ignite

68
00:05:28,629 --> 00:05:16,080
and the second stage will begin shutting

69
00:05:40,390 --> 00:05:30,469
mission control moscow reports all

70
00:05:40,400 --> 00:05:44,310
second stage separation

71
00:05:44,320 --> 00:05:53,510
confirmed the third stage is igniting

72
00:06:17,270 --> 00:05:56,550
karen nyberg waving

73
00:06:20,710 --> 00:06:19,029
now five minutes and 30 seconds

74
00:06:22,550 --> 00:06:20,720
following launch the soyuz is being

75
00:06:24,390 --> 00:06:22,560
propelled

76
00:06:26,629 --> 00:06:24,400
by the single engine of the soyuz's

77
00:06:28,790 --> 00:06:26,639
third stage that engine providing 30

78
00:06:48,950 --> 00:06:28,800
tons of thrust burning for four minutes

79
00:06:53,189 --> 00:06:51,350
visiting vehicle officer reporting to

80
00:06:56,230 --> 00:06:53,199
flight director

81
00:07:20,070 --> 00:06:56,240
royce renfrew that third stage engines

82
00:07:57,909 --> 00:07:22,390
six and a half minutes since launch all

83
00:08:01,589 --> 00:07:59,589
mission control moscow reporting that

84
00:08:03,990 --> 00:08:01,599
the roll pitch and yaw control thrusters

85
00:08:09,909 --> 00:08:04,000
are all functioning well as the crew

86
00:08:15,430 --> 00:08:12,869
third stage engine and continues to

87
00:08:17,110 --> 00:08:15,440
operate normally

88
00:08:19,990 --> 00:08:17,120

seven minutes and 30 seconds since

89
00:08:23,990 --> 00:08:20,000
launch the spacecraft speed is almost 13

90
00:08:28,070 --> 00:08:25,909
once this third stage delivers the soyuz

91
00:08:29,909 --> 00:08:28,080
to orbit and the module is separated a

92
00:08:32,230 --> 00:08:29,919
series of pre-programmed commands will

93
00:08:34,230 --> 00:08:32,240
be executed to prepare the soyuz for its

94
00:08:36,310 --> 00:08:34,240
orbit operations

95
00:08:38,630 --> 00:08:36,320
these stored commands called time tag

96
00:08:40,709 --> 00:08:38,640
commands allow many of the soyuz systems

97
00:08:43,029 --> 00:08:40,719
to be automatically activated by onboard

98
00:08:47,430 --> 00:08:43,039
computers at precise time stored in

99
00:09:16,710 --> 00:08:49,030
eight minutes into the flight all

100
00:09:20,389 --> 00:09:18,070
eight and a half minutes since the

101
00:09:22,470 --> 00:09:20,399
launch from the baikonur cosmodromes

102
00:09:24,710 --> 00:09:22,480
launch pad number one

103
00:09:27,110 --> 00:09:24,720
soyuz rocket and spacecraft continue to

104
00:09:29,590 --> 00:09:27,120
function as planned

105
00:09:31,829 --> 00:09:29,600
at eight minutes and 45 seconds coming

106
00:09:33,190 --> 00:09:31,839
up just now the third stage will cut off

107
00:09:35,750 --> 00:09:33,200
and separate

108
00:09:37,590 --> 00:09:35,760
the single liquid fueled engine will

109
00:09:45,110 --> 00:09:37,600
have shut down and drop away at an

110
00:09:48,389 --> 00:09:46,710
visiting vehicle officer here in mission

111
00:09:50,710 --> 00:09:48,399
control reports to flight director royce

112
00:10:00,070 --> 00:09:50,720
renfrew that third stage separation has

113
00:10:03,750 --> 00:10:01,829

soyuz capsule and crew inside are now

114
00:10:05,350 --> 00:10:03,760
safely in orbit and the spacecraft is

115
00:10:07,350 --> 00:10:05,360
automatically executing its