



1  
00:00:07,269 --> 00:00:05,190  
that first umbilical separating

2  
00:00:29,349 --> 00:00:07,279  
indicating we're about 35 seconds away

3  
00:00:32,709 --> 00:00:31,109  
launch command has been issued that

4  
00:00:36,630 --> 00:00:32,719  
second umbilical we're tracking the

5  
00:00:36,640 --> 00:00:45,110  
we have preliminary booster ignition

6  
00:00:48,790 --> 00:00:46,549  
and liftoff

7  
00:00:51,270 --> 00:00:48,800  
liftoff of reid wiseman max arrive and

8  
00:00:52,790 --> 00:00:51,280  
alexander gerst an international crew on

9  
00:00:58,549 --> 00:00:52,800  
their way to the international space

10  
00:01:03,270 --> 00:01:00,069  
right now getting good first stage

11  
00:01:05,509 --> 00:01:03,280  
performance the soyuz delivering 930 000

12  
00:01:07,270 --> 00:01:05,519  
pounds of thrust it's four boosters and

13  
00:01:08,870 --> 00:01:07,280

single core engine

14

00:01:10,870 --> 00:01:08,880

the first stage of the soyuz measuring

15

00:01:12,789 --> 00:01:10,880

68 feet in length and 24 feet in

16

00:01:14,550 --> 00:01:12,799

diameter burning liquid fuel for the

17

00:01:36,550 --> 00:01:14,560

first two minutes and six seconds of the

18

00:01:36,560 --> 00:01:49,670

corner

19

00:01:54,149 --> 00:01:51,830

now just about one minute 10 seconds

20

00:01:57,109 --> 00:01:54,159

into the flight of soyuz tma-13m

21

00:01:59,429 --> 00:01:57,119

velocity of the vehicle at 1 100 miles

22

00:02:01,830 --> 00:01:59,439

per hour

23

00:02:03,270 --> 00:02:01,840

all indications uh good for the rocket

24

00:02:15,589 --> 00:02:03,280

as it continues the first stage

25

00:02:19,910 --> 00:02:17,910

next major event will be the jettison of

26  
00:02:29,750 --> 00:02:19,920  
the escape tower at the very top of the

27  
00:02:34,949 --> 00:02:33,509  
and also be sure to watch for the

28  
00:02:36,790 --> 00:02:34,959  
boosters

29  
00:02:45,509 --> 00:02:36,800  
to break off indicating the end of the

30  
00:02:48,710 --> 00:02:47,030  
getting confirmation first stage

31  
00:02:51,030 --> 00:02:48,720  
separation you can see the four strap-on

32  
00:02:52,790 --> 00:02:51,040  
boosters now breaking away they have

33  
00:02:55,110 --> 00:02:52,800  
been jettisoned completing their job and

34  
00:02:57,910 --> 00:02:55,120  
they'll drop away at an altitude of 28

35  
00:02:59,470 --> 00:02:57,920  
statute miles soyuz craft itself now

36  
00:03:25,509 --> 00:02:59,480  
traveling at about 3

37  
00:03:32,390 --> 00:03:27,190  
getting indication the second stage

38  
00:03:35,750 --> 00:03:33,990

and getting confirmation the launch

39

00:03:37,509 --> 00:03:35,760

shroud surrounding the soyuz craft has

40

00:03:45,430 --> 00:03:37,519

been jettisoned the rockets altitude now

41

00:03:49,190 --> 00:03:47,270

a little over three minutes into launch

42

00:03:50,949 --> 00:03:49,200

now the soyuz craft traveling at a speed

43

00:03:52,789 --> 00:03:50,959

of about four thousand seven hundred

44

00:03:54,470 --> 00:03:52,799

miles an hour

45

00:03:56,550 --> 00:03:54,480

three crew members giving the thumbs up

46

00:03:58,949 --> 00:03:56,560

inside the core stage performing as

47

00:04:01,589 --> 00:03:58,959

expected that core engine of the soyuz

48

00:04:03,750 --> 00:04:01,599

56 feet in length 13 and a half feet in

49

00:04:06,789 --> 00:04:03,760

diameter with a single engine and four

50

00:04:09,110 --> 00:04:06,799

fuel chambers providing between 178

51  
00:04:11,429 --> 00:04:09,120  
thousand and 222 thousand pounds of

52  
00:04:13,270 --> 00:04:11,439  
thrust depending on the altitude

53  
00:04:15,429 --> 00:04:13,280  
it'll fire for about the total of 3

54  
00:04:16,949 --> 00:04:15,439  
minutes and 28 seconds

55  
00:04:20,150 --> 00:04:16,959  
the stage is going to continue to burn

56  
00:04:22,469 --> 00:04:20,160  
until about the 4 minute 43 second mark

57  
00:04:25,189 --> 00:04:22,479  
soyuz uses what's called a hot staging

58  
00:04:27,270 --> 00:04:25,199  
technique so the third stage will ignite

59  
00:04:29,270 --> 00:04:27,280  
while the second stage is still burning

60  
00:04:31,110 --> 00:04:29,280  
that's why the soyuz has that small open

61  
00:04:33,830 --> 00:04:31,120  
area in between the second and third

62  
00:04:37,990 --> 00:04:35,830  
again continuing to get views inside the

63  
00:04:41,189 --> 00:04:38,000

cabin again keep your eye on the giraffe

64

00:04:43,510 --> 00:04:41,199  
of hanging in the top left corner

65

00:04:46,150 --> 00:04:43,520  
the crew is always using a token

66

00:04:49,030 --> 00:04:46,160  
to signify when the crew is in

67

00:04:57,110 --> 00:04:49,040  
microgravity so you'll see that float

68

00:05:01,270 --> 00:04:58,950  
continuing to get good reports all

69

00:05:17,189 --> 00:05:01,280  
systems reported as nominal going as

70

00:05:38,710 --> 00:05:19,029  
and pretty soon coming up on second

71

00:05:42,550 --> 00:05:40,390  
and getting confirmation the second

72

00:05:44,710 --> 00:05:42,560  
stage is shut down and separated the

73

00:05:48,150 --> 00:05:44,720  
core booster separated an altitude of

74

00:05:50,790 --> 00:05:48,160  
105 miles soyuz now being propelled by a

75

00:05:53,670 --> 00:05:50,800  
single engine of the soyuz's third stage

76  
00:05:55,590 --> 00:05:53,680  
the engine providing 67 000 pounds of

77  
00:06:21,990 --> 00:05:55,600  
thrust it will burn for about four

78  
00:06:54,950 --> 00:06:23,749  
getting reports of third stage engine

79  
00:06:59,029 --> 00:06:57,029  
again continuing to get good indications

80  
00:07:01,350 --> 00:06:59,039  
from the vehicle as the third stage

81  
00:07:02,950 --> 00:07:01,360  
engine continues to fire

82  
00:07:07,350 --> 00:07:02,960  
it burns for four minutes and two

83  
00:07:11,670 --> 00:07:09,670  
so it has about two minutes and 20

84  
00:07:30,710 --> 00:07:11,680  
seconds or so left

85  
00:07:34,230 --> 00:07:32,469  
and you'll continue to get a view from

86  
00:07:37,430 --> 00:07:34,240  
here inside the russian flight control

87  
00:07:39,670 --> 00:07:37,440  
center uh now

88  
00:07:41,270 --> 00:07:39,680

tied in to the rocket as the third stage

89

00:07:43,270 --> 00:07:41,280

continues to

90

00:08:11,189 --> 00:07:43,280

send the astronauts into its preliminary

91

00:08:15,990 --> 00:08:13,670

and now seven minutes 30 seconds since

92

00:08:18,070 --> 00:08:16,000

that launch from baikonur velocity of

93

00:08:23,029 --> 00:08:18,080

the vehicle now almost 13

94

00:08:27,510 --> 00:08:25,110

and once this third stage delivers the

95

00:08:28,950 --> 00:08:27,520

soyuz to orbit the module is separated

96

00:08:31,189 --> 00:08:28,960

again a series of pre-programmed

97

00:08:34,550 --> 00:08:31,199

commands will be executed in order to

98

00:08:36,230 --> 00:08:34,560

prepare the soyuz for orbital operations

99

00:08:38,230 --> 00:08:36,240

storage commands are known as time

100

00:08:40,310 --> 00:08:38,240

tagged commands they allow many of the

101  
00:08:43,269 --> 00:08:40,320  
soyuz systems to be automatically

102  
00:08:45,590 --> 00:08:43,279  
activated by onboard computers at very

103  
00:08:47,509 --> 00:08:45,600  
precise times that are already stored on

104  
00:08:49,670 --> 00:08:47,519  
board

105  
00:08:52,230 --> 00:08:49,680  
again all indications continuing the

106  
00:08:54,470 --> 00:08:52,240  
third stage continuing to

107  
00:08:57,190 --> 00:08:54,480  
perform as expected

108  
00:09:13,910 --> 00:08:57,200  
just about 30 seconds now expected until

109  
00:09:13,920 --> 00:09:41,910  
in just about 15 seconds now

110  
00:09:46,389 --> 00:09:43,990  
and you saw that bit of a jolt for them

111  
00:09:48,790 --> 00:09:46,399  
as that third stage cut offs cuts off

112  
00:09:50,550 --> 00:09:48,800  
and separates the single liquid fueled

113  
00:09:53,430 --> 00:09:50,560

engine shutting down and dropping away

114

00:09:54,630 --> 00:09:53,440

at an altitude of about 125 statute

115

00:09:56,389 --> 00:09:54,640

miles

116

00:09:58,230 --> 00:09:56,399

the third stage will perform an

117

00:10:00,230 --> 00:09:58,240

avoidance maneuver by opening a valve in

118

00:10:01,990 --> 00:10:00,240

its liquid oxygen tank

119

00:10:11,990 --> 00:10:02,000

but again

120

00:10:17,590 --> 00:10:14,870

and getting confirmation on all systems

121

00:10:19,590 --> 00:10:17,600

being deployed successfully confirmation

122

00:10:21,430 --> 00:10:19,600

of spacecraft separation

123

00:10:23,670 --> 00:10:21,440

the capsule the crew inside safely in

124

00:10:25,350 --> 00:10:23,680

orbit automatically executing the

125

00:10:28,230 --> 00:10:25,360

pre-programmed commands to deploy those

126

00:10:30,710 --> 00:10:28,240

antennas and solar arrays

127

00:10:35,269 --> 00:10:30,720

soyuz itself now orbiting at an altitude

128

00:10:37,750 --> 00:10:35,279

of about 143 miles by 118 miles that

129

00:10:39,910 --> 00:10:37,760

orbit will be raised systematically over

130

00:10:42,069 --> 00:10:39,920

the course of the next six hours as the