



1  
00:00:02,080 --> 00:00:04,870

launch

2  
00:00:08,870 --> 00:00:07,349

t-minus 15 seconds there goes the second

3  
00:00:10,870 --> 00:00:08,880

umbilical tower moving away from the

4  
00:00:12,950 --> 00:00:10,880

soyuz

5  
00:00:14,629 --> 00:00:12,960

t-minus 10 first stage engines are at

6  
00:00:17,430 --> 00:00:14,639

flight speed

7  
00:00:18,550 --> 00:00:17,440

sit 5 four three

8  
00:00:22,790 --> 00:00:18,560

two

9  
00:00:28,550 --> 00:00:25,910

and liftoff lift off of the soyuz rocket

10  
00:00:30,950 --> 00:00:28,560

as ron garan andrew alexander sama

11  
00:00:32,310 --> 00:00:30,960

kutiayev and andre borisenko begin their

12  
00:01:02,869 --> 00:00:32,320

journey to the international space

13  
00:01:06,390 --> 00:01:03,990

as you're hearing everything looking

14

00:01:08,390 --> 00:01:06,400

good so far in the first 45 seconds of

15

00:01:10,149 --> 00:01:08,400

the soyuz tma-21s

16

00:01:11,510 --> 00:01:10,159

flight the soyuz is now heading toward a

17

00:01:17,749 --> 00:01:11,520

link up with the international space

18

00:01:32,710 --> 00:01:20,550

the pressure is within norm and we are

19

00:01:36,950 --> 00:01:34,310

one minute and 12 seconds into flat

20

00:01:37,990 --> 00:01:36,960

velocity of the soyuz is now 1100 miles

21

00:01:39,510 --> 00:01:38,000

per hour

22

00:01:41,510 --> 00:01:39,520

then good first stage performance and

23

00:01:43,910 --> 00:01:41,520

the soyuz is delivering 102 tons of

24

00:01:50,389 --> 00:01:43,920

thrust from its four boosters

25

00:01:54,389 --> 00:01:52,310

first stage of the soyuz measured 68

26  
00:01:56,310 --> 00:01:54,399  
feet in length and 24 feet in diameter

27  
00:01:58,310 --> 00:01:56,320  
and it's burning liquid fuel for the

28  
00:01:59,990 --> 00:01:58,320  
first two minutes and six seven six

29  
00:02:02,069 --> 00:02:00,000  
seconds of the flight

30  
00:02:05,190 --> 00:02:02,079  
1 18

31  
00:02:09,830 --> 00:02:06,630  
we are doing good

32  
00:02:12,869 --> 00:02:09,840  
all the parameters are within the norm

33  
00:02:19,190 --> 00:02:16,630  
110 seconds momentum

34  
00:02:29,670 --> 00:02:19,200  
broad beach here nominal

35  
00:02:32,710 --> 00:02:31,030  
these completed their job and have

36  
00:02:34,070 --> 00:02:32,720  
dropped away at an altitude of 28

37  
00:02:36,390 --> 00:02:34,080  
statute miles

38  
00:02:39,910 --> 00:02:36,400

soyuz is traveling at about

39

00:02:42,110 --> 00:02:39,920

3 350 miles per hour now 2 minutes and

40

00:02:56,869 --> 00:02:42,120

20 seconds into its flight

41

00:03:01,110 --> 00:02:59,589

here inside the capsule as the crew is

42

00:03:03,190 --> 00:03:01,120

making their way into orbit again you

43

00:03:06,390 --> 00:03:03,200

can see here on the bottom of the screen

44

00:03:09,270 --> 00:03:06,400

alexander simon coutive and next to him

45

00:03:10,869 --> 00:03:09,280

alex uh andre warcinko out of your ron

46

00:03:14,309 --> 00:03:10,879

guerin i don't think we can see it but

47

00:03:18,070 --> 00:03:16,229

two minutes and 55 seconds now into the

48

00:03:20,229 --> 00:03:18,080

flight and the escape tower and launch

49

00:03:23,990 --> 00:03:20,239

shroud have by now been jettisoned

50

00:03:25,910 --> 00:03:24,000

formats of control distance on three

51  
00:03:27,990 --> 00:03:25,920  
minutes and three seconds soyuz is

52  
00:03:34,869 --> 00:03:28,000  
traveling at a speed of about 4 700

53  
00:03:39,190 --> 00:03:37,190  
and there is a view of nasa astronaut

54  
00:03:42,470 --> 00:03:39,200  
ron garan making his way into space for

55  
00:03:44,229 --> 00:03:42,480  
the second time run is mine

56  
00:03:45,350 --> 00:03:44,239  
soy's core stage is performing as

57  
00:03:47,350 --> 00:03:45,360  
expected

58  
00:03:49,509 --> 00:03:47,360  
the core stage of the soyuz is 56 feet

59  
00:03:51,270 --> 00:03:49,519  
in length 13 and a half feet in diameter

60  
00:03:53,350 --> 00:03:51,280  
with a single engine with four fuel

61  
00:03:55,030 --> 00:03:53,360  
chambers providing 96 tons of thrust for

62  
00:03:56,149 --> 00:03:55,040  
its three minutes and 28 seconds of

63  
00:03:58,710 --> 00:03:56,159

operation

64

00:04:01,830 --> 00:03:58,720

now three minutes and 37 seconds into

65

00:04:03,750 --> 00:04:01,840

the flight

66

00:04:05,350 --> 00:04:03,760

again view here of ron garan in the

67

00:04:07,190 --> 00:04:05,360

center of the screen and just in the

68

00:04:09,270 --> 00:04:07,200

corner of the view also

69

00:04:16,550 --> 00:04:09,280

the soyuz commander alexander cemeco

70

00:04:21,349 --> 00:04:19,590

uh nominal stable

71

00:04:23,670 --> 00:04:21,359

civilization nominal and we are doing

72

00:04:29,189 --> 00:04:23,680

well on board and feeling great 40

73

00:04:35,030 --> 00:04:32,390

the second stage thrusters are operating

74

00:04:39,909 --> 00:04:36,390

copy

75

00:04:43,110 --> 00:04:41,510

four minutes and 20 seconds into the

76  
00:04:52,189 --> 00:04:43,120  
flight as you hear everything continuing

77  
00:04:52,199 --> 00:05:03,430  
270 seconds in flight nominal flight

78  
00:05:03,440 --> 00:05:10,150  
280

79  
00:05:16,070 --> 00:05:12,310  
the separation on the second flight

80  
00:05:18,070 --> 00:05:16,080  
and yes you can feel that stage

81  
00:05:19,749 --> 00:05:18,080  
second station we have separation on the

82  
00:05:21,510 --> 00:05:19,759  
second side

83  
00:05:23,510 --> 00:05:21,520  
five minutes now into the flight and as

84  
00:05:26,310 --> 00:05:23,520  
you heard the core boosters are burned

85  
00:05:27,430 --> 00:05:26,320  
out and separated at an altitude of 105

86  
00:05:29,110 --> 00:05:27,440  
miles

87  
00:05:32,710 --> 00:05:29,120  
third stage

88  
00:05:35,350 --> 00:05:32,720

now ignite are 11 commanders issued copy

89

00:05:39,590 --> 00:05:36,790

core stage engine has now filled its

90

00:05:41,110 --> 00:05:39,600

role for today and dropping away

91

00:05:43,029 --> 00:05:41,120

about four minutes of power flight now

92

00:05:45,430 --> 00:05:43,039

remaining soyuz is being propelled by a

93

00:05:46,950 --> 00:05:45,440

single engine of the soyuz third stage

94

00:05:48,550 --> 00:05:46,960

that engine is providing 30 tons of

95

00:05:52,550 --> 00:05:48,560

thrust and will burn for four minutes

96

00:06:02,469 --> 00:05:54,550

so right now right before the separation

97

00:06:02,479 --> 00:06:08,870

340 seconds in flight

98

00:06:08,880 --> 00:06:21,749

everything is fine on board

99

00:06:25,670 --> 00:06:24,550

six minutes now until into the flight of

100

00:06:27,749 --> 00:06:25,680

uh

101  
00:06:29,670 --> 00:06:27,759  
ron guerin alexander sama kutiaya and

102  
00:06:32,150 --> 00:06:29,680  
andre borisenko

103  
00:06:37,110 --> 00:06:32,160  
in slide

104  
00:06:37,120 --> 00:06:42,350  
everything continuing to go well

105  
00:06:42,360 --> 00:06:48,950  
380 seconds

106  
00:06:54,870 --> 00:06:51,110  
you can also see there in view the uh

107  
00:06:57,270 --> 00:06:54,880  
nominal flight toy dog which is uh

108  
00:06:59,670 --> 00:06:57,280  
being used as a operating

109  
00:07:00,950 --> 00:06:59,680  
indication of when the crew reaches zero

110  
00:07:03,510 --> 00:07:00,960  
gravity

111  
00:07:05,909 --> 00:07:03,520  
that dog was a given to commander swedes

112  
00:07:22,150 --> 00:07:05,919  
commander alexander simekudiyev by his

113  
00:07:22,160 --> 00:07:29,270

120 seconds 420 seconds in flight

114

00:07:46,309 --> 00:07:30,950

thank you

115

00:07:46,319 --> 00:07:51,830

540 seconds

116

00:07:55,990 --> 00:07:54,150

seven minutes and 32 seconds velocity of

117

00:07:59,110 --> 00:07:56,000

the soil is now almost

118

00:08:00,790 --> 00:07:59,120

13 500 miles an hour

119

00:08:03,350 --> 00:08:00,800

once the third stage

120

00:08:05,589 --> 00:08:03,360

delivers the soyuz to an orbit uh to

121

00:08:07,350 --> 00:08:05,599

orbit and the module is separated series

122

00:08:09,510 --> 00:08:07,360

of pre-programmed commands will be

123

00:08:11,670 --> 00:08:09,520

executed to prepare the soyuz for

124

00:08:13,270 --> 00:08:11,680

orbital operations

125

00:08:15,350 --> 00:08:13,280

these stored commands

126  
00:08:16,710 --> 00:08:15,360  
are called time tag commands and allow

127  
00:08:19,189 --> 00:08:16,720  
many of the soyuz systems to

128  
00:08:21,110 --> 00:08:19,199  
automatically activate

129  
00:08:23,670 --> 00:08:21,120  
using onboard computers at the precise

130  
00:08:32,509 --> 00:08:23,680  
times stored in those computers in the

131  
00:08:49,829 --> 00:08:36,310  
490 seconds 9 minutes light

132  
00:08:55,350 --> 00:08:51,670  
eight and a half minutes now into flight

133  
00:08:57,670 --> 00:08:55,360  
all right alexander andrei ronald

134  
00:09:00,550 --> 00:08:57,680  
i wish you luck

135  
00:09:04,070 --> 00:09:00,560  
uh we will have separation now

136  
00:09:07,990 --> 00:09:04,080  
uh and this is a great

137  
00:09:10,630 --> 00:09:08,000  
great anniversary plate and

138  
00:09:12,150 --> 00:09:10,640

have a great one

139

00:09:13,509 --> 00:09:12,160

more welsh well which is there by the

140

00:09:15,910 --> 00:09:13,519

team on the ground

141

00:09:18,070 --> 00:09:15,920

we are weightless

142

00:09:20,949 --> 00:09:18,080

right separation

143

00:09:23,430 --> 00:09:20,959

confirming separation confirming

144

00:09:26,230 --> 00:09:23,440

weightlessness

145

00:09:30,550 --> 00:09:26,240

very good and we are handed over to the

146

00:09:33,350 --> 00:09:32,150

nine minutes and ten seconds into the

147

00:09:35,590 --> 00:09:33,360

flight and as you heard there at the

148

00:09:37,430 --> 00:09:35,600

nine minute mark the third stage cut-off