1
00:00:09,830 --> 00:00:04,070
all systems are go

2
00:00:11,589 --> 00:00:10,629
nine

3
00:00:12,629 --> 00:00:11,599
eight

4
00:00:13,669 --> 00:00:12,639
seven

5
00:00:14,629 --> 00:00:13,679
six

6
00:00:15,589 --> 00:00:14,639
five

7
00:00:16,550 --> 00:00:15,599
four

8
00:00:17,590 --> 00:00:16,560
three

9
00:00:20,070 --> 00:00:17,600
two

10
00:00:25,670 --> 00:00:22,950
and we have liftoff of tdrs m on the

11
00:00:26,870 --> 00:00:25,680
atlas v rocket from space launch complex

12
00:00:29,109 --> 00:00:26,880
41

13
00:00:31,750 --> 00:00:29,119

tdrs m securing space to ground

14
00:00:33,910 --> 00:00:31,760
communication for nasa's low-earth orbit

15
00:00:38,869 --> 00:00:33,920
operations including the international

16
00:00:43,030 --> 00:00:40,470
should your maneuver steer to its

17
00:00:51,590 --> 00:00:43,040
planned path an inclination of 26.2

18
00:00:55,670 --> 00:00:53,189
hearing the voice of patrick moore

19
00:00:57,430 --> 00:00:55,680
providing launch vehicle asset data

20
00:00:59,670 --> 00:00:57,440
patrick is the united launch alliance

21
00:01:01,270 --> 00:00:59,680
denver network operations center command

22
00:01:08,630 --> 00:01:01,280
control center

23
00:01:12,789 --> 00:01:10,469
the atlas rocket carrying teachers

24
00:01:19,190 --> 00:01:12,799
nominal supersonic speed at one minute

25
00:01:23,510 --> 00:01:21,590
passing one minute into play

26
00:01:25,270 --> 00:01:23,520
the vehicle is now three miles in

27
00:01:32,950 --> 00:01:25,280
altitude

28
00:01:36,550 --> 00:01:35,109
standing by for max q and now passing

29
00:01:39,190 --> 00:01:36,560
one minute

30
00:01:48,389 --> 00:01:39,200
by 32 seconds

31
00:01:52,550 --> 00:01:50,789
one minute 30 seconds into flight now

32
00:01:54,469 --> 00:01:52,560
passing through max q maximum dynamic

33
00:01:56,230 --> 00:01:54,479
pressure

34
00:01:58,149 --> 00:01:56,240
this is the point when mechanical stress

35
00:01:59,990 --> 00:01:58,159
on the rocket reaches its peak because

36
00:02:01,990 --> 00:02:00,000
of the rocket's velocity and resistance

37
00:02:04,950 --> 00:02:02,000
created by the rd-180 is throttled down

38
00:02:07,109 --> 00:02:04,960

to 95 thrust as expected engine response

39
00:02:08,630 --> 00:02:07,119
looks good this engine thrust profile

40
00:02:16,710 --> 00:02:08,640
will continue until the vehicle reaches

41
00:02:19,750 --> 00:02:18,070
about two minutes into the flight of

42
00:02:21,110 --> 00:02:19,760
that passing two minutes into flight

43
00:02:23,030 --> 00:02:21,120
approximately two minutes remaining in

44
00:02:25,030 --> 00:02:23,040
the first stage of flight

45
00:02:26,309 --> 00:02:25,040
vehicle trajectory traveling right down

46
00:02:28,630 --> 00:02:26,319
the middle of the range track looking

47
00:02:33,430 --> 00:02:28,640
good rd180 engine operating parameters

48
00:02:37,350 --> 00:02:35,509
booster engine cut off slated for four

49
00:02:38,949 --> 00:02:37,360
minutes two seconds after launch atlas

50
00:02:40,630 --> 00:02:38,959
five rocket now weighs just one half of

51
00:02:42,710 --> 00:02:40,640
what it did at launch burning propellant

52
00:02:44,630 --> 00:02:42,720
at a rate of almost 2 600 pounds per

53
00:02:46,150 --> 00:02:44,640
second

54
00:02:48,070 --> 00:02:46,160
and vehicle has gone to close loop

55
00:02:49,990 --> 00:02:48,080
guidance

56
00:02:59,830 --> 00:02:50,000
now passing two minutes 30 seconds into

57
00:03:03,430 --> 00:03:01,750
and rcs pyro valve has been fired

58
00:03:05,910 --> 00:03:03,440
centaur reaction control system is now

59
00:03:08,710 --> 00:03:05,920
pressurizing the flight levels

60
00:03:10,630 --> 00:03:08,720
atlas 5 is now 30 miles in altitude 43

61
00:03:17,509 --> 00:03:10,640
miles downrange distance traveling at 4

62
00:03:20,470 --> 00:03:19,110
and now passing three minutes into

63
00:03:25,670 --> 00:03:20,480

flight approximately one minute

64
00:03:25,680 --> 00:03:30,789
rd-180 continues to perform well

65
00:03:34,710 --> 00:03:32,390
vehicle trajectory continuing down the

66
00:03:36,789 --> 00:03:34,720
middle of the range track

67
00:03:39,910 --> 00:03:36,799
ula's patrick moore providing vehicle

68
00:03:39,920 --> 00:03:48,550
three minutes 20 seconds into flight

69
00:03:51,509 --> 00:03:50,309
now passing three minutes 30 seconds

70
00:03:54,869 --> 00:03:51,519
into flight

71
00:03:58,710 --> 00:03:57,030
and vehicle has reached the 5g throttle

72
00:04:01,350 --> 00:03:58,720
limit

73
00:04:03,270 --> 00:04:01,360
and we've begun boost phase chill down

74
00:04:09,670 --> 00:04:03,280
less than 30 seconds away from booster

75
00:04:14,309 --> 00:04:11,350
three minutes 50 seconds into flight

76
00:04:16,069 --> 00:04:14,319
standing by for beco momentarily

77
00:04:17,430 --> 00:04:16,079
six seconds after b code the centaur

78
00:04:21,110 --> 00:04:17,440
second stage will separate from the

79
00:04:26,230 --> 00:04:22,790
and we have beco booster engine cutoff

80
00:04:31,909 --> 00:04:27,830
ten seconds after separation good

81
00:04:37,430 --> 00:04:34,390
the central single rlc engine ignites

82
00:04:43,189 --> 00:04:39,270
we have ignition and full thrust on the

83
00:04:45,110 --> 00:04:43,199
rl10 the rl10 produces 22 900 pounds of

84
00:04:46,230 --> 00:04:45,120
thrust and burns for just under eight

85
00:04:47,590 --> 00:04:46,240
minutes

86
00:04:49,270 --> 00:04:47,600
and we have good indication of fairing

87
00:04:50,870 --> 00:04:49,280
separation

88
00:04:52,310 --> 00:04:50,880

this is the first of two planned burns

89
00:04:53,990 --> 00:04:52,320
for today's mission this first burn

90
00:04:58,710 --> 00:04:54,000
should last approximately 13 minutes and

91
00:05:02,469 --> 00:05:00,950
the payload fairing protecting tdrs m

92
00:05:04,790 --> 00:05:02,479
during its flight through the atmosphere

93
00:05:07,590 --> 00:05:04,800
and rng operating parameters all looking

94
00:05:12,150 --> 00:05:09,189
vehicle trajectory continuing down the

95
00:05:18,070 --> 00:05:15,670
the centaur is now 107 miles in altitude