



1

00:00:02,020 --> 00:00:04,260

George Diller/ NASA Commentator: 10, 9, 8,
7, 6,

2

00:00:04,260 --> 00:00:09,030

5, 4, 3, 2, 1.

3

00:00:09,030 --> 00:00:12,860

Zero and liftoff of the Delta II with GRAIL.

4

00:00:12,860 --> 00:00:15,570

On a journey to the center of the moon!

5

00:00:15,570 --> 00:00:18,580

Steve Agid/Flight Commentator: Chamber pressure
rising in all six

6

00:00:18,580 --> 00:00:20,510

grounded solid motors.

7

00:00:20,510 --> 00:00:24,770

Good chamber pressure on the main engines.

8

00:00:24,770 --> 00:00:27,619

Good chamber pressure on both verniers.

9

00:00:27,619 --> 00:00:28,789

Good chamber pressure on all six ground-lit
motors.

10

00:00:28,789 --> 00:00:31,850

Twenty seconds into the flight.

11

00:00:31,850 --> 00:00:39,920

We have 29 seconds. Mark. 29 seconds, Mach
1,

12

00:00:39,920 --> 00:00:42,890

vehicle now going transonic.

13

00:00:42,890 --> 00:00:43,890

35 seconds in.

14

00:00:43,890 --> 00:00:51,090

38 seconds in, MaxQ. Maximum Dynamic Pressure (inaudible).

15

00:00:51,090 --> 00:00:55,170

Coming up on the 45-second mark.

16

00:00:55,170 --> 00:00:59,931

Mark. 45 seconds in, altitude 3.4 nautical miles.

17

00:00:59,931 --> 00:01:01,560

Downrange distance 13.4 nautical miles.

18

00:01:01,560 --> 00:01:04,049

Velocity 1,742 miles per hour.

19

00:01:04,049 --> 00:01:10,200

Up one-minute mark. Mark. One minute into the flight.

20

00:01:10,200 --> 00:01:17,299

Standing by for solid motor burnout, about 10 seconds from now.

21

00:01:17,299 --> 00:01:21,840

Pressure decreasing on the solids

22

00:01:21,840 --> 00:01:29,310

Standing by for burnout. And we have burnout.

23

00:01:29,310 --> 00:01:36,249

Standing by for sep. And we have separation.

24
00:01:36,249 --> 00:01:38,781
And we have ignition on the three airlit motors.

25
00:01:38,781 --> 00:01:44,599
The three airlit motors have come up on chamber pressure.

26
00:01:44,599 --> 00:01:47,590
Chamber pressure on the airlit motors.

27
00:01:47,590 --> 00:01:50,859
One minute, 39 seconds into the flight, the Delta vehicle now only weighs

28
00:01:50,859 --> 00:01:53,799
about one-half of what it did at launch expelling propellant now at the rate

29
00:01:53,799 --> 00:01:56,029
of about 2,700 pounds per second.

30
00:01:56,029 --> 00:01:59,950
One minute, 50 seconds in.

31
00:01:59,950 --> 00:02:05,229
Altitude now 21.8 nautical miles.

32
00:02:05,229 --> 00:02:07,779
Downrange distance 51 nautical miles.

33
00:02:07,779 --> 00:02:10,920
Velocity 4,493 miles per hour.

34
00:02:10,920 --> 00:02:21,500
(Inaudible) and 30 seconds now remaining on our three airlit motors.

35
00:02:21,500 --> 00:02:25,750

Chamber pressure is beginning to decline.

36

00:02:25,750 --> 00:02:28,210

We have a good engine control in the main engine.

37

00:02:28,210 --> 00:02:29,890

Good engine control in the verniers.

38

00:02:29,890 --> 00:02:32,000

Settling down for the initial launch transients.

39

00:02:32,000 --> 00:02:39,270

Standing by for burnout of the three airlit motors.

40

00:02:39,270 --> 00:02:40,570

We have burnout.