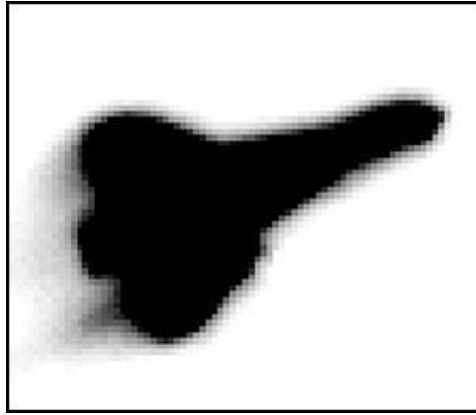




0. COLUMBIA'S LAST MINUTES - Story Preface

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10. COLUMBIA IS LOST

In its final moments of flight, *Columbia* had debris falling from the orbiter's left-wing area. [NASA describes](#) what time this was occurring: "This image is a view of the underside of *Columbia* during its entry from mission STS-107 on Feb. 1, 2003, as it passed by the Starfire Optical Range, Directed Energy Directorate, Air Force Research Laboratory, Kirtland Air Force Base, New Mexico. The image was taken at approximately 7:57 a.m. CST."

On Saturday morning, February 1st, *Columbia* was scheduled to land at [Kennedy Space Center](#) on one of the [largest runways](#) (15,000 feet long and 300 feet wide) in the world. It was a good day for the orbiter to return, according to NASA's shuttle team. The weather was excellent. Everything seemed to be going perfectly.

Flying over the Ocean, approaching Hawaii, *Columbia's* crew [watched the effects of reentry](#) as they discussed how "amazing" and "bright" the light show was outside the shuttle's window. Recovered after the disaster, the partially burned video records crew members as they prepared for landing. (One of the astronauts observes that he "definitely wouldn't want to be outside now.")

But as *Columbia* continued her reentry into Earth's atmosphere, ground controllers noticed weird readings from some of the temperature [sensors](#). (This [glossary of NASA terms](#) will aid in understanding the data.) First there was a loss of temperature measurements for the shuttle's left-wing hydraulic systems. Then a gauge showed excessive structural heating.

At the first press conference following the disaster, [Ron Dittamore](#) describes what ground controllers saw:

- At 7:53 a.m. CST (8:53 a.m. EST), there was a loss of temperature measurements. The readings were neither high nor low - they were off-scale.
- At 7:56 a.m. CST, sensors showed a 20-30 degree temperature rise in the main-gear tire [wheel well](#) on the left side of the shuttle. Although the temperature reading was higher than normal, there appeared to be no cause for alarm.
- At 7:58 a.m. CST, three temperature sensors for the shuttle's left-wing area were off-scale again.
- At 7:59 a.m. CST, the left inboard and outboard temperatures showed an off-scale load. One of these measurements was sensed by *Columbia's* on-board computer.
- While Rick Husband was responding - likely to acknowledge the measurements - his transmission was cut off.
- Immediately thereafter, mission control lost all contact with *Columbia*.

Further, according to Dittamore, the left side of the fuselage, above the wing, experienced an abnormal temperature rise of about 60 degrees over five minutes while the right-side temperature increased a normal 15 degrees (given the shuttle's reentry mode). All the readings came from sensors underneath the heat tiles, on

the aluminum hull of the craft.

When the temperature of the shuttle rises, one can expect increased drag on the spacecraft. When drag is increased, the shuttle's automated flight system will correct for that increase. *Columbia's* adjustments were so large that "we have never seen it to this degree," according to Dittmore.

Notwithstanding, the corrected flight path was still within *Columbia's* capabilities.

At the time of the last transmission (this video includes recreations), the shuttle was hurtling to Earth at a speed of Mach 18.3 and an altitude of 207,135 feet. When they lost the data, mission controllers instantly knew they "had a bad day."

"It was," said Dittmore, "as if someone had cut the wire."

See [Alignments to State and Common Core standards for this story online at:](#)

<http://www.awesomestories.com/asset/AcademicAlignment/COLUMBIA-S-LAST-MINUTES-Columbia-Space-Shuttle-Explosion>

See [Learning Tasks for this story online at:](#)

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Media Stream



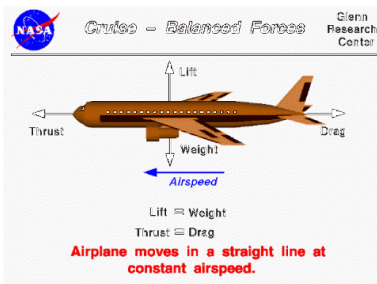
Runway at Kennedy Space Center

NASA Photo.

Runway information, NASA's Kennedy Space Center web site.

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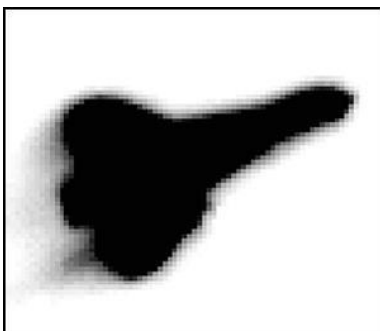
Effects of Drag on the Shuttle

NASA Diagram.

Information and quoted passage, courtesy NASA's Glenn Research Center.

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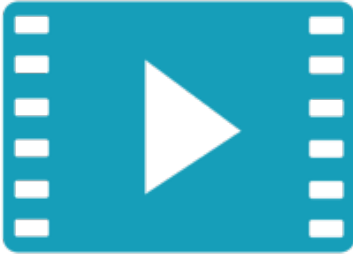
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COLUMBIA'S LAST MINUTES

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Space Shuttle Columbia - Sensors Go Off-line

Clip from "Columbia's Last Flight" - from the series "Seconds from Disaster" - online, via National Geographic's Channel at YouTube. Copyright, National Geographic, all rights reserved. Provided here as fair use for educational purposes and to acquaint new viewers with the program. License: Standard YouTube.

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Sid Bennett

Producer:

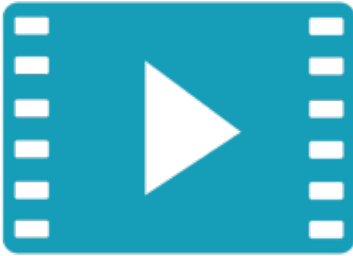
Anna Kirkwood

Original broadcast:

June 28, 2005 - Season 2 of "Seconds from Disaster," Episode 1

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Columbia - Video of the Crew's Final Minutes

Video of the *Columbia* astronauts, during re-entry, recovered after loss of the mission and released by NASA. Online, courtesy NASA.

Quotations from the *Columbia* Crew Survival Investigation Report, linked in its entirety above.

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