

This video was the only video recovered after *Columbia* disintegrated during re-entry. It depicts the crew during their final preparations, before landing.

The tape ends four minutes before the first failure. The rest of the video was destroyed.

What happened to the crew, during their final moments? According to the [Columbia Crew Survival Investigation Report](#) - which was released in late December, 2008 - the orbiter went into a flat spin (see Figure 2.1-13, pg 132 of 400) before it fell apart. The astronauts - whipped around in their seats as the orbiter spun out of control - sustained lethal damage from the helmets which were designed to protect them. Their seat restraints (see Figure 3.4-17, pg 348) also broke loose.

When the catastrophe began - producing five different "events with lethal potential" (see Executive Summary, pgs xix - xxi) which harmed the astronauts - the orbiter lost its ability to continue as a controlled flight. According to the Survival Investigation Report:

*The loss of hydraulic pressure would have resulted in a Master Alarm being annunciated and the orbiter pitching up. While the drag had yet to diverge out of bounds of the drag profile, the orbiter was no longer in controlled flight. This marks the beginning of the transition from a controlled glide to an uncontrolled ballistic [see pg 393 for "ballistic tutorial"] entry.* (Survival Investigation Report, page 103 of NASA's pdf version, linked herein.)

Did the crew know what was happening? Recovered debris indicates that [Bill McCool](#) - the pilot, in seat 2 (see [page 336, Figure 3.4-1](#)) - took action during a nauseating flat spin:

*A crew module panel was recovered with switch configurations [see pages 331-32] indicating an attempt by the PLT/Seat 2 to recover the hydraulic systems [see page 343, Figures 3.4-10 and 3.4-11] and hydraulic pressure by performing steps to initiate the restart of APUs [auxillary power units] 2 and 3... [This action] shows good systems knowledge by the crew members as they worked to attempt to restore orbiter control.* (Survival Investigation Report, page 111 of NASA's pdf version, linked above.)

Redacted details, on the causes of death for the crew members, are set forth in the Survival Investigation Report, beginning at Section 3.4 (pg 333). Among the findings, are these:

*The crew was unaware of an impending survival situation prior to the LOC [loss of control]. At the time of LOC, the flight deck crew was probably troubleshooting the caution-and-warning messages that were associated with the FCS [Flight Control System] fault, left main landing gear talk-back, and tire pressure messages. One of the middeck crew members was likely attempting to become seated and restrained under the dynamic LOC conditions. Until the forebody separated from the orbiter vehicle, the crew was conscious and had not suffered serious injuries. Cause of death was unprotected exposure to high-altitude conditions and blunt trauma.* (Section 3.4.4 - Synopsis of crew analysis - page 352.)

AND

*The crew was not exposed to a cabin fire or thermal injury prior to depressurization, cessation of breathing, and loss of consciousness.* (Section 3.4.2.3, Conclusion L1-4, page 351.)

No one could have survived the events which the astronauts endured during their orbiter breakup - see Section 4.5.9.2 (beginning at page 383 of the linked report). NASA released the Columbia Crew Survival Investigation Report at the end of 2008 - during the holiday season - so the children of the astronauts would not hear what had happened to their parents while they were in school.

The Survival Investigation Report was ordered after the [Columbia Accident Investigation Board](#) issued a scathing report in 2003.

**See, also:**

**[Department of Defense Video - Disintegration of the Crew Module Maneuvers During Re-Entry](#)**

**[Electrically Charged Plasma - Product of Re-Entry](#)**

Credits:

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.

See Alignments to State and Common Core standards for this story online at:

<http://www.awesomestories.com/asset/AcademicAlignment/Columbia-Video-of-the-Crew-s-Final-Minutes1>

See Learning Tasks for this story online at:

<http://www.awesomestories.com/asset/AcademicActivities/Columbia-Video-of-the-Crew-s-Final-Minutes1>