



0. THE EXPLOSION - Story Preface

1. EARLY WARNINGS

2. AN ACCIDENT ROOTED IN HISTORY

3. WARNINGS IGNORED

4. LAST-MINUTE PLEAS

5. THE FINAL MINUTES

6. THE EXPLOSION

7. THE LAST WORDS

8. THE HORROR OF DESTRUCTION

9. THE UNTHINKABLE

10. THE TRANSCRIPTS

11. CHALLENGER'S AFTERMATH

This NASA image depicts the first evidence of black smoke from the lowermost joint of the right-hand Solid Rocket Booster (SRB) on the day STS 51-L (the official designation of *Challenger's* final mission) left the launchpad. The image shows the condition of the aft field joint milliseconds after liftoff.

As *Challenger* ascended, it encountered tremendous wind shear 32 to 62 seconds after liftoff. (It was the worst wind shear any shuttle launch had ever faced.) Already weakened by the cold weather, the O-rings (which may have been resealing after liftoff) lost all chance to keep from completely eroding.

As the O-rings eroded, the aft field joint came completely out of alignment. A gap had opened through which blow-by gases could come into contact with *Challenger's* external tank. The potentially fatal failure cycle - known to responsible officials before liftoff - had commenced.

At 58.32 seconds, an unusual plume in the lower part of the right Solid Rocket Booster was recorded by cameras tracking *Challenger's* liftoff. At 58.772 seconds the first indication of smoke is visible from the right SRB. A fraction of a second later, at 58.778, the "first flickering flame appeared on the right SRB in the area of the aft field joint." By 59.262, the flickering flame had grown into "a continuous, well-defined plume."

At 64.660 seconds after liftoff,

*...there was an abrupt change in the shape and color of the plume. This indicated that it was mixing with leaking hydrogen from the External Tank...Within 45 milliseconds of the breach of the External Tank, a bright sustained glow developed on the black-tiled underside of the *Challenger* between it and the External Tank.*

Meanwhile, the crew was given the command to give the shuttle more power:

You are go at throttle up

The last response (this video includes historical footage, recreations and animations) ever publicly heard from *Challenger*, rebroadcast many times the night of the disaster, was:

Roger, go at throttle up

People watching the news that night took some small measure of comfort from those last words: "At least they never knew what happened."

Except - those were **not** the last recorded words of *Challenger's* crew.

See [Alignments to State and Common Core standards for this story online at:](http://www.awesomestories.com/asset/AcademicAlignment/THE-EXPLOSION-Challenger-Disaster)

<http://www.awesomestories.com/asset/AcademicAlignment/THE-EXPLOSION-Challenger-Disaster>

See [Learning Tasks for this story online at:](http://www.awesomestories.com/asset/AcademicActivities/THE-EXPLOSION-Challenger-Disaster)

<http://www.awesomestories.com/asset/AcademicActivities/THE-EXPLOSION-Challenger-Disaster>



Challenger's Last Launch - Unusual Plume

Image online, courtesy NASA. A different view of this event also appears, within a group of pictures, at [pages 26-27](#) of the "Report of the Presidential Commission on the Space Shuttle *Challenger* Accident."

View this asset at:

<http://www.awesomestories.com/asset/view/Challenger-s-Last-Launch-Unusual-Plume>



Visible Smoke

Image online, courtesy NASA.

View this asset at: <http://www.awesomestories.com/asset/view/Visible-Smoke>



Visible Flame

Image online, courtesy NASA.

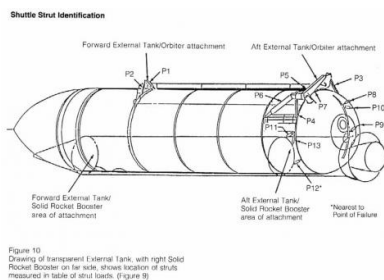
View this asset at: <http://www.awesomestories.com/asset/view/Visible-Flame>



Growing Flame

Image online, courtesy NASA.

View this asset at: <http://www.awesomestories.com/asset/view/Growing-Flame>

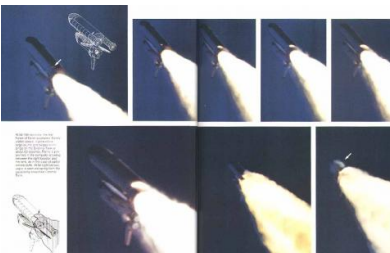


External Tank Cutaway Drawing

Image online, courtesy NASA.

View this asset at:

<http://www.awesomestories.com/asset/view/External-Tank-Cutaway-Drawing>



The Breach Photo Series

Image online, courtesy NASA.

View this asset at:

<http://www.awesomestories.com/asset/view/The-Breach-Photo-Series>



THE EXPLOSION

View this asset at: <http://www.awesomestories.com/asset/view/THE-EXPLOSION>



Challenger - Last Words from the Crew

Clip from "*Challenger: The Untold Story*", online via the [National Geographic](#) channel at YouTube. Copyright, National Geographic, all rights reserved. Clip provided here as fair use for educational purposes and to acquaint new viewers with the program.

View this asset at:

<http://www.awesomestories.com/asset/view/Challenger-Last-Words-from-the-Crew>