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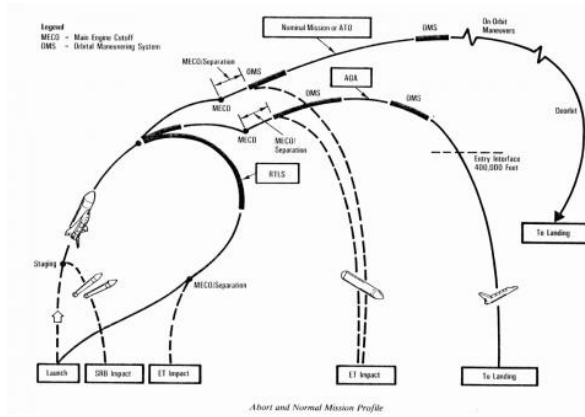
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If a non-explosive event (such as engine failure) happens during a shuttle launch, is there a way for the crew to abort the mission but still save the orbiter, so it returns to earth intact? NASA has four different intact abort modes during the shuttle's ascent: "abort to orbit, abort once around, transatlantic landing and return to launch site." NASA drawing online via Kennedy Space Center. Click on the drawing for a better view.

Suppose that an unexpected event (called "a contingency") occurs during, or soon after, a shuttle launch. Is there a way for the astronauts to safely escape?

NASA has four primary "abort methods" if a shuttle develops a contingency:

- Return to launch site (RTLS): This procedure can only happen if the contingency is known within 2 minutes 20 seconds after liftoff (if an engine is not functioning) or within 3 minutes 45 seconds (if all three engines are running);
- Transatlantic landing (TAL) in Spain (Moron and Zaragoza) or in France (at Istres): Applies if the contingency is known within the first five minutes after launch and requires no orbit maneuvering;
- Abort to orbit (ATO): Allows the shuttle to fly at a lower orbit so mission control can evaluate problems and choose either an early de-orbit burn (preceding a landing) or a maneuver that would allow the shuttle to go into a higher orbit (and continue the mission);
- Abort once around (AOA): Permits the orbiter to fly once around the Earth, then make a normal entry and landing.

NASA has a defined order of preference for the various abort modes. The type of problem, and when it occurs, would determine what method is selected to remedy the situation or end the mission.

If the contingency is a system failure that could jeopardize the crew and the vehicle, Mission Control would select the method that gets the shuttle on the ground as soon as possible. A return to the launch site, or a transatlantic landing, would take about 35 minutes. An "abort to orbit" would take about 90 minutes.

But if the shuttle launched and all three engines failed, the astronauts would use the in-flight escape system before they "ditched" the vehicle. In more than one hundred shuttle missions, that has never happened.

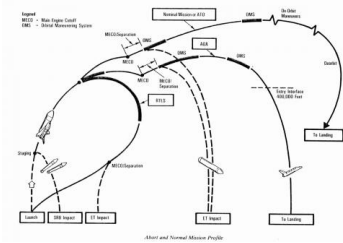
See [Alignments to State and Common Core standards for this story online at:](http://www.awesomestories.com/asset/AcademicAlignment/ABORTING-THE-MISSION-Columbia-Space-Shuttle-Explosion)

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See [Learning Tasks for this story online at:](http://www.awesomestories.com/asset/AcademicActivities/ABORTING-THE-MISSION-Columbia-Space-Shuttle-Explosion)

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Media Stream

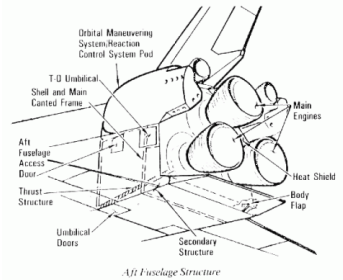


Shuttle - Normal and Abort Mission Profile

Graphic, NASA.

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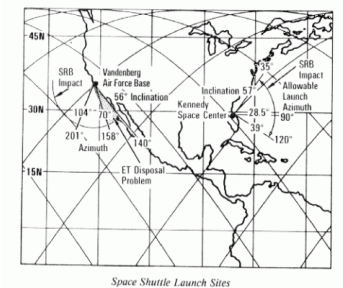


Shuttle Orbiter Three-Engine Diagram

Graphic, NASA.

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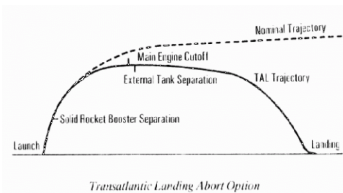
Orbiter Return to Launch Site - Abort Mission Diagram

Diagram, NASA.

Information and quoted passage, from NASA's [Human Space Flight](http://www.nasa.gov) web site.

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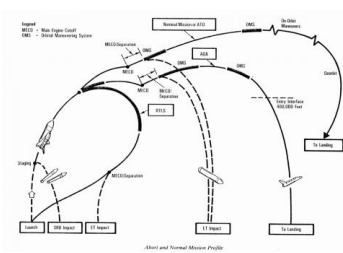


Shuttle Orbiter - Transatlantic Abort Option

Image online, courtesy the [space-shuttle.com](http://www.space-shuttle.com) website.

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ABORTING THE MISSION

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Space Shuttle - Launch Camera, STS-112

Video clip from NASA, launch of STS-112.

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