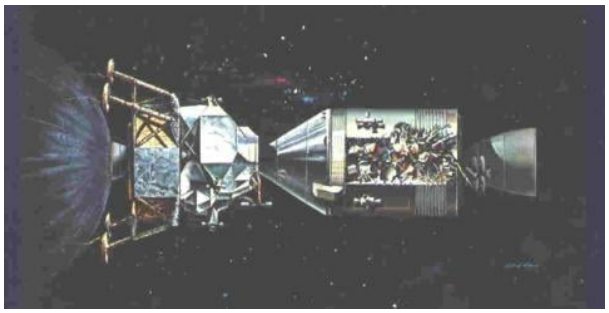
AWESOME stories

APOLLO 13



0. APOLLO 13 - Story Preface

1. WILBUR AND ORVILLE WRIGHT

2. AIRCRAFT CONTROL

3. LIFT AND DRAG

4. KITTY HAWK

5. THE FIRST FLIGHT

6. FLYER 3 and OTHER FAMOUS FLIGHTS

7. THE FIRST ROCKETS

8. EXPERIMENTAL PLANES

9. THE SOUND BARRIER

10. THE SPACE RACE

11. THE FIRST MAN & WOMAN IN SPACE

12. ALAN SHEPARD'S FLIGHT

13. JOHN GLENN'S ORBIT

14. DEATH IN THE COMMAND MODULE

15. TO THE MOON

16. APOLLO 11

17. APOLLO 13

18. THE SHUTTLE'S DESIGN FLAW

The accident which occurred during Apollo 13's intended trip to the Moon took place in the spacecraft's "Service Module." When an oxygen tank exploded, the event nearly resulted in a fatal mission. Image from a NASA document entitled *Apollo 13* "*Houston, we've got a problem.*" Online, courtesy NASA. Click on the image for a better view.

Everything seemed normal as Apollo 13 made its way through space following launch on April 11, 1970. Some people said the number "13" should never have been used in the first place. Other individuals (who make decisions about such things) weren't bothered by unscientific superstitions. They used the in-sequence mission number.

Jim Lovell, commander of the mission, was looking forward to his time on the moon. (The link is NASA's exploration plan for Apollo 13.) So was Fred Haise. On the other hand, Ken Mattingly (originally slated as the third member of the crew) was still home in Houston. He'd been exposed to German measles and, seventy-two hours before launch, was replaced by Jack Swigert.

Turns out, it was a good thing Mattingly was still on the ground. His expert help would soon be needed by his crew mates. (This link takes you to the official portrait of the crew which includes Mattingly in the middle.)

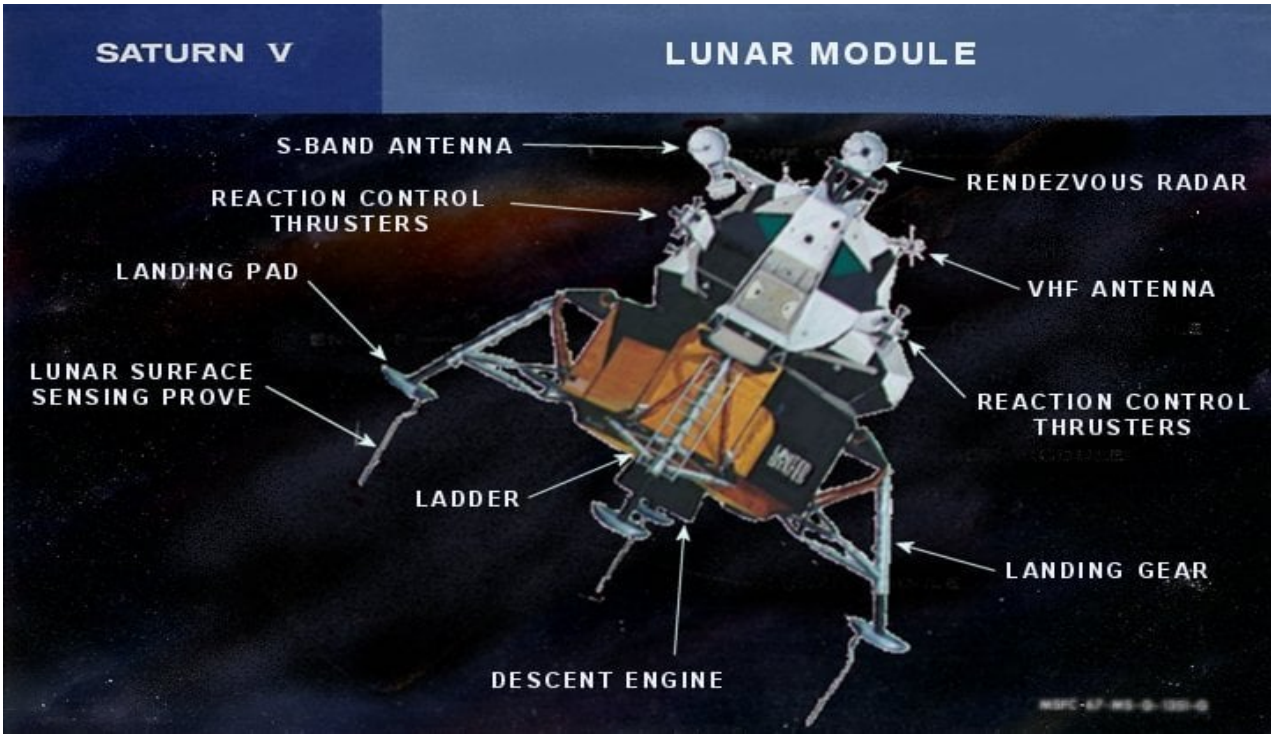
Nearly fifty-six hours into the flight - at about 10:06 PM EST, on the 13th of April, 1970 - Apollo 13 was in serious trouble. (This link takes you to the official Report of the Apollo 13 Review Board, in PDF format.) A short in the current from fuel-cell three had disrupted the cryogenic oxygen tank power supply. Two other shorts occurred a few seconds later.

Not only was the mission in trouble, the lives of the crew were in danger. The severely damaged Service Module had lost its ability to produce oxygen and water. Swigert, followed by Lovell, radioed mission control:

> *Houston, we've had a problem.*

Mission Control in Houston, together with Ken Mattingly, feverishly worked out a way to get the crew back to earth. It wasn't easy. The solution was complicated.

Meanwhile, with their oxygen being depleted, the crew in space had to power-down their Command Module ("Odyssey"), power-up the Lunar Module ("Aquarius"), and make sure they had working airlines. The tiny LM would not take them to the moon this trip, but it would help to save their lives.



Creating a solution on the ground, flight controllers needed to develop a mission-saving system which could be duplicated in space. Simple items, such as cardboard and tape, were used to a create a "mail box" that saved the astronauts.

One hour before reentry, the crew jettisoned *Aquarius*. Their "life boat" would not survive a reentry.

Apollo 13 landed in the Pacific Ocean 142 hours, 54 minutes and 41 seconds after lift-off. The USS *Iwo Jima* recovered the men and *Odyssey*. Nearly two-thirds of the mission had been under extreme emergency conditions. (These links include historical footage of the launch, the problem and the recovery.)

NASA's Houston team - and the flight crew members (all of whom are still alive except for Swigert who died of cancer in 1982) - had turned in a brilliant performance. Calm thinking by Johnson Space Center personnel, working under extraordinary pressure, helped to save the mission. Of their collective efforts, Jim Lovell later said:

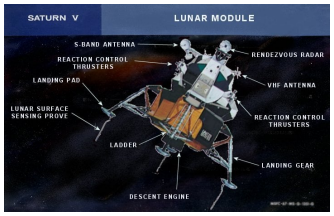
> *I think one of the things that showed the people of the world was that even if there is a great catastrophe, good leadership and teamwork, initiative and perseverance - these things make for getting an almost certain catastrophe into a successful recovery.*

Returning the crew safely was one of NASA's finest moments. Sixteen years later, horrible misjudgments and a lack of effective teamwork caused one of its greatest disasters.

See Alignments to State and Common Core standards for this story online at:
http://www.awesomestories.com/asset/AcademicAlignment/APOLLO-13-History-of-Flight

See Learning Tasks for this story online at:
http://www.awesomestories.com/asset/AcademicActivities/APOLLO-13-History-of-Flight

Media Stream



Lunar Module
View this asset at: http://www.awesomestories.com/asset/view/



Apollo 13 - Earth from Space

Image AS13-60-8591; online, courtesy NASA.

PD

View this asset at: http://www.awesomestories.com/asset/view/Apollo-13-Earth-from-Space



Apollo 13 Launch

Image online, courtesy NASA.

PD

View this asset at: http://www.awesomestories.com/asset/view/Apollo-13-Launch



Apollo 13 - Lift-off

Image online, courtesy NASA.

PD

View this asset at: http://www.awesomestories.com/asset/view/Apollo-13-Lift-off



Jim Lovell

Image online, courtesy NASA.

View this asset at: http://www.awesomestories.com/asset/view/Jim-Lovell

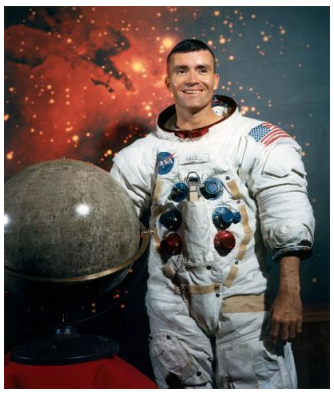


Jim Lovell - Space Suit Photo

Image online, courtesy NASA.

PD

View this asset at: http://www.awesomestories.com/asset/view/Jim-Lovell-Space-Suit-Photo



Fred Haise - Apollo 13 Crew Member

Image online, courtesy NASA.

PD

View this asset at: http://www.awesomestories.com/asset/view/Fred-Haise-Apollo-13-Crew-Member



Apollo 13 - Original Crew

Image online, courtesy NASA.

PD

View this asset at: http://www.awesomestories.com/asset/view/Apollo-13-Original-Crew



Apollo 13 Crew - Jack Swigert with Jim Lovell and Fred Haise

Image online, courtesy NASA.

PD

View this asset at:
http://www.awesomestories.com/asset/view/Apollo-13-Crew-Jack-Swigert-with-Jim-Lovell-and-Fred-Haise



Jack Swigert - Launch Day for Apollo 13

Image online, courtesy NASA.

PD

View this asset at: http://www.awesomestories.com/asset/view/Jack-Swigert-Launch-Day-for-Apollo-13



Apollo 13 Crew

Image online, courtesy NASA.

PD

View this asset at: http://www.awesomestories.com/asset/view/Apollo-13-Crew



Apollo 13 - Damaged Service Module

Image online, courtesy NASA.

PD

View this asset at: http://www.awesomestories.com/asset/view/Apollo-13-Damaged-Service-Module



Apollo 13 - Repairs in Progress

Image AS13-62-9004; online, courtesy NASA.

PD

View this asset at: http://www.awesomestories.com/asset/view/Apollo-13-Repairs-in-Progress



Apollo 13 - View of the Moon from the Spacecraft

Image AS13-62-8885, online courtesy NASA.

PD

View this asset at:
http://www.awesomestories.com/asset/view/Apollo-13-View-of-the-Moon-from-the-Spacecraft

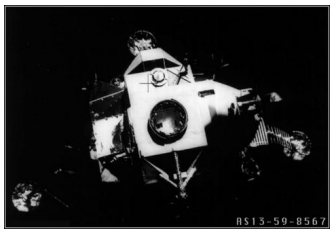


Apollo 13 - Moon View from a LM Window

Image AS13-62-8909; online, courtesy NASA.

PD

View this asset at: http://www.awesomestories.com/asset/view/Apollo-13-Moon-View-from-a-LM-Window



Apollo 13 - Separation from Aquarius

Photo online, courtesy NASA.

PD

View this asset at: http://www.awesomestories.com/asset/view/Apollo-13-Separation-from-Aquarius

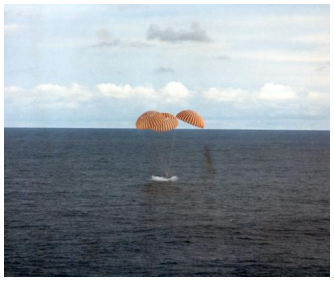


Apollo 13 Descending from a Near-Fatal Trip to Space

Image online, courtesy NASA and the Lunar and Planetary Institute website.

PD

View this asset at:
http://www.awesomestories.com/asset/view/Apollo-13-Descending-from-a-Near-Fatal-Trip-to-Space



Apollo 13 - Splash Down in the Pacific

Image, described above, online courtesy NASA.

PD

View this asset at: http://www.awesomestories.com/asset/view/Apollo-13-Splash-Down-in-the-Pacific



Apollo 13 Crew Aboard the USS Iwo Jima

Photo of Apollo 13 crew, aboard the USS Iwo Jima, post-mission. Image online, courtesy NASA.

PD

View this asset at:
http://www.awesomestories.com/asset/view/Apollo-13-Crew-Aboard-the-USS-Iwo-Jima



Apollo 13 - After the Recovery

Photo of Apollo 13 crew, aboard the USS Iwo Jima, post-mission. Image online, courtesy NASA.

PD

View this asset at: http://www.awesomestories.com/asset/view/Apollo-13-After-the-Recovery



Apollo 13 - Gene Kranz Celebrates Safe Recovery

Image S70-35145; online, courtesy NASA.

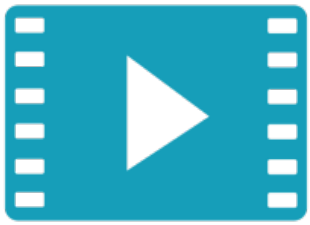
PD

View this asset at:
http://www.awesomestories.com/asset/view/Apollo-13-Gene-Kranz-Celebrates-Safe-Recovery



APOLLO 13

View this asset at: http://www.awesomestories.com/asset/view/APOLLO-13



Apollo 13 - Launch Sequence

Saturn V Launch Views (AS-508) - Launch of Apollo 13, online courtesy NASA.

PD

View this asset at: http://www.awesomestories.com/asset/view/Apollo-13-Launch-Sequence