

**NARRATIVE
NONFICTION**
reads like fiction
but it's all true

DISASTER

The incredible true story of three astronauts fighting for survival 240,000 miles from Earth.

BY LAUREN TARSHIS

APOLLO 13

1 The command module, nicknamed *Odyssey*

2 The service module, site of the explosion

3 The LEM, used to shuttle the astronauts to and from the surface of the moon

IN SPACE

AS YOU READ

Think about the challenges the astronauts faced.

The three astronauts of Apollo 13 were doomed. That's how it seemed on April 13, 1970.

Commander Jim Lovell and officers Fred Haise and Jack Swigert were speeding through space when a violent explosion rocked their spacecraft. The blast tore apart one side of their ship. Within minutes, half their oxygen supply had bled out, and the ship's power was draining fast.



Without power and oxygen, the astronauts would soon suffocate. And they would be stranded in the forever blackness of space.

Apollo 13 was supposed to be a research mission to the moon. Now, it would be a fight for survival hundreds of thousands of miles from Earth.

A Mission to the Moon

Two days earlier, Apollo 13 had blasted off from Florida's Kennedy Space Center. Lovell, Haise, and Swigert were strapped inside their small spacecraft, which was perched atop a 360-foot-tall rocket packed with millions of pounds of explosive fuel.

Five, four, three, two, one . . .

With a deafening roar and a brilliant flare of fiery gas, the rocket **catapulted** Apollo 13 into the sky. It streaked through the air at 24,000

miles per hour—14 times the speed of a bullet. The force strained the astronauts' hearts. It stretched back the skin on their faces until it seemed the skin would rip away from their skulls. The men felt as though their bones might shatter.

But this was normal. In fact, the launch was just about perfect.

Soon the astronauts had left Earth and were cruising toward their destination. Their mission was to land on the moon and explore a hilly section called Fra Mauro. They were to gather samples of the moon's sandy dirt and 4-billion-year-old rocks.

First, though, the astronauts had to get there.

The 240,000-mile journey would take three days, and it would not be a luxurious ride. The astronauts were crammed into Apollo 13's command module, a car-sized

capsule, nicknamed *Odyssey*, that was part cockpit, part sleeping cabin. Meals were pouches of dried food, prepared by adding warm water and kneading for three minutes. There were no showers, no sinks, no toilets. (The astronauts urinated into bags, and then released their urine into space through a hatch. Solid waste was sealed up in odor-proof plastic bags to be brought back to Earth.) And, of course, there was no gravity to hold the astronauts—or anything else—down. Floating in their jumpsuits, the men looked like big fish stuck in a tiny tank.

But if space travel was uncomfortable, Lovell, Haise, and Swigert never complained. They felt thrilled and honored to be on this mission, and confident they would succeed.

After all, they had a team of brilliant flight engineers supporting them back at Mission Control in Houston, Texas. Like hovering parents, these engineers

MISSION CONTROL ▶

It was from this room in Houston, Texas, that engineers communicated with Apollo 13's astronauts—and helped them get home. Inset: Flight director Gene Kranz.

monitored every detail of the flight, from the ship's position in space to each astronaut's heartbeat. The astronauts and Mission Control stayed in constant contact.

Two days into the journey, the mission seemed flawless. There was no sign of the catastrophe to come.

A Space Race

Only 15 years before the launch of Apollo 13, the idea of humans traveling through space was the stuff of science fiction. Then, on October 4, 1957, Russia shocked the world by successfully launching a **satellite**, Sputnik 1, into Earth's **orbit**.

At the time, America and Russia (then part of the Soviet Union) were sworn enemies. The countries were **vying** to become the most powerful nation on Earth.

Many Americans saw the launch of Sputnik as a national humiliation, a

sign that the U.S. had fallen behind.

In the following years, America caught up with Russia and launched its own satellites. Soon the two countries were racing toward a new goal: to put a human being in space.

Leading America's efforts was a new government agency called the National Aeronautics and Space Administration (NASA). NASA hired hundreds of brilliant scientists and engineers. They perfected rockets powerful enough to blast out of Earth's orbit. They designed new aircrafts and developed cutting-edge technologies. And they

began training astronauts, 20th-century Christopher Columbuses who would journey

PSSSSST!

Odyssey is also the name of a famous ancient story about a perilous voyage across the sea.



THE LAUNCH ▶

Apollo 13 lifts off for the moon.

The astronauts are in here!



◀ THE ASTRONAUTS

From left to right: Jack Swigert, Jim Lovell, and Fred Haise. America's first astronauts were all white men. Prejudice and discrimination kept women, African Americans, Latinos, and other groups out of many professions through the 1970s. Space exploration was one of them.

THE AGONIZING WAIT ▶

The entire world was drawn into the drama of Apollo 13. For the families of the astronauts, the wait was especially brutal. Here, Jim Lovell's wife (striped dress), children, and friends watch news reports about what was happening on the ship.



on the moon. Some 600 million people around the world tuned in to the TV broadcast to witness Armstrong's boot making its mark on the moon's sandy surface.

In the months after Armstrong's celebrated step, however, something unexpected happened: Many Americans lost interest in space travel. At the time, the U.S. had big challenges at home. The Vietnam War was claiming the lives of thousands of U.S. soldiers every year. Millions of people were living in poverty. How could the government spend billions of dollars a year on space travel when there were so many problems to solve here on Earth? Besides, after a decade with dozens of successful missions, space travel had come to seem rather ho-hum.

That is, until 55 hours and 53 minutes into the Apollo 13 mission, when disaster struck.

A Catastrophe

On April 13, 1970, Lovell, Haise, and Swigert were preparing for the moon landing, which was about a day away. To get to the moon's surface, they would use a second spacecraft: the **lunar** excursion module (LEM). The LEM and *Odyssey* were latched together like LEGOs. When Apollo 13 arrived in the moon's orbit, the LEM would

be detached and used as a shuttle to and from the moon's surface.

The astronauts had just finished an inspection of the LEM when Mission Control asked them to perform a routine task: Turn on the fans inside the oxygen tanks. With a flip of a switch, Swigert completed the job.

Seconds later, there was a loud bang. The spacecraft moaned and shuddered.

"Houston, we've had a problem," Lovell said.

In fact, it was a catastrophe.

At first, nobody knew what had happened. Lovell suspected a meteor had hit them. Actually, faulty wiring in an oxygen tank had triggered an explosion. The blast drained the spacecraft's power and sent the oxygen supply venting into space. Within hours, there

would be no air left to breathe, and *Odyssey* would be dead.

News of the accident spread around the world. Predictions were grim. Few believed the astronauts would survive. But aboard Apollo 13, there was no time for **dismal** predictions. The three men had spent thousands of hours training for this trip. They knew rule number one in an emergency is to focus on the problem. Worry and panic do not get you closer to a solution. And so the astronauts got to work.

Scanning the Sky

At Mission Control in Houston, flight director Gene Kranz gathered his engineers. These men knew Apollo 13's systems better than they knew their own bedrooms. Now they would do everything in

their power to bring the astronauts home. Soon, both Kranz's team and the astronauts had come up with the same idea: to use the LEM as a lifeboat.

The LEM had its own supply of power, oxygen, and water. The astronauts would climb through a hatch into the LEM and stay there until they approached Earth. Then they would climb back into *Odyssey* for the final plunge through Earth's atmosphere, during which the ship would be superheated to 5,000 degrees in the thickening air. (Unlike *Odyssey*, the LEM was not equipped with a heat shield. If the astronauts attempted to enter Earth's atmosphere in the LEM, they would be incinerated.)

The astronauts had barely settled into the LEM when a new problem cropped up. The journey

home would take four days, but the LEM didn't have enough power or water to last that long. So the astronauts turned off all but the most **critical** systems, including the heat. Outside, the temperature was 280 degrees below zero. Soon the men were shivering. But the cold was the least of their worries.

Every minute, it seemed, new problems arose. The ship kept drifting off course. The LEM's air filters stopped working, and the air became toxic with CO₂, the gas humans exhale with every breath.

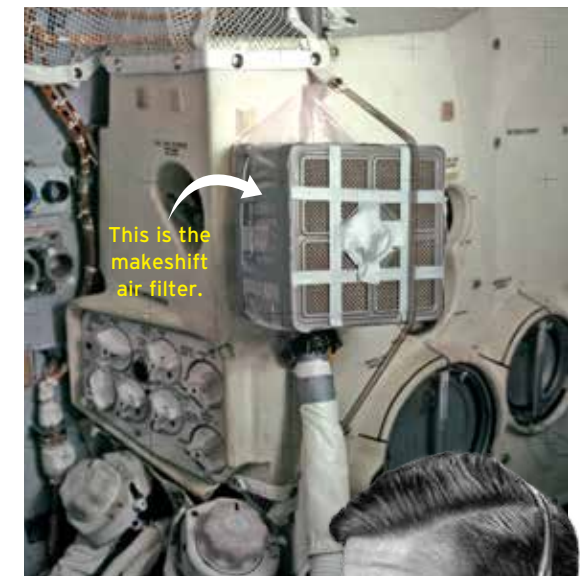
With many systems damaged or powered down, the engineers had to use their ingenuity to find creative solutions.

To correct the spacecraft's position, they instructed the astronauts to fire the engine in short bursts. To clean the toxic air, the engineers designed a fix for the air filters using materials on board—cardboard from the flight manual, duct tape, and tubing from extra spacesuits.

The days passed. The astronauts barely slept. Neither did the NASA engineers back on Earth. The LEM became cluttered with trash and full urine bags that floated through the air. Meanwhile, on Earth, people crowded into churches to offer prayers for Apollo 13. Outside, they scanned the sky, wondering if the astronauts could make it home.

Free Fall to Earth

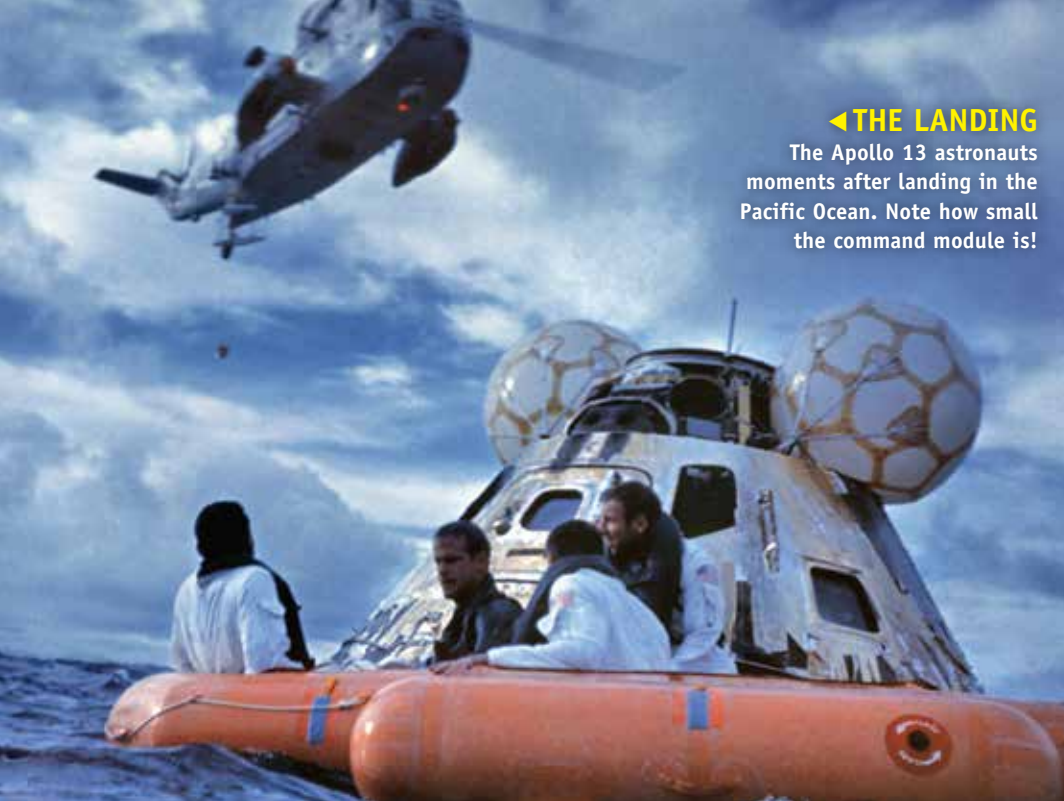
Apollo 13 approached Earth on the morning of Friday, April 17. The astronauts were about to face the most perilous part of their ordeal. ➔



THE DRAMA ▶

Right: Jules Bergman of ABC News shows viewers an Apollo 13 model. Top: The filter the astronauts made to keep themselves from being poisoned to death by the toxic air.





◀ THE LANDING

The Apollo 13 astronauts moments after landing in the Pacific Ocean. Note how small the command module is!

NASA's Joe Kerwin tried to make contact. "Odyssey, Houston standing by, over."

Nothing.

"Try again," Kranz barked.

"Odyssey, Houston standing by, over."

Still nothing.

Five minutes.

Some engineers fought back tears.

Then, a voice crackled over the radio.

"OK, Joe," said Swigert.

At Mission Control, joy and relief flooded the entire room. Kranz pumped his fist.

Inside *Odyssey*, Lovell, Haise, and Swigert watched the sky outside the windows turn from angry red to soft pink and finally to blue. Their speed slowed as the air thickened.

Pop.

Odyssey's parachutes opened.

The ship floated down to Earth, feather-like. It came to rest in the warm waters of the Pacific Ocean.

The Apollo 13 mission was over, a failed mission that would go down in history as one of NASA's greatest successes.

Lovell looked at Haise and Swigert. "Fellows," he said, "we're home." ●

What if *Odyssey's* electrical system couldn't be powered up? What if *Odyssey's* heat shield had been damaged in the explosion? What if the parachutes had turned to blocks of ice and didn't open?

Incredibly, the astronauts had no trouble powering up *Odyssey*. Even with frozen wires and walls dripping with condensation, the electrical systems were soon humming.

But what about the heat shield? If it failed, the ship would burn up.

The world would know the fate of Apollo 13 in four minutes. That's how long communication with *Odyssey* would be blacked out as it fell to Earth.

"Gentlemen," Lovell said. "We're about to reenter. I suggest you get ready for a ride."

The men tightened their seat belts as *Odyssey* began its 25,000 mph free fall to Earth. Through the small windows, all they could see was fiery red.

At Mission Control, the command room was packed with engineers and visitors. Nobody spoke. The room was completely silent.

The minutes ticked by with agonizing slowness.

One minute.

Two minutes.

Three minutes.

Four minutes . . .

WRITING CONTEST

The Apollo 13 mission was called "a successful failure." Why might that be? Explain. Be sure to use text evidence to support your answer. Send your response to **APOLLO 13 CONTEST**. Five winners will each get *One Small Step* by P.B. Kerr. See page 2 for details.

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