



National Aeronautics and
Space Administration

April 13, 1970



Mission Brief



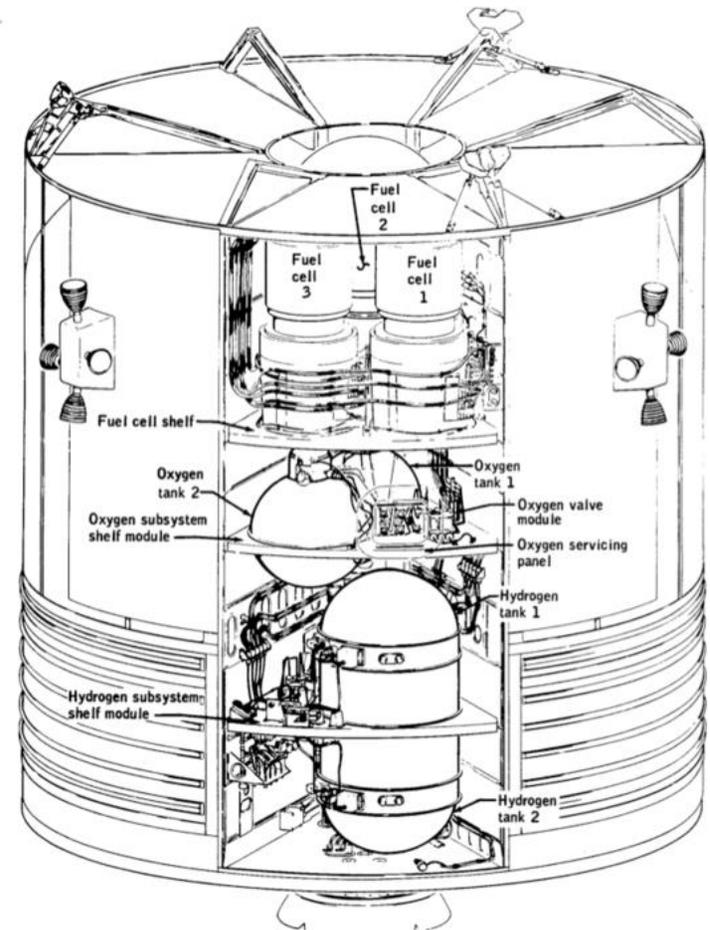
Mission Update: Explosion on Odyssey Command Module has left Apollo 13 crew with a damaged space craft, leaking oxygen and diminished power. Houston's Mission Control must bring the astronauts back safely from over 200,000 miles in space.

To conserve energy, the Odyssey has been shut down and the three astronauts must move into the LEM, Lunar Excursion Module. The LEM, or Aquarius, is designed for only two astronauts and the CO₂ levels are increasing to a dangerous level!



Final Project Evaluation Report

“The No. 2 oxygen tank, serial number 10024X-TA0009, had been previously installed in the service module of Apollo 10, but was removed for modification and damaged in the process. The tank was fixed, tested at the factory, installed in the Apollo 13 service module and tested again during the Countdown Demonstration Test at NASA's Kennedy Space Center beginning March 16, 1970. The tanks normally are emptied to about half full. No. 1 behaved all right, but No. 2 dropped to only 92 percent of capacity. Gaseous oxygen at 80 pounds per square inch was applied through the vent line to expel the liquid oxygen, but to no avail. An interim discrepancy report was written, and on March 27, two weeks before launch, detanking operations resumed. No. 1 again emptied normally, but No. 2 did not. After a conference with contractor and NASA personnel, the test director decided to "boil off" the remaining oxygen in No. 2 by using the electrical heater within the tank. The technique worked, but it took eight hours of 65-volt DC power from the ground support equipment to dissipate the oxygen. Due to an oversight in replacing an underrated component during a design modification, this turned out to severely damage the internal heating elements of the tank.”



Restrictions: You cannot look over the partition to see your Apollo 13 colleagues.

Remember, you are 200,000 miles away!

Mission Control: Use the parts that can be found on the Aquarius and Odyssey capsules to convert a square CO₂ scrubber into cylinder scrubber. **Build the new scrubber converter and write an emergency plan for the Apollo 13 crew.** Read the plan to the astronauts so that they can build the same scrubber converter, install it into the LEM, and lower the CO₂ levels. You have 15 minutes before the CO₂ levels become deadly and the Apollo 13 crew dies.

Astronauts: Keep warm and wait for Houston to come up with a new procedure. Gather up the materials you may need. **Build the converter exactly as it is described to you.** Insert your new converter into the LEM in less than 15 minutes or you will die of CO₂ poisoning and are lost in space forever.





Apollo 13
Astronauts



