

1st PLACE WINNER
(1st-2nd Grade)



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Breakdown on the way to Venus

By Lucas Kramer (2nd grade)

It was Saturday evening, 12:30 p.m. I was driving down the road in a van, but, this wasn't any trip, and I was on my way to launch pad at the Kennedy Space center. I knew that I was going to be launched in an Ares 1 and when we would reach orbit we would catch up and dock at the space station to spend the night in the Venus Lander. On the trip I had two companions: Neil Armstrong and John Glenn. Already I was at the launch pad. I was really surprised how fast the trip was. During training I misheard and I thought we were going to pad B, but really we were going to pad A. I unplugged my spacesuit cooling system from the wall of the van and walked over to the elevator which would take me to the top of Ares 1. I was going to be the pilot!

On my way up in the elevator the four of us (Ms. Ansari, Neil Armstrong, Buzz Aldrin and I) were all thinking the same thing: We might not be able to get to Venus because the braking engines are only 20% reliable. (When we had test fired the braking engines 80% of the time when they had fired the ionizers, the engines had overheated because the heat would cause one of the transistors to break which would close the regenerative cooling valve. If the engine overheated the computer would melt down and shut off all the fuel valves.) Soon we were at the elevator, but because of a hydraulic leak it took us ten times longer to get to the top of the launch tower.

Finally we reached the cockpit just 25 minutes and 30 seconds before the launch, but when I looked out the window I saw smoke coming out of the bottom of the pad! I realized it was just the hydrogen vent letting out the excess hydrogen from the fuel tank while they were fueling up the main tank. Suddenly, I heard a loud thump, but we

realized it was just a bald eagle that had landed on the nosecone. I heard a 'wrrrrrrrrrrrr' at first I thought it was the preburners firing up, but after a brief check of my instruments, I discovered it was the hydraulic pump. Then I heard the countdown 10, 9, 8, 7, 6, 5, main ignition sequence, 4,3,2,1, lift off, yes we have liftoff. Several seconds later I heard the Ares has cleared the tower! As soon as the engine fired the Ares 1 shook so hard I thought there was an explosion, but the instruments told me otherwise. Everything was working perfectly.

Several minutes into the flight, Neil Armstrong said, " Lucas will you please press the ejection seat disablement button because Buzz Aldrin keeps reaching over and is trying to push the button on my ejection seat.

I said, " Sure," but I had apparently pressed the wrong button and the room filled with smoke with a loud roar. I realized I accidentally pressed the ejection seat test fire button, but since Neil's anchor pins were in, he didn't go catapulting out the roof. The accidental test firing produced so much carbon dioxide that Ms. Ansari had to constantly replace the lithium hydroxide canisters. Suddenly I heard a loud boom and the capsule began to shake extremely hard and I heard a whir sound. I realized that the first stage had just separated. The preburners were starting. I turned around just make sure that Buzz Aldrin wasn't getting into any trouble. As I turned I saw a large gear fly by the windshield. One of the planes that was taping the launch was having engine trouble and one of the engines fell off and disintegrated a short distance from us. About two minutes later I heard a boom and another violent shaking. The second stage had separated and we were in orbit. Up ahead I saw the space station so I fired my engines to slow me down to put me into a lower and faster orbit so that we could catch up with the space station.

Once we were in the lower orbit, I began manually controlling the Orion capsule in alignment of the space station. Soon we were only 2 feet away so I fired the backwards pointing engines to put us in a higher orbit to slow us down. We made contact with the space station and I climbed over to the airlock and connected the anchor pins so that there would be an air tight seal between us and the space station. We climbed out into the space station and went to our sleeping quarters to spend the night.

The next day I looked out the window and saw the spacecraft we would be taking to Venus. I floated through the node and went into the docking tunnel and climbed into the Venus Lander 1. I climbed in and found that Buzz and Neil were already inside trying to repair a small electrical short they had discovered when they had tested their equipment.

Occasionally there were sparks and puff of smoke coming out of the control box so they thought they had better check that. When the short was repaired they reassembled everything and fired the undock and departure engines.

RROOOOAARR,

was the sound we heard when the wiring shorted out 137,123,585,945,678,890 nanometers from Venus (I had accidentally bumped the dial on the distance display causing it to read in nanometers instead of miles)! I manually flew it while Buzz worked on the short. Then I heard an odd thumping coming from the heat shield. Thump, thump, thump.... I realized that the preburners and the undock and departure engines were having alignment trouble. I opened up the service panel and to my horror the bottom of the Lander was filling up with liquid oxygen and hydrogen because the broken preburners had broken on the pump side and was spraying everywhere. The puddle of liquid hydrogen and oxygen had already covered most of our main computers and most of our hybrid landing motors. There wasn't anything I could do about it because the emergency shutoff valve was already submerged in the liquid hydrogen and oxygen. I closed the panel and I told everyone to switch to the back up computers (which were mounted on the ceiling) and to shut off the main computer because the main computer was extremely likely to short out and cause an explosion. Neil Armstrong punched in the code on the rear control panel to start the back up computers. Then, something cold touched my back. It surprised me so I screamed, " eeeeeekkkk." It wasn't just I was surprised, but also that the liquid hydrogen and oxygen were all the way up to the seat. I told everyone to unbuckle and float up to the ceiling. Hearing a loud zap, the liquid hydrogen and oxygen had detonated through the blow disc. Neil Armstrong had a new blow disc on before hardly any oxygen could escape. Meanwhile, back at the Space station, Ms. Ansari was watching the control panel. When saw the temperature suddenly spike inside the capsule.

She immediately called us and asked, "Are you OK?"

I said, "We're fine except for a large explosion due to hydrogen and oxygen build up."

She didn't expect an explosion. Ms. Ansari quickly grabbed a bunch of spare parts and threw them into the rescue capsule; hopped in and fired the departure engines. RRROOOOOOAAAARRRR! Ms. Ansari quickly pressed the rescue button to fire the accelerator engines and soon she was at the Venus Lander 1. She docked and hopped in with all her spare parts. She immediately began helping Lucas, Neil and Buzz to repair the Venus Lander 1.

"Can you please solder this wire from J8 to V6 on the breadboard? And then install this computer with cord 1 at socket 8, cord 2 at socket 5 and cord 3 at socket 3."

I said, "Sure" and quickly installed the computer and wired the breadboard.

I accidentally mixed up cords 1 and 2 and accidentally connected p6 to J8. When they were finished I asked Ansari to come with us. She said sure and so I flipped several switches to put the capsule on auto pilot and to fire our main engines (now repaired) to reaccelerate us. GURGLE MUFF! I heard from the engine! Neil admitted it was his pet bunny! Neil took him (his name was Comet!) out of its cage so it wouldn't cause any more problems! Ansari held Comet for most of the rest of the journey. Comet had apparently chewed through a wire while Neil was testing to see if bunnies like carrots in space!

I saw Venus looming up ahead and so I attempted to fire the braking engines. I knew the computer may melt down, but we really wanted to get to Venus. Everything was going great until the ionizers fired. The impulse was so great I thought everything must be working perfectly until I smelled molten silicon. I thought, "Oh, no, the computers must have melted down." I quickly shut off the braking engines and fired the main engines so we could orbit Venus while we repaired the braking engines. Then we could land. I fired the main engines and headed directly to the center of Venus. I fired the left retrorocket and we swerved to the right of Venus and we were caught into Venus' gravity and swung into orbit. I decided to burn the main engines for 1 full orbit so we wouldn't enter Venus' atmosphere and crash, but when the first orbit was over and we began to repair the braking engines while trying to turn off the main engines, I discovered the wire that Comet had chewed through was the wire that sent current to the transistors that would shut off the engine. I walked over to the engine room to repair the wire and while I did the main engine continues to burn and we went through a higher and higher orbit.

I thought to myself, we better work quickly so we don't go out of orbit. But when we finally had the wire repaired and got back to the switch we were hurling towards Mars.

I thought to myself, I should not have skipped the training in the multi axis chair.

I asked Neil to take abort joystick and get us stabilized, but when I looked at the fuel gauge 15 minutes later and we were still tumbling, the gauge read empty.

I thought at first that the fuel gauge was off because the engines were still operating, but then the engines quit. I remember thinking to myself at the time; this was just the result of Neil's work.

I looked over at Neil and he was frantically working on trying to get the engine to fire. It was then I realized we were out of hydrazine.

I dove into the engine room. I cut the hydrogen and oxygen line, put T pipes on them and connected the T's up to a spare hot-and-cold-water-mixing-valve. I mounted the valve on the control panel. I crossed out hot and labeled it hydrogen and I crossed out

cold and named it oxygen. Then I cut the hydrazine line and put in another T pipe and connected it up to the output on the hot and cold water mixing valve. I adjusted the hot and cold water mixing valve to 2/3 hydrogen and 1/3 oxygen and I pressed the igniter button. Nothing happened because I had apparently forgotten to open up the fuel valve that was on the hydrazine engine. I opened the valve and walked up to the control panel. Kaboooooooooooooooooom! The explosion sent us hurling towards the center of Mars. I had to get the system working before we crashed into Mars. I called everyone to the engine room and discovered that the engine had blown up because the hydrogen and oxygen exploded with too much force. Without thinking of what I was doing, loosely jammed a steel pipe down the combustion chamber and coiled a vaporizer hose up and wedged that on the inside of the steel pipe. The output vaporizer hose was hooked up to a diffuser which hooked onto the bell of the engine. I hooked the intake up to the hydrazine tank knowing that there was some hydrazine left but the engine had shut down before it ran out of hydrazine. If air bubbles came down the intake pipe, the hydroxide engine would probably blow up. A valve would snap shut when the fuel tank was low to prevent air bubbles from getting into the fuel. When the valve shut the fuel stopped flowing to the engine causing it to shut down. Thinking about even less about what I was doing(I think the oxygen was low in the cabin because of the way I reconfigured the fuel hose.), I shoved everything I could find into the combustion chamber and hooked up the hydrazine tank up to the warm water intake on the hot-and-cold water mixing valve. Then thinking even less about what he was doing, he pressed all the igniter and hydrazine engines. Everything flew out of the engine. I walked over to the oxygen meter and pressed the on button. At once I returned to sanity.

I immediately shut off all the engines except the one that we just repaired (our forwards facing engine). Neil returned to the controls and stopped the tumbling motion.

When we were in low orbit I fired the engine, the parachutes automatically deployed and Neil had to make the heat shield pop out (the motor that was supposed to put them out automatically had somehow shorted out). We think it was due to Comet gnawing on the chord. I then deployed to small parachutes that deployed 2 small rocket motors on long cables that slowed us down to a halt that stopped us 50 feet above the Martian surface. I fired the landing button and the rockets set us down on Mars. We were just getting ready to hop out when the parachutes floated down to block the hatch. Neil opened the hatch anyway and shoved off the parachute to explore Mars. It wasn't Venus like we had intended, but good enough!