

In July 1969 the Apollo 11 mission landed on the Moon. Buzz Aldrin and Neil Armstrong spent less than a day on it, and just over an hour walking on its surface. In the world, the Universe or, as they termed it, the 'space' of the Mage and the Boffin, things happened slightly differently.

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The Moon spun past the small windows in the Lander, with their intended landing site passing the lower window on every orbit. The Lander slowly drifted away from the Orbiter. T-Base, short for Terra Base, monitored the separation rate and the relative positions of the two craft. Back on the home planet the ground crew compared the trajectories for deviations from the predicted values. The Lander rotated end over end as it drew away and the Orbiter Pilot, Hadden, nicknamed Ogre, visually checked it out.

"T-Base, Lander checks out OK, visually," he said.

"Orbiter, roger. Lander, stabilise for descent."

"T-Base, stabilising attitude for descent burn," said Ross.

The Mage said into his microphone "Lander, all is green. Descent burn in eleven minutes twelve seconds. Duration forty-three point three seconds." He was T-Base Communicator on this shift, and all messages went through him.

"Roger, T-Base," said the Boffin from her seat in the Lander. She was Lander Commander, and squeezed in next to her was Ross, an Army man and Lander Pilot.

The Mage's voice counted down towards the burn. The Boffin and Ross had nothing to do, except watch for red lights and wait. They listened to the constant chit chat about their height above the Moon, the distance to the target landing area, even their own physical condition, their heart rates and so on. Even when the Mage was silent, the background messages went on, and timing bleeps came over the radio channel.

"Sixty seconds. Still green for go."

"Roger that," said the Boffin.

"Ten, nine, eight, seven, six, five, four, three, two, one, zero. Ignition of main Lander engine."

Abruptly the Lander started to shake violently and Ross and the Boffin were hammered in the back by its engines. After forty-three seconds the shaking stopped, and they were back to free fall again.

"Lander, injection into descent orbit confirmed. All lights green. Go for landing,"

"T-Base. Roger that," said the Boffin. She gave Ross the thumbs up, and he returned it.

T-Base kept calling out range and height. Everything was on track for landing, and they simply waited in free fall, performing checks, until T-Base passed control to Ross for the landing.

"Lander, control of Lander to Lander Pilot in ten, nine, eight, seven, six, five, four, three, two, one, zero," said The Mage at T-Base. "You have control, Lander."

Ross' controls and his board lit up. Of course his control movements would be fed through the Lander's computer, so it was a joint effort between Ross and the computer. The Boffin hovered her hands over her control board and unlatched the "Abort" button. Ross would follow the predicted

trajectory down to about one hundred metres, and then would land the Lander manually, with computer assist. The Boffin's main job was to monitor everything and hit the "Abort" button if necessary.

T-Base started calling numbers, range and height.

"Lander, engine ignition in ten, nine, eight, seven, six, five, four, three, two, one, zero," said T-Base and the shaking restarted.

The noise was deafening, and the shaking was so bad that the Boffin had trouble keeping her hands on her control board. She knew that it was worse for Ross as he continually adjusted thrust and attitude. She was confident of his abilities, though, as she had seen how good he was in training.

As the burn slowed their horizontal velocity, they tilted, so that their fall was also slowed a little. The shaking eased a little as the engines were throttled back.

"One thousand metres. Five hundred. Three hundred. One fifty," said the Boffin. Their sideways velocity had fallen rapidly, and they were now descending almost vertically. "One hundred, eighty, seventy, sixty. Drifting only slightly."

She felt the sideways engines firing as Ross kept them on trajectory. The main engines fired in bursts as Ross adjust their descent.

"Fifty, forty, thirty, twenty..."

"Lander, all green for landing," broke in T-Base.

"Twenty two," said the Boffin. "Eighteen, twenty, twenty-two, eighteen, fifteen, ten."

Ross was hovering the Lander as he searched for a clear spot.

"Twelve, ten, eight, five, four, contact light, two, one. Touch down!"

The engines automatically cut out as the Lander legs touched down. The Boffin and Ross were jolted forward then back as the shock was absorbed by the legs of the Lander.

"T-Base, this S-Base, S for Selene. We are down in one piece, I confirm."

"S-Base, roger," said the Mage. "Congratulations, S-Base."

Ross and the Boffin could hear the cheering at T-Base behind his voice.

"We did it, Prof," said Ross. That was the Boffin's nickname in training.

"Sure did, Pancake." That was Ross' nickname, given to him because a landing gear failure in early training had forced him to perform a belly landing. Safely.

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"I'd like to go to the Moon," said the Boffin one day, several years earlier.

"OK, let's step there, dear. We'd have to be careful about air, of course, because there is none up there," said the Mage.

"No, you must have read that they are sending manned missions to the Moon by rocket! They are asking for volunteers for the program."

He sighed. “Yes, I know. I was teasing. And I think you know it. Why don’t you apply if you want to go?”

She kissed him. “I knew that you were teasing, of course. OK, I’ll apply. Why don’t you apply for a job there too?”

The Mage nodded and stroked his beard. “Yes, it might be interesting to be on the Ground Crew. I can keep my eye on you, too.”

So they both applied and both were accepted. While the Mage worked his way up until he was one of the designated communicators for the manned launches, the Boffin went before the selection committee. They looked at her CV and her qualifications, and then looked at her.

“Hmm, you’re a professor of Physics at Central University, I believe?”

“Yes, that is correct.”

“And you’ve also been certified in the Air Force’s ST-120 aircraft?”

“Yes, from when I was in the Air Force and I’m certified to fly them at supersonic speed, sir. I’ve kept up my certification as a Reserve.”

“So why do you want to go to the Moon?”

The Boffin had thought about this quite a bit. She’d also bounced ideas off the Mage.

“Well, there’s the attraction of being the first person on the Moon of course. I’d go down in history. Then I thought that even if I’m accepted onto the program, I might not actually get to be the first. But even if I was on the second or third crew to get there, it would still be an enormous achievement. And this mission will advance science so much. Apart from the knowledge we gain about the Moon, from which we can learn more about the solar system, I’m sure that the technology that we develop to get to the Moon will benefit all mankind. And it’s the first step to the stars.”

The committee grilled her for an hour, and finally the Chairman said “Thank you, we’ll let you know.”

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The Boffin got the nod from the selection committee, and she and the other eleven trainees gathered at the Space Centre for their training. They were referred to as the “First Intake” and all acquired nicknames, sooner or later. The Boffin was “Professor” or “Prof” almost from the start. Others such as Ross acquired theirs as the training progressed. There were three other women trainees, but they were Army and Navy. The Boffin was only female civilian trainee, but she had been in the Air Force of course.

There was friendly rivalry between the trainees as they were tested in the centrifuge and in the water tanks, the simulators and the mock-ups. They rode the “vomit comet” to experience weightlessness. They performed exercises in vacuum tanks. The Boffin easily passed all the tests, and she loved the flying training in the Air Force supplied ST-120 jets. They trained in other aircraft, of course, but she’d flown the ST-120s before, and Trainer One and Trainer Two were the latest versions. All the trainees had flown at least a few hours in the jets before they were selected, but some had more experience than the others.

As training in the jets progressed the trainees were unofficially ranked by the trainers, and two of the trainees were well out in front. One was the Boffin and the other was the top Air Force pilot, who had brought the nickname of “Ace” with him from the Air Force.

The night before the final training flight there was a knock at the Boffin’s door.

“Hi, Ace, come on in,” she said. “What would you like to drink? I’ve decaf this and decaf that, and I’ve even got no alcohol beer.”

“Thanks Prof, I’ll have the acorn dust please.”

The Boffin made him a decaf coffee. He took a sip and made a face. “You know, I’ll be glad when we’ve been to the Moon. Then we’ll know if sipping this stuff has been worthwhile.”

“Yes, I know exactly what you mean. What can I do for you, Ace?”

“Well, it’s about the flight tomorrow. You and me, in T-1 and T-2. You see, I’m used to being ‘Top Gun’ in the ST-120 and I think that its possible that I could lose that title tomorrow. I just thought that I’d let you know that I’m OK with that if it happens, Prof. You are good. Though, I’m going to try my best to beat you, of course.”

“Wow, thanks for the compliment, Ace. I love flying those beauties and I know I’m good at it. I’m not sure I’m the best though. I’m also going to do my best tomorrow.”

“I wouldn’t want it any other way,” said Ace, smiling. “Good luck tomorrow, Prof.”

He handed back his coffee and turned to go.

“Good luck to you, too, Ace.”

He smiled again and left.

The next day they took off, the Boffin in T-1 and Ace in T-2. They both performed faultlessly, flying the loops, rolls and the other manoeuvres that the instructors required of them. Then they did a simulated flameout approach to the runway, and a touch and go each. After a few more exercises, the instructors sent them a little offshore and instructed them to run parallel to the shore. This was new!

“Accelerate to Mach 1.2,” ordered the instructor. “Repeat, Mach 1.2”

Since she was in T-1, the lead aircraft, the Boffin called “Yay! Three, two, one, go!”

Their aircraft leapt ahead, and their sonic booms startled a few seagulls as they sped up the coast.

“Come alongside, Ace,” she said, since she was in T-1.

“Roger. Thanks, Prof.”

They flew side by side for a while. The instructors gave them three minutes then called them back in. They slowed and turned back to the airport as instructed, with Ace flying beside her. He gave her a thumbs up which she returned. They landed in tandem, Ace bringing up the rear, and parked and handed their aircraft over to Ground Crew as usual. They caught a ride back to the Main Block.

“That was great!” said Ace. “They let us go supersonic. I had wondered why we had extra fuel.”

“Me too. Who did best, do you think?”

“That’s hard to tell. I think we both did well. I don’t know.”

They high fived each other.

At the main block the instructors held a debriefing session with the rest of the trainees and a few others, relatives and friends, like the Mage and Ace’s wife who was, like the Mage, a part of the Launch Team.

“I know that you know that we have been unofficially ranking you during these flying tests,” said the chief instructor. “All of you have exceeded the requirements by a wide margin, so I’m not going to tell you all your rankings. I do know that there have been bets laid as to who would be ranked first, so I’d better tell you that. In the end, we decided that it was too hard to separate Prof and Ace, so we ranked them both first. Well done, guys!”

Over good-natured catcalls and jeers, not to mention amicable but intense discussions about the bets, the chief instructor presented them with fake medals the size of dinner plates. Then the Moon Project Manager spoke.

“For the rest of the training, which is mostly in the simulators and classrooms, we will be separating you into four teams of three. We will announce those teams, and the order in which they will go to the Moon, shortly. We will shuffle and reorder the teams as we feel is necessary until we are happy with them.”

When the list came out, the Boffin was scheduled second and named as commander for the flight. She analysed her feelings on the matter and came to the conclusion that she was happy with the result. She felt envious of Ace and his team, who were scheduled to go first, but she wasn’t angry or even disappointed. This was a good thing, because, naturally, the Psych team questioned her about it later.

She learned that her Orbiter Pilot was going to be Ogre, and her Lander Pilot was to be Pancake. She knew both of them well, of course, and was pleased. They’d worked together well.

Four days before the scheduled lift off, Ace came to see her. He looked a little downcast.

“Prof, I just called in to let you know that my team has been downgraded to fourth. You are now up to number one. You are going to the Moon first.”

“What? Why? How do you feel about that?”

“Yeah, well, my Lander Pilot, Blondy, dislocated his shoulder when we were getting out of the Lander simulator in full suits.” Blondy, who was neither blond nor dizzy had mistaken the salt for the sugar in the mess one time and hence acquired his nickname. The Boffin recalled that his real name was Mishka.

“Oh no! Sorry to hear that. You must be gutted!”

“Not as much as Blondy. He’s kicking himself. Yes, I’m gutted, but I know that you’ll do us proud, Prof. We all knew that this could happen, was almost bound to happen to someone at some stage. They gave me the option of stealing Pancake off you, but I said no. At this late stage we should keep the teams together, I feel, and the bosses agreed.”

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The Boffin reflected that her space suit, while it could not be described as uncomfortable, could not be described as comfortable either. It was inflexible. Inconvenient. While she could not turn her

head or bend at the waist, she could bend her arms fairly well. The same could not be said for her legs. She could bend them, but it wasn't easy.

They had been on the ground on the Moon for a few hours now and the Mage, back on the home planet, had given them the go ahead to exit from the Lander.

"S-Base, you are go for depressurisation and exit from the Lander."

The Boffin and Ross had already sealed their helmets and were ready to lose all air.

"Roger, T-Base. Depressurising now." The Boffin flicked the switch.

Not much seemed to happen, though the suits may have stiffened a little.

"S-Base Commander, pressure at zero. You are go to pop the hatch."

The Boffin lifted the cover on the hatch release switch on her keyboard and flipped it. There was a clunk.

"T-Base, I'm opening the hatch and proceeding to the top of the ladder."

She moved to the hatch and reached for the hatch lever. She had to lean backwards slightly to get enough leverage, but she got it unlatched then she pushed it, leaning forwards and it swung open and clicked into place.

"T-Base, hatch open. Nice view."

She turned around somehow got down on hands and knees, then backed into the hatch. Her suit got caught on the hatch a couple of times, but eventually she made it. When she was clear she lifted herself to a kneeling position, and then raised herself using the hand rails until she was standing on the small platform outside of Lander. She reflected that she had entered a new world backside first.

As practised on Terra, she leaned back a little and moved a boot down to the first rung of the ladder. She repeated the process until she couldn't feel a next rung. She nodded to herself, then holding the hand rails she did a little bunny hop and was standing on the Moon's surface.

"T-Base. That's mankind's first big step into the Universe. I'm down on the surface. It's sort of powdery and clings to my boots. Ready for S-Base Pilot."

"S-Base Pilot, you are go for exit."

"T-Base, roger," said Ross.

The Boffin watched as Ross wriggled his way out of the Lander. His suit got caught on the hatch a couple of times too, but he made it out and climbed down the ladder. She looked around. Everything was monochrome, except for some coloured panels on the Lander, and the logos and stickers on it and their suits.

"T-Base, we are both outside the Lander. Ready to start the EV task list."

"S-Base, roger. Please deploy the flag, which is in Lander Pilot's A1A."

All the pockets on the suits were numbered. A1A was on Ross' right thigh. The Boffin leaned slightly forward to pop the seal and removed the rolled up flag. She handed it to Ross, who extended the pole and tried to push it into the dirt. It went in a little, but not enough to stand by itself. He retrieved it and opened three support legs, and then pushed it in again. With the support

legs and the thirty or forty millimetres the pole that went into the ground, it was stable enough. There was, of course, no wind to blow it over. Ross unfolded the flag and its stiffener pole, and they were done. They faced the flag and the Boffin and Ross saluted it.

“T-Base. Flag deployed. Penetration of the pole was about thirty millimetres. Stabilisers deployed. The ground here is pebbles and small rocks, a covering of dust, loose soil. Samples should be simple to obtain,” reported the Boffin.

“S-Base, roger. Commander, deploy the collection device. In Lander Pilot’s A2B”

She removed the device, which was essentially a claw with a scoop, from Ross’ pocket. She selected a small rock and picked it up. It was made difficult by the suit, which restricted her movements.

“Small rock, going into Lander Pilot’s B11.”

With difficulty, she dropped the rock into Ross’ first sample pocket. He then sealed it with a snap.

“Three-four pebbles, going in Lander Pilot’s B12,” she reported.

Finally, she picked up some dust, which tended to fly everywhere and put it into Ross’ B13 pocket.

“T-Base, reporting that this is unexpectedly strenuous, for the record. It shouldn’t stop us performing the scheduled tasks though. Passing collection device to Lander Pilot.”

She gave the device to Ross, who filled her sample pockets. His rock was a little large, but went in eventually.

They used the scoop device to gather more samples from around the site, each bagged and tagged and stored in a larger bag. This would be loaded into the Lander later.

“T-Base, collections done, query photographs next?” she asked.

S-Base said “Confirmed.”

The Boffin and Ross retrieved their cameras from each other’s pockets and started on the scheduled series of photographs, including pictures of each other.

“T-Base, confirm OK to move away from the Lander, please?”

“S-Base, confirmed.”

They bunny hopped to about fifty metres from the Lander, and started on the second series of photographs. Ross photographed a larger rock near their stopping point. He scraped it with a pointed tool and then took another photo of it. The Boffin covered the Lander from their new vantage point, as well as taking other photos in the same direction as in the first set. It was planned to make stereo pairs for the stereographic viewer.

“Pancake, what do you think of the view,” said the Boffin.

Ross looked around. “Mmm, very monochrome, Prof. Brilliant highlights, but not much reflection. Deep blacks in shadows, so it’s almost impossible to see into them. Difficult to judge the terrain and distances.”

“I’d agree with that. Not much to add. T-Base, did you copy that?”

“S-Base, yes thanks. You should head back to the Lander, now. You’ve been out forty-three of the scheduled fifty-six minutes, and you have just the two science packages to deploy, each of which takes five minutes. So you are slightly behind schedule.”

“T-Base, roger.”

They stowed the cameras back into their pockets, then bunny hopped back to the Lander where they unlocked the two packages from the outside of the Lander and each took one to deploy. The Boffin listened to the chit chat between Ross and T-Base. His experiment was soon deployed. The Boffin struggled with hers, as the drill refused to bite. T-Base had a few suggestions, but they didn’t work.

Ross came over. “Trouble, Prof?” He’d heard her chit chat with T-Base.

“Yeah. Drill won’t bite.”

Ross had a go, but it still didn’t work. Finally, they both put their weight on the drill and it went in. After that the package deployed quickly and easily enough.

Ross prepared to enter the Lander. He grabbed the guide bars and hopped onto the ladder.

“Whoa!” he said as he sailed past the first rung and onto the second. “Watch that, Prof. It’s easy to jump too far.”

“Thanks, Pancake.”

He carefully climbed the remaining rungs and knelt on the platform and crawled into the Lander. She winched up the large sample bag and Ross reached out through the hatch and grabbed it and brought it into the Lander. She followed him up the ladder, carefully jumping to the first rung. She thought to herself that she could probably hop up the rungs. Still, it wasn’t the time to experiment, so she climbed up the conventional way.

Crawling into the Lander was more difficult than she expected, probably because she was tired, but she got there in the end. It felt like home! She pulled the hatch to and latched it, then sank into her couch.

“T-Base, we’re back in the buggy,” she joked. “Confirm OK to pressurise.”

Back on Terra, the Mage snorted. “S-Base, confirmed.”

The Boffin flicked the switch to lock the hatch and the cabin filled with the breathable air mixture. Unfortunately on this initial mission they were not permitted to remove their helmets, but those on subsequent missions would be allowed to do so. However, they could now unlatch their helmets and breath the cabin air, which was a bit fresher.

“S-Base, you’re scheduled to take a meal, then sleep for eight hours.”

“T-Base, confirmed.”

She rolled her eyes at Ross and took the prescribed number of mouthfuls of what even the Ground Team called “Baby food”. It oozed up the food tube like thick soup. She found it to be just the right side of unpleasant, but it was all she had until they were back on Terra. Then she and Ross somehow managed to drop off to sleep.

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The rearranged schedule meant that the testing teams suddenly concentrated their efforts on the Boffin's team. Their third member, Hadden, whose nickname of Ogre had come from his character in his favourite game, was supposed to stay aloft in the Orbiter while they were on the surface of the Moon, but theoretically he could be called on to descend with Ross or the Boffin if the other team member was unable to descend for some reason. So he had to be trained on all the surface procedures too. Besides, he was scheduled to descend at a later date.

Ross and Hadden were suited up and practising in the low gravity simulator which used weights and pulleys to simulate low gravity, when Ross missed a step and fell over. Hadden tried to help him up, but he also fell over. They ended up laughing uncontrollably and took a long time to get up.

The Boffin was livid. "What are you two clowns playing at? Am I going to have to get replacements in, because that was just ridiculous. If you fall over up there, you could be in trouble. Serious trouble."

"You're right," said Hadden, "Sorry Prof", and he pushed Ross over again.

"Hey," he said. Hadden helped him up.

He said, "Thanks, Ogre." Then he pushed Hadden over and helped him up.

"Much better," said the Boffin. "Concentrate on business, guys. It's a matter of life and death."

Then she pushed them both over. They struggled to their feet in next to no time, then looked at her.

"Much better," she said, and all three burst out laughing.

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The three of them were tested in all the scheduled surface activities, orbital activities, and possible failure scenarios. They worked in the simulators so often that they could point to a switch when asked while blindfolded. When they weren't scheduled for a test or a lecture they were usually in the gym or studying the schedules.

Sometimes they practised with other members of the First Intake, and the Boffin was pleased that there didn't seem to be any hard feelings from the others. Envy, yes, but no hard feelings.

The day before lift off day came. The medics gave the trio one last going over, and the Boffin, as usual, got quizzical looks and retests. Nominally she was the oldest of the trainees, but of course, she couldn't tell them her real age. In the majority of the tests she tested well below her nominal age, so the medics were suspicious, and she didn't blame them. She used some of the Mage's mind techniques to calm their fears, and counted it as the one and only time that she had cheated during the whole time she was involved in the program.

Lift off time was just after seven in the morning of the next day. She, Hadden and Ross donned their suits at two in the afternoon, and the technicians hooked them up to their suit's internal "waste control and disposal" systems. It was uncomfortable and intrusive, but the technician who fitted her up was efficient and matter of fact, which helped a lot.

They were loaded into a bus and driven out to the launch site where they and their minders rode the lift to the top of the large "launch vehicle". This was an amazing piece of technology in its own right being over one hundred metres tall. It had three stages, and the "Lunar Package" rode on top of it. They were fitted one by one into the large module attached to the top of the third stage of the rocket. It was around midnight, so they had around seven hours to check out their systems one last time.

In a quiet few minutes the Boffin listened to the chit chat between the dozens of people overseeing the launch. Some of it made sense, some of it was pure noise.

Voice one : “Item sixty-seven dash one, sub three, IC oxygen, seven point nine, plus or minus zero point two.”

Voice two : “Seven point nine. Check.”

Voice one : “Item sixty-seven dash one, sub four, IC hydrogen, zero point seven, plus or minus zero point two.”

Voice two : “Zero point seven. Check.”

Most of their work during this phase fell to Hadden and Ross. Her conversations were mainly with Ground Control and concerned progress through the various checklists. Gradually they got through them, but surprisingly the time seemed to pass quickly enough.

Eventually Ground Control called “Thirty minutes to lift off,” and chit chat fell away. All checks had been done. All checklists had been completed. The Boffin suddenly became nervous.

“Steady Prof,” said Hadden. “Nearly there!”

The Boffin laughed. “Thanks, Ogre. I’m OK. It’s having nothing to do that gets to me.”

Thirty minutes became twenty, then ten. Chit chat started to build again, as fuel lines were purged and heaters started in the launch vehicle. A voice gave a weather report. Ten minutes became five then two. The Boffin, Hadden and Ross mostly just listened. This was launch vehicle stuff.

“T minus thirty seconds,” said the Mage. “Go for launch.”

Things started to rumble as pre-launch machines started up.

“T-minus twenty. T-minus fifteen. Ten, nine, eight, seven, six, five, four.”

“Ignition at minus seven,” said a second voice. Launch crew.

The launch module started to shake.

“Three, two, one, zero. We have lift off.”

The Boffin was pressed heavily into her seat as the roar of the big engines behind them reached a crescendo, and the rattling and shaking battered them as they soared away into the sky.

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“S-Base, T-Base calling. Time to wake up.”

The voice was familiar, but it wasn’t the Mage, who had finished his shift while she was asleep. It was a Navy officer called Miles. The Mage probably hadn’t left though, she thought.

“T-Base, we’re both awake.”

“S-Base, status is go for ascent to the Orbiter. T minus forty-two minutes. Please proceed with checklist.”

“T-Base, please tell Orbiter Pilot we will be up to join him shortly.” Of course, he knew that.

“S-Base, will do.” Miles was relaxed about her off-script request.

They settled down to perform the checklists. With five minutes to go they sealed their helmets and went to suit air.

“S-Base, arm the lift off mechanisms. That’s AA-1, AA-2, and AB-6.”

The Boffin lifted the covers and flipped the switches. “AA-1, AA-2, AB-6.”

“S-Base, T minus thirty seconds, twenty, fifteen, ten, nine, eight, seven, six, five, four, three, two, one, zero.”

Nothing happened.

The Boffin said “T-Base, we do not have...”

Then the engines fired, and they were on their way up to meet Orbiter, but with a delay of five seconds.

“Lander, there appears to have been a five-second delay in ignition of the ascent engines. Please hold while we check.”

The engines continued to fire as they were pushed into orbit. Then they shut off, and the Boffin estimated that they had shut off five seconds later than expected. Good. Everything was delayed by five seconds, so they would reach the correct orbit, but five seconds or several hundred kilometres behind the Orbiter.

“Lander, we confirm clean separation and injection into orbit. We confirm a five-second delay in ignition. We are checking the implications. Please hold.”

The Boffin said “T-Base, roger, holding.”

Down on Terra, the Mage looked at the Computer, Col. “What do you think, Col? What effect will the delay of five seconds have?”

The “Computer”, Col, was one of those individuals who could perform vast calculations very quickly and intuitively in his head. He looked at the numbers and shook his head.

“I don’t see it making much difference. Docking with Orbiter might be a minute or two late, and they might have to do a mini burn to catch him, while in orbit. But they’ve got enough fuel. Then they should be able to make a correction burn or two on the way back, if necessary. Mmm. Yes, though we will have to put it through the computer for confirmation, of course.”

The Mage conveyed this estimate to Miles, who relayed it to Lander and Orbiter.

“Lander, we have to confirm, but everything looks good. Schedules will be revised as we get the figures through.”

“T-Base, roger from Lander,” said the Boffin.

“T-Base, roger from Orbiter too,” said Hadden.

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The first stage engines stopped and the stage separated and dropped away. Stage two fired, and then it too dropped away. The third stage fired and put them into Terra orbit, but didn’t separate and fall

away. The Boffin, Hadden and Ross were mere passengers at the moment, so they listened to the chit chat from T-Base and relaxed as best they could in what would be the Orbiter.

“Orbiter, jettisoning nose cone now,” said the Mage for T-Base. “Extraction in seventy-three minutes.”

“T-Base, roger. We felt the nose cone go. Starting checklist for power up of Orbiter now,” said Ogre.

The three of them started on the checklist, getting the occasional “Roger” from T-Base. They reached the pause point and awaited the call from T-Base.

“Orbiter, we have go for injection into transition trajectory. Stage three engines to fire in ten, nine, eight, seven, six, five, four, three, two, one, zero.”

The engines fired and the rattling and shaking started again, with less intensity this time. Thirty four seconds later they cut out.

“Orbiter, you are on trajectory. You are on your way to the Moon. Good luck!”

“T-Base, roger and thanks. Continuing with Orbiter checklist.”

The Boffin settled into the routine of going down the checklists. She held her hand over the locket that the Mage had given her before they had lifted off. She couldn’t touch it of course as it was under her suit. The Mage-like part of her character felt comforted by it. No, she thought, it was the human part of her.

“We’ll soon be able to see the stars again,” said Hadden.

T-Base came in at that point. “Extraction in twelve minutes. Counting.”

Hadden sighed.

“What’s up, Ogre,” said the Boffin.

“Oh, nothing really, Prof. There’s all this furious activity on checklists, and powering up and stuff. Then before anything important happens we have times when we just get to sit here and chew our fingernails. You felt it before lift off.”

“Let me know how you chew your fingernails in your suit, with the gloves on, Ogre,” responded the Boffin.

Ogre and Pancake laughed and there was even a snort from T-Base.

“Orbiter, thirty seconds to extraction, twenty, fifteen, ten, nine, eight, seven, six, five, four, three, two, one, zero.”

They felt a substantial jolt, as the third stage was jettisoned. Twelve seconds later the exterior panels of the “Lunar Package” blasted into space, allowing light to stream through the small windows in the Orbiter. The combined Orbiter and Lander continued on towards the Moon, while the third stage spun off on an orbit that would take it away from the linked craft. The Boffin remembered that it and the discarded remnants of the “Lunar Package” would now become satellites of the Sun.

“Orbiter, you have go to pressurise the Lander,” said T-Base.

Hadden, as Orbiter pilot unlatched the switch and flicked it. He waited until the pressure was equalised, then reported T-Base. "T-Base. Lander pressure OK. Do we have go to enter the Lander?"

"Orbiter, yes, we confirm pressure OK. You have go to enter the Lander and start the power up checklist."

The Boffin unbuckled herself and pulled herself up to the Orbiter's hatch to the Lander and unlatched it. She swung the hatch open, revealing the Lander's hatch. She lowered herself back to her couch.

"Your turn, Pancake."

Ross pulled himself up to the dual hatches and connected the umbilicus to connect the Lander systems to the Orbiter systems. He swung the Lander hatch open into the Lander. He disappeared into the Lander, and some indicators on the Boffin's board lit up as he started to power up the Lander. She listened to the chit chat between Ross and T-Base as they started down the extensive checklist.

"Orbiter, you two should get some sleep. Lander Commander, you are scheduled to take over from Lander Pilot in eight hours."

"T-Base, roger."

The Boffin and Hadden settled down to sleep. They would take about two days to reach the point where the engines would be fired to put them into orbit around the Moon. While they would always have something to do, there was not as much pressure during this period.

...

As they rose from the Moon's surface, there were a couple of other shorter burns which nudged them into the same orbit as the Orbiter.

"Lander, you will approach the Orbiter slightly faster than expected, but within operational parameters, and slower than some training exercises. Loading the docking program into the computer."

"T-Base, roger," replied the Boffin.

The docking program would only get them so close. Ross would control their craft, with the assistance of the computer, to complete final few metres of the docking.

"Lander, you are thirty kilometres below and two hundred and fifty behind Orbiter and approaching at ten kilometres a minute. Three second burn in five, four, three, two, one."

Slowly the distance between the Lander and the Orbiter shrank.

"T-Base, Orbiter sees Lander," said Hadden suddenly.

"Orbiter, roger. Did you copy Lander?"

"T-Base, affirmative. We don't see Orbiter yet."

Two more minutes passed before Orbiter appeared in the forward window.

"T-Base, Lander now sees Orbiter," said the Boffin.

Slowly the craft drew closer to one another. Eventually they were ten metres or so apart.

“Lander, you are go to dock with Orbiter.”

“T-Base, roger. Lander approaching Orbiter now. Ten metres, eight metres, six metres..” said the Boffin, as Lander approached Orbiter. Ross was trying to align a template on Lander with a target on the Orbiter. He approached to three metres and then stopped.

“Pancake, what’s the issue?” asked the Boffin, concerned.

Ross was sweating and his hands were trembling.

“Pancake, this is a practice. I’ve never seen you miss in a practice.”

Ross looked at her. “A practice? Oh, yes. OK, Prof.”

He knew what she meant. He relaxed, wiped his hands, and edged Lander closer and closer to the Orbiter. A rod on the Lander slid into a socket on the Orbiter and a green light on the Boffin’s board came on. A solid clunk told them that their clamps had locked onto the Orbiter. Some indicator lights came on.

“T-Base, Lander docked to Orbiter,” said Ross.

“Orbiter, go to lock onto to Lander, open your hatch, and connect the umbilicus.”

“T-Base, roger,” said Hadden.

Another solid clunk told them that Orbiter’s clamps had locked on to Lander. Then they could hear a rattling as Hadden connected the umbilicus, which carried air and direct communications between the two craft.

“T-Base, locked on, hatch opened and umbilicus connected,” said Hadden.

A section of the Boffin’s control panel lit up with green lights.

“Lander, go to open your hatch,” said T-Base.

The Boffin unlocked the hatch on her control board and swam up to the hatch and unlatched it. She pulled it towards her, and she could see into Orbiter.

“Welcome back guys,” said Hadden, in the Orbiter. His voice echoed oddly through the communication systems.

...

Ross and the Boffin moved backwards and forwards between Orbiter and Lander, powering up the Lander as they coasted towards the Moon. There were scheduled correction burns, but they only needed one short one.

“The next big burn is going to be interesting,” said Ross during a break.

“Why?” asked the Boffin.

“Well, we’ll be out of sight of Terra, and out of communication.”

“Mmm, yes, but we’ve practised it. Several times. This will just be like another practice, won’t it?”

Ross mulled this over. “Yes, you’re right, Prof. We’ve done it tens of times in practice.”

As they flew ever closer to the Moon, its gravity changed their trajectory. If the next burn did not happen they would swing around the Moon and then off into space. The Boffin thought that they would then return to somewhere near Terra, but she hadn’t checked the trajectory. There was a plan for the possibility though. She knew that she had been over it at least once.

“Orbiter, you have go to enter Moon orbit. The burn will take twenty-three seconds and will occur out of radio contact. The burn is already loaded into the computers.”

“T-Base, roger,” said the Boffin.

Ross had got over his jitters. The Boffin didn’t blame him for having them. She had seen the steadiest and most unshakeable people get them. She’d had them herself, once or twice!

“Orbiter, contact will be lost in five, four, three, two, one, ---.” Not only did they lose the T-Base Communicator, they lost all the other background chit chat too. It was definitely unsettling.

“Burn in forty three-seconds, guys. Thirty, twenty, ten, nine, eight, seven, six, five, four, three, two, one, zero,” said the Boffin.

The shaking jolting started as the burn began. Things rattled and a pen, impelled by the artificial gravity of the burn moved past her. She grabbed it.

“Nice catch, Prof,” said Ross.

The burn ended and the Boffin looked at her computer.

“Burn successful. Exactly on time. Thirty seconds until we re-establish contact with T-Base.”

They had a few checks to do and completed them just in time for the re-establishment of contact.

“Orbiter, T-Base confirming contact.”

“T-Base, roger. We’ve missed you,” said the Boffin.

“Orbiter, please keep to the script. We’ve missed you too.”

The Boffin laughed. In her mind T-Base was always the Mage, even when he wasn’t on duty. It was actually him, this time, though.

“T-Base, roger. Starting checklist MO-1. Moon Orbit one.”

“Orbiter, roger. MO-1 Item 1A, O2 Main 1, status green.”

“T-Base, MO-1 Item 1A O2 Main 1, check.”

And so they continued. The Mage reflected that their lives were being ruled by checklists.

...

The Boffin transferred the sack of moon rock and other specimens from the Lander to the Orbiter. Then they removed and bagged the specimens from their suits. These were all stowed away in a safe and the safe was sealed. The Boffin also copied all the Lander logs to a storage device, and stored the device and all the checklists into another safe.

“T-Base. Specimens, logs and checklists are safely locked away.”

“Orbiter. You are go to shut down the Lander.”

The Boffin and Ross re-entered the Lander and started to shut down the systems. Then they returned to the Orbiter. Before the Boffin shut Lander’s hatch from the outside, she took one last look around, and sighed. She disconnected the umbilicus and shut the Orbiter’s hatch.

“Lock the hatch please Ogre, and let T-Base know.”

“T-Base, Orbiter hatch closed and locked,” said Hadden.

“Orbiter, go to undock and jettison Lander.”

“Can we do this, please, Ogre?” asked the Boffin.

“Sure, Prof. You or Pancake?”

“Pancake, go ahead.”

“T-Base, countdown please,” said Ross.

“Orbiter, ten, five, four, three, two, one, zero.”

Ross pushed the button and the Orbiter jolted as the latches holding the Lander were released. Little thrusters would push the Lander ascent stage away from the Orbiter and it would eventually crash into the Moon.

“T-Base, Lander ascent stage jettisoned.”

“Orbiter, roger. Trans-Terra burn in twenty minutes.”

“I’ll miss that box of bolts,” said the Boffin.

“Me, too,” said Ross.

“Orbiter, roger that,” said T-Base, even though they weren’t officially required to comment.

“T-Base, thanks,” said the Boffin, pleased.

“Orbiter, back to business. Post jettison checklist is O-97, starting at item thirty-seven.”

“T-Base, roger.”

And off they went again.

That kept them busy until T-base said “Contact will be lost in ten, nine, eight, seven, six, five, four, three, two, one., --”

“Trans Terra burn in fifteen, ten, five, four, three, two, one, zero,” said the Boffin.

Orbiter shook as her engines fired. The jolting was less than they had experienced in the Lander but was disconcerting nevertheless. The engines cut out just as they emerged from behind the Moon.

“Orbiter, confirming contact. Trajectory looks good. You are homeward-bound.”

“T-Base, roger.”

They had two and a bit days to coast back to Terra, with maybe one mid course correction. They would sleep, eat, and tackle several more checklists before they configured the Orbiter for splashdown.

...

With Lander powered up and ready to go, Ross and the Boffin moved into it, and Hadden shut the Orbiter's hatch and locked it. Ross shut the Lander's hatch, and the Boffin locked it from her control board.

"Lander, twenty minutes to separation. Good luck."

"T-Base, thanks. Orbiter, see you soon."

"T-Base, roger. Lander, I'll be here." All communication had to go via T-Base.

"Lander, Orbiter, separation in fifteen minutes. Lander, one final checklist before separation."

"T-Base, roger."

Ross and T-Base worked their way through the separation checklist. Sometimes they involved Hadden in Orbiter. The Boffin just listened, and finally they were done.

"Orbiter, Lander, you have go for separation. Orbiter, release your latches."

"T-Base, latches released." The two craft were only held together by the Lander's latches.

"Orbiter, Lander, separation in two minutes. One minutes. Thirty seconds, twenty seconds, ten seconds, five, four, three, two, one, zero."

There was a solid clunk as the latches unlocked and the two craft were disconnected.

"Lander Pilot, go, to back away from Orbiter."

"T-Base, roger."

Ross made small movements with his controls and Orbiter appeared to retreat in their small forward window.

"We're on our way," said Ross quietly.

Then louder. "T-Base, Lander separated from Orbiter. About two metres. Slowing."

"Lander, looking good. Go for rotation for visual inspection by Orbiter."

"T-Base, roger."

...

"Orbiter, time to wake up. You have a long day ahead."

"T-Base, roger," replied the Boffin, yawning.

"Orbiter, the breakfast today is full English, and the drink is coffee."

The Boffin grimaced. "T-Base, roger. Not funny."

Hadden and Ross were also awake. They sucked up the “full English” from their food tubes and the “coffee” from their drink tubes. Of course, they didn’t taste anything like full English, but they didn’t exactly taste bad.

“Orbiter, if you are all awake and fed, we will start configuring the Command Module.”

“T-Base, sorry, we are ready.”

Hadden and T-Base started a long conversation. Basically, they were going to jettison the Orbiter power plant, attitude thrusters, fuel tanks and other gear that they had no more use for. The craft would shrink to become just the Command Module, which had no engines, just attitude thrusters.

They would re-enter Terra’s atmosphere at the highest speed yet achieved by a spacecraft. They would skip across the atmosphere like a stone skimming water, re-enter and streak through the atmosphere. When they had slowed sufficiently their parachutes would open, and they would splash down in the ocean. Things were likely to get rough.

There were a series of clunks as bits of the craft were jettisoned. Some would miss Terra, most would burn up in the atmosphere, and some might achieve orbit for a while.

“Command Module, twelve minutes to re-entry. Thirteen minutes seventeen seconds to radio blackout.”

“T-Base, roger.”

“Command Module, five minutes.”

“T-Base, for the record we’re feeling the effects of the atmosphere. A few light jolts.

“Command Module, one minute.”

“T-Base, buffeting increasing.”

“Command Module, re-entry point reached, six minutes and five seconds to radio blackout.”

The Command Module was entering the atmosphere backwards and the protective screen was boiling off, as designed. All that could be seen from the forward windows was the glow of the ablative material as it boiled off.

Then the buffeting eased and the glow diminished.

“No nerves, Pancake?”

“No, Prof,” he said, surprised. “There’s nothing I can do, is there?”

The buffeting increased again and the glow reappeared. This time the intensity of the buffeting increased and the glow from the shield material lit up the interior of the Module.

Then the buffeting died away and the glow ceased. They had slowed to the point where friction was no longer melting the shield.

The Boffin looked at the clock and schedule. “Three minutes thirty-three seconds to drogue chutes deploy.”

There was no radio contact with T-Base. T-Base would probably see their chutes before full radio contact was achieved. As it was, the radio was emitting only clicks, buzzes and other noise.

A bump shook the Module.

“Drogues deployed.” said Hadden.

A much larger bump shook them.

“Main chutes deployed.”

They were still falling of course, but more slowly.

“Command ... Confirm, you have ... them ... chutes ... twenty ... metres,” said the radio.

“T-Base, we hear you but you are breaking up,” said the Boffin. “We have chutes deployed.”

“Command Mod... We have visual contact. We see y..., range about”

“T-Base, we got about fifty percent of that. We are swinging like a pendulum and rotating.”

“Command Module, about three minutes to splash down. Do you read me?”

“T-Base, roger. We now read you one hundred per cent.”

“Command Module, one chute is partially deployed. You will hit hard, but not too hard.”

“T-Base, roger that.”

“Hold on guys. You heard the man,” the Boffin said.

The Command Module smashed into the water and rebounded a little, tumbling as it did so. The three crew members were jolted and spun around, but that didn’t last long.

“Deploy the floatation devices, Ogre.” They didn’t need T-Base for that.

Hadden, flipped the switch and various bangs and rattles indicated that the floats were being deployed, and the Command Module stabilised. All that was left was a steady up and down cycle as the waves lifted and dropped the Module.

“T-Base, Command Module is down and all OK, but a bit shaken up. Come and get us! Sorry, I mean ‘Command Module ready for retrieval’.”

“Command Module, roger, coming to get you. Divers will be with you in about twelve minutes. Inflatables in eighteen.”

Clanks and bangs signalled the arrival of the divers, whose job it was to check that the Command Module wasn’t going to sink or drift away.

“T-Base, confirming divers have arrived.”

“Command Module, roger. Inflatables in three. Go to unlock the hatch.”

Hadden lifted the cover and unlocked the hatch.

“T-Base, hatch unlocked.”

The exit hatch was designed to only open from inside in an emergency, so they waited for the inflatables. A slight bumping announced the arrival of the inflatables, and with a hiss and a clang the hatch was opened.

“Hi, welcome to Terra,” said the sailor who appeared in the hatch. “Here’s your landing kit.”

He passed three packages through to the crew, who started to remove their spacesuits, and began to change into their “recovery suits”. That’s a fancy name for overalls, thought the Boffin.

“Command Module, the Carrier Narcissus will be there in about forty-five minutes. Cruiser Knightsbridge in twenty-five. Navy tells me that they will get you out of there, well before that.”

“T-Base, roger.”

In the restricted space removal of the spacesuits was cumbersome, but eventually they managed to change to the recovery suits. They passed the safes with the specimens out to the sailors in the inflatables, and then were ready to leave the Command Module. For some reason they all hesitated.

“Come on guys, no time to get nostalgic. You first, Pancake, then me, and then Ogre.”

Ross scrambled out of the hatch and disappeared.

“Sign off, Ogre,” said the Boffin. Then she started to climb out of the Module.

“T-Base, we’re disembarking, Command Module signing off,” said Hadden.

“Command Module, roger.”

Then Hadden followed the Boffin out of the craft.

...

“Do you think that I should have gone?” said the Boffin.

They were relaxing at home after all the de-briefing, and the television appearances, and the parades had finished. They were sitting on the sofa. The Mage had his arm around her, and she was leaning against him with her feet tucked up on the seat.

“Mmm, because you are the Boffin? Well, you applied like any other citizen, you were selected, you passed all the tests, and you did all the training. No one knows you are the Boffin, so why not? Did you use any of the powers given to you as Boffin to excel in the tests? Or any that you’ve learnt from me?”

“No, of course not. That would be cheating and wrong. But maybe I did well in the tests because I’m the Boffin. Maybe I bumped someone else out of the program without realising it.”

The Mage thought a bit. “Didn’t you tell me that you were a national fencing champion, and you were a national class middle distance runner, though you didn’t win any of the top races? And you were a top scientist with several highly regarded papers to your name? Not to mention your service in the Air Force. And that was before we met, and became the Mage and the Boffin? I’d heard of you before the war started and everything got turned upside down.”

“Had you? I didn’t know that. I’d heard of you too. I was always defending you to my colleagues, which didn’t always go down well towards the end. How strange that we knew about each other before we met.”

“But anyway, you were always an achiever, even before you became the Boffin. I think that you would have got into the program even you hadn’t been the Boffin.”

She kissed him. “Maybe you’re biased.”

He snorted. "Of course I am. But I'm right."

They were companionably quiet for a while.

"I'm going up there again, remember? As Popeye's Orbiter Pilot and Yoyo's Lander Pilot."

He nodded.

"What if I had been killed up there?"

The Mage seemed to consider this seriously. "I don't know. There's that young physicist that you've been lunching with. Ooof!"

She'd elbowed him in the ribs.

"Yeah," she said. "Joking aside, she'd make a good Boffin. You and I both tend to believe in determinism and are sceptical about freewill. Maybe if I was killed, you would eventually hook up with Anna or someone else, and she would become the new Boffin. I'd hate to think of you grieving for ever. But you should have said that you'd be devastated!"

"Of course I would. You know that. Oh, you wanted me to say it. So sorry. It was so obvious to me that I made a joke of it."

She seemed mollified. He thought a bit.

"Well, I would be shattered, as you know. I don't know what would happen then. We don't know much about this Mage and Boffin thing, when I come to think of it. Maybe there would be a new Boffin, but I can't say that the idea is very appealing. Maybe I'd stop being the Mage, and some other couple would take up the reins. I'd be a sad old man, ageing like anyone else."

Her eyes misted over. "Oh, I love you so much. Shall I withdraw from the program?"

"What! Do you want to? I don't think you do, do you?"

"I don't want to, but it makes me sad thinking of you, all by yourself, if I should get killed."

"My dear, we are a team. You're the one that goes out and helps out the dragons or tells off the Prince. I'm the one who stays at home and reads his books and reflects on the deep mysteries."

Of course, they both did what was necessary, and usually did it together, but in a funny sort of way he was correct.

"We were given these powers, remember," he continued. "We didn't ask for them. We are still human, and we still have the human urges to succeed and to enjoy our lives. We shouldn't hide away because we might take someone else's place, and we shouldn't be scared of what might happen to either one of us. That would be such a miserable existence. So don't withdraw from the program. You would regret it, and if you regretted it, so would I."

"Thank you, my love," she said. "You're a wise, wise man."

"I know," he said. "I know."