

Our First Steps

Chapter VIII – Space Cadet

„...plus, you must account for the centripetal acceleration. So yeah, I think you did it wrong.“

Cherry, though sitting at the opposite side of the table, still flinched as Bliz finished her needlessly detailed and condescending explanation. In a defensive reflex, she sank her head deeper into her pile of study notes, cursing herself for not picking the Stable IV canteen instead. Zvezda and Geist were far more fun than these high-strung ponies.

As if to prove her point, Scud shot up into the air, and, hovering a few hooves above the ground, began bearing down on the blue pegasus:

„And just who are you to talk to me like that? Oh, I forgot! Redstone's favourite student! I'm telling you, he only gives you such good marks because you ask all those smart-sounding questions!“

„Now, wait just one second,“ Bliz coldly began, „I do not care if you prove me wrong on the basis of truth, or a fault in my logic. But these quite unsubstantiated ad equem attacks-“

„Oooh!“ the pink pegasus interrupted her theatrically, „I can speak dead languages! I'm so smart!“

„Look, it's quite a simple term. It's not my fault you aren't culturally inclined.“

„While you were spending months buried in ancient books, I was practising my flying! After all, who aced the ejection tests?“

„I did!“ Rainbow interjected, „Are you trying to say you're better at flying than me?“

„You scored just two points more! And should I really remind you about yesterday's mechanics test? Who got ten percent there, huh?“

Ugh. Cherry tried to concentrate on the badly scribbled notes lying before her, tuning out the escalating argument before somepony said something so insulting, even she would have to join.

Not that it was of any use, of course. She could ignore the shouting, but not concentrate on her revision at the same time. Fortunately, at least one pony still had a shred of common sense left:

„Girls, stop!“ Ala resolutely bellowed, stopping every other candidate mid-sentence, „It was just an orbitals minitest! Why is everypony so on edge!“

The confrontation did cease, only to be replaced by a cold war. The answer to Ala's question was obvious enough, after all, though none dared voice it; Only one could be the first. And every one of the seven wanted it to be them.

Cherry looked up from her notes, surveying the situation around the table. Bliz and Scud,

though now silent, kept staring scornfully at each other, as Dash glared at them both. Ala was alternating her gaze between everypony else, trying to make sure the argument did not restart. As she looked around, Cherry noticed today's copy of the *Herald* tossed down on the table. On its front page stood Rainbow, dressed up and posing majestically before a large painting of the Moon. A special interview or something. Cherry noted once again that not only were those space suits shiny, but they also looked *really good* in photographs.

„What's it saying about us?“ she casually asked as if nothing had happened, nodding towards the paper and breaking the icy silence, „Good or bad?“

Ala stared in confusion at Cherry, then, tracing her sight, smiled in relief:

„Not much. Just highlights from the conference. Boring stuff, really.“

Scud, breaking her staring contest with Bliz, looked over to Ala:

„What do the editorials say? I wanna hear the editorials.“

As Ala fumbled through the pages, the tension began to melt away. Gradually, the pegasi loosened up, with Scud landing back on the ground and Rainbow resuming her lunch.

„Let's see here,“ Ala eventually found the correct page, „Great step forward for ponykind... Despite grand announcements, there's still a long way to go... oh, this one looks interesting! 'The Space Age; One giant leap backwards'.“

„Backwards?“ Rainbow spat out in surprise, „What? Are they crazy?“

„I'm not quite sure,“ Ala paused, then began to read the article out loud. „So, the Equestria Seven were announced yesterday... and guess what? They're all ponies. They're all female. Listening to Celestia's grand speech, even a jaded pessimist like myself could begin to believe our society would finally leave all its discriminatory baggage behind and move onward to the future. No such luck, it seems. There is not a single minority, not even a token male, amongst those dubbed 'Equestria's Finest'. Tell me, readers, what does that tell to those of us who did nothing wrong except be born to the 'wrong' parents? It says, clearly and loudly, 'Don't even bother. You can never be the best. You-“

Scud snorted, „I bet it's written by a griffon.“

„It is, yeah,“ Ala nodded, glancing at the final line.

„We were chosen because we're the best, not because we're trying to oppress minorities!“ Scud continued, „I swear, these advocates read into this way too much.“

„She's right, though,“ Cherry quietly began, then, seeing the look on Scud's face, quickly continued. „Just look around. No griffons here.“

„Well, duh. We were all recruited from the best flying academies. It's not my fault those are all

pegasi.“

„That's the point though, isn't it?“ Bliz suddenly spoke up, causing Cherry to smile. If Bliz was on her side, then she was probably in the right. That mare did not make mistakes.

„The recruiters did not correct for such bias. There might be dozens of brilliant griffon fliers, and we simply wouldn't have noticed them, because we didn't actively look,“ the blue pegasus continued, „If we are to give them an equal chance, we have to do exactly that.“

„If they're so good, why do they need special attention, then?“

„Now that is a very interesting question,“ Bliz' voice suddenly changed to a far more academic tone, „The real answer is, as always, extremely multifaceted. First off, obviously, we must check we share the same description of 'minority'. Too many ponies seem to assume it just refers to numbers, when, in fact, it is the institutional power which a group possesses that is far more important...“

Cherry zoned out. Although she agreed with Bliz – the first few words, at least – she couldn't care for pretentious million-word dissertations on the obvious. Returning to her notes, she instead began memorizing how to calculate the eccentricity of an orbit. An equally useless equation, true, but it would be on the next test for sure.

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„Right, now that we're all *finally* present,“ the Director began, shooting a cold glance towards Redstone.

„I was busy! Marking tests over lunch!“ the old stallion defended himself, „Is ridiculous! You would not believe how many of these mares don't know difference between periapsis and apoapsis. Five out of seven failed! Five!“

„From what I've seen of your teaching style, that's not a big surprise,“ Lyuka chided the professor.

„Objection!“ he shot back, „Why should I have to teach basics? They should read around subject themselves! That's what library is for!“

„Okay, Lyuka, Professor, we have a meeting to do here,“ Wilhelmina quickly calmed the two ponies before a real shouting match began, „Now, before we officially begin, are there any last comments? Questions?“

„Anypony remembered to feed the chickens?“ Lyuka pipped up, causing the assembled chiefs to erupt in laughter.

Wilhelmina laughed along; That joke never got old. The five had been holding a meeting on

Sequine's farm, talking about flight trajectories, when suddenly a flock of hungry hens stormed the little cottage, scattering all of their notes and making an utter mess of their prototype gyroscope...

*Hay. How many years ago was that? Five? Six?*

Suddenly feeling very nostalgic, Will looked around at the other members of their club. Lyuka, 'Assistant Director'. Redstone, 'The Professor'. Sequine, 'E.M.'. Sunny, 'The Supervisor'. Ancient nicknames, all chosen on youngsters' whims at their very first meeting, still held at the College...

Ah, those were the times. Seeing the laughter slowly die down, Will shook her head clear of the past, then focused on the voice recorder lying at the centre of the table. Suddenly surrounded with a dim blue glow, the switch flipped to the active position, and two large reels on the device began spinning, passing the magnetic tape from one cylinder to the other. Clearing her throat, the Director announced:

„Council of the Chief Designers, meeting two seventy four. Special session at the behest of the Assistant Director.“

„Thank you, Director,“ Lyuka winked, then looked back through her notes. As they waited, Wilhelmina smiled to herself. Keeping the recordings anonymous was yet another ancient decision, just in case somepony accidentally happened to stumble upon their ever-so-slightly illegal experiments involving high explosives. Now that the project had gone public, it was no longer necessary, of course, but old habits died hard.

„Right,“ Lyuka took a deep breath, „Everypony ready? 'Cause this is exciting.“

„I have to supervise flight training in half hour,“ Redstone glanced at the clock, „Can you get to point?“

„Yes. Well. Okay,“ Lyuka nodded, then, positively giddy with excitement, triumphantly announced: „We... we got it. We finally got it!“

„Got what?“ Redstone impatiently snapped.

„The liquid propellant formula! We got it!“ Lyuka flew up into the air in excitement, then circled the table, dropping a copy of her notes before each pony, „A stable hypergol!“

Wilhelmina looked at the page in amazement.

„I spent so much time looking at liquid fluorine, I missed this completely obvious thing staring me right in the face!“ Lyuka finished rounding the table, but remained in the air, gesticulating wildly, „Take some ammonia, add some electrolysed sulphuric acid, and what do you get? Boom! The perfect fuel!“

„Two nitrogen atoms, in *both* fuel and oxidizer? Most interesting,“ Redstone noted as he studied the sheet, as surprised as everypony else, „I thought you had given up on those ages ago. Not

enough power.“

„Yeah, halogens were much more reactive,“ Lyuka waved him off, „Especially chlorine trifluoride.“

„Wait, I remember that one,“ Sunny began, „That's the one that burnt down your lab, wasn't it? Small wonder nopony got hurt there.“

„A few minor burns,“ Wilhelmina pointed out, „And that one pony had a heart attack. Thank Celestia for our medical corps.“

„Yeah. Collapsed five hundred feet away. Trust me, when you see a giant vat of trifluoride slowly starting to tip over, you start galloping so fast Celestia couldn't catch you,“ Lyuka spoke from experience, „Poor thing's heart couldn't keep up. Anyway, that's the exact problem. The halogens are so reactive, they set the engine chamber on fire. No matter what metal we try, it ends up in flames. Some of those fuels even burn *cement*. Fun stuff. This fuel plus Tetraoxide, though? Perfect.“

Nodding, Will looked at the other sheet. A concept sketch of Equestria's first liquid-fuelled engine.

*Lyuka-E*, she smirked as saw the title in the corner of the diagram, *Trust Lyuka to name highly explosive unstable designs after herself*.

„So, how soon can we get production started?“ she looked back at the assistant director. An uncomfortable smile was her reply. Uh oh.

„Well, now that we've solved our *first* giant problem, there's still, kind of, uh, one more...“ she slowly began, pointing to the sketch „Look at it closer. You'll see it.“

The Director glanced over the schematic again. A small spherical combustion chamber, a large supersonic nozzle, and a giant mess of pumps and plumbing that...

She blinked. The piping was random. Literally random. They began and ended in nonsensical places, intersected themselves, and angled impossibly. This was a napkin sketch, not a workable production design!

Lyuka uncomfortably smiled again, „Yeah. I've got no idea how to power the fuel pumps.“

„Like all pumps. Steam engine,“ Sequine impatiently dismissed the concern.

„Well, you tell me how to get a high-volume high-speed steam-powered turbopump, complete with boiler, auto-feeder, and regulator, under one hundred pounds total mass, and I'll put it there, sure.“

The pale unicorn stared into the air for a second, blinked, then smashed her head into the desk, opting to waste no words where actions would suffice.

The Director smiled, but only faintly. This was a big problem, and there wasn't much time left to fix it. Their schedule called for the first test firings to take place within a month. If they didn't meet that goal, there'd be no hope of putting a mare into space, not without missing their already-published deadline.

„What about little rocket engine?“ Redstone suggested, „Add tiny combustion chamber. Burn small bit of fuel there. Use pressure from explosion to power turbopump, which then channels fuel to actual engine. Conceptually, simple.“

„I thought about that, yeah. Seems like the only option, to be honest,“ Lyuka scratched her head, still hovering in the air.

„Won't that, like, halve the efficiency, though?“ Sunny wondered aloud, „I mean, you'll have two separate engines in there, and only one providing thrust. And how will you power the first one, anyway? With a *third* engine?“

„No, no, no, the first chamber would be tiny, producing just enough power for the pump,“ Lyuka quickly clarified, „Only needing a low fuel flow. It can be gravity-fed or something.“

„Oh, okay. And we can't gravity-feed the main one because...?“

„It needs far more fuel per second. It's pushing a giant rocket into orbit, after all.“

„Good point. So, small engine it is?“

„I still don't like the idea,“ Wilhelmina shook her head, „It won't double the fuel usage, but it *will* double the complexity. Like the Supervisor said, two engines in one. Twice the piping, two combustion chambers, two separate throttling systems. A typical over-engineered system where too much can go wrong. There must be a simpler solution somewhere; And, as typical, we just keep missing it.“

The assembled ponies studied their papers in silence. After a few minutes of complete quiet, Will sighed. This would be another of *those* meetings.

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Her vision dimming as she pulled a sharp upwards turn, Cherry swished through yet another of the floating metal hoops. Feeling a momentary faint sensation as her feathers brushed against its glowing frame, she gritted her teeth:

Don't tell me-

Hearing a loud klaxon blare from the ground, Cherry swore profanely, then continued her rapid climb. Entering a clockwise spin, she began scanning the ground below for her next targets.

In a few seconds, she spotted them; A cluster of three hoops, hovering just above the low roof of Stable VII; Each at ninety degrees from the last one, and with barely ten yards of clearance between them. Ridiculous.

Cursing the Professor for the hundredth time in as many seconds, Cherry suddenly folded her wings. Her speed being what it was, she continued gliding upwards for a few more seconds; Soon enough, though, old-fashioned gravity took over, and Cherry began plummeting towards the ground like a rock.

Feeling the air rush past her – its chill providing a thankful reprieve from the desert sun and her own body heat – Cherry flipped around in mid-fall, bringing the rapidly approaching ground before her eyes. After continuing to stare at it for a few more moments, she deployed her wings in one fell swoop, already regretting putting style before substance.

A flare of pain ignited in her wings as she entered the high-gee turn and slowly began to level out. Fighting the instinct to fold them back, she instead forced herself to extend her outermost feathers even further, increasing lift. More pain was the result, but she didn't care. *Four last rings... just four more.*

As her fully deployed wings fought to avoid snapping, Cherry's sudden fall slowly transformed itself into a mere rapid descent. With satisfaction, she noticed the long roof of the vehicle assembly building now approaching straight-on. *Perfect timing.*

Feeling the pain subside, she immediately forced her wings to start working again, and accelerated even faster. Despite the complexity of all these movements, there were no thoughts running through Cherry's head. Her universe consisted of the whooshing air, the trio of floating rings, and the flat roof of the building. High gee aerobatics were the ultimate rush.

As the hoop grew in size before her, she froze the motion of her wings, concentrating on nothing but the incoming object. Running on pure instinct, she took two last breaths, then, exhaling deeply, spiralled to the side and angled her trailing feathers upwards.

The rapid turn pushed down on her chest and resulted in yet more protest from her overworked wings. Suddenly seeing the clear sky before her, Cherry wasn't quite sure what just happened; But there was no klaxon, and, turning her head around, she could see the three rings quickly shrinking into the distance behind her. She would have congratulated herself, but it wasn't over yet.

All too aware of the acute outcries sounding from every fringe of her body, Cherry began a soft climb upwards, tracing out a very wide loop. Halfway through the circle, she spotted the final ring; High above her, charting out a small figure of eight as it oscillated through the sky, bathed in a dim blue glow. Cherry scoffed.

Moving target? That the best you can do, Redstone?

She would have defiantly screamed these thoughts, but couldn't afford to spare the air. Accelerating towards the flying hoop, she gave little thought to analysing its motion. In the rush of the flight, thinking was unnecessary; Her body knew what to do.

Angling herself slightly to the left and upwards, she sped up, giving the air a few final blasts from her wings. Meanwhile, the flying ring continued in its trajectory.

Three, two, one-

A whoosh of air, the blink of an eye, and it was done.

Right through the middle, Professor. How 'bout that? Cherry smirked.

The groundside klaxon boomed thrice, announcing the end of the test. Hearing the sweet sound of release, she spread her wings one last time, using all her remaining strength to keep them extended as she gently descended towards the Equenaut complex.

Spotting a small group of ponies watching her from the ground, she softly angled her feathers for a minute correction of her glide slope, then hit the ground galloping. Quickly slowing down, she came to a final stop mere hooves before Redstone. Glaring at the infernal professor, she nevertheless promptly saluted:

„Cherry Skies, reporting mission complete!“

Four camera flashes recorded her pose for posterity. Nodding in satisfaction, Redstone looked up from the clock lying in the sand:

„Very good, cadet! Hundred ten seconds, five more for brushing ring thirty seven.“

„Yes!“ Rainbow, though visibly tired, jumped off the ground in excitement, „First! First place! I win! I win!“

This drew a rush of activity from the small group of reporters gathered here; Whether it was her laid-back yet competitive personality, her jokes, or her sympathetic background – she was the only one of the Seven to not graduate from an elitist private academy, after all – Rainbow was adored by the papers. As the journalists quickly rushed to take ever more pictures of the winning pegasus, Cherry rolled her eyes and looked around.

The two engineering unicorns were already levitating their metal hoops back to storage. Meanwhile, the other equenauts lay on the ground, motionless, water dripping from them as they recuperated. Noticing this, Cherry began searching for a bucket of water to likewise drench herself with. Only a few seconds later, however, Redstone looked back at her, having finished scribbling down the results in his unreadable mouthwriting:

„Third place, miss Skies! Bliz ahead by six seconds, then Dash by half second more.

Congratulations, everypony, you broke last week's records. Half hour rest, then report for orbital mechanics resit! Dismissed!“

Cherry had no words for the professor. Well, she had plenty, but there were too many reporters around to use them.

„Resit?“ Scud got out in shock, but Redstone was already walking away, notepad in mouth and not heeding a word. She turned around to the others.

„Resit?“ she repeated, still in disbelief. Meanwhile, the other equenauts slowly got back on their hooves, moaning and cursing under their breaths. That thrice-damned professor.

Cherry sighed. Finally locating the bucket, she resigned herself to merely gulping down half its contents. Having done that, she slowly and uncertainly began wobbling after the others, advancing in the general direction of her living quarters. Already, she was imagining her revision notes lying on her desk, and exactly how she'd permanently maim her lecturer with them.

Catching up with the others, she glanced sideways at Rainbow, still talking to the small group of reporters. *Silly filly*, Cherry thought to herself, *I can't wait 'till-*

„You know, I can't wait 'till she washes out,“ Scud, also looking in the same direction, confided, „She's already failed three mechanics tests. And the less competition, the better.“

It took for somepony else to voice these thoughts to help Cherry realize just how cold they really were. Stopping in her tracks, she glanced back at Rainbow.

Sorry, girl. I hope you'll do fine.

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„Just popping in,“ Redstone announced, happily poking his head through the open door, „Any progress?“

Wilhelmina shook her head resolutely.

„Okay then. Have to supervise equenauts again. Hopefully they won't all fail *this* time,“ Redstone shook his head in wonder, then left the room. As the Commissar slammed the door shut from the outside, Will turned her head back to the desk, which now lay covered in many large sheets of paper, each home to dozens of vague scribbles and hundreds of quick calculations.

„How much specific impulse do we need for orbit, again?“ Sunny asked, placing her head on the table and yawning.

„Three hundred thirty. Forty would be better,“ Will checked the appropriate equation.

„That doesn't leave a great deal of wiggle space.“

„Nope.“

Some more unproductive silence followed. Wilhelmina tried to focus on the schematics before her, but the past few hours have been too strenuous; She was tired, demotivated, and utterly out of ideas. No matter how hard she tried to think about the problem, nothing was coming out of her brain.

„How much thrust do we really need anyway?“ Lyuka spoke into the air, „Can't we just leave out the pump altogether and gravity-feed the stupid thing?“

„I'll have the Professor work out the minimal acceleration later,“ Wilhelmina slowly replied, „But look at the equations. One gee gives you nowhere near enough pressure. It's a rocket engine, not a candle.“

„Pressure fed!“ Sequine suddenly suggested.

„Yeah, that one sounds good,“ Lyuka began in a tired voice, „'Cept gaseous fuels have a lower energy density than horseapples. We need liquids. And you try pressurizing a liquid!“

There was no response from Sequine. None was strictly required, after all.

„Rocket-powered pump it is, I guess. I don't think we can work out more until Redstone's run the thrust profile numbers. Should we adjourn, comrades?“

Tired groaning was her reply. Not even bothering to speak the old and tried closing words, Wilhelmina resolutely flipped the switch and shut down the obedient voice recorder.

*We already got the propellant! That's half the work done!* she wondered as the ponies slowly filed out, *Why is this other half so hard?*

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After two solid minutes of lying dead in the shower as cold water washed over her, Cherry began hurriedly revising orbitals from her messy notes. They still refused to make any sense, especially after all that flying. Eventually, she just gave up, and repeated the exact questions that had been on the last exam. Going more by automation than conscious thought, she looked up all the words she hadn't known last time, and checked up on how to get rid of those evil triangles again. Hopefully the upcoming paper would be similar to the last. It was a risky bet, but she had no energy for anything more.

Twenty minutes later, sitting in Redstone's chalky classroom, she was looking over the test in shock. She re-read every question four times, trying to find the catch. This was Redstone, after all, there must've been one. But no matter how hard she tried, she couldn't see it.

This was the exact same test. To the last decimal number and blank space, Cherry remembered every one of these questions from today's morning. Unable to see one single difference, she shrugged, then began.

Quickly going one-by-one, she filled in all the blanks of the opening paragraph, then started on the equations. Unlike last time, she knew how to calculate the eccentricity, and even remembered to add the planet's radius to the height above the planet when computing the orbital periapsis. Not too shabby.

Ten minutes afterwards, Redstone scooped up the papers and momentarily left the room. As soon as he had shut the door, the complaining began:

„That was the *exact same* test!“

„How on Equestria do you do question four? How?“

Meanwhile, Cherry sat back in her chair, quietly listening with a smug grin on her face. This bet certainly wouldn't work again, but for now, she was at the top of her world.

„Seriously, I reread the entire chapter for *this*?“ Bliz announced in disbelief, the last to speak before the Professor returned again, this time accompanied by Geist. Cherry gave the latter – and only the latter – a cheerful wave.

„I hope you did much better this time around, class!“ the Professor grinned, about as smugly as Cherry had earlier, „Anyway, after such good flying I think you deserve special treat! Pack up, we're going to Stable VI!“

„Six?“ Ala asked in confusion as the class tiredly got off their chairs, „What's in Six?“

„Precision engineering,“ Bliz excitedly replied, „There must have been a major breakthrough! I wonder if they prototyped the flight computer yet?“

Cherry, though certainly thankful there'd be no more teaching, would definitely have preferred ending early instead. Sure, computers looked cool enough; Especially the bigger ones, with their hundreds of gears and other clockwork that span in elaborate ways, making neat ticking sounds, especially when coupled with the cyclic clicking of several dozen relays, all running at once. Or the newer models, with those awesome condenser jars that kept flashing blue while working. Last weekend, Redstone had taken them to Sequine's basement to look at a few, and she still remembered the memory fondly.

Despite all their coolness, though, they remained utterly confusing machines that seemed magic, but weren't – most of the time, at least – and they deeply bugged Cherry. No matter how much she stared at the spinning gears, she still couldn't see where the all the maths came from.

After the group had made their way to Six and entered their target hangar, however, these

thoughts immediately vanished into thin air.

Towering in the middle of the white room stood a shining ball of polished metal. Though bisected at the equator by a heavy-looking reinforcing ring, and intersected with a small round window on one side, it was otherwise a perfect sphere. Cherry grinned as she saw her own reflection distorted in its spherical surface.

„Star Walker capsule, model A,“ Redstone announced proudly, „Study it well, ponies. One day, your lives are going to depend on it.“

As the five other candidates carefully approached the prototype, Cherry looked around the white hangar. In the far corner, Zvezda and her friends, all dressed up in white helmets and labcoats (and looking quite fetching in them, Cherry noted), were studying the impressed equenauts from afar, looks of accomplishment on their faces, and empty mugs of coffee on their tables.

Meanwhile, Bliz chose to approach Redstone instead. Hearing her inquisitive voice speak up, Cherry's ears shot to attention; Usually, in class, the mare just asked pointless trivialities. But outside, the situation could be quite different, and Cherry listened carefully, just in case:

„I presume this is not the full spacecraft, Professor? It seems rather... incomplete. Especially on the inside.“

„What?“ Redstone broke from staring at the vehicle in astonishment, then looked at Bliz:

„No!“ he began, then paused briefly and reconsidered, „Well, yes and no. Theoretically, it has all support necessary for space. Oxygen regenerator, food racks, water tank.“

„But for a practical orbit, we need a lot more, no?“

„Indeed, yes, yes. Communications. Retrograde engine. Manoeuvring thruster. Flight computer. All present in Comrade Module. Which isn't built yet. Nor is this module, really. Right now, it's just heatshield plus window. Still looks breathtaking, though. Thought you'd like it.“

„Flight computer?“ Rainbow suddenly interrupted. Turning away from the capsule and towards the Professor, she continued:

„That reminds me! We haven't really learnt anything about *flying* this thing,“ she punctuated her point by kicking its polished surface with her hind leg, drawing a gasp from the other equenauts and a flurry of panicked activity from the assembly team, „It's all flight computer this, flight computer that. Or how fix the computer when it fails. What about, you know, flying?“

She outstretched her wings to add weight to her words. Redstone looked back sceptically:

„Miss Dash, respectfully speaking, I don't think *you*, of all ponies, should be complaining about presence of flight computer. You consistently score bottom of class in every single astronav exam.“

Dash paused for a bit, probably taken aback by the Professor's audacity; Cherry wished to say

she was likewise, but she wasn't, not really. Belittling somepony in front of all the others was due course for Redstone, that evil slavedriver. Having recovered, anger flared up on Rainbow's face:

„Look here, Professor. Two weeks ago, I was just the local weathermare for Ponyville, never having solved for 'ex' once in my life. I think I'm doing pretty good, considering!“

„Laws of physics do not care about context, cadet,“ Redstone retorted, „Your background is irrelevant. All that matters is whether you can do it, or not. And right now, you cannot.“

„Actually, Professor, there is one additional argument for automation here,“ Bliz took the Professor's side – both literally and metaphorically, Cherry noted, as she saw the mare position herself next to Redstone – then resumed, again starting up with her annoying academic voice, „We simply have no data on how pony physiology may react to whatever awaits us up there, chronic weightlessness and space-ray bombardment to name just a few. Will you be able to sleep? Eat? Stay conscious? Maybe. But if there's even the slightest chance of the contrary, wouldn't you prefer an automated system ready to take you to safety, just in case?“

„Well, I do know I signed up for flying. Not to be pony in a can!“ Rainbow stood her ground. Cherry shared her feelings, and, judging by the silence coming from the others, most of the Seven probably did as well. However, encouraged by the leader of the pack supporting Redstone, they slowly joined in:

„If it was my life, I'd prefer a computer. Just for the first flight, you know?“

„You're just being selfish! We're spending millions of bits here, we can't wager them without any backup!“

„Miss Dash, I did say council of chief designers seeks valuable input from equenauts,“ Redstone wrapped up, „But flight computer stays. Final decision.“

If they stopped there, that might have been fine. But Scud just couldn't resist a flippant snort:

„Just 'cause the papers love you doesn't give you special authority, Dash.“

That was enough to break Cherry. Marching up to Rainbow's side, she faced down the pink pegasus:

„How 'bout you stop with the insults and start arguing the real issue here?“ she shrieked, then turned to Redstone, „Look, I know you want the first flight to be automated. But what if the electrics fail?“

„They cannot! Program is logically watertight!“

„So, when you talk about all those bajillions of wires and condensers inside,“ Rainbow began, „You're also saying there's zero chance of just one snapping loose? Getting installed the wrong way around?“

„Cadet, I suggest you read up on your polarity restrictions!“ Redstone suddenly snapped, „I want a full presentation – in front of class – on condensers. By tomorrow!“

„What? How is that even-“

„Tomorrow, cadet!“ he remained resolute, then, realizing something, ineptly resumed, „Okay, there is launch tomorrow, no classes then. But day after tomorrow!“

„You're still not answering her point!“ Cherry demanded, „What if one wire falls out?“

„There is backup computer! Pilot flips one switch, and all is fixed!“

„'Cept there isn't, Professor, is there?“ Zvezda suddenly walked up to the arguing ponies, „Weight concerns. Even with just one computer, we're still three hundred pounds long of the target. There's no way we'll fit a second one in.“

„Well, then just use final backup! Open envelope, enter unlock code, activate manual control!“ Redstone sighed as if he was talking to a bunch of simpletons, „Simple!“

„Because manual overrides never fail, am I right, Professor?“ Cherry snapped coldly, „And no pony certainly *almost froze to death* from a simple override failure?“

As Redstone looked on the three mares in befuddlement, Cherry smiled at the other two.

„Thanks, by the way,“ she whispered into Zvezda's ear.

„I was just correcting Redstone,“ Zvezda quickly whispered back, almost defensively. Cherry gave her a questioning look:

Why would she want to deny helping me? Strange pony. Really smart, though. Probably has her own genius reasons.

Meanwhile, Bliz stepped up to defend Redstone:

„We are arguing over emotions here. In the big picture, we have no idea what is more likely to fail – the computer or the pony. It's a matter of trust, that's all.“

„Well, I trust myself,“ Dash simply stated, glancing at her wings.

„And I trust the computer.“

Silence followed as the two sides waited, each trying to compose a new argument. Eventually, Redstone hesitantly spoke up:

„I... suppose... we could implement *both* systems. Computer and manual. No unlock codes, no control lockout. Just one simple switch.“

„Professor!“ Scud spoke up in disbelief, obviously unable to admit defeat, „What about all those reasons you mentioned? What if weightlessness makes a pony go crazy? Claw at the controls in madness? What then?“

„Then we've already failed, no?“ Zvezda posed, „We want to go to space. If we can't live in

space, then this entire project is pointless.“

„Just put the switch somewhere hard to toggle,“ Cherry shrugged, „Somewhere it can't get flipped by accident.“

„While we're changing stuff, can we also get a bigger window?“ Rainbow livened up, looking at the capsule again with a giddy smile, „If I'm gonna be driving myself, I'd like a good view.“

„Geist, note it down. No control lockout. Bigger window,“ Redstone sighed in annoyance to his overworked aide, then looked back at Dash, „Realize this doesn't change your homework, cadet! Now that you've got manual controls, I expect you to be more studious than ever! Starting with condensers.“

Rainbow blinked back.

„Are you serious? We already have seven pages of-“

„Very serious, cadet.“

Cherry, seeing Rainbow drawing breath for another argument, smiled sadly at her, then shook her head. *This one you can't win, girl.*

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After the equenauts had all filed out of the workshop and Blues had firmly sealed the door behind them, the four engineering ponies looked at each other.

„So... More work for us?“ Sara asked.

„Not sure. Maybe less, even,“ Zvezda shook her head, „We don't have to install an overcomplicated override system now.“

„I want to go back to the rocket,“ Terra sighed, „Far less politics. Just do what you're told and you won't get shouted at.“

„True,“ Blues replied, „Then again, we're getting paid a lot more here. Little wonder they expect more of us.“

„If you ask me, the pay's nowhere near good enough,“ Sara protested, „We're getting paid production line money for design-level work!“

„Complain as much as you want,“ Zvezda shook their complaints off, „There's one thing that outweighs all of that.“

„That is?“

„We're pretty much irreplaceable now. Having brought us in on the project, they can't really hire a new crew without re-training, which would take way too much time. So, if the Director wants to

keep to her precious schedule, she can't kick us out, no matter what we do!“

„What if the hatch seal fails? The computer doesn't power up? What happens to us then?“ Blues pointed out, „With a rocket explosion, there's fifty other ponies to share the blame with. Here, we're four.“

„Yeah, yeah. But these other perks balance it out,“ Zvezda smiled mischievously, causing a terrified look to appear on Sara's face:

„Whatever mad bender you're planning, leave me out! I'm not getting fired over one crazy night, no matter how wild it might be!“

„That's not what I meant. Come on, Sara, honestly: Do I look like that kind of mare to you?“

„Well, you *did* get pretty drunk at that assembly completion party we-“

„That was once! One night! And never again!“

„Pop corn staaaand,“ Terra hummed, bringing up the most embarrassing event of that night. Zvezda quickly spoke up again, trying to suppress the bad memories:

„Look, I'm not talking about getting drunk here! I'm talking about finally finding out what's going on in this crazy place.“

There was a silence. Zvezda, a conspiratorial smile on her face, gestured the three other mares to approach her closer, until they had formed a small circle. Looking around, she whispered:

„Don't you ever wonder? The woollen-hat wearing ponies? Where we get all that electricity from? What's the deal with these bunkers? And – most annoyingly – what on Equestria do we need a Commissar for?“

„Oh, come on, Zvez!“ Sara burst out laughing, „Now you're just being paranoid!“

„Well, did *you* see a windmill anywhere? A dam? Or power lines that stretch out across the desert? There's only the railway, nothing else!“ Zvezda insisted.

„Maybe they've electrified the rails?“ Terra wondered aloud, still uneasy with Zvezda's latest mood.

„Nope. Measured the voltage once in the night. Not a zip. And even if this one got explained away, what about all the others? Like I said, why do we need a Commissar? It's not like we're at war.“

„OR ARE WE?“ Sara shouted theatrically, her eyes widening in mock surprise. The other two mares burst out laughing.

„Look, girls, I'm not saying there's a huge conspiracy going on, all right?“ Zvezda defended herself, a bit irked by the reaction she was getting, „I just think this is all a bit... weird. Things don't happen without reasons. And there's a lot of strange things happening about this Cape. I want to



know the reasons.“

She looked with desperation at her friends. They stood there uncertainly for a moment, then Sara broke the silence with a grin:

„Oh, why the hay not? We owe you at least that much. And I was getting bored just assembling stuff anyway.“

Sara stretched out her hoof; Zvezda put her own on top, then Blues and Terra did the same.

„Say, if we're going to be solving conspiracies, don't we need a team name?“ Blue suddenly asked.

„Good idea! I propose...“ Sara began, then quickly glanced around the room, her gaze eventually coming to a stop over a small pneumatic hammer lying in the corner, its manufacturer's logo prominently visible, „... Team Konik!“

„How about... Starwalkers?“

„No, no, no, I got it: Special Bureau of... uh, Telescopic... err, Zoom. No. Something else. Something beginning with Z. So each word starts with the same letters as our names!“

Zvezda laughed nervously, „How about we leave the naming for later, girls?“

„The Rivet Inquisition!“

„Girls?“

„The Power Four!“

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After Redstone had dismissed the group for the day, a few hours earlier than usual – citing the tiring exercise and tomorrow's test launch as the only reasons – the equenaut corps scattered back to their quarters.

Most of them, at least. Cherry, on the other hoof, headed straight for the library, making her way past large groups of the strange hat-wearing ponies as she trotted down to Stable I; Her wings were still aching terribly from this noon's flight, and she decided to not abuse them any more, at least not today.

Only a few minutes into her journey, she noticed it wasn't just the hat-wearers that were strutting about in larger crowds today; Ponies from all departments were being unusually active, lugging large film cameras and crates of film around, putting up informational posters in the lobbies, cleaning the corridors, and setting up additional garbage bins.

Cherry had heard from Geist, who heard from Redstone, who had heard from the Director

herself, that an unbelievable number of ponies from all across Equestria had reserved tickets for the upcoming launch. This put a smile on her face. The influx of reporters had already died down since the initial announcement, and Cherry was definitely looking forward to dressing in that awesome space suit again; Especially now that the prototypes have had their circulation membranes and piping installed. Spiffy-looking? Water-cooled? In the middle of the sweltering desert? Yes please!

Arriving at the library – a re-purposed storage room, but, as it was favoured by the entire Council of Chief Designers, exquisitely furnished with lush carpets, plush sofas, and beautifully carved wooden tables – Cherry pulled an old textbook from the shelves and trotted over to her favourite reading table; The one closest to the room's large fireplace. Putting the book up on a chrome stand, she flipped to the right chapter and lay down on the conformable sofa, basking in the warmth of the fire.

As she slowly went through the page, re-reading every paragraph several times just to *begin* understanding it – she got lucky on today's resit, but wanted to make sure she'd do even better next time – a bored part of her mind wondered about the fire. For a concrete bunker in the middle of the desert, it sure was awful cold down here. Weird.

Eh. The room was probably underground. Or they had some good air conditioning. Either way, there definitely was a good reason for it, and Cherry quickly dismissed the matter. Especially with these stupid orbital mechanics to learn. She still disliked having to spend so much time in the library, but her wings ached, the room was pleasantly warm, and nopony was bothering her. Media and attention were all very good, but even Cherry liked a break from them every so often. Plus, perhaps most importantly, none of the other equenauts were here.

Relaxing on the comfortable sofa, occasionally reaching to turn a page, and listening to the gentle crackling of the fire, the orange pegasus spent a long time with the book, taking notes and doodling spaceships in the margins when the text got too obtuse. Time didn't really seem to exist in the confines of the room.

Of course, Cherry only realized this when she had reached the end of the chapter. She blinked. Now that had never happened before. Not in a single sitting. Looking up at the clock, she suddenly realized why that was; She had spent a whole four hours here in this library.

She blinked again. Now *that* had certainly never happened before.

Getting up from the sofa, she stretched her legs one-by-one, then both of her wings. They were still sore, but getting slightly better now. Absent-mindedly looking around the otherwise empty library – the librarian probably was on a coffee break or something – she removed the astronomy book from its stand, and, grasping its spine with her teeth, carried it back to the shelf.

Spotting the end of a rainbow tail with the corner of her eye, she stopped in her tracks, then, after a moment's consideration, trotted over to the equenaut. Rainbow had come off as quite different to the other equenauts today, at least in Cherry's eyes. Different enough to intrigue her.

„Hi!“ she smiled, rounding the corner and seeing Dash spread out over several textbooks, wearing thick reading glasses and almost dying from boredom, „Don't see you 'round here often.“

A tired sigh was her reply. „Why would you? Not like I don't have better places to be...“

Cherry, recognizing her past self in Rainbow's words, grinned encouragingly and approached to peek over her shoulder:

„Theory of condenser operation?“ she shook her head, „Seriously. Redstone can be such a jerk.“

„Tell me about it!“ Rainbow turned another page, and stared at it blankly, „I mean, I point out a glaring technical flaw, and what does he do? Drown me in homework!“

„Yeah...“ Cherry nodded, likewise looking over the open textbook, „Say, can you understand a single word on that page? 'Cause I sure don't.“

Rainbow suddenly looked up, eyes widening:

„You... don't?“

„Nope,“ Cherry giggled.

„What about that huge electrics presentation you gave on Saturday?“

„Geist wrote the whole thing! Not my fault, not really. I just kind of accidentally slipped I didn't get anything over lunch one time, and then he spent three evenings in a row explaining it all in an understandable way! Nice stallion, really.“

Dash collapsed back into her sofa, removing her glasses:

„Thank Celestia! I could swear I was surrounded by geniuses around here!“ she exclaimed in relief, „I thought I was the dumb one out... not that I'm not, of course.“

„Well, Bliz is a genius. Ala too,“ Cherry began, „But the others? Me? Hardly!“

„They always keep talking about politics and art and maths and, and *stuff* over lunch. I try to start a chat about the Wonderbolts. Or about just how cool this all is; I mean, we're going to space! Space! Then they just sneer and carry on.“

Cherry nodded along, then rolled her eyes, „Exactly! That's why I eat in Stable IV whenever I can. Or alone in my quarters... can't stand the pretentiousness in the Equenaut canteen. Only thing going for it is the food.“

„Stable IV? With all the brainiac scientists and engineers? Aren't they even worse?“

„You'd be surprised! They're a fun bunch. Well, okay, a few aren't, but that's just life.“

„You've been here the longest, though. You know them all,“ Rainbow sighed, „Me? Not really. Everypony here is just so... *professional*. Even in their spare time, they're all studying physics books and ancient poetry! Makes me feel guilty for just wanting to take a nap!“

Cherry laughed, „You've been spending way too much time in Stable Nine! Look, join me next lunch with my crew, and you'll see.“

„I still feel pretty stupid, though,“ Dash remained mopy, „All these geniuses around...“

Cherry was a bit surprised to see this side of her. At the few equenaut dinners Cherry had attended, Dash seemed as boisterous as the rest; And before the cameras, even more. Spending as little time with the rest of the Seven as possible – instead much preferring to hang out with the assembly crews – she never noticed just how different Dash was.

„Don't mind the others,“ Cherry tried to encourage the blue pegasus, „They're just showing off. I'd bet they don't understand half the things they talk about.“

„Hey, I know they are!“ Rainbow raised her head in protest, „Don't go thinking I'm some mushy emotional wastebasket! I just... all this gets to you after a while, you know? I love competitions, but to have one going twenty-hour seven? Without a single break, ever? Come on!“

„Especially with stakes like this,“ Cherry added quietly, „First mare in space? Your name'll become as famous as Celestia's, remembered for all ages...“

„...while the others become footmarks in a dusty book,“ Rainbow completed the sentence, „What kind of obituary is 'Fifth mare in space'? Seriously.“

Cherry beamed at Dash:

„A pretty cool one, actually!“

She just stared back.

„The way I look at it, all of us already won,“ she continued, „Every pony in the land is talking about us. We're the 'Best fliers in Equestria'! We're going to space!“

„So, you're telling me to give up?“ Dash slowly asked, distaste apparent in her voice.

„Hay no! I'm not giving up either, am I now?“ Cherry quickly clarified, „But don't sweat it if you lose.“

Dash still seemed unconvinced. Remembering something the mare had mentioned earlier, Cherry tried a new approach:

„It's like being accepted to the Wonderbolts, and moping you're not the captain.“

That seemed to grab her attention.

„'Cept it's better,“ she added, „The Wonderbolts don't get to go to space.“

After a pause that seemed to stretch on forever, a sad smile appeared on Rainbow's face.

„You're right.“

Getting off the couch and picking up her reading glasses, she resolutely shut the textbook, then continued, „I'm just stressed out. From this crazy place, from Redstone, from everything. I'm not usually like this, you know!“

Cherry nodded in satisfaction. Much better!

„So, you'll join us for dinner tomorrow?“

„Well, not tomorrow, sorry. I've got friends coming over. For the launch,“ Rainbow shook her head apologetically, „I haven't seen them in two weeks! Also, I kind of need Twi's help with these stupid condensers...“

„Yeah, don't sweat it.“

Turning around to leave, Dash looked back, a devious smile on her face, „Next lunch, though? Why not!“

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Watching the hat-wearing ponies slowly drag the Cosmodrome's latest creation across the rail lines and towards the launching pad, the Director's heart swelled with pride. Very unlike the strictly practical affair of their last launch, this vehicle rollout was a far more grandiose event.

Powerful searchlights lined the length of the rocket railway, making its white metal skin shine like a pearl in the darkness of the night. The sky was perfectly clear, and the moon silently watched from its place among the stars, no longer as mysterious as it had once been. Looking at it, the Director smirked defiantly. For every generation until theirs, that little silver sphere had symbolized magic and impossibility. Now, it was a target.

Of course, reporters were likewise present, the early arrivals from the more professional papers, and they were doing their best to get both objects in shot at once and record the symbolism that way. From her vantage point atop the small launch control platform, Wilhelmina could count at least four film cameras, all tracking the slowly advancing vehicle as it made its way across the tracks.

Turning around, she glanced around their new launching site; The little ignition platform at its centre lay utterly dwarfed by the massive spectator podiums and observation towers, most of which were still being finished even now; The air glowed with magic as lengthy wooden planks were levitated into place, and ringed with the rhythmic beating of hammers. Occasionally, the entire scene would light up for a fraction of a second, as if from lightning, while the powerful ignition

systems were tested; They would have to light all five of the new vehicle's engines simultaneously and without failure, and so were being given utmost care.

Two thousand ponies would be coming tomorrow, arriving by every possible means of transportation; And for every seat sold, ten more had to have been turned away in disappointment, not from any want, but simply the sheer lack of infrastructure here in the middle of the desert.

The Director smiled. Despite the omnipresent scepticism from self-proclaimed 'experts' all across society, the masses of Equestria were nevertheless thrilled by the Space Programme; The intoxicating combination of Celestia's grand speech, the photogenic equenauts, and the scant few minutes of released archive footage, all resonated powerfully with the common ponies of sprawling cities and farming villages alike. And they weren't even sending a mare into space yet!

Wilhelmina took a deep breath of the cold dry air, then looked around the imposing scene once more. A little off to her left stood Sequine, the only other Chief Designer to have already finished with her duties. She noted the unicorn's face was completely emotionless, and chuckled:

„What's the matter, Sequine? Still not enough for you?“

„Not yet,“ she spoke softly into the night, „Moon rocket.“

Despite the denying words, Will could tell from Sequine's voice that even she was impressed by the sight. At least a little.

„Still remember our first meeting?“ she absent-mindedly asked, not really expecting a reply from the succinct pony. To her great surprise, she got one:

„Lyuka's bedroom. I brought cake. It was cold.“

Now, for somepony like Sequine, that right there was a whole novel of saccharine nostalgia.

Wilhelmina also remembered, just like it was yesterday. *Redstone still had that ridiculous beard. And the way Lyuka styled her mane! I never had it like that... did I?*

The sight of the gleaming white rocket, slowly making its way under their platform, mingled with these humble memories.

„And just to think, from that little college bedroom came all this,“ she looked around, taking another deep breath, „Just us five, a few pieces of blank paper, and one guiding dream.“

„Stolen voice recorder,“ Sequine reminded her of the last object.

„Yeah. That too. Doesn't sound as poetic, now, does it?“

„World's not poetic.“

„Stories are, though,“ Will retorted, „And that's what will survive. We'll all turn to dust. Our designs will get replaced and forgotten. The stars we know will grow cold and die. But the stories? They won't. They will perpetuate, getting passed from generation to generation, until the last pony

draws her last breath. With time, no one will know of our names, of all the hardships we went through to get here. But our stories will remain.

You know, at times like these, I wonder, I really do; What legends will they tell of us, a thousand years from now?"

But for the briefest beautiful moment, the sentence was left hanging poetically in the midnight air.

„Sad jokes whose rockets blew up.“

„Stop spoiling it!“