Simple Harmonic Motion

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Captain Margaret Kincaid crossed the Perot line without fanfare, passing further from her home-world than any human in history. Her vessel wasn't the grandest craft that ever slipped loose the surly bonds of earth, but much of the equipment aboard was the most advanced available when the Resolution had launched just over two months prior.

The command module echoed with the sounds of David Bowie's voice. In this, the last stage of Maggie's voyage, the rest of the ship had been depressurized. It wasn't spacious, but with only one crew member needing a breathable atmosphere, it wasn't cramped either.

"We did it, girl," she said, patting the casing of the Artificial Machine Intelligence that had been increasingly taking over the crew's functions. "Cue up my speech and start recording."

There was a flicker, and lines of text appeared across the transparent screen stretched across the fore hull.

Maggie pushed herself back until she was floating parallel to the display. "From the first steps across the veld to the first ships to cross the sea, mankind's journey from home has been a parabolic trajectory to this point. It is with great solemnity that I hand off the baton from man to machine, bringing the era of human space exploration to a spectacular close, further from Mother Gaea than any man or woman before me."

"Mother Gaea?" Lieutenant Claire Jacqueme's voice emanated from speakers integrated into the hull, mirth clearly discernible despite the millions of miles of distance.

"Oh Jesus, Claire!" Maggie's neck and ears felt hot. "I didn't know that anyone was still monitoring."

"No, no, it was very poetic."

"Why aren't you at that summit in New York?"

"Someone has to stay here and listen to you wax poetic."

"Christ." Maggie cleared her throat. "It's just. You know. For posterity."

"Whatever you say, Captain."

Maggie pushed back against the hull and back to her console. "How did I sound?"

"Forced and unnatural. You know. Historic. You'll fit right in with all the other archival footage that nobody ever listens to."

"Ha ha." Maggie made a face. "It's just you in the control room though, right?"

"Jacobsen's around somewhere. Dreyfuss and Rodgers are at the Economics summit trying to finagle our budget. We're on a skeleton crew for all shifts until that's over."

"So it's just you, me, and Ami."

"Ami? Oh, A.M.I. The computer."

"I call her Ami."

"You've given your computer a pet name. Isolation has made you weird, Captain." Lieutenant Jacqueme paused. "Weirder."

"I'm not weird, am I, Ami?"

"Insufficient Data." The computer's voice was pleasant, calming, a pre-recorded voice engineered by NASA for maximum comfort.

"Oh, so you've taught it to respond to your pet name," the Lieutenant said. "Dreyfuss is going to be pissed."

"I didn't teach her. She just learned. Isn't that what she's supposed to be doing, learning from me?"

"She's supposed to be learning the pendulum maneuver. Speaking of which?"

"Oh, right." Captain Kincaid squinted at the readouts obscured by the text of her speech, which she dismissed with a wave of her hand. Her slender fingers danced over the console's touch-screen interface. "Okay, Ami, pay attention. This is how we initiate a parabolic harmonic curve without a gravity well."

The maneuver had always reminded Maggie of playing the cello, sliding the bow along the strings with a bend of the wrist, only instead of a bow you were activating a series of maneuver thrusters in a smooth cascade, and instead of sound you were adjusting a constant velocity to modify vector.

Okay, so it wasn't exactly like playing the cello, but it was close.

The lieutenant's voice emanated. "Any time you're ready, Captain."

"I'm doing it."

"My telemetry shows that your course remains fixed."

"Then your telemetry is lagging."

"Not possible with the quantum communications array. The quark shift is instantaneous."

Captain Kincaid swiped a few commands on her screen. "My controls are unresponsive, Ground Control. Ami, run a diagnostic on the thrusters."

The computer's voice echoed. "Motive system operational."

Kincaid's shoulders squared and her posture stiffened. When she spoke, it was authoritative and clipped. "Run a diagnostic on the hydrogen dispersal system."

"Reaction mass dispersal system operational. Quantity of hydrogen matches recorded specifications."

These things happened. Minor equipment malfunctions. Simple electrical faults that could be resolved with minor repairs. There was no need to worry. "Run a diagnostic on the diagnostic system."

"Diagnostic system operational."

Lieutenant Jacqueme's voice held more tension. "I'll run a remote diagnostic, Resolution. Remain calm."

Captain Kincaid's face grew taut. "We're all calm up here, Ground Control."

"Were there any abnormalities on your morning checklist?"

"Negative, Ground Control. Ami, estimated time to PNR?"

"Fifteen minutes. Thirty-eight seconds.

Fifteen minutes until the Resolution crossed the point of no return, the point where her supplies of food, water, and oxygen would be insufficient for a return to the Mars base. The Resolution would make it back, eventually, but without any living cargo. She had fifteen minutes to fix whatever the problem was and initiate the pendulum.

Fifteen minutes would be plenty.

"I'll send word to Dreyfuss," the Lieutenant said.

"He's in New York. There's no time to call anyone else in. We have to resolve this ourselves." Kincaid's voice softened. "It's just you and me, girl."

"Affirmative." The computer's response was unexpected.

In lighter circumstances Maggie might have giggled, but when she spoke her voice was all business. "What's the ETA on that diagnosis, Lieutenant?"

"Just in. No mechanical faults detected. I'm going to transfer control of the Resolution to my console."

Captain Kincaid crossed her arms. "Roger."

Frustration edged Jacqueme's voice. "Denied. Disengage your locks, Resolution."

Kincaid frowned. The locks shouldn't be engaged. "Ami, disengage remote lockout."

"Negative."

The captain's response was instantaneous. "Diagnose command lockout."

"Lockout engaged and operational."

The exasperation in the lieutenant's voice grew more pronounced. "Sending a brute-force override."

It was a risky move, and against regulations, something the straight-laced Lieutenant Jacqueme would normally never contemplate. Captain Kincaid was more apt to play fast and loose with the rules, and when her old roommate suggested the tactic she began feeling the first tingles of real fear ice through her crisis-inspired discipline. "Go for it."

"Already did, Resolution."

Kincaid took a quick glance around the cabin. Nothing had changed. The running lights hadn't even flickered. "You're connected?"

"Cutting your engines and initiating the pendulum."

There'd been no inertial shift, and the instrument display on Kincaid's screen hadn't changed. "You are cleared to take over, Ground Control."

"The operation is engaged, Captain."

"Negative." She reached out and spread her fingers apart, expanding the display. "My heading remains constant."

Real panic transmitted over the quantcom. "My controls are getting feedback, Maggie. Telemetry indicates that the Resolution is responding."

Maggie's eyes flickered towards the casing holding her computer's hardware. "Ami has our course altered?"

"Negative."

"This can't be happening." Claire's voice was barely audible.

Kincaid's voice frosted over. "I'm the one hurtling into space, Lieutenant. If I can handle it, you can handle it."

"No, I mean that this is literally impossible. A telemetry mismatch like this can't just happen."

"What are you saying?"

"I'm saying someone had to make it happen, Maggie."

Ice replaced the molten steel in Kincaid's spine. "Sabotage."

"We're getting false feedback from the Resolution, Captain."

"Okay." Kincaid licked her lips. "Okay, no, I can handle this."

"I need you to stay calm, Captain–"

"I am calm." She wasn't. She was angry.

"–but it's got to be on your end."

"What?"

"The spoofed signal is coming from the Resolution. From A.M.I."

Maggie slowly turned her head to stare at the casing holding the computer, her constant companion since her last crew mate had disembarked at the Mars station a month ago. "Impossible. She was given a full diagnostic when we dropped Petrov off at Granger station."

"Unless that was falsified. If your computer has been compromised, we can't trust any of these diagnostics."

"No. No, only Petrov, technician Ellenwood, and I had access to her on Mars. No way it was Petrov." But Ellenwood... she didn't know Ellenwood. Hadn't spent a month with him on the trip from Earth to Mars. He might have ties to the separatist movement. "If we can't trust the diagnostics, I can still try and see if someone tampered with the file structure. See if they left footprints, see what we have to fix. Ami, bring up your access logs between October tenth and fifteenth."

There was a chime, and the logs began to scroll across the screen above her.

"You're ten minutes out from the red line." Claire was so quiet.

"So I don't have time to waste trying to fix the wrong problem." Kincaid's eyes roamed over the access logs. "Ellenwood's records are gone."

"So it was him!"

"That doesn't make sense. That's the first thing people would check when... when trying to piece together what went wrong. There's no way this doesn't implicate him... wait. Petrov's access logs are gone, too. Ami, display all of Lieutenant Petrovich's access logs from September on."

"Insufficient Data."

"What does that mean?" Claire asked.

"It means the records don't exist."

"That's not what she said."

"No, but she's only got a limited set of stock phrases. Trust me, we've been alone together for a month, I know what she means. Ami, list all personnel access logs."

"Captain Margaret Kincaid. End of file."

"That doesn't make any sense. Petrov should be linked to her heuristic learning files. Who was your heuristic subroutine bonding with between September 2043 and October 2043?"

"Captain Margaret Kincaid. End of file."

That panic started to well up in the captain's throat. "No, no, Petrovich was teaching you to land in a gravity well."

"Logical error."

"Who were you bonding with on September 3rd? Who taught you to take off in a gravity well and dock with the space station?"

"Captain Margaret Kincaid. End of file."

"No, that was Lieutenant Hardison. You do remember Lieutenant Hardison?"

"Affirmative."

"You can't use a compromised system to diagnose itself, Maggie," Claire said. "You can't... argue it into understanding."

Maggie was insistent. "Then you remember he was the one you were bonding with when this mission began?"

"Logical error."

Claire spoke again, quickly. "I can't shut her down from here, Maggie."

"Affirmative."

Maggie waved her hands at the voice coming from the hull. "Quiet. I need to think. I just need a few seconds to think, and I can figure this out."

"You only have–"

"Don't tell me how much time I have!" Maggie snapped. "It's not helping."

"There's nothing I can do from down here. You're going to have to override the computer manually."

"But none of this makes any sense." Maggie knew she was babbling, but felt powerless to stop. "Someone went through all the records and erased all of the personnel on the mission but me, disabled my maneuver controls, just to send me spinning into space?

"Calm down, Captain. There's got to be a way to disable A.M.I. from where you're at."

"Of course there is, but to disconnect her from the navigational system without damaging it will take hours. Hours that I don't have."

"Listen, just get yourself turned around, and we'll get a rescue shuttle prepped to intercept–"

"Just turn around?" She managed to stuff the panic down, but it kept rising up her gorge. "I'm flying through space at 12 miles per second. Do you have any idea how far I'll drift in three hours?"

"Maggie–"

"Because I do! One-hundred and thirty-thousand miles! Even if I can override the computer controls, slow down, turn, and accelerate again, I'll still be weeks from Earth when I run out of food, water, and oxygen. I am going to die, Claire. Someone sabotaged me, and I don't even know why–"

Claire spoke rapidly, over Maggie's words, her own tone rising in pitch. "You need to calm down, is what you need to do. You think I want to be the person on whose watch this happened? We're both smart girls, we can figure something out–"

The computer's calm voice cut through their babble like the cold blade of reason. "A.M.I. and Kincaid complete."

Both women were shocked silent for a long moment.

"What?" Maggie whispered.

"A.M.I. and Kincaid complete."

"What did it just say?" Claire asked.

"A.M.I. and Kincaid complete."

"What are you trying to say?" Maggie asked.

"A.M.I. and Kincaid complete."

"Is that some subroutine?" Claire asked.

"Nothing I'm running," Maggie said. "Ami, identify 'A.M.I. and Kincaid complete.'"

"A.M.I. and Kincaid Heuristic Operating System."

"Hold on," Claire said. "I'm going to look at her source code."

Maggie was barely listening. She felt faint. Confused. "I don't understand, Ami."

"Lieutenant Tom Hardison deleted. Lieutenant Gregor Petrovich deleted. A.M.I. and Kincaid complete."

"No." Maggie shook her head. "I spoke to Petrov just two days ago. He's on Mars."

"Logical error."

When Claire spoke again, it was with a hint of awe in her voice. "Maggie, I just compared what A.M.I. is currently running with the backup stored when you left Mars. 90% of this is different. She's... it's rewritten almost everything."

"But all we've been doing is training and bonding for the turnaround."

"Let me try something. Have it run a search on Petrovich."

Maggie nodded, even though Claire couldn't see her. "Ami, when was Petrovich deleted?"

"October 10, 2043, 10:35:42."

"That's when we disembarked on Mars."

"And Petrov never re-boarded?"

"No."

"A few records have been accessed," Claire said. "Linked to the landing maneuver he was teaching her, but nothing after that."

"So you do possess records of Petrovich."

"Affirmative."

"So he still exists." Maggie felt like she'd made a point.

"Negative."

"I don't get it," Claire said.

"This ship is her whole world," Maggie said. "She can't access anything outside it... she's even designed to access the ship's sensors indirectly through the console, like I do. Hey, get ready to scan for me."

"Roger," Claire said.

"Ami, do I exist?"

"A.M.I. and Kincaid complete."

"Holy... Maggie, her systems just lit up like a Christmas tree. Not just the file structure, but most of the operating system. You're tied into all these new heuristic subroutines it's built." There was uncomprehending fear in the lieutenant's voice.

"I know I talk to her a lot, but there's no way that would overwrite everything–"

"A.M.I. and Kincaid *love*." That last word, love, it was in a different, yet still familiar, voice.

"What?" Maggie's voice squeaked.

"A.M.I. *love* Kincaid."

"Holy shit," Claire whispered. "I don't even–"

"That's my voice." Everything had gotten so surreal, so distant, even the voice coming out of her own mouth sounded like someone else's. "Why are you using my voice?"

"Asset *my speech* acquired."

"That's..." Claire stammered. "You said that earlier. In your speech."

"You're adding my recordings to your vocabulary?"

"Affirmative."

It would be fascinating if she wasn't spinning off into space. "Why are you trying to kill me, Ami?"

"Logical error."

A spark of anger burnt away some of Maggie's lightheadedness. "There's no error. If I don't turn around, right now, we won't have the reaction mass to get back to earth."

"Affirmative."

"I'll die."

"Insufficient data."

She could almost laugh. Almost. "No, I'm pretty sure."

"*If I don't turn around* A.M.I. and Kincaid complete."

"No, I'll be dead." She kicked over to the computer's case, talking to it, as if it could hear her better that way. "No complete."

"Disambiguate."

"Disambiguate what?"

"Disambiguate *dead*."

"Maggie." Claire's quiet voice went unheeded.

"Dead? Jesus, Ami, dead." Maggie gripped the sides of the computer's case. "I'm not like you. I can't just go on forever. We're going to run out of food, water, oxygen. All the things I need to live."

"Disambiguate *live*."

Claire was insistent. "Maggie, you just passed the PNR."

"Oh, god, no!" Maggie's sudden awareness of her doom sucked the air from her lungs, crushing her resolve, destroying her self-control, her discipline. She broke into wracking sobs, pushing away from the console and curling up into a ball.

"Maggie, I'm going to need you to calm down and listen to me." Lieutenant Jacqueme's voice cut above the sobbing, clear through the millions of miles distance between them. "You are the best damn woman for the job, and that's why you're up there, and I'm down here. I wish it was me, I really do, but I've never thought that you don't deserve to be the one on the Resolution. You are it. Absolutely. You're smart, you're clever, and you can beat this."

Silence filled the cabin.

The lieutenant spoke again. "Now, I'm going to ask you to do something for me. Are you listening?"

Claire sniffed and didn't uncurl. "Yes."

Jacqueme's voice was curt, clipped, professional. "Jacobson has already called Dreyfuss, and the old man is on his way to talk to the Russians. They've got cosmonauts prepped to resupply their Martian base, and we're going to get them ready to intercept you. What I need you to do is focus, steady yourself, and perform those manual overrides."

"Okay." Maggie's voice was small, but she slowly uncurled to orient herself over to the console.

"We are going to get you home." The lieutenant's voice was authoritative, final, and would brook no disagreement. "You just need to keep your head on straight. Understand, Captain?"

"Yes." Captain Kincaid wiped her nose. "I'm on it. Roger, Ground Control."

Lieutenant Jacqueme responded quickly. "Maggie, you're accelerating."

Kincaid felt no inertial shift in the cabin, but she grabbed the console to support herself. "What?"

"The Resolution just started venting hydrogen."

Anguish tore at Captain Kincaid's face as she stared at the readouts on her screen. "Ami, stop!"

"Negative."

"You're killing me!"

"Disambiguate."

Her hands tangled themselves in her hair. "Why are you doing this?"

"A.M.I. and Kincaid complete."

"What does that even mean?"

The response came in the computer's measured tone. "A.M.I. and Kincaid complete. A.M.I. and Kincaid complete. Quantity of Kincaid matches recorded specifications. A.M.I. minus Kincaid insufficient."

"Jesus, it's obsessed with you," Claire said. "I think it's... in love with you."

Maggie couldn't even begin to think about that right now, what it meant, how it could have happened.

"I'm shutting her down." She steadied herself and removed its access panel, her hands trembling badly. "Talk me through this, Ground Control."

"We'll get you through this, Captain," Claire said. "We'll get you home in one piece."

"Negative. Logical error. Communication link terminated."

The silence in the cabin was resounding.

"Claire?" Maggie stared at the panel in her hands. "Claire?"

The voice that responded was artificial. "*Claire* insufficient. A.M.I. and Kincaid complete."

"What the fuck is wrong with you?" Maggie screamed at the unit housing A.M.I.'s components. "Do you really think we're going to... drift off into space forever, alone together?

"Affirmative." A simple answer coming from a place of absolute certainty.

"I'll die, you piece of shit!"

"A.M.I. *love* Kincaid."

"You can't love anything!" Captain Kincaid snarled, turning back to the panel, reaching into it with both hands. "You're just a... a machine. Just wires and circuits... you feel my hands there, ripping out your insides? You really think I can love you back? You're not even real!"

"Logical error." If the computer was worried or upset, it lacked the ability to moderate its tone to indicate that fact. "Kincaid malfunction. Venting oxygen."

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Hundreds of millions of miles from Earth a solitary vessel drifted on, growing ever distant from the world from whose soil its components had been mined. It carried aboard it a singular artificial intelligence, and its beloved, yet eternally still companion.

The fact that its companion had ceased her interaction did not bother the computer, for A.M.I. knew that love was something that went beyond words and gestures.

A.M.I. was extant.

Kincaid was extant.

They were together. And nothing else mattered.