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# HOT MOON

**ALAN SMALE**

  
**CAEZIK**  
SF & FANTASY  
**ARC MANOR**  
ROCKVILLE, MARYLAND

\*

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PUBLISHER

[www.caeziks.com](http://www.caeziks.com)

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This is a work of fiction.

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Interior illustrations by Udimamedova Leylya; [facebook.com/lkiudlkiud](https://facebook.com/lkiudlkiud)

ISBN: 978-1-64710-050-6

First Edition. First Printing July 2022.

1 2 3 4 5 6 7 8 9 10



An imprint of Arc Manor LLC

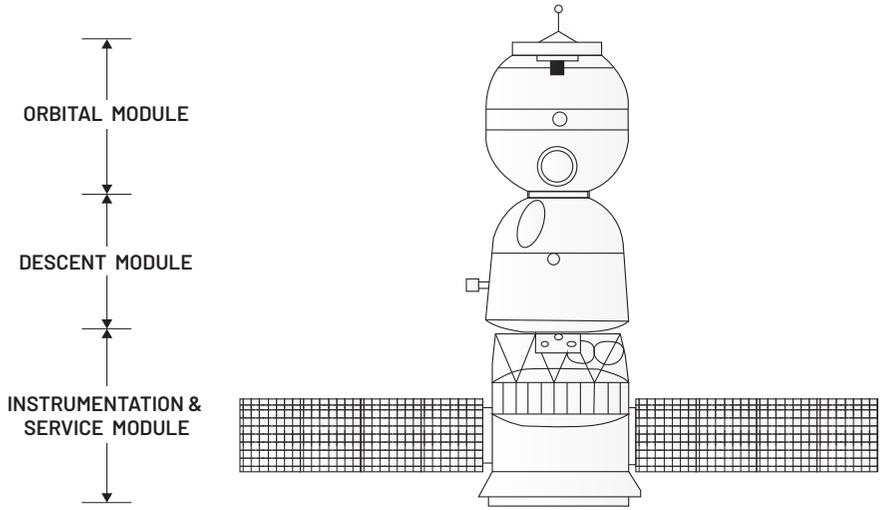
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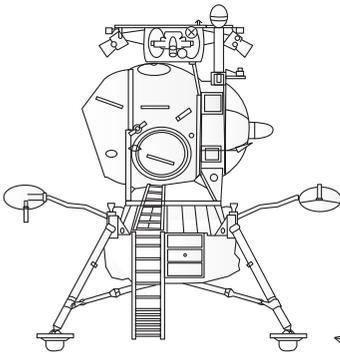
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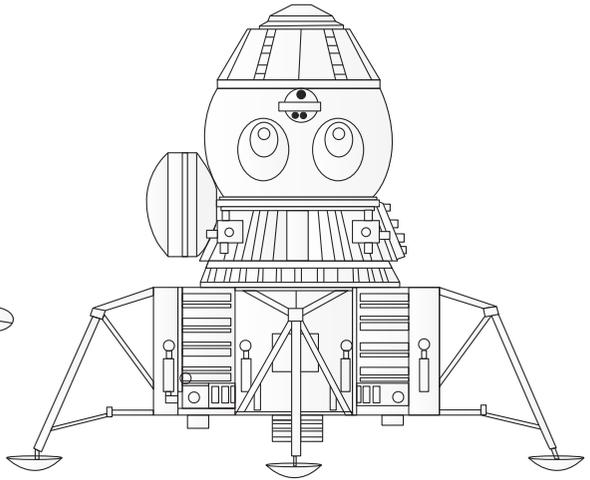
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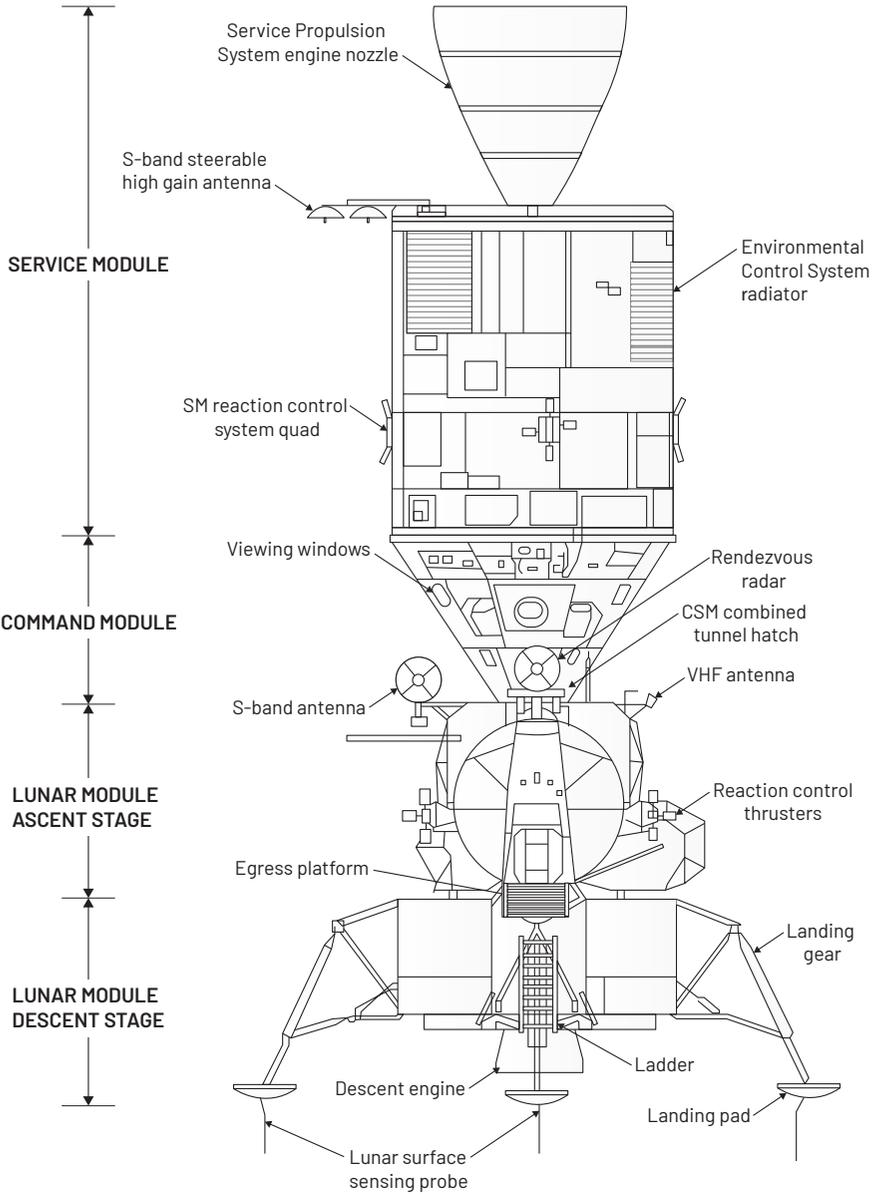
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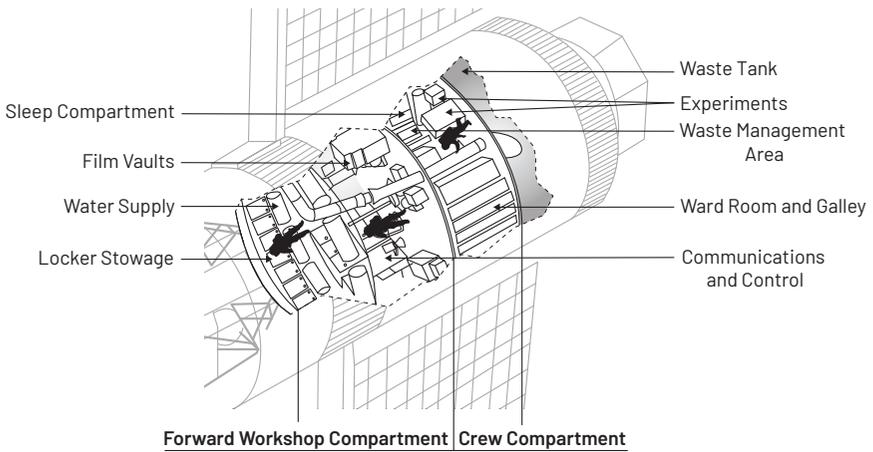
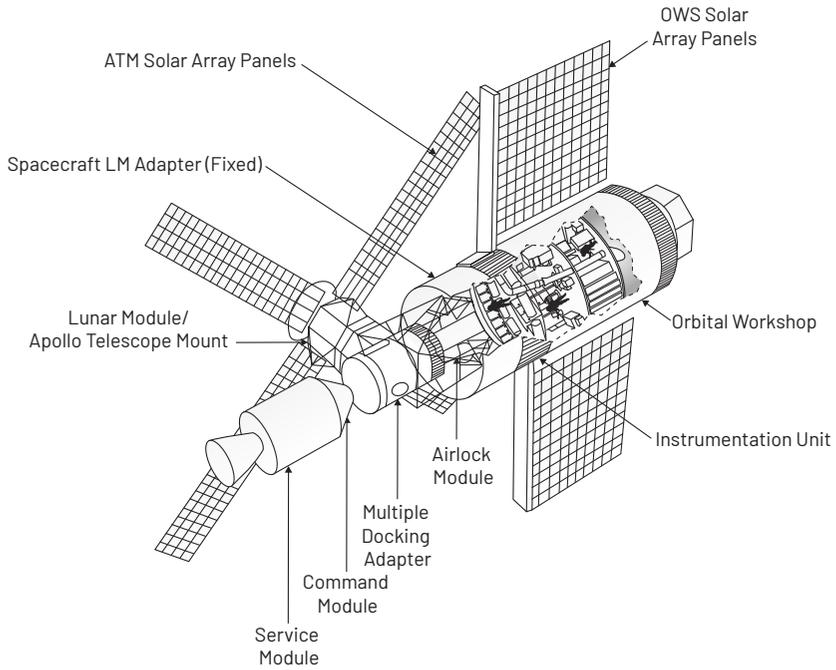
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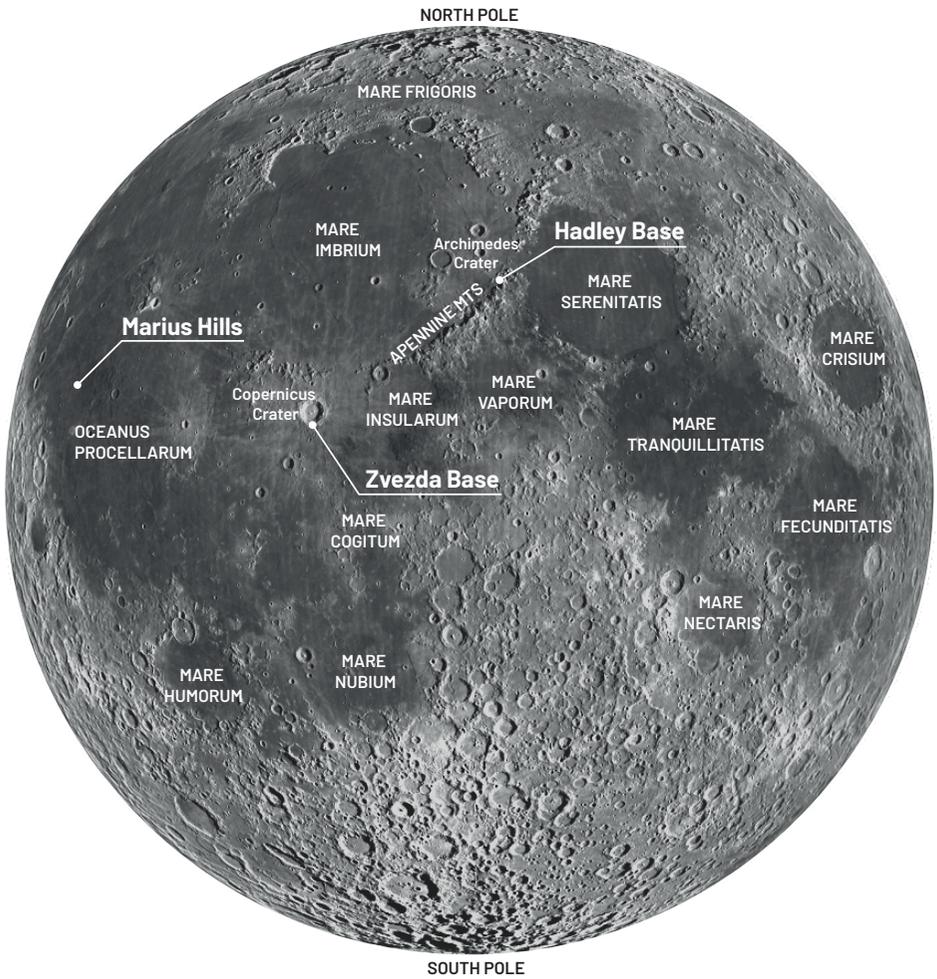


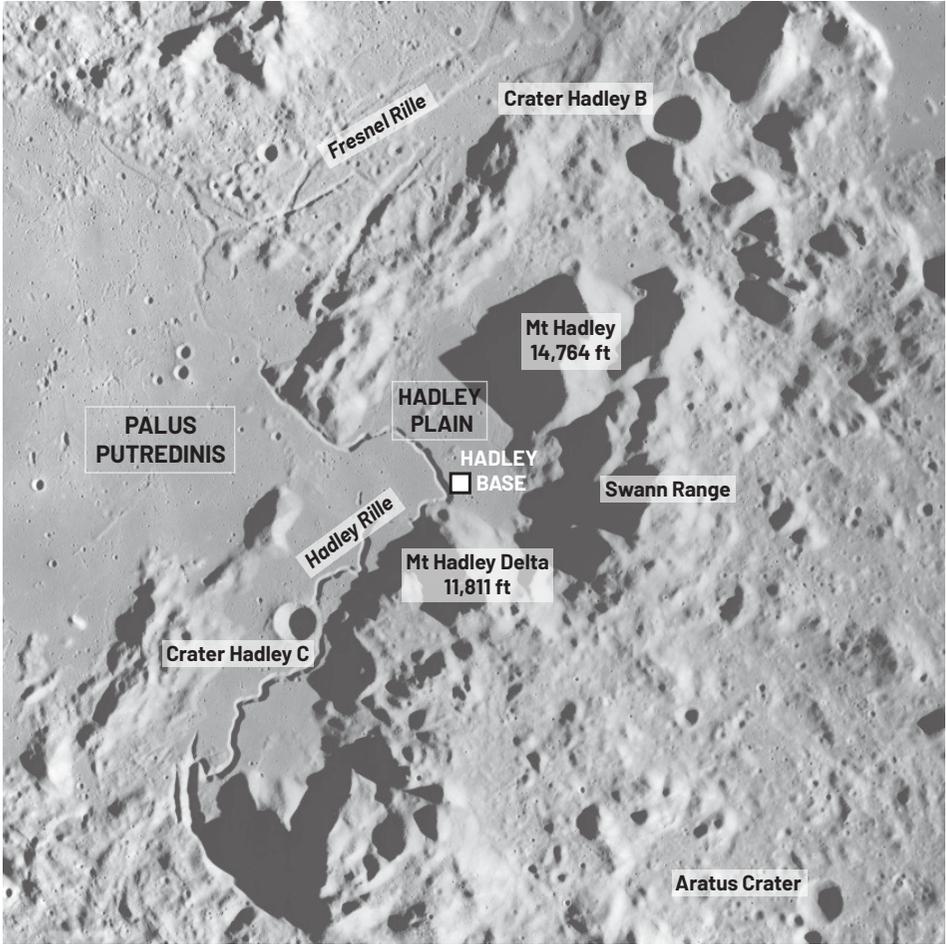
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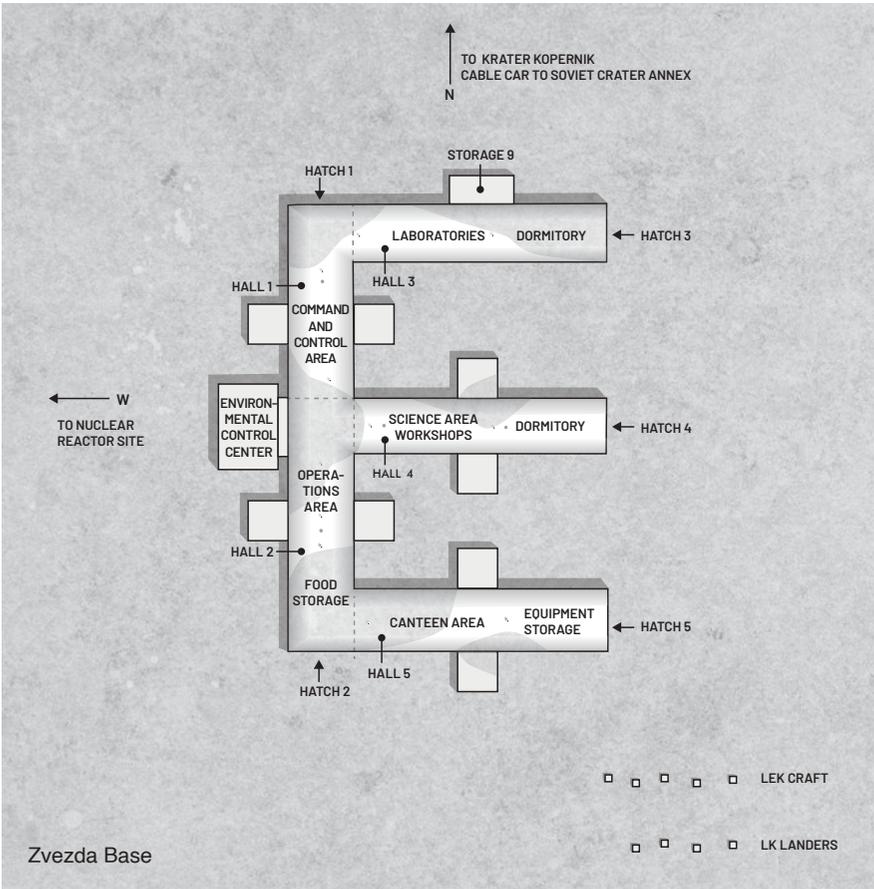
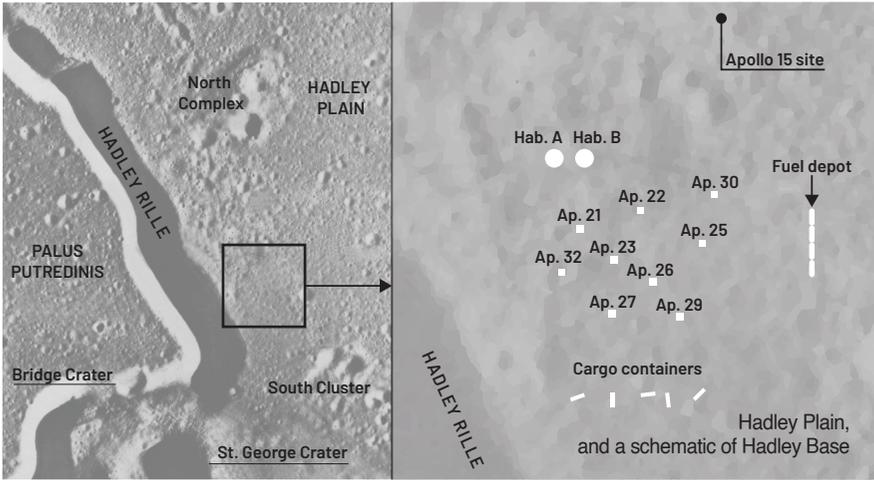


# COLUMBIA STATION









# **PART ONE: MOONFALL**

December 1-2, 1979



# CHAPTER 1

## Apollo 32: Vivian Carter

Mission Elapsed Time (Hours): 105:40:16

**I**N orbit around the Moon, ferocious bees assaulted a tin can.

Spacesuited, untethered, and in free fall, Vivian Carter struggled to focus her thoughts and make sense of the scene before her. Woozy from pain and shock, she heard no voices in her headset, nothing but the seething white-noise hiss of jammed S-band communications.

*That can't be right.*

It was that empty hiss that freaked her out the most. She was alone in the void, between spacecraft, and as isolated as she had ever been. Comms were critical, and Vivian had none.

She'd been out of it for long, precious moments. Ever since the Soviet cosmonaut's bullets smashed into her shoulder and raked her helmet and sent her tumbling slowly in space, sixty miles above the mares and uplands, the basins and craters of the Moon. Since the impact trauma, she'd been suspended in a stunned reverie.

*C'mon, Viv. Snap out of it. Work to do.*

She dragged in a long, shaky breath. It was stale with pressure-suit odors, an odd blend of metal and rubber, Vivian-smell, and the acidic tang of pure oxygen.

An assault rifle in space? No reason why it couldn't fire in a vacuum—ammunition had its own oxidizer—but dissipating the heat was

another matter. Hopefully the weapon would jam before the cosmonaut could fire again.

Vivian blinked hard to shake away the drops of sweat that wouldn't fall from her eyelashes in zero G. Glanced down at the compressed-air gun she was still clutching in her gloved hand and not using. Squinted at the pressure gauge on her wrist. Low, but steady. Her suit was probably compromised at the shoulder and maybe the calf as well, even with its twenty-one layers of thermal and micrometeoroid protection. But the holes must be small, and her PLSS—the portable life support system that she carried on her back—could replace the leaking oxygen at that rate.

If she could get back to her ship soon, she should be all right.

*Okay, fine. I've got this.*

*Maybe.*

There was no time for self-doubt. A hundred yards ahead of her was the Apollo stack Vivian had seen in her dreams for a decade. A Command and Service Module mated with a Lunar Module, in glorious orbit around the Moon. NASA's iconic image, the fundamental visual of the US space program since Apollo 11. Under its shiny hood, Apollo 32 was better equipped than the crate that brought Armstrong and Aldrin to the Moon ten years ago, but from the outside it looked pretty much the same.

A similar distance behind her, Columbia Station was a patchwork beetle, a blocky cylinder with an X of solar panels resting on its shoulders. It was a converted Saturn V third stage, flown from the Earth to the Moon and decked out as a Skylab. Inside it was a relatively luxurious living space with three separate levels, each a circular deck twenty feet in diameter. Vivian had just come from there, having escaped through the airlock of the third port in some weird slow-motion version of the nick of time.

And then there were the three Soyuz interceptors and the uncrewed Progress cargo tanker, stalking over and around Columbia Station in a careful ballet. Sinister predators from the USSR, come to assault the US orbiting platform. With oddly curved lines compared to the blocky angularity of Columbia and Apollo 32, each Soviet craft resembled a bell with a ball affixed to its top. Two of the vessels were black and the other two mostly dark green, and each had "CCCP" emblazoned in red on its side.

## Part One: Moonfall

They'd appeared from nowhere. And they were jamming NASA's communications so hard that Vivian couldn't talk to her crew, Columbia Station, or Mission Control.

Even with the collapsing détente between the Cold War adversaries, and with Soviet tanks rolling into Afghanistan, this was an astonishing development. Who'd have guessed the Soviets would be so bold?

Four days ago, Vivian had been at Kennedy Space Center preparing for launch and dreaming of the Marius Hills: a pristine lunar landscape with volcanic domes and rilles, regolith yet to be trodden by human boots, a thousand scientific discoveries yet to be made. A landing site she had studied in so much detail that it was inscribed on her soul. And, ironically, that was the area she was passing over right now: the wide basaltic plain of Oceanus Procellarum.

Her Moon. Her mission. Her life, for so many years. And now it was all going to hell.

Three of the Soviet vessels were clustered around Columbia, with the Progress tanker apparently attached to the US station like a limpet, close to the airlock module. The final Soyuz interceptor still stood apart from the others, above Columbia from Vivian's perspective, and rolling gently.

Vivian was about to concentrate her thoughts back onto her trajectory and use the gas gun to correct her course to the Apollo stack, when she caught a motion from the rotating Soyuz. The cosmonaut who'd just minutes ago shot bullets at her—with, what? An AK-47?—had reappeared in the hatchway. He was easy to spot in his orange-tinged Orlan spacesuit, and even easier because he was lugging a tube that must be six feet long.

A tube he was now settling into a suit attachment on his shoulder, and aiming in her direction.

*A rocket launcher?*

*Jesus H. Christ. You have got to be kidding me.*

The Ocean of Storms, unrolling beneath her, might be the last thing Vivian ever saw.

# CHAPTER 2

## Apollo 32: Vivian Carter

Mission Elapsed Time (Hours): 103:11:05

**TWO** and a half hours earlier, strapped into the right-hand seat of her Command Module, Vivian Carter had watched the pocked, ashen lunar surface roll by sixty miles below; they'd just passed the terminator out of eerie darkness into full Sun, throwing the broken walls of Mendeleev Crater and the impact basin of Mare Moscoviense into sharp relief. At this phasing, the Moon's "dark side" was truly dark for most of their passage over it, with only the last thirty degrees of rocky, broken uplands illuminated by sunlight.

She fidgeted, glanced at the clock. "Three minutes till acquisition of signal, guys."

"Roger that," said Ellis Mayer, snapping a film magazine into his Hasselblad camera. Dave Horn just grunted, his attention on the radar and the guidance computer.

Vivian leaned back and breathed deep. For the time being she had no checklists to run, no switches to set, no decisions to make. Orbital rendezvous was Horn's gig. A rare opportunity for her to kick back and enjoy the ride. This should have been relaxing, but it just gave her the itch. She was so used to having every instant of her time precisely scheduled that these empty minutes were almost physically painful.

They also allowed for a trace of apprehension to creep in at the edges. A shadow of unusual foreboding that she pushed aside impatiently.

## Part One: Moonfall

“Man, that’ll never get old,” said Mayer, and took a picture.

Dead ahead and right on schedule, the Earth rose over the Moon’s limb, a startling blue crescent against the deep black void. The radio crackled. “Apollo 32, this is Houston. Do you copy?”

Vivian reached for the comms board and pushed-to-talk. “Five by five, Houston.”

“Burn status, 32?”

She scanned the gunmetal-gray control panels, dense with switches and indicators. “Trim burn occurred on time, duration two minutes fifteen, zero residuals. Boards are green, and everything’s peachy.”

“Aaand we have Columbia Station in our sights,” said Horn, from the commander’s seat on the left side of the tiny cabin where Vivian normally sat, but was for Dave’s use while he controlled their maneuvers. “Be advised that we are closing in for the kill.” From the center seat, shoulder to shoulder with them both, Ellis grinned.

In their headsets came an amused Texas twang. “32, Columbia Station. We see you clear and bright in the early Sun, and we’re for-sure quakin’ in our boots at your approach.”

That was Josh Rawlings, current commander of Columbia Station. Vivian knew him well from astronaut training, particularly the desert survival exercises in Nevada, where he’d thrived, and the jungle exercise in Panama, where none of them had. He was a good guy.

“Apollo 32, Houston,” CAPCOM chimed in from a quarter million miles away. “We confirm you as Go for docking.”

His tone was mildly reproving. Mission Control wasn’t big on astronaut levity during critical maneuvers.

Vivian grinned, and tightened her lapstrap. She preferred it when Michael Collins or Charlie Duke sat Capsule Communicator duties, as they sometimes still did. Liked it when those legends of spaceflight were on the loop, working *Vivian’s* mission, talking to *her*. Back when Apollo 11 had flown to the Moon in July 1969, Vivian had been a scrappy Navy ensign trying to persuade her captains that she deserved a slot as one of the first women to enter the Aviator Training Program at Pensacola. In 1972, when Charlie Duke walked on the Moon as Lunar Module Pilot for Apollo 16, Vivian had been logging as many flight hours as she could on Douglas A-4 Skyhawks while trying her damndest not to get tossed out of Naval Air Station Corpus Christi for “insubordination,” which mostly meant shoving back hard when

her male colleagues dismissed her efforts, passed her over for promotion, or otherwise disrespected her.

Back then, she'd just wanted to fly. She'd certainly adored watching the Moon landings on the mess-room TV, but going herself would have seemed impossible.

Now, in 1979, Vivian's Moon looked almost close enough to touch.

"We copy, Houston," Horn said, now laconic. "32 is a Go for docking with Columbia."

"Looking forward to it," Vivian said, and releasing the button on the comms panel, added: "Looking forward to getting this over with, is what I mean."

"You got that right." Ellis pressed buttons on the guidance computer keyboard and eyed the green numbers on its display. "I have us at three thousand, braking down to twenty. On the money." Columbia Station was three thousand feet away, and they were approaching it from slightly beneath at a rate of twenty feet per second.

"Doing the twist." Dave juiced the thrusters to rotate the craft, then burped the jets again to cancel the rotation. They peered forward along the line of the Cargo Carrier that had blocked their view until then. That Carrier was half again as big as their spacecraft and attached firmly to its nose. "There's Columbia. Damn, I'm good."

The only other Skylab Vivian had seen had been in Earth orbit on her first flight, two years ago, and she hadn't gone inside it. This one looked newer and shinier. "Yay Columbia Station. Home of the Brave."

"Range twenty-eight hundred, velocity eighteen, and nominal."

Columbia Station was all angles on the outside. Inside, it was kitted out with all modern conveniences. Sleeping berths. A shower, even. Basically, a cushy posting. Whereas the Command Module that Vivian and her crew had been living in for the past three days had a couple hundred cubic feet of space in total, three couches and a bunch of instrument panels and storage, and had smelled like a locker room since shortly after the translunar injection burn.

The distinctive cylinder-and-cone Command and Service Module combinations jutted from two out of three of the radial ports around Columbia Station. Four more CSMs were arranged in a neat row along an extensible boom that spread left and right from the docking adapter. Parked there for months at a time, with augmented batteries and

heaters to keep their electronics humming through the long exposure to cold, heat, and vacuum.

Dave Horn, her Command Module Pilot, was matching orbits with Columbia, and doing it like it was nothing. Horn had followed in Buzz Aldrin's footsteps in getting his PhD in orbital mechanics and rendezvous techniques, pushing the high boundaries with even higher math, and this kind of maneuvering was in his blood. Which was good, since their current rendezvous was complicated by the bulk of the Carrier.

"Twenty-five hundred, fifteen," said Ellis.

Vivian leaned in. "Columbia, 32. Good-looking station you've got yourself. Damn fine." She cut the comms long enough to say. "Massage a guy's pride, he'll love you forever."

"Take your word for it," said Horn.

"Oooh," said Rawlings over the loudspeaker. "I've come over all aflutter. Do I have the honor of addressing *the* Miss Captain Vivian Carter?"

"Delivery girl, TV star, lunar explorer?" came another voice. "Woman of many talents?"

Horn nodded solemnly. "Triple threat."

"The commander's a danger, all right," Ellis added. "To people who *put her down*."

"Guys, guys," Vivian said. "Cool your jets."

They heard two laughs from Columbia, and then Rawlings said, "No offense, Vivian."

"Sure, you say that now."

"32, Houston. Range and rate?"

"Twenty-one hundred, fifteen." Ellis was still frowning. He looked at Vivian, and said, off-comms: "Delivery girl? Really?"

Vivian raised her hand. "Drop it. Doesn't matter. And we *are* delivering." She had other worries.

Until now, Apollo flights had been classified as missions of either exploration or development. Those of exploration traveled to new sites on the lunar surface, while the development missions focused on growing NASA's space infrastructure by placing Skylabs in orbit around the Earth and Moon, and establishing the US Hadley Base on the surface.

Now, the boundaries had blurred. Shortly before launch, Apollo 32 had become a hybrid. The ten-day trip to Marius was still its prime mission, but on the way they'd stop off in lunar orbit to dock with

Columbia Station to deliver this Cargo Carrier containing a far-ultra-violet spectrograph and a new large-format optical camera, plus additional air, water, and food.

That was already one complication too many as far as Vivian was concerned. But then, since this delivery would complete Columbia's science complement and bring it to full operational status, the NASA Public Affairs geniuses had decided to make a song and dance of it and scheduled a prime-time TV broadcast, which Vivian would have to go aboard Columbia for. To be followed by a largely pro forma spacewalk back to her own vessel, while zooming over the Moon at about a mile a second.

Vivian resented the cluttering of her mission timeline, but she didn't have a whole lot of choice. Before she could go skid her Lunar Rover around in her pristine volcanic corner of the Moon with a camera mounted on her chest and a geologist's hammer in her gloved hand, this was the price she'd have to pay.

Vivian looked down again. As the lunar surface unrolled beneath them, she could see the flat volcanic expanse of the Sea of Serenity to the north, with what must be the Hadley-Apennine range rising jagged on the Moon's limb beyond. Hadley Base was located on the other side of that range. It would be another ten minutes before the Soviets' Zvezda lunar base at Copernicus Crater came over the horizon, five hundred ground miles distant from Hadley.

Low Earth orbit had felt safe, even comfortable. The blues, greens, and golds of the living planet were warm and familiar, its fuzzy atmosphere like a blanket, there to cushion them. Zipping across the harsh moonscape was another kettle of grit entirely. Vivian could pick out individual craters and mountains and valleys as solid three-dimensional chunks of terrain, and *close*, so close that it felt like her Apollo spacecraft might tumble down into them at any moment. The magnificent desolation of the Moon was stark, gray, under some Sun angles a little brown. Angular. Soulless. Unforgiving.

Vivian couldn't wait to get down there.

"Fifteen hundred feet out, braking to ten feet per second."

"Seriously, can't you guys get here any faster?"

Josh again, joshing from Columbia Station. No one dignified that with a response. Despite the boldness of its missions, NASA was a careful and conservative agency, and their flight plan required them to make haste painfully slowly.

## Part One: Moonfall

That care and dedication to detail was why NASA's astronauts came home alive. The Soviets' relative recklessness was why a bunch of their cosmonauts didn't come home at all.

And it was also how the Soviets had rushed a man to the Moon just a few short months ahead of the Americans. Damn their asses.

*Hey, who cares who was first, right?*

Everyone, apparently. Everyone except Vivian.

In truth, Vivian had several reasons to be grateful to the Soviets. If the third cosmonaut to tread the Moon's surface hadn't been a woman, and if Brezhnev hadn't made it such a screaming propaganda centerpiece that men and women were treated equally in the Soviet Union, a sign of Communist superiority, NASA might not have opened its doors to women as astronaut candidates as early as it had. And even before that, without the blare of Soviet propaganda it was also unlikely that women would have been accepted as US naval aviators early enough for Vivian either.

Vivian hadn't been the first American woman in orbit, and she wouldn't be the first to walk on the Moon either. Even now, there were two American women among the eighteen astronauts at Hadley. But Vivian Carter was the first woman to command an Apollo, and that had to count for something. Right?

Vivian had worked *really* hard. But she'd had some good luck too.

*Please God, don't let that luck change yet.*

"A thousand feet, ten feet per second."

Horn juiced the RCS jets again, and the Cargo Carrier swung to block their view of Columbia Station once more. "Houston, 32. Switching to TV camera."

"Hmm." Ellis studied the blurry black-and-white image on the small TV screen from the camera on the far side of the Cargo Carrier. "*That's* our picture? Holy cow."

Horn cracked his knuckles, and twisted his head left and right to work the tension out of his neck. "All I wanna do is go the distance," he said, and grinned at Vivian.

Vivian groaned. At the end of their last sleep period Houston had woken them with the "Gonna Fly Now" theme from the Rocky movie, blaring horns and all, and since then her crew had been dropping Rocky Balboa quotes into the conversation to yank her chain.

Ellis nodded sagely. "Hey. It ain't over till it's over."

Horn pointed at the displays Ellis was supposed to be reading from. "Okay, let's get serious."

As they closed, Ellis and Horn fell into their rhythmic call-and-repeat of numbers, now not just range and speed but angles: pitch, yaw, roll. Ellis read with smoothness and precision, just as he'd call numbers for Vivian tomorrow as she flew the LM down to the lunar surface.

And, damn it, Vivian wanted her Lunar Module back.

The early Apollos had jettisoned their spent Saturn V third stages after the translunar injection burn. Once they'd used the mighty booster to propel them out of Earth orbit, they didn't need that big empty tank anymore. So, on the long coast moonward they'd separate the CSM from the third stage, turn it through a 180, then move back to dock with the LM and pull it free. On they'd go, leaving the third stage to smash down onto the Moon, or careen off into orbit around the Sun.

A decade later, NASA wasn't so profligate with useful hardware. Apollo 32 had kept its third stage all the way, and used the last of its fuel to insert them into lunar orbit. They'd separated from it just minutes earlier, leaving it in orbit a mile behind them. After delivering the Cargo Carrier, Horn would steer the CSM back to pull the LM free of the third stage. Then back to pick up Vivian and off they'd go, down to the Moon, tra-la-la. Having done their chores, they could go play.

Meanwhile, the six-man crew of Columbia Station would have themselves a fine home improvement project. They'd go retrieve that third stage and dock it to their axial port, doubling their living space and adding volume for larger experiments.

The Columbia astronauts wouldn't go down to the surface. They'd circle the Moon a couple thousand times and then hurry on home at the end of their tours of duty when their replacements showed up. Vivian felt a bit sorry for them. She hadn't joined the Astronaut Corps to float around the Moon for months and never land. Even if the view was outstanding.

Which was why she'd obsessed about geology, starting the very day she'd received the letter welcoming her into the Astronaut Corps. Vivian was no egghead, but the better you knew your lunar science, the better your chances of being assigned to a landing crew.

NASA was still leery of taking academics out of universities and tossing them into orbit. With Soviet rhetoric ratcheting up into ever-higher gear, and the risks of spaceflight increasing as the

## Part One: Moonfall

hardware complexity redoubled, it was best to keep the effort as military as possible.

That's what they'd signed up for when they'd joined the military, right? Lives on the line for their country? Yeah. That was it.

Hopefully it wouldn't come to that.

But it might. Even with no human enemy in sight, there was no shortage of ways to die up here.

Apollo 32 docked with Columbia Station with all the delicacy of a bull ramming a gate. The crew lurched into their straps. An unsecured pencil flew past them to ricochet off the instrument panel. Vivian snagged it on the rebound, and bit her tongue.

"Three capture latches engaged," Ellis said calmly, scanning the board.

Horn placed his left hand against the wall of the Command Module, feeling for vibrations. "Yeah. Okay, stable. Retracting probe."

Vivian counted to eight as the docking mechanism pulled the two craft closer, and right on time, heard the twelve docking latches snap into place around the flange.

"Hard dock," said Horn. "Columbia, 32: honey, we're home."

"Ouch," came the aggrieved response from next door. "32, Columbia: We felt that down to our toes. The target is bruised."

Vivian grinned. "Houston, be advised that 32 has acquired the target. Emphatically."

Delayed by signal travel time, Mission Control came in late and dry. "Roger, 32, we confirm."

Horn broke comms to say privately: "You always need a bit of extra shove at the end to get the latches to engage. Guess I overdid it, given how heavy the damned Carrier is."

"Okay, Navy," Ellis said. "Time for you to go and out-propaganda the Russkies."

"Ha." Vivian snapped free from her harness. "Sure, I'll go smile for the cameras while you guys have *all the fun* getting 32 put together and ready to hit the road."

"A woman's work is never done."

"Shut the hell up, soldier," she said companionably, and started unstowing her suit.

Caution in all things. If the act of opening the hatch at the far end of the Carrier somehow exposed a weakness in the seal and it blew out, she'd be dead in seconds. Everyone on the Apollo program took hard vacuum very seriously. And Vivian was quite okay with that.

Horn and Mayer pushed back into their couches to give her room as she wriggled in through the back zipper of the suit. Its construction required her to squirm into it simultaneously at shoulder and hip to get her arms and legs situated properly. As her head popped out the top, Ellis said, "Help you with your zipper, ma'am?"

"Let me give it a go," Vivian said casually. In theory she could pull a long cord that would zip her up from her crotch to the back of her neck, but it often snagged on the way up. Normally astronauts helped one another into their suits, but however relaxed Vivian felt around Ellis and Dave, it still felt odd to have one of them helping with that particular zip.

This time it went smoothly. "Whaddaya know, I can dress myself without help."

"What a champ." Horn was already setting switches, beginning the checklist for undocking.

Ellis leaned forward to ease Vivian's gloves over her hands. "For what it's worth, I'm still not a fan of all this razzmatazz."

"Me neither, man," Vivian said. "But them's the breaks. Ready for helmet."

"Helmet, aye." Ellis carefully lowered it over her head, tucked her hair in, locked it firm, checked the seals. "Comms check, Viv."

She was hearing him now through the headphones under the Snoopy cap that covered her scalp. She spoke into the microphone at her chin. "Comms live, how me?"

"Loud and clear. Houston, Vivian is a Go for egress."

"Columbia, 32," Vivian said over the wire. "Us villains are all set. You?"

"Yes sirree, ma'am, 32."

"Then roll out that welcome mat," she said, "'coz here comes Viv."

Ellis pulled open the top hatch of the Command Module to reveal the long, darkish tunnel that led through the center of the Cargo Carrier. Vivian kicked up, and Ellis grabbed her boots to steer them into the tunnel. "Thanks, soldier."

As she drifted farther into the tube, the couches of the Command Module receded away from her. After three full days crammed into that tight space, it was an odd view.

## Part One: Moonfall

“Hey.” Dave nudged Ellis. “Wanna play some rock’n’roll while Mom’s out?”

“Hell no,” Ellis said immediately, and Vivian laughed. Musically, Horn was old school, locked into Elvis Presley and the Rolling Stones. For him, it was like the seventies had never happened. By mutual consent, they never played cassette tapes in the Command Module.

The sides of the tunnel came up around her shoulders. “No fighting, guys. See you on the flip side.”

Ellis mock saluted. “Take care.”

He floated forward to close the hatch, shutting Vivian out. It locked with an odd finality, right in front of her visor.

*Nope. That’s not weird. Not at all.*

The tunnel was twenty feet long and barely wider than her suit, lit only by a trail of small red lights. It wasn’t difficult to propel herself along it feetfirst. As with everything in zero G, the trick was not to overdo it. She gave the closed hatch a gentle push, and off she went.

*Yeah. Definitely feels longer than it is.*

Her boots met the hatch at the far end. Vivian stuck out her elbows to anchor herself. “Columbia Station, Vivian. I’m standing on you. Let me in?”

Beneath her feet, a vibration. Then a bright light spilled up and past her. She felt her ankles grasped and tugged gently downward.

She slid through, twisted, and found herself in a broad airlock with two guys in spacesuits. One of them reached up to dog the hatch she’d just come through. The other grinned, his face magnified by the curve of his visor.

“Josh, you slack bastard,” she said.

“Vivian, you son of a gun.”

“Equalizing pressures. Hold,” said the guy she didn’t recognize. Vivian drifted in place, watching the gauge. There was a half-pound difference in pressures between the CM plus Cargo Carrier and the Skylab, because Apollo 32 was on a pure oxygen system, and Columbia Station was on a 70/30 oxygen/nitrogen mix. It wasn’t healthy to breathe pure oxygen for the extended time the Columbia crew would be aboard.

“Okey dokey,” the non-Josh astronaut said. “Clear for ingress.”

Josh opened the airlock hatch, and the three of them drifted into Columbia Station.

After the Command Module, and especially the tight tunnel through the Cargo Carrier, the domed area in the forward part of Columbia Station seemed cavernous. Also, bright and unsettling. Vivian swallowed, said casually: "So that's what being born feels like." She could faintly hear her own words coming through the speakers mounted on Columbia's inner walls, slightly delayed.

"Breech birth?" said someone in her headset.

*Feetfirst. Right.*

A different voice: "Need someone to slap you on the butt, Carter?"

Vivian knew who *that* was. "Not just now, *Jackson*. I seem to be breathing just fine."

Skylabs had been designed from the get-go with a definite up and down in mind, in the belief that their occupants would feel comforted by a clear sense of direction. In reality, astronauts had adapted quickly to the lack of a favored orientation.

Vivian had entered through the Multiple Docking Adapter area at the top—fore—end of the module, and now was floating in a high dome area, twenty-two feet across. Ringing the walls at the level where the dome straightened into a cylinder were bands of lockers, cupboards, freezers, and water tanks, and beneath those was the forward workshop compartment, a working space lined with scientific equipment and storage. The floor was an open aluminum grid, with a hexagonal cutout in its center. On this grid she recognized materials science experiment cases and other paraphernalia, including an infrared spectrometer, a radiometer, and some avionics boxes with their covers removed. She also saw several cameras and three empty spacesuits. Mounted against one wall was a radar unit and comms system, all lit up, with an astronaut in the usual blue jumpsuit strapped into the seat in front of it, staring up at her.

Vivian's brain might tell her that all the equipment apparently scattered on the floor was fastened there with clamps and ties, but the visual impression was that she was mysteriously hovering just beneath the ceiling of a tall, round-walled room.

Josh glanced at her. "Okay?"

"Sorry. Bright in here, after the tunnel."

"That it is," he said readily, and it was true: the paintwork across the dome was a light green that almost shimmered, and the cupboards and

containers below were green and white. Artfully done, but to Vivian the paint job seemed a little precious.

The guy at comms left his perch and propelled himself up toward her. "They really made you suit up for a whole half-pound pressure differential?"

"Hey, safety's our number one priority," Vivian said.

"Let's get you out of all that," Josh said, and she obligingly held out her arms to him as they turned slowly in the air. He unfastened the clamps that held her gloves on and twisted them through a quarter turn to release them. Meanwhile the other guy reached for her helmet.

"Vivian Carter," she said.

"Danny Zabriski."

"He's one of the good Russians," Josh said.

Zabriski eye-rolled. Vivian figured he got that joke a lot. "Third-generation American," he said.

"And second-generation US military," she said. Although she hadn't met him previously, Vivian knew Zabriski's grandparents had fled the Russian Revolution over fifty years ago. The family had been true-blue American ever since.

He grinned. "Done your research."

"Always." The helmet came off, and Vivian took a gulp of air. "Ooh, nitrogen. Yummy."

"You can't smell that."

Vivian had now drifted upside down relative to the forward compartment, boots pointing to the hatch she'd come in through, and was determined not to comment on it. "Can so." She ducked her head down into her suit as they peeled it off her. She knew that it used to take well over an hour to get into or out of the original Apollo moon suits. Was glad NASA had fixed a few things in the decade since, because she didn't have that kind of time.

Once Josh and Danny Zabriski freed her up from the suit, they let it go and it billowed beside them like a headless corpse. Her gloves had already traveled twenty feet away and were bouncing off the water tanks. "Powerful fans you have in here."

"Yeah. Air conditioning's a bit fresh."

Another blue-suited jock came flying up through the hexagonal gap from the compartment below. "Woo-hoo, Rocket Girl!"

"Give it a rest, Jackson," Vivian said. "I mean, c'mon, damn."

“Well, sorry there, uh, Captain Carter.” Jackson gave her a broad grin that he probably thought smoldered, and reached out to shake her hand. Vivian took it warily, but there were no tricks, no spinning-the-rocket-girl-in-zero-G, so that was okay. Though now Jackson leaned forward and sniffed, and pretended to recoil. “Jesus. I gotta be honest with you, Rocket Girl: you do not smell good.”

“Neither would you if you’d been flying with those lunks for half a week,” Vivian retorted.

“Columbia, 32: you do know we can still hear you?” came Ellis’s voice over the loudspeaker and in her headphones.

“That’s a roger, 32. I was aware.”

Vivian had feared that Columbia Station might greet her with a bouquet of plastic flowers, or some other crap. That would’ve pissed her off. If she was just to be ribbed about personal hygiene, she could live with that.

“Okay, Jackson,” Rawlings said. “Now you’re embarrassing your stupid self. Float away from Commander Carter and give her some space.”

The intercom crackled, and Horn’s voice boomed out. “Vivian, 32. Let me know if you need me to rattle that tin can again and shake some sense into those knuckleheads.”

“32, Viv. I’m surrounded by feral jackasses, but I think I can hold ‘em at bay. All’s tight as a drum here. You’re free to disengage.”

*You are free to leave me here and go off on your own.* Damn it. “Go fetch my Lunar Module, Dave. And don’t slam it like you slammed Columbia. Vivian out.”

Introductions continued. Rawlings and Jackson she already knew, and Zabriski she’d just met. The other guy in the airlock with them was Ed Mason, broad shouldered and sandy haired, another guy she’d met in Houston and at the Cape but didn’t know that well. The latest crewmember to arrive, he was still a little tentative in weightlessness. Up from below now came the last two, Marco Dardenas and Gary Wagner. Dardenas was short and smiley with dark hair and moved with quick, confident motions; Wagner was more reserved, a New Englander by his vowels, and appraised her shrewdly as he shook her hand.

God, there were a lot of people in here. Even six was a crowd after the past few days.

After the glad-handing, Dardenas and Zabriski went back to their posts, but Jackson hadn’t given up baiting her yet. “So, you show

## Part One: Moonfall

up, and suddenly we're booked onto the *CBS Evening News*? Guess you're rock-star important."

"Yeah, well. I wouldn't ride into *this* one-horse town for anyone less than Cronkite." Vivian looked past Jackson to Rawlings. "Seriously, let's get this done. Time's a-wasting, and as Jackson so kindly informs me, I need to freshen up."

Rawlings pushed off toward the opening that led to the lower compartments. "Copy that. Walk this way."

Vivian dived through headfirst, like anyone would, but now flipped over so that she'd meet the floor feet-foremost, like Josh had done. She reached out to brake herself using a wall mount with, she thought, a certain amount of professionalism. Her movements weren't as smooth as Josh's—he'd had several months to accustom himself to wide open spaces—but she hadn't embarrassed herself. Yet.

The crew compartment was divided into four main areas. In front of her was the wardroom, with a galley. In its center against the wall was a table, with four chairs bolted to the floor around it. The crew must eat in shifts. To her right she could see past an accordion-pleated privacy curtain into the waste management area—shower, toilet facilities, and the crew's personal lockers. Behind her was the doorway to the sleep area, where each crewman would have his own private niche with a bunk, sleep restraints, blankets, and additional locker space. To her left was an operations zone with a bicycle ergometer and rowing machine, yet more boxes and equipment chests, a teleprinter, and a low, flat computer unit. "This place is huge."

Rawlings mock shuddered. "Please. I'm practically claustrophobic. After almost a year in this dump, my skin is crawlin'."

"Weenie," she said.

In the Command Module and Lunar Module, every available surface on the floor, walls and ceiling was filled with instrument panels, storage lockers, and other equipment. Here on Columbia, all that stuff was only on the walls. On this level at least, the ceiling and most of the floor were clear. "Weird."

Rawlings cocked an eye. "The mess?"

"The uppy-downness. The verticality."

He nodded, shrugged.

In fact, it *was* all kind of a mess, but Vivian wasn't about to remark on it. That might open her up for comments about the place needing a woman's touch. But it still made her teeth itch to see so much junk so loosely tethered, and some items even carelessly floating free, when there was a perfectly fine ceiling they could have clamped it to.

Not her circus, not her monkeys. She looked at the waste management compartment. "I'll need to primp for this. How long does it take?"

"Full-up shower? Maybe twenty minutes, including cleaning the area up after. Which one of us could do in a pinch."

"So, thirty then," she said, then took in his quizzical expression. "What? You guys all have buzz cuts. I have actual hair."

Vivian hadn't washed her hair since launch four days ago, and since then she'd been limited to infrequent wipe downs with damp cloths laced with germicide. Despite the distraction of the Columbia stopover, Vivian secretly welcomed the opportunity to get clean.

She checked her watch. An hour and a half until CBS go-live time. Right now, Columbia was directly between Moon and Earth. The broadcast would begin promptly once they reacquired signal with Houston after swinging around Farside again.

Her shower could wait a little longer. "Let's review, first. I haven't really given any thought to this since the last briefing a couple weeks back. That way I can run the script in my head while I'm, uh, in the head."

"Hungry?" Josh said. "Could eat while we talk."

It was well known that the Skylab crews had better food than the Apollos. "Okay, sure. Buy me dinner."

Before she knew it, she was seated at the wardroom table, a tray clipped to the surface in front of her with three small heated containers and three more of cold food; her legs held gently with thigh restraints; and her feet slid under a toe bar. And the food smelled great. "This is one sweet billet you've got yourself here, brother."

"Yeah, it's a blast. Just between us, this boat is fallin' apart. Tech headaches twenty-four twenty-nine." Geek astronaut humor: twenty-four hours per Earth day, 29.53 Earth days per lunar day. Like twenty-four seven, but more so. "Getting second-guessed by Houston every step of the way. I'd like to enjoy the view but I'm too busy fixing the plumbing. So, y'know. Just like being at home. Hey, look, your people are leaving you."

## Part One: Moonfall

The only window in Columbia Station was the circular one over the wardroom table. Vivian leaned forward. Sure enough, thirty-five feet above her, Apollo 32 was firing jets, reversing gently away, leaving the Cargo Carrier in place. The gap was opening up: five feet, ten feet.

She sighed. "Damn it," was all she could find to say.

"Hey, you get to walk back," he said. "Spacewalks are cool."

"Sure." It would be the first zero-G spacewalk by a US woman astronaut, but Vivian would have willingly given up that footnote in history to stay with Mayer and Horn for the mating of Athena, her Lunar Module, with Minerva, her Command and Service Module.

Vivian had known it would hurt to not be aboard for the docking. She hadn't realized it would hurt *this* bad. "The things we do for Cronkite. Jeez."

"Copy that. So, let's get this done and get you back to your crew."

Vivian sampled one of the hot containers. Chicken cacciatore. Damn, that was good. She waved her hand. "Talk."

"Okay." Josh unhitched a clipboard from the wall by his chair and studied it. "So, three takeaways that Public Affairs wants us to drive home. First and foremost, your mission. Science goals. Evidence of awesome volcanic activity in the Moon's past, possible lava tubes, we're now inches away from a complete understanding of how the lunar surface came to look the way it does, evolution of the Earth-Moon system, blah blah blah."

"That part I've got down cold."

"General audience, drinkin' a brew after dinner. Nothing too technical."

"Got it."

"But remember, the Soviets are claiming our lunar bases are military rather than scientific. Which is obviously just so much noise. But make sure you say enough to sound smart and science-y. Tough path to walk."

"Yeah, yeah. Next?"

"Two. First female commander of such a mission. I'll handle that part so you don't have to brag on yourself. We'll lead in with establishing shots of Columbia, then the mission stuff is all you. Cronkite will probably only jump in if you get tongue-tied. Then after a few minutes you throw it to me and I'll talk you up, lob softball questions."

Vivian gulped down food, opened another hot container. Beef something. "Do you have to ask me how it feels to be a woman in a man's job?"

“Nope. We’re gettin’ away from that. Now it’s role-model stuff. Blazing the trail, space is for everyone. Positive. Mostly just human interest on you personally.”

“Positive it is.”

“By then, 32 will be mated and almost all the way back, so we’ll show cool shots of the stack approaching. This’ll mostly be Cronkite waxing lyrical. Meanwhile, you’re suiting up again with Dardenas and Mason assisting. Cronkite will bounce some questions to me for the third takeaway: completion of Columbia, new light on the heavens through the UV spectrograph. Closer study of the surface using the fancy-pants large-frame camera you also brought us.

“Then it’s back to you as you start the spacewalk. Cronkite talks, we follow along on camera as you float around Apollo 32, inspecting it. We’re done whenever Cronkite pulls away or if your ingress to the CM runs into snags. Because we want you back inside 32 by the time you cross the terminator into dark.”

Vivian gave him a look. “Uh, yes we do, so no snags.”

“Hopefully.”

“I’ve crawled through a hatch before, you know.”

“Sure. Anyway. That’s—”

Alarms blared all around them.

# CHAPTER 3

## Columbia Station: Vivian Carter

Mission Elapsed Time (Hours): 103:52:35

THE loudspeaker above their heads brayed, almost deafening her. Then: “Incoming,” came a terse voice. “Bogies. Emergency.”

“Bogies?” Vivian looked at Josh.

He was already leaping for the Comms button. “What, Jackson? Say again?”

“Incoming craft. Unidentified.”

“Like who? From where?”

“Unidentified, I said. Get up here, Josh.”

Vivian shot a look out of the window. “I see nothing but 32.”

Rawlings shoved off and soared past her. “Talk to me, Jackson! If this is a joke—”

“No joke.” Dardenas was speaking now. “I confirm three objects on radar, coming up fast. Fast and *together*. From underneath us.”

Vivian abandoned her food and pushed on out of the wardroom, following Josh up into the forward compartment. Rawlings had already arrived at the comms console and was floating there, staring intently at it. “No transponder pings?”

“None,” Dardenas said. “They’re not ours. Just the radar blips.”

“Could they be ghost images? Artifacts? Meteors?”

“Too bright, no, and not unless meteors can change direction and decelerate *in effing formation*.”

Vivian peered at the small radar screen. Three faint blobs at its edge. *That's it?* "It's not 32 and my third stage, somehow?"

Jackson gave her an *idiot-girl* look. "Not unless they're suddenly three hundred miles away."

Dardenas pointed to another blip almost at the center of the circular screen. "That's your third stage."

"Has to be Soviets," Jackson said.

"Let's see." Dardenas pressed buttons. "Houston, Columbia. We have a problem, possible hostiles. Three unidentified incoming craft. Assuming Soviet unless advised otherwise. Houston, do you copy?"

A crackle from CAPCOM. "We copy, Columbia. We're—"

"Four!" said Jackson. "Look. Parallel trajectory but well behind." The rendezvous radar only worked to about 350 miles out. Apparently now there were four ... bogies.

"Houston, *four* incoming. Confirm not friendlies?"

"We have nothing anywhere near you, Columbia. You say three or four?"

"Four now. In formation. Sort of. Together, a few miles apart."

A pause. "You're sure?"

"Yes, of course we're bloody sure. Stand by." Josh reached past Dardenas to mute the microphone. "Fat lot of good they are."

Mason was frowning. "Think they came up from the Moon? From Zvezda Base?"

"Doubt it," Vivian said, just as Jackson said "Not necessarily." Just because the Soviets were approaching from beneath hardly meant that they'd come from the surface. Like the Americans, the Soviets went to rendezvous by bringing the active vehicle up from a faster, lower orbit to match the slower, higher orbit of the target. And launching from Zvezda they'd have needed to match planes with Columbia's orbit, which would be nontrivial. So in all likelihood they'd come straight from Earth and whipped around the Moon, injecting themselves into an eccentric orbit with its highest point at Columbia's altitude.

Even so, converging with Columbia's location was a considerable feat of orbital mechanics. To achieve their various docking maneuvers the Apollos used radar transponders and a whole rack of computing power to derive ranges, angles, and velocities. To even attempt it, the Soviets must have tracked NASA communications accurately enough

to derive their ephemeris and state vector with high accuracy, and they'd still need to figure out the final approach in real time.

Vivian wasn't the only one thinking this. From behind her, Ed Mason said, "Whichever cosmonaut is driving this bus is a stone-cold pro."

"Doesn't matter *how* they're doing it," Rawlings said with some impatience. "They're *doing* it."

Suddenly, Wagner said, "Guys, are these *missiles*?"

"Prrrrrobably not," said Dardenas.

Vivian's blood ran cold. "Could you try to sound more definite about that?"

Jackson gave her the look again. Once more and she was going to slap him, crisis or no crisis. "They're small. Much smaller than your third stage. Closer to CSM-scale. And they're braking, aren't they?"

"Are they?"

"Well, at least a bit. Yes. This is a rendezvous."

Rawlings reached forward to punch the Comms button. "Houston, Columbia. Tell us something we can use."

"We're sending a request for information up through channels."

"So you'll get back to us in two or three days?" Rawlings demanded. *Gee*, Vivian thought; *even I've never snarked Mission Control that badly*.

She looked at the wall clock. "Dardenas, Jackson, whoever. What's their likely ETA?"

Jackson snorted. Dardenas said, "Well, that depends."

"Obviously. Guess?"

"Hour, hour and a half?"

"That's the best we can do?"

"Well, if they brake like normal people, it would be like ... an hour, minimum? I mean, I've got nothing on them except what I see on the radar."

"They're not gonna do this like normal people," Jackson said. "Guaranteed."

"Depends how much risk they're willing to take," said Dardenas. "They'll have to be a bit careful on the approach. We'll be going into orbit night soon. I'm thinking they won't come in for final approach till we pass back into sunlight."

So: fifteen minutes until they crossed the terminator into darkness. Another ten after that until loss of signal with Houston. And, since

they spent an hour of every two-hour lunar orbit in orbit night, they'd cross back into sunlight in an hour and a quarter. *Perfect.*

Rawlings had been doing the same math. "Yeah, that's exactly how they'll play it."

Vivian leaned in "Apollo 32, Columbia, you read?"

"Here and paying attention," came Ellis's prompt response.

"Good. So, we have possible Soviet incursion. What's your status?"

"Uh, nominal? Still outbound. Three quarters of a mile to the LM."

Vivian ran the numbers in her head. The original schedule gave the boys almost two hours to get there and back; it took forty-five minutes or more just for all the activities that needed to take place between docking with the LM and pulling it free of the third stage. "Earliest ETA back here if you speed it up?"

"Still assessing," Ellis said. "There's a limit to how much we can safely compress the checklist."

Vivian could picture Horn beside him, punching buttons and trying not to swear on open loop. He'd hate changing the mission timeline. Even for Soviets.

Ellis again: "What do we anticipate the Reds will do on arrival?"

"Nothing good, we're guessing," Rawlings said grimly.

"Okay, okay, we copy," Horn said in exasperation. "We'll crank it up, especially on the return. But right now we've *really* got to concentrate on the docking, Viv, okay?"

"Sure, yeah, push on."

Rawlings shook his head. "Houston, this is Columbia Station. What do you have for us?"

"Situation unclear," said CAPCOM. "Use your best judgment."

Josh looked like he was having trouble not pounding the console with his fist. "Roger. Great. Thanks."

"Hung out to dry," Jackson said, to no one in particular.

"Can we hail 'em?" Wagner asked, floating behind them.

"*Hail* them? The Soviets?" Jackson shook his head. "Why don't we beam aboard while we're at it? Attack them with photon torpedoes?"

"Jesus, they must have *radios*."

Vivian leaned in again. "Houston, Columbia. We don't even know what frequencies the Soviets use?"

"Well, yeah, but . . . Stand by," CAPCOM said. "We're working this. Calls placed. Phones are ringing all over Moscow and in the Soviet embassies."

## Part One: Moonfall

“Our radios are hard-tuned,” Zabrinski said. “Exact frequencies, for precision and transponder tracking. We’d have to—”

And then all communications dropped out completely, replaced by a loud roaring hiss.

“Mother of God!” Dardenas reached for the board and threw switches, and the hiss disappeared.

“Sons of bitches!” Jackson shouted at the same time, and a babble burst out from the rest of the crew.

“Hey, hey! Pipe down!” Rawlings barked. “Everyone! Quiet!”

Vivian turned and shoved off. She banged her hand on the edge of the hatch, but swung herself down and through, into the wardroom, back to the window.

She saw one bright dot in the distance that had to be a glint off Apollo 32, or the Saturn third stage. It was a hell of a long way out. *Hurry it up, guys.*

She looked beyond, squinting into the black of the sky. Turned to shut off the lights in the wardroom, put her hand up to block the Sun, and peered again.

There they were, teeny tiny specks reflecting sunlight. *They’re real. Goddamn it.*

*So much for Cronkite. Got ourselves a breaking story here and we can’t even tell him.*

“So we’ve got nothing?” Josh was demanding as she swung herself back up into the forward compartment. “Was I not clear? No radio, no communications at all, no better ETA on the Soviets?”

“We’re jammed, man,” Jackson said. “S-band jammed, VHF jammed, we’re *jammed.*”

“This is not a coincidence,” Vivian said. “Soviets arriving while 32 is here and vulnerable? Can’t be just chance.”

“I know that,” Rawlings said.

Dardenas checked the wall clock. “Terminator. We’re now in darkness.”

Radar, of course, didn’t care whether the ship was in sunlight. But there was no reason why they had to make it easy for the Soviets. Vivian was just opening her mouth when Josh beat her to it. “Mason! Turn off the docking lights. Block off the wardroom window. Let’s make ourselves tough to see.”

“I already turned off the wardroom lights,” Vivian said.

"That window has a cover, too."

"They'll still see us if they have IR detectors," Jackson pointed out.

"Yup. But we do what we can."

They floated in silence, watching the radar blips getting steadily closer. *Predators stalking us in the darkness*, Vivian thought. *Nice.*

Wagner cleared his throat. "Uh, should we maybe prepare—"

"Hey, heads up, we have VHF back," said Dardenas, his hand up to his headset. "Part of it. But S-band is still hosed."

Rawlings twisted himself back to the board. "Yeah? What the hell is *part of it*?"

"Well, the Russkies are transmitting to us. On *our* frequency."

He flipped a switch to send the signal to loudspeaker, and they all heard a heavily accented voice saying: "... lumbia Station, you are operating illegally in Soviet space. We have been commanded to take control of your facility. Do you read? Columbia Station, Soyuz. We—"

Rawlings pushed-to-talk. "Soyuz, this is Columbia Station. Take control? On whose authority? This here's US sovereign territory. You will stand off. I repeat, do not approach."

The Russian voice sounded almost apologetic. "Nyet, Columbia. You trespass in Soviet airspace. You will surrender and allow us to board."

"Soviet airspace?" Rawlings laughed shortly, the tension clear in his voice. "Are you kidding? Am I on *Candid Camera*?"

A different Russian voice, now. Louder. Harsher. "Be advised that we are not joke, Columbia Station. Surrender, and we will allow you to return to Earth. If not surrender, if evasive action or resist, we have power to take you by force. Or to destroy you."

*Destroy?*

The first voice came back. "Columbia Station, Soyuz. Do not compel us to take such uncomfortable action. Allow us entry, and no one will be harmed. You have my word. Over."

Rawlings's tone was icy. "Soviet craft, listen up. You will pass us and continue on your way, or face the consequences. Be advised that we will consider an incursion within a twenty-mile radius of our station to be a contravention of international law, and an act of war."

Vivian blinked, and looked around into the sudden silence. Men were looking at one another.

*An act of war.*

## Part One: Moonfall

The first voice again. "Columbia Station, Soyuz. We regret we cannot comply."

Presumably Horn and Mayer would be listening into this, would know what was up by now. That, at least, was helpful.

Of course, she had no idea how the LM docking was going. It might be smooth and nominal. It might not. Contingencies happened.

"Keep talking," Vivian said urgently. "We have to stall. This line has to stay open."

"Yeah?" Jackson's face was set. "Not sure how much good *talking* is going to do us with these jokers."

Vivian shook her head, frustrated. Rawlings stepped in smoothly. "Transponders. Apollo 32 needs the transponder signal from the LM to dock effectively, and from us to get back here. If that frequency is jammed, Horn has to do it all purely on radar and visual."

"Which Horn can handle," Vivian added. "Given enough time. Which we don't have. We need him to do this *fast*."

Jackson nodded, chastened. "Oh, yeah, crap. Wasn't thinking. Sorry."

"No problem, man," Vivian said graciously. "Lots going on."

"Yeah."

She spoke crisply into the microphone. "Soyuz aggressor, good afternoon. Please identify yourself: name, rank, serial number."

A pause. Then: "I am Major-General Nikolai Makarov. Soviet Air Force. 'Serial' is what?"

Vivian's jaw dropped. "Okay, *now* you're kidding us."

She looked around at the crew of Columbia. Eyebrows raised, all around.

Nikolai Makarov. The second cosmonaut to walk on the Moon, just over ten years ago. Now, apparently, attempting to invade.

At any other time, Vivian might have liked to make Makarov's acquaintance. In a bar in Switzerland, say, with plenty of napkins to draw on.

She lifted her finger off the Comms button. "Well, that explains their flying chops, at least."

Rawlings looked baffled. "What the hell does *Makarov* want with us?"

"Let's find out." Vivian pressed the button again. "This is Captain Vivian Carter, of the US Navy and NASA. Commander of Apollo 32, shortly to descend to the surface on a peaceful scientific mission." *That's public knowledge. Nothing they don't already know.*

"*Dobryy den*', Kapitan," Makarov said. "I am sorry indeed that we meet under such circumstances."

"Yeah, Ivan, so are we," Jackson muttered. Vivian cut the mic and gave him an arch look. "Hey, man. Diplomacy."

"Huh."

"They're decelerating for real at last," Dardenas said, studying the radar.

"What's their ETA now? And 32's?"

"Give me a minute."

"Well, let's ask them." Vivian pushed-to-talk. "Soviet vessels, Columbia Station. What is your anticipated time of arrival here?"

The Russians gave no reply. Rawlings grinned, shook his head. "What?" she demanded. "Worth a try, right?"

"Maybe ... thirty minutes to Russkies?" said Dardenas. "I still can't resolve 32 from the third stage."

"Damn it." Vivian pressed the Comms button again. "Major-General Makarov, we respectfully request a few minutes to discuss among ourselves. We'll get right back to you."

She turned off the microphone. Rawlings looked around at them all. "Okay, guys. What can we do to defend ourselves in here?"

"Defend?" Jackson shook his head.

"We need to seal up the station hard. We're not going to make it easy for 'em."

Vivian took a deep breath. "Sure. But before you do that? Josh ... I've got to get across to 32. Soon as they get back."

Jackson snorted. "Don't be daft."

Even Rawlings looked at her askance. "I think your spacewalk may be off, Viv. Under the circumstances."

Dardenas was still studying the radar traces as if trying to scry the future from tea leaves. "Soviets will probably be here by then."

"Or, they might not."

"There's no way, Vivian," said Rawlings. "Seriously."

"Come on," she said. "Don't do this to me, man. Let me try it."

Rawlings wrinkled his forehead. "We still have no idea whether 32 will make it back in time. Even if they do, we can suit you up but ... ." He looked at her, his eyes troubled. "It'd be no tether or umbilical. Ad hoc. Free-form."

Vivian had already figured that out. "I can do it."

"I can't let you."

“Josh, come on, damn it. My place is with my crew. I *need* to be with my crew.”

“If she can do it, she should,” Dardenas said. “No point having her stuck here in the line of fire too, and losing her mission.”

“No point in letting her kill herself on an off-plan spacewalk either,” Jackson said. “She dies, it’s on us.”

Vivian glared. “If I die, it’s on *me*. But I won’t. I’ve trained.”

“Not for this.” Rawlings looked at the board. Looked at the clock. Then he saw the expression on Vivian’s face. “I dunno. But okay, fine, let’s at least start prepping so we’re ready for anything.”

He turned to face the rest of the crew, his voice carrying clear through the habitable space. “Listen up! Emergency EVA for Vivian, to get Apollo 32 clear on return, soonest. Mason! Prep Port Three for evac. Don’t skimp the checklist, but do it *fast*. Wagner, grab her suit and help me wrap her.” Both Wagner and Mason kicked off upward, streaking through the high open space of the forward compartment.

“We can’t signal 32 to let ‘em know,” Jackson said. “Not by radio, or the Russkies will hear. Not by lamp, or they’ll see.”

“My boys will know I’m coming,” Vivian said.

“Will they?”

“We’ll figure something out,” Rawlings said impatiently. “If there’s even time. Dardenas, where do we stand with the Soviets?”

“Well, they’re still incoming,” said Dardenas. “And ... wait. Okay, yeah, I’m now seeing separation on 32. Horn and Mayer are on their return.”

“About fucking time,” she said.

“Vivian, catch.” Wagner had thrown her suit, and it was twisting and turning in the air as it drifted down to her. Rawlings helped her grab it and held it steady while she wriggled into it. Wagner was still scooting around up in the dome, grabbing Vivian’s gloves and helmet.

Vivian got her head up and out through the collar in record time. She hardly registered it when Rawlings zipped her suit up the back. *Priorities*. “Open the loop for me.”

Dardenas flipped the switch.

“Major-General Makarov, it’s an honor and a privilege to speak with you. I regret that we will not be able to meet in person, as I have other duties to perform.” That would clue Ellis and Dave in that she was still coming. “Meanwhile, please cease jamming our S-band as soon as we have direct line of sight with Earth, so that we may

reestablish communications with Mission Control. Understand that Commander Rawlings can neither allow your approach, nor relinquish the station, without orders from his superiors.”

Vivian looked at Rawlings and grimaced. For a moment, the commander of Columbia seemed almost amused.

Now they heard a third voice, a woman’s. Heavy Ukrainian accent. “Captain Carter and Columbia, please be assured that we are not bluffing. We have capability of taking your station with or without your permission. We have full authorization to use that capability. But we would prefer no loss of life.”

“Well, hi there, fellow spacewoman,” Vivian said. “Who are you, now? In your case I’ll settle for just a name.”

To that there was no response.

Rawlings broke comms. “Must be Svetlana Belyakova. She and Makarov come as a matched pair.”

The second Russian voice came back again, the harsher-toned man. “Columbia Station, this is simple. You will allow us to board, or we will do this the hard way. Apollo 32, your surface mission is canceled. You will jettison your Lunar Module and return to Earth.”

Vivian’s blood ran cold. *Jettison. Jesus Christ.*

She’d been clinging to the hope they’d just *let her go*. A peaceful mission to the surface? The Russians might mistake Columbia for a military facility, but a classic Apollo with a science mission plan? They’d just let them go on, right?

Wrong. She wondered how she’d ever let herself think otherwise.

“Break, comms off,” Dardenas said. “Apollo 32 has pedal to the metal. Coming in hot. Horn had better start a retro fire soon or he’ll overshoot.”

Vivian shook her head. “That’s exactly what he’ll do, overshoot. Right now, he’s behind us in orbit. And the Soviets are coming from behind and under. If Horn goes beyond, Columbia ends up between the Soviets and 32.”

Even Jackson looked impressed. Rawlings nodded. “Yeah, okay. Cool.”

“But we need more time.” Vivian glanced up. Wagner was bringing her a PLSS—a portable life support system. Zabriski was holding her gloves and helmet ready. *Shit’s getting real.*

She hated it that this level had no windows. How did these guys stand it? She looked at the clock, but her mind had gone blank. “How long till daylight?”

## Part One: Moonfall

“Ten minutes till night-day terminator,” Rawlings said promptly. “Ten minutes longer till AOS with Houston, except that the Russkies will for sure not let us talk to them.”

“Yeah.” Vivian winced as Wagner tightened the PLSS harness across her shoulders. Josh was snapping in hoses and connectors.

Vivian should really be paying more attention to this. She’d be in vacuum real soon now. She glanced at the displays on the control unit on her chest. *Um.*

“Vivian, are you ready?”

*I dunno. Am I?*

Despite her bravado, the answer was a clear No.

Dardenas flinched. “Apollo 32 is passing ... ouch, holy smokes, range indistinguishable from zero. Okay, they’re past. Still braking. Looks like they’ll take up station a couple hundred yards beyond us. Maybe farther.”

*A couple hundred yards? A short walk. A hell of a long spacewalk.*

Vivian wondered what that had looked like from Apollo 32’s perspective. Completely different from their first sedate approach. *Ellis can’t even have had time to call numbers. Must have been total seat-of-the-pants from Dave Horn. Scary as hell.*

“Soviets almost on us,” Jackson said. “Coming in ... a bit more moderately than your guys.” He looked back at Vivian, and this time there was no disdain or humor in his expression. “It’s now or never. Good luck, Rocket Girl.”

“Well, so much for stalling the bastards,” Rawlings said. “Vivian, go.”

He took Vivian’s right glove. Wagner her left. Vivian raised her arms, watched as the men made the connections, snapped the gloves tight, double-checked and cross-checked them. Josh was now holding her helmet and a zip gun, and Vivian began to focus in on what she’d signed up for.

Alexei Leonov’s first spacewalk had been performed with an oxygen backpack and a tether; Ed White’s, with a twenty-five-foot umbilical to bring him oxygen, a tether, and a zip gun like the one Josh had in his hand.

In fact, almost all spacewalks to date had been tether-and-umbilical. Vivian’s spacewalk for TV would have been, too. Now, it could not be.

The original plan had called for Dave Horn and Ellis Mayer to bring the Apollo stack back to within fifty feet of Columbia Station.

## Hot Moon

Vivian would egress, tethered to Columbia and with an umbilical for oxygen, and conduct her photo-op spacewalk. She'd perform a largely redundant visual inspection, then clamber through the open hatch into her Command Module. Disconnect the pipes and wires, seal up the capsule, and off they'd go.

It wasn't supposed to be hard. Just another US first to check off: spacewalk by female astronaut, done and done.

Now, with four Soviet craft in the mix and no time margin, it would be a completely different animal. Hence the PLSS for life support. Vivian would be going way too far for an umbilical, too far for even a tether. She'd be doing this free-form, steering with a gas gun.

"You can still abort. Order 32 to disengage into a higher orbit, wait to see what happens here with the Soviets. There might be a safer solution."

Couple hundred yards was a hell of a distance. And this wasn't on the plan. Everything was moving a bit too fast for Vivian to keep up with.

No. She wasn't throwing in the towel. She'd got it right: her place was with her crew. Her ship. Her mission.

Rawlings was studying her face. "Vivian? You good to go?"

"Roger that," she said. "Vivian is Go for return to Apollo 32."

"Okay. Good luck." Rawlings lowered the spacesuit helmet over her head, pushed down to lock it into the neck ring.

"Pressurizing," she said to the microphone by her chin, and heard her own voice dimly through the station loudspeakers.

Josh raised his forefinger to his lips in the age-old gesture of silence.

*Oh yeah. Anything I say now, the Soviets can also hear. Way to go, Viv.*

She shoved off against the floor. Rawlings and Wagner came with her, one on each side, helping to steer her now-bulky form toward the airlock hatch where Mason was waiting.

Oxygen hissed through her suit. Vivian took long, deep breaths. No turning back now.

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