

# Minerva Girls

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James Van Pelt

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Jacqueline theorized how to build a private video connection for the three of us from broken baby monitors, trashed cell phones, and digital displays; I collected her shopping list from Dad's junkyard, and Selena took Jacqueline's scribbled plans, deciphered them, and somehow turned the three boxes of abandoned electronics I gathered into a working communication system. We sat in our own bedrooms in our own houses and talked whenever we wanted. Jacqueline came up with the idea because all of our parents said we weren't old enough for smartphones.

"Thanks, Penny," Selena said when I gave her the box of parts. "You have all the coolest stuff," she added.

We were eight, and we'd decided we should never be apart. At least I believed that then.

Six years later, near the end of summer before we were to start ninth grade, Jacqueline said, "We can go to the Moon." She sat in her favorite seat by the Submersible Club's control panel. The LED lights gave her face a ghostly hue, and dark hair covered her shoulders. She'd traded glasses for contacts at Christmas, and her face still looked naked to me. "High school is a chance to remake yourself, don't you think? I don't want to be the geeky kid with glasses."

Selena tinkered with the CO<sub>2</sub> scrubber. We could stay in the Submersible Club as long as we wanted—the scrubber worked—but the air smelled like a vegetable drawer gone bad. At the time, she'd said, "As if the glasses are what make you geeky."

"They're going to put me in with upperclassmen. It'll be bad enough being three years younger than everyone else."

So she got contacts.

I sat by a porthole. Outside, the quarry grass twisted slowly like a thick, sluggish carpet, while a catfish muscled through, probing the bottom with its whiskered mouth. Algae flecks drifted by. The day had been cloudless when we called the Club to shore and boarded her, and the water was particularly clear. Thirty feet down, where the light started to dim, I still had a good view.

"Dad doesn't have junk we can turn into a spaceship," I said. "Besides, NASA bailed on the Moon fifty years ago."

Jacqueline grinned. "You're missing the beauty, Penny. We don't need a spaceship. We'll take this." She waved her hand, encompassing the entirety of the old gas station storage tank we'd spent last summer turning into the Submersible Club. By the time we were done, Selena had taught us both how to be competent welders. "We keep water out under a lake; in outer space we can keep air in."

I imagined the three of us disappearing in a flash of flame and poor planning. “We have no rockets, and we can’t make the fuel. That stuff is wicked explosive.”

“We don’t need rockets.”

Selena extracted herself from the CO<sub>2</sub> scrubber. It filled the back quarter of the club, along with the battery packs, the diesel generator we ran when we surfaced, and her tools. “I’d like to go to the Moon.” She stood tall and slender and was a magician with her hands when it came to soldering and assembling and making it all fit. “Do you have schematics?”

“Working on the numbers,” Jacqueline said. “Two more days.”

As always, they were way ahead of me.

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Dad said, “A customer out front needs a replacement motor for his blender. It’s an Osterizer Imperial Dual Range Cyclomatic 14. Can you find one, or a motor to double for it?”

I munched on a jelly sandwich. “Is he a restoration nut? The Cyclomatic 14 is from the ’70s. He could replace it on eBay for ten bucks.”

“An eBay customer doesn’t make us money. Do we have one or not?”

Dad specialized in auto and truck parts. If you wanted a transmission for a 1948 Chevrolet Thriftmaster 5-Window Pickup, he knew exactly where we’d parked it and what size wrenches for the job, but I excelled in the smaller stuff. I spent a lot of time wandering the junkyard.

“Maybe.”

Dad sighed and leaned against the counter. “What’s it going to cost?”

I gave him the squinty eye, like I was being shrewd. “Well, we’re out of chocolate ice cream.”

“Okay, you’re on. If you can find the motor, I’ll pop for the good stuff.”

Mom always called Dad her “swarthy sweetheart.” I thought for the longest time that “swarthy” meant strong, and he is, too.

I snagged the key for the golf cart as I headed out the back door. The yard stretched over fifteen acres, much deeper than wide, and even with the cart it could take a while to get to the farthest reaches overlooking the old quarry, but I’d modified the transmission. I whipped through the twisty path, leaning into the curves, scrap metal whipping past on both sides. Dad would kill me if he saw me drive like this, but, oh, I loved to be behind the wheel. If it moved, I wanted to steer, and the faster the better. The thought of getting a driver’s license in a couple years kept me awake at night.

When I returned, after finding the little motor way back in the yard, beyond stacks of washing machines, and teetering towers of hot tubs and refrigerators, after digging through a bin of blenders, mixers, can openers, and electric knives, Dad said fondly, “You’re not like other little girls, are you? And I bet the guy will be happy to pay twenty for this.”

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The three of us attended summer school: Selena failed eighth-grade English; I had to retake World Geography (I just couldn’t keep those European countries straight on a world map, and I never remembered more than thirty-two of the states), and Jacqueline volunteered as the student assistant in A.P. Calculus for those kids who took school in summer for fun.

Most of the rooms were empty as I trudged to remedial Geography. Desks needing replacement were piled in the hallway, and the festive, “Welcome to Summer” and “We’ll Miss You!” posters had been torn down, leaving the walls bare and sad looking. I imagined how I’d feel if this were the Moon, and how light my steps would be, but I guess I couldn’t do it well enough. I stayed stubbornly Earth-bound.

Twenty kids sat in the Geography room. Worst of the worst. The Fab Four filled the back row: Melissa, Melinda, Vivian, and Victoria, like a four-pack of genetically identical lab rats. They weren’t biologically related, except maybe to some dim-witted, snobby prehumans from millennia in the past, but they dressed and did their hair and wore their makeup as if their conference called every morning. They’d disappointed teachers and underperformed together since first grade. When I passed, they rolled their eyes, as if it hurt to share their universe with me.

Heck, I would have rolled my eyes at me. How hard could it be to remember fifty states? I memorized stuff I cared about all the time.

A boy sitting near me had terrible body odor—I noticed the teacher didn't wander near my side of the room as she lectured—several others smelled of cigarettes, and the entire class stunk of sullen resentment. Aromatherapy in reverse.

The teacher handed out United States maps without labels for the states. Going left to right from the top, I filled in Washington, Idaho, Montana, North Dakota, Minnesota, Wisconsin and then the Great Lakes got in the way. A few states later, I'd be in Maine. I couldn't remember anything in the next row. Why the founding fathers didn't lay the whole thing out in a neat grid, naming alphabetically baffled me. Only a couple of the states were square—my state, Kansas, being one (almost). The mapmakers must have hated school kids.

The boy behind me poked me in the back. "Hey, junkyard," he whispered. "Let me copy your map."

I moved so he could peek over my shoulder. I wrote "Caledonia" for California, "Washwater" for Nevada, the names of Santa's reindeer for nine other states—I thought for sure he'd catch on when I labeled Florida as "Rudolph," but he kept writing until I finished. He turned it in at the end of class without thanking me. I hung back until the room emptied, asked the teacher for another sheet, and then quickly redid mine, putting in the thirty-two states I knew.

I felt bad for keeping the teacher late. I bet she wanted to leave as much as I did. I said, "Wouldn't you rather be on a sunny Rudolf beach instead?"

"Rudolf?" she said.

"Yeah, you know, where Disney World is."

She looked puzzled.

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We started calling ourselves the Minerva Girls in seventh grade. I'd been reading about virgins—just idle research—and came across Minerva, one of three virgin goddesses who never married. I tried talking Jacqueline and Selena into changing their names into Vesta and Diana, but when they learned the backstory, they both thought they made as good a Minerva as I would, although sometimes they'd call me "Minerva," when they were teasing. I'd call Jacqueline "Vesta," and Selena "Diana," to get them back. We were three goddesses trapped in a middle school.

It wasn't a big deal. They liked their real names better anyway. I wasn't fond of mine. I mean, "Penny"? I'm the coin with the least value. I guess it would be weird to call a kid "dime" or "quarter" or "dollar."

"Minerva Girls" stuck, though. We signed our schoolwork with our names and then "MG," like a doctor would add MD. Only Mr. Roman, the literacy teacher, ever asked me about it. I told him what it meant. "It's kind of a sorority," I added.

He thought about it for a second, then smiled. "Good choice."

It's a pity. Besides the other Minerva Girls, the only kindred spirits I meet are adults, and among them there aren't many.

Near Christmas later in seventh grade, a couple months after Dad began letting me greet customers and accept deliveries, a middle-aged couple standing in the junkyard office looked annoyed and impatient. I'd put a phone book on the stool behind the counter so I looked taller when people came in.

"How much'll you give us for this stuff," said the man. He held a box awkwardly.

The woman said, "It's his dead aunt's. She collected figurines. We had to clean out her house."

"Distant aunt. It's mostly ceramic. A couple of wood pieces." He set the box on the counter and opened the top.

I started to say, "We don't have demand for . . ." but the big glass eyes peeking out stopped me.

"They're all owls," said the woman. "She couldn't get enough of them."

We'd filled a shed with figurines: fairies and Christmas villages and birds and trolls and elephants and dogs and dragons. Lots of glassware, ceramic, pewter, wood and fake crystal. Almost never sold any of it, and Dad had told me to quit taking it in.

Owls, though. I had an interest in owls. "I'll give you five bucks for the box," I said while digging the bill from my pocket. That's what Dad paid me each day to watch the shop. He was somewhere in the yard, disassembling a '54 Ford Ranch Wagon featuring more rust than parts.

“Done,” said the man who took the bill, clearly relieved to have found a home for his aunt’s collection.

I carried the box upstairs to my room. Above my dresser I’d hung a poster of Minerva, a full-color image of the goddess: helmeted head, a spear in her right hand, a shield on her left, and an image of Medusa as her breastplate. A snake curled up the base of the spear, while an owl stood at her feet. They called Minerva “goddess of a thousand works” because of her dominion over so many things: wisdom and medicine and war and crafts. If she had been a witch, the owl served as her familiar, but she wasn’t. Gods don’t need familiars.

I cleaned the top of my dresser and bookcases. The owls perched on them now, watching over me. At night I contemplated them before turning off my lights.

Minerva has long been pictured with an owl. The owl represented knowledge because it hunted at night. The owl could see clearly when men could not.

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Jacqueline closed her notebook when neither Selena nor I could follow her formulas. She made up her own mathematical symbols! Her scribbling reminded me of Stephen Hawking’s *A Brief History of Time*, which I had tried to read, but it lost me a third of the way through. When she started talking about multivariable calculus, linear algebra, and vector spaces, my eyes glazed over.

We were sitting at our favorite booth in McDonalds, the one tucked by the side door. The Fab Four sat in the middle of the room, as if they’d staked claim to the area. They each ordered a milkshake. Their straws leaned the same way, and they took pictures of each other, messing with the images, and then laughing at the results. Four boys I vaguely recognized from school came in, pointedly taking no notice of the girls as they headed to the ordering counter.

Selena picked at the remnants on our tray. “Cold fries are best.” She touched Jacqueline’s notebook. “So, you think, theoretically at least, we can control gravity? Get it to push us away from Earth instead of pulling us to it.”

“Not push or pull,” said Jacqueline. She held a burger wrapper on her palm. “Imagine space as a flat plane, like this sheet of paper, but more rubbery.”

I knew where this was going. I’d read it in the first third of Hawking’s book.

Bizarrely, once they had their food, as if they weren’t sure where to sit, the boys orbited the girls before finding a table near the front.

Jacqueline said, “A mass, like a planet, creates a depression on the plane.” She pressed her finger into the paper. “So, another mass traveling along in space in a straight line gets close enough to the depression caused by the first mass. It’s caught in the depression and spirals into it, like swirling down a funnel. Not pulled or pushed: it follows the distortion in space. We stick to the surface of Earth because we’re caught in the distortion.”

Selena contemplated the paper. “So the Earth’s weight causes the space funnel. Gravity is what pulls the Earth into the space plane?”

Jacqueline sighed. “Mass, not weight. Weight is the effect of gravity on mass. Weight changes depending on where you are. If you were on the Moon, you would weigh less, but your mass would be the same. And there’s no real ‘plane’ in this explanation. It’s kind of a two-dimensional model of a multidimensional reality.”

Hawking had lost me at about this point. Gravity, space-time continuum, and quantum mechanics left me breathless and confused. Watching Jacqueline explain it made me want to crawl inside her head to see what spun there.

I looked up. Hadn’t the boys been farther away from the Fab Four earlier? It looked like they’d moved a couple tables closer.

Jacqueline said, “I believe mass isn’t the only way to distort space. In fact, mass is an ineffective way to do it. Look at how weak Earth’s gravity field is.” She tossed a French fry into the air. “I beat gravity with the flick of a wrist. Birds defeat it with light bones and favorable airflow over their wings. Just think of it, the entire mass of the Earth, if you could weigh it, is about a thousand, trillion tons. All that mass and we walk around, and jump, and throw baseballs. Mars isn’t much smaller than the Earth, and it couldn’t even hold onto its atmosphere. Gravity sucks, but just barely.”

## ANALOG

She opened her notebook again. Selena and I bent over the pages of scribbled figures. “I call it the Distortion Drive, and we’ll build it in the Submersible Club. We’ll go to the Moon.”

One of the boys stood up and walked over to the Fab Four’s table. He leaned in. “Hey, Melissa, how ‘bout you send me some digits?” He held up his phone.

“I’m Vivian,” said Vivian. “She’s Melissa.”

“Whoops, my bad.” The boy blushed. “I meant to say Vivian.”

“Sure, give me your phone.”

When he returned to his table, where his buddy’s fist-bumped him, the Fab Four huddled together, whispering furiously, laughing to themselves.

Selena said, “Do you think she actually gave him her number?”

I said, “Maybe, maybe not. Does it matter? They’re probably cousins anyway. Only inbreeding makes sense. I don’t understand that kind of attraction.”

Selena folded her arms across her chest. “Me neither. Ninth grade is going to be horrible.”

Jacqueline closed her notebook. “The math for it’s beyond me. Let’s do something simple, like conquer gravity.”

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Selena’s list of supplies included magnets of various sizes, computer motherboards, graphic cards, and a lot of copper wire. In the meantime, I needed to insulate the Submersible Club and design a working toilet. Jacqueline said it would take less than four hours to get to the Moon at one g of acceleration—she hadn’t decided whether we should try to land or not—so figure an hour when we arrived to get good pictures and enjoy the moment, and then four hours back.

I craned the Sub Club out of the quarry in the morning, let it drip dry while I suffered through another session of Geography, then sprayed on the first coat of insulation. The sticky yellow gunk went on like thick paint, and then bubbled up a couple inches before solidifying. The junkyard had everything! Dad took in freight-damaged goods, broken industrial equipment (which often needed just a part or adjustment to be fully working), and then stored it, waiting for the buyer who wanted exactly that hard-to-get item.

I had access to all of it.

Tucked into a warehouse at the property’s edge, he had stacked ten freight-damaged cases of space blankets—you know, the silvery sheets marathoners wrap themselves with after the race—twelve ounces each, seven by five feet. Ripping them from their plastic bags before dabbing them with liquid nails and gluing them to the insulation took the most time. More spray-on insulation over the blankets. Oh, and going around the portholes slowed me down too. What would be the point of traveling to the Moon if we couldn’t see anything?

Around suppertime, I put the sprayer down to stretch my back. My hands ached from directing the heavy nozzle. Dad’s statues stood sentry. He told me once, “Anyone can do art, and they should!” He welded together busted and useless metal into ten-foot-tall figures like robots or aliens or deities, and then left them to rust scattered near the quarry. Bushes and saplings grew through the oldest ones. Headlights for eyes. Wrenches for fingers. Here and there chrome caught the sun as it set. He called them the Colossi.

Midnight came just as I finished the fourth layer, almost a foot thick coating on our space ship, which didn’t match what NASA used to protect the Apollo astronauts, but we weren’t going to be in space nearly as long.

The Sub Club looked like a giant, aluminum-wrapped burrito, hanging from the crane’s cable. Beyond the circle of klieg lights, frogs croaked merrily. Tiring work, all the spraying and gluing, but at least we’d be warm.

The full Moon floated overhead, white, round, and beautiful.

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Jacqueline waited for me on the sidewalk in front of the junkyard. Day five of the enforced misery of summer school waited. We walked next to the eight-foot chain link fence the city made Dad build to hide the business from their sensitivities. He’d zip-tied blue tarp to the fence, but weather had faded and ripped it.

“Insulation is done,” I said. “I need to know if the toilets I’m designing will be for zero-gravity

use, or will we have a floor and ceiling?"

"We'll generate gravity," she said distractedly, looking at her feet as we walked.

"You seem down. Is everything okay?"

"If I were sixteen," she said, "I could make up my own mind. I could do what I want. I wouldn't have to go to school." She stepped to the side to kick a piece of gravel. It skittered across the street."

"If I were sixteen, I'd take up race car driving."

Jacqueline didn't laugh. "My mom decided public schools aren't good enough for me."

We reached the corner. A car full of teenage boys roared past, easily going twenty over the limit. I don't think they saw us. I almost said, "They aren't good enough for anyone," but Jacqueline didn't seem to be in the mood.

"You're going to be with upperclassmen. What more does she want?"

"Thomas Jefferson High School for Science and Technology."

"Where?"

"Alexandria, Virginia. We're moving before school starts."

I tried to picture the map. Virginia was in the east, somewhere. Wichita was in the middle. "You'll be a thousand miles away!"

"More. Mom's looking at houses now. I can't have my genius daughter in a second-rate school," she said."

I thought about Jacqueline's news all through Geography, which didn't help me follow the lecture on the importance of the Mississippi as a navigable river, nor the scintillating retelling of the search for its headwaters. It's in Minnesota by the way. You can put a canoe in Lake Itasca and then paddle for 2,300 miles to the Gulf of Mexico.

If this trip to the Moon doesn't work out, I thought, maybe the three of us could float a raft down the Mississippi. We could go low tech. No phones. It would take weeks and weeks, and Jacqueline's mother wouldn't be able to find her.

Our teacher showed a fifty-year-old filmstrip on a projector with a quarter-inch layer of dust on the top.

"I hope you are all taking notes," she said. "In high school, you will be taking notes all the time."

Teachers had been making the when-you-are-in-high-school threat for a couple of years, like "in high school you can never turn in late assignments," and "in high school you will have more homework," and "in high school the decisions you make will affect you for the rest of your life."

I didn't worry about it because I could always ask Jacqueline and Selena for help. We'd get past high school together, but now Jacqueline would be gone.

Nothing could be worse, except after class ended, I met Jacqueline and Selena for lunch, and Selena announced, "My Dad got a job in Texas. We're moving before school starts."

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The school sent home scheduling information for next year. Everybody who hadn't failed a class registered in May, but for kids like me, we had to have an extra meeting with our counselor and then do two schedules: one for if we passed the summer makeup class and one for if we didn't.

I spread the registration materials on the kitchen table along with worksheets to try to build a set of classes freshmen could take and didn't overlap. The popular sections were filled so I had fewer choices.

Normally scheduling sucked. This was worse. I couldn't see high school without the other two Minerva girls. What would be the point?

Besides, the only interesting classes, Electrical Design, Metal Shop, Astronomy, and Driver's Ed, weren't offered to freshmen.

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At two in the morning, I opened my closet and took out the communicator the three of us had built when we were eight. I'd chosen to house mine in a Batman lunchbox. Selena picked an "I Believe in Unicorns" lunch box, and Jacqueline liked a *Futurama* one. We hadn't used them since fifth grade, when we finally got phones.

I pressed the all-call button, then laid on the carpet, looking at the ceiling. The owls peered

down. Wherever Jacqueline and Selena kept their boxes, they would emit a soft “meow.” Selena went through a cat phase when she built the communicators.

Selena answered before I could press the button again. “You couldn’t sleep either?” she said. “Not a wink.”

The speaker hissed to itself. For two years the three of us had lost sleep talking to each other through our lunchboxes. Shared secrets. Told stories and jokes. Discussed the mysteries of the Universe, like what idiot thought skirts were a good idea or why library time only came once a week. Cried sometimes. Giggled a lot. We didn’t have brothers or sisters, but we had our lunchboxes long after our houses had grown quiet.

A sharp click told me Jacqueline had joined the conversation. “Sorry. I heard the box, but I couldn’t remember where I’d put it. You wouldn’t believe the dust bunnies under my bed. What’s up?”

I didn’t know how to start. Finally I said, “Are you sure you guys have to go?”

Selena said, “No choice. Dad’s being a butt. Says Texas is a great opportunity, and I can make new friends.” She sniffed. “He doesn’t know me very well. In my whole life here I’ve only made two friends.”

Jacqueline said, “It’s a done deal.”

Hearing them say it made me mad. I don’t like it when someone tells me there isn’t a way out. Here’s what I’ve learned from living in a junkyard: it’s not about what you don’t have; it’s about what you do with what you do have, or something like that. Nothing is broken that can’t be salvaged or rebuilt (not that I wanted to swap out my friends like a burned out solenoid—what was my choice there? One of the Fab Four?). What I mean is if your car has a bad starter, there are lots of starters that aren’t exactly the same model, but will work—you don’t give up on the car—so I don’t believe in “I don’t have a choice.”

There’s alternatives.

“Let’s not focus on the choices we don’t have,” I said. “We have a deadline.”

Jacqueline and Selena said at the same time, “What?”

“End of August, one week, we leave for the Moon. Our great adventure before you move. I’ll have the Sub Club ready. How close are you guys?”

Selena said, “I finished a prototype, not tested, but it’s a couple hundred pounds. I need a way to get it to the quarry.”

I checked the window. Moon shadows everywhere. We had hours before sunrise. “I can be there in twenty.”

At Selena’s house, she’d opened the garage. Light streamed onto her driveway. I’d hitched a trailer to the golf cart and driven there mostly in alleys. The cart didn’t have headlights or taillights, I didn’t have a driver’s license, and I wasn’t in the mood to explain to a cop (or Dad) why I was driving a non-street-legal vehicle a couple of hours before dawn.

The device dangled from an engine hoist. Selena wore overalls and safety glasses pushed up on her forehead.

“Looks like a cappuccino machine on steroids,” I said. About the size of a mini-fridge, it featured layers of coiled copper wiring, brass tubing, and old-fashioned radio vacuum tubes, fronted by a mother board with several switches and a video game joystick.

“More sculpture than a machine,” she said. “Building to Jacqueline’s formulas is like assembling a lawn mower with sheet music for instructions.”

I backed the trailer under the device. Selena lowered it and then strapped it down.

Jacqueline waited for us at the quarry, her notebook tucked under her arm. No hint of sunlight yet. The Sub Club shimmered under the klieg lights, while Dad’s Colossi cast long shadows into the dump.

“I trust the numbers, but I think we should fire the Distortion Drive up remotely the first time, to be safe.”

I slung a cable over the top of the device, then anchored the ends to stone outcrops. “If it works, I don’t want it flying off.”

Selena nodded. “Maybe another cable going the other way? Better safe than sorry.”

By the time we'd solidified the anchors and rigged the power source, the eastern sky had lightened.

We crowded into the crane's control booth fifty yards from our test site. Selena connected the video game joystick to the wires that ran to the Distortion Drive. She held it out to Jacqueline. "You should do the honors."

I had my phone out to film our results.

I guess I thought the Distortion Drive would rise up from the golf cart trailer until the cables stopped its progress. That, or it wouldn't move, which seemed more possible. I steadied the phone and turned on the video.

Jacqueline took a deep breath, then pushed the joystick forward a tick.

I lurched against the glass, as if someone had tipped the control booth from behind. Selena squeaked and caught herself from falling.

Jacqueline bumped her head on the window. Then the control booth shifted back into place.

I said, "What happened?" while rubbing my shoulder.

"Dang," said Jacqueline. "That's going to leave a welt." She sat on the control booth floor, her notebooks spilled around her.

"My machine!" Selena opened the door.

Jacqueline grabbed Selena's leg. "Not yet."

A clattering like hail rattled the control booth's metal ceiling for a couple seconds. Gravel and marble-sized rocks bounced off the ground around the booth. My toolbox that I'd left next to the trailer slammed down along with the wrenches and other tools that had been in it.

"I hadn't considered that," said Jacqueline. "I'll need to narrow the distortion field."

"Did it work?" I said. I peeked cautiously through the door and checked the sky. A dust cloud a few hundred feet up marked an otherwise clear morning.

Selena laughed. "Good thing we tied the drive down to the bedrock and not wrecked cars or anything else unattached, or the whole mess could have flown straight up, and it would be raining thousands of pounds of scrap metal instead of loose rocks."

"So it did work?"

Jacqueline carefully detached the power cord from the joystick. "We need finer control. I barely touched this. I don't see how we could bring the Club in for a gentle landing based on what we just saw."

In a week, the moving vans would arrive at Jacqueline's and Selena's houses. If we couldn't solve the problem by then, we'd never get to the Moon.

After we finished breakfast in my house and returned to the quarry, we noticed the other change: Dad's colossi had fallen, their heads pointed toward our Distortion Drive, all following the lines of bent space that for a moment had centered on a couple hundred pounds of magnets, copper wire and vacuum tubes scavenged from the junkyard.

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Just before midnight, the lunchbox meowed, and Jacqueline said, "We don't have a week. Mom wants us to visit her sister in Kansas City before we move. We're packing right now and leaving in the morning. I'll be back the day before summer finals, and then gone to Virginia the day after."

"It's up to Selena, then."

The line crackled in the silence. I'd taken Selena a box full of rheostats, light dimmers, volume controls, and a broken sound board with sliding switches. She'd dug into the mess and said dubiously, "I'll have to rebuild the control system altogether. How much time do I have?"

A silly question. She knew as well as I did.

Selena broke in. I didn't realize she'd entered the conversation. "No pressure, guys. Did you know that according to Jacqueline's formulas, the difference between the Sub Club not moving or tearing open a black hole in the fabric of space right above the quarry is only a few hundredths of a decimal point?"

"I should figure in a couple safeties," Jacqueline said.

"You think?" I said.

Minerva looked down at me from her poster. The owls passed judgement.

I failed the states-map test for the second time on Friday with only twenty-eight states correctly labeled. I had regressed! At this rate when school started, I would be repeating the class, knowing less than I did a year ago.

The Fab Four passed. They high fived each other silently. Normally I would have spent the rest of the class trying to figure out how they cheated. It undoubtedly involved their phones and Google Maps in some way.

Geography felt like a weight. Not only would ninth grade be unbearable, but I'd be stuck in it until the school kicked me out. I'd heard that you couldn't be twenty-one and still attend high school. I'd be old enough to vote, but unable to attend the junior-senior prom, not that I wanted to.

Then the assistant principal walked in—a portly woman wearing a baseball cap, a floral print dress, and high top tennis shoes—she whispered something to the teacher, who nodded and pointed at me.

In the hallway she said, “We had a complaint about you, missy.”

“I haven't done anything!” A true statement. I hadn't even been tardy.

“Did you or did you not give another student incorrect information about the state names while you were studying for yesterday's test?”

“That's what he said?”

“So you did intentionally give him bad information?”

My fists clenched. I couldn't say that we didn't study together, since I let him copy my answers. Either way I was screwed.

“I thought it would be funny,” I said with a rise at the end, like asking a question.

“You're not in middle school anymore, missy. We take education seriously in this building.” She wrote something in a notebook. “I'm keeping my eye on you. You're not off to a good start. We will be contacting your parents.”

As I walked home, I kicked every rock on the sidewalk out of the way. If I'd had a baseball bat, I might have beaten up a couple of mailboxes too.

The assistant principal didn't call on Friday or Saturday. On Sunday I went to Selena's house. If Dad got a phone call, I wanted to put off talking to him about it as long as possible.

Selena sat at her worktable in the garage, surrounded by the parts I'd given her and a bunch of other electronics I didn't recognize. Her back was to me as she bent over her contraption. A wisp of solder smoke drifted above her. I tried imagining her space repurposed by the people who would move into her house. They'd probably store paint and fertilizer on it or—I thought about the most boring thing possible—exercise equipment.

“Can I help?” I said.

She pushed her safety goggles onto her forehead. “I can't regulate the power finely enough. None of these do the job.” She waved her hand at the switches and toggles. “We can go up, but we'll never slow down to land.”

I picked up a large, cream-colored dial that looked as if it might have come off a dishwasher. Wires spiraled from the back of it.

“They aren't sensitive enough?”

Selena nodded.

“What if you hooked them up in a series?”

She perked up. “What do you mean?”

“If this control can take the power from, let's say, ten to one, but that's too much power at the lowest setting, why don't you hook up another one in front of it? The first one could take the power down to one, and that's all the power the second one gets, so it now gives you from one to one tenth. A third dial could take that power and go from one tenth to one one-hundredth. Couldn't you hook them up to that way and deliver very fine fractions of power?”

Selena cocked her head at me. “That's brilliant. I mean, power doesn't work quite that way, and there are inefficiencies in the switches, but the concept is good.” She slapped her safety goggles

back on and turned to the table. "I can work on this. Thanks!"

Dad ambushed me when I got home and took away the keys to the golf cart. He looked at me wryly, "You played a mean trick on that kid, even if he was an idiot. Did you really call Nevada 'Washwater'?"

"I know most of the states, Dad."

"Yeah, but do you know that one?"

I shut my eyes, wishing he would go away. He patted my shoulder as he went to greet a customer out front.

It's not that far to the back of the junkyard as a crow flies or a souped-up golf cart drives, but the path winds between steep walls of twisted metal, and I had plenty of time to think as I walked to the quarry. I couldn't remember a single person who had moved away in my whole life who I still knew. Moving cut the cord. The friendship ended. If you move, you make new friends, and your old ones fade. A couple months from now, Jacqueline and Selena would be sitting in classes with new people, getting to know them. I'd be a faint memory, if they gave me a thought. That's how it goes when you move. Everything is different, so you adapt.

But if friends move away from you, your best friends, and everything else is the same, they leave a hole.

Long after the Sun set, Selena still hadn't come to the Club. Hooking the switches up in a series was probably a lame idea anyway. It wouldn't work.

Sometimes, when I felt blue, I'd sit in the Sub Club by myself at night, but I wouldn't submerge it. I'd leave the hatch open, laying on my back inside, and look at the circle of stars. Little waves lapped the metal sides like tiny hands tapping time. I'd gone to sleep that way more than once.

With the insulation wrapping it, I didn't have that option. It would take hours to peel it off to make it water-worthy again.

The walk back to the house in the dark would spook most people out, I know. Cooling metal contracts, so there's a continuous symphony of creaks, groans, and pops. Then, the rats get active. If the Moon shines, I can spot their eyes, but I like the yard at night.

I gathered three of my favorite owls from my room, marched back to the Club and set them where I could see them as I worked.

School started in three days, on a Wednesday, the day after finals for summer school, where I could show I knew enough about eighth grade geography to move on in my classes, or once again bog down on the thirty-third state. The Minerva Girls would get Monday afternoon together, if we were lucky, if Jacqueline's mother got her home in time.

I lowered the Distortion Drive through the hatch and into the Club. A close fit, but it went onto the mount perfectly. I bolted it down.

Under the owls' watchful ceramic eyes, I gathered plastic sheets and tubing. You can make almost anything with enough material and a glue gun, and I had a space toilet to design.

\* \* \*

The lunch box meowed before dawn on Monday. "I've rigged a control panel," said Selena. "I'll bring it to the Club after class. Finishing my last essay for English."

Nothing from Jacqueline, not even a text message.

\* \* \*

Since they'd scheduled the Geography final for tomorrow, the teacher arranged us into groups to compose flash cards and to quiz each other. I know I've made it sound like the class only worried about where the states are, but we studied continents and other nations and capitals and deserts and mountain ranges and major rivers. It didn't matter; I couldn't focus. I'd spent most the night working in the Club, not only mounting the Distortion Drive, but also laying in food, charging batteries, testing the heaters, filling the backup oxygen tank, and a dozen other chores.

I also stress tested the ports, and in a moment of genius, came up with a patch system if a bit of space junk or a rock traveling really fast punched a hole in us. It involved gluing a half-inch thick disk of rubber to the bottoms of several five-gallon buckets that I'd cut out. Any breach smaller than a silver dollar would get a patch slapped over it, and the internal pressure would

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hold it in place and seal it.

I hoped.

Quite a bit of work for a ten-hour trip, I thought.

And a ridiculous amount of work if the Sub Club remained Earthbound . . . or ripped space into tiny pieces, scattering our atoms to the wind . . . not that that seemed likely. A true waste either way.

\* \* \*

We arrived at the Sub Club together. Selena put down a box she'd brought, and we hugged Jacqueline, which felt awkward. We weren't really huggers.

Jacqueline said, "Kansas City makes Wichita look like paradise. Mom took away my cell phone as soon as we got there, because I kept checking it while we were supposed to be visiting my aunt. They spent the entire visit talking about diets and how thick their ankles were getting. Where's the Drive?"

"In the Club. Everything's ready except the control board."

Selena opened the box. She'd made a bigger board, and it sported several sliding switches next to the video game joystick. "These are power intensity," she said. "I tried to do too much with the first version. The joystick only controls direction now." She brought out a second, smaller board with a screen that looked like it came from an e-reader. "This is a mass proximity detector so we don't have to navigate visually when we land. It piggybacks on the distortion. Kind of a natural implication of Jacqueline's math."

Jacqueline nodded.

I checked the sky: cloudless and clean. The Club waited, as ready as a ship could be. "Let's plug her in and see how she flies."

We looked at each other. Jacqueline wiped a strand of hair from in front of her eyes. I didn't remember a time when we didn't know each other. She nodded. Selena smiled the way she always did when she'd finished a project.

I climbed in last after unmooring the Club, pulling the hatch closed behind me.

Sun through the ports provided plenty of light. Jacqueline took her usual spot. She hung a stopwatch around her neck and opened a notebook. Selena sat cross-legged next to the oxygen scrubber. The Distortion Drive rested in my usual station. Selena had already attached the new controls. I braced myself against the wall to avoid putting my foot on it as I lowered myself in.

"What next?" I said.

Jacqueline said, "Selena and I have been talking, but we weren't sure how you'd feel about it."

I held my breath. What could they say now that would be worse than the news they'd already dumped on me? Jacqueline did the math. Her formulas were why we were here. Selena assembled the Distortion Drive. She'd turned Jacqueline's numbers into reality. They'd done all the work. Maybe they'd tell me I wasn't needed. Sit still, they'd say. Don't touch anything.

"It seems obvious to me now," said Selena.

"I hadn't thought about it until Selena brought it up," said Jacqueline, "but there's really no other choice."

"None," said Selena.

I bit my lip. "What are you guys talking about?"

Neither said anything, waiting for the other to speak.

Finally, Jacqueline said, "I can't drive."

Selena added, "Me neither."

Jacqueline leaned forward and toggled a switch on the Distortion Drive. The vacuum tubes flickered before settling into a soft glow. Deep inside the device, a soft buzz arose. The control board lit up. I could see that Selena had labeled the sliding switches, "Slow," "Faster," and "Really Fast."

Jacqueline said, "Would you be our pilot, Minerva?"

"Yeah," said Selena. "We'd be proud if you took us to the Moon, Captain."

I took a deep breath, a shaky one. "Watch through the ports and tell me what you see." I pushed

the first sliding switch part way up. Jacqueline started her stopwatch. Nothing else happened. No lurch like we'd felt in the crane booth. I pushed it a little harder.

Selena gasped, "I think we're going fast enough."

Really, I felt nothing, but when I craned my neck to peer out the port, the quarry had dwindled to the size of a postage stamp. Circles of sunlight crept along the Club's walls, which must have been rotating slowly.

Jacqueline studied a notebook, then checked the stopwatch. "We should clear the atmosphere in a few minutes. Faster than I thought the Club could handle, but we're dragging air with us. No aerodynamic friction."

I scooted close to the port. Selena joined me. The quarry disappeared, absorbed into a broadening landscape of grid marks that must have been roads and farms, and then those faded from view. The sky grew dark out the side ports.

"Look," Selena said in awe, "the Earth's curve."

I kept staring down. "That's North America," which seemed a stupid thing to say, but the shape I'd been studying for weeks revealed itself below in all its reality. "That's Maine," I said, pointing. Then I named all the states on the eastern seaboard, the ones I never identified correctly on the tests. I knew all of them without their boundaries. I knew the rivers, and I bet if it had been night time, I could name the brighter flickers of light, from Chicago to New York, from Washington D.C. to Atlanta. Every map I'd ever looked at looked right back at me, not abstract at all. The globe became an actual place.

The test tomorrow would be a cinch. I wouldn't have to be in the ninth grade forever.

Which would be a great place to end the story. I mean, going to the Moon was awesome and all. We took a bunch of pictures. It took a few tries to get the hang of the steering, but I'm pretty good at driving. I really am.

No, the best part, the one that made it worthwhile, happened after we landed back at the quarry, a perfect touchdown late in the evening, I might add, right on the cradle I'd built for the Club.

What a way for us to end the summer. When Jacqueline and Selena moved away, we'd have this adventure to hold us together. You can forget someone you hung out with when you were growing up, just like you can't name everybody in your kindergarten class picture, but you can never forget your two best friends who went to the Moon with you. That's not a connection you lose.

I thought that as the Sub Club creaked around us, warming from its time in outer space. I wanted to laugh. I couldn't wait for tomorrow.

The best part happened when Jacqueline scribbled a bunch of figures into her notebook. "I just realized," she said, "that the same numbers I've used to distort space could be used for other purposes."

"Like what?" I said.

"Teleportation," she said. "In theory."

"Oh?" said Selena. "You mean instant travel?"

Jacqueline said, "Press a button, and a person could jump from one place to another. No time involved."

"Like from Kansas to Virginia?" I said.

"Or Texas?" said Selena.

"Well, sure," said Jacqueline, "if I had somebody who could turn these equations into a working device."

Selena said, "And if that person knew somebody who could find the parts."

I looked out the port at the junkyard, where the klieg lights cast stark shadows and reflected from crumpled chrome and broken glass in the yard beyond, as piercing as the stars we'd so recently been among. "Give me a shopping list."

Jacqueline said, as if she just grasped it, "We've been to the Moon! We're legends. Engineering legends. Just nobody knows yet."

"No," I said. "We're better than that."

"Indeed," Selena added.

I took a deep breath, braced myself, and opened the hatch. Outside, the frogs chorused as they

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always did. I spotted one of the ceramic owls, its eyes like tiny spotlights. Me and my two best friends sat together in a device of our own making.

“We’re Minerva Girls.”