

What's possible?

Imagining the future of radio.

Technology is always changing. Some of the strange or exciting devices on these cards use radio waves in ways that are possible now. Many are just on the horizon. While every technology example on the cards might not be realistic now, imagination can fuel the work of scientists, engineers, artists, and advocates to change the future. Your ideas today could be the technology of tomorrow.

COMING SOON



Based on current technology, and could be here in the near future.

FAR FUTURE



This technology has some connections to ongoing research, but might take longer to arrive.

SCIENCE FICTION



Connected to real ideas, but way beyond current science.

You Design the Future

If you led a design team, how could wireless technologies like Wi-Fi, Bluetooth, or satellite communications be used in something new?

What would it do? Who would use your invention? What systems would it connect to for power and communications?

If your invention was in a sci-fi movie set 100 years in the future, how would it be used?



You Design the Future!

Imagine a new invention that uses radio waves.

NAME OF YOUR INVENTION:

TECHNOLOGY

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Juicy Questions

Technologies are not always helpful. Technologies can impact different people in different ways—a new device or service that you appreciate could have unintended consequences for someone else. When thinking about the cards, consider:

Who would most value or benefit from this technology and who might be harmed?

What kind of data about you does this technology collect and share with others?

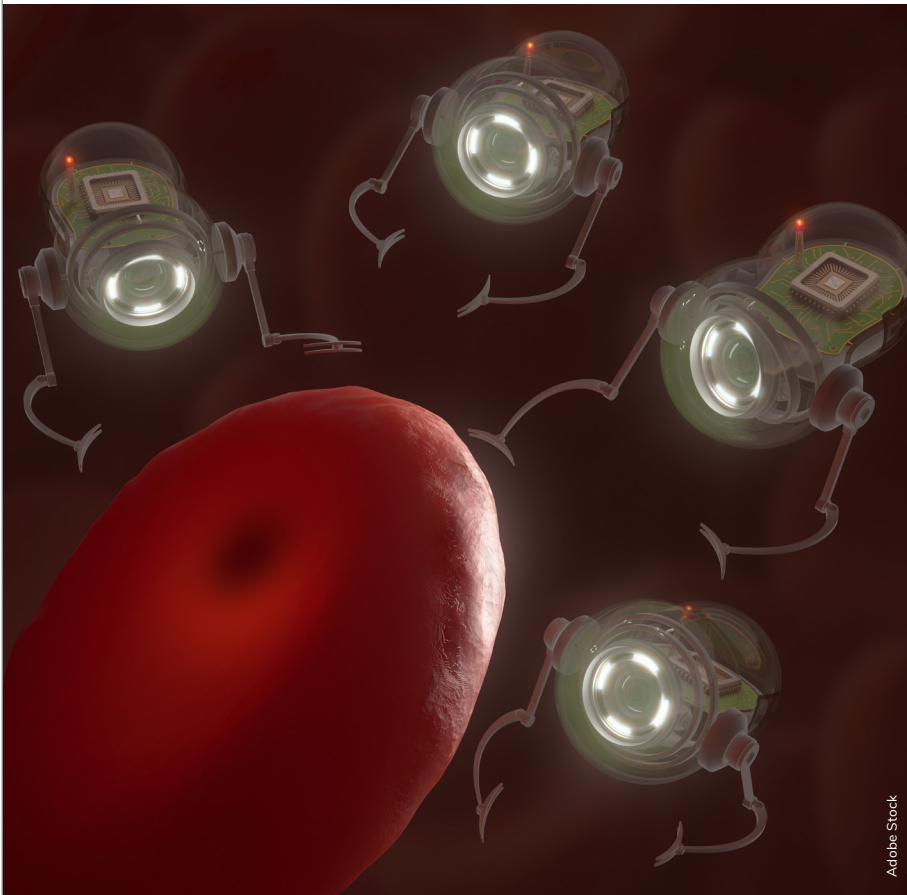
How would this technology change our relationships to family, friends, and others in our community?

What would it take to manufacture, operate, and eventually dispose of this technology?

How do you think this technology would interact with our bodies and the environment?

Bloodstream Biosensors

Microscopic sensors that move through your body.



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TECHNOLOGY

FAR FUTURE >>>

Network Stickers

Peel-n-stick networks that can connect device-to-device or to each other to cover wide areas.



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TECHNOLOGY

FAR FUTURE >>>



Network Stickers

Peel-n-stick networks that can connect device-to-device or to each other to cover wide areas.

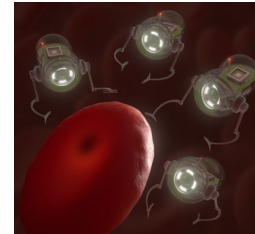
Attach this solar-powered sticker anywhere to create an open access Wi-Fi network that allows wireless devices to share files, play games, or broadcast video and music.

These hyperlocal networks might also help people maintain communications when disasters disrupt larger infrastructure or build community networks outside corporate or government control.

QUESTIONS TO CONSIDER:

Would you use devices for free if ads were included?

What if people used your network for criminal activity?



Bloodstream Biosensors

Microscopic sensors that move through your body.

These free-flowing sensors make it easy to monitor your health—from blood sugar to heart rate to viruses or chemicals—without bulky readouts and wires.

Biodata can be sent to a user's computer and to a doctor or analysis center. It can also be used to control devices like insulin pumps or implantable defibrillators. GPS data also makes it possible to know where a user is, should they require help.

QUESTIONS TO CONSIDER:

Would you accept free sensors if the manufacturer sold your biodata for profit?

What if you could continuously share your biodata with a health provider for a lower insurance rate?

Color-Changing Thread

Clothes harvest energy from radio waves to slowly change color and pattern.



unsplash.com / Tommy Van Kessel

TECHNOLOGY

COMING SOON >>>

Biodegradable Remote Sensor

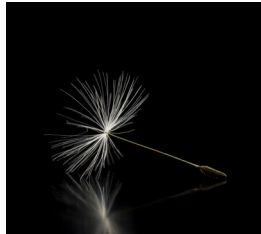
These sensors can monitor ecosystems nearby or far away—even undersea.



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TECHNOLOGY

FAR FUTURE >>>



Biodegradable Remote Sensor

These sensors can monitor ecosystems nearby or far away—even undersea.

Made of thin, flexible biopolymers, the sensors are biodegradable and share data with a large network of receivers for worldwide coverage.

These sensors can help monitor coral reefs, rainforests, or farm fields. Scientists and members of the public can use them to track real-time levels of chemicals in the air, water, soil, and plant life.

QUESTIONS TO CONSIDER:

What would be required to build a widespread network of receivers across a rainforest or ocean?

Who would pay for this construction, and how would that change how the environmental data may be used?



Color-Changing Thread

Clothes harvest energy from radio waves to slowly change color and pattern.

This clothing changes color as it interacts with low-power radio waves around you, slowly cycling through colors as you walk around town.

Conductive threads absorb the energy emitted from radio communication devices. The more radio waves you encounter, the more energy absorbed—and the faster the colors can cycle.

QUESTIONS TO CONSIDER:

Would you still use this wearable technology if it caused minor disruptions in cell phone signals?

What if energy harvested from radio waves could be used to replace natural processes like photosynthesis?

Radio Wave Shield

Block the radio waves that carry data in and out of your home or business.



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TECHNOLOGY

SCIENCE FICTION >>>

Drone Flock

These camera drones talk with each other to track whatever they are recording.



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TECHNOLOGY

COMING SOON >>>



Drone Flock

These camera drones talk with each other to track whatever they are recording.

Getting the perfect shot takes some practice, but this new fleet of networked drones can help. Multiple drones talk to each other to create amazing panoramas, record people walking and talking, or capture simultaneous activities in different areas of a city.

If the drones could also locate specific radio transmitters like a cell phone, they may even be able to locate lost people in the woods or other remote areas.

QUESTIONS TO CONSIDER:

What if a drone flock could be commanded to follow and record a single person?



Radio Wave Shield

Block the radio waves that carry data in and out of your home or business.

We expect privacy and safety in our homes: we lock doors and pull curtains to keep people from looking in. But what about the invisible activity of our wireless devices that could be intercepted?

Radio wave shields can block certain electromagnetic radiation, allowing users to better control the data flowing around them on radio waves.

QUESTIONS TO CONSIDER:

If the radio wave shield was a giant plastic bubble, would you use it around your home to protect your privacy?

What if wave shields could be used to block communication someone didn't like, like live streaming from a protest?

Just-In-Time Transit System

Sensors and communication technologies connect self-driving cars and scooters to users for efficient travel within a city.



TECHNOLOGY

COMING SOON >>>

Buy Everywhere

Grab-and-go micro-stores wherever, whenever you need them.



TECHNOLOGY

COMING SOON >>>



Buy Everywhere

Grab-and-go micro-stores wherever, whenever you need them.

Non-staffed micro-stores are spread across the landscape. Grab what you need: drinks and snacks at the beach; sports equipment and poop bags at the park.

Radio identifiers in your phone, and the items purchased, access your payment service of choice, and automatically charge your purchases.

QUESTIONS TO CONSIDER:

Would you have a radio identifier implanted under your skin so you can purchase something without a phone?

If all transactions were contactless, no cashier would know what you bought, but who would?



Just-In-Time Transit System

Sensors and communication technologies connect self-driving cars and scooters to users for efficient travel within a city.

A self-driving network of cars and electric scooters communicate with each other using radio waves and automatically move to areas of high demand.

Free to use, people gain access to available cars and scooters by swiping their phones. Cell phone tracking is used to predict demand and optimize routes based on your previous trips.

QUESTIONS TO CONSIDER:

What if a just-in-time transit system could only work if people gave up their personal cars?

Would you be OK with a transit system knowing where you go?

Next-Gen GPS Satellites

New GPS better pinpoints users, devices, and services.



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TECHNOLOGY

COMING SOON >>>

Mind-Reader Headphones

Radio waves “read” your brain to tailor a playlist of music and news.



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TECHNOLOGY

SCIENCE FICTION >>>



Mind-Reader Headphones

Radio waves “read” your brain to tailor a playlist of music and news.

Creating the perfect playlist can be difficult. These headphones use a special type of radio wave—and hundreds of tiny receivers—to “read” how you feel and maybe even what you’re thinking about. When this data is uploaded to a music provider, the headphones are able to predict music and podcasts to fit your mood.

QUESTIONS TO CONSIDER:

What if devices around you changed their behavior based on your mood?

Would these adaptations be worth sharing your private feelings with others?



Next-Gen GPS Satellites

New GPS better pinpoints users, devices, and services.

The Global Positioning System (GPS) is a helpful tool when you are traveling to a new place, but what if it could help a food vendor find your seat during a sporting event, let you locate your friend in a crowd at a music festival, or direct you to the specific stall for a deal on peaches at a farmer’s market?

New GPS satellites with stronger transmission power will make location finding more reliable.

QUESTIONS TO CONSIDER:

What if GPS trackers were as small as a grain of sand and could be hidden in your clothes or jewelry?

Would you attach this tracker to something or someone?

Self-Tracking Packaging

Packages that are “aware” of where they are and if they are lost.



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TECHNOLOGY

SCIENCE FICTION >>>

Remote Dance Partner

Sync up your new dance moves with a friend across the world.



Adobe Stock

TECHNOLOGY

COMING SOON >>>



Remote Dance Partner

Sync up your new dance moves with a friend across the world.

Slap on some sensors and get down with the latest in broadband cellular communications. Transmit all the moves from your arms and legs in almost real-time when you and your friend wear tiny matching sensors.

When you move, the corresponding sensors will vibrate on your friend, giving them immediate feedback. Use an app to sync music and video recording to create the latest dance craze on social media.

QUESTIONS TO CONSIDER:

What if doctors could operate through the internet and never touch the patient by using robots that transmit information through gesture and touch?



Self-Tracking Packaging

Packages that are "aware" of where they are and if they are lost.

Companies can place your online order in these lightweight reusable boxes equipped with radio transmitters and receivers. With a high-speed Wi-Fi network over warehouses, ships, trains, planes, delivery trucks, and neighborhood centers, your package delivery can be continuously tracked on its way to you.

Customers and companies can tell exactly where a package is at all times, and a small light and alert sound will indicate trouble if it is sent to the wrong city or stolen from your porch.

QUESTIONS TO CONSIDER:

What if you could tag all your favorite possessions with trackers so they will never be lost?

How many would you need? Could this be used to track waste?

You!

DESCRIBE YOURSELF:

Think about you, your friends, and family.

What do you like to do?

How do radio technologies help you? When do they create harm or challenges?

PEOPLE

Teacher

NAME: Chase (he/him)

AGE: 39

HOUSEHOLD INCOME: \$\$\$\$

TECHNOLOGY: smartphone, Chromebook

Established teacher who loves working with kids



PEOPLE

PEOPLE



Teacher

Chase, Age 39

Chase has been teaching high school science for the past seven years in rural Kentucky, where he grew up.

To make extra money to buy supplies for his students, he picks up shifts as a test-prep tutor on the weekends.

HOPE FOR THE FUTURE:

Chase hopes new industries will come to the Appalachians that will encourage people to move there.

PEOPLE



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You!

Think about you, your friends, and family.

What do you like to do?

How do radio technologies help you? When do they create harm or challenges?

HOPE FOR THE FUTURE:

What is one thing you hope for in the future?

Rideshare & Delivery Driver

NAME: Sienna (she/her)

AGE: 27

HOUSEHOLD INCOME: \$\$\$\$

TECHNOLOGY: smartphone

New arrival to the US supporting her family



PEOPLE

Artist

NAME: Alex (she/her)

AGE: 9

HOUSEHOLD INCOME: \$\$\$\$

TECHNOLOGY: iPad, Chromebook

Young artist just starting out



PEOPLE

PEOPLE



Artist

Alex, Age 9

Alex recently moved to the suburbs outside of Chicago with her dad, twin sister, and their dog.

She loves to do art. Painting and drawing on her iPad are her favorite ways to make new art.

HOPE FOR THE FUTURE:

Make a lot of friends at her new school.

PEOPLE



Rideshare & Delivery Driver

Sienna, Age 27

Sienna immigrated to a US city with her family three years ago.

To make money, she drives for rideshare and food delivery apps, switching between apps to try and make as much as possible.

HOPES FOR THE FUTURE:

Sienna hopes to work less and spend more time with family.

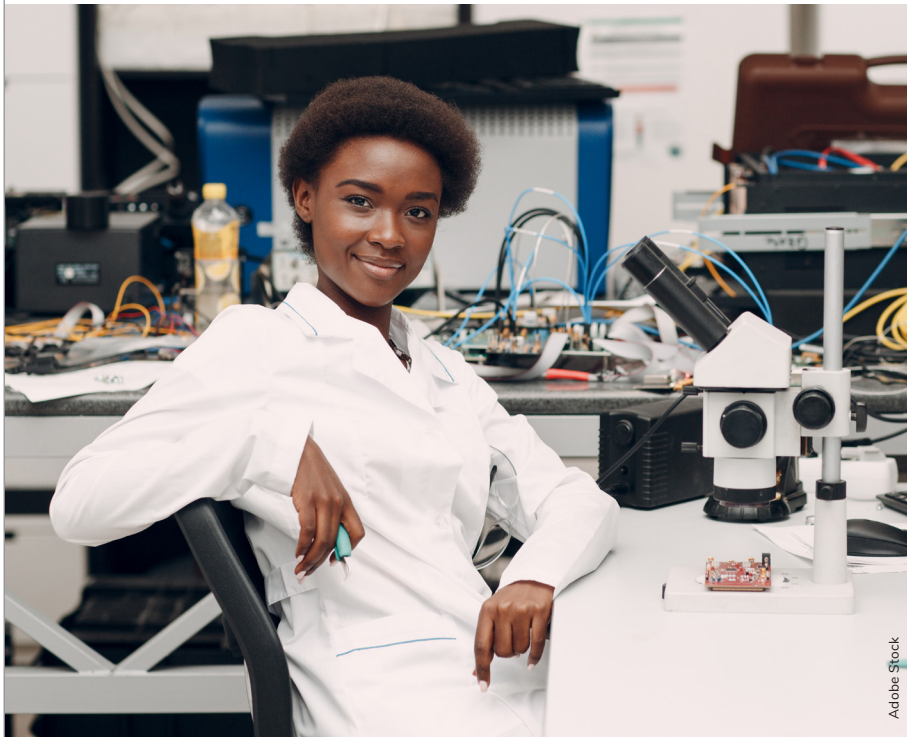
Medical Technology Engineer

NAME: Maira (she/her)

AGE: 29

HOUSEHOLD INCOME: \$\$\$\$

TECHNOLOGY: radio, laptop, desktop computer, cell phone
Entrepreneurial, wants to start her own company



PEOPLE

Environmental Activist

NAME: Luis (he/him)

AGE: 37

HOUSEHOLD INCOME: \$\$\$\$

TECHNOLOGY: smart home devices, Facebook-sponsored Wi-Fi network, computer, high-speed internet, scientific instruments

Travels internationally



PEOPLE

PEOPLE



Environmental Activist

Luis, Age 37

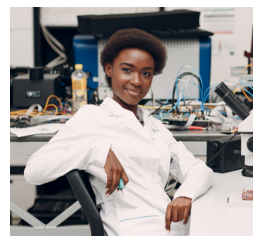
Born and raised in the Ecuadorian rainforest, Luis cares deeply about the health of the environment, but the forests he belongs to are threatened by deforestation as well as temperature and climate changes.

Luis works with partners from around the world to learn more about ecosystems.

HOPES FOR THE FUTURE:

Bring together scientific data and knowledge of people in his region to care for nature everywhere.

PEOPLE



Medical Technology Engineer

Maria, Age 29

Maria grew up with a medical condition that required her to go to the doctor's office weekly for checkups.

She now works for a company researching new uses for wireless technologies and hopes to start her own company that creates ways to more easily monitor medical conditions.

HOPE FOR THE FUTURE:

People only go to a hospital in emergencies (which there will be fewer of), not for routine monitoring or testing.

Olympic Hopeful

NAME: Lydia (she/her)

AGE: 14

HOUSEHOLD INCOME: \$\$\$\$

TECHNOLOGY: mobile device, computer, high-tech performance analytics

Determined paraplegic athlete competing at international level



PEOPLE

Underground DJ

NAME: DJ Wavy (they/them)

AGE: 16

HOUSEHOLD INCOME: \$\$\$\$

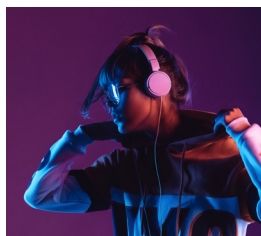
TECHNOLOGY: latest smartphone, MacBook, high-speed Wi-Fi, 5G

High school junior and member of art collective



PEOPLE

PEOPLE



Underground DJ

DJ Wavy, Age 16

DJ Wavy started out making beats and posting them on SoundCloud while they were in middle school.

They joined a street art collective of musicians, muralists, and graffiti artists. They throw their own parties, sometimes in abandoned warehouses and lots, and stream shows online.

HOPE FOR THE FUTURE:

Collaborate with artists from around the world and even throw their own music festival.

PEOPLE



Olympic Hopeful

Lydia, Age 14

Lydia is a world-class athlete. She was born with congenital limb differences resulting in the use of a wheelchair.

Lydia didn't always feel so comfortable about her body, but now embraces all that she is capable of and competing is a point of pride.

HOPES FOR THE FUTURE:

- 1) Win medal—Lydia knows she needs to get the most out of training and technology.
- 2) A world with no limitations.

Caregiver

NAME: Junior (he/him)

AGE: 42

HOUSEHOLD INCOME: \$\$\$\$

TECHNOLOGY: prepaid smartphone

Father of two children, aged 2 and 8



PEOPLE

Hacker

NAME: Ingrid (she/her)

AGE: 63

HOUSEHOLD INCOME: \$\$\$\$

TECHNOLOGY: multiple laptops, personal server,
power backups

Former electrical engineer and social worker



PEOPLE

PEOPLE



Hacker

Ingrid, Age 63

Ingrid worked as an electrical engineer, then social worker, then learned to program when she wanted to access data from the personal and medical devices she and her family used.

She publishes how-to guides to help people hack the devices they own and take control of their personal data and limit what is sent to manufacturers.

HOPE FOR THE FUTURE:

A world in which her grandkids can be whatever they want to be.

PEOPLE



Caregiver

Junior, Age 42

Junior lives in South Africa with his two children. He likes to video chat with his wife, who works abroad, as well as with family members who live across the country.

While his kids sleep, he likes to learn new languages and has been working as a document translator for people in his area.

HOPES FOR THE FUTURE:

Stay more connected and care for his family around the country and world.

Social Media Influencer

NAME: Roza (she/her)

AGE: 18

HOUSEHOLD INCOME: \$\$\$\$

TECHNOLOGY: iPhone, laptop

Uses YouTube to meet people, make money,
and publicize issues important to her



PEOPLE

Child of Alzheimer's Patient

NAME: Lonnie (she/her)

AGE: 50

HOUSEHOLD INCOME: \$\$\$\$

TECHNOLOGY: laptop, smartphone

Pays for home care for her aging father



PEOPLE

PEOPLE



Child of Alzheimer's Patient

Lonny, Age 50

Lonnie is a lawyer in North Carolina. She uses her father's medical insurance to pay a portion of his care.

Lonnie's father was lost for several hours in the neighborhood and the insurance company informed her that the cost of care will increase unless she can better monitor her father's whereabouts and safety.

HOPE FOR THE FUTURE:

Find a solution that lets her father stay active and feel independent.

PEOPLE



Social Media Influencer

Roza, Age 18

Roza studied English at school in the far east of Russia and wanted to become a translator—until she discovered fame creating YouTube content about Russia and clothing trends.

Roza could make more money—for herself and her family—if she signed up as an exclusive creator and shared data about her purchases and day-to-day life.

HOPES FOR THE FUTURE:

Buy state-of-the-art camera technology to create content more easily and more often.

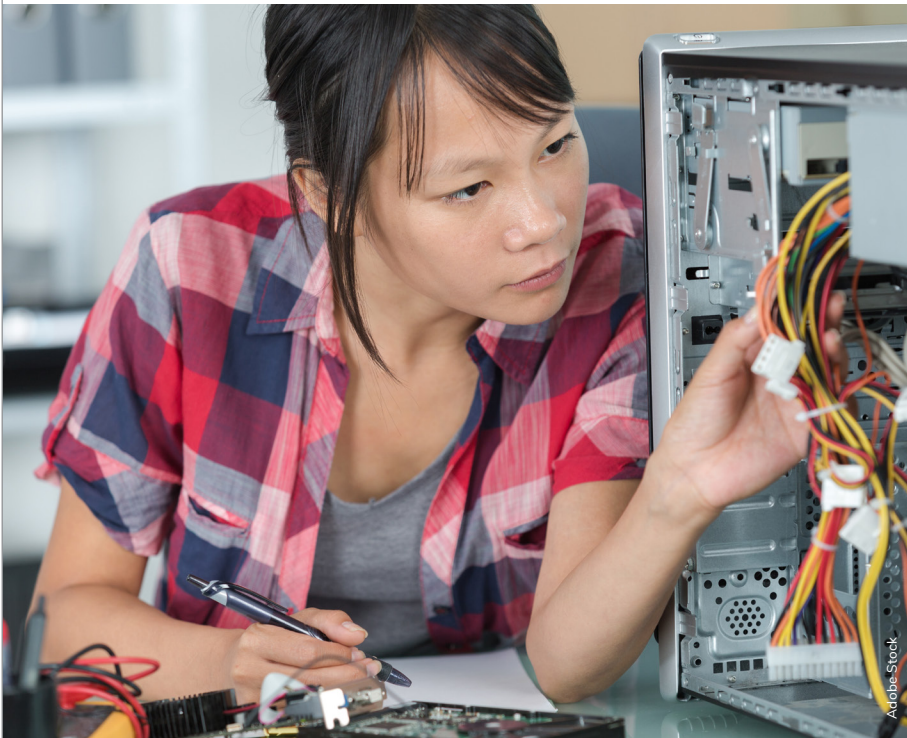
Repair Technician & Elecatrician

NAME: Mika (she/her)

AGE: 28

HOUSEHOLD INCOME: \$\$\$\$

TECHNOLOGY: ham radio, drones, multiple phones, computer
Self-employed electrician and device repair technician



PEOPLE

Volunteer Firefighter

NAME: Nat (they/them)

AGE: 26

HOUSEHOLD INCOME: \$\$\$\$

TECHNOLOGY: handheld radio, pager, smartphone with emergency alert app

Employed as an electrician, serves as chief for the local volunteer fire department and ski patrol



PEOPLE

PEOPLE



Volunteer Firefighter

Nat, Age 26

Nat grew up and learned to be an electrician in Arizona, but moved to a small town in Idaho because they enjoy the mountains.

Nat is worried that communications will become cost-prohibitive in their area, where mountains make it difficult to send and receive radio messages. They're also concerned about possible negative effects on people and the environment from all the different wavelengths.

HOPES FOR THE FUTURE:

Keep being able to safely do the things they and their neighbors enjoy.

PEOPLE



Repair Technician & Electrician

Mika, Age 28

Mika works out of her house, repairing phones and computers and doing home electrical work. She also loves taking apart and tinkering with old technologies.

When Hurricane Maria damaged communications across her country, Mika used her knowledge of old ham radios to connect everyone, from households to hospitals.

HOPE FOR THE FUTURE:

Rebuild her community back stronger than ever, with opportunity for social and economic connection.