Telecommunications Equipment Installers/Repairers

Snapshot

Career Cluster(s): Arts, A/V Technology & Communications; Architecture & Construction; Business Management & Administration; Information Technology; Human Services; Manufacturing; Science, Technology, Engineering & Mathematics

Interests: Technology; installation; telecommunications; consumer services

Earnings (Yearly Average): $57,910

Employment & Outlook: Decline Expected

OVERVIEW

Sphere of Work

Telecommunications equipment installers and repairers, also known as telecom technicians, set up and maintain devices or equipment that carry communications signals, such as telephone lines and Internet routers. Technicians may work for a telecommunications organization, small business, or own their own installation and repair company. This sphere of

A technician working and checking if all servers are up and running. Photo via iStock.com/PeopleImages. [Used under license.]

work is also related to individuals who set up advanced systems such as smart-home networks.

Work Environment

Telecom technicians often work in the field, physically installing and setting up the equipment in peoples' homes and businesses, which requires dexterity and physical strength. Others work in a central office. Most telecom technicians work full-time. Some businesses offer 24-hour repair services. Telecom technicians in these companies work shifts, including evenings, holidays, and weekends. Some are on call around the clock in case of emergencies.

Occupation Interest

Individuals attracted to telecommunications have an interest in technology and customer service. They strive to provide the latest devices and connections to individuals, whether for home or business use, and to troubleshoot and fix components that are not working. As such, they are constantly keeping up with the latest advances in technology, such as smart-home systems. They must also be customer-oriented and courteous since much of the work takes place in peoples' homes or businesses. Technicians may choose to open their own company, relying on advertising, word-of-mouth, and contracts to generate business.

A Day in the Life—Duties and Responsibilities

The specific tasks of telecom technicians vary with their specialization and where they work.

Central office technicians set up and maintain switches, routers, fiber-optic cables, and other equipment at switching hubs,

Profile

Interests: Data, Things, People
Working Conditions: Both Inside and Outside
Physical Strength: Medium Work, Heavy Work
Education Needs: Certificate, Associate Degree, On-the-Job Training
Licensure/Certification: Not Required
Opportunities for Experience: On-the-Job Training, Apprenticeship
Interest Score: RIC

Duties and Responsibilities

- Installing communications equipment in offices, private homes, and buildings that are under construction
- Setting up, rearranging, and replacing routing and dialing equipment
- Inspecting and servicing equipment, wiring, and phone jacks
- Repairing or replacing faulty, damaged, and malfunctioning equipment
- Testing repaired, newly installed, and updated equipment to ensure that it works properly
- Adjusting or calibrating equipment to improve its performance
- Keeping records of maintenance, repairs, and installations
- Demonstrating and explaining the use of equipment to customers

called central offices. These hubs send, process, and amplify data from thousands of telephone, Internet, and cable connections. Telecom technicians receive alerts about equipment malfunctions from automonitoring switches and are able to correct the problems remotely.

Headend technicians perform work similar to that of central office technicians but work at distribution centers for cable and television companies. Headend technicians monitor signals for local cable networks through headend control centers.

Home installers and repairers—sometimes known as station installers and repairers—set up and repair telecommunications equipment in customers' homes and businesses. For example, they set up modems to install telephone, Internet, and cable television services. When customers have problems, home installers and repairers test the customer's lines to determine if the problem is inside the building or outside. If the problem is inside, they try to repair it. If the problem is outside, they refer the problem to line repairers.

Telecommunications equipment installers and repairers who work at a client's location must track hours worked, parts used, and costs incurred. Workers who set up and maintain lines outdoors are classified as line installers and repairers.

Technicians may also be required to attend classes and training sessions on an ongoing basis in order to stay apprised of the latest technology and installation techniques and requirements.

Technicians who own their own company must also be well-versed in how to run a business, especially if employing others.

WORK ENVIRONMENT

Immediate Physical Environment

Some telecom technicians provide in-home installation and repair services, while others work in central offices or electronic service centers. Equipment installation may require climbing onto rooftops and into attics and climbing ladders and telephone poles. Telecom technicians occasionally work in cramped, awkward positions, in which they stoop, crouch, crawl, or reach high to do their work. Sometimes they must lift or move heavy equipment and parts. They also may work on equipment while it is powered, so they need to take necessary precautions.

The work of telecom technicians can be dangerous. Telecommunications equipment installers and repairers have one of the highest rates of injuries and illnesses of all occupations. Common injuries include falls and strains. To reduce risk of injury, workers wear hard hats and harnesses when working on ladders or on elevated equipment. To prevent electrical shocks, technicians may lock off power to equipment that is under repair.

Human Environment

Telecom technicians may conduct on-site visits by themselves, or with a small team of co-workers, depending on the size of the job. In many cases, they must be prepared to deal with clients face-to-face, and often in their private dwellings, requiring courteous behavior and attentiveness. If installing new equipment or services, the technician may need to teach the client how to operate it. If conducting installation or repair at a business during open hours, they may also have to work around customers of that business. Technicians who own their own businesses are also responsible for staffing and financial matters.

Technological Environment

These workers use many different tools to inspect equipment and diagnose problems. For instance, to locate distortions in signals, they may employ spectrum analyzers and polarity probes. They also commonly use hand tools, including screwdrivers and pliers, to take equipment apart and repair it.

Many telecom technicians work with computers, specialized hardware, and other diagnostic equipment. They follow manufacturers' instructions or technical manuals to install or update software and programs on devices. They must keep pace with emerging technologies in order to provide clients with the latest systems they want, including advanced surveillance and wireless systems.

Technicians who own their own business should be familiar with standard word processing, recordkeeping, and accounting software.

EDUCATION, TRAINING, AND ADVANCEMENT

High School/Secondary

High school students interested in a career in telecommunications should become familiar with the latest phone and Internet technology, as well as evolving systems such a smart-homes. This can be done outside of school on a hobby basis, and by reading and viewing online tutorials. In class students should focus on math and science, as well as English to enhance communication skills.

Suggested High School Subjects

- Advanced Math
- Algebra
- Biology
- Chemistry
- Construction Math
- Earth or Life or Physical Science
- Economics
- English
- Entrepreneurship
- Geometry
- History
- Personal Finance
- Physics
- Political Science
- Pre-Calculus
- Psychology
- Statistics
- Trigonometry

Transferable Skills and Abilities

Color Vision

- Telling apart color-coded wires

Customer-service Skills

- Being friendly and polite when in customers' homes and businesses
- Teaching people how to maintain and operate communications equipment

Dexterity

- Repairing small devices, connecting components, and using hand tools

Mechanical Skills

- Familiarity with devices installed and repaired, and with internal parts and appropriate tools
- Understanding manufacturers' instructions when installing or repairing equipment

Troubleshooting Skills

- Troubleshooting and devising solutions to problems that are not immediately apparent

Related Career Pathways/Majors

Arts, A/V Technology & Communications Career Cluster

- Telecommunications Pathway

Architecture & Construction Career Cluster

- Maintenance/Operations Pathway

Business Management & Administration Career Cluster

- General Management Pathway

Human Services Career Cluster

- Consumer Services Pathway

Information Technology Career Cluster

- Information Support & Services Pathway
- Network Systems Pathway

Manufacturing Career Cluster

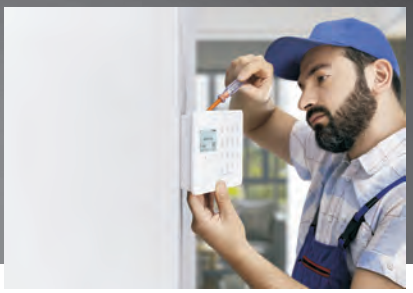
- Maintenance, Installation & Repair Pathway

Science, Technology, Engineering & Mathematics Career Cluster

- Engineering & Technology Pathway
- Science & Mathematics Pathway

Fast Fact

Most self-employed professionals work in construction and trades. That number is 19.6 percent, followed by 10.9 percent in retail, 10.7 percent in real estate, and 10.3 percent in consulting. Source: smallbizgenius.com



Installing a home security system. Photo via iStock.com/sefa ozel. [Used under license.]

Postsecondary

Telecom technicians typically need postsecondary education in electronics, telecommunications, or computer networking. Generally, postsecondary programs include classes such as data transmission systems, data communication, AC/DC electrical circuits, and computer programming. Most programs lead to a certificate or an associate degree in telecommunications or related subjects. Some employers prefer to hire candidates with an associate degree.

Related College Majors

- Computer Networking
- Electronics
- Telecommunications

Adult Job Seekers

Adults seeking a career in telecommunications have the best chance if they come from a related discipline or have previous experience with telecom components, electronics, or computer networking. They can enhance their skills through individual classes or pursue full certificates or degrees if desired.

Additional Requirements

Once hired, telecom technicians receive on-the-job training, typically lasting a few weeks to a few months. Training involves a combination of classroom instruction and hands-on work with an experienced technician. In these settings, workers learn the equipment's internal parts and the tools needed for repair. Technicians who have completed postsecondary education often require less on-the-job instruction than those who have not.

Some companies may send new employees to training sessions to learn about equipment, procedures, and technologies offered by equipment manufacturers or industry organizations.

Fast Fact

Women are no strangers to entrepreneurship: the number of women-owned business in the US has increased by 114 percent in the last 20 years. Women own four out of ten businesses.
Source: whattobecome.com

Women own four out of ten businesses. Photo via iStock.com/Ridofranz. [Used under license.]

Because technology in this field constantly changes, telecom technicians must continue learning about new equipment over the course of their careers.

EARNINGS AND ADVANCEMENT

Earnings depend on the nature of the technician's work, and whether he or she works for a large company, small business, or runs his/her own business. Median annual earnings of farmers and farm managers were $57,910 in 2019. The lowest 10 percent earned less than $33,090, and the highest 10 percent earned more than $85,620.

Telecommunications equipment installers and repairers may receive paid vacations, holidays, and sick days; life and health insurance; and retirement benefits. These are usually paid by the employer if the business is not self-owned.

EMPLOYMENT AND OUTLOOK

Telecom technicians held 215,700 jobs in 2019. Employment is expected to decline 3 percent through the year 2029, since consumers increasingly demand wireless and mobile services, which often require less installation, instead of landline-based services. This shift in demand means that telecommunications companies are expected to require fewer telecommunications equipment installers.

Some job opportunities should come from the need to replace workers who leave the occupation. Although job opportunities will vary by specialty, those with an associate degree and strong customer-service skills should have the best job prospects.

Technologies such as mobile video streaming and broadband Internet require high data transfer rates in telecommunications systems. Central office and headend technicians are likely to be needed to service and upgrade switches and routers to handle increased data usage, resulting in some job opportunities for them.

Related Occupations

- Broadcast/Sound Engineering Technician
- Electrical and Electronics Installer/Repairer
- Line Installer/Repairers

MORE INFORMATION

International Society Broadband Experts (ISBE)
140 Philips Road
Exton, PA 19341
610.363.6888
info@scte.org
www.scte.org

National Alliance for Communications Technology Education and Learning (NACTEL)
www.nactel.org

NCTA—The Internet & Television Association
25 Massachusetts Avenue NW, Suite 100
Washington, DC 20001
202.222.2300
info@ncta.com
www.ncta.com

Society of Cable Telecommunications Engineers (SCTE)
140 Philips Road
Exton, PA 19341
610.363.6888
info@scte.org
www.scte.org

Telecommunications Industry Association (TIA)
1310 North Courthouse Road, Suite 890
Arlington, VA 22201
703.907.7700
tiaonline.org

USTelecom
601 New Jersey Avenue NW, Suite 600
Washington, DC 20001
www.ustelecom.org

Stuart Paterson

Conversation With...

KEVIN MCCARTHY

Co-founder & President
X-Pert Communications, Inc., State College, PA
Electronics, 28 years

What was your individual career path in terms of education/training, entry-level job, or other significant opportunity?

I finished high school a year early because I was bored sitting at a desk in school. After I graduated, I didn't know what I wanted to do. My dad served in the US Navy, and he convinced me to talk to a Naval recruiter. The recruiter talked me into enlisting and going into the electronics division. I was always a gadget kind of guy, and it seemed interesting. As it turns out, they sent me to a Navy school for three years to become an electrical engineer. So, I was in school year-round, which was kind of ironic. But it was a mix of textbook and lab-based training, so I enjoyed it.

I spent eight years in the Navy—three in school, three onboard a ship, and two years at a naval air station, repairing radars and communication equipment. I loved it. I liked being in the Navy, in general, and I liked my job. I wasn't mentally ready for college, and I'm sure I would have dropped out if I tried to go.

After the Navy I worked for a company when high speed Internet was just coming to people's homes in the late 1990s. I worked with a good person, Christopher Gray. We had a lot in common—we were military veterans and had young kids—and we became good friends. But after a couple [of] years, we were laid off. We started working together doing side jobs on anything technology related. We discovered there was a real demand in our area for installing structured cabling in homes and businesses for better telecommunications connectivity. Structured cabling carries voice or data information from any device connected to the Internet. The cabling is designed to work for phones, computer networks, and other IP technology in use today and in the future. Think of the cables as a paved highway that carries traffic of a lot of different types of vehicles. The highways function as designed for cars and trucks that have been on the road for years, and they also function for new models of vehicles as those are released.

Chris and I started our technology and telecommunications company, X-Pert Communications, in 2002; he is vice president.

It took us two years to be able to hire an employee, and he's still with us. Those first two years were a struggle. One week we might do wiring, the next we might be cleaning gutters, anything to keep us going and build the business. Now, we have 22 employees.

We started out only installing structured cabling and soon branched out to include some of the advanced systems that were using the cabling. All of our work now is in commercial buildings.

We install surveillance systems, HVAC smart technology controls, card readers and facial recognition systems to control building access, and we do other specialty work for large commercial buildings. Everything is the latest technology, everything is IP-based. It all connects to your computer network. Specialty work has grown during the COVID-19 pandemic. We now install facial recognition for building access control and use thermal cameras to check people's temperatures before granting access to buildings. It works like this: you walk up to the door and look into the camera. It's set up to recognize if you have access to the building, then it takes your temperature. If you have a fever, it won't open the door for you. We have that installed in several factories.

Having a business partner with personality traits that are different from your own is beneficial. Not only do Chris and I have a solid friendship, we also trust each other and balance each other in business decisions. For example, I am cautious and methodical and benefit from Chris's eagerness and enthusiasm. A business partnership is similar to a marriage; it lasts and works best when built upon friendship, trust, and loyalty.

When we started the business, we got a lot of help from a Pennsylvania incubator program geared toward people who were laid off. The program provided business classes and hours with lawyers and other professionals at no charge. It basically cost us nothing to incorporate and get a set of books set up. We're also certified as a Veteran Owned Small Business, which has its advantages. The federal government requires a percentage of veteran participation in some of its contracts. There's not much federal work in our area, but Pennsylvania has a similar program, and we get a lot of work that way.

What are the most important skills and/or qualities for someone in your profession?
You have to be able to analyze data, solve problems, make decisions, and pay attention to details. You have to be a good listener to customers and to coworkers. You have to be trustworthy. We deal with a lot of sensitive information on people's computers and in their offices.

What do you wish you had known going into this profession?
I wish I'd known the importance of cash flow. We never worried about it until it became an issue. We learned some hard lessons. I wish I'd known more about managing employees. In the Navy I learned to lead people. Managing employees is different. In the navy it's about accomplishing a mission; with employees it's more about nurturing them.

Are there many job opportunities in your profession? In what specific areas?
There's definitely a shortage of qualified technicians. We have a hard time finding people who can program and troubleshoot advanced systems we install. There are technical schools that teach skills, and we do a lot of on-the-job training.

A lot of young people aren't getting into the construction industry. When we look for people to hire, we seem to be getting older people who are getting retrained. I'm hoping that as things get more technical, it may start to draw younger people. Our technicians' jobs involve working on a laptop in the field instead of swinging a hammer.

How do you see your profession changing in the next 5 years? How will technology impact that change, and what skills will be required?

The industry evolves quickly. We never know where it's going in the next few years, but we always try to adapt and go where the market takes us. The advanced systems side of our company will start to grow more, the surveillance systems, and wireless systems will become a bigger part of our business because they're starting to be required everywhere now. To work in this field, you'll need to keep your skills current as technology changes.

What do you enjoy most about your job? What do you enjoy least about your job?

I enjoy problem solving and troubleshooting. I love meeting new people, that my hours are flexible. There's always something new happening, and every day is different.

I don't like that I am always on call. On Christmas Day, I'm on call—even on vacation, no matter what. That's just part of the business.

There's also a certain amount of stress when you have employees. We get to know our workers and their families. I feel responsible for them and need to make sure our company has work so they keep their incomes. Work doesn't come to us. We have to look for it and bid it.

Can you suggest a valuable "try this" for students considering a career in your profession?

We've had, in the past, high school students work with us during the summers, as kind of a mini-internship where they are exposed to different aspects of the business. They get to see how we estimate, bid, and manage projects. We also have a big warehouse full of inventory that has to be maintained. Find a company like ours and ask to spend a couple of days, follow someone around to see what he or she does.

Conversation With...

JENNIFER MALLETT

Level Up Your Home/Level Up Automation
Northborough, MA
Home automation industry, 12 years; entrepreneur, 5 years

What was your individual career path in terms of education/training, entry-level job, or other significant opportunity?

My father started his own business when I was in high school, so I spent my summers working for his startup and got a taste of what being in a small business was like. I really loved the energy and the feel of the risk and what was on the line for his family. I picked up on that excitement. I went to Bentley University in Waltham, Massachusetts, with the intent of studying business, figured out I wanted to focus on marketing, and graduated with a BS in Marketing.

When I graduated, my dad set me up with twenty interviews, some informational, with his colleagues. That was one of the best things I did because it forced me to get out of a student role and interact with people in the workplace. I landed at Reebok International LLC as a marketing intern for their women's fitness group. I was there 18 months, had five different managers and was laid off twice. It was a public company, and I learned pretty quickly, "Wow, this isn't what I learned in college." I ended up at Bose Corporation, where I stayed for close to 15 years in a variety of roles. It was a fantastic experience.

The company's founder, Dr. Amar Bose, had a vision for the workplace: for people to reach their highest personal potential whatever their role. I traveled the country and ran a business unit for 7 years. However, I always wanted to start my own business. Six years ago, I started talking with Bose about outsourcing their US and Canadian home installation for audio business because they were looking to outsource, and I thought it would be a great way to roll into my new business. I left the company in order to negotiate that contract. I ended up not moving forward with it because, from a financial perspective, I was taking all the risk. We left it that I would be a Bose dealer, and they referred customers to me.

In the end, this allowed my business to broaden its reach to automation and smart and connected homes. I can be agnostic about brands we install and reach people that need help understanding home automation.

We want to be the go-to company for smart home automation in the United States and are working on franchising. We started by contracting with mom-and-pop installers, but 2 years in

I knew I wanted more control and a more branded experience including workers showing up in Level Up shirts and vans. It took about 2 years to find the right legal company to specialize in franchises, and we just started selling those in January. Our vision is 10 units by the end of this year and a goal of 150 units in 5 years.

We have one showroom in Massachusetts. The vision is for us to have micro-showrooms in different parts of the country.

COVID-19 has accelerated our business on the residential side. People have been investing in home improvement projects and that, along with the growth rate of connected products, is projected to double in 5 years. I do believe the numbers because past projections have come through. People are remodeling homes, bathrooms, looking to age in place. We've sold more audio and TV outdoor systems. The business side is growing more slowly during COVID because the workplace is currently different.

What are the most important skills and/or qualities for someone in your profession?

There's a lot of glamour around being an entrepreneur, but at the end of the day you have to have a lot of grit and resilience and the ability to pick yourself up and keep going where you need to go. Day to day is very stressful because not only are you creating your own income, you're responsible for other people's incomes.

You also have to be in a place where you're always evolving your business. If you stand flat-footed on success, it's not going to last very long.

What do you wish you had known going into this profession?

Even though I ran a business of similar size and scale at Bose, I wish I'd known that it would be entirely different running my own. I was very surprised when Bose rock stars came into this startup experience and were not a good fit at all.

Are there many job opportunities in your profession? In what specific areas?

Definitely. The term "smart home" was coined in the eighties but it's still early in this industry, and there's a tremendous need for people in the space. Part of our mission with our franchising program is to create the workforce of tradespeople to install and maintain smart systems. Think about plumbers and electricians. None of these people specialize in network-connected products. Smart thermostats have changed that to some degree in the HVAC industry, and there's certainly been more market penetration there and in plumbing. When our industry gets together to talk, we talk about how we are going to address what will be a huge labor shortage.

How do you see your profession changing in the next 5 years? How will technology impact that change, and what skills will be required?

The technology is moving at a lightning-fast pace right now. The things that are of real interest involve how to help people age in place. The technologies coming out, for example, include sensors that don't need to be worn and can be put throughout the house and can detect patterns, and whether someone has fallen. For example, say a person gets coffee at 8 a.m. but it's 10 o'clock, and they haven't moved. Someone can be notified. Those sensors also can check things like biometrics, and this also is very important for people aging in place. In addition, there are systems that control things like automated window shades, music, or security

so people can push a button and the home's doors lock and the security system goes on. This is going to become more mass market in the next 5 years. The workforce needs to be there.

What do you enjoy most about your job? What do you enjoy least about your job?
I love seeing where we're going to go next and trying to push the envelope of what's out there for us. Anything that's new, I love. It's super-energizing.

I don't like the day-to-day operations as much, such as an employee issue. Fortunately, after 5 years, I've found a great team member who can take a lot of that off my plate.

Can you suggest a valuable "try this" for students considering a career in your profession?
Get a connected product and work with it. Get hands-on and talk with people about it, what you learned, and share your experience and the benefits of that product.