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Dave Felice, editor

A Message from Our Director

Happy Fall to all. In Denver we are back to guiding tours. Please send us an email at telcomhist@aol.com to schedule a visit. The Denver Architectural Foundation has booked several.

Mike has been finding all sorts of mysterious artifacts in the back room; I have included pictures and hope you can help us. Jack has done a wonderful job of reorganizing and updating our library and it's amazing. Thanks to Jody and Jeff, we have a wonderful new database search tool that will make research easier.

The Seattle Museum is hosting our next board meeting and several of the Denver folks will be going to see all the wonderful accomplishments of the Seattle folks.

In this edition of Connections News, you'll find extensive information about the development of the AT&T Picturephone.

We want to thank those of you who contributed to our Challenge Grant fundraiser; we are very pleased with the result. You all are just the best!

Renee Lang, Managing Director



Do you know what this item is, or anything about how it was used?

In Memoriam

The Telecommunications History Group remembers two former board members and ardent advocates of historical preservation.



Mary Patricia Riffle, 82, of Denver passed away on November 18, 2022. Mary was retired from U S WEST and served on THG's board of directors from 1995-2012. Mary also served as our Executive Director during 2007.

Mary brought beauty, excellence, adventure, and class to everything she touched.

Mary Riffle joined Mountain Bell in 1979. She started her career working in the employee communications group in the Public Relations Department, along with THG founder Herb Hackenburg. When the successor company, U S WEST, dissolved Public Relations as a department, Mary continued in a similar role within the Network organization.

Kathryn (Kay) Lee Pride, 83, of Denver, passed away on April 8, 2023. After working as a freelance journalist, Kay joined the public relations team for the state operations of Mountain Bell, then the Denver-area phone company. She rose to the ranks of management there, despite the obstacles that she faced as a woman in the workforce.



Kay left U S WEST in 1989 to become the communications director for Jefferson County Schools, then became the public relations director for the Jefferson County Library system, where she spent the rest of her career.

Kay served on the THG board of directors from 2007- 2013. Kay was a very active, hands-on member of our team, always willing to roll up her sleeves and help with whatever needed doing.

Mary and Kay were dear friends. We miss these fine women very much.

Modern technology references ancient history

When people ask Alexa to do something, they may not realize they are making a reference to ancient culture, says a prominent author-historian. Simon Winchester says the name is taken from Alexandria, the ancient seaport established by Greece in northern Egypt.

Winchester calls the Great Library of Alexandria "a true wonder of the ancient world." Winchester writes: "Alexandria triggered a revolution (in knowledge). The device created more than 2,000 years later which allows someone to call forth information was called Alexa in honor of the Great Library." He says the name is powerfully symbolic of the development of libraries and the ability to share information.

Alexa is the voice command used to activate Amazon electronic devices.

Operating Picturephone on display at Connections Museum

Visitors and volunteers at the THG Connections Museum Seattle agree that a working demonstration of original AT&T Picturephones makes an amazingly compelling exhibit.

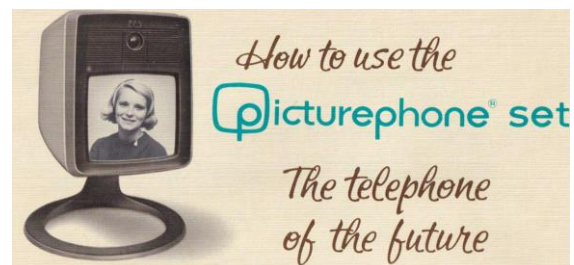
“It intrigues me that something so mundane can really elicit such a strong reaction,” says senior volunteer Sarah Autumn. “Seeing ourselves on a computer screen is just expected and unsurprising. But for some reason walking up to a Picturephone and seeing yourself projected on one screen here and on another over there has already become a visitor favorite.”



Recounting the full history of AT&T's Picturephone project might take an entire book. But as a brief recap, the idea of the video telephone is almost as old as the telephone itself. A cartoon drawing of an “electric camera obscura” on a wall sized screen appeared in Punch magazine in 1878. In 1927, an audience in New York watched an AT&T demonstration of Secretary of Commerce Herbert Hoover speaking in Washington. Bell Labs continued its research for the next three decades despite uncertainty about the commercial viability of video telephony.

In 1964 AT&T introduced Picturephone Model 1 at the New York World's Fair and at Disneyland in California, demonstrating the first ever transcontinental video telephone call. The company also set up a few Model 1 systems in booths in Grand Central terminal and in Chicago.

AT&T continued to refine the product, introducing Picturephone Mod II in 1970. Westinghouse became the largest customer with 12 sets. Cost of development is estimated at over \$500 million. Despite AT&T predictions of 100,000 systems by 1975, installations peaked at only 453. A 1975 brochure in the THG Connections Museum collection shows that a call from San Francisco to New York on the “Picturephone Meeting Network” cost \$6.50 per minute.



THG has several Picturephone devices from this era. The Model 1 is merely a display unit, which has illumination behind a transparent screen.



Four full production Mod II Picturephones with custom carrying cases came to the museum by way of the Pacific Northwest Bell group responsible for displays. Many artifacts were apparently donated to the museum by that group in the 1980s and 1990s. These Picturephones had likely not been exhibited for at least 20 years by the time they reached the museum. They were on static display because they did not work anymore and nobody tried to fix them.

Earlier this year, new volunteer Jay De Jaen joined the THG crew. Jay has experience repairing old television sets and making his own vacuum tubes from scratch. So he was enthusiastic about trying to make the Picturephones work again. Repairing these old devices was a complicated

challenge. Jay says he was surprised by how many special and custom-made parts and components were inside.

Unlike a black and white television set from the era, AT&T engineered the Picturephone Mod II to an extremely high standard of quality, with many parts for which no direct replacements are available today. Two of the museum's devices also bore evidence inside of earlier unsuccessful repair attempts.

One of the goals was to restore these historic machines to as close to their original condition as possible, but in a few cases Jay had no choice but to design and to build a replacement part from modern components. The original high voltage regulators for the picture tube for example were a highly specialized part with a limited lifetime.



AT&T wrote extensive documentation when these devices were made, and volunteers succeeded in tracking down the original descriptions. Having the original diagrams made it at least possible to tackle a restoration.

Over the past few months Jay has been working on this project on the table in the museum where visitors can see what he's doing and ask him questions. That in itself has been a delightful experience for many of them. And with slow persistence, one, then two and now

three of the Picturephones are fully working again, and the short transmission line connecting them was brought back to life too.

With two of these wonderful old devices working together again as they did in 1970, visitors are fascinated as they see themselves and their friends on the small black and white picture tubes.

Story and photographs by Connections Museum volunteers.

Small demand for Picturephone technology



With apps and services such as Skype and FaceTime, video telephone calls are now cheap, easy, and readily available over the internet on computers and smartphones. Yet, video telephony remains but a small sliver total calls. It seems clear that most people do not see a reason to, or do not want to, be routinely seen on telephone calls. Still, the new services are, in another sense, a final acceptance that one day all telephone calls would have video as well as audio. This long held vision was most famously expressed in AT&T's Picturephone, introduced as a futuristic demonstration at the 1964 New York World's Fair, and then commercially in Pittsburgh and Chicago in 1970,

only to be withdrawn as a commercial failure a few years later.

Bell Labs, AT&T's R&D division, held a well-publicized demonstration of its television research at its New York Headquarters in April 1927. The event featured a conversation between US Secretary of Commerce Herbert Hoover in Washington and AT&T President Walter Gifford in New York. Hoover's live moving image was seen, at 50 lines resolution, by both Gifford and the invited audience. A yearlong demonstration of two-way 50-line television, connecting AT&T New York headquarters and Bell Labs followed in 1930. But the electromechanical system used in these demonstrations proved a dead end.

A large screen video telephone system featured prominently in Fritz Lang's 1927 classic film *Metropolis* and Charlie Chaplin's 1936 classic film, *Modern Times*.

Bell Labs resumed video telephone research in 1956.

From this work came the April 1964 debut of the Picturephone as a major attraction at the AT&T Bell System pavilion at the New York World's Fair. Eight Picturephone booths allowed fair visitors to make their own video telephone calls. For the most part, selected visitors conversed with visitors in adjacent booths, though on occasion a booth would be connected to a similar booth at Disneyland in California. The exhibit was very popular. But when Bell Labs interviewed seven hundred visitors, only half thought that seeing the other person was important in a telephone conversation.

In a second 1964 trial, AT&T opened public Picturephone rooms in New York, Chicago, and Washington. Any two of these rooms could be rented at rates from \$16 to \$27 for the first three minutes. Just 71 calls were made in the next six months, and the number declined from there. While the rooms remained through 1970, no calls were made in the final year.

Despite these setbacks, AT&T pushed ahead, choosing to focus on the positive reactions from the World's Fair. Bell Labs designed an improved Picturephone set. Known as the Picturephone MOD II, it was a technological tour de force.

The new design had an innovative silicon photodiode array camera, a zoom lens, and some graphics capability. It had a 5.25 x 5 inch screen, well suited to show a single person, a full-motion black and white picture at 250 lines resolution, 30 interlaced frames per second, and the ability to alternatively focus on the speaker or on a document laid in front of the unit. The picture could be turned off, and set to show the caller's image back to him/herself. Sound was provided by a touch-tone speaker phone. The Picturephone required three pairs of twisted copper wires to operate: the first carried the audio as it would in a conventional telephone circuit, and the additional two pairs carried the video.

AT&T had been guided for over fifty years by a well understood corporate mission of achieving universal telephone service in the U.S., a mission that both the company and the Federal Communications Commission agreed had been accomplished as household penetration passed 90 percent in 1969. It seemed to many at Bell Labs and elsewhere at AT&T that universal video telephony was a worthwhile new mission, one that company officials believed could have as big an impact as the telephone itself.

Thus in its 1969 Annual Report, AT&T confidently predicted that "with perhaps one million sets in use, Picturephone service may be a billion dollar business by 1980." The following year's report forecast 50,000 sets in 25 cities by 1975. A 1970 press release predicted a million sets by



1980. Director Stanley Kubrick sent a team to Bell Labs to study the future of telephony. The result was the prominent inclusion of a Bell System Picturephone booth in his 1968 film 2001 A Space Odyssey.

With great confidence, AT&T introduced commercial Picturephone service in central Pittsburgh on July 1, 1970. Initially, the focus was on large business customers, since the service was expensive, at \$160 per month for the equipment and service, and the first thirty minutes of calls; additional calls were \$0.25 per minute. This is equivalent in 2014 dollars to \$950, plus \$1.50 per additional minute. The day before, AT&T and Bell of Pennsylvania had



hosted a well-publicized ceremonial first call between Pittsburgh Mayor Peter Flaherty and Chairman and CEO John Harper of Alcoa, a leading Pittsburgh-based corporation.

Picturephone service expanded to central Chicago and the suburb of Oak Brook the following year. The sets could also transmit documents and graphics, though the latter was limited by the 250 lines resolution. The number of sets in Pittsburgh peaked at 32 in

1972. Despite price reductions of \$75 a month for service and the first forty-five minutes of calls to try and stimulate demand, sets in Chicago peaked at 453 in early 1973. AT&T got a new CEO, John de Butts in 1973, and he pulled the plug, having concluded that the Picturephone would not be a successful extension of telephone service.

There are multiple reasons for the Picturephone failure. The first is a chicken-and-egg problem that plagues all new networked technologies. A Picturephone is only useful if the person you want to contact has one. A new technology needs some niche group of enthusiasts to sustain it over these early years; and the Picturephone did not find such a group. Secondly, Picturephone proved more expensive than its value, even to the targeted business markets. Most new technologies are expensive at first. AT&T was confident that costs would come down over time, but with the coming digital technologies, Picturephone did not last that long.

Finally, most of those few customers that had Picturephone service didn't like it. Most users, even in a business setting, simply did not like being routinely seen on the telephone, or at best found it added little value. What some did find more useful was the ability to share documents and other graphics.

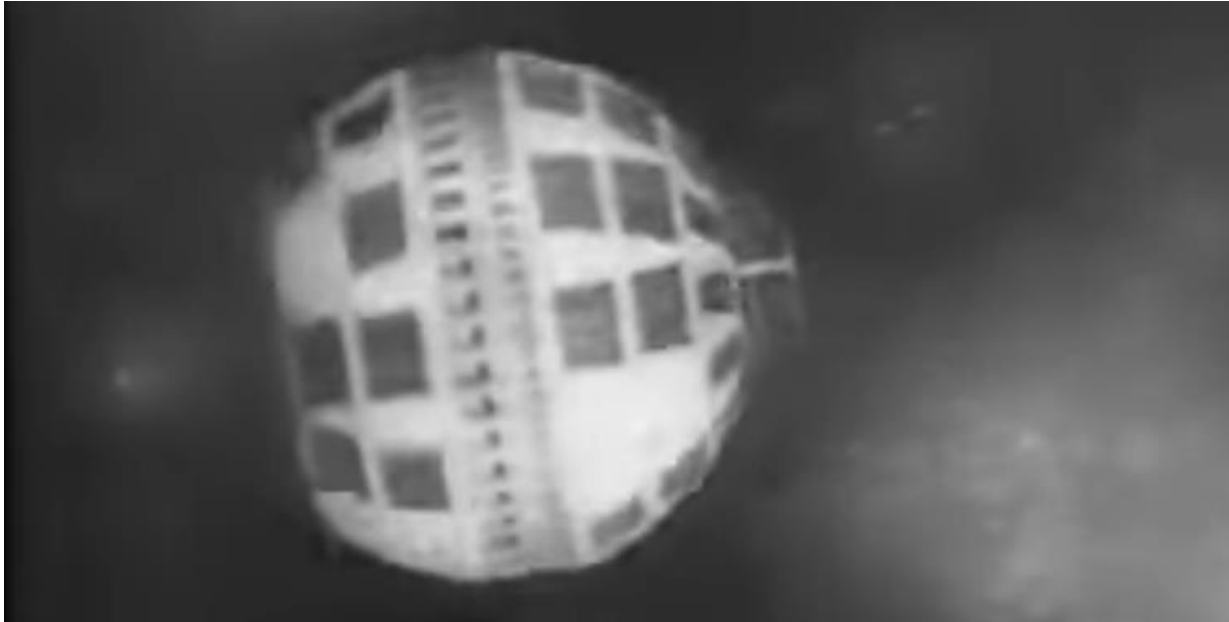
Video telephony still seemed such an obvious extension of telephone service. AT&T itself introduced a consumer-oriented color videophone in 1992, the AT&T Videophone 2500. Using data compression technologies, it offered a small full-color picture that could be sent over standard telephone lines. Even though it was sold in pairs, and marketed for uses such as family events, it too failed to find a market. Other companies marketed similar video telephone sets in the 1990s and early 2000s with equal lack of success. In a way, the 21st Century rise of the internet and the world wide web has delivered on the promises. Video telephony is readily available, with voice and documents being shared globally. There is just minimal demand for dedicated video telephone sets operated as part of the wired telephone network.

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Communications go into space

Every day, hundreds of millions of people worldwide routinely use satellites to watch television, listen to radio, make phone calls, and move data, all made possible by the pioneering efforts of the Bell System.

Introducing technology unknown outside the laboratories, AT&T launched Telstar, the world's first telecommunications satellite, in July 1962, from Cape Canaveral. Like many Bell System innovations, Telstar dramatically altered communications, and paved the way today's technology.



In the first official international Telstar broadcast transmitted, President John F. Kennedy hailed satellite technology as "another indication of the extraordinary world in which we live."

Kennedy said: "Carrying messages is an essential requirement for peace (and) the understanding which will inevitably come from the speedier communications will increase the well being and security of all people."

Science fiction writer Arthur C. Clark laid the foundation for satellite broadcasting. In 1945, Clarke proposed a series of orbiting space stations in orbit high enough to match the earth's rotation. The satellites would then appear to be "geostationary," and able to send consistent signals to all locations.

Today, scientists refer to the orbit 26,000 miles high as the Clarke Belt. Clarke went on to fame as the author of the "Space Odyssey" series. Clarke's space station theory languished for another two decades, while the scientific and engineering communities caught up.



A communications balloon, called Echo 1, preceded Telstar. Hanging in the atmosphere about 1,000 miles up, Echo 1 had no processing capabilities. It served as a giant mirror to reflect broadcast signals to the east and west coasts.

Bell Laboratories appointed a team of John Robinson Pierce, Rudy Kompfner, and James Early to improve the space technology by adding transmission and receiving functions. The project began seriously in summer 1960. The three men were considered a dream team as veterans of the development of the transistor.

Apparently, there was rivalry between AT&T and the recently established National Aeronautics and Space Administration (NASA). The condensed version is that space agency officials were disturbed because Bell Labs was getting most of the public adulation. NASA even planned its own satellite, called Relay, although the agency had no experience with communications technology.



A model of the Telstar satellite is displayed at THG's Connections Museum in Seattle

time was only 20 minutes. While barely comparing with today's constant information streams, Telstar was hailed as a major achievement.

“Good evening, Europe. This is the North American continent, live via AT&T Telstar, July 23, 1962,” said CBS News anchor Walter Cronkite, at the start of the first official commercial broadcast.

The 170-pound Telstar survived long enough to prove the feasibility of satellite communication. By the end of 1962, radiation from an upper atmosphere nuclear test cooked the transistors in the satellite and made it inoperable. Telstar 2 was launched in May 1963. While they are no longer functional, both satellites are still in earth orbit.

NASA's rival satellite, Relay 1, was inoperable for its first two weeks after launch in December 1962. The satellite was repaired and carried a worldwide broadcast of the November 1963 funeral of President Kennedy.

Bell Labs bid as a contractor for Relay while continuing work on Telstar. But Labs needed NASA rockets to launch the satellite. After exhausting other alternatives, AT&T offered to pay the entire cost of getting Telstar into space (about \$30 million today), and give NASA full access to the satellite services. NASA then agreed to launch Telstar in, five months ahead of Relay.

On July 10, 1962, a NASA Thor Delta rocket blasted into the upper atmosphere, carrying the delicate Telstar satellite in the nose cone. The rocket placed Telstar and elliptical orbit 3,700 miles up and still 22,300 miles below the area to be named the Clarke Belt. In its low orbit, Telstar circled earth every two hours and 37 minutes. Broadcast

Musician perceives satellite sounds

Many popular recordings have telephone references, but it's unusual that a telecommunications device has its own song.

British music producer and writer Joe Meek used keyboard instruments to emulate electronic sounds for the recording "Telstar", released in August 1962. Meek's group, The Tornados, recorded the instrumental song at his small studio in North London only two weeks after the launch of the namesake satellite. "Telstar" was the first U.S. #1 hit by a British group. Over five million copies of the futuristic-sounding record have been sold worldwide.



Meek was influenced by earlier organ instrumentals from U.S. artists. He tried to display an extra-terrestrial sound with the Clavioline keyboard on "Telstar," played by a studio musician named Geoff Goddard, who also supplied the "humming" vocal at the end of the song. The 5-member Tornados originally formed as a backing group for Meek's productions.

Telstar stories Dave Felice, with material from multiple Internet sources

Visit Telecommunications History Group museums

Everyone is cordially invited to visit the Connections Museums and the THG Archives of the Telecommunications History Group in Seattle and Denver.

In Seattle, the museum is located at 7000 East Marginal Way South. The museum is open from 10:00 a.m. to 3:00 p.m. every Sunday, or by appointment. Send email to info@connectionsmuseum.org for additional information. There is no admission charge, but contributions are always welcome. From Interstate-5 northbound or southbound, take Exit 162 to Corson Ave South.

In Denver, the museum is located at 931 14th Street. The archives are next door at 1425 Champa Street. Because of security concerns, access is by appointment only. Appointments may be scheduled by sending an email to telcomhist@aol.com. There is no admission charge, but contributions are welcomed. From Interstate-25 southbound, take the Speer Boulevard 212A exit; from northbound I-25, take the Auraria Parkway exit.

Your telephone story is important

If you have a story you'd like to share, an idea for a story, or something you'd like to see, send e-mail to telcomhist@aol.com. Put the word Editor in the subject field.

If you have documents or artifacts you think might be worth donating to the Telecommunications History Group, contact THG at telcomhist.com for an advance evaluation.

Phone conversation called key to success

Acquiring and using conversation skills is crucial to effective telephone calls, says Mary Jane Copps, known as "The Phone Lady." At the same time, she's concerned about Artificial intelligence (AI) and says the potential misuse is "terrifying"

Working with clients usually in sales or customer service, Copps trains people to achieve success with phone contacts. In exclusive comments for Connections News, she says conversation is as important as ever, particularly with the proliferation of alternative methods of communication, such as social media.

"Conversation is not dead," says Copps. "But we do have a massive generational difference about phone use. The majority of people entering the work force today have never had a home phone. Talking on the phone is a skill once taken for granted because everyone had similar experiences."

When she started her business 17 years ago, Copps says she originally thought talking on the phone was just common sense. Now, she observes, people need to learn how to continue a conversation after saying hello.

"I'm not opposed to technology or written communication. But technology cannot convey the tone of someone's voice and we may actually miss a lot of information. With text and social media, we are not actually connecting as if in real time."

The Phone Lady says she began to understand the importance of communication from a previous job in real estate. She had two phones on her desk, and was frequently jumping from one conversation to another. "I've never been busier than I am now," she proclaims.

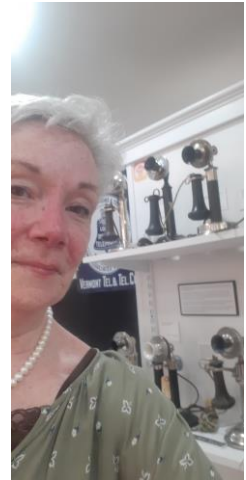
Copps works worldwide. On Radio New Zealand recently, she noted phone anxiety is real and can be just as fearsome for some people as public speaking. (https://www.rnz.co.nz/audio/player?audio_id=2018897714)

She tells of working with a London law firm whose clients complained about not being able to contact their lawyers. What she found were problems such as lack of private space for calls and the need to reserve time for phone contacts instead of focusing on paperwork. She says junior lawyers overlooked the importance of scheduling calls at a specific time. "It's important to recognize that sincere real time conversation leads to success."

Lower long distance costs also led to problems such as increased telemarketing, especially robo-calling. "People are rightly nervous if they don't know who is calling. The person making a legitimate sales call needs to be able to prove the call is valid, and that the customer is still in charge," she says.

"Leaders have always had success through the talent and ability to get people to listen," she notes. "Phone conversations are very similar because people have the opportunity to exchange ideas and talk about resolving problems."

Artificial Intelligence could become a threat if not handled ethically, she says. "AI could re-create me. I don't know what to think." Copps adds that overwhelming reliance on technology could actually lead to greater real time human interaction.



Mary Jane Copps is based in Halifax, Nova Scotia. She commented in a telephone interview for THG Connections News after visiting the New Hampshire Telephone Museum. Her book is available online. Original story by Dave Felice. Copps provided the photographs.

Telecommunications News in Brief

Battery Pioneer dies

The 2019 Nobel Prize recipient for chemistry, John Goodenough, has died at age 100 in Texas. Goodenough was honored, along with British-American scientist M. Stanley Whittingham and Akira Yoshino of Japan, for pioneering work in development of the lithium-ion battery for devices ranging from hearing aids to electric cars.

In awarding the prize, the Royal Swedish Academy of Sciences said: "The rechargeable battery laid the foundation of wireless electronics such as mobile phones and laptops. (The battery) also makes a fossil fuel-free world possible."

Goodenough was known as a great researcher and highly regarded professor at the University of Texas in Austin.

Smithsonian anniversary

On July 1, 1836, Congress accepted a bequest from British scientist James Smithson that his entire estate would go to the United States.

Smithson, a fellow of the Royal Society of London from age 22, studied mineral composition, geology, and chemistry. In 1891 he proved zinc carbonates were true carbonate minerals. One type of zinc carbonate was named *smithsonite* in his honor. Smithson died in Genoa in 1829, directing that if his only relative, nephew Henry James Hungerford, died without an heir, the whole of the Smithson estate would go to the U.S. to found what became the Smithsonian Institution.

The bequest was highly unusual because Smithson had never visited America. Alexander Graham Bell became a regent at the Smithsonian. Today, the Institution is composed of 19 museums, including the recently-opened Museum of African American History and Culture.

Wired telephones continue decline

Only about 25 percent of Americans still have wired telephones, according to an analysis recently published by The Washington Post.

The decline in use of landline phones has tripled since 2010. As of last year, 73 percent of U.S. adults report living their lives with only a cellular phone. Households of those 65 and older dominate the group continuing to use landlines.

The data on phone use appear in a National Health Interview Survey. The survey is actually operated by the Centers for Disease Control (CDC) as a health indicator. Researcher Stephen Blumberg says people who rely on a cell phone are more likely to engage in risky health-related behavior such as smoking, binge drinking, and going without health insurance, even when the statistics are properly adjusted for demographic differences.

Thirty-four percent of those using landlines are homeowners. Hispanic Americans are less likely to have a landline than White or Black Americans, according to the survey. Only two percent of adults use landline exclusively.

In 2019, the Federal Communications Commission stopped requiring carriers to run copper wire to every home. The 3-year transition ended last year and carriers are beginning to scrap Plain Old Telephone Service (POTS) in favor of less-costly digital technologies.