



# CONNECTIONS *news*

[www.telcomhistory.org](http://www.telcomhistory.org)  
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Dave Felice, editor

## A Message from Our Director

Hard to believe it's 2024. I look at all the artifacts and documents we have in the archive and museums and think about what it was like one hundred years ago. Candlestick phones were still in use, and the Western Electric 50 type dial desk set. Here in Denver, we didn't have dial service till 1929.



In trying to imagine what communications will be like in a hundred years or even twenty years I can see how our museums and archive will continue to be an important part of this communications history.



Paradoxically, in a world saturated with digital devices, the graphic symbol for a telephone is still a stylized Model 500 series handset. Some people who use digital phones may never have seen an integrated transceiver, yet they recognize the international symbol. It's something to ponder.

In this newsletter, you'll find out how a telephone engineer, working under strictly confidential conditions, helped bring an end to World War II.

Have a wonderful spring and thanks so much for your support and love of our history.

Renee Lang, Managing Director

## Little box makes a big noise

The January feature for The Seattle Times magazine *Pacific NW* is accompanied by a shorter story about "an odd looking (telephone) doodad." Writer Brendan Kiley says the strange device might be his favorite item at the THG Connections Museum in Seattle.

The unusual item is a Hush-A-Phone. In 1921, a time of inventive approaches to technical problems, the Hush-A-Phone was the first serious challenge to the monopoly power of AT&T.

After visiting the Connections Museum and getting a crash course in telephone history from volunteer Ed Mattson, Kiley describes Hush-A-Phone as what looks like "a big, clunky, one-hole harmonica." Users could place the device over the mouthpiece (microphone) of a "candlestick" (two-piece phone) to prevent others nearby from hearing what was spoken. He says the device was popular in competitive office environments. The device was modified in later years to be used with a single handset mouthpiece.



Kiley writes: "The humble Hush-A-Phone was not invented at Bell Labs. Bell tried to quash the small company, claiming the attachment was an 'unauthorized' alteration of 'their' (AT&T) equipment."

In 1948, following a complaint by Hush-A-Phone, the Federal Communications Commission ruled that customers could cup their hand over the mouthpiece, but using a device instead was unfairly adapting AT&T property. On appeal in 1956, the D.C. Circuit Court of Appeals ruled that telling customers using their hand was acceptable, while an attachment was not, was "neither just nor reasonable."

Neither AT&T nor the FCC appealed Judge David Bazelon's ruling. AT&T filed a new tariff which permitted "foreign attachments" as long as they did not "endanger telephone employees, property or service."

"It's a funny little ruling, but the effects were enormous," writes Kiley. "It was seen as a legal turning point, slightly cracking the door for startups to build and sell telephone equipment

to the public." Kiley says "a goofy-looking accessory" eventually led to the legal break-up of the Bell System monopoly on phone service and equipment.

**AMAZING**  
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The same distinctive features which have led to the adoption of the Hush-A-Phone by thousands of users are present in a new model which snaps right on the transmitter of the handset phone. The phone is removed from and returned to the cradle without interference therewith. Made of black plastic and weighs only 5 ounces.

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 Surrounding noises in offices, factories or similar work areas are kept out of the transmitter and off the line, providing a quiet wire and improved hearing at both ends of wire.
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**HOW TO ORDER**

Specify model number of your phone when ordering. The model number appears on the flat side of phone.

E-1  
F-1  
F-1-C Cradle with Buttons  
G-1  
G-1 With Buttons  
G-1 \*Call Director

File all Western Electric phones  
 Please specify entire number and description  
 \*When ordering Call Director G-1 Model—we will send adapters which will raise Director 2" off Desk or Table.

## Keeping telephone history alive and clicking

A newspaper magazine writer finds a diverse and dedicated crew of volunteers at the Connections Museum of the Telecommunications History Group in Seattle.

Writing in the January 28, 2024 edition of *The Seattle Times Pacific NW* magazine section, Brendan Kiley often refers to the kindred spirit of the multi-generational volunteers who literally bring life into the museum artifacts. "In a museum devoted to the technology that has brought us together, perhaps the most powerful connection flows between its volunteers" he says.

The multiple page museum profile is accompanied by large color photographs from Ken Lambert of the Times. Lambert's photos highlight both the volunteers and the way visitors get close encounters with the museum equipment, either by taking it apart and putting it back together, or by watching it function.

"The Connections Museum...doesn't look like a museum," writes Kiley. "It is a sensually dense environment. Almost nothing is behind glass"

When the museum is open on Sundays, volunteers give guests a personalized tour. The museum is housed in a portion of a Pacific Northwest Bell (now Lumen) Central Office in Seattle's Georgetown neighborhood.

Kiley's text reminds readers of the museum's mission "to acquire, preserve and promote the rich history heritage of the telecommunications industry." That heritage includes the nearly five decade Bell System career of Les Anderson. The operating No. 1 Crossbar Switching System from the 1930s is one of Anderson's special projects. A framed photo of Anderson at work commemorates his volunteer commitment which continued until his death in 2022 at age 98.

The museum was established forty years ago. Herb Warrick, an assistant vice president at Pacific Northwestern Bell, encouraged others to join in efforts to save obsolete electro-mechanical equipment from the junk yard.

Kiley quotes 95-year-old volunteer Bob Dickensheets as saying "the president of the company at the time was an alert and broad-minded man." Dickensheets himself retired from PNB in 1982. "The museum is unique," says Dickensheets. "You can stand right in front of the equipment, watch it operate, even touch it."

According to Kiley, it's apparent "(S)imply displaying the old machines isn't enough. The Connections Museum wants to be a relational, tactile experience, a place for bonding."

That bonding is evident as Kiley reports on how Ed Mattson, another telecom retiree, views his fellow volunteers. "They sometimes call themselves 'The Church of Telephone.' "



According to Kiley, 38-year-old senior volunteer Sarah Autumn adds, "we really do love each other like a family."

Board president and Microsoft retiree Peter Amstein is himself a working volunteer at the museum. Kiley says Amstein divides volunteers into three groups. Museum founders -- telephone employees and retirees -- make up the first group, followed by "old techies" and "new techies." According to Kiley, Amstein "places himself in the 'old techies' camp."



The volunteers get together on Tuesdays to work on the equipment. Sometimes they just tinker the way people have done since the beginning of telephony. Reporter Kiley recounts one recent time when 26-year-old volunteer Jay De Jaen worked on a mercury arc rectifier, a device which converts household-type electricity (AC) to the one-way direct current (DC) that a battery would produce. De Jaen needed something to serve as the electrical load, and apparently had the notion to use a second-hand wafflemaker to provide it.

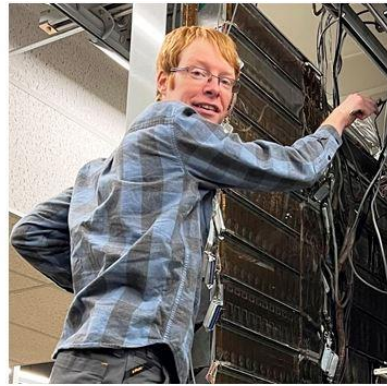
Kiley writes: "De Jaen jiggers a handle on a gray box, tilting oblong glass tubes which should create a spark (and) ignite the mercury vapor. De Jaen crouches to fiddles with alligator clips, some 100-watt light bulbs, and a purple gizmo that looks like an electric waffle iron for children.

"About an hour later, De Jaen and the rectifier have attracted a small crowd, eager to see if the thing will ignite. Finally, after the umpteenth tilt, the mercury sparks, filling the oblongs with an eerie flickering blue glow. The volunteers murmur approval (and) laugh appreciatively at De Jaen's ingenuity."

Kiley concludes that visitors can go to "gawk at old-fashioned telecommunications...to feel the rattling and thrumming of the electromechanical brain." But he says, people might leave with "an unexpected booster shot of" a more human connection.

The Seattle Connections Museum has had other media coverage in recent years, but nothing has increased visitor traffic in the way that this story has. The volunteers report the museum activity has been extremely busy every Sunday since the publication, with many visitors saying they saw the article.

Readers can find the full article on the Seattle Times website: <https://www.seattletimes.com/pacific-nw-magazine/from-old-phones-to-volunteers-everything-clicks-at-the-connections-museum/>. The newspaper has a limit of one free article per month.



Some THG Connections Museum volunteers at work. From top left, Kevin Hannon (center) leads a tour group in February. Colin Slater works on the museum's long distance trunk equipment. Jay De Jaen is rebuilding a 1950s broadcast TV camera, and Aidan Kelly maintains a dial-up internet display.

## 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 Connections 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](mailto: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 Connections 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.

Visits may be scheduled by sending an email to [telcomhist@aol.com](mailto: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.

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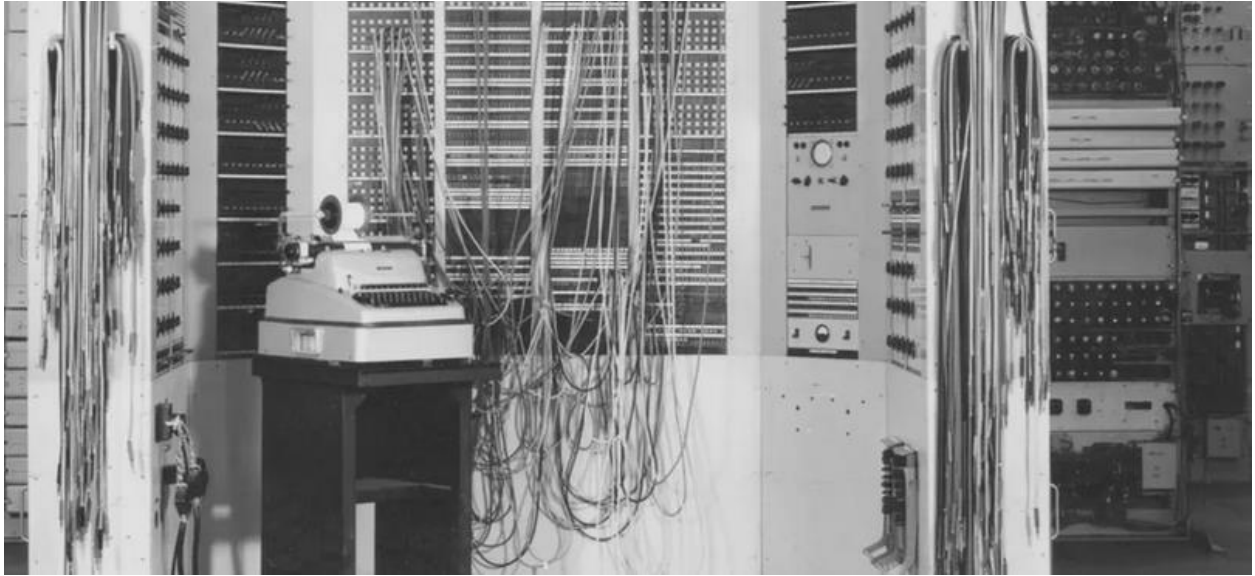
### ***Your telephone story is important***

*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](mailto:telcomhist@aol.com). Put the word Editor in the subject field.*

*Contact THG at [telcomhist@aol.com](mailto:telcomhist@aol.com) for an advance evaluation if you have documents or artifacts you think might be worth donating to the Telecommunications History Group.*

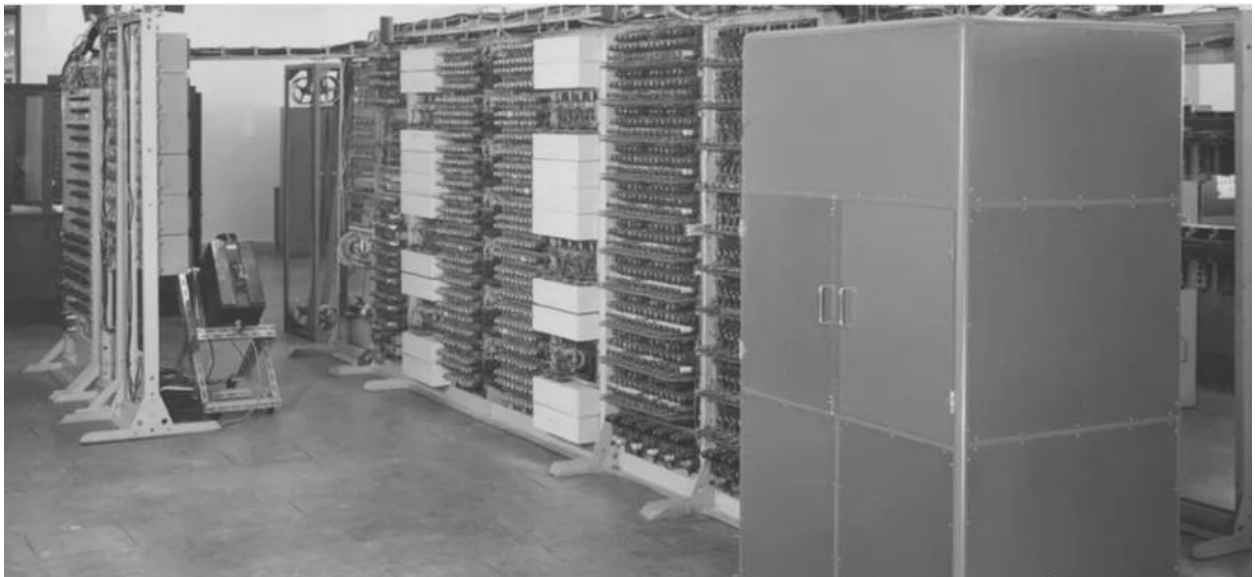
## British code-breaking technology revealed

After 80 years of strict secrecy, the United Kingdom's official information agency, known as GCHQ (Government Communications Headquarters) is letting the world public see black-and-white photographs of a computing device that helped win World War II.

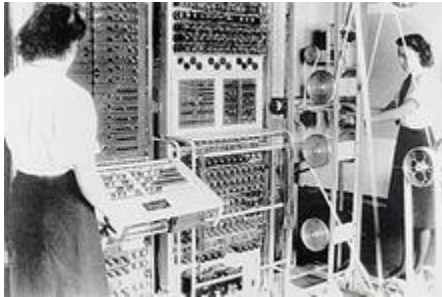


Many consider the device, known as "Colossus", to be the world's first digital computer. In spite of its huge impact, the engineers and code-breakers who worked on the Colossus operation were sworn to absolute confidentiality. The very existence of the machine wasn't widely known until the early 21st Century.

"Technological innovation has always been at the center of our work at GCHQ, and Colossus is a perfect example of how our staff keep us at the forefront of new technology - even when we can't talk about it", says Anne Keast-Butler, current director of GCHQ.



Bletchley Park is a sprawling country estate, with a large manor house and numerous smaller buildings. The complex is located near the town of Milton Keynes, in Buckinghamshire, about 50 miles northwest of London. During WWII, Bletchley was home to many notable computer scientists, mathematicians, and cryptoanalysis experts, including Alan Turing. He developed



numerous processes directly related to modern information technology and artificial intelligence.

Members of the Women's Royal Naval Service (WRENS) worked at the complex known as "B.P." or "Room 47, Foreign Office." Cryptanalyst Joan Clark was one of only a few women in that role. Bletchley is near the station where the Oxford-Cambridge rail line intersects with Britain's main north-south trains. There are high-capacity telephone and telegraph connections at a repeater station in a nearby village.

In 1941, Prime Minister Winston Churchill thought the Colossus project was important enough to authorize almost unlimited resources. "Action this day make sure they have all they want on extreme priority and report to me that this has been done," Churchill wrote in a message to leadership.

Colossus, a set of large computers, was devised to decode strategic secret German messages in the latter part of WWII. Alan Turing previously designed a mechanical device to break German code. As outlined in a project memorandum, telephone engineer Thomas H. "Tommy" Flowers reasoned that the mechanical work could be done with tube (valve) circuitry. Operators put the huge computer into operation just in time to produce the information that German forces believed the Allies would invade Europe from Calais, not Normandy. Some historians say Colossus, running 24-hours per day, shortened the war by as much as two years.

A photograph of a typed memorandum on lined paper, discussing a suggestion for a new machine design using valves and relays instead of mechanical movement.

2. Flowers, of the P.O., has produced a suggestion for an entirely different machine, in which the message, and the wheels to be compared with it, would be set up on valves, by means of relays. This would involve 5000 or so valves, and about 2500 relays. (The heat the valves would generate would be equal to that of 8 two-bar electric fires!) Mechanical movement would be avoided altogether, and speeds of 5000 to 10,000 a second would be possible.

This is, of course, a much more ambitious scheme. I feel that this is basically the right sort of approach, and that it is very much to our advantage to try out these techniques, and if possible get a step ahead with them. At the same time, since there is risk of hold-ups along these new paths, I emphasized that the simpler tape-machine (which has also the advantage of easy adaptability to all sorts of purposes) should be gone on with also, at full speed. They are quite willing to follow up both lines at once, and that is what I recommend should be done.

A pretty strong priority will be wanted ~~to~~ to get that number of valves and relays in a finite time.

Before Bletchley, Flowers was an assistant engineer at Britain's GPO (General Post Office), the agency which operated the telephone, telegraph, and postal systems. Only in recent years has he received credit as the leader of the Colossus development team.

In all, Bletchley built ten of the seven foot tall computers. After the war, eight were destroyed. The team had to turn over all documentation to GCHQ. The technology was so effective it was still in use until the early 1960s, when the remaining machines were dismantled. In 2008, a team of volunteers built a functioning reconstruction of a Mark 2 Colossus for the National Computing Museum at Bletchley Park.

## Remembering Ken Pratt

For Ken Pratt, his time as a Telecommunications History Group volunteer was nearly as long as his 34-year career at Mountain Bell. THG staff and volunteers fondly recall Ken's contributions and guidance over nearly 30 years at the Denver archives. Ken died in August 2023 at age 102.

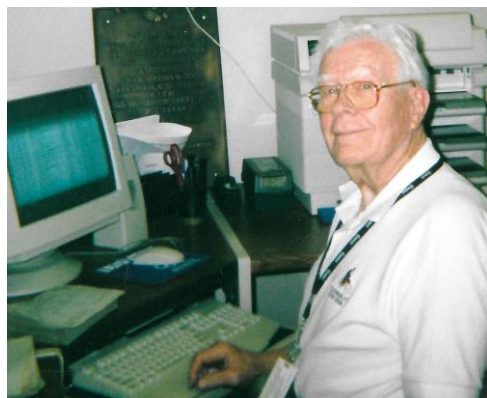
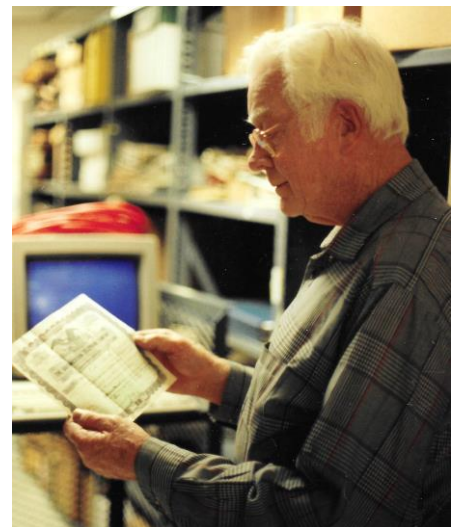


The court-ordered Bell System break-up in 1984 was the incentive Ken needed to retire at age 62. By some reckoning, Ken started his "second career" with THG about ten years later. His final work at Mountain Bell involved a determination of which entity got which assets at the Divestiture. "Being privy to some of this information because of my personnel work I was at the head of the line to apply for retirement," Ken wrote in a 10-page summary of his telephone career.

"At the agreed upon time, Bell Laboratories personnel came to our Mountain Bell computer center and, with the help of our task force, implemented the change in ownership of some \$250,000,000 of investment with no problems," he added.

Ken Pratt started working for the telephone company in 1949 when he graduated from the University of Denver with a degree in electrical engineering. "Mountain Bell was preparing for some large projects in Idaho, particularly for the dial conversions of all exchanges in the Boise-Nampa-Caldwell area and combining many of them into a free calling area," he said. His wife, Jewel, was pleased with the job offer, since her parents lived in Twin Falls, Idaho.

Over the years, Ken advanced rapidly and worked in many construction and engineering jobs, including the then-new field of microwave transmission. Ken wrote that at one point, he got frustrated with decentralization of general engineering and actually looked for another job, getting offers from IBM and Lenkurt. He decided to stay in Idaho, then transferred to Denver in 1958 in the new field of Operations Research.



Pratt attended the 18-month Bell Labs Operating Engineers Training Program and relocated to New Jersey. He returned to Denver as a District Manager.

Eventually, he became the Mountain Bell coordinator for the Management Job Evaluation project. He returned to Network Engineering, responsible for producing a five-year plan.

Pratt turned down a retirement offer in 1982 and stayed to work through some of the asset transfer questions related to Divestiture.

Ken's energy and expertise as a volunteer became legendary. THG expresses its sincere appreciation for the generous donations made in his memory.



## Pocket devices start in late 1960s

The widespread practice of carrying an electronic device with computing capability begins with the handheld Texas Instruments' Cal-Tech of 1967, says author-historian Simon Winchester.

In his latest book Knowing What We Know, Winchester tells how a little-known company technician Jerry Merryman got the assignment of developing "a calculator no larger than a paperback book that would ideally fit into a shirt pocket."

By 1965, the 33-year-old Merryman was drawing on the history of accumulated human learning which Winchester describes as "the transmission of knowledge from ancient wisdom to modern magic."

Merryman was a competitive slide-rule champion who took just three days to design the new electronic device. At the time, he focused on harnessing the power of transistor arrays for complex mathematical functions. He apparently did not consider incorporating a telephone, camera, and other computer functions.

The new calculator could perform all the computations of a slide rule, cost about \$400, ran on two batteries, and could fit into a generously sized pocket. Japan's Canon Corp. marketed the device. TI introduced its own Model 2500 (shown here) in the early 1970s.



Engineer Jack Kilby won the Nobel Prize for his solid-state integrated circuits, invented several years earlier for Texas Instruments.

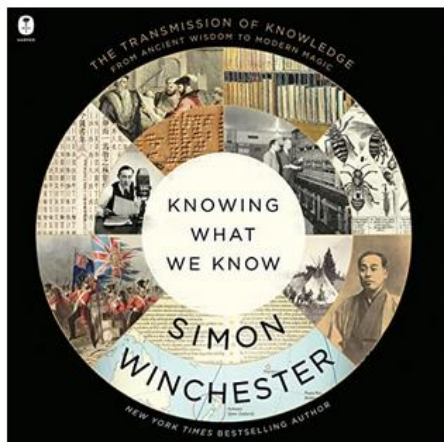
Winchester quotes Merryman as later saying: "Silly me. I thought I was making a calculator. In fact, we were creating an electronic revolution." The irony of the development, according to the author, is that a pocket calculator had an impact that could not, and still cannot, be measured.

The evolution of The Texas Instruments calculator, becoming smaller, cheaper, and more powerful, allowed people to harness the energy of letting the machines do mundane work, according to Winchester. The next steps were word processing, navigation, and full computing.

The book traces the world history of accumulated human knowledge, from ancient Babylon to powerful pocket computers known colloquially as "smart phones." Winchester says the massive potential of computer-based Artificial Intelligence (AI) is yet to be determined.

Founded in 1924 and headquartered in Dallas, Texas Instruments remains one of the world's largest manufacturers of semiconductors. The handheld TI-83 is still a popular calculator.

A New York Times review calls Winchester's book "(A) brilliant and all-encompassing look at how humans acquire, retain, and pass on information and data, and how technology continues to change our lives and our minds." Knowing What We Know is copyright 2023 by Barnhill Press Ltd., printed by HarperCollins.



Story by Dave Felice

## Using telecommunications structure for vehicle charging

BT (British Telecommunications) is testing the use of telephone pedestals as charging stations for electric vehicles. The two-year pilot program involves retrofitting what are known in Britain as "cabinets" currently providing copper-based broadband and phone services. The testing could determine the practical use of pedestals for widespread charging capability.

"The charging solution works by retrofitting the cabinets with a device that enables power to be shared to a charge point alongside the existing broadband, with no need to create a new grid (power) connection," says Hamish Hallett of BT media in exclusive comments for Connections News.

"Once the cabinet is no longer needed for broadband, as nationwide full fibre rollout progresses, the broadband equipment is recycled, and additional EV charge points can be added. This allows re-use of existing infrastructure while deploying more charge points."

Hallett says the company has been overwhelmed by the level of interest, even though it's too early for any real wide-scale results. The tests involve technical considerations such as pedestal location, power availability, customer accessibility, and engineering. The company also must determine the level of local government involvement and funding options.

The first phase of the program involves BT employees in Northern Ireland and Scotland, expanding nationwide during 2024. BT officials say successful implementation could make a significant contribution to reducing the carbon footprint of the transport system.

It's estimated that as many as 60,000 cabinets might be suitable for upgrades to EV charging points. Neither testing nor implementation will disrupt existing telecommunications services.



"With the ban on sales of internal combustion engines by 2030, and only around 45,000 public charge points today, the UK needs a massive upgrade to meet the needs of the EV revolution," says Tom Guy, the Managing Director at Etc., BT's digital enterprise group.

"We have a once-in-a-lifetime opportunity to connect by innovating our cabinet infrastructure. The pilots are critical to assess effective technical, commercial, and operational routes to market."

The UK Government has committed \$1.9 billion in public funding to increase charging stations to 300,000 from about only 45,000 currently.

"Wider availability of charge points will help build confidence that switching to an EV is the right option," says Helen Clarkson, CEO at Britain's Climate Group.

According to Green Car Reports, cities worldwide are looking at how to provide more street-side charging. Pop-up charging stations are also being tested in the U.S. and UK. Connections on light poles invite drivers to shop and charge in several locations, including Lancaster, California.





## TELEPHONE CITY

### *Built Since V-J Day*

**T**his city is imaginary but its buildings are real. Each is a Bell Telephone building constructed or enlarged since V-J Day. You see about 400 here. Some 2,400 smaller structures, also new since the war ended, are not shown.

Our picture helps to bring out the vast job the Bell System is doing to meet the nation's greatly increased needs for telephone service. But the buildings are only a part of the story. If you could look in the windows, you would see much more.

For instance, you would see tremendous quantities of equipment — floor after floor of busy switchboards and intricate dial apparatus. And you would see people, men and women who are your neighbors, working to serve the community well.

The money for these buildings, and for the equipment needed to give telephone service, does not come out of the money you pay for your service. It must come from investors—hundreds of thousands of men and women all over America who invest their savings in the telephone business with the expectation that earnings will be adequate to pay them a reasonable return.



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