

FCC Paper Report 43-01
ARMIS Annual Summary Report

COMPANY Northern New England Telephone
Telephone Operations LLC
STUDY AREA: New Hampshire
PERIOD: From: Jan 2011 To: Dec 2011
COSA: FPNH

A ACCOUNT LEVEL REPORTING
(Dollars in thousands)

ROW	CLASSIFICATION (a)	Total (b)	Nonreg (c)	Adjustments (d)	Subject To Separations (f)	State (g)	Interstate (h)
Revenues							
1010	Basic Local Services	82,958	N/A	0	82,958	82,958	0
1020	Network Access Services	139,250	N/A	0	139,250	9,443	129,807
1030	Toll Network Services	13,911	N/A	0	13,911	13,881	31
1040	Miscellaneous	33,250	N/A	0	33,250	22,165	11,084
1045	Nonregulated	7,540	7,540	N/A	N/A	N/A	N/A
1060	Uncollectibles	3,597	101	0	3,497	1,615	1,882
1090	Total Operating Revenues	273,312	7,439	0	265,872	126,832	139,040
	Imputation of Directory Revenue	23,300					
	Total Assessed Revenue	296,612					
	Assessment	942,999				403,229	
	Assessment Factor	\$ 0.00318				\$ 0.00318	

The revenue data above is available on the FCC ARMIS website at http://fjallfoss.fcc.gov/eafs7/adhoc/table_year_tal

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Backgrounder

In today's rapidly changing business environment, many of the most exciting innovations are being spearheaded by AT&T Labs, the long-respected research and development arm of AT&T.

History

The year was 1901...the beginning of a new century. Twenty-five years earlier, Alexander Graham Bell made his historic first call to his assistant, Watson, capping the exciting invention of the telephone. While Bell Telephone prospered in the years following the phone's invention, the company was not alone in the market. By the turn of the century, well over 10,000 rival telephone companies had sprung up to compete for a share of the rapidly growing voice communications marketplace.

The founders of the Bell System quickly rose to meet this competitive threat and to unify communications within the United States. They recognized the need to work toward a concept of universal service that would ultimately allow a caller to pick up a telephone and reach another person anywhere in the world, efficiently and cost-effectively. They began to work toward this concept by making strategic acquisitions and supporting global standards. The founders also realized that to overcome the technological obstacles that were certain to arise in this new industry, they needed a commitment to a long-term research and development effort that would be second to none in the industry. To achieve this, the Bell System established Bell Labs in 1925.

Throughout the next seven decades, Bell Labs was responsible for some of the world's major inventions across a broad spectrum of technologies, including the transistor, the field of Information Theory, the solar cell, and the communications satellite.

In 1996, as part of the "tri-vestiture" that saw AT&T divest its equipment and computer businesses, AT&T inherited the divisions of Bell Labs that focused on the areas of computing, information, and communication science, and the name changed to AT&T Labs. While the name may have changed, AT&T Labs' commitment remains, to create the innovations that drive the AT&T global network to the cutting edge and technologies to transform AT&T and the industry.

Many technologies that AT&T Labs pioneered fueled the "IT Revolution" of the late 1990's. With the new millennium came a renewed interest and appreciation for AT&T's sound business practices and AT&T Labs' legacy of world-class research and innovation. Through the economic uncertainty at the outset of the 21st century, AT&T Labs has been a consistent provider of products and services in areas ranging from IP network management and optical technology to automatic speech recognition and next-generation text-to-speech products.

The research and development capabilities of AT&T Labs continue to give AT&T a significant competitive advantage. Other companies can also take advantage of the expertise at AT&T Labs by licensing technologies and patents from the Labs' impressive [portfolio](#).

An Unsurpassed Record of Achievement

AT&T Labs carries on a tradition of technology breakthroughs and product and service innovations that spans 120 years. No dedicated research organization can point to a longer history or wider range of inventions and discoveries. Beginning with the invention of the telephone in 1876, even a partial list of accomplishments by the company's scientists, engineers, and product development specialists is remarkable:

- 1876—Alexander Graham Bell called for his assistant, using the celebrated phrase, "Mr. Watson! Come here! I want you!" This marked not only the first phone call but also the beginning of a revolution in communications and commerce.

- 1918—H. Nyquist began investigating ways to send pictures over telephone circuits, leading to the first primitive facsimile transmission in 1924.
- 1920s—AT&T engineers invented the technology that brought sound to Hollywood motion pictures. In addition, several AT&T Bell Labs groups discovered techniques that were later adapted for broadcast sound recording and phonographic records.
- 1926—Bell System engineers pioneered technological breakthroughs that resulted in the first two-way conversation across the Atlantic.
- 1927—AT&T was the first company in the United States to demonstrate the technology that made television possible.
- 1929—AT&T Bell Labs invented the first artificial larynx. Thirty years later, the Labs introduced an electronic artificial larynx based on a design that's still in use today.
- 1933—As part of a series of experiments to reduce phonograph distortion, A.C. Keller and I.S. Rafuse tried two-channel recording. This ultimately led to the first U.S. single-groove stereo recording seven years later.
- 1933—K. Jansky pointed his radio antenna toward the Milky Way's center and was startled to hear noise apparently coming from the stars. This discovery led to a new tool for astronomical research called the radio telescope.
- 1939—AT&T Bell Labs developed the first production high-frequency radar, which permitted sharper beams using smaller antennae. This technology also would lead to the creation of the microwave oven several decades later.
- 1939—H.W. Dudley invented an artificial talking machine called the "Voder," the world's first electronic speech synthesizer.
- 1939—The first electrical and digital computer, consisting of 450 telephone relays and 10 crossbar switches, was able to divide two eight-digit numbers and find the answer in about 30 seconds.
- 1947—J. Bardeen, W.H. Brattain, and W. Shockley created the first transistor. Their work would earn a Nobel Prize.
- 1948—Claude Shannon developed a new theory of communications, signaling the dawn of the "information age."
- 1950s—R.S. Ohl discovered that sunlight shining on a silicon wafer produces a surprisingly strong electrical current. This led to the invention of the first solar cells.
- 1951—AT&T Bell Labs was instrumental in developing the technology needed to support direct distance dialing.
- Late 1950s and beyond - AT&T Labs developed the laser into a useful device for transmitting information.
- 1960—AT&T Bell Labs launched Echo, an experimental balloon off which messages could be bounced. This led the way for the development of Telstar, the world's first active communications satellite.
- 1965 —While conducting radio astronomy experiments A.A. Penzias and R.W. Wilson were frustrated by noise in their receiving system. The pair determined that this noise came from "background radiation." Their hypothesis supported the Big Bang theory on the creation of the universe.
- 1969—The Internet was launched as an application on the UNIX operating system, which was developed at AT&T Bell Labs.
- 1977—AT&T Bell Labs recognized the potential for transmitting information as lightwaves carried through glass fibers. This research led to the installation of the first lightwave system to provide a full range of telecommunications services—voice, data, and video—over a public switched network.
- 1983—AT&T Bell Labs researchers divided wireless communications into a series of cells that automatically switched callers as they moved from cell to cell. This development led to the introduction of cellular phones and made today's mobile communications possible.
- 1983—AT&T researcher Bjarne Stroustrup built the first version of C++. The C++ language is so flexible that it's used in PCs and supercomputers, as well as in software that runs everything from cameras to elevators.
- 1989—AT&T Bell Labs introduced a speech-driven robot, named SAM for Speech-Actuated Manipulator. With one arm, two video cameras, and the ability to understand 300 billion sentences, SAM could perform highly technical jobs that were too hazardous for humans.
- 1992—AT&T Bell Labs combined research work in speech recognition and speech synthesis, putting all the components in place to create a real-time language translator.
- 1992—AT&T Bell Labs introduced fault tolerance software that allows a telecommunications system to "tolerate" hardware faults, and some of the design and coding faults that threaten to shutdown a system.
- 1993—The Model 70 computer videophone not only made simultaneous video communication possible, it offered callers the ability to open, view, and edit files, as well as annotate and write comments on the screen.

- 1998—AT&T Labs developed the Phone Web Interactive Voice Response (IVR) system, which automates routine phone transactions. Smaller companies could now afford an IVR system because Phone Web does not require premises equipment and costly programming. Phone Web allowed a customer to access the content and interactions of Web pages through a telephone.
- 1999—AT&T Labs researchers lead the way in the new field of Quantum Computing, which seeks to apply the principles of Quantum Physics to computing. Quantum Computing will dramatically speed up processing time by allowing a computer to simultaneously compare a range of possibilities rather than weighing one possibility at a time, as computers currently operate.
- 2000—AT&T Labs researchers developed a suite of state-of-the art fraud protection tools that rely on the AT&T Network Connection (ANC) system for transport of long-distance services. The ANC fraud protection package makes it possible to detect fraud in a matter of hours instead of days.
- 2001—The publication of "Web Principles and Protocols: HTTP/1.1, Networking Protocols, Caching, and Traffic Measurement" codifying standard techniques for measuring network traffics. The authors helped found the annual ACM Internet Measurement Conference. AT&T Labs researchers also developed Natural Voices Text-to-Speech: In 1936 H.W. Dudley, a Bell Labs scientist, invented the first electronic speech synthesizer. Since that time AT&T Labs has been at the forefront in developing this technology. In 2001, AT&T unveiled the most advanced synthetic speech system to date, AT&T Natural Voices. At the heart of this technology is the AT&T Natural Voices Text-to-Speech (TTS) Engine, and this engine supports a library of multilingual male and female voice fonts in languages including U.S. English, Latin American Spanish, German, U.K. English, Parisian French and Canadian French (and this list will continue to grow). AT&T Natural Voices' TTS technology is the key to giving voice- a pleasant, natural and crystal clear voice-to a new generation of AT&T managed business services. Integrated with other AT&T Labs speech technologies-including speech recognition, natural language understanding, and dialog management-Natural Voices is "Closest to the customer's ear," providing human-like speech output capabilities that will help accelerate the use of speech technologies in automated customer interaction systems.
- 2002—Distributed Feature Composition (DFC) was integrated with Web capabilities to create the V+Plus platform. DFC is a modular architecture for the description, analysis, and rapid implementation of telecommunication services. AT&T Labs also introduced the world's first cross-country distributed, large -scale optical mesh restoration technology.
- 2003—Advanced features for AT&T Consumer VoIP Trial built and deployed on the V+Plus Advanced Managed Voice Services platform. AT&T offered MVS2PC: Automated software migration from mainframe to Linux. AT&T Labs also offered Tomo-gravity: Invention of scalable methods for inference of large scale IP network-wide traffic matrices from link loads and SCAMP shown to be the world's largest publicly known database by far as verified by being awarded two Grand Prizes in the 2003 Winter Top 10 Very Large Database contest. Data management for SCAMP is provided by Daytona.
- 2004—Introduction of Ultra Long Haul WDM Transmission into AT&T's cross-country Fiber Network. AT&T Labs also offered Advanced features for AT&T CallVantage® Service deployed on the V+Plus Advanced Managed Voice Services platform and launched AT&T Internet Protect(sm) managed security services using proprietary technology from AT&T Labs including AT&T's Daytona(tm) data management system.
- 2005—Creation of AT&T Traffic Analysis Service (TAS) tools addressing 24x7 network-wide IP traffic analysis and leveraging Daytona(tm) scalable data warehouse technology. AT&T also had successful field trials of pre-standard WiMax equipment supporting broadband fixed wireless access to AT&T customers. AT&T Labs created innovative IP multicast network management tools to support industry-leading proactive and reactive management for AT&T's emerging IP multicast services.

Technical Expertise and a High Business IQ

AT&T has averaged over two global patents issued per business day since the inception of AT&T Labs. The goal is to continue to create value for AT&T's customers and the company through unmatched innovation.

AT&T Labs is recognized as the world's leading corporate R&D organization that focuses on developing next-generation solutions for the Internet and the world's networks. AT&T Labs development concentrates on technologies that align with AT&T's business objectives. We apply our research in practical and profitable ways. In research endeavors in fundamental sciences such as mathematics and cryptography, we focus on outcomes that are germane to the long-term interests of AT&T.

Unsurpassed expertise and real-world experience are key assets that enable AT&T Labs to create meaningful competitive advantages for AT&T customers and shareholders. Nearly 80% of the scientists and researchers that comprise the AT&T Labs Research unit have a Ph.D. or another advanced degree. Several are members of the National Academy of Science or National Academy of Engineering, and many more individuals are elected Fellows of prestigious industry organizations such as the IEEE and the ACM. In addition, members of AT&T

Labs Research have won major industry [awards and prizes](#) for their work. In the past two decades, over 50 AT&T Labs professionals have been named [AT&T Fellows](#) for demonstrated technical and scientific excellence.

Recent Outstanding Success Stories

AT&T Labs research has resulted in a steady course of major achievements over the past several years. A sampling of AT&T Labs' recent accomplishments includes:

- Developing a sophisticated text-to-speech (TTS) engine and synthesized voices referred to as *AT&T Natural Voices™*. The TTS technology, now a component of services for AT&T Business customers, is capable of creating remarkably natural-sounding synthetic speech in a variety of voices from computer-readable printed text.
- Creating *How May I Help You?™* (HMIHY), the most robust, flexible, and conversational natural language speech understanding system in the world. HMIHY has completed a successful field trial and is now widely deployed to handle the majority of AT&T Consumer Services customer-care traffic through its 0300 access number.
- Playing a key role in planning the deployment of the Nationwide Intelligent Optical Network. AT&T is moving to a new, all-optical network by doubling the amount of information that can be sent over optical fiber each year. The new network restores service faster in the event of a failure or disaster and can dramatically shorten provisioning time for new high-speed circuits for business customers who have direct access to the network, among other advanced capabilities.
- Deploying IP-enabled frame relay capabilities, giving customers the advantages of IP connectivity with the reliability of the frame relay system.
- Developing data mining solutions that have helped AT&T reduce fraud and save customers money. New solutions based on enhanced fraud management tools allow customers to access call detail securely for any phone number through a Web-based interface.
- Launching AT&T's *Global Enterprise Management System (GEMS)*, a comprehensive network, systems, and applications management platform. GEMS allows for end-to-end network viewing, failure prediction, and diagnostics on a global scale. It provides a significant competitive edge for AT&T and its customers.
- Evolving AT&T's e-commerce site to help consumers and business customers purchase calling plans online while reducing customer care costs.
- Developing AT&T Visualization of Massive Data Sets, a network visualization tool that uses powerful computer graphics and data mining to integrate and explore network information and efficiently put this knowledge to work in the AT&T Network.

AT&T Labs will apply these innovations to improve the customer experience, evolve AT&T's IP communications network and services, automate corporate systems and operations, and advance the company's intelligent networking efforts.

Contributions that Benefit the Entire Industry

AT&T Labs is a nexus of Internet research. Labs researchers have taken leading roles in the work of the World Wide Web Consortium (W3C), helping to define standards and shape the future of the Internet. Labs researchers have led efforts in improving Internet security—for example, helping to protect the personal information of Web users, to identify vulnerabilities of wireless networks, and to trace the sources of the unauthorized copying that significantly impacts the movie industry:

- AT&T Labs has contributed to the development of the P3P protocol, which became an official recommendation of the W3C in the spring of 2002. The adoption of P3P by browsers and Web sites will pave the way for effective privacy protection such as AT&T's Privacy Bird™ software.
- With the growing use wireless networks by businesses, AT&T Labs researchers such as Steve Bellovin have demonstrated the ease with which the security of these systems can be violated. Bellovin's work has spurred a drive for greater diligence in protecting the information being carried over such networks.
- Researchers at AT&T Labs and the University of Pennsylvania have concluded in a new study that 77% of all unauthorized copies of new and popular movies on file-sharing networks come from movie industry insiders and not consumers.

A Never-ending Commitment to Innovation

Although AT&T Labs is constantly evolving, its mission and philosophy will not change. AT&T Labs is committed to remaining the world's leading R&D center for communications and networking technologies, products, and services—focused on the success of AT&T and its business partners.

At AT&T Labs we are extremely proud of our pioneering history. This pride drives us to continue our pursuit of innovation. So, as rich as our history is, we believe the best is yet to come.

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