

Fritz Messere

BELL LABORATORIES, formerly AT&T's Bell Telephone Laboratories, Bell Laboratories is the research and development arm of Lucent Technologies. Bell Labs is the largest and most successful communications research facility in the world, boasting more than 26,000 patents and inventions. Many modern-day communications technologies including the transistor, communications satellite, and sound-motion pictures were developed at Bell Labs. Formed by Theodore Vail in 1925 as the successor to the Western Electric Research Laboratories, Bell Labs was created to integrate the various research and engineering programs of AT&T in one division. Under Frank B. Jewett, its first president, Bell Labs quickly developed key communications inventions that would modernize the communications industry and point to future development interests for the labs. Sound-motion pictures, television network transmission technology, and the negative-feedback circuit (which was important for the development of high-fidelity sound and long-distance telephony) were some inventions that came out within its first three years of operations.

During the next decade, Bell Labs invented stereophonic sound, speech synthesis, and the first electronic digital computer. As World War II approached, its efforts were directed toward helping the U.S. military solve problems in wireless telephony and radar. Later inventions and developments included coaxial cable, microwave relay, cellular telephony, and the Unix computer-operating system. While Bell Labs is probably best known for the development of the transistor, which ushered in the solid-state communications and computer eras, its inventors and scientists have developed an impressive list of modern communications technologies such as the charge-coupled device (CCD), used in most television cameras today; and electronic system switching, which made direct-distance dialing, 800 numbers, and call forwarding possible. Laser technology, developed in 1958, has revolutionized communications, helping to make the information age possible. Seven Bell Labs scientists have been awarded the Nobel Prize, and five have received the National Medal of Science. Breakthrough basic research points to the fact that Bell Labs has been blessed with brilliant researchers and has cultivated an environment supporting important basic research. Nobel Prize winner Karl Jansky is credited with being the father of radio astronomy, Claude Shannon originated a new area of mathematical inquiry called "information theory," and Arno Penzias and Robert Wilson are credited with detecting background radiation supporting the "Big Bang" theory. In 1985, President Ronald Reagan recognized the achievements of Bell Labs when it became the only U.S. laboratory ever to be awarded the National Medal of Technology.

During its early years, Bell Labs funding was split between revenues generated by AT&T as a regulated monopoly and those derived from its patents used in various manufacturing sectors. However, as a result of the 1956 Consent Decree, AT&T was barred from exploiting technologies not directly related to its core business as a telephone company. Many of the laboratories' innovations such as Unix, a popular computer-operating system, were not able to be marketed as a result. With the 1984 breakup of AT&T, Bell Labs was freed of the Justice Department constraints and was able to market its inventions and license its technology. Though some scientists and government policy makers expressed concern that without telephone tariff subsidies AT&T would be unable to afford to continue its tradition of funding basic research, AT&T chairman Robert A. Allen pledged to continue funding Bell Labs with a view toward long-term development. In 1996, as part of a massive restructuring of AT&T, Bell Labs became a subsidiary of Lucent Technologies,

Historical Dictionary of American Radio
Godfrey and Leigh
Greenwood Press @ 1998

Fritz Messere

currently under the leadership of Dan C. Stanzione. Bell Laboratories employs 25,000 people located in eight states and 21 countries.

Today, Bell Labs has focused its research into three areas related to the information age: microelectronics technology, photonics, and advanced-software systems. The lab is also involved in high-definition television (HDTV) and super-conductivity research. Though critics say that expenditures are out of proportion to the value of its commercial developments, Bell Labs is widely regarded as the finest private research organization in the world.

Baida, Peter. "Breaking the Connection." *American Heritage* 36 (5) (June—July 1985): 65-80.

Bernstein, Jeremy. *Three Degrees above Zero: Bell Labs in the Information Age*. New York: Charles Scribner, 1984.

Kleinfeld, Sonny. *The Biggest Company on Earth*. New York: Holt, Rinehart, and Winston, 1981.

BENNY, JACK 39

Oslin, George P. *The Story of Telecommunications*. Macon, Ga.: Mercer University Press, 1992.

"Why Own One of the Wonders of the World." *Economist* (July 13, 1991): 87-88.

Bell Laboratories. <http://www.bell-labs.com/>