

History of Telecommunication Technology

(A concise, organized overview for quick study)

Period	Key Development	Significance
Ancient civilizations (c. 3000?BC – 500?BC)	Smoke signals, drums, fire beacons, carrier pigeons	First long?distance “messaging” methods; relied on visual or auditory cues.
Optical telegraph (1792)	Claude?François?Chappe’s semaphore system in France	First mechanical system that transmitted information over hundreds of kilometers using visual arms.
Electrical experiments (mid?1800s)	Telegraphy (Samuel?Morse, 1837) – Morse code; telegraph wires	First practical use of electricity for instant long?distance communication; laid the groundwork for all later electronic networks.

- **Morse Telegraph** – Standardized code, global adoption.
- **Submarine cables** – 1850: First trans-Atlantic cable (failed); 1866: Successful cable (SS Great Eastern).
- **Multiplexing** – 1880s: Ability to send multiple messages over a single line (e.g., Wheatstone-type multiplex).
- **Impact** – Revolutionized news distribution, finance, military command; shrank perceived distance between continents.

Year	Milestone	Description
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History of Telecommunication Technology

1876	Alexander Graham Bell patents the telephone	Converts sound to electrical signals and back.
1880s	Early telephone exchanges	Manual switchboards connect callers.
1908	First transatlantic telephone call (via radio)	Demonstrates voice over long distances without cable.
1915	First commercial radio broadcast (KDKA, Pittsburgh)	Opens mass communication to the public.

- **Key concepts:** Analog modulation (AM), voice frequency (300–3400 Hz), early network topology (star, point-to-point).

4. Radio & Broadcasting (1920–1940)

- **AM Radio** – Dominant medium for news, entertainment; 1920s radio sets become household items.
- **Shortwave & International Broadcasting** – Enables global reach (e.g., BBC World Service, 1932).
- **FM Radio (1933)** – Edwin Armstrong's frequency modulation reduces static, improves fidelity.
- **Television (1936)** – First regular TV service (BBC); combines audio and video transmission.

5. The Wire-Based Digital Revolution (1940–1970)

Decade	Innovation	Effect on Telecommunication
1940s	Pulse Code Modulation (PCM) – Digitizes analog voice signals.	Basis for digital telephony and later data networks.
1950s	Coaxial cable – High-bandwidth transmission for TV and data.	Supports early cable TV and long-haul data links.
1960s	Satellite communications – Telstar (1962) launches first communications satellite.	Enables global live TV, telephone, and data links.
1970s	Integrated circuits (ICs) – Miniaturize switching equipment.	Reduces cost, increases reliability; paves way for digital switching.

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- Transition: