

# Evolution of Telecommunication Technology

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(A concise, structured overview for quick study)

## 1. Early Foundations (Pre-20th Century)

| Period                   | Key Development                                                                                                  | Impact                                                                                                    |
|--------------------------|------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Ancient & Medieval       | Smoke signals, drums, beacon fires, carrier pigeons                                                              | First long-distance “messaging” systems, limited to line-of-sight or animal speed.                        |
| 1800s – Electrical Era   | • <b>Telegraph (1830s–1840s)</b> – Morse code, Samuel Morse<br>• <b>Telephone (1876)</b> – Alexander Graham Bell | Enabled near-instant text and voice transmission over wires; laid the infrastructure for modern networks. |
| Late 1800s – Radio Waves | Heinrich Hertz demonstrates electromagnetic waves (1886–1889).                                                   | Provides the physical basis for wireless communication.                                                   |

## 2. The Birth of Wireless Communication (1900–1940)

| Year        | Milestone                                                 | Significance                                                   |
|-------------|-----------------------------------------------------------|----------------------------------------------------------------|
| 1901        | Guglielmo Marconi sends first transatlantic radio signal. | Demonstrates practical long-range wireless transmission.       |
| 1915        | First transatlantic voice radio broadcast.                | Voice over radio becomes feasible.                             |
| 1920s–1930s | Commercial AM radio broadcasting expands globally.        | Mass media reaches millions; creates a new information market. |
| 1937        | First public television broadcast (BBC).                  | Adds visual dimension to wireless media.                       |

## 3. Post-War Expansion & Analog Mobile (1940–1970)

| Phase       | Technology                                                             | Core Features                                        |
|-------------|------------------------------------------------------------------------|------------------------------------------------------|
| 1940s–1950s | <b>Microwave Relay Networks</b> – point-to-point line-of-sight towers. | High-capacity backbone for telephone and TV signals. |

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| Phase | Technology                                                   | Core Features                                                           |
|-------|--------------------------------------------------------------|-------------------------------------------------------------------------|
| 1960s | <b>Satellite Communications</b> – Telstar (1962).            | First geostationary communications satellite; global TV and data links. |
| 1970  | <b>First Mobile Phone Call</b> – Motorola DynaTAC prototype. | Portable voice communication; analog “1G” concept emerges.              |

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## 4. Digital Revolution (1970?1990)

| Decade     | Breakthrough                                                             | Resulting Services                                                     |
|------------|--------------------------------------------------------------------------|------------------------------------------------------------------------|
| 1970s      | <b>Digital Switching (SS7) and Packet Switching (ARPANET).</b>           | More reliable voice routing; foundation for data networks.             |
| 1980s      | <b>Cellular 1G (Analog)</b> – e.g., AMPS (Advanced Mobile Phone System). | First commercial mobile voice networks, limited capacity.              |
| Late 1980s | <b>Integrated Services Digital Network (ISDN).</b>                       | Digital voice + data over existing copper lines; early broadband feel. |

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## 5. The Internet Era & Broadband (1990?2005)

| Year  | Innovation                                                      | Effect on Telecom                                                |
|-------|-----------------------------------------------------------------|------------------------------------------------------------------|
| 1991  | <b>World Wide Web</b> (Tim Berners?Lee).                        | Explodes demand for data transmission.                           |
| 1992? | <b>DSL (Digital Subscriber Line) &amp; Cable Modem</b> rollout. | Broadband access over existing telephone/cable plants.           |
| 1993  | <b>2G (GSM)</b> – digital cellular, SMS text messaging.         | Massive increase in mobile subscriber base; data services start. |
| 1998  | <b>Fiber?to?the?Home (FTTH) trials</b>                          |                                                                  |