

Wireless Mobile Communication

Lecture 7

- Basic Cellular System

Topics to be Covered

- Basic Concepts
- Cordless System
- Pager System
- Base Station

Basic concepts

- Simplex, half-duplex, and full duplex

Full Duplex
Systems

Communication systems which allow simultaneous two-way communication. Transmission and reception is typically on two different channels (FDD) although new cordless/PCS systems are using TDD.

Half Duplex
Systems

Communication systems which allow two-way communication by using the same radio channel for both transmission and reception. At any given time, the user can only either transmit or receive information.

- Simplex Systems

Communication systems which provide only one-way communication.

- Most of system because of simplicity

- Time division duplexing, TDD:

- indoor system only, because of delay

- Different from FDMA and TDMA

Basic concepts

Base Station	A fixed station in a mobile radio system used for radio communication with mobile stations. Base stations are located at the center or on the edge of a coverage region and consist of radio channels and transmitter and receiver antennas mounted on a tower.
Mobile Station	A station in the cellular radio service intended for use while in motion at unspecified locations. Mobile stations may be hand-held personal units (portables) or installed in vehicles (mobiles).
Subscriber	A user who pays subscription charges for using a mobile communications system.
Transceiver	A device capable of simultaneously transmitting and receiving radio signals.
Mobile Switching Center	Switching center which coordinates the routing of calls in a large service area. In a cellular radio system, the MSC connects the cellular base stations and the mobiles to the PSTN. An MSC is also called a mobile telephone switching office (MTSO).
Control Channel	Radio channel used for transmission of call setup, call request, call initiation, and other beacon or control purposes.
Roamer	A mobile station which operates in a service area (market) other than that from which service has been subscribed.
Handoff	The process of transferring a mobile station from one channel or base station to another.
Page	A brief message which is broadcast over the entire service area, usually in a simulcast fashion by many base stations at the same time.

Pager System

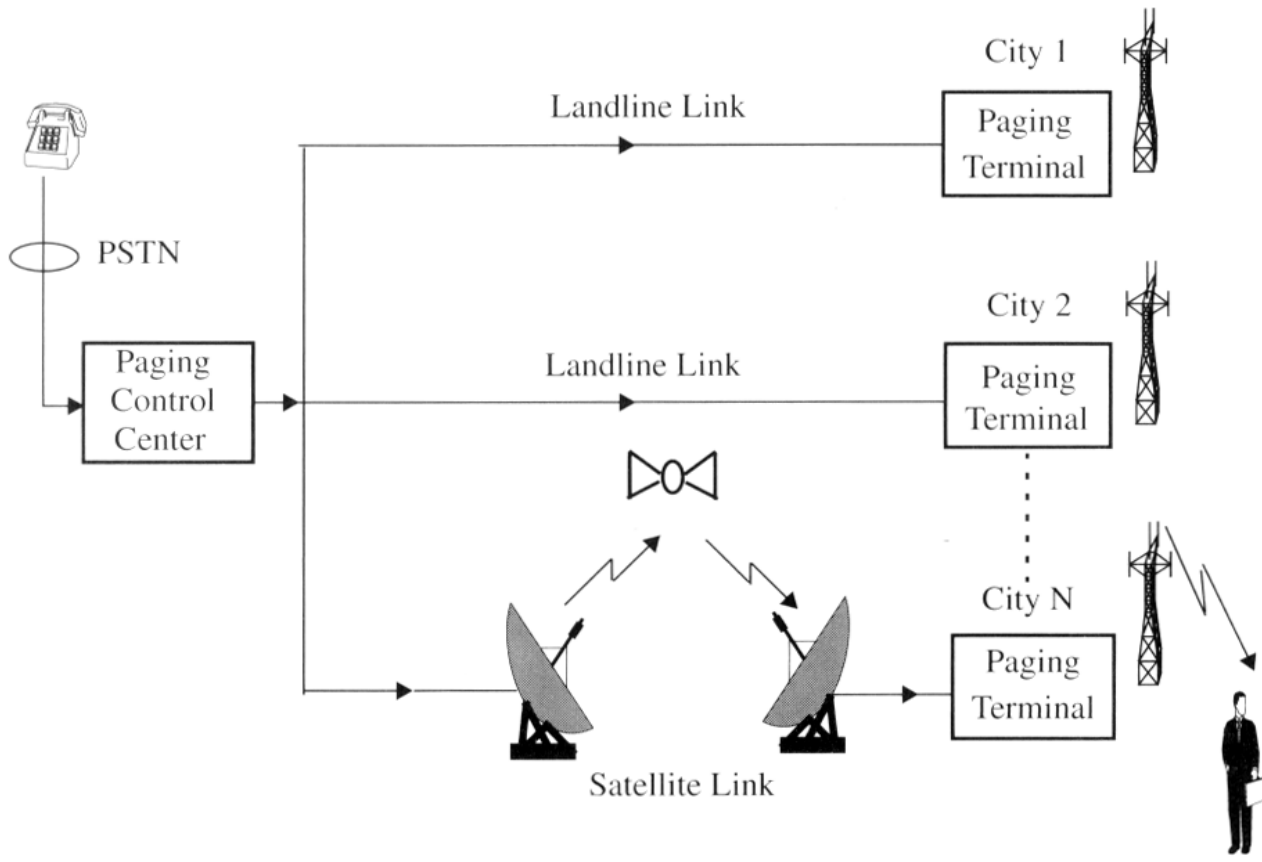


Figure 1.3 A wide area paging system. The paging control center dispatches pages received from the PSTN throughout several cities at the same time.

Cordless phone

- Virtually all telephones now sold in the US use the 900 MHz, 2.4 GHz, or 5.8 GHz bands. There is no specific requirement for any particular transmission mode on 900, 2.4, and 5.8, but in practice virtually all 900 MHz phones are inexpensive, bare-bones analog models; digital features such as [DSSS](#) and [FHSS](#) are generally only available on the higher frequencies.
- The recently allocated 1.9 GHz band is used by the popular [DECT](#) phone standard from Europe

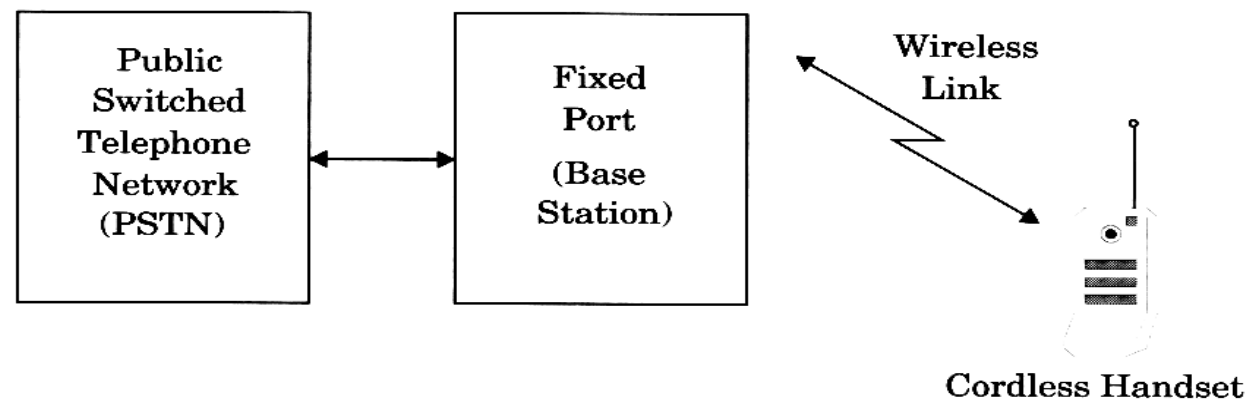


Figure 1.4 A cordless telephone system.