

# Wireless Mobile Communication

# Lecture 6

- Introduction to Cellular Mobile Communication

# Topics to be Covered

- Spectrum Allocation
- Various Standards used in various Countries

# Europe Standards

- GSM
- CT2
- Dect

**Table 1.2** Major Mobile Radio Standards in Europe

Standard	Type	Year of Introduction	Multiple Access	Frequency Band	Modulation	Channel Bandwidth
<b>ETACS</b>	Cellular	1985	FDMA	900 MHz	FM	25 kHz
<b>NMT-450</b>	Cellular	1981	FDMA	450-470 MHz	FM	25 kHz
<b>NMT-900</b>	Cellular	1986	FDMA	890-960 MHz	FM	12.5 kHz
<b>GSM</b>	Cellular /PCS	1990	TDMA	890-960 MHz	GMSK	200 kHz
<b>C-450</b>	Cellular	1985	FDMA	450-465 MHz	FM	20 kHz/ 10 kHz
<b>ERMES</b>	Paging	1993	FDMA	Several	4-FSK	25 kHz
<b>CT2</b>	Cordless	1989	FDMA	864-868 MHz	GFSK	100 kHz
<b>DECT</b>	Cordless	1993	TDMA	1880-1900 MHz	GFSK	1.728 MHz
<b>DCS-1800</b>	Cordless /PCS	1993	TDMA	1710-1880 MHz	GMSK	200 kHz

# Japan Standards

**Table 1.3** Major Mobile Radio Standards in Japan

Standard	Type	Year of Introduction	Multiple Access	Frequency Band	Modulation	Channel Bandwidth
<b>JTACS</b>	Cellular	1988	FDMA	860-925 MHz	FM	25 kHz
<b>PDC</b>	Cellular	1993	TDMA	810-1501 MHz	$\pi/4$ -DQPSK	25 kHz
<b>NTT</b>	Cellular	1979	FDMA	400/800 MHz	FM	25 kHz
<b>NTACS</b>	Cellular	1993	FDMA	843-925 MHz	FM	12.5 kHz
<b>NTT</b>	Paging	1979	FDMA	280 MHz	FSK	12.5 kHz
<b>NEC</b>	Paging	1979	FDMA	Several	FSK	10 kHz
<b>PHS</b>	Cordless	1993	TDMA	1895-1907 MHz	$\pi/4$ -DQPSK	300 kHz

# North American Major Standards

- PCS
- GSM
- Coreless
- FDMA
- TDMA
- CDMA
- Modulation
  - FM
  - QPSK
  - GMSK
  - BPSK
  - QAM

**Table 1.1** Major Mobile Radio Standards in North America

Standard	Type	Year of Introduction	Multiple Access	Frequency Band	Modulation	Channel Bandwidth
<b>AMPS</b>	Cellular	1983	FDMA	824-894 MHz	FM	30 kHz
<b>NAMPS</b>	Cellular	1992	FDMA	824-894 MHz	FM	10 kHz
<b>USDC</b>	Cellular	1991	TDMA	824-894 MHz	$\pi/4$ -DQPSK	30 kHz
<b>CDPD</b>	Cellular	1993	FH/ Packet	824-894 MHz	GMSK	30 kHz
<b>IS-95</b>	Cellular/ PCS	1993	CDMA	824-894 MHz 1.8-2.0 GHz	QPSK/ BPSK	1.25 MHz
<b>GSC</b>	Paging	1970s	Simplex	Several	FSK	12.5 kHz
<b>POCSAG</b>	Paging	1970s	Simplex	Several	FSK	12.5 kHz
<b>FLEX</b>	Paging	1993	Simplex	Several	4-FSK	15 kHz
<b>DCS-1900 (GSM)</b>	PCS	1994	TDMA	1.85-1.99 GHz	GMSK	200 kHz
<b>PACS</b>	Cordless/ PCS	1994	TDMA/ FDMA	1.85-1.99 GHz	$\pi/4$ - DQPSK	300 kHz
<b>MIRS</b>	SMR/PCS	1994	TDMA	Several	16-QAM	25 kHz
<b>iDen</b>	SMR/PCS	1995	TDMA	Several	16-QAM	25 kHz