

# Wireless Mobile Communication

# Lecture 5

- Wireless Local Area Network

# Topics to be Covered

- Wireless LAN
- Wireless Personal Area Network

# Wireless LAN and PAN

- Wireless Local Area Network (WLAN) using the IEEE 802.11
- HiperLAN is a European Standard
- Wireless Personal Area Network (WPAN)
  - Bluetooth
- HomeRF

# Wireless LANs or WLANs

- Based largely on spread-spectrum technology.
- Operate in IR, radio range (e.g., 2.4-2.4834 GHz).
- Raw bandwidth 4 MHz with effective throughput around 2 Mbps per hub. Infrared-based bridges run at speed up to 622 Mbps.
- Standards were finalized in 1997 by IEEE (802-11)
- Moderate success over the last few years.

# Wireless local loop (WLL)

- Local loops were owned by ILECs (incumbent local exchange carriers). The Telecommunication Act of 1996 opened the local loops for competition.
- Options:
  - twisted pair (old and slow); not the way to go
  - fiber: optimum choice, but too expensive now for low capacity application (needs killer applications).
  - So, Wireless local loops is a good choice. But it radio frequency and other electromagnetic interference can be a problem.

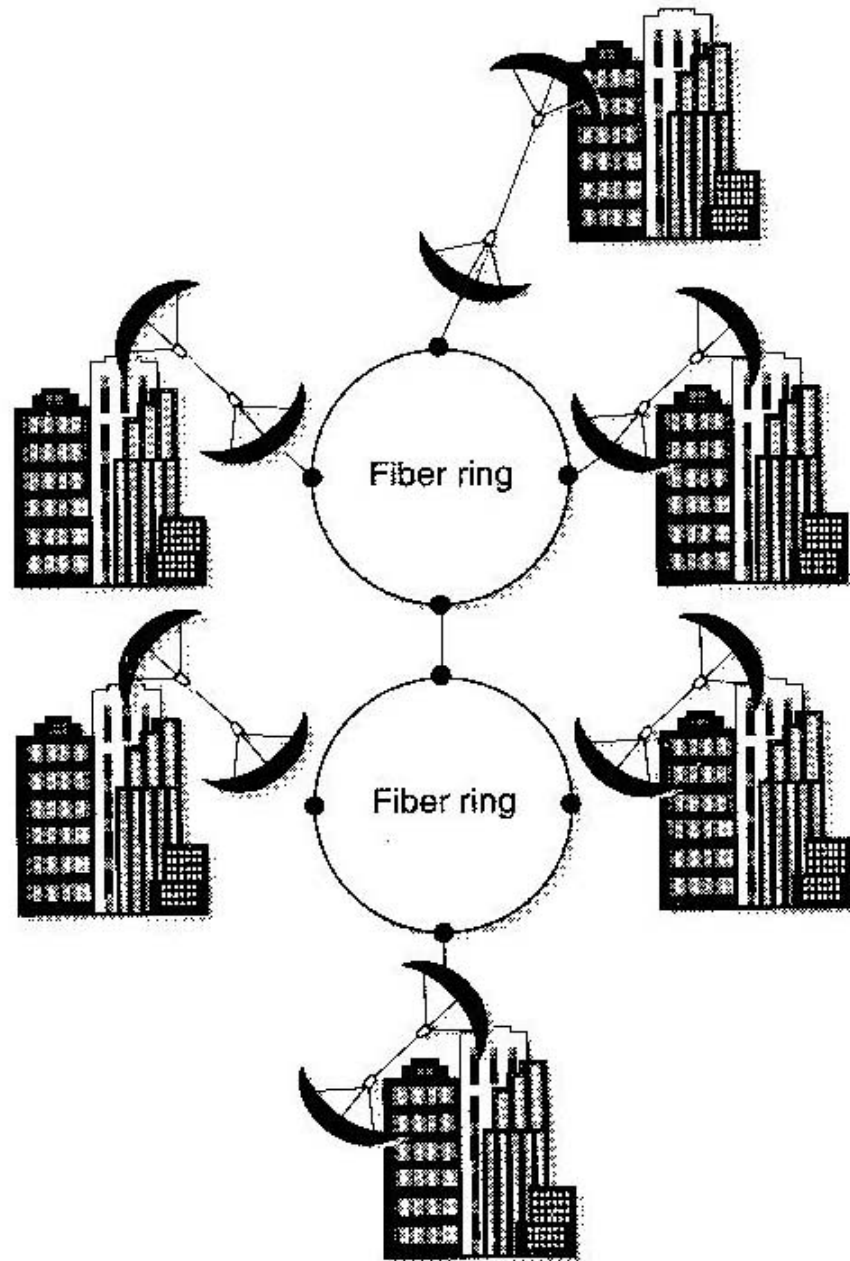


Figure 11-10 Wireless Local Loop (WLL) configurations

# Low-earth orbiting satellites (LEOs)

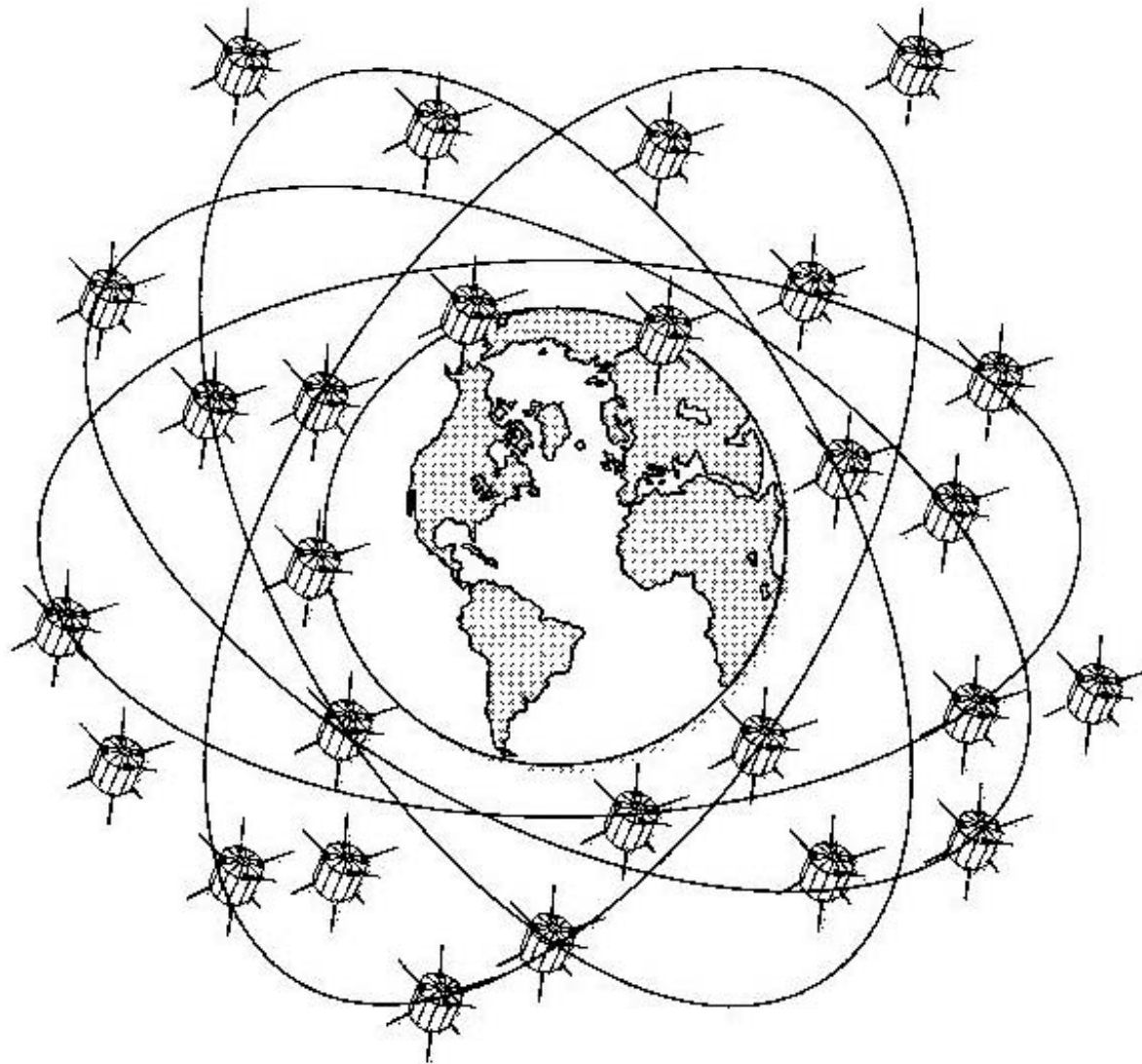


Figure 11-11 Low-Earth Orbiting (LEO) satellite constellation



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**Table 11-2 SATELLITE FREQUENCY BANDS**

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<b>IEEE Band Designation</b>	<b>Frequency Range (Upper-Lower Limits)</b>
L-band	1-2 GHz
S-band	2-4 GHz
C-band	4-8 GHz
X-band	8-12 GHz
Ku-band*	12-18 GHz
K-band	18-27 GHz
Ka-band**	27-40 GHz
Q-band***	33-50 GHz
U-band****	40-60 GHz
V-band*****	40-75 GHz
W-band	75-110 GHz

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\*Ku = under K-band

\*\*Ka = above K-band, commonly designated as 20-30 GHz

\*\*\*FCC designation

\*\*\*\*FCC designation

\*\*\*\*\*FCC designation, 50-75 GHz

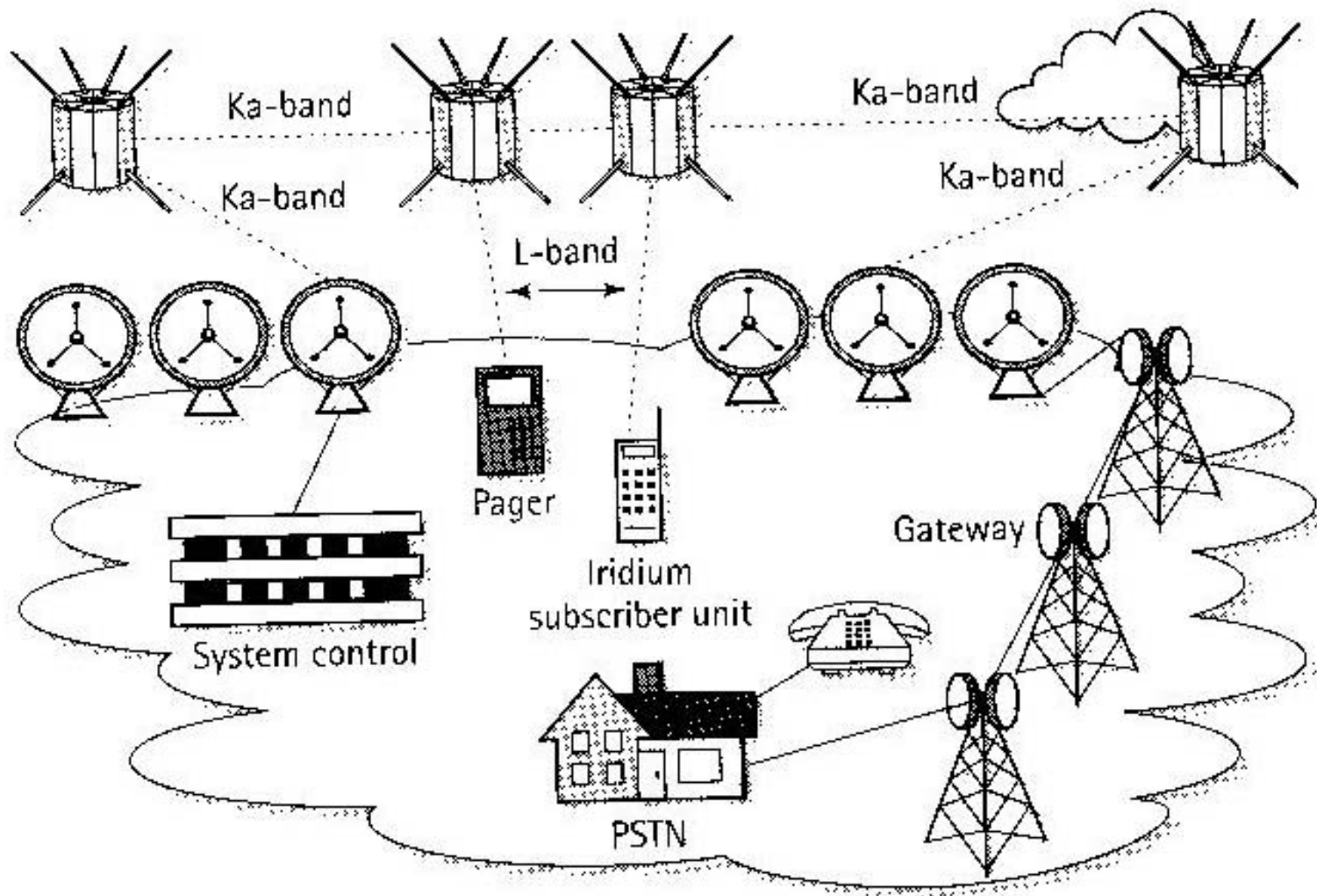


Figure 11-12 Iridium network