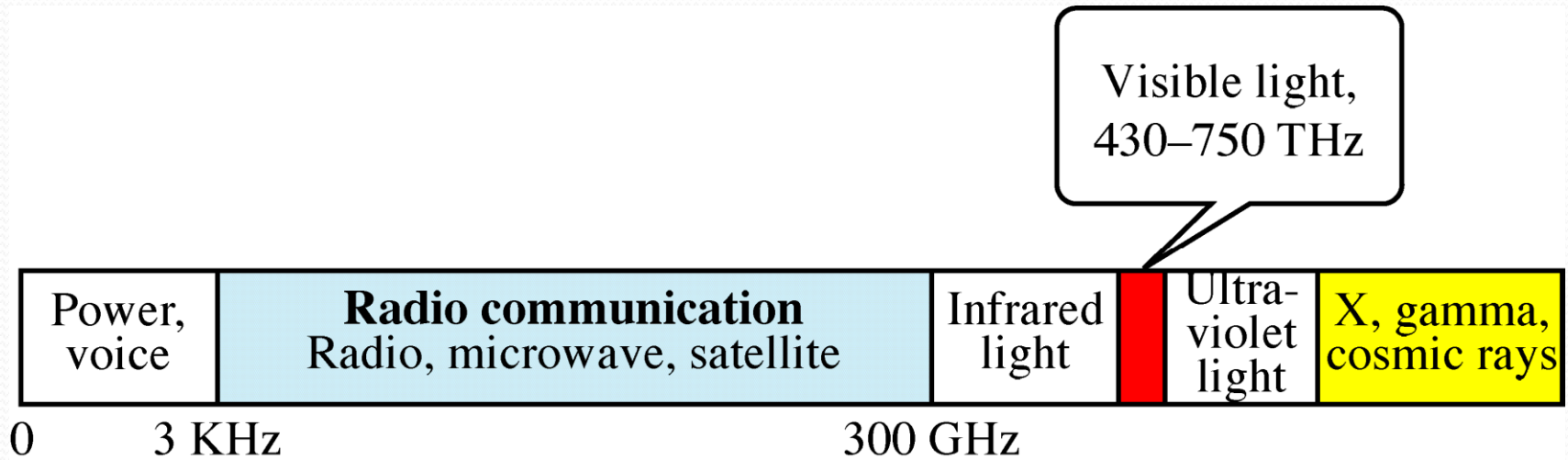


Transmission Media

- **Guided Media**
- **Unguided Media**

Electromagnetic Spectrum



```
graph TD; A[Transmission media] --> B[Guided]; A --> C[Unguided]
```

Transmission
media

Guided

Unguided

```
graph TD; A[Guided media] --- B[Twisted-pair cable]; A --- C[Coaxial cable]; A --- D[Fiber-optic cable];
```

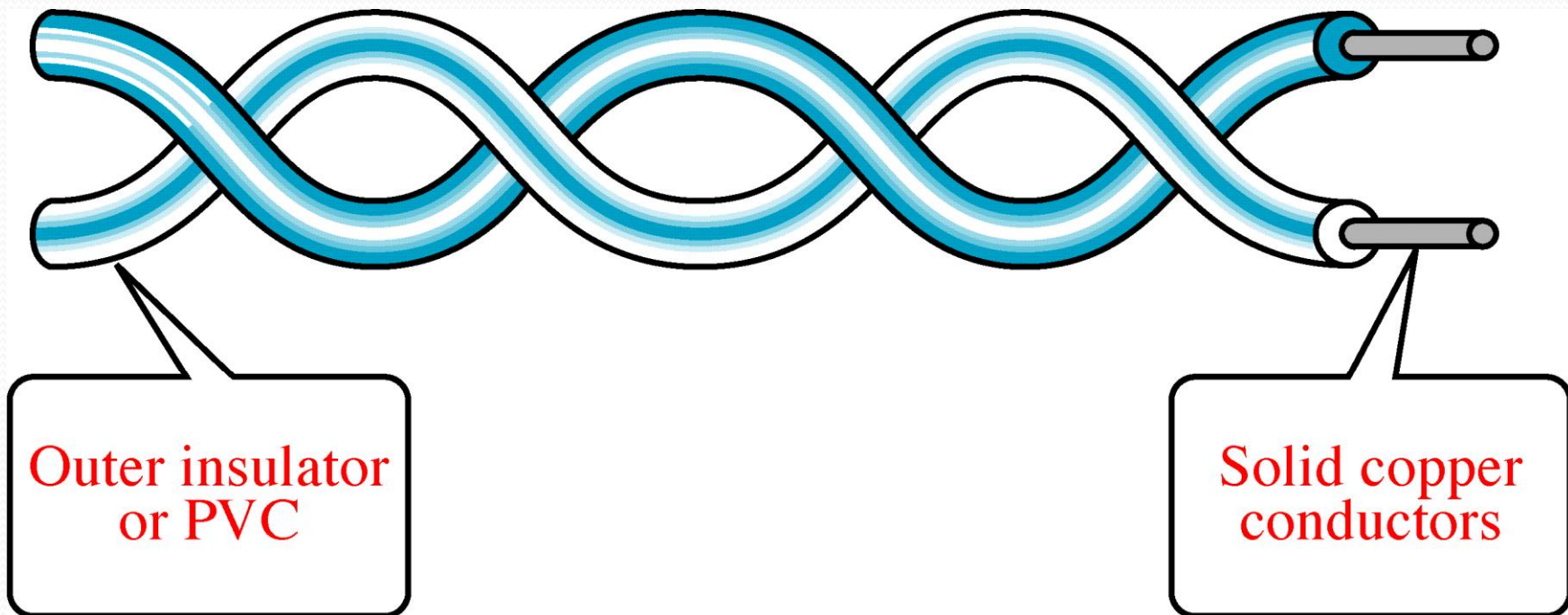
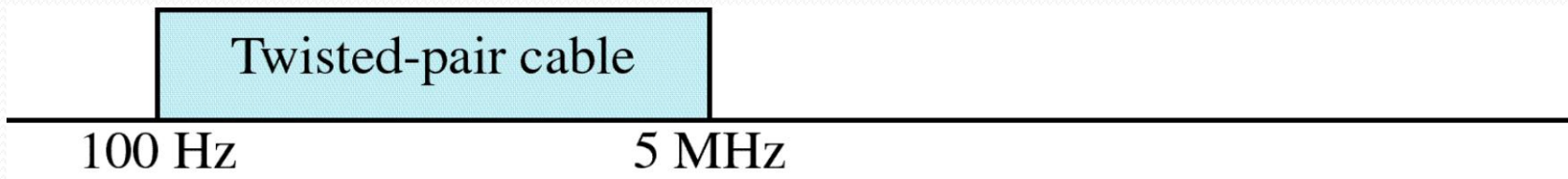
Guided media

Twisted-pair
cable

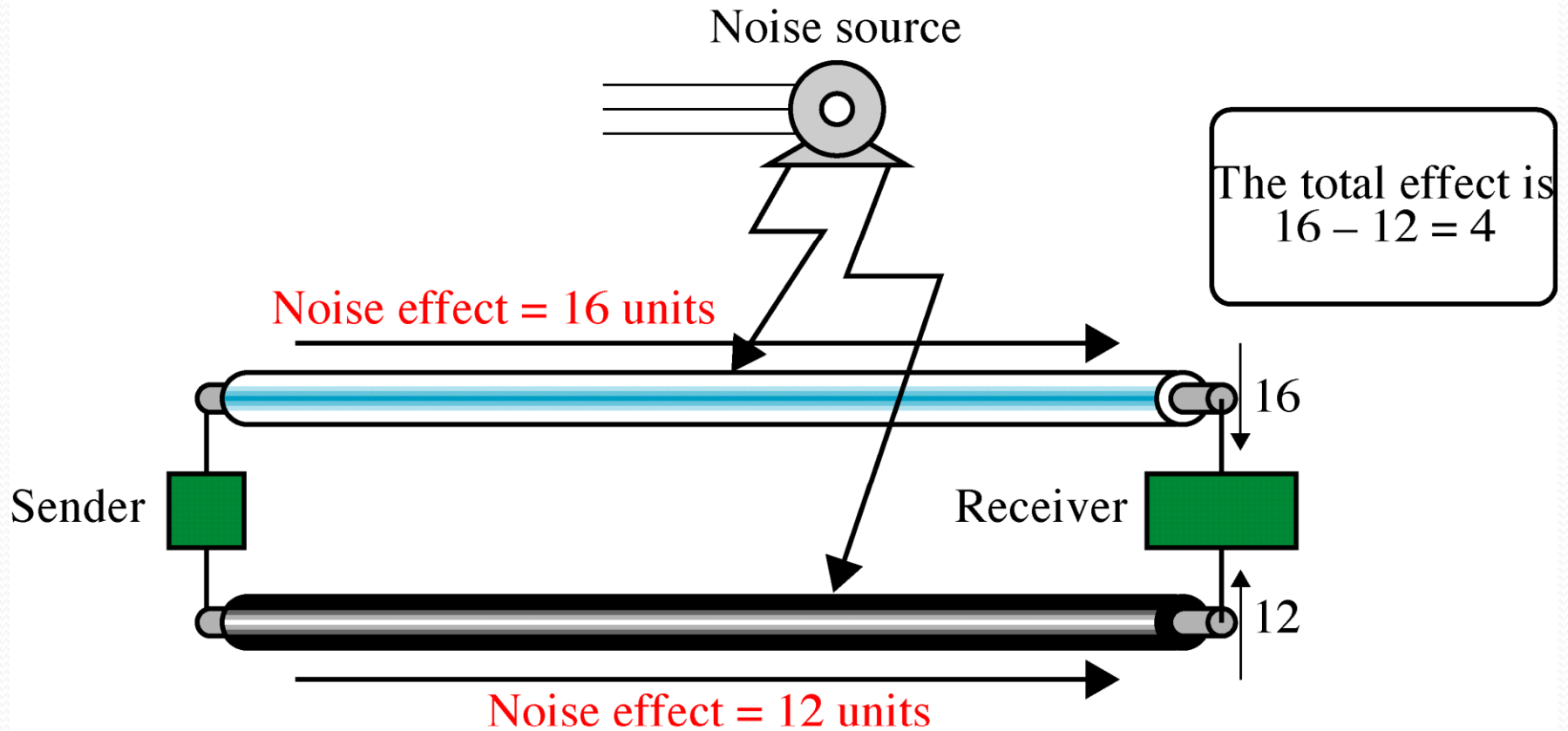
Coaxial
cable

Fiber-optic
cable

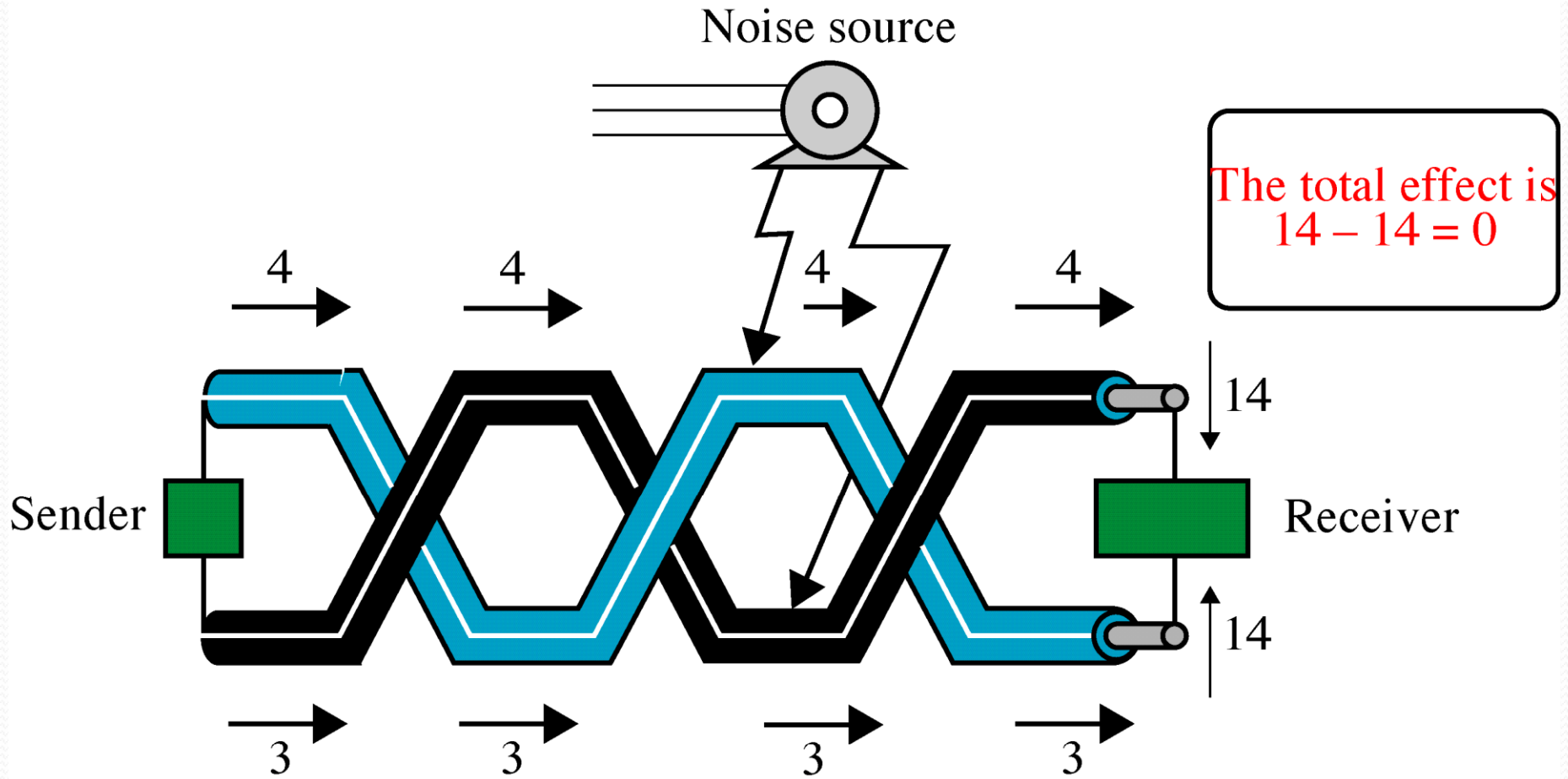
Twisted-Pair Cable



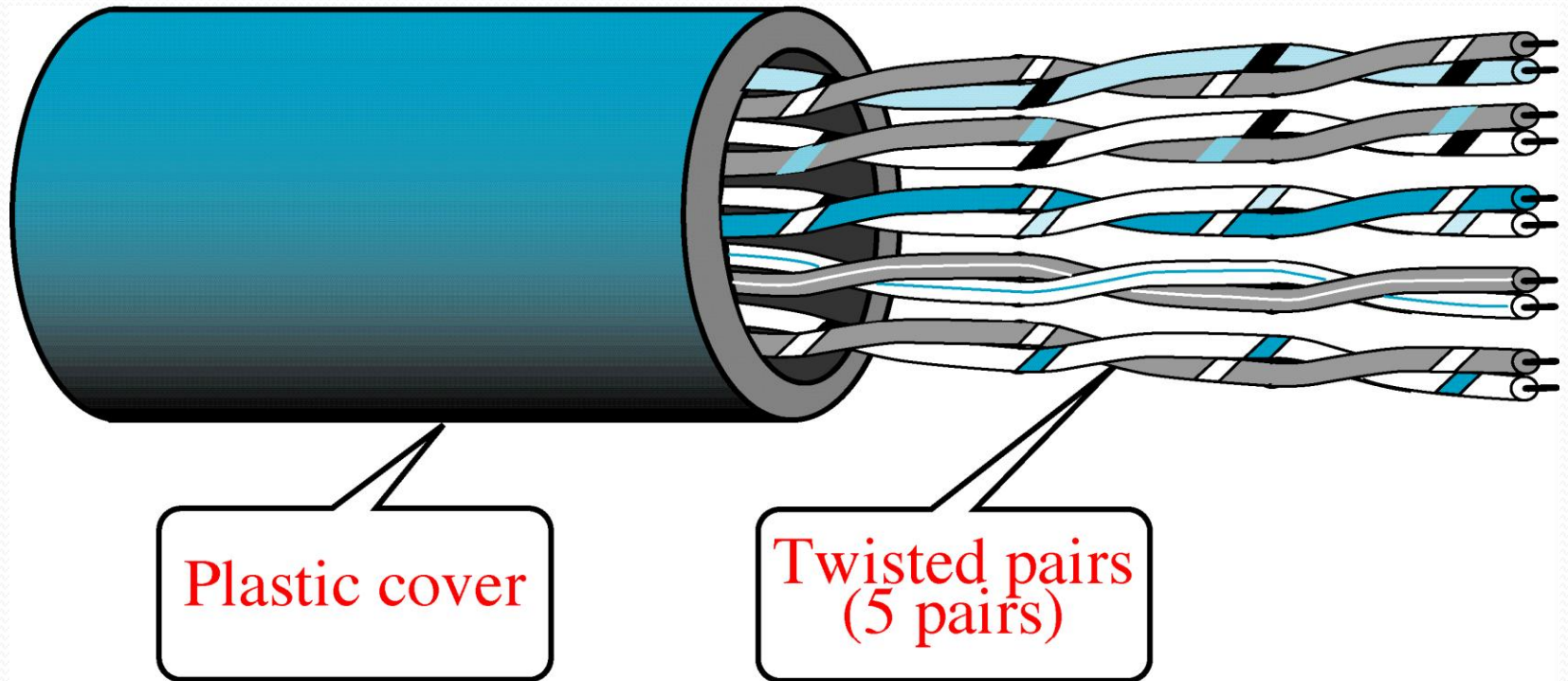
Effect of Noise on Parallel Lines



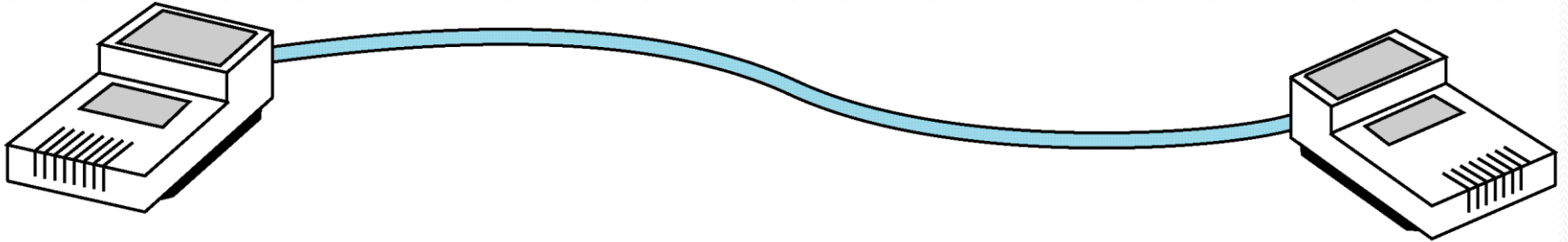
Noise on Twisted-Pair Lines



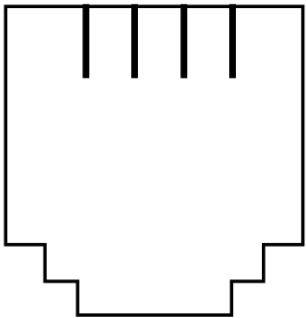
Unshielded Twisted-Pair Cable



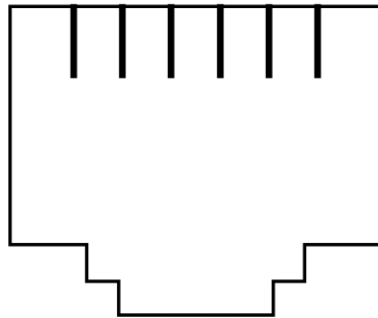
UTP Connectors



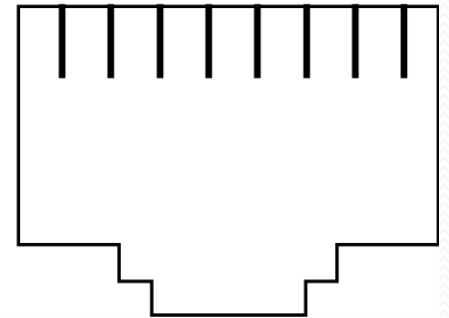
4-conductor



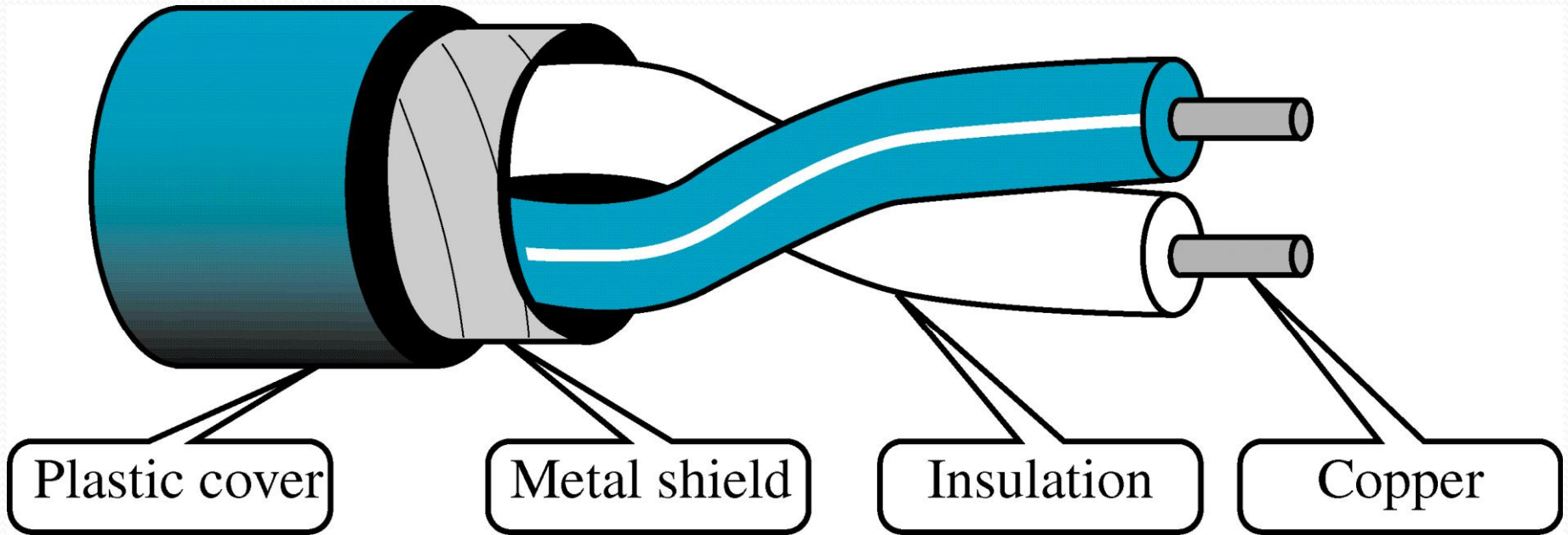
6-conductor



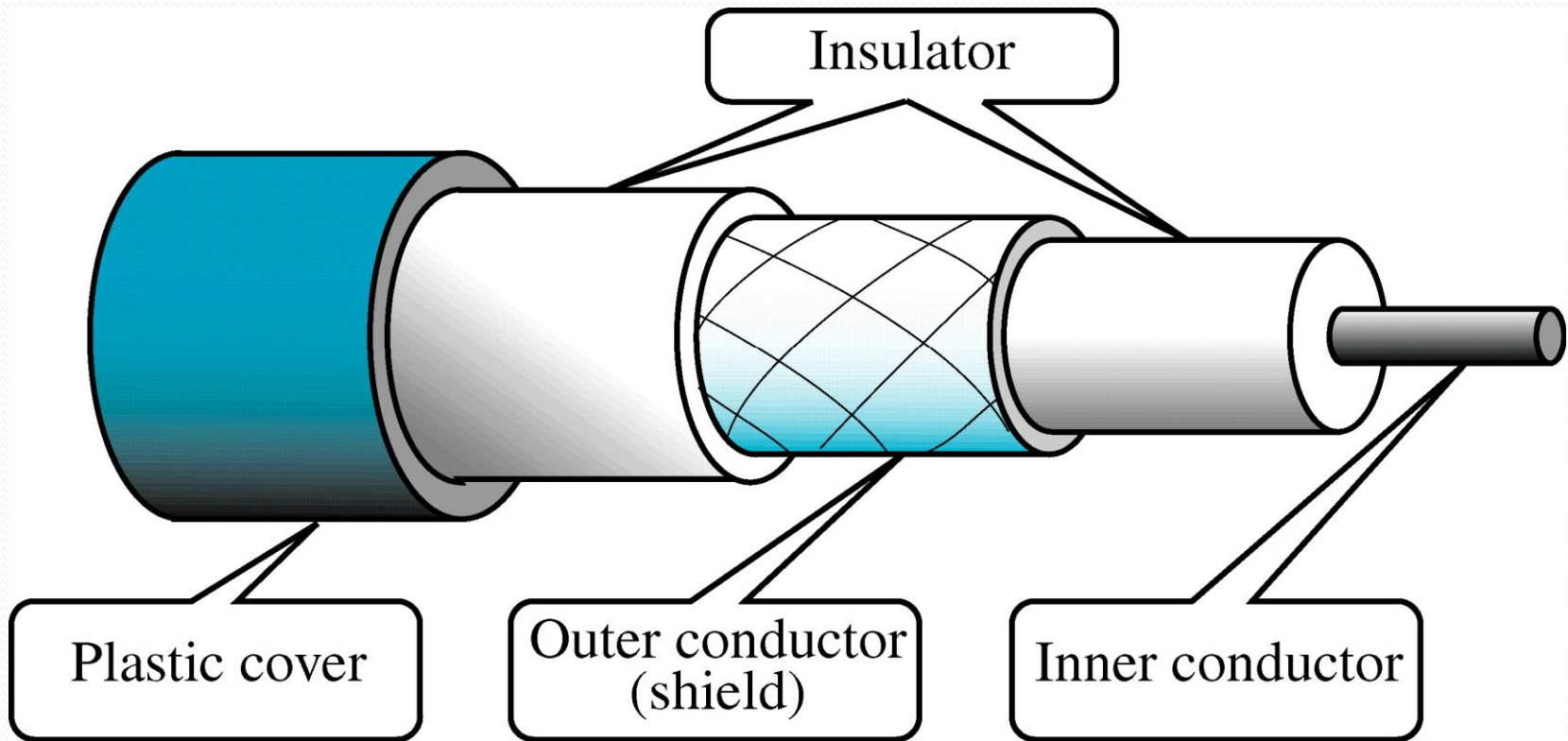
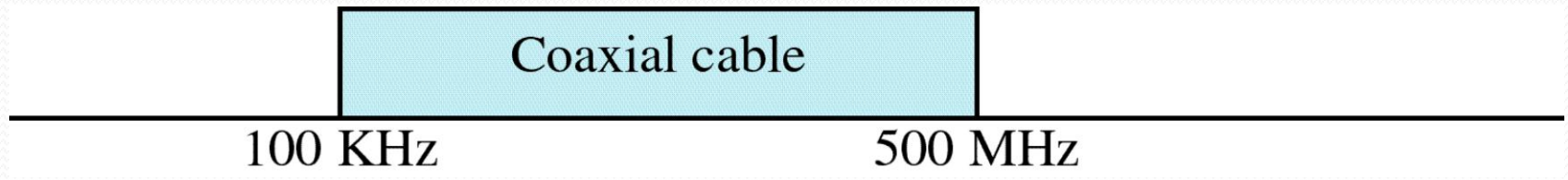
8-conductor



Shielded Twisted-Pair Cable



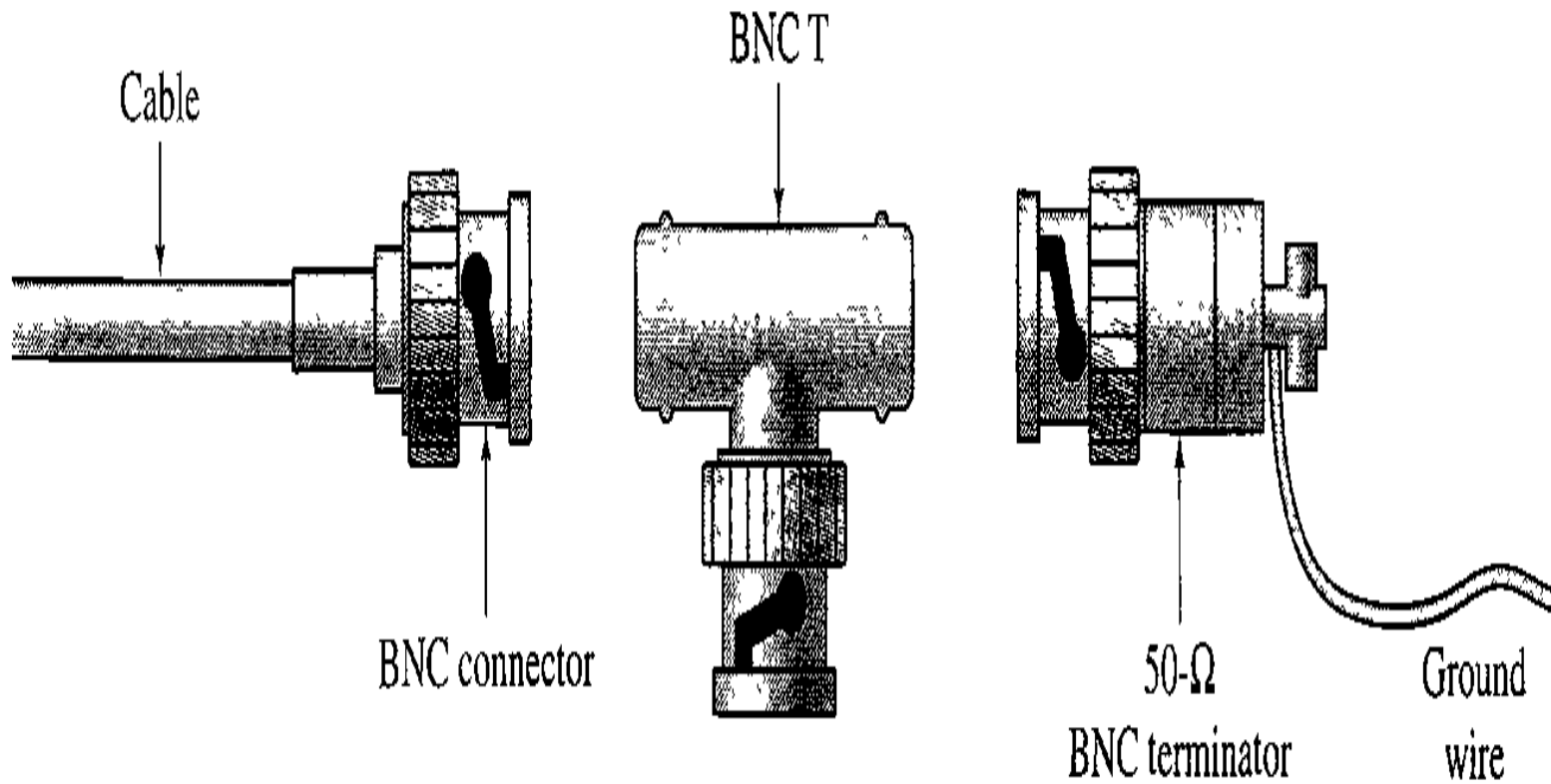
Coaxial Cable



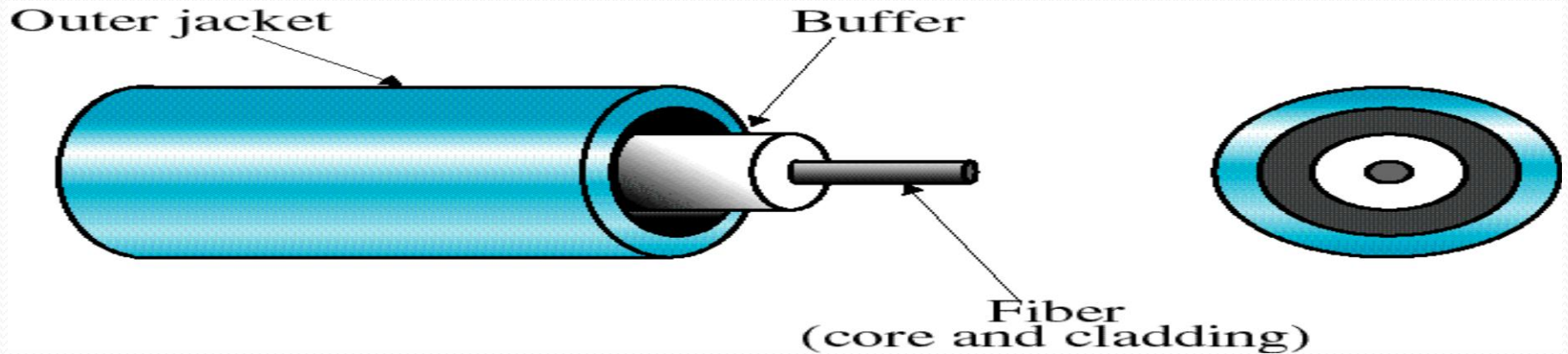
CATEGORIES OF COAXIAL CABLES

CATEGORY	IMPEDENCE	USE
RG-59	75 Ohm	Cable TV
RG-58	50 Ohm	Thin Ethernet
RG-11	50 Ohm	Thick Ethernet

BNC(Bayone-Neill-Concelman) Connector



Fiber Construction



- ✓ Fiber Optic is made of glass or plastic and transmit signals in the form of light.
- ✓ Bandwidth capacity is certainly in excess of 50,000Gbps(50 Tbps).
- ✓ Similar to coax, except without outer braid.
- ✓ Core is typically 8-10 microns in diameter, about the thickness of a human hair.
- ✓ Fiber can connect in three ways:
 - ✓ They can terminate in connectors and be plugged into fiber socket.
 - ✓ Spliced manually with special sleeve and clamp them in place.(10% light loss).
 - ✓ Two pieces of fiber can be fused to form solid connector

Light Sources in Fiber Optic Cable

Two Kinds of light sources are typically used to do the signaling:

- ✓ LED
- ✓ Semiconductor Laser

Item	LED	Semiconductor Laser
Data Rate	Low	High
Fiber Type	Multi cost	Multimode or single mode
Distance	Short	Long
Lifetime	Long Life	Short Life
Temperature Sensitivity	Minor	Substantial
Cost	Low Cost	Expensive

- ✓ The receiving end of an optical fiber consists of photodiode, which gives off an electrical pulse when struck by light.
- ✓ Response time of a photodiode is 1 nsec, which limits data rate refers to about 1Gbps

