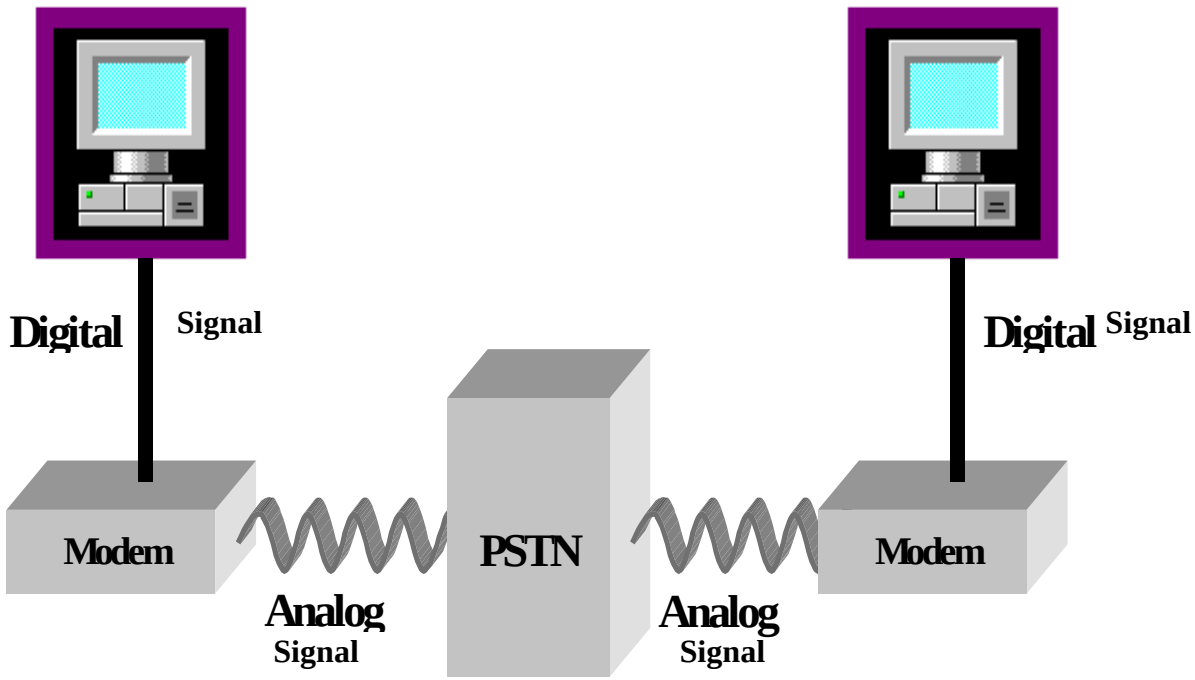
Network Communications Chapter 7

Modems, DSL, Cable Modems and ISDN

Public Switched Telephone Network (PSTN)



PSTN Public Switch Telephone Network

Figure 7.1

Telephone Carrier Signal (Sine Wave)

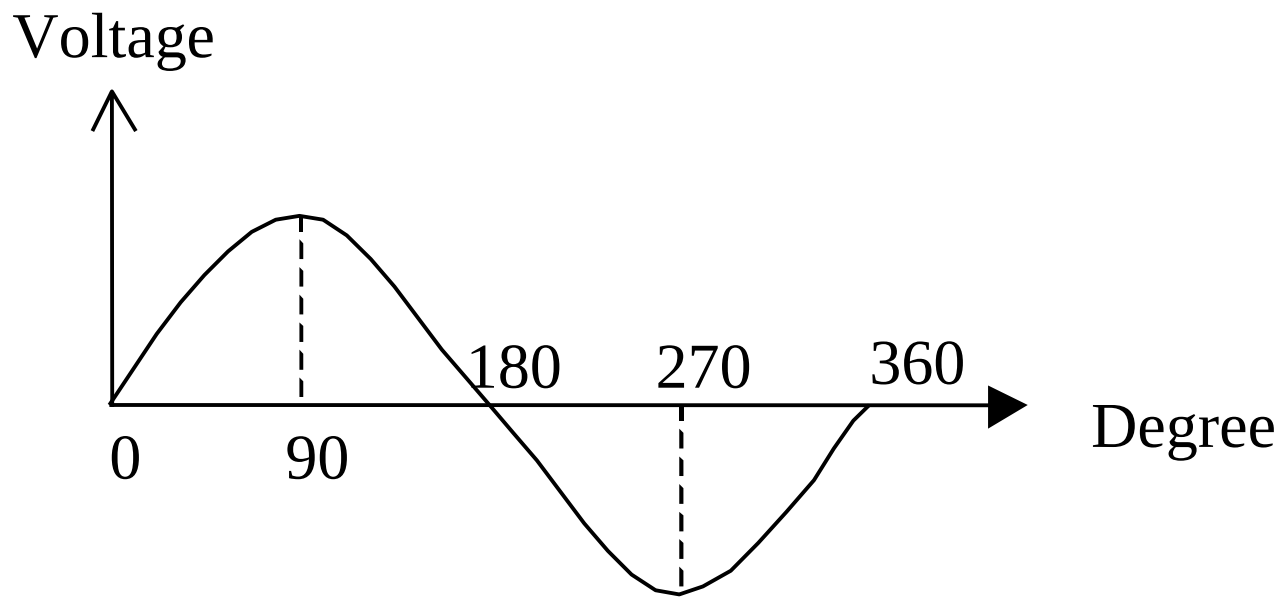


Figure 7.2

Amplitude Shift Keying (ASK)

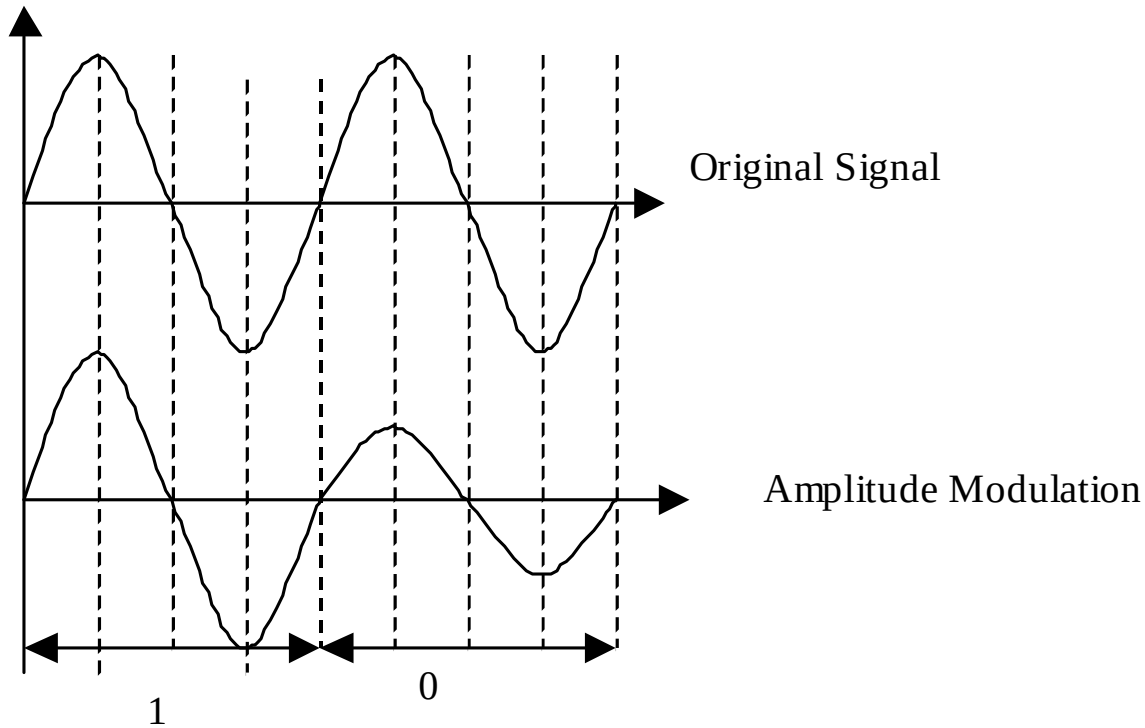


Figure 7.3

Frequency Shift Keying (FSK)

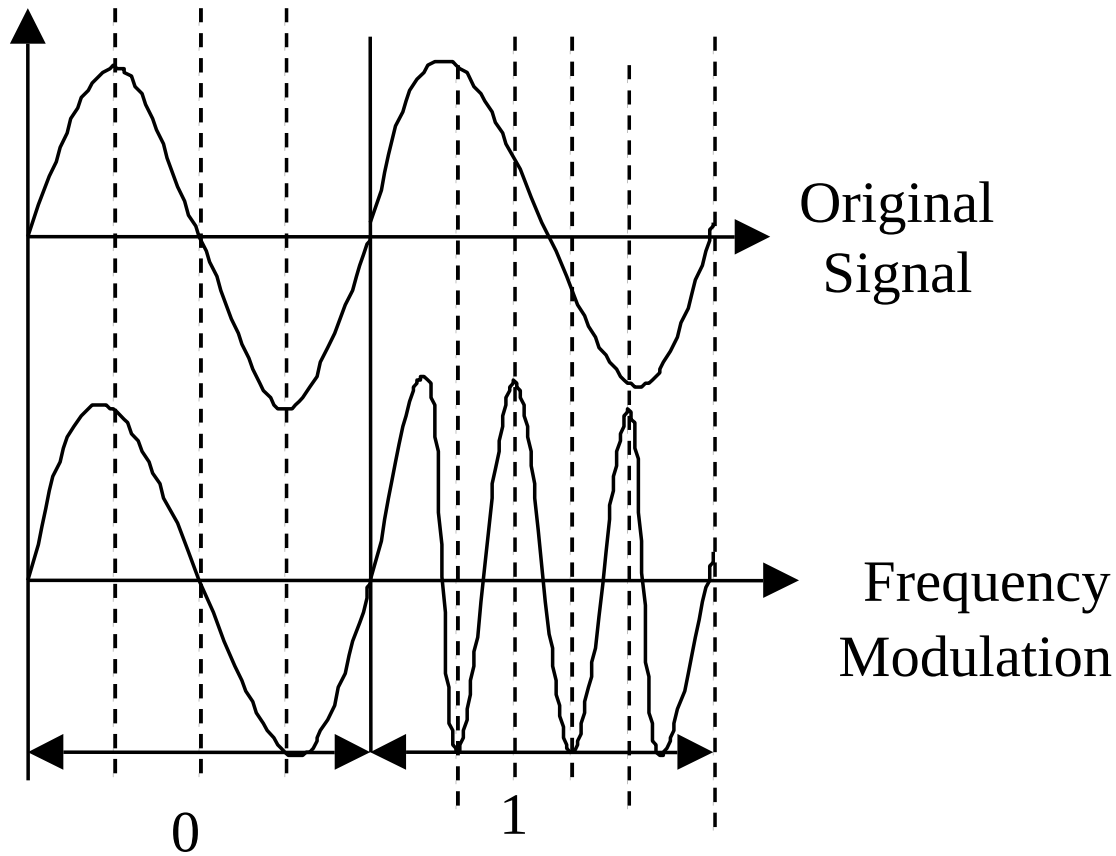


Figure 7.4

90 Degree Phase Shift

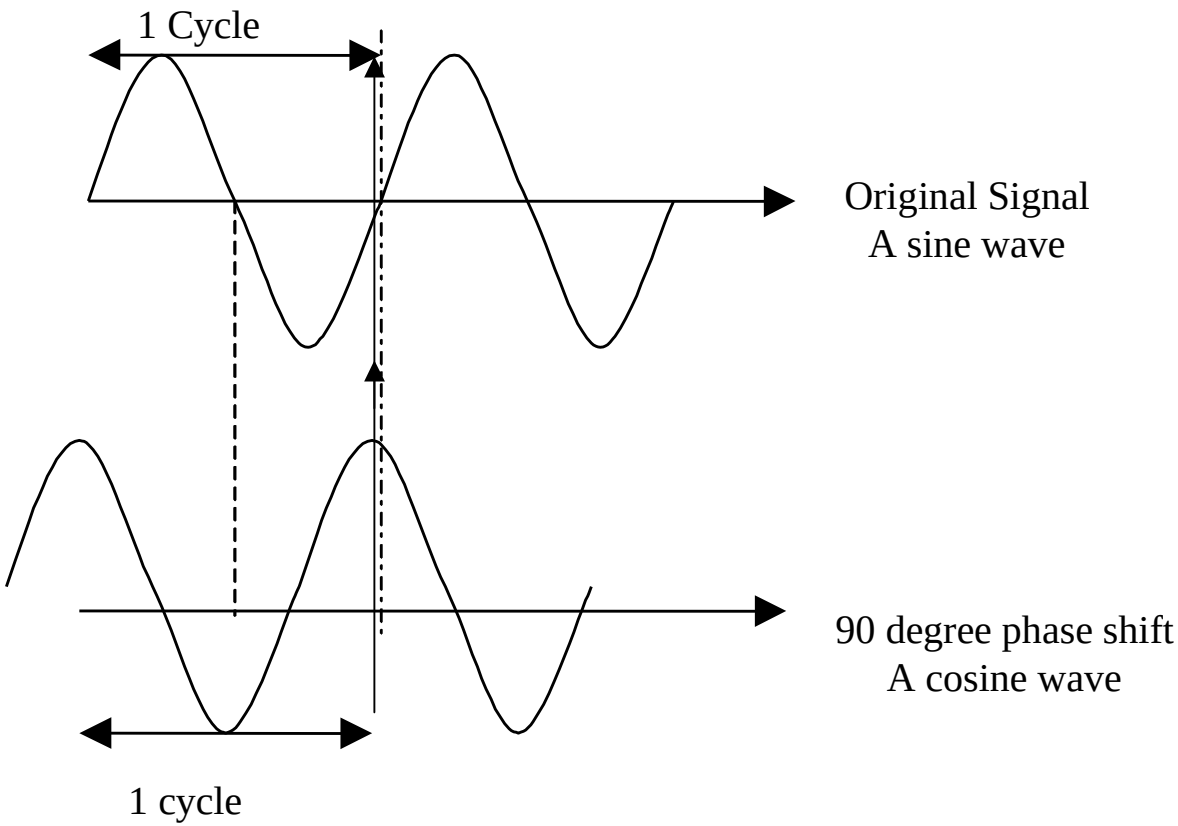
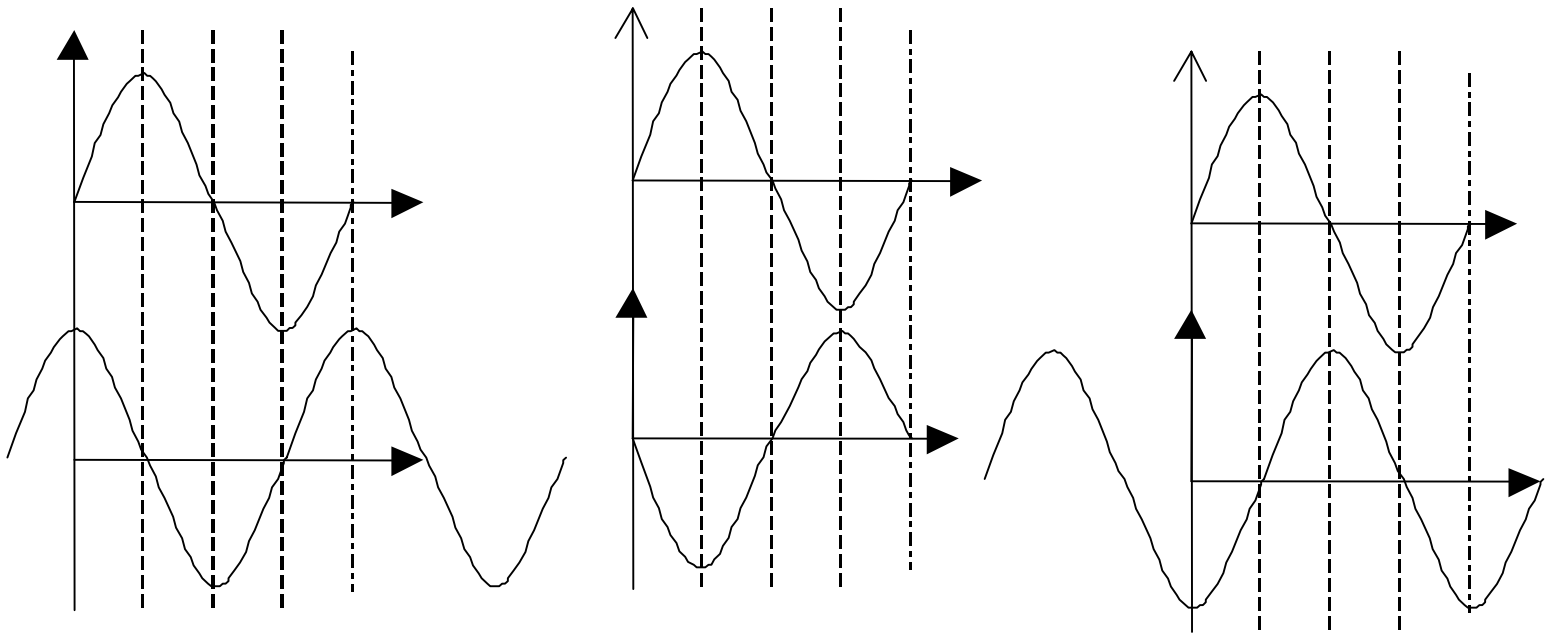


Figure 7.5

Phase Shifting the Carrier



a. 90 degree shift

b. 180 degree shift

c. 270 degree shift

Figure 7.6
Note: Error in text

Constellation Diagrams

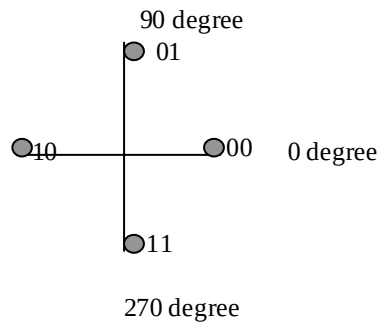


Figure 7.7
QPSK

Bits	Phase Shift
00	0
01	90
10	180
11	270

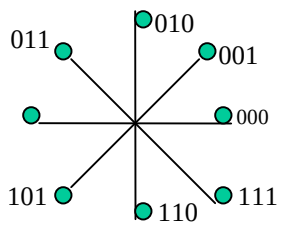


Figure 7.8
8-PSK

Bits	Phase Shift
000	0
001	45
010	90
011	135
100	180
101	225
110	270
111	315

8 – QAM Modulation

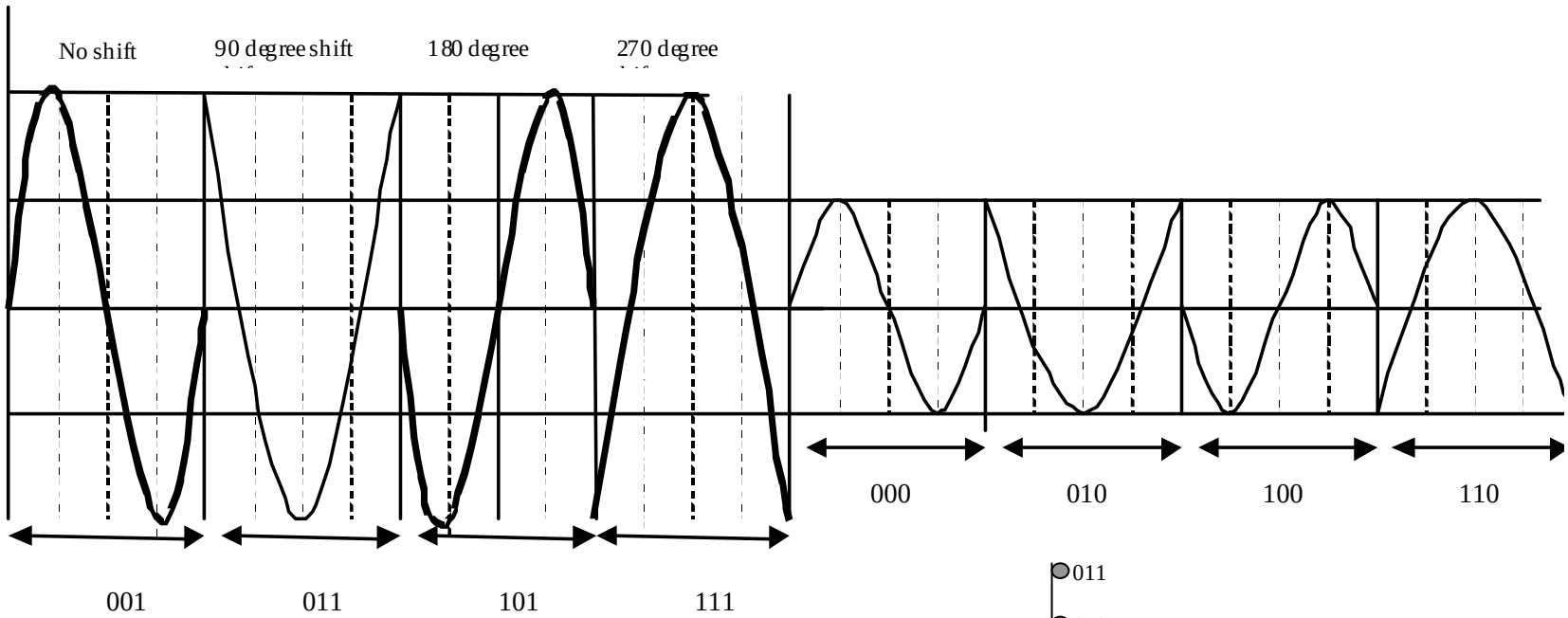


Figure 7.9

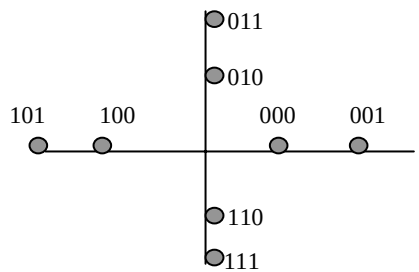


Figure 7.10

56 Kb/sec Modem Connection

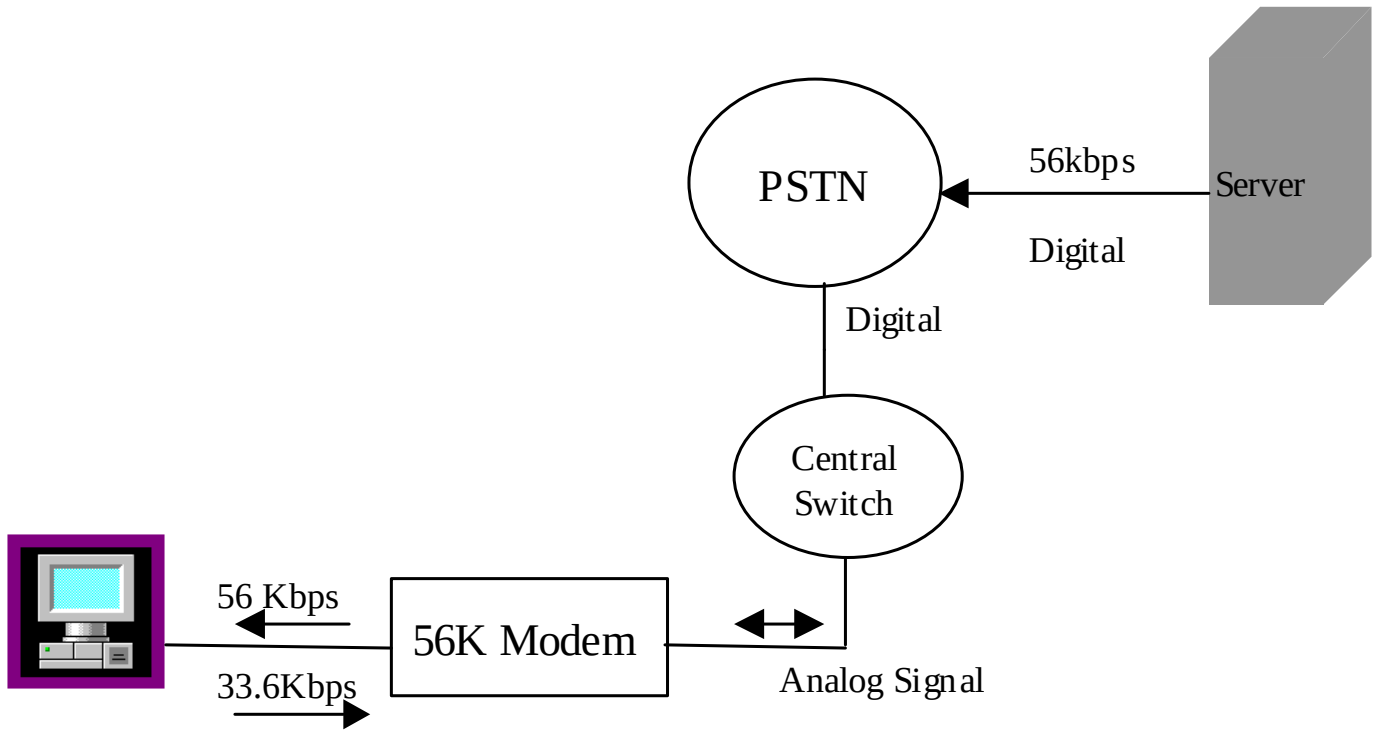


Figure 7.11

ADSL Modem

Asymmetric Digital Subscriber Line

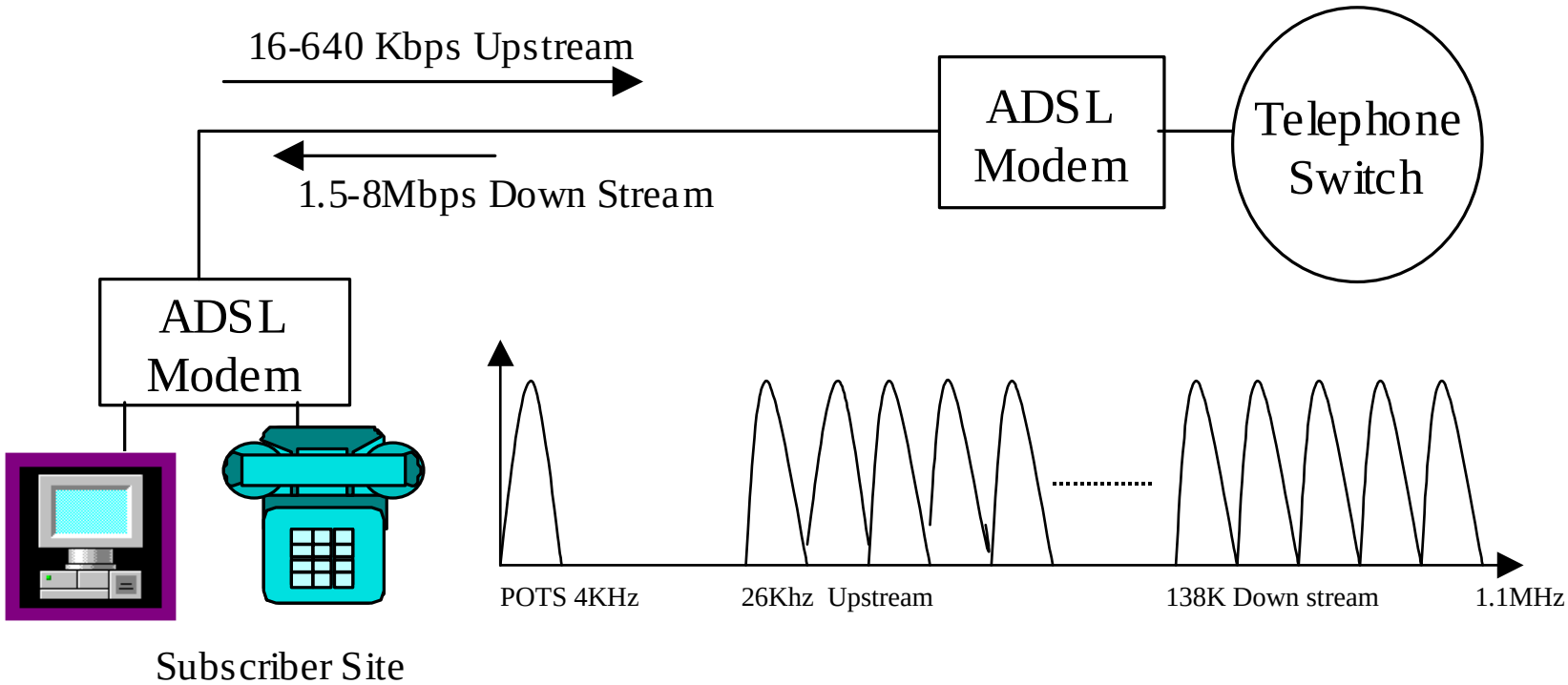


Figure 7.12

Figure 7.13

ADSL Modem Architecture

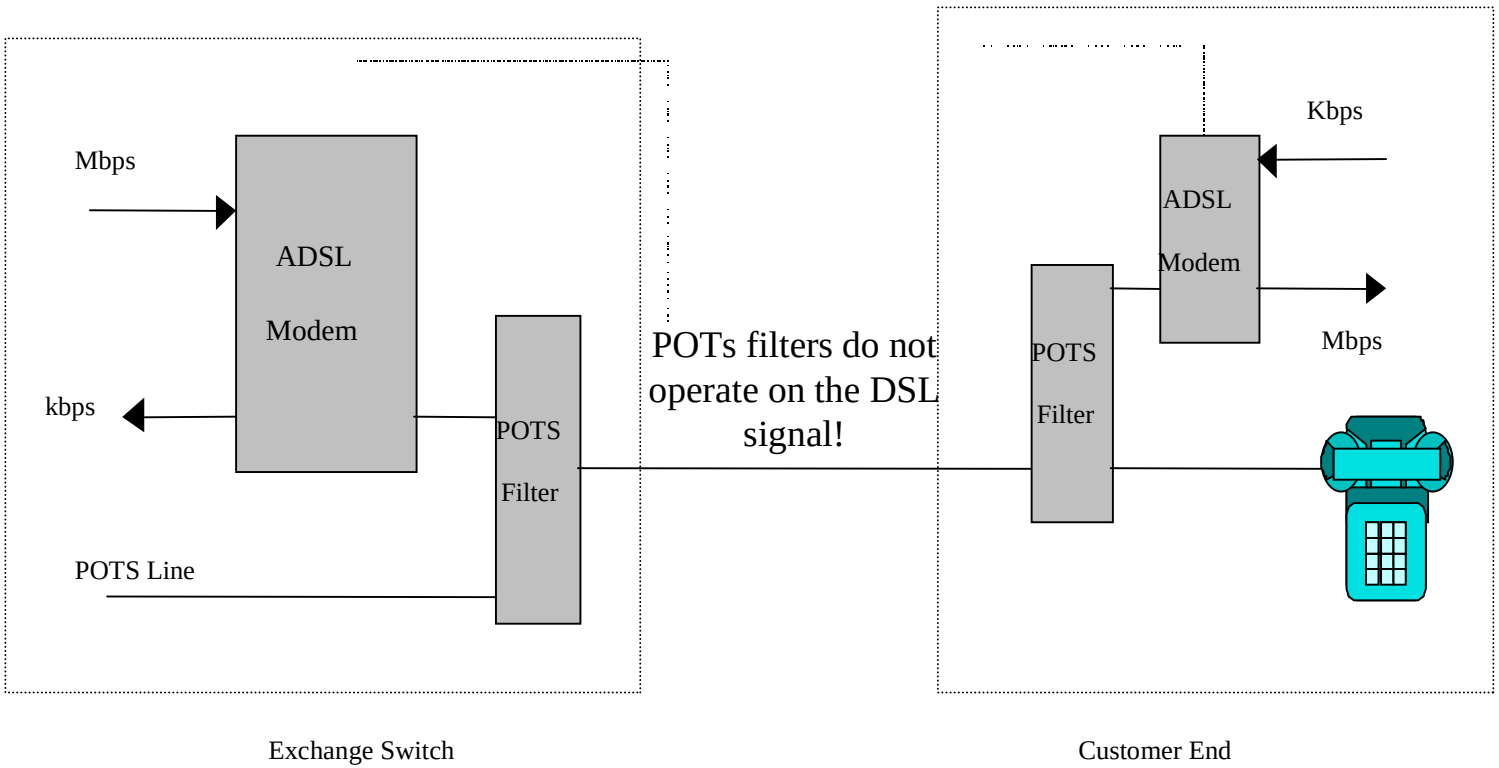


Figure 7.14

Cable TV Distribution

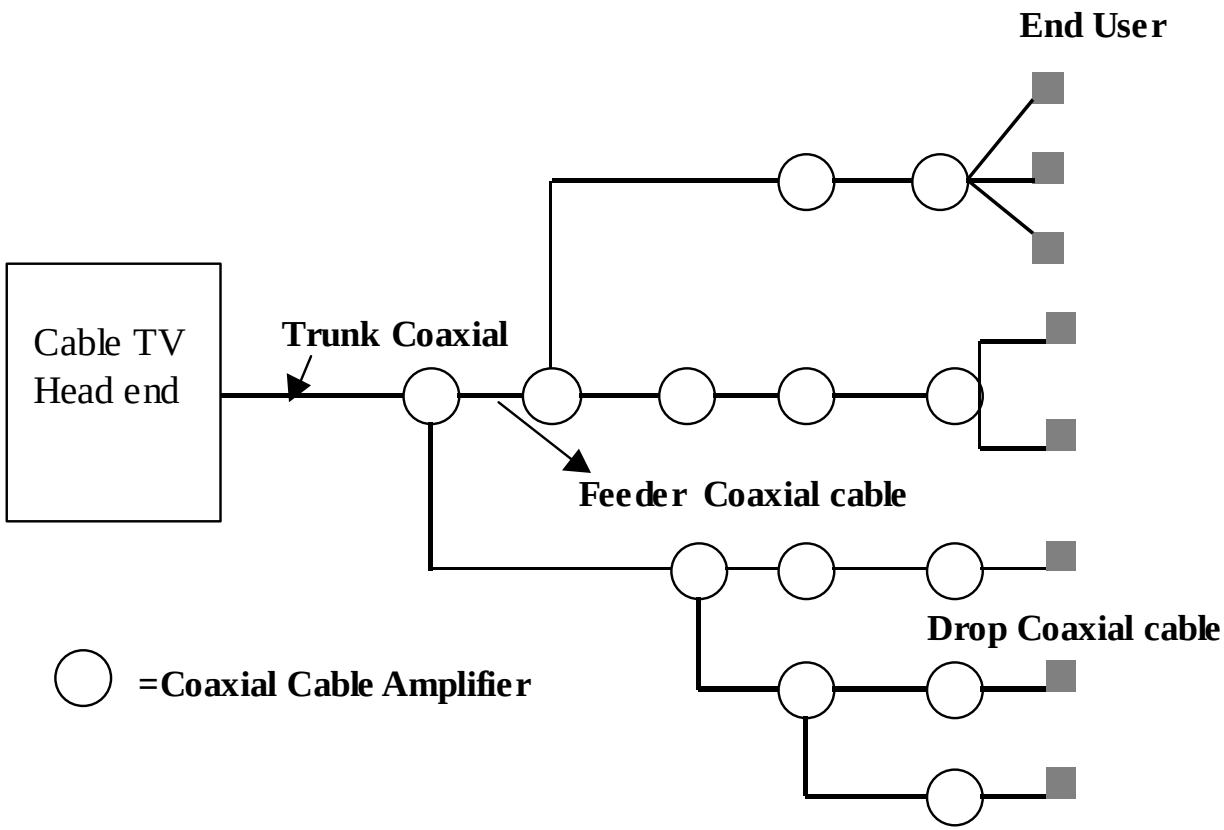


Figure 7.15

Hybrid Fiber Coax (HFC)

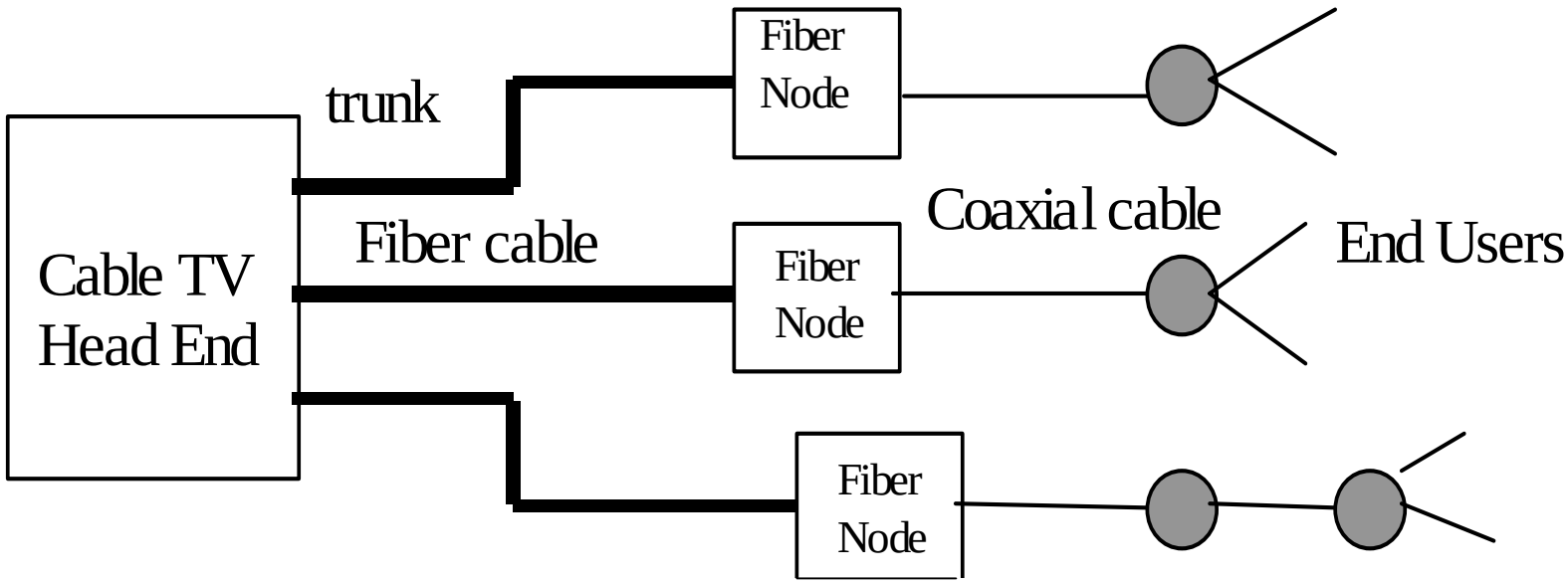


Figure 7.16

A Cable Modem Connection

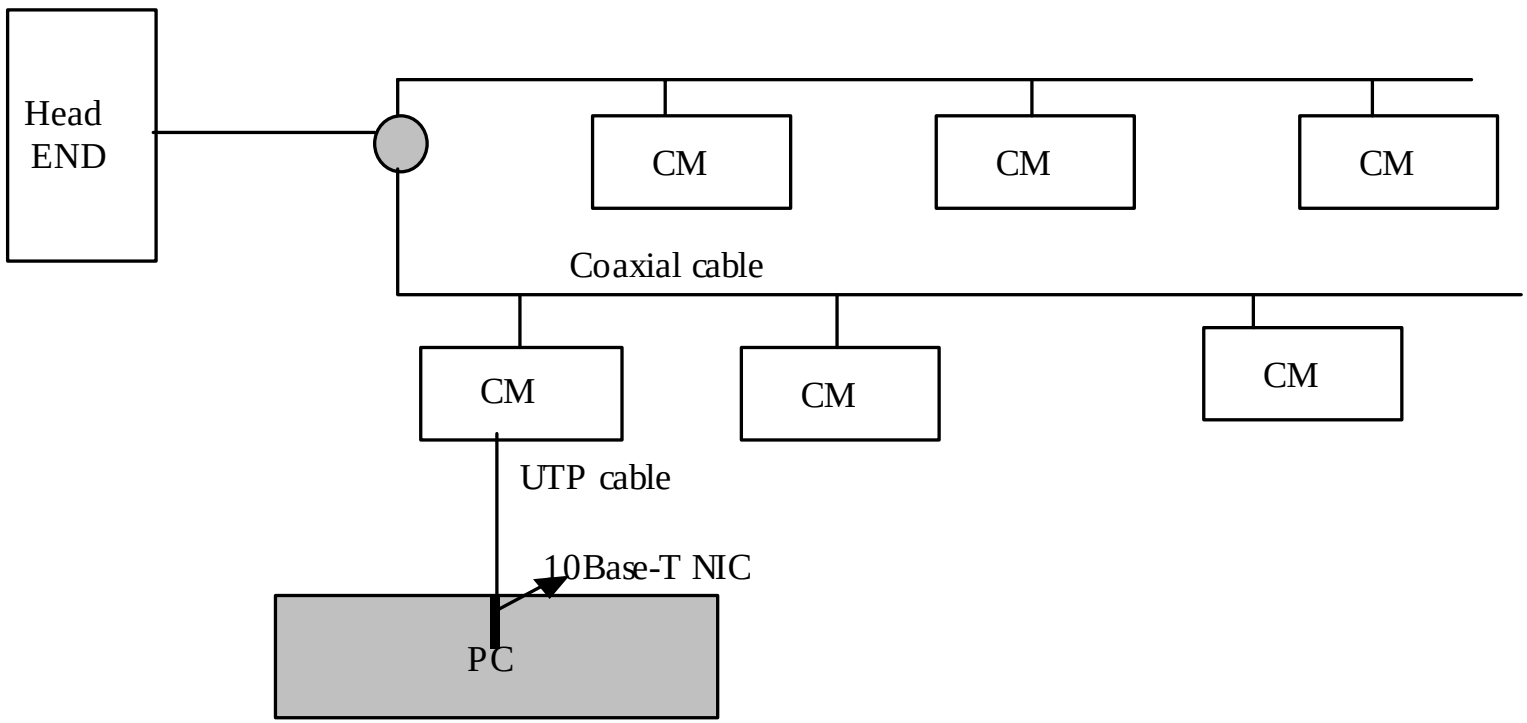
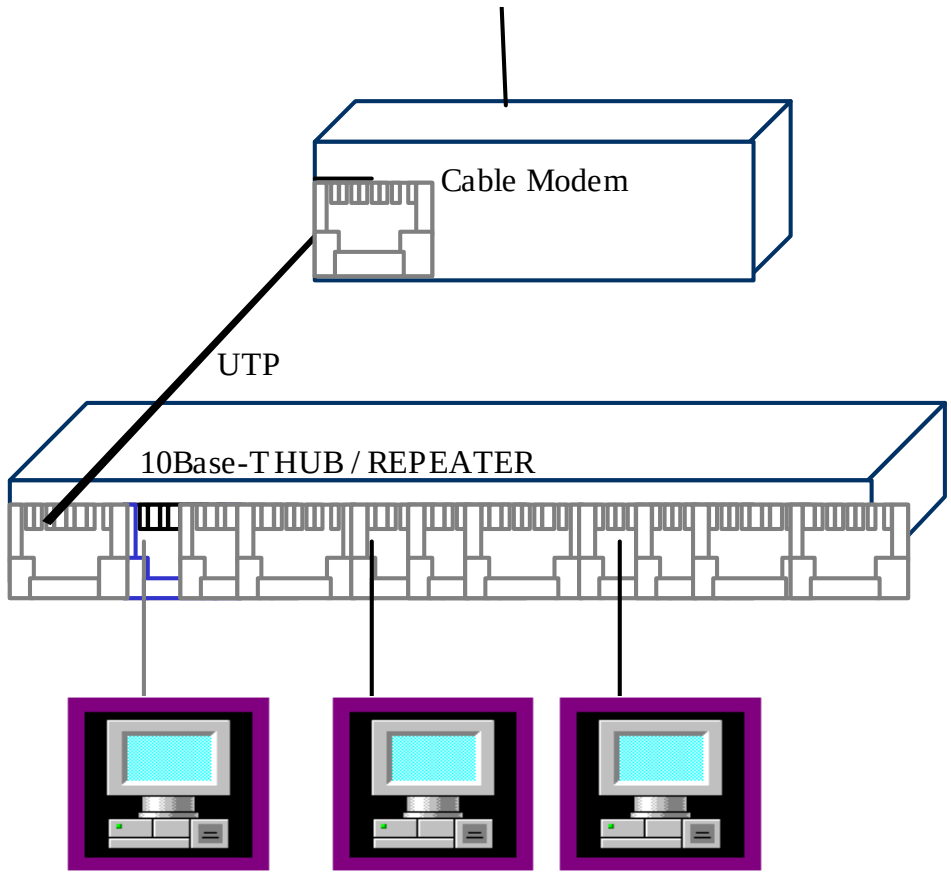


Figure 7.17

Sharing a Cable/DSL Modem



Should be a Router and a Hub / Switch

Figure 7.18

ISDN Basic Rate
2B + D: 144 Kb/sec

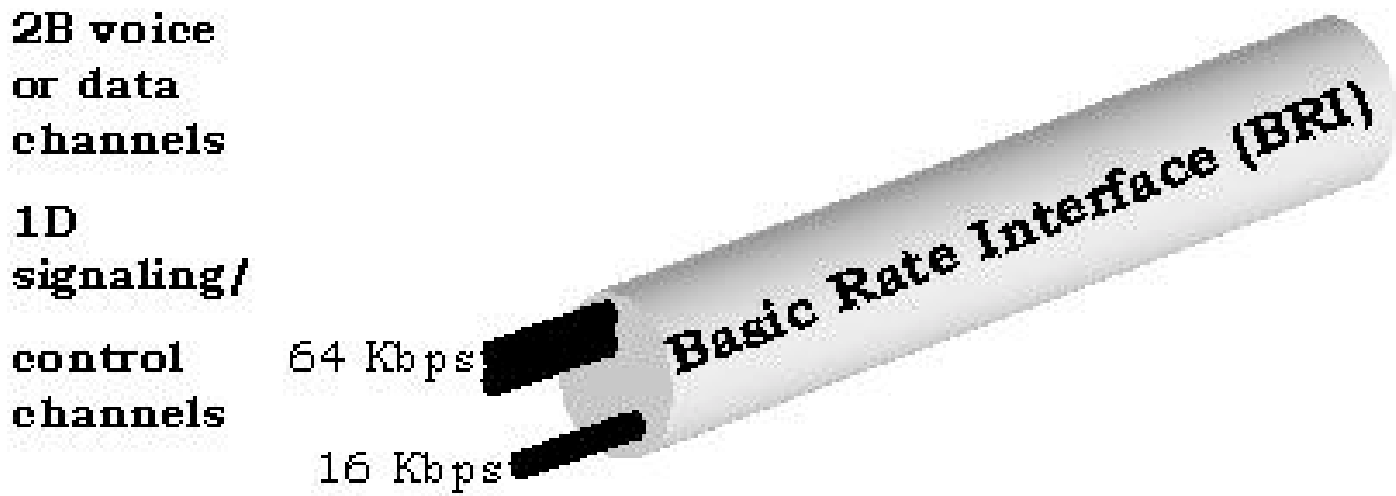


Figure 7.19

Using the Basic Rate Interface

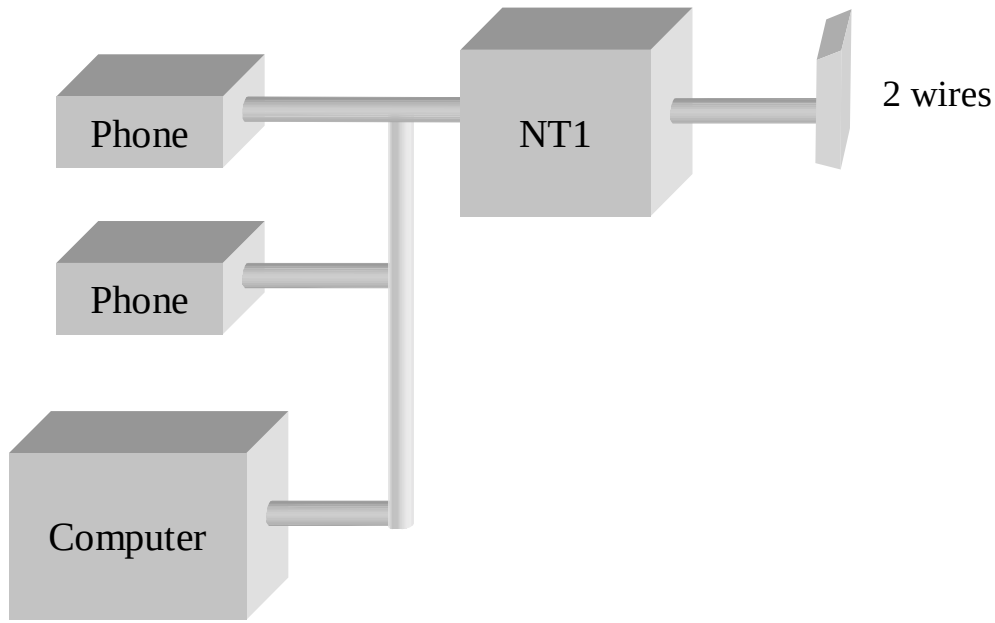


Figure 7.20

ISDN Primary Rate
23B + D (T1)

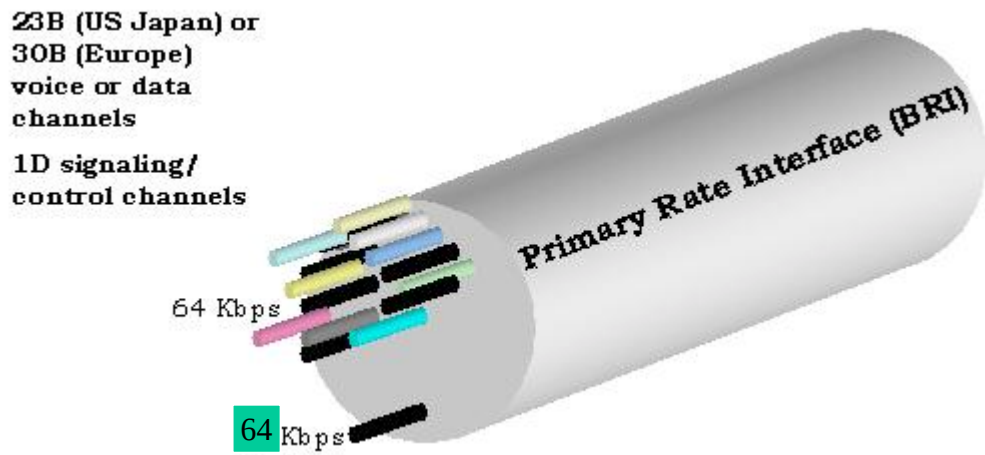


Figure 7.22

8 bits	1bit	8 bits	1bit	8 bits	1bit	8 bits	1bit
B1	D	B2	D	B1	D	B2	D

Figure 7.21

ISDN PRI Application

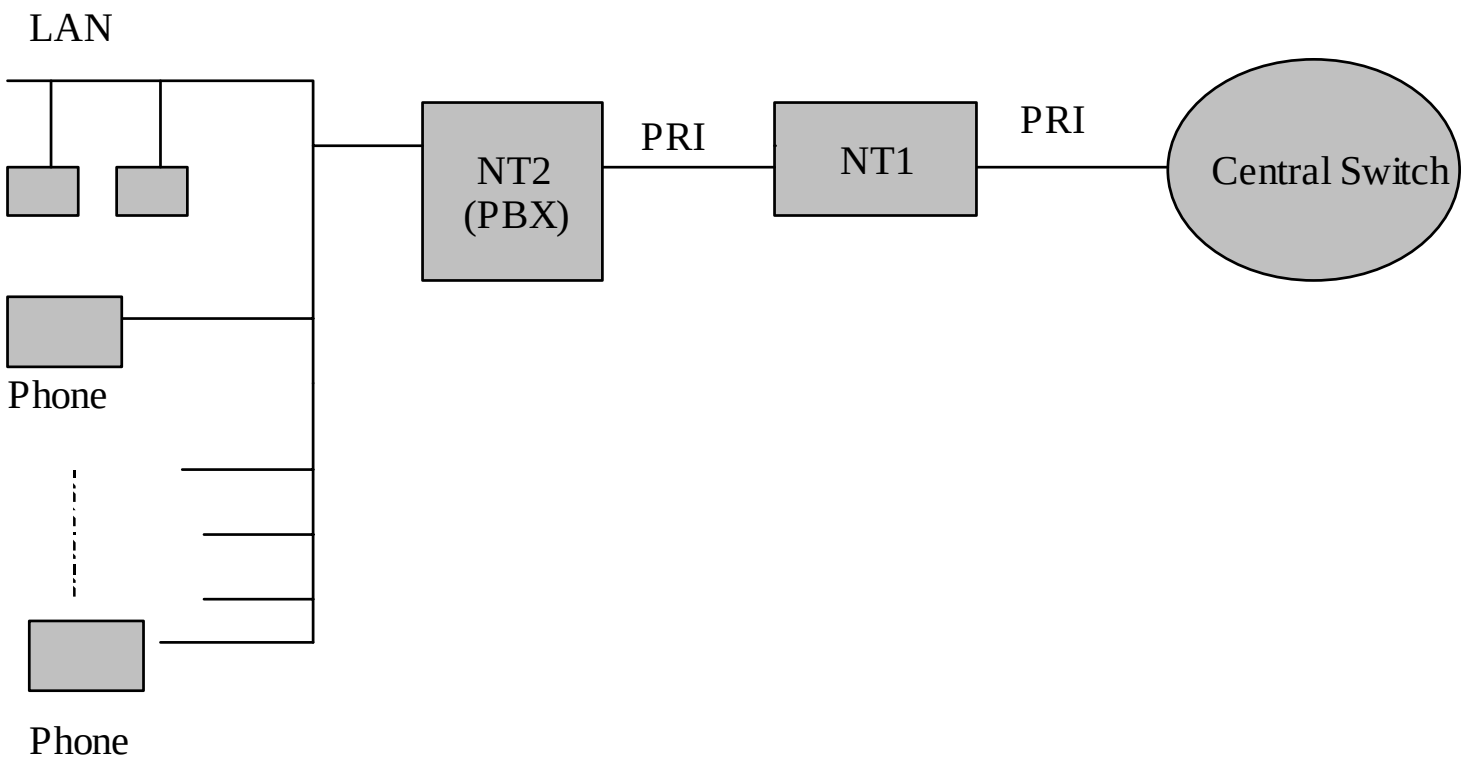


Figure 7.23