

✓ Analog Transmission

In Chapter 3, we discussed the advantages and disadvantages of digital and analog transmission. We saw that while digital transmission is very desirable, a low-pass channel is needed. We also saw that analog transmission is the only choice if we have a bandpass channel. Digital transmission was discussed in Chapter 4; we discuss analog transmission in this chapter.

Converting digital data to a bandpass analog signal is traditionally called digital-to-analog conversion. Converting a low-pass analog signal to a bandpass analog signal is traditionally called analog-to-analog conversion. In this chapter, we discuss these two types of conversions in two sections:

- ❑ The first section discusses digital-to-analog conversion. The section shows how we can change digital data to an analog signal when a band-pass channel is available. The first method described is called amplitude shift keying (ASK), in which the amplitude of a carrier is changed using the digital data. The second method described is called frequency shift keying (FSK), in which the frequency of a carrier is changed using the digital data. The third method described is called phase shift keying (PSK), in which the phase of a carrier signal is changed to represent digital data. The fourth method described is called quadrature amplitude modulation (QAM), in which both amplitude and phase of a carrier signal are changed to represent digital data.
- ❑ The second section discusses analog-to-analog conversion. The section shows how we can change an analog signal to a new analog signal with a smaller bandwidth. The conversion is used when only a band-pass channel is available. The first method is called amplitude modulation (AM), in which the amplitude of a carrier is changed based on the changes in the original analog signal. The second method is called frequency modulation (FM), in which the phase of a carrier is changed based on the changes in the original analog signal. The third method is called phase modulation (PM), in which the phase of a carrier signal is changed to show the changes in the original signal.