Line Coding

Figure 4.1 *Line coding*

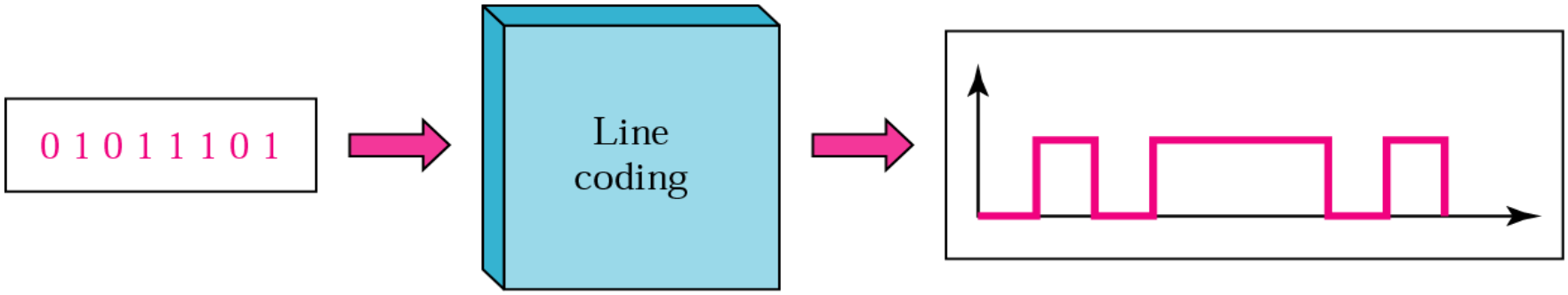
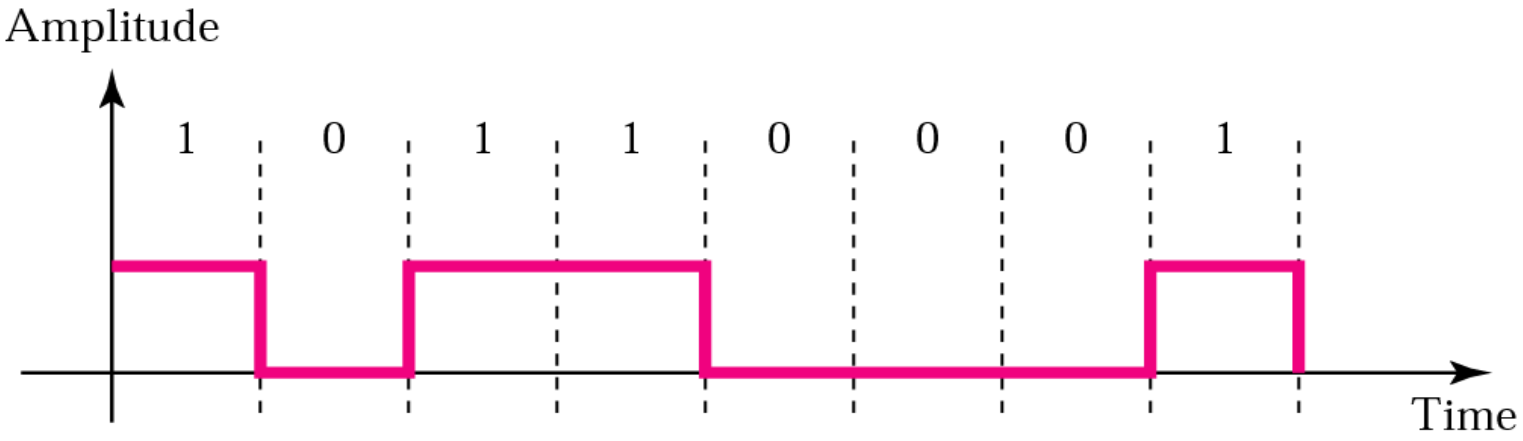
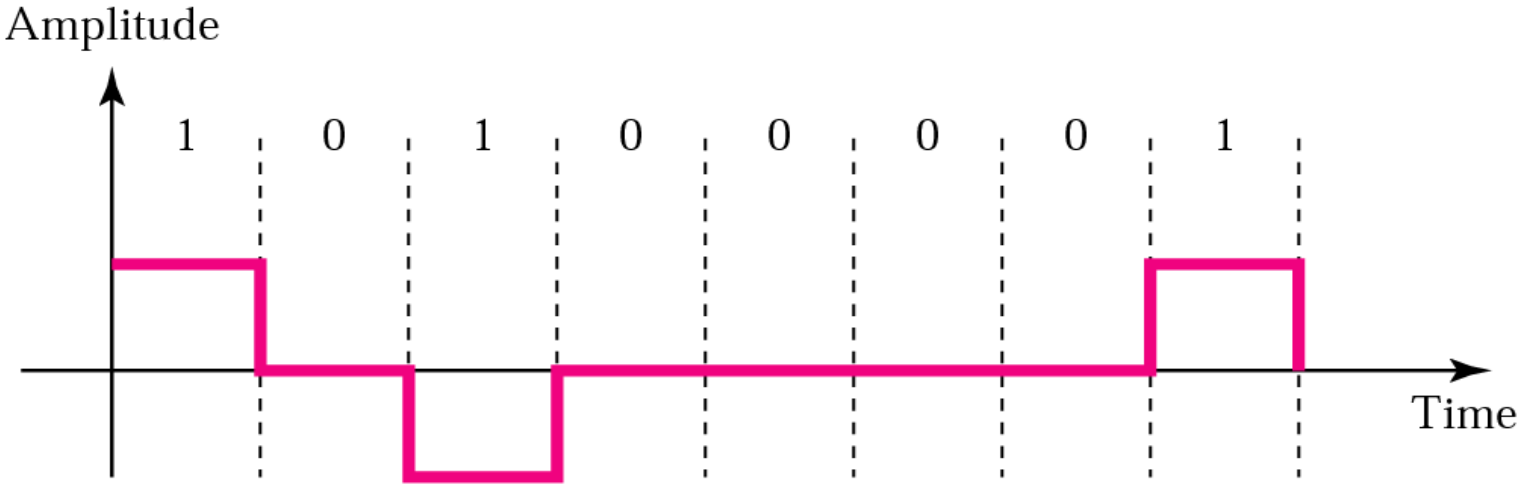


Figure 4.2 *Signal level versus data level*

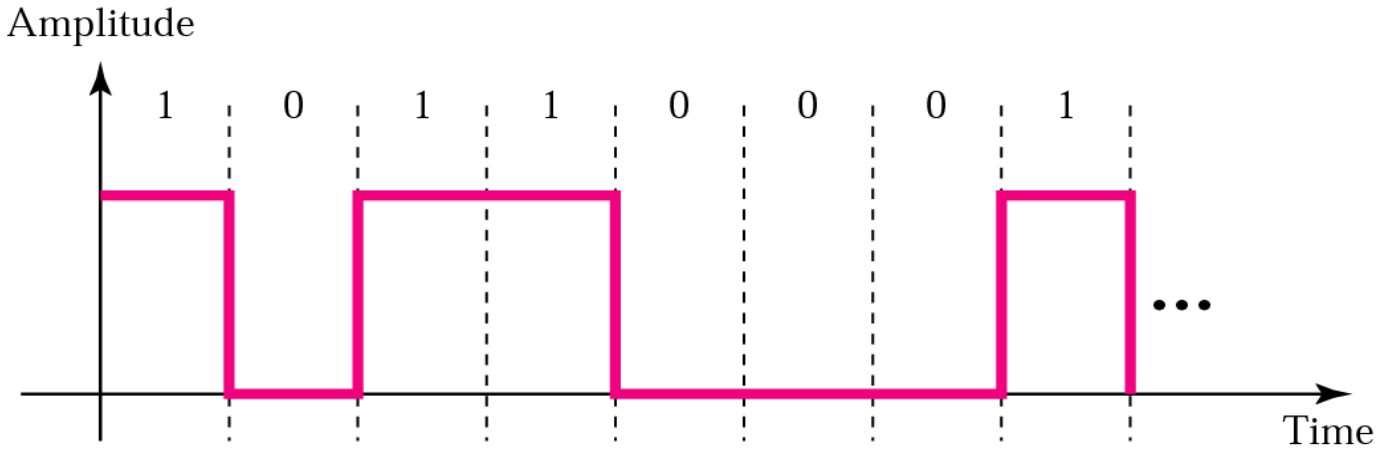


a. Two signal levels, two data levels

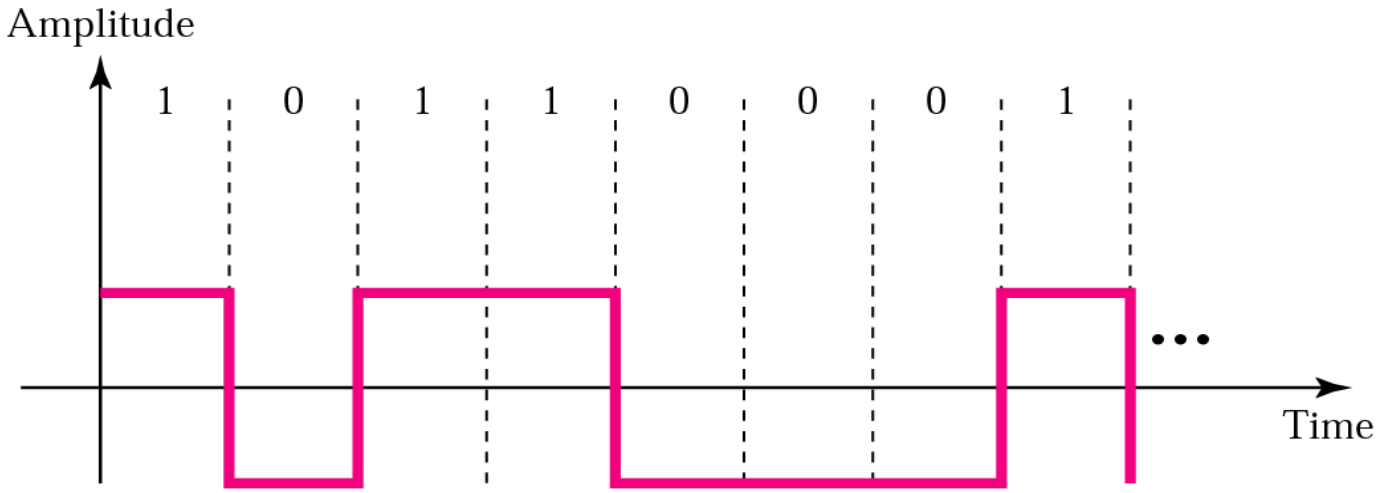


b. Three signal levels, three data levels

Figure 4.3 *DC component*

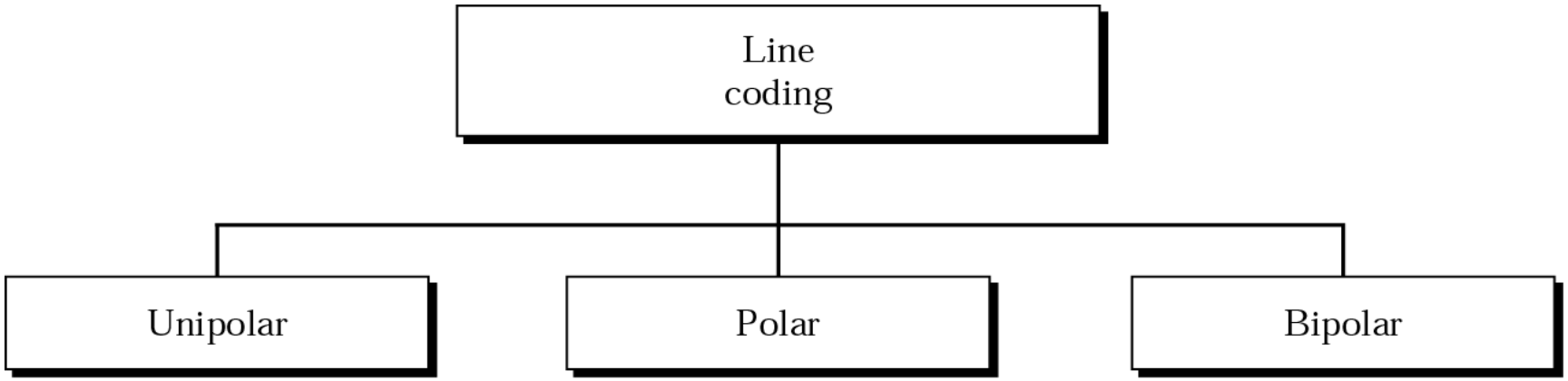


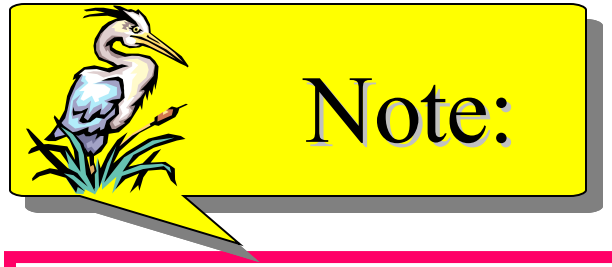
a. A signal with dc component



b. A signal without dc component

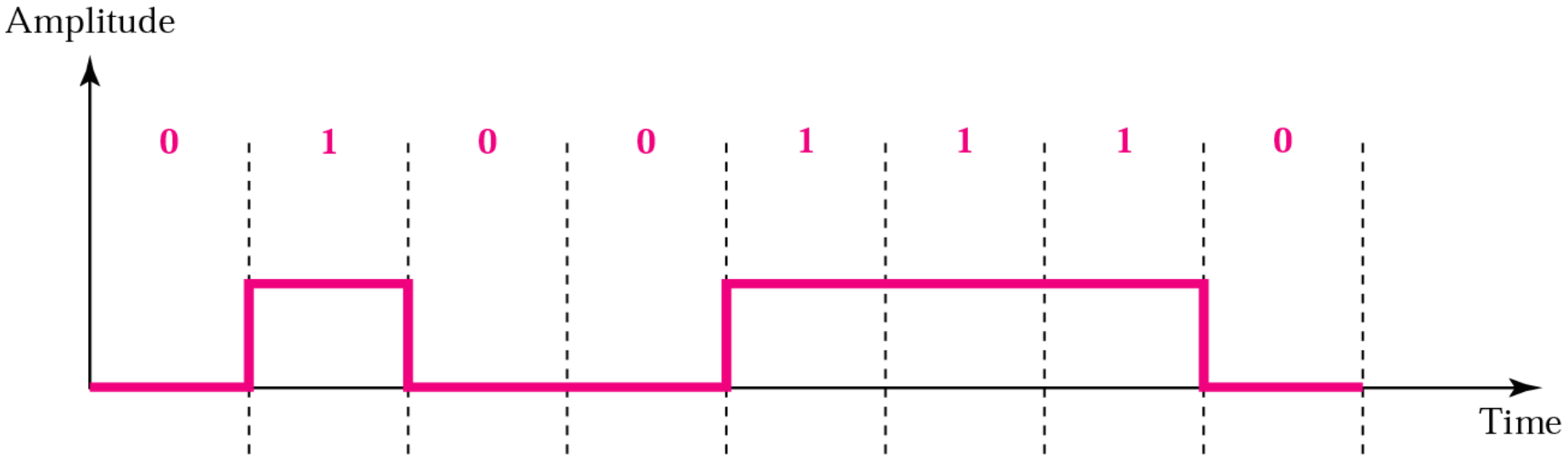
Figure 4.5 *Line coding schemes*

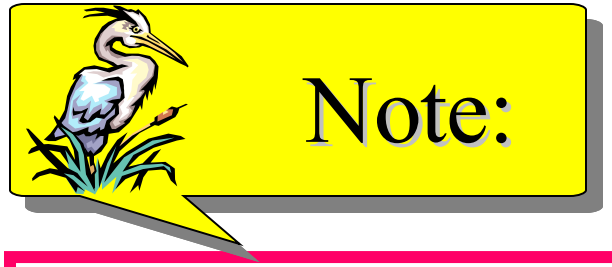




Unipolar encoding uses only one voltage level.

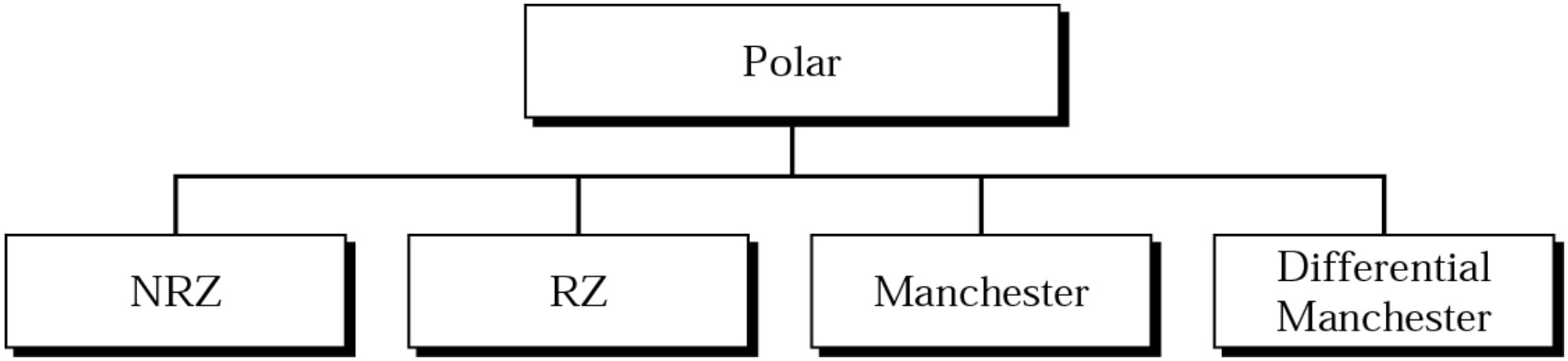
Figure 4.6 *Unipolar encoding*

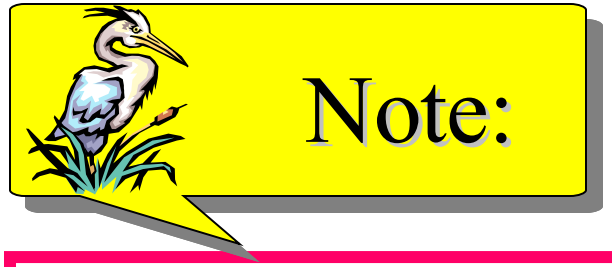




Polar encoding uses two voltage levels (positive and negative).

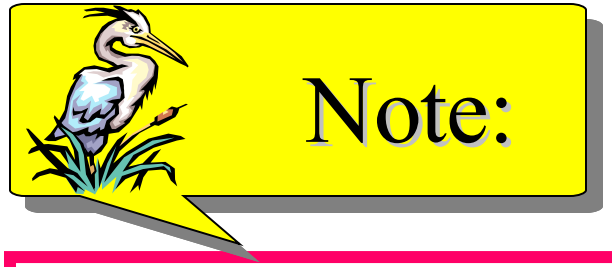
Figure 4.7 *Types of polar encoding*





Note:

In NRZ-L the level of the signal is dependent upon the state of the bit.



In NRZ-I the signal is inverted if a 1 is encountered.

Figure 4.8 *NRZ-L and NRZ-I encoding*

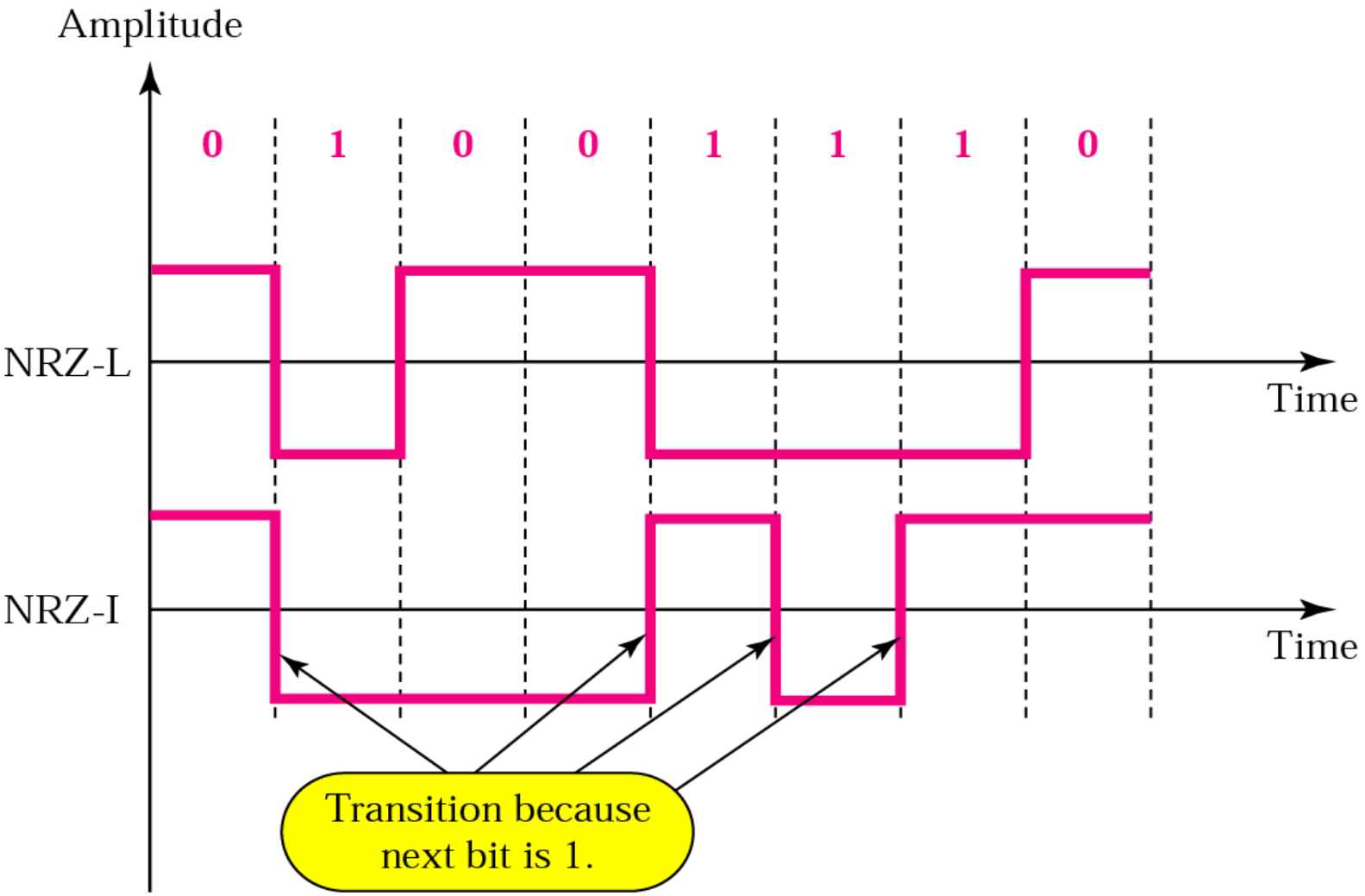
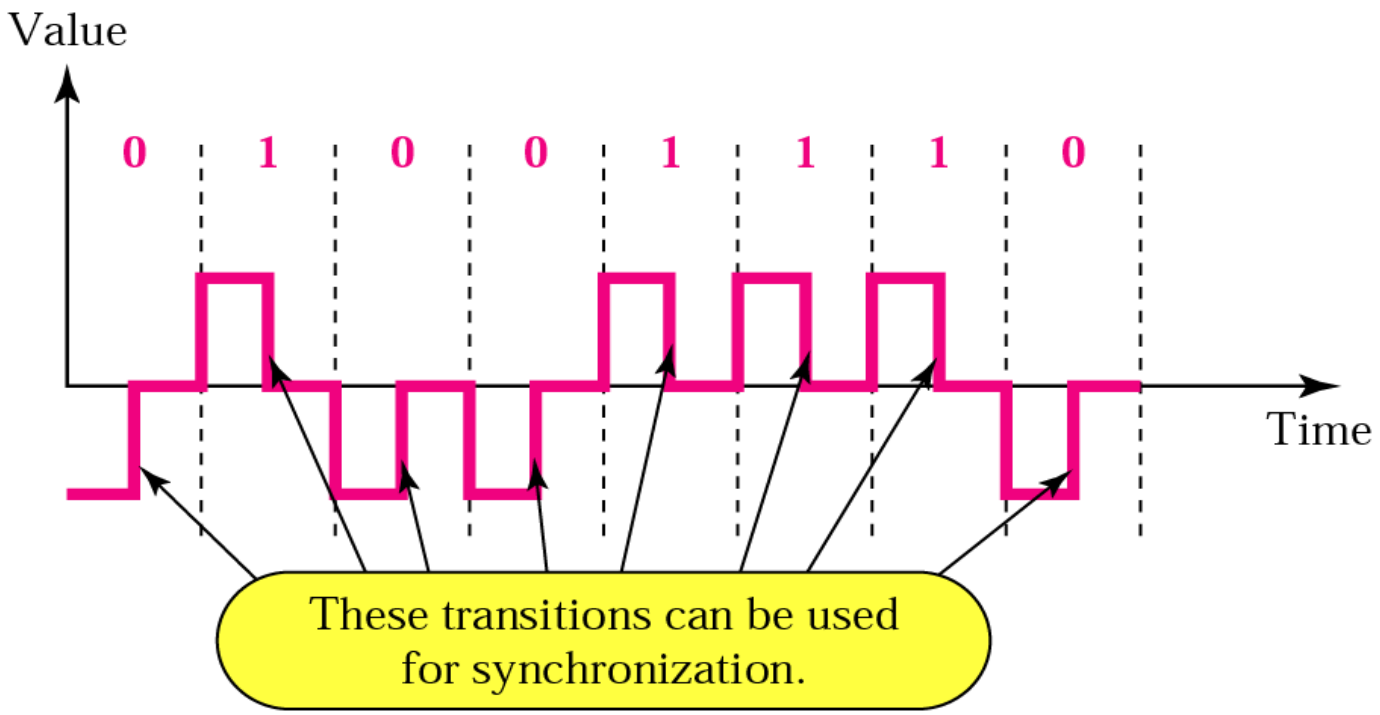
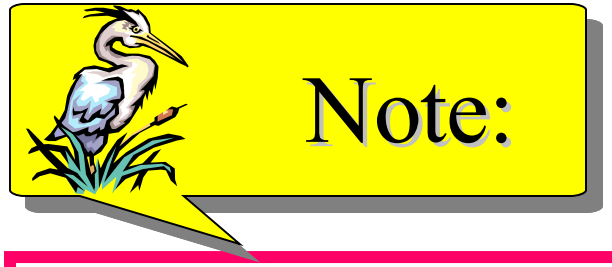


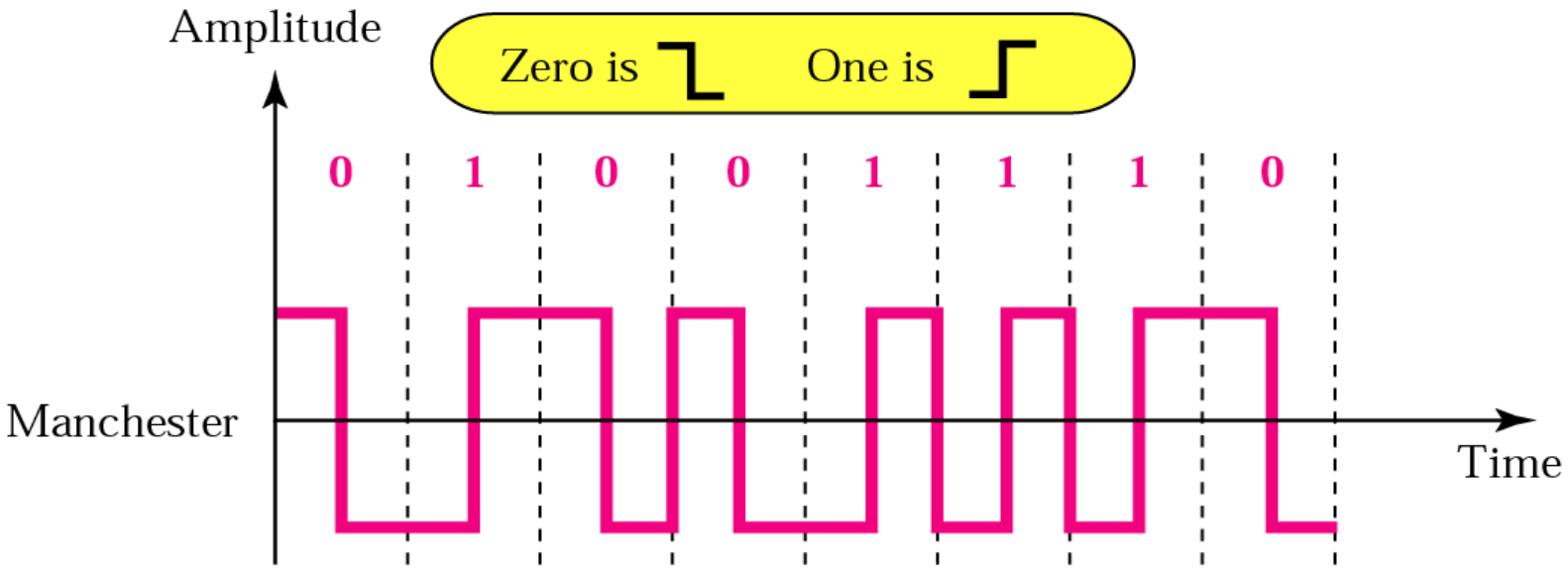
Figure 4.9 *RZ encoding*

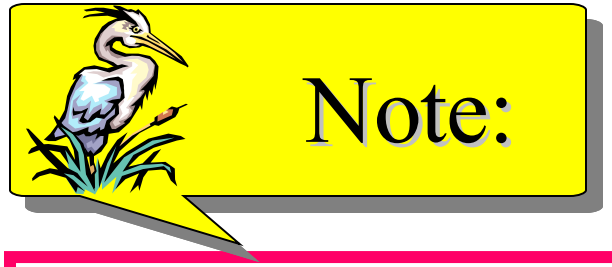




A good encoded digital signal must contain a provision for synchronization.

Figure 4.10 *Manchester encoding*

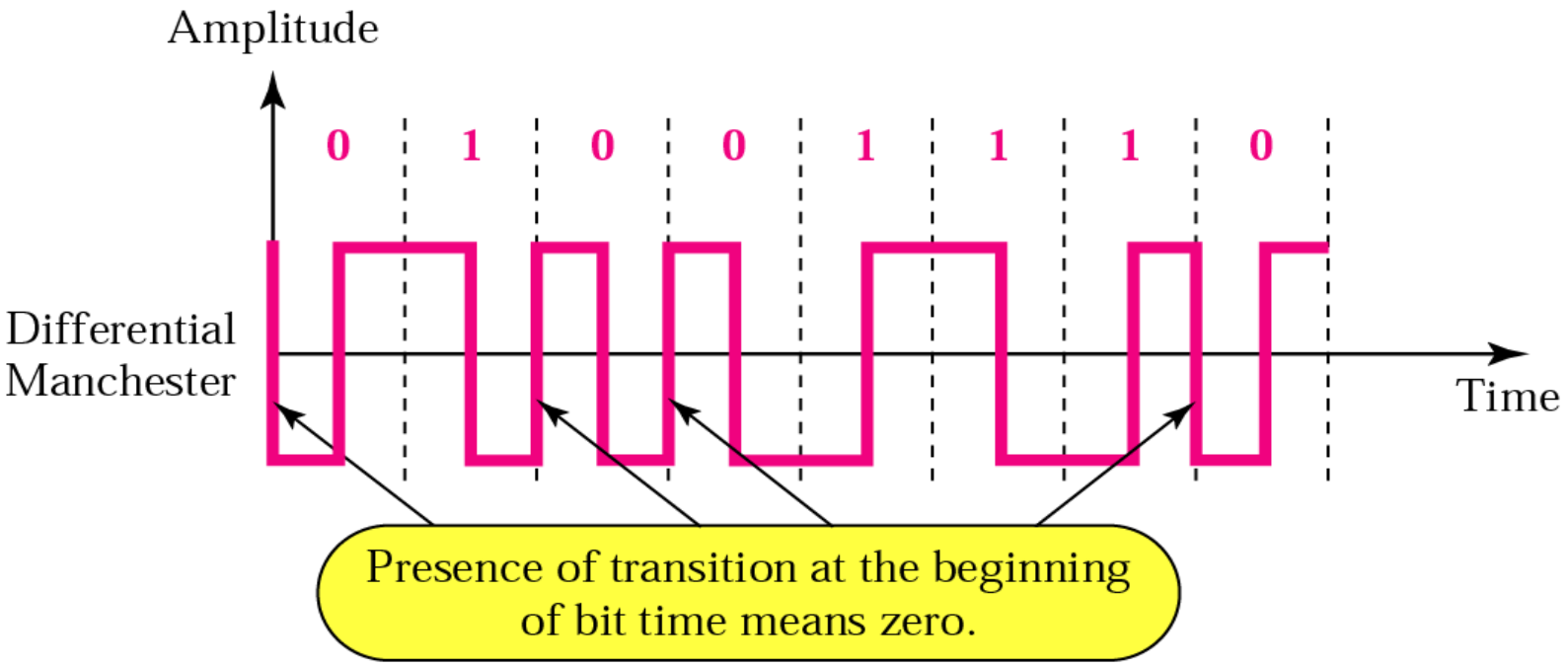


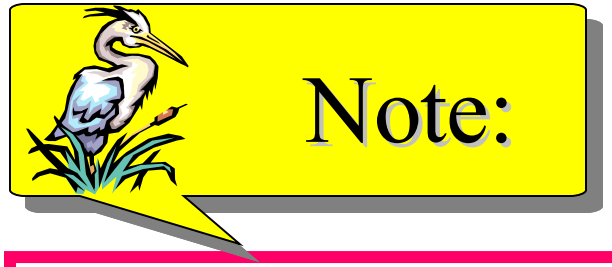


Note:

In Manchester encoding, the transition at the middle of the bit is used for both synchronization and bit representation.

Figure 4.11 *Differential Manchester encoding*





In differential Manchester encoding, the transition at the middle of the bit is used only for synchronization. The bit representation is defined by the inversion or noninversion at the beginning of the bit.

Figure 4.12 *Bipolar AMI encoding*

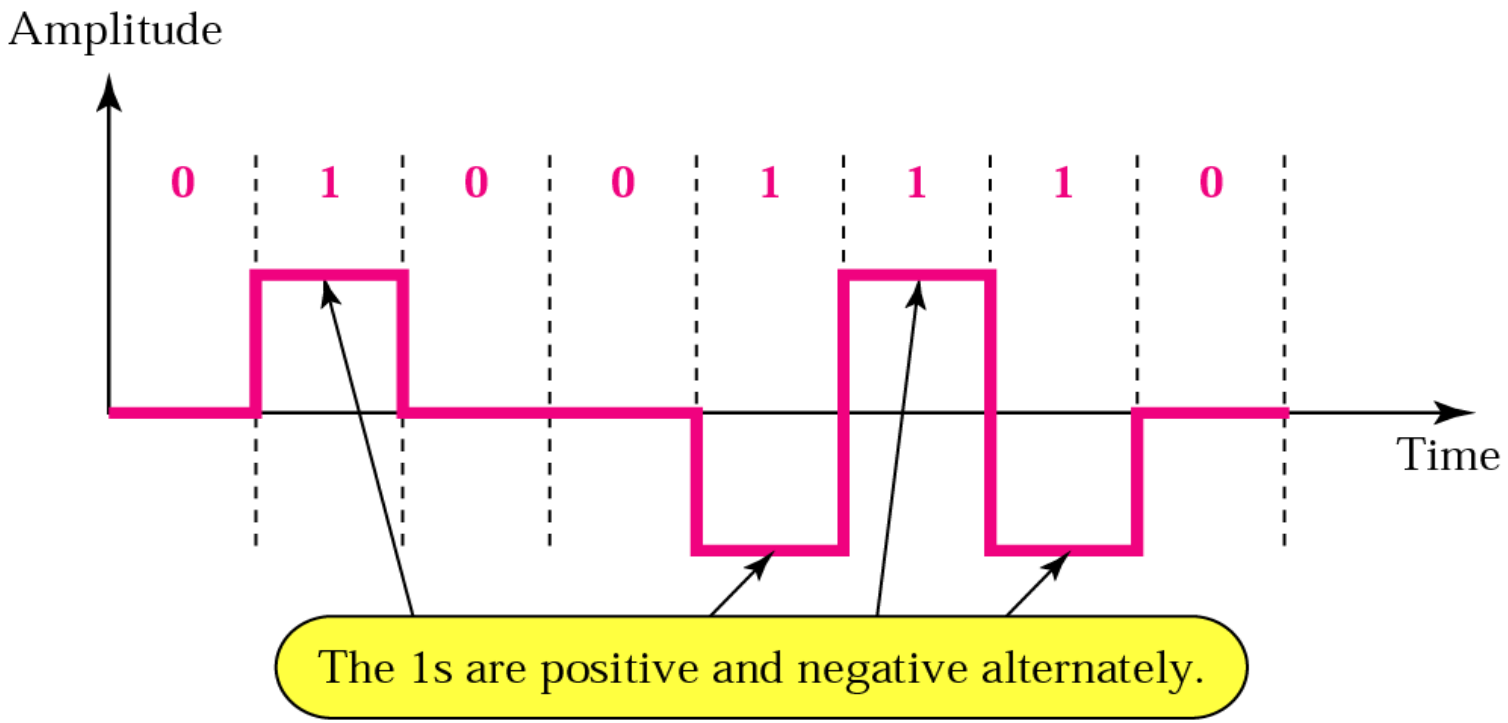


Figure 4.13 *2B1Q*

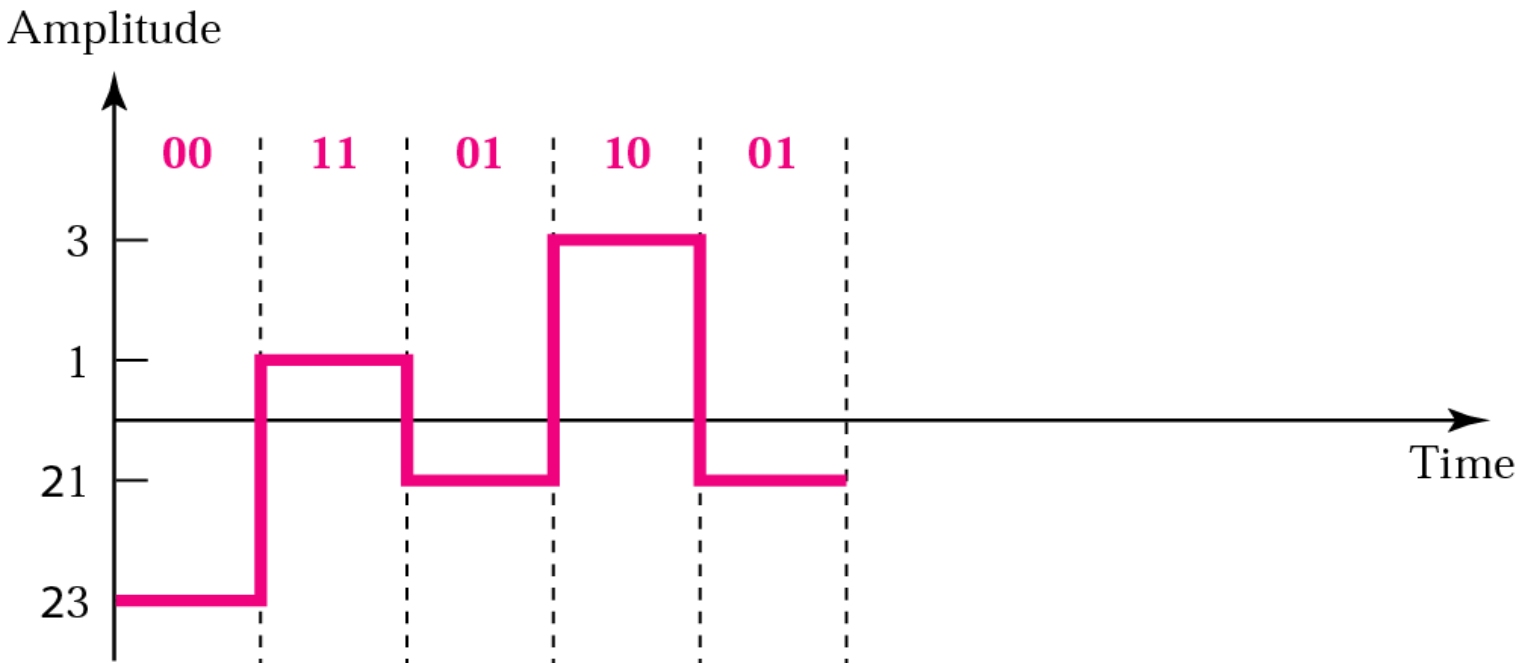


Figure 4.14 *MLT-3 signal*