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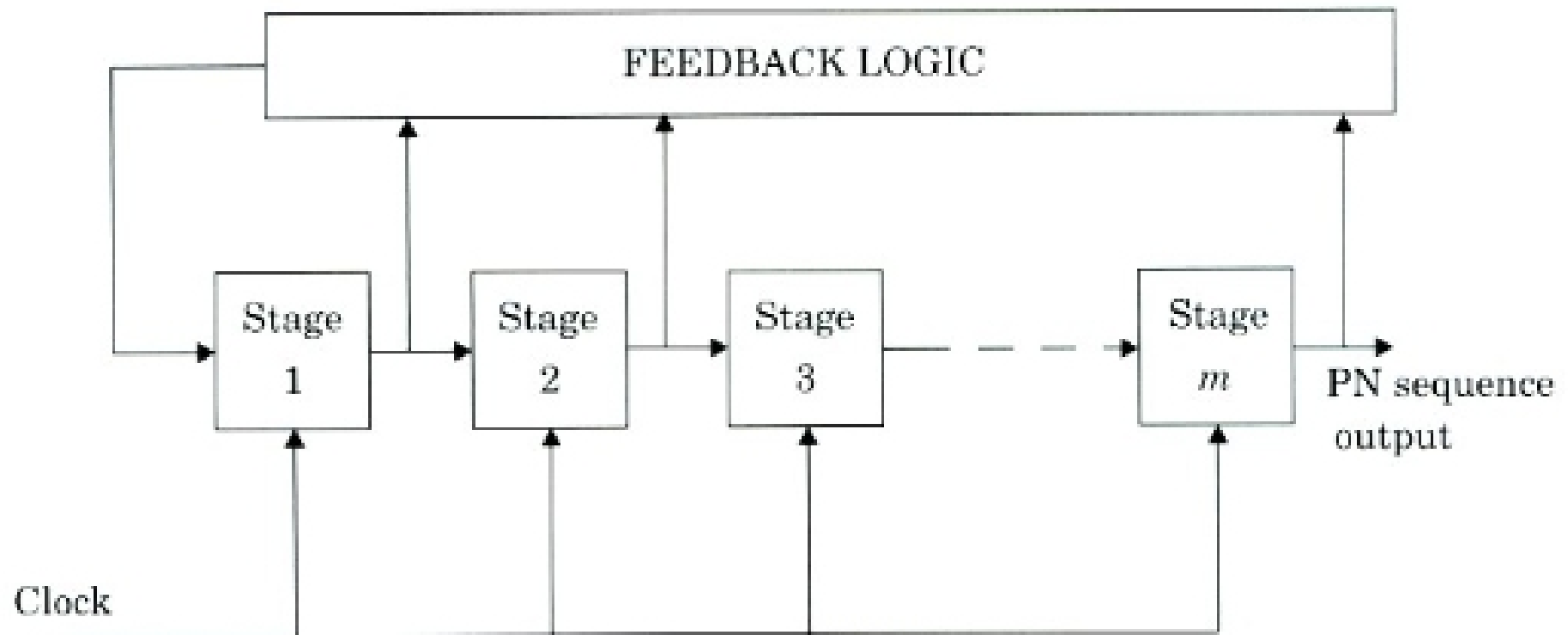
# *spread-spectrum transmission*

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- Three advantages over fixed spectrum
    - Spread-spectrum signals are highly **resistant to noise and interference**. The process of re-collecting a spread signal spreads out noise and interference, causing them to recede into the background.
    - Spread-spectrum signals are **difficult to intercept**. A Frequency-Hop spread-spectrum signal sounds like a momentary noise burst or simply an increase in the background noise for short. Frequency-Hop codes on any narrowband receiver except a Frequency-Hop spread-spectrum receiver using the exact same channel sequence as was used by the transmitter.
    - Spread-spectrum transmissions can **share a frequency band with many types of conventional transmissions with minimal interference**. The spread-spectrum signals add minimal noise to the narrow-frequency communications, and vice versa. As a result, bandwidth can be utilized more efficiently.
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# PN Sequence Generator

- Pseudorandom sequence
  - Randomness and noise properties
  - Walsh, M-sequence, Gold, Kasami, Z4
  - Provide signal privacy



**Figure 6.48** Block diagram of a generalized feedback shift register with  $m$  stages.