



SNS COLLEGE OF TECHNOLOGY

An Autonomous Institution
Coimbatore-35



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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

19ECB301-ANALOG AND DIGITAL COMMUNICATION

III YEAR/ V SEMESTER

UNIT 4 – DIGITAL MODULATION TECHNIQUES

TOPIC – **PSK-BPSK**



- **Phase Shift Keying (PSK)** is the digital modulation technique in which the phase of the carrier signal is based on inputs at a particular time.

- PSK technique is widely used for wireless LANs, bio-metric, contactless operations, along with RFID and Bluetooth communications.

- PSK is of two types, depending upon the phases the signal gets shifted. They are –

Binary Phase Shift Keying (BPSK)

This is also called as 2-phase PSK or Phase Reversal Keying. In this technique, the sine wave carrier takes two phase reversals such as 0° and 180° .

BPSK is basically a Double Side Band Suppressed Carrier (DSBSC) modulation scheme, for message being the digital information.



Quadrature Phase Shift Keying (QPSK)

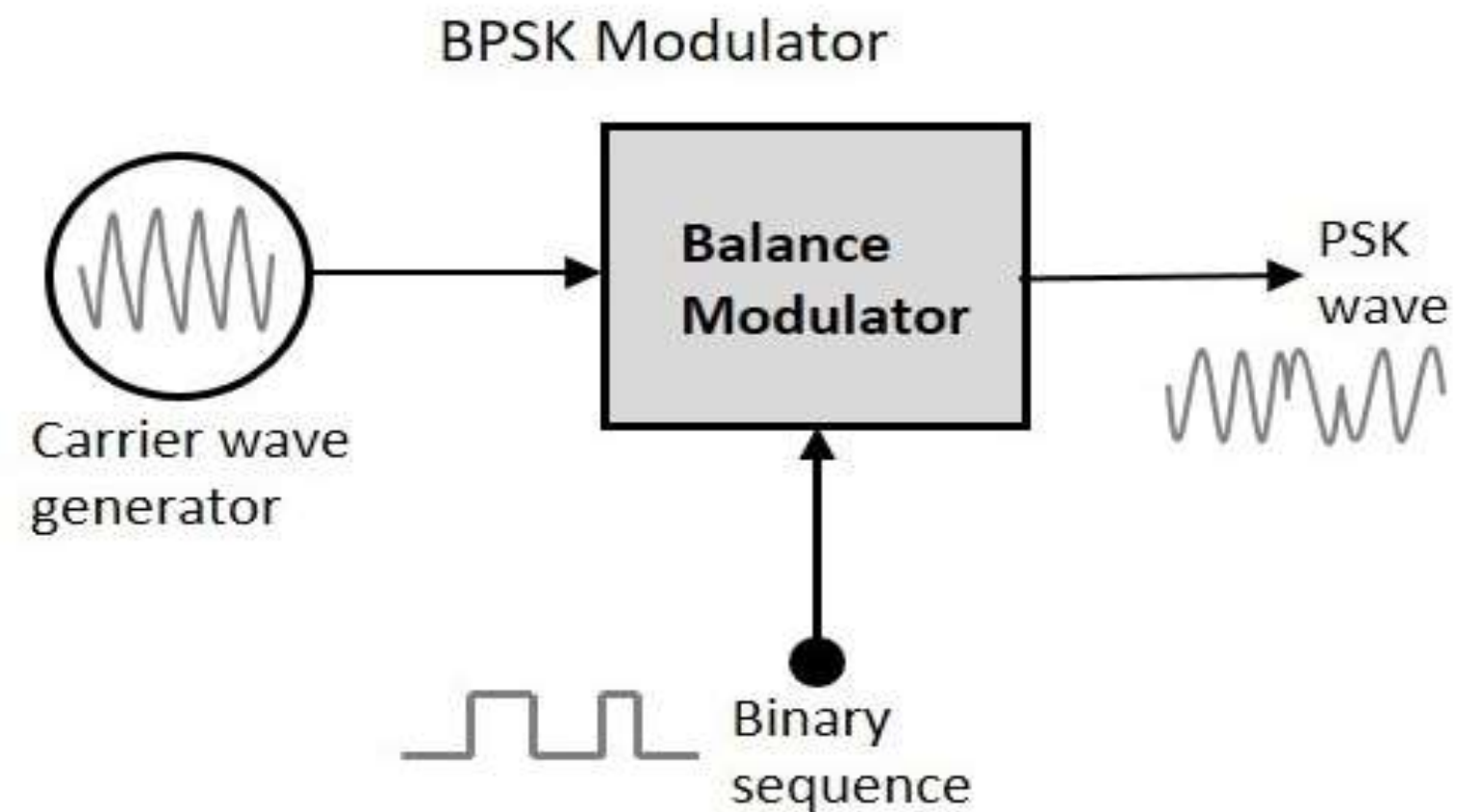
This is the phase shift keying technique, in which the sine wave carrier takes four phase reversals such as 0° , 90° , 180° , and 270° .



BPSK Modulator



The block diagram of Binary Phase Shift Keying consists of the balance modulator which has the carrier sine wave as one input and the binary sequence as the other input.



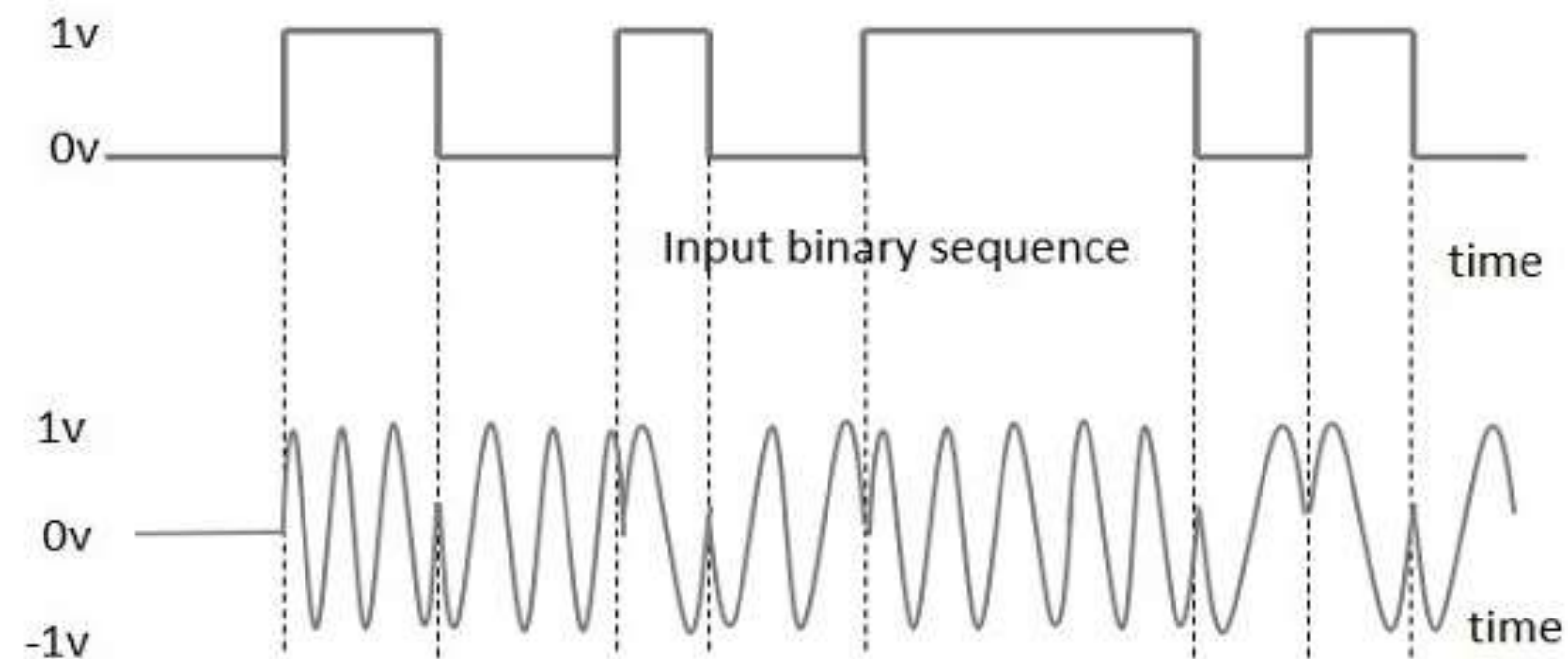


BPSK Modulator



The modulation of BPSK is done using a balance modulator, which multiplies the two signals applied at the input. For a zero binary input, the phase will be 0° and for a high input, the phase reversal is of 180° .

The output sine wave of the modulator will be the direct input carrier or the inverted (180° phase shifted) input carrier, which is a function of the data signal.



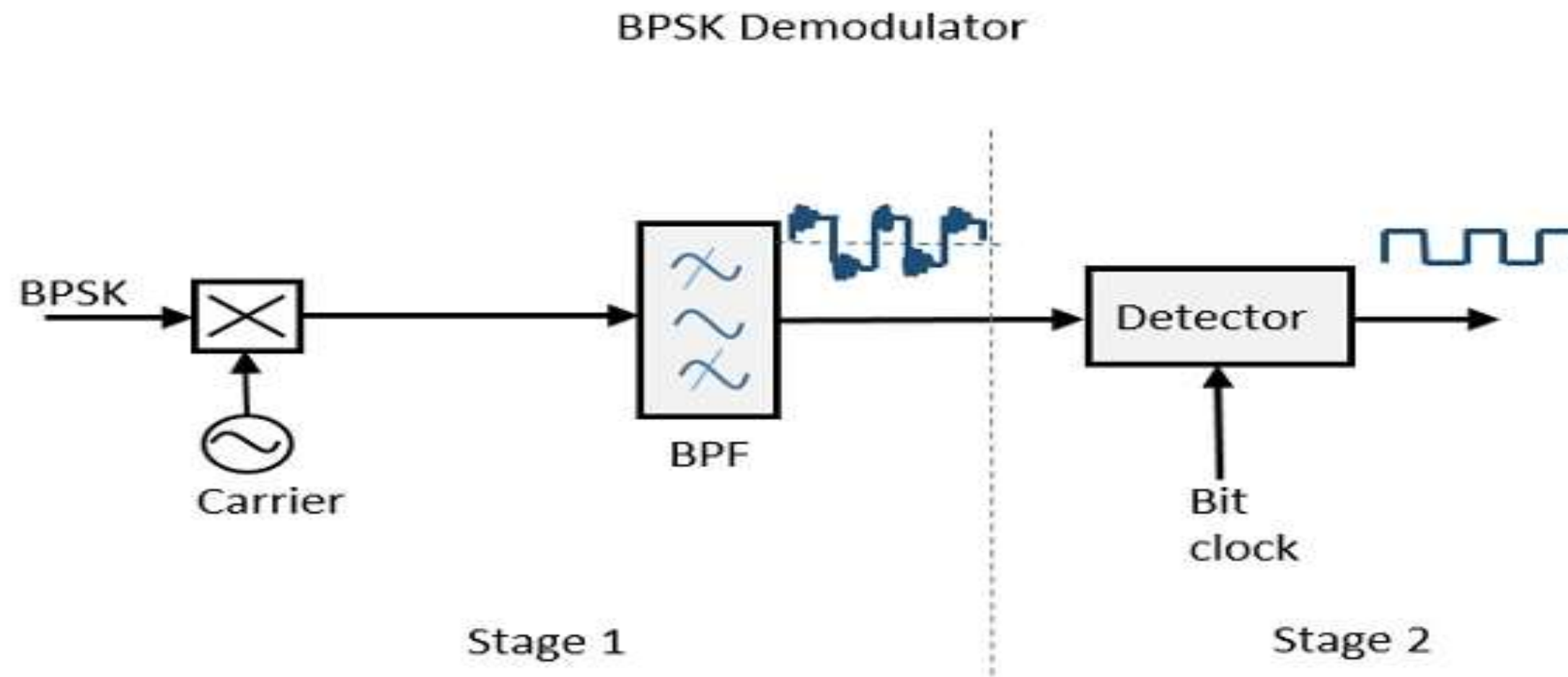
BPSK Modulated output wave



BPSK Demodulator



The block diagram of BPSK demodulator consists of a mixer with local oscillator circuit, a band pass filter, a two-input detector circuit.





BPSK Demodulator



- By recovering the band-limited message signal, with the help of the mixer circuit and the band pass filter, the first stage of demodulation gets completed.
- The base band signal which is band limited is obtained and this signal is used to regenerate the binary message bit stream.
- In the next stage of demodulation, the bit clock rate is needed at the detector circuit to produce the original binary message signal.



THANK YOU