Experiment 9

AIM: To Measure bit error rate.

EQUIPMENT:- Link – B Advance Fiber Optic Communication Trainer Kit, Power Supply Fiber Optic Cable (Plastic), 20 MHz Dual channel Oscilloscope, Probes, Patch Chords

THEORY:

BIT ERROR RATE: In telecommunication transmission, the bit error rate (BER) is a Ratio of bits that have errors relative to the total number of bits received in a transmission. The BER is an indication of how often a packet of other data unit has to be retransmitted because of an error. Too high a BER may indicate that a slower data rate would actually improve overall transmission time for a given amount of transmitted data since the BER might be reduced, lowering the number of packets that had to be resent**.**

OBSERVATION:

S.No: Error Counter Eb BER

S No	Error Counter	Eb	BER

BER = Eb/Tb

Where Eb – Errored bits Tb – Total bits Transmitted in a period of time t seconds.

Measuring Bit Error Rate: A BERT (bit error rate tester) is a procedure or device that measures the BER for a given transmission. The BER, or quality of the digital link, is calculated from the number of bits received in error divided by the number of bits transmitted.

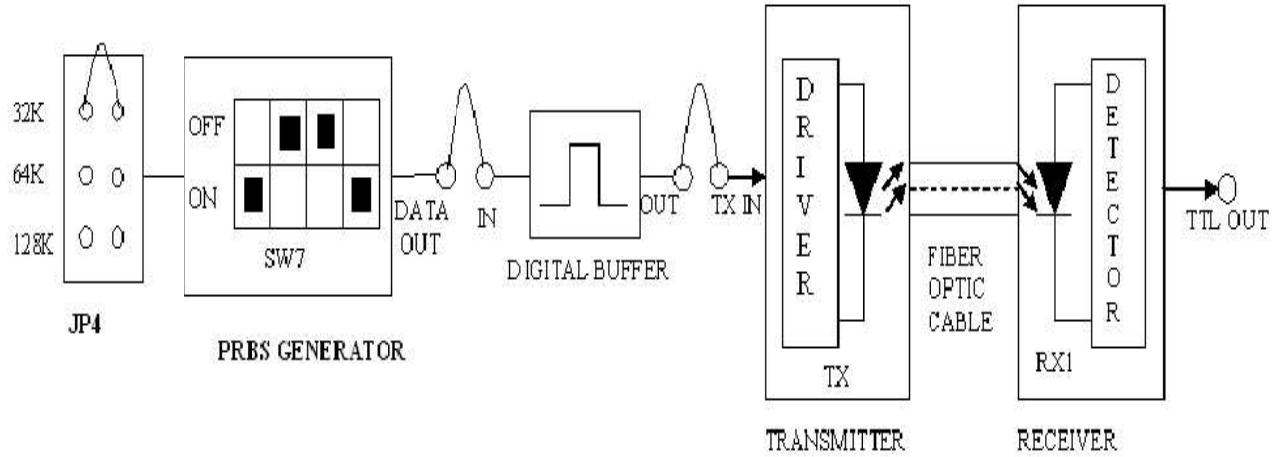
BER = (Bits in error) / (Total bits transmitted)

PROCEDURE:

1. Make connections as shown in figure. Connect the power supply cables with proper polarity to Link – B Kit. While connecting this, ensure that the power supply is OFF.
2. Keep PRBS switch SW7 as shown in figure to generate PRBS signal.
3. Keep switch SW8 towards TX position.
4. Keep switch SW9 towards TX1 position.
5. Keep the switch SW10 at fiber optic receiver output to TTL position.
6. Select PRBS generator clock at 32 KHz by keeping jumper JP4 at 32K position.
7. Keep Jumper JP5 towards +5V position.
8. Keep Jumper JP6 shorted.
9. Keep Jumper JP8 towards Pulse position.
10. Switch ON the power supply.
11. Connect the post DATA OUT of PRBS Generator to the IN post of digital buffer. 12.Connect OUT post of digital buffer to TX IN post.
13. Slightly unscrew the cap of SFH 756V (660) nm. Do not remove the cap from the connector. Once the cap is loosened, insert the one Meter Fiber into the cap. Now tighten the cap by screwing it back.
14. Slightly unscrew the cap of RX1 Photo Transistor with TTL logic output SFH 551V. Do not remove the cap from the connector. Once the cap is loosened, insert the other end of fiber into the cap. Now tighten the cap by screwing it back.
15. Connect detected signal TTL OUT to Bit Error Rate event counter DATA IN post & post IN of Noise Source.
16. Connect post OUT of Noise Source to post RXDATA IN of Bit Error Rate event counter.
17. Connect post CLK OUT of PRBS Generator to post CLK IN of Bit Error Rate event counter.
18. Press Switch SW 11 to start counter.
19. Vary pot P3 for Noise Level to observe effect of noise level on the error count.
20. Observe the Error Count LED's for the error count in received signal in time 10 seconds as shown in figure.

RESULT: Thus Bit error rate for given Sequence was measured.

BLOCK DIAGRAM:



JUMPER SETTING DIAGRAM: