

Lecture 10 - PN Sequences and Scramblers

Exercise 1: (a) How many flip-flops would be required to generate a ML PRBS of period 16383? (b) How many ones would the sequence have? (c) What is the longest sequence of 0's? (d) How many runs of 5 ones are there?

$$(a) \quad 16383 = 2^k - 1 \quad k = \log_2(16384) = 14$$

$$(b) \quad 2^{k-1} = 8192$$

$$(c) \quad 13 \quad (\text{one run of } k-1 \text{ zeros})$$

$$(d) \quad k-l = 5 \quad 14-l = 5 \quad l = 9$$

9 runs of 5 ones.

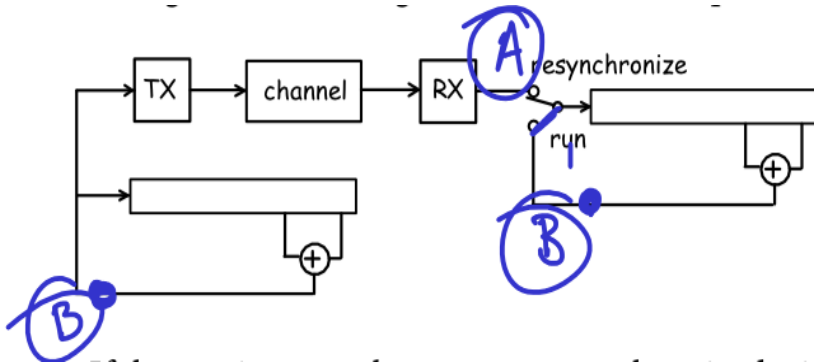
Exercise 2: Why not?

scrambling algorithms are public \rightarrow no secrecy

Exercise 3: How many errors will appear in the output of a V.34 descrambler if there is one input error?

3 errors
(1 for initial error
1 for each flip)

Exercise 4: In the diagram above, what two signals would the receiver compare to detect errors?



compare **A** & **B**