Proposed PCS Text for tx_mode=SEND_S

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SEND_S Signals

- Details of the SEND_S signal was given in “wang_3bp_01_1114.pdf”.
- In forced mode (autoneg disabled), “SEND_S” signals enable reliably link synchronization
  - Defined in 97.6
  - Based on length 255 PN sequences
  - MS: $g_M(x) = x_8 + x_4 + x_3 + x_2 + 1$
  - SL: $g_S(x) = x_8 + x_6 + x_5 + x_4 + 1$
- SEND_S is one of the tx_mode values, however it is not defined in D1.3 PCS.
- Proposed changes are shown in following slides.

#1 New paragraph at the end of 97.3.2.2

On page 39, line 44:

When Auto-Negotiation is disabled, the 1000BASE-T1 PHYs shall follow 97.6 to achieve synchronization prior to link training. Under this mode if a PMA_TX_MODE.indication message has the value SEND_S, PCS Transmit generates sequences of codes defined in 97.3.5a to the PMA via the PMA_UNITDATA.request primitive. These codes are used for PHY link synchronization and only transmit the values {–1, +1}.

#2 Insert new sub-clause 97.3.5a

On page 52, line 39:

97.3.5a SEND_S signals

During PHY Link Synchronization, PCS Transmit employs the SEND_S signal to achieve synchronization prior to link training. If the PHY is configured as MASTER, PCS Transmit shall employ Equation (97–nn)

$$p_M(x) = x_8 + x_4 + x_3 + x_2 + 1 \qquad (97\text{-}nn)$$

as PN sequence generator. If the PHY is configured as SLAVE, PCS Transmit shall employ Equation (97–nn1)

$$p_S(x) = x_8 + x_6 + x_5 + x_4 + 1 \qquad (97\text{-}nn1)$$

as PN sequence generator. The period of both PN sequences is 255.

#2 new sub-clause 97.3.5a (cont.)

Continue from last slide

An implementation of MASTER and SLAVE PHY SEND_S PN sequence generators by linear-feedback shift registers is shown in Figure 97-mm. The bits stored in the shift register delay line at time n are denoted by $S_n[7:0]$. At each symbol period, the shift register is advanced by one bit, and one new bit represented by $S_n[0]$ is generated.

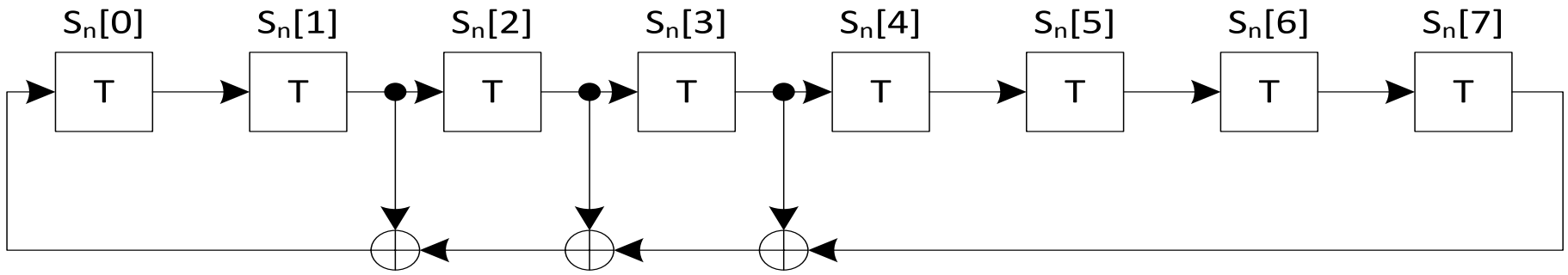
The PN sequence generator shall be reset upon execution of the PCS Reset function, or whenever tx_mode value changes to SEND_S from any other values. If PN sequence generator reset is executed, all bits of the 8-bit shift register may be set to arbitrary values except for all zeros.

97.3.5a.1 Generation of symbol T_n

The bit $S_n[0]$ is mapped to the transmit symbol T_n as follows: if $S_n[0] = 0$ then $T_n = +1$, if $S_n[0] = 1$ then $T_n = -1$.

#3 Add Figure 97-mm close to 97.3.5a

MASTER PHY SEND_S PN sequence generator



SLAVE PHY SEND_S PN sequence generator

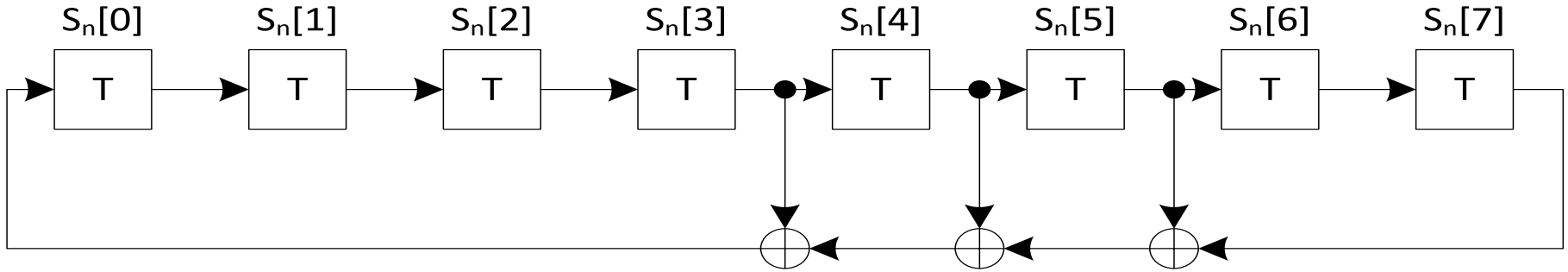


Figure 97-mm --- SEND_S PN sequence generator by linear feedback shift registers S_n