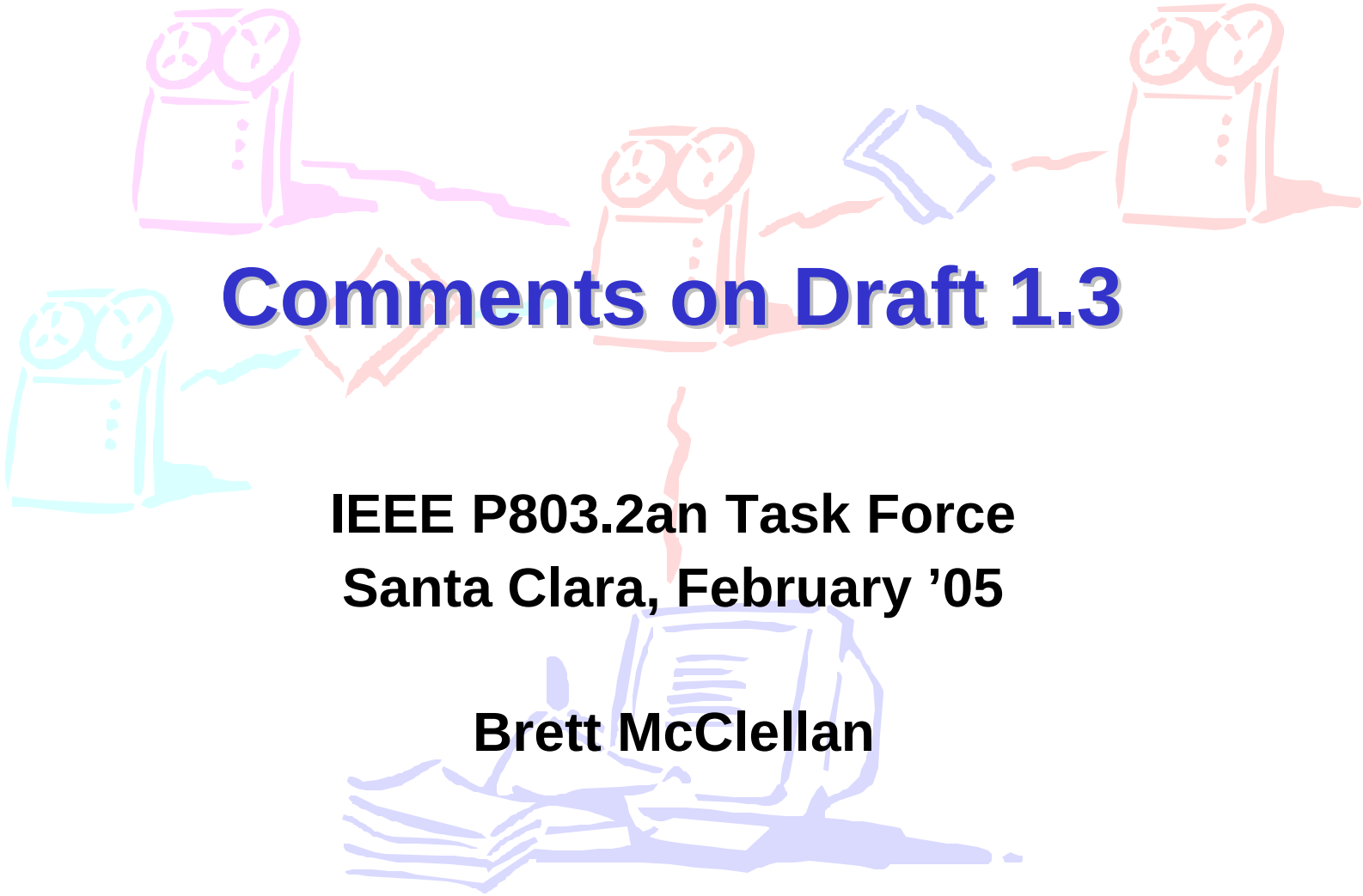


Comments on Draft 1.3

IEEE P803.2an Task Force
Santa Clara, February ’05

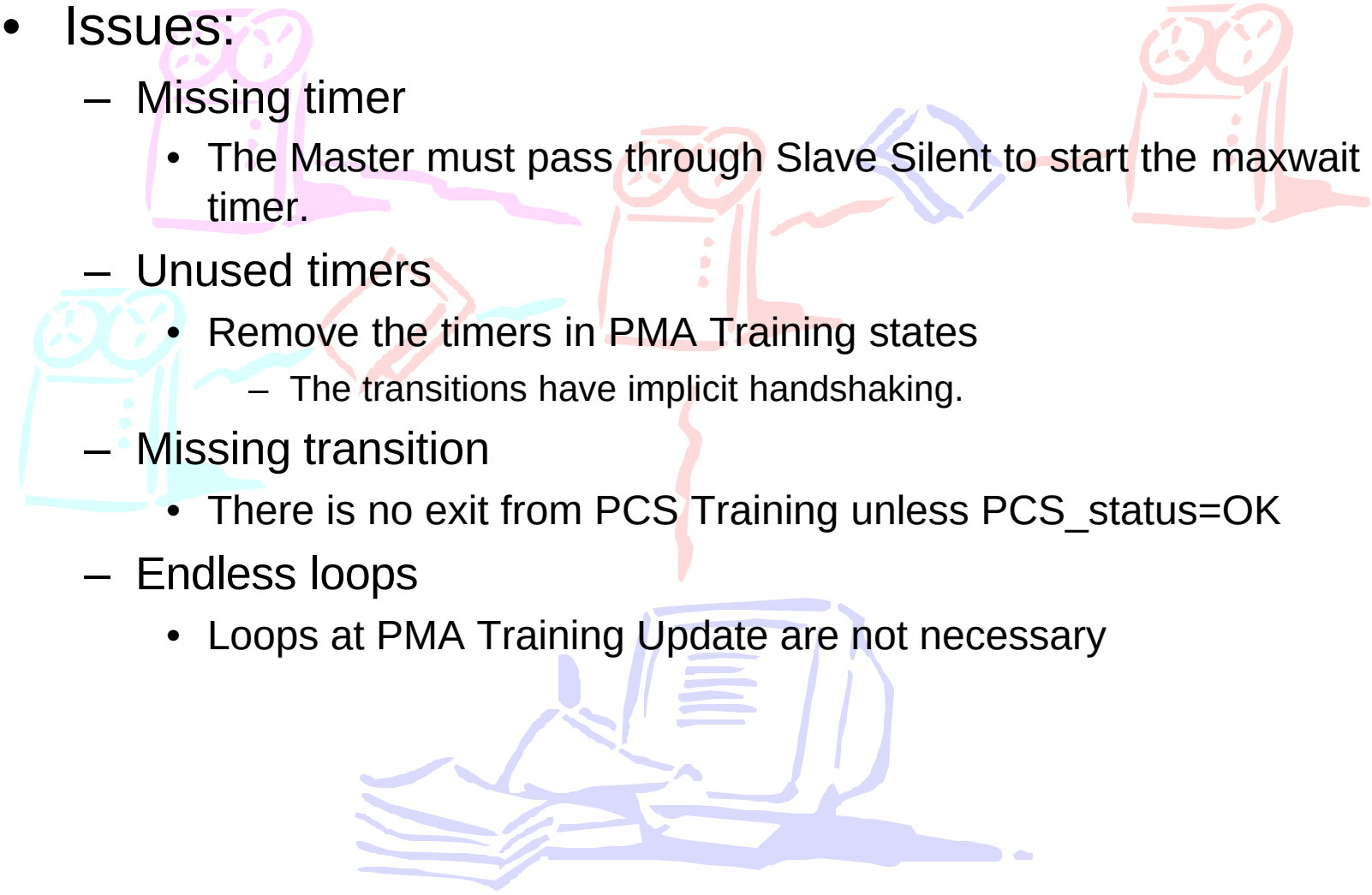
Brett McClellan

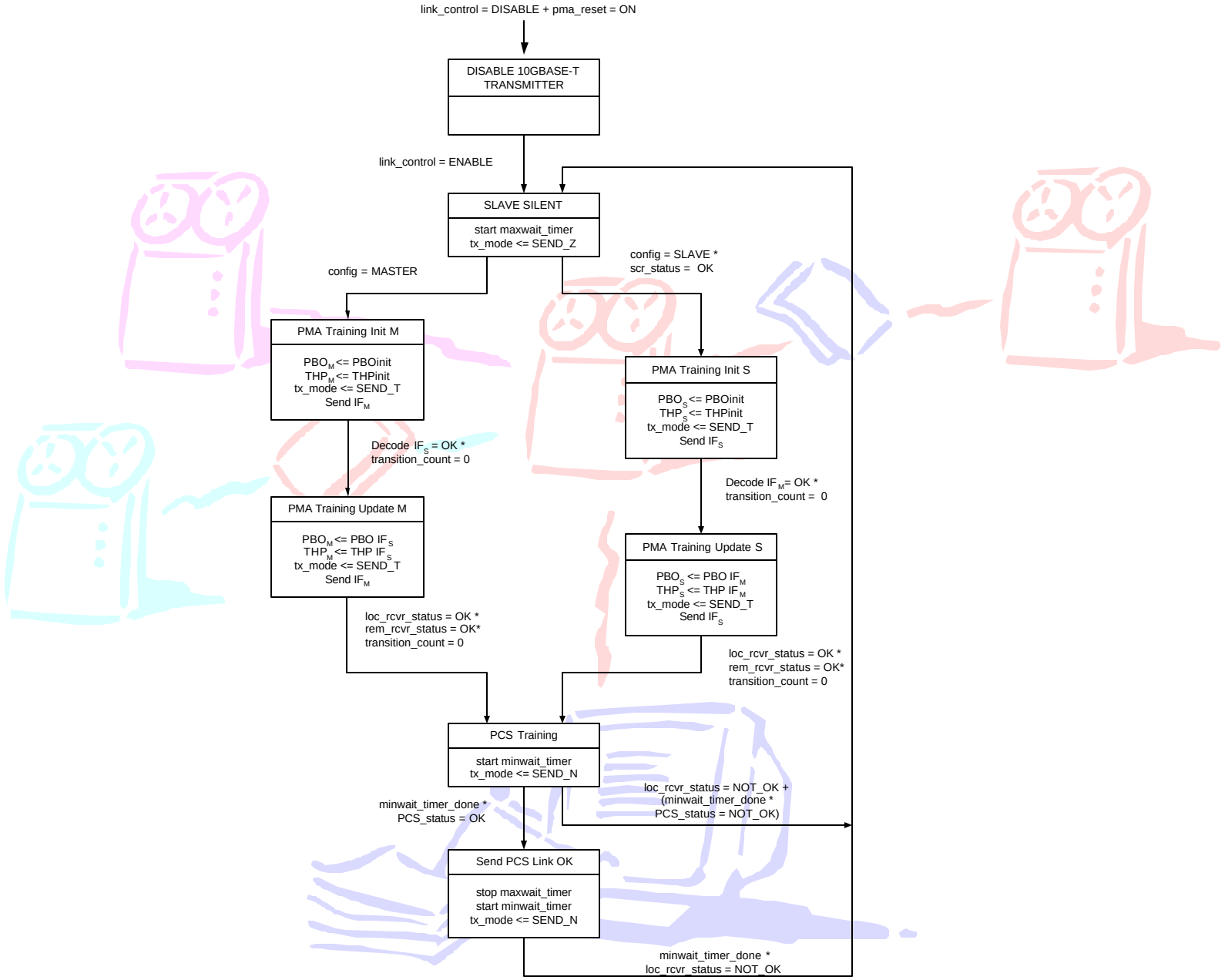
Info Field Proposal

- Info Field: 16 bytes
  - Start of Frame Delimiter: 4 bytes
    - BBA70000- minimum hamming distance of 7
  - Current TX setting: 1 byte
    - X, PBO(2:0), THP(3:0)
  - Next TX setting: 1 byte
    - X, PBO(2:0), THP(3:0)
  - Requested TX setting: 1 byte
    - X, PBO(2:0), THP(3:0)
  - Message Field : 1 byte
    - X(7:4), loc_rcvr_status, trans_to_Training_Update, trans_to_PCS_Training, trans_to_slave_silent
  - Transition Counter : 1 byte
    - Trans_counter(7:0): # of frames until next transition
  - Reserved Field: 5 bytes
    - For future use or vendor field.
  - CRC16: 2bytes $(x+1)(x^{15}+x+1)$

PHY Control State Diagram

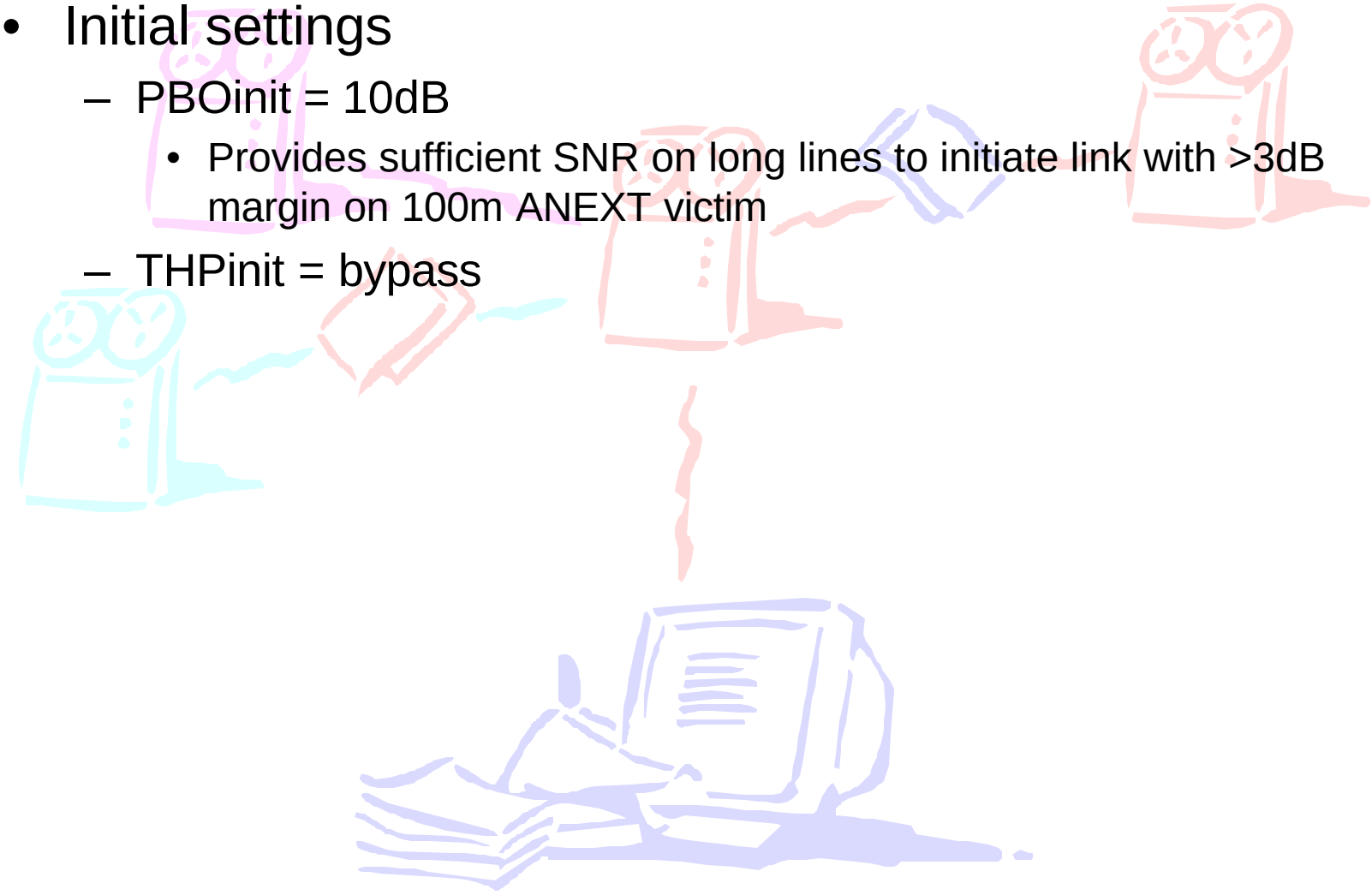
- Issues:
  - Missing timer
    - The Master must pass through Slave Silent to start the maxwait timer.
  - Unused timers
    - Remove the timers in PMA Training states
      - The transitions have implicit handshaking.
  - Missing transition
    - There is no exit from PCS Training unless PCS_status=OK
  - Endless loops
    - Loops at PMA Training Update are not necessary




link_control = DISABLE + pma_reset = ON
DISABLE 10GBASE-T TRANSMITTER
link_control = ENABLE
SLAVE SILENT
start maxwait_timer
tx_mode <= SEND_Z
config = MASTER
config = SLAVE *
scr_status = OK
PMA Training Init M
PBO_M <= PBOinit
THP_M <= THPinit
tx_mode <= SEND_T
Send IF_M
PMA Training Init S
PBO_S <= PBOinit
THP_S <= THPinit
tx_mode <= SEND_T
Send IF_S
Decode IF_S = OK *
transition_count = 0
Decode IF_M= OK *
transition_count = 0
PMA Training Update M
PBO_M <= PBO IF_S
THP_M <= THP IF_S
tx_mode <= SEND_T
Send IF_M
PMA Training Update S
PBO_S <= PBO IF_M
THP_S <= THP IF_M
tx_mode <= SEND_T
Send IF_S
loc_rcvr_status = OK *
rem_rcvr_status = OK*
transition_count = 0
loc_rcvr_status = OK *
rem_rcvr_status = OK*
transition_count = 0
PCS Training
start minwait_timer
tx_mode <= SEND_N
minwait_timer_done *
PCS_status = OK
loc_rcvr_status = NOT_OK +
(minwait_timer_done *
PCS_status = NOT_OK)
Send PCS Link OK
stop maxwait_timer
start minwait_timer
tx_mode <= SEND_N
minwait_timer_done *
loc_rcvr_status = NOT_OK

PHY Control State Diagram

- Initial settings
  - PBOinit = 10dB
    - Provides sufficient SNR on long lines to initiate link with >3dB margin on 100m ANEXT victim
  - THPinit = bypass



Link Monitor

- Issues
  - Link fail timer
    - The link_fail_inhibit_timer (pg 36 ln 32) will timeout in 750ms.
    - If the state machine has not transitioned to Link Up, then the link has failed and autoneg starts over.
    - If the time difference between PHY's entering startup is 192ms (pg 36 ln 46) then only 558ms is available for startup.
    - I propose to set link_status= OK as soon as the training pattern has been detected.
    - The maxwait_timer is responsible for timing the startup and setting link_status=FAIL if startup has not completed.
  - Transitions to Link Down
    - The current diagram does not match the text (PCS_status vs. loc_rcvr_status.
    - The diagram allows an immediate transition to Link Down if PCS_status=NOT_OK in the Hysteresis state.
    - I propose that the transition to Link Down occur only after the maxwait_timer has timed out and either PCS_status = NOT_OK or loc_rcvr_status = NOT_OK.

Link Monitor

- Timers
  - maxwait_timer
    - Limits the time allowed in the Training states before the link has failed.
    - 1000BASE-T was 750ms
    - TBD- needs more study
      - Range could be 750ms to seconds
  - Minwait_timer
    - Sets the minimum amount of time in the PCS Training state
    - ie. the minimum time after transitioning from 2PAM to 16PAM until ready for Link Up
    - Proposal: 1ms (~3000 frames)
      - Equal to 8 x LFER monitor timers

Proposed Link Monitor