- switch to RESYNC state also if RECV_TIMER elapses and local_nodeID != 0, meaning that a false carrier occurred and the curID variable might be out of sync. In this case the PHY skips his TO and waits for a new BEACON in order not to disrupt current cycle.
- switch to RECOVER state if RECV_TIMER elapses and local_nodeID = 0. In RECOVER state, since the curID variable might be out of sync, the PHY waits for all nodes to be silent for at least RECV_BEACON_TIMER before sending a new BEACON. This is required not to send a BEACON while other PHYs might still be using their TO.

When condition (2) occurs, the PHY now gets a TO having a packet to be transmitted. COMMIT state is then entered to signal other PHYs to stop their TO_TIMER and wait for a packet by the means of a COMMIT request. COMMIT state is left once the data to be transmitted is available from the MAC or the PLCA delay line.

When condition (3) occurs, the PHY now gets a TO without being ready to send a packet. In this case the YIELD state is entered to just skip the TO, allowing other PHYs a chance to transmit. In some rare cases (e.g. a non-PLCA enabled node ~~transmits~~ is connected to the network) it is possible to receive data in YIELD state. If this unlikely event happens, PLCA switches ~~in~~ to RECEIVE state to wait until the end of the transmission and increment curID properly.

Commented [PB1]: [PLCA_ROBUST] fix wording

When condition (4) is met, another PHY has yielded its transmit opportunity, causing the curID variable to be incremented and TO_TIMER to be reset.

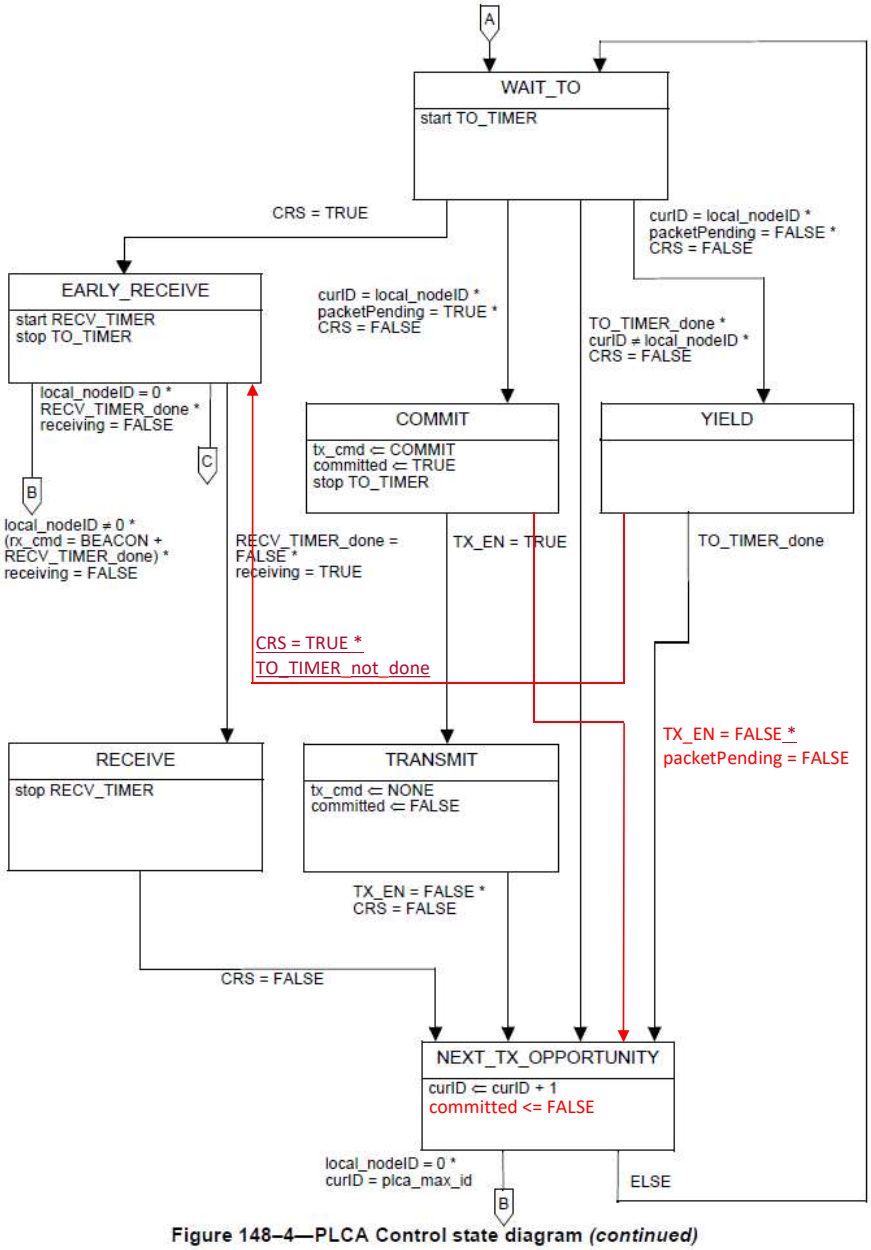

Figure 148–4—PLCA Control state diagram *(continued)*

Commented [PB2]: [PLCA_ROBUST] modify state diagram with editorial license to redraw in compliance with IEEE style rules.

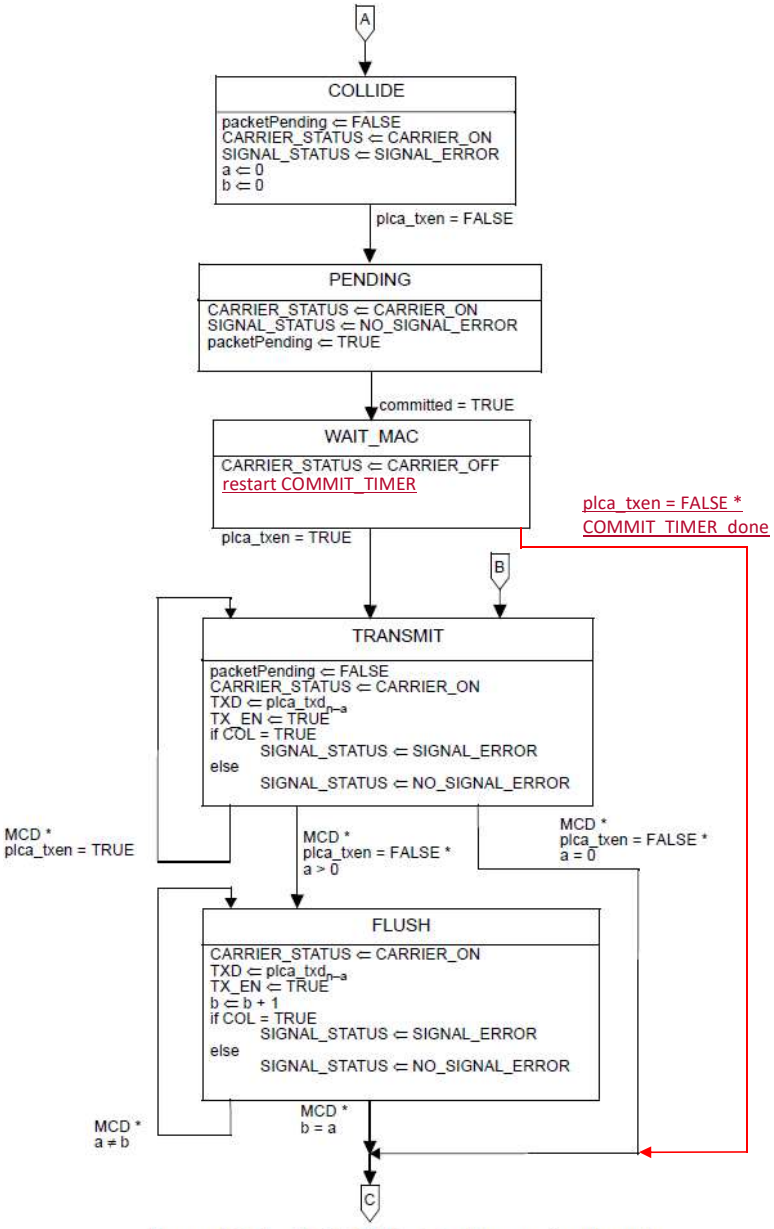

Figure 148–5—PLCA DATA state diagram *(continued)*

Commented [PB3]: [PLCA_ROBUST] Change state Diagram

COMMIT_TIMER:
Define the maximum time the PLCA Data state machine is allowed to stay in WAIT_MAC_STATE.
Duration: 288 bit times

148.4.7 PLCA Status

148.4.7.1 PLCA Status state diagram

PLCA Status state diagram is responsible for reporting whether nodes are actively sending/receiving the BEACON. The PLCA Status function shall conform to the PLCA Status state diagram in Figure 148–6 and associated state variables, functions, timers and messages.

Upon reset or when PLCA is disabled, PLCA Status function enters "INACTIVE" state and reports plca_status as "FALSE". As soon as the PLCA Control function enters the SYNCING state (i.e. receiving or transmitting the BEACON), plca_active variable is set to TRUE and PLCA Status switches to ACTIVE state, reporting plca_status as "TRUE".

From "ACTIVE" state, whenever plca_active is set to FALSE by PLCA Control function, the PLCA Status function enters "HYSTERESIS" state, still reporting plca_status as "TRUE" and arming PLCA_STATUS_TIMER.

If plca_active is reset to TRUE, then PLCA Status reverts to "ACTIVE" state, effectively filtering the momentarily inactive state. Instead, if PLCA_STATUS_TIMER expires while plca_active is still FALSE, the PLCA Status function reverts to "INACTIVE" state, reporting plca_status as "FALSE".

148.4.7.2 PLCA Status variables

plca_status
: The plca_status signal is used to report whether PLCA nodes are actively transmitting or receiving the BEACON. This signal maps to aPLCAStatus attribute as specified in 30.3.9.1.2. When MDIO is present this signal maps to register 28.15.15.
Values: TRUE or FALSE

plca_active
: See 148.4.5.2.

148.4.7.3 Functions

No functions are defined for PLCA Status state diagram.

148.4.7.4 Timers

PLCA_STATUS_TIMER
: Represents the time plca_status is maintained in TRUE state when plca_active is FALSE while in HYSTERESIS state.
Duration: the duration of this timer is controllable and should be at least 2 × (TO_TIMER × (plca_max_id + 1) + BEACON_TIMER) for reliable operations.