

# MAC interface

## 1 Control Messages

### 1.1 PhyLayer -> MAC

- RX\_START
  - Start of message indicator
- RX\_FAIL
  - Message receive failure. Occurs after a RX\_START, if the message either fails CRC checks or collides with something else.
- TX\_END
  - Message being transmitted has completed.
- TX\_FAIL
  - End of transmit (like TX\_END) but the message has failed to be transmitted. For most radios, this should never happen (but there are valid cases for packet-based radios e.g. CC2420)
- After a START\_CARRIERSENSE, one of the following must be sent to the MAC
  - CHANNEL\_IDLE
    - \* If the specified 'length' has finished, with no 'busy' channel noticed.
  - CHANNEL\_BUSY
    - \* If the channel is 'busy'

### 1.2 MAC -> PhyLayer

- SET\_TRANSMIT
- SET\_LISTEN
- SET\_SLEEP
  - Transition the PhyLayer into the given mode.
- START\_CARRIERSENSE
  - Start doing carrier sense. Has a 'length' parameter specifying the length of time/number of bytes (FIXME: pick one) to do carrier sense for.

## 2 Data packets

The MAC layer transfers messages to the Phy layer for transmission (TX packets) and expects to receive message from the Phy layer when messages arrive from other nodes (RX packets). The diagrams below indicate the interaction between the packet types and the control messages listed above.

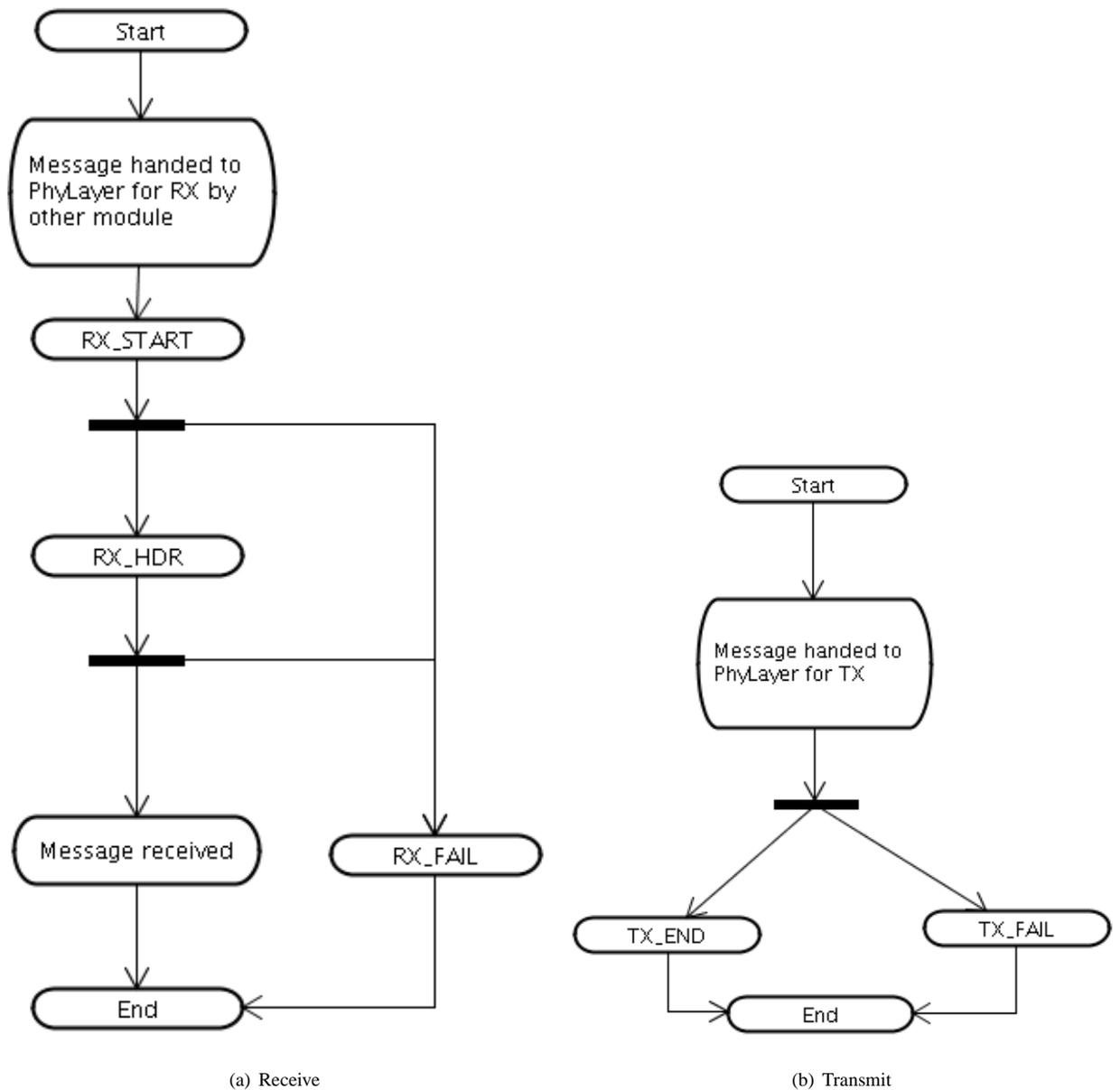


Figure 1: Message sequences

### 2.1 PhyLayer -> MAC

Packets from the PhyLayer should contain

- RSSI

- (Total reception time? i.e. time required to physically send/receive this packet. Or should this just be discoverable via length functions? See Section 3)

## 2.2 MAC -> PhyLayer

Packets to the PhyLayer should contain

- Preamble length
- Other fields as required by the PhyLayer (bitrates, tx power,etc)

## 3 Functions

- Packet time function - The MAC layer will need a function to be able to determine the time necessary for transmitting a packet. Technically this is just the packet length divided by bitrate, but as the MAC doesn't know how much headers the PhyLayer wants to add, this is probably a PhyLayer feature. This is needed both for the MAC and for potential stuff with network time synchronisation as well.

Related item: telling the difference between data stored in simulation packets vs. length of "real" packets.