# Multi-Point Reconciliation Sublayer (MPRS)
## [RS Input Process demystified]

Duane Remein, Huawei
Glen Kramer, Broadcom LTD

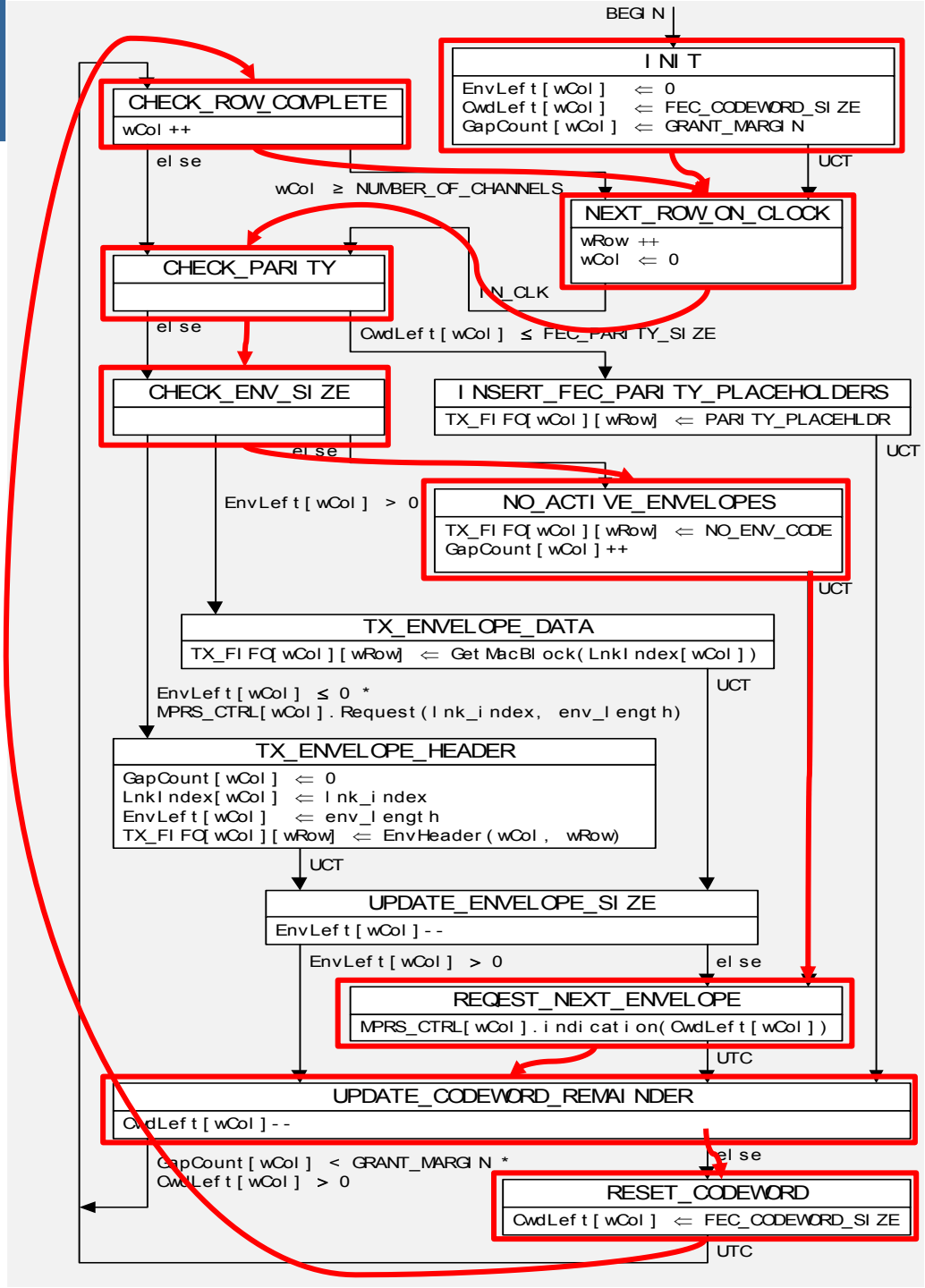
# Motivation

- Walk through the RS Input Process
  - Assume a single channel (same for multiple channels, just make multiple passes)

Warning! Best viewed with animation!

# Initial passes

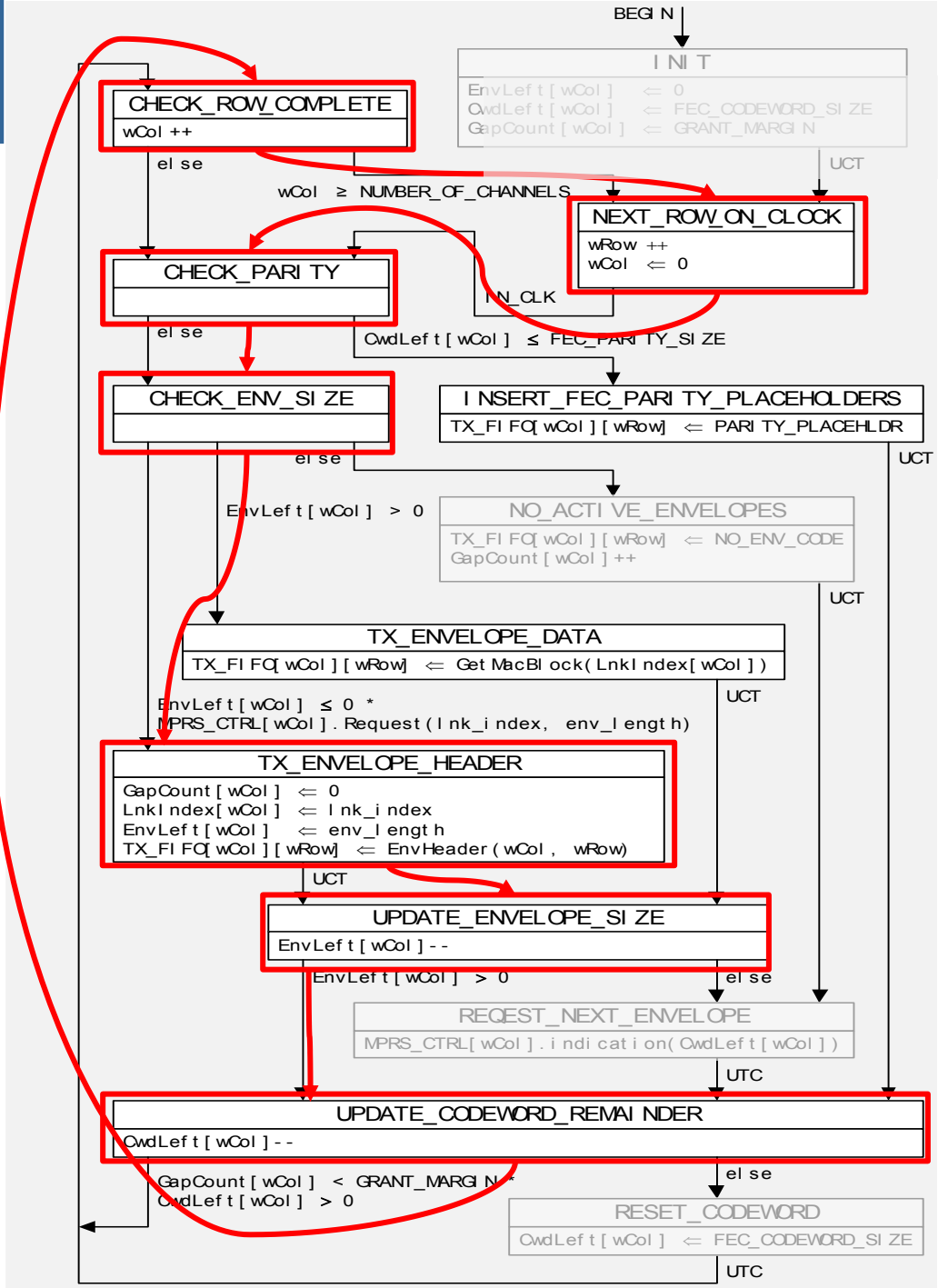
- INIT
  - EnvLeft = no active envelope
  - CwdLeft = full codeword
  - GapCount = laser off
- NEXT_ROW_ON_CLOCK
  - Selects row/column in buffer
- CHECK_PARITY
  - Not parity time
- CHECK_ENV_SIZE
  - No active envelope (EnvLeft =0)
- NO_ACTIVE_ENVELOPE
  - Set control code to signal PCS
  - Increment GapCount
- REQUEST_NEXT_ENVELOPE
  - Signal MPCP ready for next env
- UPDATE_CODEWORD_REM.
  - Decrement CwdLeft
  - GapCount > margin
- RESET_CODEWORD
  - Set CwdLeft to FEC size
- CHECK_ROW_COMPLETE



# New Envelope

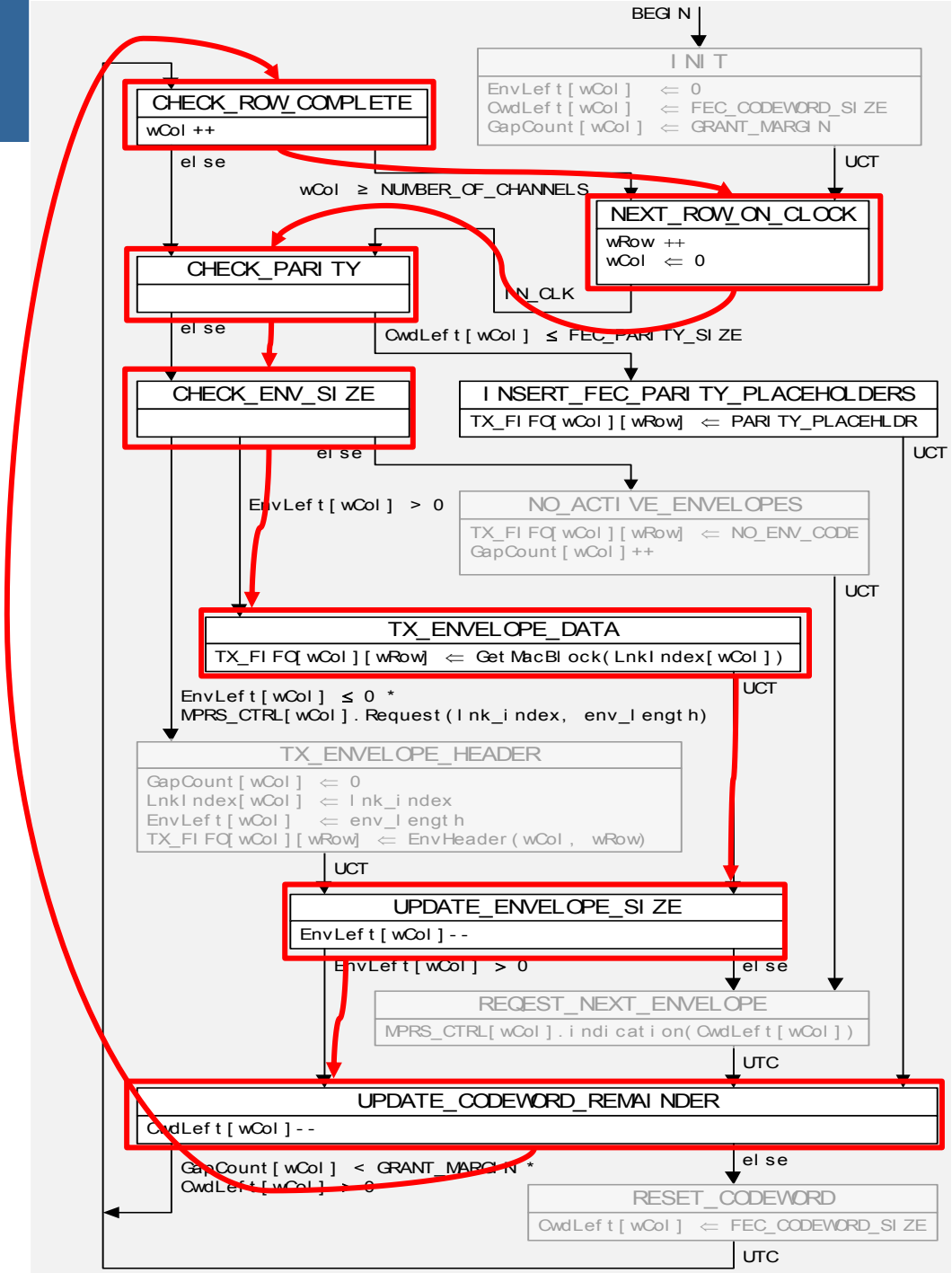
- CHECK_ROW_COMPLETE
- NEXT_ROW_ON_CLOCK
  - Selects row/column in buffer
- CHECK_PARITY
  - Not parity time
- CHECK_ENV_SIZE
  - New active envelope:
  - **EnvLeft = 0 AND MRPRS_CTRL returns something**
- TX_ENVELOPE_HEADER
  - Reset GapCount
  - Set LLID (LinkIndex[]) to lnk_index
  - Set EnvLeft to env_length
  - Set Tx Data to header
- UPDATE_ENVELOPE_SIZE
  - Decrement EnvLeft (> 0 )
- UPDATE_CODEWORD_REM.
  - Decrement CwdLeft
  - GapCount < margin & CwdLeft > 0
- CHECK_ROW_COMPLETE





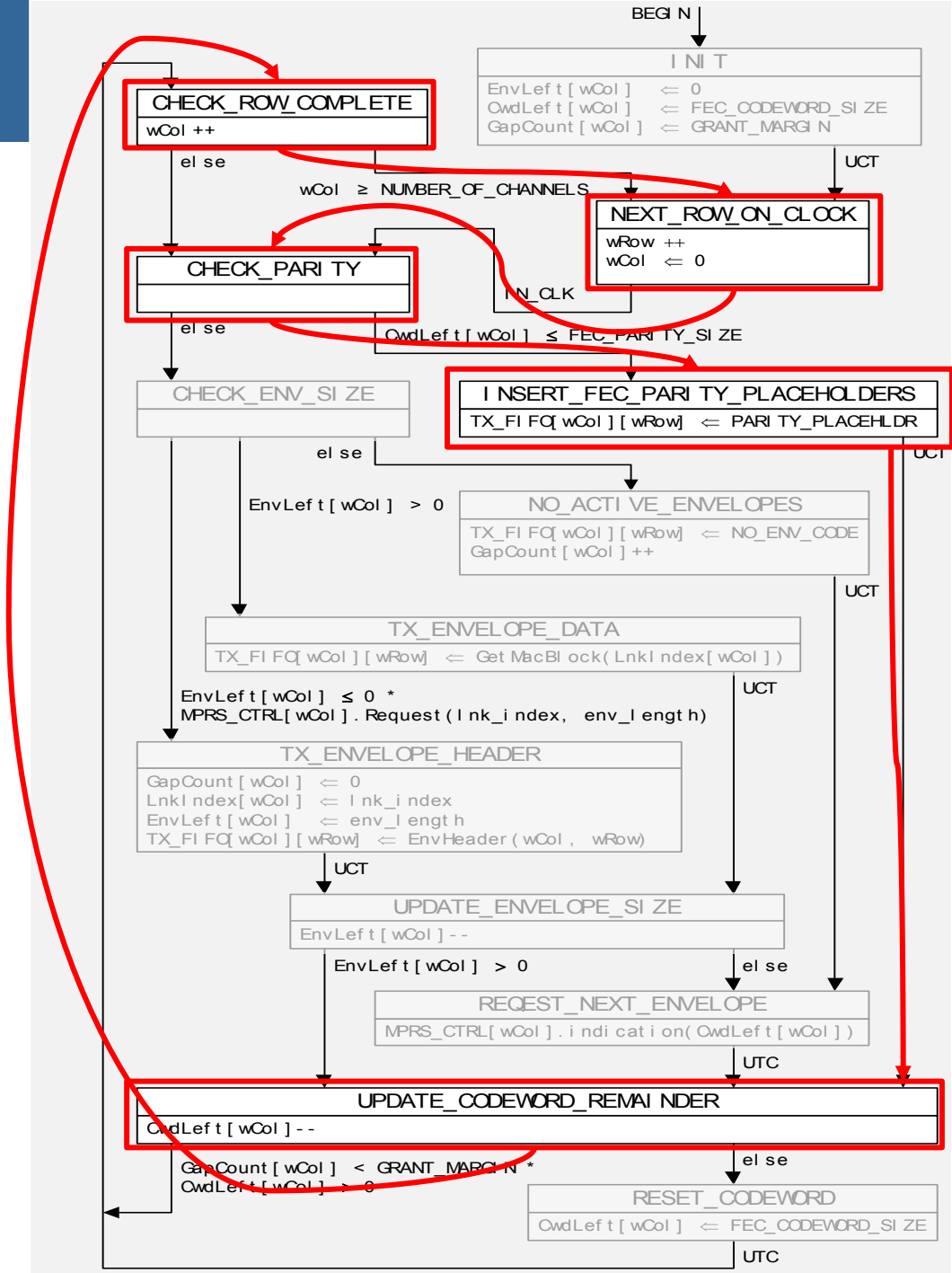
# Envelope Data

- CHECK_ROW_COMPLETE
- NEXT_ROW_ON_CLOCK
  - Selects row/column in buffer
- CHECK_PARITY
  - Not parity time
- CHECK_ENV_SIZE
  - Old active envelope
  - **EnvLeft > 0**
- TX_ENVELOPE_DATA
  - Set Tx Data to next block of data from MAC
- UPDATE_ENVELOPE_SIZE
  - Decrement EnvLeft
- REQUEST_NEXT_ENVELOPE
  - Signal MPCP ready for next env
- UPDATE_CODEWORD_REM.
  - Decrement CwdLeft
  - GapCount < margin & CwdLeft > 0
- CHECK_ROW_COMPLETE



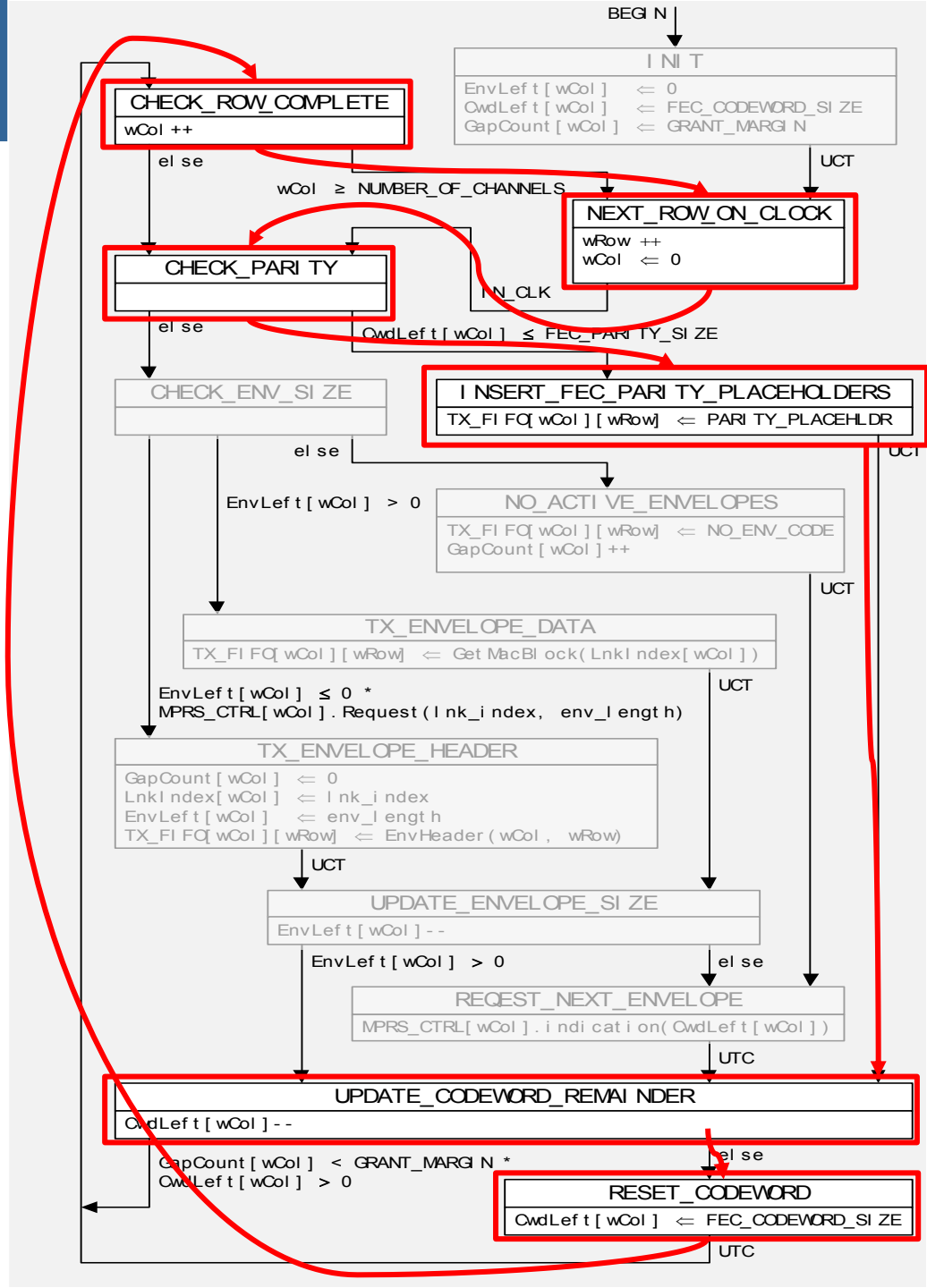
# Parity

- CHECK_ROW_COMPLETE
- NEXT_ROW_ON_CLOCK
- CHECK_PARITY
  - YES! Parity time!
  - **CwdLeft <= FEC parity size**
- INSERT_FEC_PARITY_PLACEHOLDERS
  - Set Tx parity placeholder control code
- UPDATE_CODEWORD_REM.
  - Decrement CwdLeft
  - GapCount < margin & CwdLeft > 0
- CHECK_ROW_COMPLETE



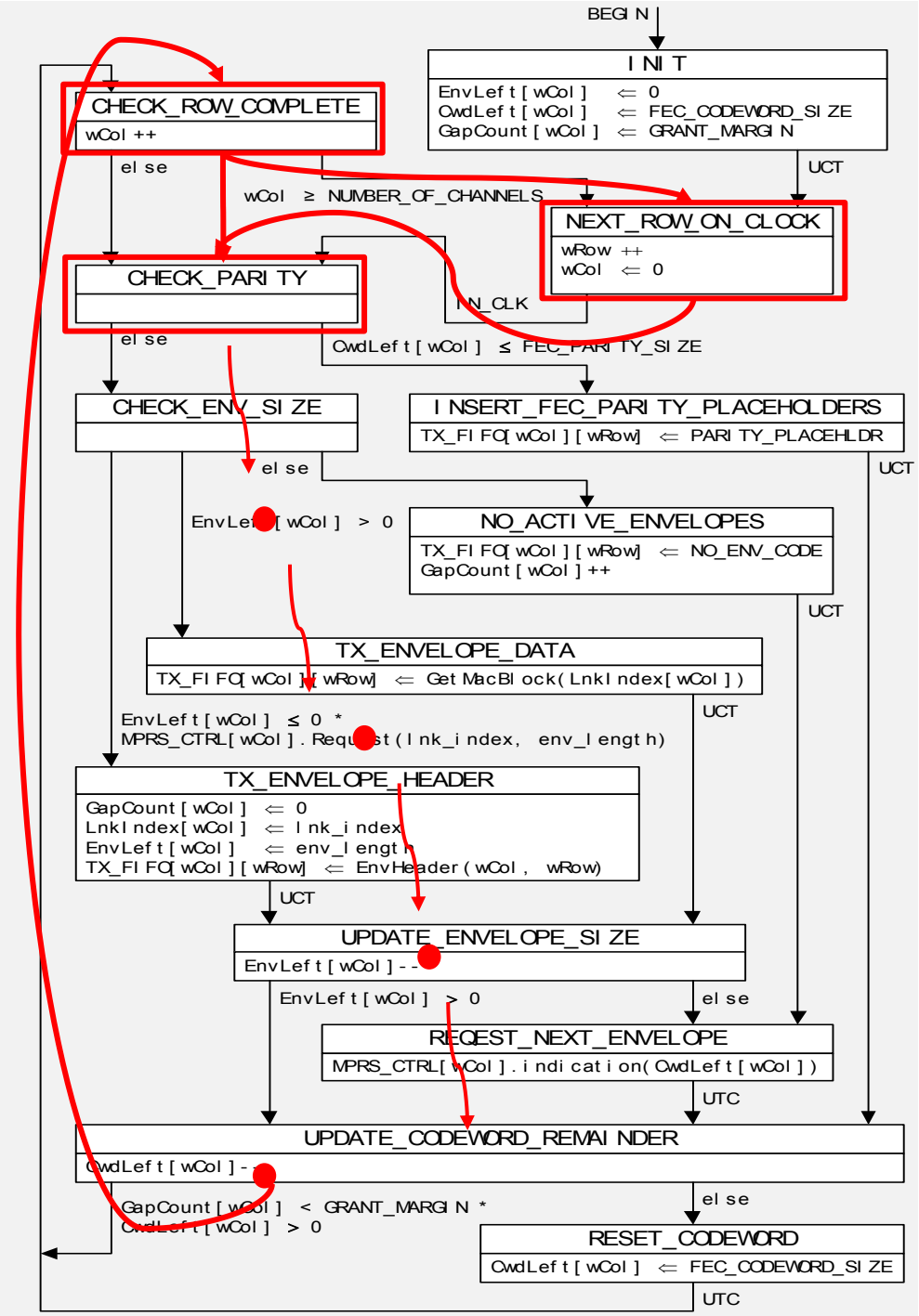
# FEC Complete

- CHECK_ROW_COMPLETE
- NEXT_ROW_ON_CLOCK
- CHECK_PARITY
  - YES! Parity time!
- INSERT_FEC_PARITY_PLACEHOLDERS
  - Set Tx parity placeholder control code
- UPDATE_CODEWORD_REM.
  - Decrement CwdLeft
  - **CwdLeft = 0**
- RESET_CODEWORD
  - Set CwdLeft to FEC size
- CHECK_ROW_COMPLETE



# Multiple Ch

- wCol = 0
  - CHECK_ROW_COMPLETE
  - NEXT_ROW_ON_CLOCK
  - CHECK_PARITY …
- wCol = 1
  - CHECK_ROW_COMPLETE
  - NEXT_ROW_ON_CLOCK
  - CHECK_PARITY …
- wCol = 2
  - CHECK_ROW_COMPLETE
  - NEXT_ROW_ON_CLOCK
  - CHECK_PARITY …
- wCol = 3
  - CHECK_ROW_COMPLETE
  - NEXT_ROW_ON_CLOCK
  - CHECK_PARITY …



# Thank You