

DL-SCH processing in the PHY layer

One or two transport block(s) of dynamic size delivered from the MAC layer

CRC insertion per transport block
Append 24 bit CRC to transport block

Code-block segmentation including possible per-code-block CRC insertion
If TB size does not match one of the 188 block sizes between 40 and 6144 bits accepted by the Turbo coder, then segment and/or pad the transport block.
Channel coding (Turbo coding)
I.e. forward error correction (FEC). Insert redundant bits (function of original bits), so that errors can be detected and possibly corrected by the receiver.

Rate matching and physical-layer hybrid-ARQ functionality
Of the three bit blocks of each code block, choose the bits to transmit to match the desired code rate, and reassemble the code blocks of the initial transport block to a "codeword"
Bit-level scrambling
XOR with scrambling sequence

Data modulation
(QPSK, 16QAM, 64QAM)
Map groups of 2 (QPSK), 4 (16QAM), and 6 (64QAM) bits to the corresponding modulation symbols.

Antenna mapping
Map symbols to layers, precode symbols of these layers, and assign precoded symbols to antenna ports. The number of layers and antenna ports is implied by the used multi-antenna transmission scheme.

Resource element mapping
At each antenna port, map the assigned symbols to resource elements of the allocated resource-block pairs

