Creation of G – Generating Matrix

* All bit positions, which value is equal to are used as parity bits.
* Otherwise fill with Identity matrix as follows:
* Fill in the missing parity bits:
  + For p1: Check Bit | Skip Bit | Check bit | Skip bit | Check bit …

… Sum must be equal to 0, choose a1 (p1) accordingly

* + For p2: Skip First | Check Bit | Check Bit | Skip Bit | Skip Bit …

… Sum must be equal to 0, choose a2 (p2) accordingly

* + For p3: Skip First 3 | Check Bit | Check Bit |Check Bit | Check Bit …

… Sum must be equal to 0, choose a4 (p3) accordingly

* Convert G to standard shape of
* Create a control matrix

Hamming [7,4] Codeword generation C = d\*G

* B … Data Bits | P … Parity Bits | D … Inut data bits (B D) | G … Generating Matrix

Simulated error matrix Er (Identity matrix) and control matrix H:

Syndrome precalculation for all possible errors:

* The multiplication is H \* Column (Thus 7 times to produce all syndroms).
* For a given (non-zero) syndrome, the error is in a corresponding bit position of Er.
  + For example a syndrome of [0 1 1] corresponds to the 3rd row of Er and thus the error comes from the 3rd position of the codeword C.