92.2.3.1 **FEC code**

The FEC code used is a linear cyclic block code - the Reed-Solomon code (255, 223) over the Galois Field of GF(2^8) - a non-binary code operating on 8-bit symbols. The code encodes 223 information symbols and adds 32 parity symbols. The code is systematic—meaning that the information symbols are not disturbed in any way in the encoder and the parity symbols are added separately to each block.

The code is the systematic form of the RS code based on the generating polynomial $G(x)=\prod_{i=0}^{31} (x-\alpha^i)$

where α is equal to 0x02 and is a root of the binary primitive polynomial $x^8+x^4+x^3+x^2+1$.

A codeword of the systematic code is presented by $D(x) + P(x) = G(x) * L(x)$ where:

$D(x)$ is the data vector – $D(x)=D_{222}X^{254} + ... + D_0X^{32}$. D_{222} is the first data octet and D_0 is the last.

$P(x)$ is the parity vector – $P(x)=P_{31}X^{31} + ... + P_0$. P_{31} is the first parity octet and P_0 is the last.

A data octet (d_7, d_6, ..., d_1, d_0) is identified with the element: $d_7*\alpha^7 + d_6*\alpha^6 + ... d_1*\alpha^1 + d_0$ in GF(2^8), the finite field with 2^8 elements. The code has a correction capability of up to sixteen symbols.

For the (255,223) Reed-Solomon code, the symbol size equals one octet. d_0 is identified as the LSB and d_7 is identified as the MSB bit in accordance with the conventions of 3.1.1.