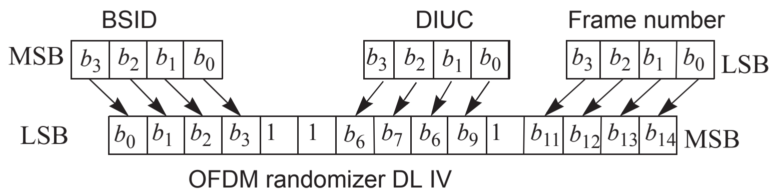

Figure 200—OFDM randomizer DL IV for burst #2...N

On the UL, the randomizer is initialized with the vector shown in Figure 201. The frame number used for initialization is that of the frame in which the UL map that specifies the UL burst was transmitted.

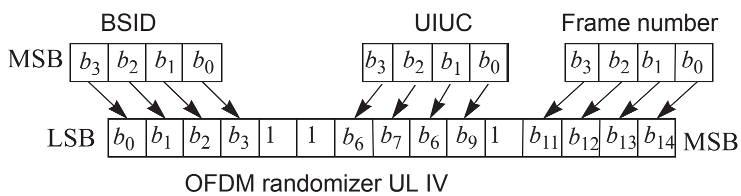

Figure 201—OFDM randomizer UL IV

8.3.3.2 FEC

An FEC, consisting of the concatenation of a Reed-Solomon outer code and a rate-compatible convolutional inner code, shall be supported on both UL and DL. Support of BTC and CTC is optional. The most robust burst profile shall always be used as the coding mode when requesting access to the network and in the FCH burst.

The encoding is performed by first passing the data in block format through the RS encoder and then passing it through a zero-terminating convolutional encoder.

8.3.3.2.1 Concatenated Reed-Solomon-convolutional code (RS-CC)

The Reed-Solomon encoding shall be derived from a systematic RS (N = 255, K = 239, T = 8) code using GF(2^8),

where

N is the number of overall bytes after encoding
K is the number of data bytes before encoding
T is the number of data bytes which can be corrected

The following polynomials [Equation (20) and Equation (21)] are used for the systematic code:

Code Generator Polynomial: $$x) = (x+\lambda^0)(x+\lambda^1)(x+\lambda^2)\ldots(x+\lambda^{2T-1}), \lambda = 02_H \quad (20)$$

Field Generator Polynomial: $$p(x) = x^8 + x^4 + x^3 + x^2 + 1 \quad (21)$$

This code is shortened and punctured to enable variable block sizes and variable error-correction capability. When a block is shortened to K' data bytes, add 239-K' zero bytes as a prefix. After encoding discard these 239-K' zero bytes. When a codeword is punctured to permit T' bytes to be corrected, only the first $2T'$ of the total 16 parity bytes shall be employed. The bit/byte conversion shall be MSB first.

Each RS block is encoded by the binary convolutional encoder, which shall have native rate of 1/2, a constraint length equal to 7, and shall use the generator polynomials codes shown in Equation (22) to derive its two code bits.

$$\begin{aligned} G_1 &= 171_{OCT} \qquad FOR\ \ X \\ G_2 &= 133_{OCT} \qquad FOR\ Y \end{aligned} \tag{22}$$

The generator is depicted in Figure 202.

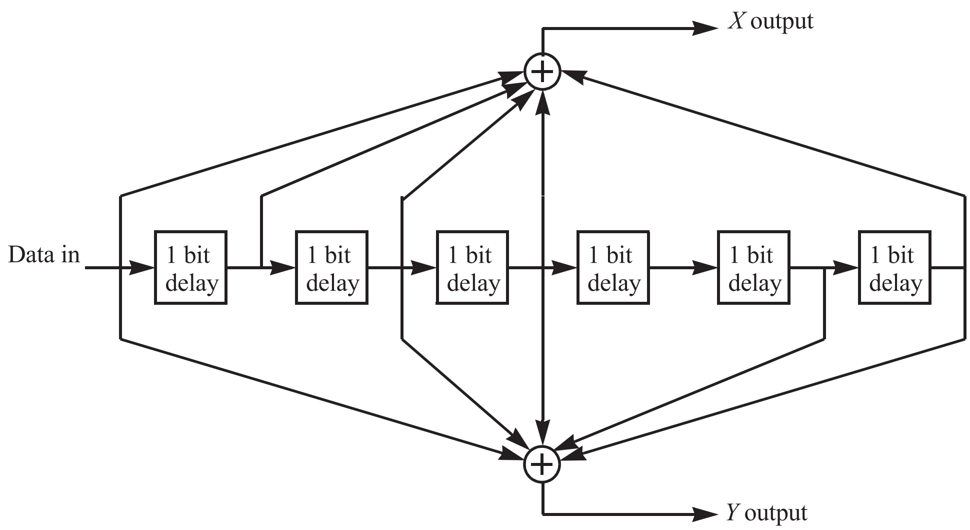

Figure 202—Convolutional encoder of rate 1/2

Puncturing patterns and serialization order that shall be used to realize different code rates are defined in Table 249. In the table, "1" means a transmitted bit and "0" denotes a removed bit, whereas *X* and *Y* are in reference to Figure 202.

Table 249—The inner convolutional code with puncturing configuration

	Code rates			
Rate	1/2	2/3	3/4	5/6
d_{free}	10	6	5	4
X	1	10	101	10101
Y	1	11	110	11010
XY	X_1Y_1	$X_1Y_1Y_2$	$X_1Y_1Y_2X_3$	$X_1Y_1Y_2X_3Y_4X_5$

The encoding is performed by first passing the data in block format through the RS encoder and then passing it through a convolutional encoder. A single 0x00 tail byte is appended to the end of each burst. This tail byte shall be appended after randomization. In the RS encoder, the redundant bits are sent before the input bits, keeping the 0x00 tail byte at the end of the allocation. To ensure that the number of bits after the convolutional encoder is divisible by N_{cbps}, as specified in Table 258 in 8.3.3.3, zero (0b0) pad bits are