Mueller Exhibit 57

EXHIBIT A

SAMSUNG'S PATENT L.R. 3-1(A)-(D) DISCLOSURES FOR U.S. PATENT NO. 6,928,604

ASSERTED CLAIM (PATENT L.R. 3-1(A))	**ACCUSED INSTRUMENTALITY AND HOW EACH ELEMENT IS MET BY ACCUSED INSTRUMENTALITY (PATENT L.R. 3-1(B)-(D))**
1. A mobile communication system having input data frames of variable size, comprising:	Apple's 3G Products[1] contain a mobile communication system having input data frames of variable size. *See, e.g.,* Apple iPhone user guide re iOS 3.1: (iPhone 3G or later, p. 21): 3G 3G Shows that your carrier's 3G network is available, and iPhone can connect to the Internet over 3G. Available on iPhone 3G or later. See "How iPhone Connects to the Internet" on page 40. http://www.apple.com/iphone/specs.html (iPhone 4)

[1] "Apple's 3G Products" include iPhone 3G, iPhone 3GS, iPhone4, iPad 3G, iPad2 3G and any other products compliant with 3GPP UMTS standard.

Cellular and wireless

- GSM model: UMTS/HSDPA/HSUPA (850, 900, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz)
- CDMA model: CDMA EV-DO Rev. A (800, 1900 MHz)
- 802.11b/g/n Wi-Fi (802.11n 2.4GHz only)
- Bluetooth 2.1 + EDR wireless technology

Location

- Assisted GPS
- Digital compass
- Wi-Fi
- Cellular

iPad iOS 3.2 user guide: (iPad)

Cellular Data

Use Cellular Data settings (on iPad Wi-Fi + 3G only) to turn Data Roaming on or off, change your account information, or add a Personal Identification Number (PIN) to lock the micro-SIM card.

Turn the cellular data network on or off: Choose Cellular Data, then turn Cellular Data on or off.

Turn data roaming on or off: Choose Data Roaming, then turn data roaming on or off.

View your account information: To see or change your account information, tap View Account.

Chapter 17 Settings

http://www.apple.com/ipad/specs/ (iPad 2)

Wireless and Cellular	▪ Wi-Fi (802.11a/b/g/n) ▪ Bluetooth 2.1 + EDR technology	▪ Wi-Fi + 3G model: UMTS/HSDPA/HSUPA (850, 900, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz) ▪ Wi-Fi + 3G for Verizon model: CDMA EV-DO Rev. A (800, 1900 MHz) ▪ Data only[8] ▪ Wi-Fi (802.11a/b/g/n) ▪ Bluetooth 2.1 + EDR technology Learn more about Wi-Fi + 3G ▸
Carriers		at&t verizon

	3GPP Technical Specification 25.212 v6.0.0 ("TS 25.212 v6.0.0") §4.2 Figure 1: Given the range of applications for Apple 3G products, the input data frames are not all of the same size. TS 25.212 v6.0.0 §4.2.1.1: 4.2.1.1 CRC Calculation The entire transport block is used to calculate the CRC parity bits for each transport block. The parity bits are generated by one of the following cyclic generator polynomials: - $g_{CRC24}(D) = D^{24} + D^{23} + D^6 + D^5 + D + 1$; - $g_{CRC16}(D) = D^{16} + D^{12} + D^5 + 1$; - $g_{CRC12}(D) = D^{12} + D^{11} + D^3 + D^2 + D + 1$; - $g_{CRC8}(D) = D^8 + D^7 + D^4 + D^3 + D + 1$. Denote the bits in a transport block delivered to layer 1 by $a_{im1}, a_{im2}, a_{im3}, \ldots, a_{imA_i}$, and the parity bits by $p_{im1}, p_{im2}, p_{im3}, \ldots, p_{imL_i}$. A_i is the size of a transport block of TrCH i, m is the transport block number, and L_i is the number of parity bits. L_i can take the values 24, 16, 12, 8, or 0 depending on what is signalled from higher layers.
[a] a processor for determining the number of input data frames to concatenate to compose a super frame; and	Apple's 3G Products include a processor for determining the number of input data frames to concatenate to compose a super frame. *See, e.g.,* TS 25.212 v6.0.0 §4.2.2:

4.2.2 Transport block concatenation and code block segmentation

All transport blocks in a TTI are serially concatenated. If the number of bits in a TTI is larger than *Z*, the maximum size of a code block in question, then code block segmentation is performed after the concatenation of the transport blocks. The maximum size of the code blocks depends on whether convolutional coding or turbo coding is used for the TrCH.

http://www.tgdaily.com/hardware-features/50344-the-real-iphone-4-teardown

TS 25.212 v6.0.0 § 4.2.2.2:

	4.2.2.2 Code block segmentation Segmentation of the bit sequence from transport block concatenation is performed if $X_i>Z$. The code blocks after segmentation are of the same size. The number of code blocks on TrCH i is denoted by C_i. If the number of bits input to the segmentation, X_i, is not a multiple of C_i, filler bits are added to the beginning of the first block. If turbo coding is selected and X_i < 40, filler bits are added to the beginning of the code block. The filler bits are transmitted and they are always set to 0. The maximum code block sizes are: - convolutional coding: Z = 504; - turbo coding: Z = 5114. The bits output from code block segmentation, for $C_i \neq 0$, are denoted by $o_{ir1}, o_{ir2}, o_{ir3}, \ldots, o_{irK_i}$, where i is the TrCH number, r is the code block number, and K_i is the number of bits per code block. Number of code blocks: $C_i = \lceil X_i / Z \rceil$
[b] a turbo encoder for turbo encoding the super frame consisting of more than one input data frame.	Apple's 3G Products include a turbo encoder for turbo encoding the super frame consisting of more than one input data frame. *See, e.g.,* TS 25.212 v6.0.0 §4.2.2: **4.2.2 Transport block concatenation and code block segmentation** All transport blocks in a TTI are serially concatenated. If the number of bits in a TTI is larger than Z, the maximum size of a code block in question, then code block segmentation is performed after the concatenation of the transport blocks. The maximum size of the code blocks depends on whether convolutional coding or turbo coding is used for the TrCH.

<table>
<tr>
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TS 25.212 v6.0.0 §4.2.3, Table 1:

4.2.3 Channel coding

Code blocks are delivered to the channel coding block. They are denoted by $o_{ir1}, o_{ir2}, o_{ir3}, \ldots, o_{irK_i}$, where i is the TrCH number, r is the code block number, and K_i is the number of bits in each code block. The number of code blocks on TrCH i is denoted by C_i. After encoding the bits are denoted by $y_{ir1}, y_{ir2}, y_{ir3}, \ldots, y_{irY_i}$, where Y_i is the number of encoded bits. The relation between o_{irk} and y_{irk} and between K_i and Y_i is dependent on the channel coding scheme.

The following channel coding schemes can be applied to TrCHs:

- convolutional coding;
- turbo coding.

Table 1: Usage of channel coding scheme and coding rate

<table>
<tr><th>Type of TrCH</th><th>Coding scheme</th><th>Coding rate</th></tr>
<tr><td>BCH</td><td rowspan="4">Convolutional coding</td><td rowspan="3">1/2</td></tr>
<tr><td>PCH</td></tr>
<tr><td>RACH</td></tr>
<tr><td rowspan="2">CPCH, DCH, DSCH, FACH</td><td>1/3, 1/2</td></tr>
<tr><td>Turbo coding</td><td>1/3</td></tr>
</table>
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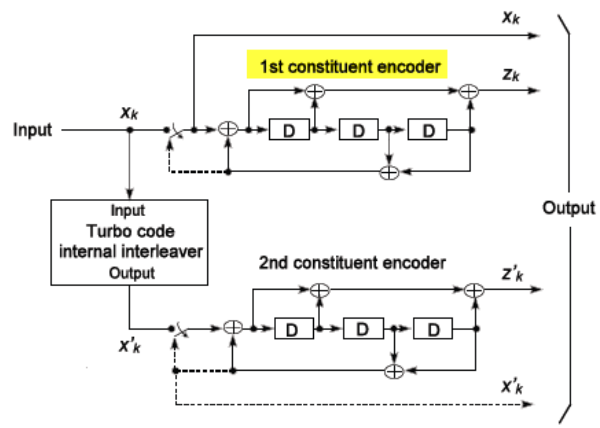
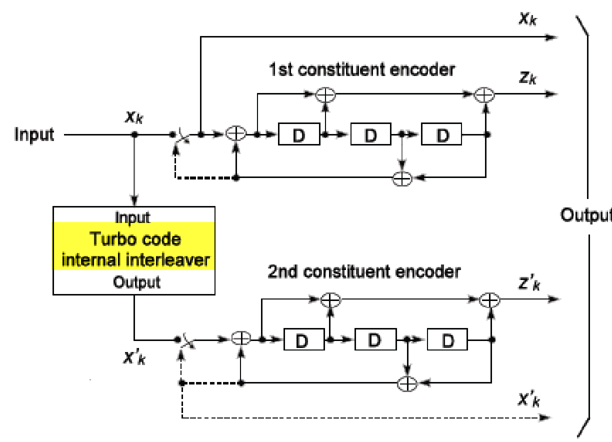
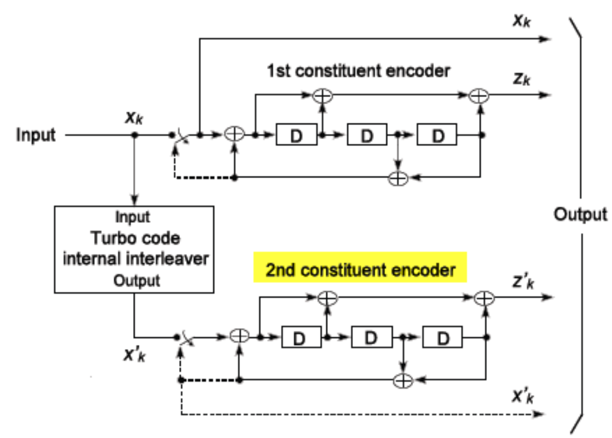
<td>2. The mobile communication system as claimed in claim 1, wherein the turbo encoder comprises:</td>
<td>See claim 1.</td>
</tr>
<tr>
<td>[a] a first constituent encoder for encoding data of the super frame;</td>
<td>Apple’s 3G Products include a first constituent encoder for encoding data of the super frame. See, e.g.,</td>
</tr>
</table>

	TS 25.212 v6.0.0 §4.2.3.2.1, Figure 4: **4.2.3.2 Turbo coding** 4.2.3.2.1 Turbo coder The scheme of Turbo coder is a Parallel Concatenated Convolutional Code (PCCC) with two 8-state constituent encoders and one Turbo code internal interleaver. The coding rate of Turbo coder is 1/3. The structure of Turbo coder is illustrated in figure 4.  **Figure 4: Structure of rate 1/3 Turbo coder (dotted lines apply for trellis termination only)**
[b] an interleaver for interleaving the data of the super frame; and	Apple's 3G products include an interleaver for interleaving the data of the super frame. *See, e.g.*, TS 25.212 v6.0.0 §4.2.3.2.1, Figure 4:

	4.2.3.2 Turbo coding 4.2.3.2.1 Turbo coder The scheme of Turbo coder is a Parallel Concatenated Convolutional Code (PCCC) with two 8-state constituent encoders and one Turbo code internal interleaver. The coding rate of Turbo coder is 1/3. The structure of Turbo coder is illustrated in figure 4.  **Figure 4: Structure of rate 1/3 Turbo coder (dotted lines apply for trellis termination only)**
[c] a second constituent encoder, operably connected to said interleaver, for encoding the interleaved data of the super frame.	Apple's 3G Products include a second constituent encoder, operably connected to said interleaver, for encoding the interleaved data of the super frame. *See, e.g.,* TS 25.212 v6.0.0 §4.2.3.2.1, Figure 4:

	4.2.3.2 Turbo coding 4.2.3.2.1 Turbo coder The scheme of Turbo coder is a Parallel Concatenated Convolutional Code (PCCC) with two 8-state constituent encoders and one Turbo code internal interleaver. The coding rate of Turbo coder is 1/3. The structure of Turbo coder is illustrated in figure 4.  **Figure 4: Structure of rate 1/3 Turbo coder (dotted lines apply for trellis termination only)**
3. The mobile communication system as claimed in claim 1,	*See* claim 1.
wherein said interleaver includes an interleaving address mapper for interleaving the data of the super frame.	The interleaver contained in Apple's 3G Products include an interleaving address mapper for interleaving the data of the super frame. TS 25.212 v6.0.0 §4.2.3.2, Figure 4:

4.2.3.2 Turbo coding

4.2.3.2.1 Turbo coder

The scheme of Turbo coder is a Parallel Concatenated Convolutional Code (PCCC) with two 8-state constituent encoders and one Turbo code internal interleaver. The coding rate of Turbo coder is 1/3. The structure of Turbo coder is illustrated in figure 4.

Output from the Turbo coder is

$$x_1, z_1, z'_1, x_2, z_2, z'_2, \ldots, x_K, z_K, z'_K,$$

where $x_1, x_2, \ldots, x_K$ are the bits input to the Turbo coder i.e. both first 8-state constituent encoder and Turbo code internal interleaver, and K is the number of bits, and $z_1, z_2, \ldots, z_K$ and $z'_1, z'_2, \ldots, z'_K$ are the bits output from first and second 8-state constituent encoders, respectively.

The bits output from Turbo code internal interleaver are denoted by $x'_1, x'_2, \ldots, x'_K$, and these bits are to be input to the second 8-state constituent encoder.

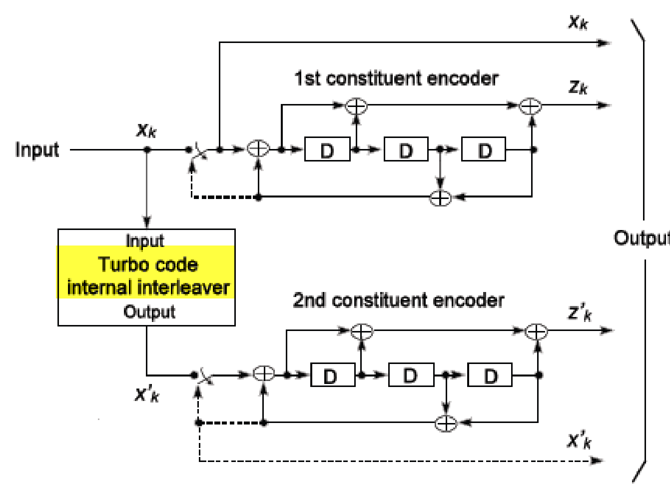


Figure 4: Structure of rate 1/3 Turbo coder (dotted lines apply for trellis termination only)

	#### 4.2.3.2.2 Trellis termination for Turbo coder Trellis termination is performed by taking the tail bits from the shift register feedback after all information bits are encoded. Tail bits are padded after the encoding of information bits. The first three tail bits shall be used to terminate the first constituent encoder (upper switch of figure 4 in lower position) while the second constituent encoder is disabled. The last three tail bits shall be used to terminate the second constituent encoder (lower switch of figure 4 in lower position) while the first constituent encoder is disabled. The transmitted bits for trellis termination shall then be: $x_{K+1}, z_{K+1}, x_{K+2}, z_{K+2}, x_{K+3}, z_{K+3}, x'_{K+1}, z'_{K+1}, x'_{K+2}, z'_{K+2}, x'_{K+3}, z'_{K+3}$. #### 4.2.3.2.3 Turbo code internal interleaver The Turbo code internal interleaver consists of bits-input to a rectangular matrix with padding, intra-row and inter-row permutations of the rectangular matrix, and bits-output from the rectangular matrix with pruning. The bits input to the Turbo code internal interleaver are denoted by $x_1, x_2, x_3, \ldots, x_K$, where K is the integer number of the bits and takes one value of $40 \leq K \leq 5114$. The relation between the bits input to the Turbo code internal interleaver and the bits input to the channel coding is defined by $x_k = o_{irk}$ and $K = K_i$. The following subclause specific symbols are used in subclauses 4.2.3.2.3.1 to 4.2.3.2.3.3: K Number of bits input to Turbo code internal interleaver R Number of rows of rectangular matrix C Number of columns of rectangular matrix p Prime number v Primitive root $\langle s(j) \rangle_{j \in \{0,1,\cdots,p-2\}}$ Base sequence for intra-row permutation q_i Minimum prime integers r_i Permuted prime integers

Table 2: List of prime number p and associated primitive root v

p	v	p	v	p	v	p	v	p	v
7	3	47	5	101	2	157	5	223	3
11	2	53	2	103	5	163	2	227	2
13	2	59	2	107	2	167	5	229	6
17	3	61	2	109	6	173	2	233	3
19	2	67	2	113	3	179	2	239	7
23	5	71	7	127	3	181	2	241	7
29	2	73	5	131	2	191	19	251	6
31	3	79	3	137	3	193	5	257	3
37	2	83	2	139	2	197	2		
41	6	89	3	149	2	199	3		
43	3	97	5	151	6	211	2		

(3) Write the input bit sequence $x_1, x_2, x_3, \ldots, x_K$ into the $R \times C$ rectangular matrix row by row starting with bit y_1 in column 0 of row 0:

$$\begin{bmatrix} y_1 & y_2 & y_3 & \cdots & y_C \\ y_{(C+1)} & y_{(C+2)} & y_{(C+3)} & \cdots & y_{2C} \\ \vdots & \vdots & \vdots & \cdots & \vdots \\ y_{((R-1)C+1)} & y_{((R-1)C+2)} & y_{((R-1)C+3)} & \cdots & y_{R \times C} \end{bmatrix}$$

where $y_k = x_k$ for $k = 1, 2, \ldots, K$ and if $R \times C > K$, the dummy bits are padded such that $y_k = 0 or 1$ for $k = K + 1, K + 2, \ldots, R \times C$. These dummy bits are pruned away from the output of the rectangular matrix after intra-row and inter-row permutations.

4.2.3.2.3.2 Intra-row and inter-row permutations

After the bits-input to the $R \times C$ rectangular matrix, the intra-row and inter-row permutations for the $R \times C$ rectangular matrix are performed stepwise by using the following algorithm with steps (1) – (6):

(1) Select a primitive root v from table 2 in section 4.2.3.2.3.1, which is indicated on the right side of the prime number p.

(2) Construct the base sequence $\langle s(j) \rangle_{j \in \{0,1,\cdots,p-2\}}$ for intra-row permutation as:

$s(j) = (v \times s(j-1)) \mod p$, j = 1, 2,…, (p - 2), and $s(0)$ = 1.

(3) Assign $q_0 = 1$ to be the first prime integer in the sequence $\langle q_i \rangle_{i \in \{0,1,\cdots,R-1\}}$, and determine the prime integer q_i in the sequence $\langle q_i \rangle_{i \in \{0,1,\cdots,R-1\}}$ to be a least prime integer such that g.c.d(q_i, p - 1) = 1, $q_i > 6$, and $q_i > q_{(i-1)}$ for each i = 1, 2, …, R – 1. Here g.c.d. is greatest common divisor.

(4) Permute the sequence $\langle q_i \rangle_{i \in \{0,1,\cdots,R-1\}}$ to make the sequence $\langle r_i \rangle_{i \in \{0,1,\cdots,R-1\}}$ such that

$r_{T(i)} = q_i$, i = 0, 1, …, R - 1,

where $\langle T(i) \rangle_{i \in \{0,1,\cdots,R-1\}}$ is the inter-row permutation pattern defined as the one of the four kind of patterns, which are shown in table 3, depending on the number of input bits K.

Table 3: Inter-row permutation patterns for Turbo code internal interleaver

Number of input bits K	Number of rows R	Inter-row permutation patterns <$T(0)$, $T(1)$, …, $T(R - 1)$>
($40 \le K \le 159$)	5	<4, 3, 2, 1, 0>
($160 \le K \le 200$) or ($481 \le K \le 530$)	10	<9, 8, 7, 6, 5, 4, 3, 2, 1, 0>

$(2281 \le K \le 2480)$ or $(3161 \le K \le 3210)$	20	<19, 9, 14, 4, 0, 2, 5, 7, 12, 18, 16, 13, 17, 15, 3, 1, 6, 11, 8, 10>
K = any other value	20	<19, 9, 14, 4, 0, 2, 5, 7, 12, 18, 10, 8, 13, 17, 3, 1, 16, 6, 15, 11>

(5) Perform the i-th ($i = 0, 1, \ldots, R - 1$) intra-row permutation as:

if ($C = p$) then

$U_i(j) = s((j \times r_i) \bmod (p-1))$, $j = 0, 1, \ldots, (p - 2)$, and $U_i(p - 1) = 0$,

where $U_i(j)$ is the original bit position of j-th permuted bit of i-th row.

end if

if ($C = p + 1$) then

$U_i(j) = s((j \times r_i) \bmod (p-1))$, $j = 0, 1, \ldots, (p - 2)$. $U_i(p - 1) = 0$, and $U_i(p) = p$,

where $U_i(j)$ is the original bit position of j-th permuted bit of i-th row, and

if ($K = R \times C$) then

Exchange $U_{R-1}(p)$ with $U_{R-1}(0)$.

end if

end if

if ($C = p - 1$) then

$U_i(j) = s((j \times r_i) \bmod (p-1)) - 1$, $j = 0, 1, \ldots, (p - 2)$,

where $U_i(j)$ is the original bit position of j-th permuted bit of i-th row.

end if

(6) Perform the inter-row permutation for the rectangular matrix based on the pattern $\langle T(i) \rangle_{i \in \{0, 1, \cdots, R-1\}}$,

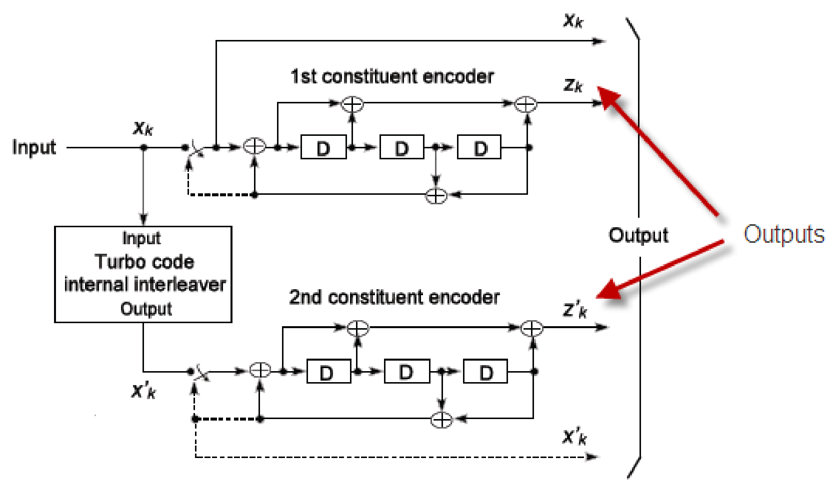
where $T(i)$ is the original row position of the i-th permuted row.

	4.2.3.2.3.3 Bits-output from rectangular matrix with pruning After intra-row and inter-row permutations, the bits of the permuted rectangular matrix are denoted by y'_k: $$\begin{bmatrix} y'_1 & y'_{(R+1)} & y'_{(2R+1)} & \cdots y'_{((C-1)R+1)} \\ y'_2 & y'_{(R+2)} & y'_{(2R+2)} & \cdots y'_{((C-1)R+2)} \\ \vdots & \vdots & \vdots & \cdots & \vdots \\ y'_R & y'_{2R} & y'_{3R} & \cdots & y'_{C\times R} \end{bmatrix}$$ The output of the Turbo code internal interleaver is the bit sequence read out column by column from the intra-row and inter-row permuted $R \times C$ rectangular matrix starting with bit y'_1 in row 0 of column 0 and ending with bit y'_{CR} in row R - 1 of column C - 1. The output is pruned by deleting dummy bits that were padded to the input of the rectangular matrix before intra-row and inter row permutations, i.e. bits y'_k that corresponds to bits y_k with $k > K$ are removed from the output. The bits output from Turbo code internal interleaver are denoted by $x'_1, x'_2, \ldots, x'_K$, where x'_1 corresponds to the bit y'_k with smallest index k after pruning, x'_2 to the bit y'_k with second smallest index k after pruning, and so on. The number of bits output from Turbo code internal interleaver is K and the total number of pruned bits is: $R \times C - K$.

	$\langle T(i) \rangle_{i \in \{0,1,\cdots,R-1\}}$ Inter-row permutation pattern
	
	$\langle U_i(j) \rangle_{j \in \{0,1,\cdots,C-1\}}$ Intra-row permutation pattern of i-th row
	
	i Index of row number of rectangular matrix
	
	j Index of column number of rectangularmatrix
	
	k Index of bit sequence
	
	4.2.3.2.3.1 Bits-input to rectangular matrix with padding
	
	The bit sequence $x_1, x_2, x_3, \ldots, x_K$ input to the Turbo code internal interleaver is written into the rectangular matrix as follows.
	
	(1) Determine the number of rows of the rectangular matrix, R, such that:
	
	$$R = \begin{cases} 5, \text{if } (40 \le K \le 159) \\ 10, \text{if } ((160 \le K \le 200) \text{ or } (481 \le K \le 530)) \\ 20, \text{if } (K = \text{any other value}) \end{cases}.$$
	
	The rows of rectangular matrix are numbered 0, 1, …, R - 1 from top to bottom.
	
	(2) Determine the prime number to be used in the intra-permutation, p, and the number of columns of rectangular matrix, C, such that:
	
	if (481 ≤ K ≤ 530) then
	
	$p = 53$ and $C = p$.
	
	else
	
	Find minimum prime number p from table 2 such that
	
	$K \le R \times (p+1)$,
	
	and determine C such that
	
	$$C = \begin{cases} p-1 & \text{if } K \le R \times (p-1) \\ p & \text{if } R \times (p-1) < K \le R \times p \\ p+1 & \text{if } R \times p < K \end{cases}.$$
	
	end if
	
	The columns of rectangular matrix are numbered 0, 1, …, C - 1 from left to right.

4. The mobile communication system as claimed in claim 2, further comprising:	*See* claim 2.
[a] a multiplexer for multiplexing respective outputs of the first and second constituent encoders; and	Apple's 3G Products include a multiplexer for multiplexing respective outputs of the first and second constituent encoders. *See, e.g.,* TS 25.212 v6.0.0 Figure 1:

	4.2.3.2 Turbo coding **4.2.3.2.1 Turbo coder** The scheme of Turbo coder is a Parallel Concatenated Convolutional Code (PCCC) with two 8-state constituent encoders and one Turbo code internal interleaver. The coding rate of Turbo coder is 1/3. The structure of Turbo coder is illustrated in figure 4. The transfer function of the 8-state constituent code for PCCC is: $$G(D) = \left[1, \frac{g_1(D)}{g_0(D)}\right],$$ where $$g_0(D) = 1 + D^2 + D^3,$$ $$g_1(D) = 1 + D + D^3.$$ The initial value of the shift registers of the 8-state constituent encoders shall be all zeros when starting to encode the input bits. Output from the Turbo coder is $$x_1, z_1, z'_1, x_2, z_2, z'_2, \ldots, x_K, z_K, z'_K,$$ where $x_1, x_2, \ldots, x_K$ are the bits input to the Turbo coder i.e. both first 8-state constituent encoder and Turbo code internal interleaver, and K is the number of bits, and $z_1, z_2, \ldots, z_K$ and $z'_1, z'_2, \ldots, z'_K$ are the bits output from first and second 8-state constituent encoders, respectively. The bits output from Turbo code internal interleaver are denoted by $x'_1, x'_2, \ldots, x'_K$, and these bits are to be input to the second 8-state constituent encoder.

	 **Figure 4: Structure of rate 1/3 Turbo coder (dotted lines apply for trellis termination only)**
[b] a channel interleaver for interleaving an output of the multiplexer.	Apple's 3G Products include a channel interleaver for interleaving an output of the multiplexer. *See, e.g.*, TS 25.212 v6.0.0 Figure 1:

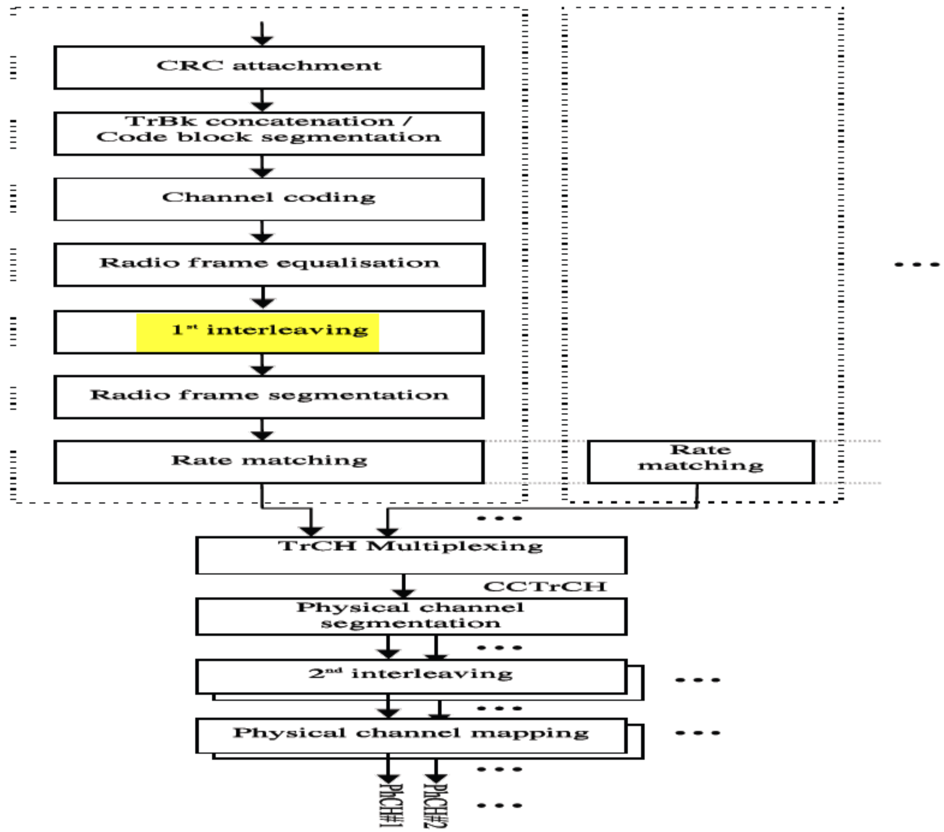


Figure 1: Transport channel multiplexing structure for uplink

TS 25.212 v6.0.0 §§ 4.2.3.3, 4.2.4:

	### 4.2.3.3 Concatenation of encoded blocks After the channel coding for each code block, if C_i is greater than 1, the encoded blocks are serially concatenated so that the block with lowest index r is output first from the channel coding block, otherwise the encoded block is output from channel coding block as it is. The bits output are denoted by $c_{i1}, c_{i2}, c_{i3}, \ldots, c_{iE_i}$, where i is the TrCH number and $E_i = C_iY_i$. The output bits are defined by the following relations: $c_{ik} = y_{i1k}$ $k = 1, 2, \ldots, Y_i$ $c_{ik} = y_{i,2,(k-Y_i)}$ $k = Y_i + 1, Y_i + 2, \ldots, 2Y_i$ $c_{ik} = y_{i,3,(k-2Y_i)}$ $k = 2Y_i + 1, 2Y_i + 2, \ldots, 3Y_i$ $\ldots$ $c_{ik} = y_{i,C_i,(k-(C_i-1)Y_i)}$ $k = (C_i - 1)Y_i + 1, (C_i - 1)Y_i + 2, \ldots, C_iY_i$ If no code blocks are input to the channel coding ($C_i = 0$), no bits shall be output from the channel coding, i.e. $E_i = 0$. ## 4.2.4 Radio frame size equalisation Radio frame size equalisation is padding the input bit sequence in order to ensure that the output can be segmented in F_i data segments of same size as described in subclause 4.2.7. Radio frame size equalisation is only performed in the UL. The input bit sequence to the radio frame size equalisation is denoted by $c_{i1}, c_{i2}, c_{i3}, \ldots, c_{iE_i}$, where i is TrCH number and E_i the number of bits. The output bit sequence is denoted by $t_{i1}, t_{i2}, t_{i3}, \ldots, t_{iT_i}$, where T_i is the number of bits. The output bit sequence is derived as follows: - $t_{ik} = c_{ik}$, for k = 1… E_i; and - t_{ik} = {0, 1} for k= E_i +1… T_i, if $E_i < T_i$; where - $T_i = F_i * N_i$; and - $N_i = \lceil E_i / F_i \rceil$ is the number of bits per segment after size equalisation. TS 25.212 v6.0.0 §4.2.5:

	4.2.5 1st interleaving In Compressed Mode by puncturing, bits marked with a fourth value on top of {0, 1, δ} and noted p, are introduced in the radio frames to be compressed, in positions corresponding to the first bits of the radio frames. They will be removed in a later stage of the multiplexing chain to create the actual gap. Additional puncturing has been performed in the rate matching step, over the TTI containing the compressed radio frame, to create room for these p-bits. The following subclause describes this feature.
6. The mobile communication system as claimed in claim 1, further wherein	*See* claim 1.
the number of input data frames to make the super frame is determined by a data size of a frame.	Apple's 3G Products include the mobile communication system wherein the number of input data frames to make the super frame is determined by a data size of a frame. *See, e.g.,* TS 25.212 v6.0.0 §4.2.2:

	4.2.2 Transport block concatenation and code block segmentation All transport blocks in a TTI are serially concatenated. If the number of bits in a TTI is larger than Z, the maximum size of a code block in question, then code block segmentation is performed after the concatenation of the transport blocks. The maximum size of the code blocks depends on whether convolutional coding or turbo coding is used for the TrCH. **4.2.2.1 Concatenation of transport blocks** The bits input to the transport block concatenation are denoted by $b_{im1}, b_{im2}, b_{im3}, \ldots, b_{imB_i}$ where i is the TrCH number, m is the transport block number, and B_i is the number of bits in each block (including CRC). The number of transport blocks on TrCH i is denoted by M_i. The bits after concatenation are denoted by $x_{i1}, x_{i2}, x_{i3}, \ldots, x_{iX_i}$, where i is the TrCH number and X_i=M_iB_i. They are defined by the following relations: $x_{ik} = b_{i1k}$ $k = 1, 2, \ldots, B_i$ $x_{ik} = b_{i,2,(k-B_i)}$ $k = B_i + 1, B_i + 2, \ldots, 2B_i$ $x_{ik} = b_{i,3,(k-2B_i)}$ $k = 2B_i + 1, 2B_i + 2, \ldots, 3B_i$ … $x_{ik} = b_{i,M_i,(k-(M_i-1)B_i)}$ $k = (M_i - 1)B_i + 1, (M_i - 1)B_i + 2, \ldots, M_iB_i$

	#### 4.2.2.2 Code block segmentation
	
	Segmentation of the bit sequence from transport block concatenation is performed if $X_i>Z$. The code blocks after segmentation are of the same size. The number of code blocks on TrCH i is denoted by C_i. If the number of bits input to the segmentation, X_i, is not a multiple of C_i, filler bits are added to the beginning of the first block. If turbo coding is selected and $X_i < 40$, filler bits are added to the beginning of the code block. The filler bits are transmitted and they are always set to 0. The maximum code block sizes are:
	
	- convolutional coding: $Z = 504$;
	- turbo coding: $Z = 5114$.
	
	The bits output from code block segmentation, for $C_i \neq 0$, are denoted by $o_{ir1}, o_{ir2}, o_{ir3}, \ldots, o_{irK_i}$, where i is the TrCH number, r is the code block number, and K_i is the number of bits per code block.
	
	Number of code blocks:
	
	$C_i = \lceil X_i / Z \rceil$
	
	Number of bits in each code block (applicable for $C_i \neq 0$ only):
	
	if $X_i < 40$ and Turbo coding is used, then
	
	$K_i = 40$
	
	else
	
	$K_i = \lceil X_i / C_i \rceil$
	
	end if
	
	Number of filler bits: $Y_i = C_iK_i - X_i$
	
	for $k = 1$ to Y_i -- Insertion of filler bits
	
	$o_{i1k} = 0$

	end for
	for $k = Y_i+1$ to K_i
	$o_{i1k} = x_{i,(k-Y_i)}$
	end for
	$r = 2$ -- Segmentation
	while $r \le C_i$
	for $k = 1$ to K_i
	$o_{irk} = x_{i,(k+(r-1)\cdot K_i-Y_i)}$ *I*
	end for
	$r = r+1$
	end while

10. A channel encoding method for a mobile communication system having turbo encoder input data frames of variable size, comprising the steps of:	*See* claim 1. Apple infringes this claim because it has performed each and every step of this claim, including but not limited to through testing and use by its employees. Apple also infringes this claim by selling Apple's 3G Products to customers and encouraging those customers to use the products in a manner that meets each and every step of this claim.
[a] determining the number of input data frames to construct a super frame;	*See* claim 1[a].

[b] concatenating the number of the input data frames into a super frame; and	*See* claim 1[a].
[c] turbo encoding data of the super frame consisting of more than one input data frame.	*See* claim 1[b].
11. The channel encoding method as claimed in claim 10, wherein the turbo encoding step further comprises the steps of:	*See* claim 2.
encoding data of the super frame;	*See* claim 2[a].
interleaving data of the super frame; and	*See* claim 2[b].
encoding data of the interleaved super frame.	*See* claim 2[c].
12. The channel encoding method as claimed in claim 10, further comprising	*See* claim 10.
the step of channel interleaving the turbo encoded data in accordance with the size of the super frame.	Apple's 3G Products channel interleave the turbo encoded data in accordance with the size of the super frame. TS 25.212 v6.0.0 Figure 1:

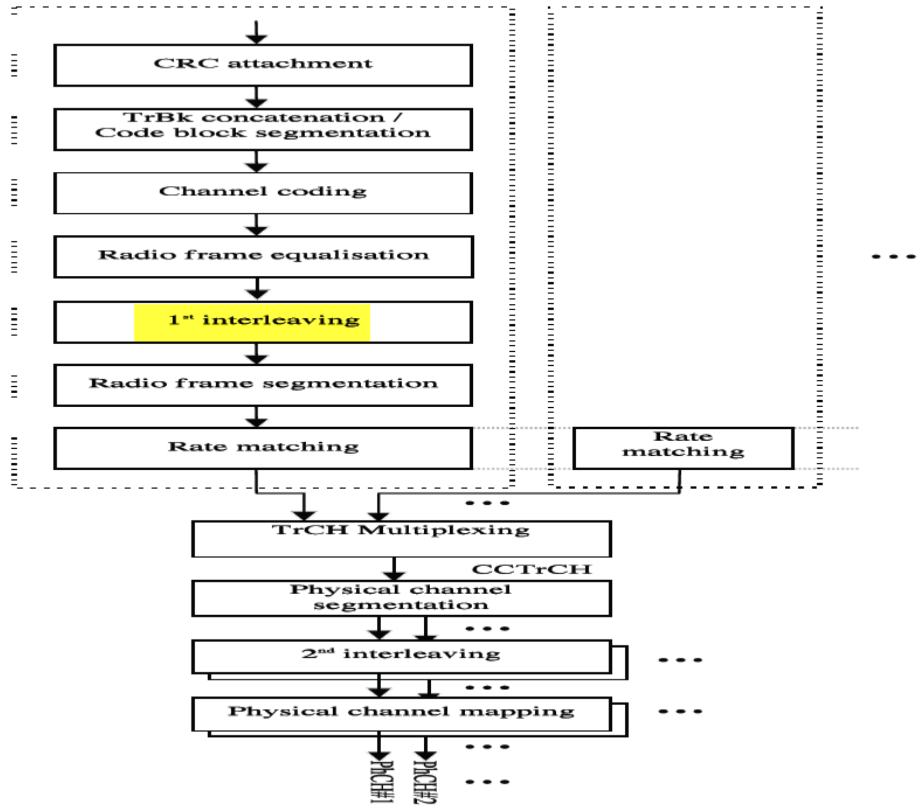


Figure 1: Transport channel multiplexing structure for uplink

TS 25.212 v6.0.0 §§ 4.2.3.3, 4.2.4:

4.2.3.3 Concatenation of encoded blocks

After the channel coding for each code block, if C_i is greater than 1, the encoded blocks are serially concatenated so that the block with lowest index r is output first from the channel coding block, otherwise the encoded block is output from channel coding block as it is. The bits output are denoted by $c_{i1}, c_{i2}, c_{i3}, \ldots, c_{iE_i}$, where i is the TrCH number and $E_i = C_iY_i$. The output bits are defined by the following relations:

$$c_{ik} = y_{i1k} \quad k = 1, 2, \ldots, Y_i$$

$$c_{ik} = y_{i,2,(k-Y_i)} \quad k = Y_i + 1, Y_i + 2, \ldots, 2Y_i$$

$$c_{ik} = y_{i,3,(k-2Y_i)} \quad k = 2Y_i + 1, 2Y_i + 2, \ldots, 3Y_i$$

$$\ldots$$

$$c_{ik} = y_{i,C_i,(k-(C_i-1)Y_i)} \quad k = (C_i - 1)Y_i + 1, (C_i - 1)Y_i + 2, \ldots, C_iY_i$$

If no code blocks are input to the channel coding ($C_i = 0$), no bits shall be output from the channel coding, i.e. $E_i = 0$.

4.2.4 Radio frame size equalisation

Radio frame size equalisation is padding the input bit sequence in order to ensure that the output can be segmented in F_i data segments of same size as described in subclause 4.2.7. Radio frame size equalisation is only performed in the UL.

The input bit sequence to the radio frame size equalisation is denoted by $c_{i1}, c_{i2}, c_{i3}, \ldots, c_{iE_i}$, where i is TrCH number and E_i the number of bits. The output bit sequence is denoted by $t_{i1}, t_{i2}, t_{i3}, \ldots, t_{iT_i}$, where T_i is the number of bits. The output bit sequence is derived as follows:

- $t_{ik} = c_{ik}$, for k = 1… E_i; and
- $t_{ik} = \{0, 1\}$ for k= E_i +1… T_i, if $E_i < T_i$;

where

- $T_i = F_i * N_i$; and
- $N_i = \lceil E_i / F_i \rceil$ is the number of bits per segment after size equalisation.

TS 25.212 v6.0.0 §4.2.5:

	4.2.5 1st interleaving In Compressed Mode by puncturing, bits marked with a fourth value on top of {0, 1, δ} and noted p, are introduced in the radio frames to be compressed, in positions corresponding to the first bits of the radio frames. They will be removed in a later stage of the multiplexing chain to create the actual gap. Additional puncturing has been performed in the rate matching step, over the TTI containing the compressed radio frame, to create room for these p-bits. The following subclause describes this feature.
17. A mobile communication system having turbo encoder input data frames of variable size, comprising:	*See* claim 1.
[a] a decoder for turbo decoding data being received as a super frame including a plurality of original input data frames; and	*See* claim 1[b].
[b] a frame reconstructor for segmenting an output of the turbo decoder into a number of original input data frames in accordance with a message information about the original input data frames constituting said super frame.	Apple's 3G Products include a frame reconstructor for segmenting an output of the turbo decoder into a number of original input data frames in accordance with a message information about the original input data frames constituting said super frame. See claim 1[a]. *See, e.g.,:* TS 25.212 v6.0.0 § 4.3.2:

	### 4.3.2 Transport format detection based on TFCI If a TFCI is available, then TFCI based detection shall be applicable to all TrCHs within the CCTrCH. The TFCI informs the receiver about the transport format combination of the CCTrCHs. As soon as the TFCI is detected, the transport format combination, and hence the transport formats of the individual transport channels are known. TS 25.212 v6.0.0 § 4.6: ### 4.6 Coding for HS-SCCH The following information is transmitted by means of the HS-SCCH physical channel. - Channelization-code-set information (7 bits): $x_{ccs,1}, x_{ccs,2}, \ldots, x_{ccs,7}$ - Modulation scheme information (1 bit): $x_{ms,1}$ - Transport-block size information (6 bits): $x_{tbs,1}, x_{tbs,2}, \ldots, x_{tbs,6}$ - Hybrid-ARQ process information (3 bits): $x_{hap,1}, x_{hap,2}, x_{hap,3}$ - Redundancy and constellation version (3 bits): $x_{rv,1}, x_{rv,2}, x_{rv,3}$ - New data indicator (1 bit): $x_{nd,1}$ - UE identity (16 bits): $x_{ue,1}, x_{ue,2}, \ldots, x_{ue,16}$
18. The mobile communication system as claimed in claim 17,	*See* claim 17.
further comprising a processor for determining a number and a size of original input data frames constituting said super frame based upon received message	Apple's 3G Products include a processor for determining a number and a size of original input data frames constituting said super frame based upon received message information about the number and the size of the original input data frames combined into the super frame, and providing the determined number and size information to the frame reconstructor.

information about the number and the size of the original input data frames combined into the super frame, and providing the determined number and size information to the frame reconstructor.	See claim 1[a]. *See, e.g.,:* TS 25.212 v6.0.0 § 4.3.2: **4.3.2 Transport format detection based on TFCI** If a TFCI is available, then TFCI based detection shall be applicable to all TrCHs within the CCTrCH. The TFCI informs the receiver about the transport format combination of the CCTrCHs. As soon as the TFCI is detected, the transport format combination, and hence the transport formats of the individual transport channels are known. TS 25.212 v6.0.0 § 4.6: **4.6 Coding for HS-SCCH** The following information is transmitted by means of the HS-SCCH physical channel. - Channelization-code-set information (7 bits): $x_{ccs,1}, x_{ccs,2}, \ldots, x_{ccs,7}$ - Modulation scheme information (1 bit): $x_{ms,1}$ - Transport-block size information (6 bits): $x_{tbs,1}, x_{tbs,2}, \ldots, x_{tbs,6}$ - Hybrid-ARQ process information (3 bits): $x_{hap,1}, x_{hap,2}, x_{hap,3}$ - Redundancy and constellation version (3 bits): $x_{rv,1}, x_{rv,2}, x_{rv,3}$ - New data indicator (1 bit): $x_{nd,1}$ - UE identity (16 bits): $x_{ue,1}, x_{ue,2}, \ldots, x_{ue,16}$
19. The mobile communication system as claimed in claim 17,	*See* claim 17.

wherein said message information is received during a call setup.	*See* claim 17[b].
20. The mobile communication system as claimed in claim 17,	*See* claim 18.
further comprising a processor for determining a number and a size of original input data frames constituting said super frame based upon received message information about the number and the size of the original input data frames combined into the super frame, and providing the determined number and size information to the frame reconstructor.	*See* claim 18.
21. A channel decoding method for a mobile communication system having turbo encoder input data frames of variable size, comprising the steps of:	*See* claim 17.
turbo decoding data received as a super frame including a plurality of original input data frames; and	*See* claim 17[a].
segmenting an output of the decoder into a number of original input data frames in accordance with message information about the original input data frames constituting said super frame.	*See* claim 17[b].

22. A mobile communication system having turbo encoder input data frames comprising:	*See* claim 1.
[a] a processor for determining to concatenate a number of input data frames to compose a super frame when a data rate of the input data frames is less than a predetermined value;	*See* claim 1[a].
a first constituent encoder for encoding data of the super frame;	*See* claim 2[a].
an interleaver for interleaving the data of the super frame;	*See* claim 2[b].
a second constituent encoder for encoding output of the interleaver; and	*See* claim 2[c].
a channel interleaver for interleaving the output of the turbo encoder.	*See* claim 4[b].
24. A channel encoding method for a mobile communication system having turbo encoder input data frames of variable size, comprising the steps of:	*See* claim 10.
comparing a data rate of input data frames to a turbo encoder with a predetermined value;	*See* claim 22[a].
deciding to compose a super frame if the data rate is less than the predetermined value; and	*See* claim 22[a].

turbo encoding the super frame which is composed of a number of input data frames.	*See* claim 1[b].