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4.2.3 PCPCH

The spreading and modulation of the message part of the random-access message part is basically the same as for the uplink dedicated physical channels, see section 4.2.1, where the uplink DPDCH and uplink DPCCH are replaced by the data part and the control part respectively.

4.3.3.3 Preamble PAPR reduction

In order to reduce the PAPR during the transmission of the RACH preamble, CPCH access preamble and CPCH CD preamble, ~~transmission~~ the following technique is used.

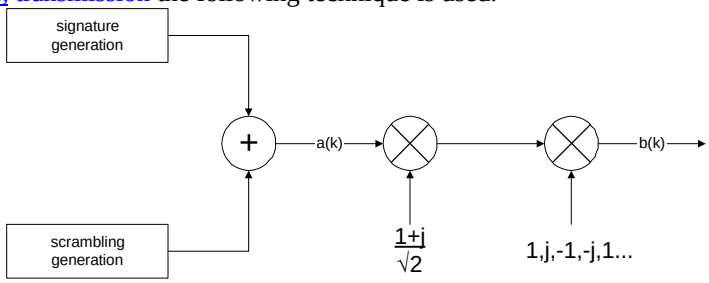

Figure ~~11~~8 - Baseband modulator for RACH and CPCH preambles.

The binary preamble $a(k)$ is modulated to get the complex valued preamble $b(k)$,

$$b(k) = a(k)\ e^{j(\frac{\pi}{4}+\frac{\pi}{2}k)}, k = 0, 1, 2, 3, \ldots, 4095.$$

4.3.4.1 Access preamble scrambling code

The access preamble scrambling code generation is done in a way similar to that of PRACH with a difference of the initialisation of the x m-sequence. The long code ~~c257~~ c257 (as described in Section 4.3.3.1) for the in-phase component is used directly on both in phase and quadrature branches without offset between branches. In the case when the RACH preambles are shared between the RACH and CPCH, the same scrambling codes used in the RACH preamble will be used for the CPCH preamble as well.

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~~For the access preamble scrambling code this is done as follows:~~

~~$x_n(0)=n_0$, $x_n(1)= n_1$, … ,$x_n(7)= n_7$, $x_n(8)= 1$, $x_n(9)=0$,… , $x_n(22)= 0$,$x_n(23)=1$, $x_n(24)=0$~~

4.3.4.2 CD preamble ~~spreading~~ scrambling code

The long code c257 used for scrambling ~~code for~~ the access preamble is also used as the CD preamble scrambling spreading code. The 4096 chips from 4096 to 8191 of the code are used for the CD preamble ~~spreading~~ scrambling with the chip rate of 3.84 Mchip/s. The long code ~~c_{257}~~ c257 for the in-phase component is used directly on both in phase and quadrature branches without offset between branches. In the case when the RACH preambles are shared between the RACH and CPCH, the 4096 chips from 4096 to 8191 of the long code c1 used to scramble the RACH preamble will be used for the CPCH CD preamble.

4.3.4.5 Scrambling code for the CPCH message part

In addition to spreading, the message part is also subject to scrambling. The scrambling code is cell-specific and has a one-to-one correspondence to the spreading code used for the preamble part.

The scrambling codes used are formed from the continuation of the sequence xn and y used for the CD scrambling code and described in 4.3.4.2. Specifically, the values $x_n(8192)$, $x_n(8193)$,…, $x_n(46591)$, and y(8192), y(8193),…, y(46591) are generated according to the recursive relations in 4.3.3.1 and used to form the nth constituent codes, c_{1n} and c_{2n} (the left most index corresponding to the first chip scrambled in the message) as described in section 4.3.3.5. ~~same set of codes as is used for the other dedicated uplink channels when the long scrambling codes are used for these channels. The long scrambling codes for 256 to 511 (c_{257} to c_{512}) of the long scrambling codes are used for the CPCH. The phases 8192 and above of the codes are used for the message part (phases 0 to 4095 of c_{257} are used in the access preamble spreading and phases 4096 to 8191 for the CD preamble) with the chip rate of 3.84 Mchips/s.~~

~~The generation of these codes is explained in Section 4.3.2.2. The mapping of these codes to provide a complex scrambling code is also the same as for the other dedicated uplink channels and is described in Section 4.3.2.~~

In the case when the RACH preambles are shared between the RACH and CPCH, the same code set used to scramble the message part for the RACH will be used to scramble the message part for CPCH. The difference in this case is that the starting point of the codes will be chip 8192.