
Agenda item: **Ad hoc 9**

Source: **Philips**

Title: **Proposal for power control in compressed mode**

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Introduction

This text proposal for TS25.214 updates the description of power control in compressed mode for consistency with the descriptions of Algorithm 1 power control and Algorithm 2 power control.

The text is a modified version of those previously presented in [1,2], here extended to cover the case that the recovery period may overlap with one of the set of concatenated TPC commands used in algorithm 2.

References

[1] TSGR1(99)b42 *"Text proposal on power control"*, Philips, August 1999

[2] TSGR1(99)d66 *"Text proposal on power control in compressed mode"*, Philips, August 1999

5.1.2.3 Transmit power control in compressed mode

< Note: The following is a working assumption of WG1. >

The aim of uplink power control in downlink or/and uplink compressed mode is to recover as fast as possible a signal-to-interference ratio (SIR) close to the target SIR after each transmission gap.

In downlink compressed mode, no power control is applied during transmission gaps, since no downlink TPC command is sent. Thus, the transmit powers of the uplink DPDCH(s) and DPCCH are not changed during the transmission gaps.

In simultaneous downlink and uplink compressed mode, the transmission of uplink DPDCH(s) and DPCCH is stopped during transmission gaps. *<Note: the initial transmit power of each uplink DPDCH or DPCCH after the transmission gap is FFS. >*.

After each transmission gap, 2 modes are possible for the power control algorithm. The power control mode (PCM) is fixed and signalled with the other parameters of the downlink compressed mode (see TS 25.231). The different modes are summarised in the table 1:

Table 1. Power control modes during compressed mode.

Mode	Description
0	Ordinary transmit power control is applied with step size Δ_{TPC}
1	If algorithm 1 is being used, ~~O~~ordinary transmit power control is applied with step size $\Delta_{RP\text{-}TPC}$ during one or more slots after each transmission gap. If algorithm 2 is being used, algorithm 1 is applied with step size 1dB during one or more slots after each transmission gap.

~~<Note: The exact power control algorithm in compressed mode when concatenation of TPC commands are used in normal mode is still FFS. The current description only applies when no concatenation is done in normal mode. >~~

For mode 0, the step size is not changed and the ordinary transmit power control is still applied during compressed mode (see subclause 5.1.2.2), using the same algorithm for processing TPC commands as in normal mode (see sections 5.1.2.2.2 and 5.1.2.2.3).

For mode 1, if algorithm 1 (section 5.1.2.2.2) is being used in normal mode then during one or more slots after each transmission gap, called the recovery period, the ~~ordinary~~ same power control algorithm is applied but with a step size $\Delta_{RP\text{-}TPC}$ instead of Δ_{TPC}, where $\Delta_{RP\text{-}TPC}$ is called recovery power control step size and is expressed in dB. The step size $\Delta_{RP\text{-}TPC}$ is equal to the minimum value of 3 dB and $2\Delta_{TPC}$. If algorithm 2 (see section 5.1.2.2.3) is being used in normal mode, then during one or more slots after each transmission gap, called the recovery period, algorithm 1 (section 5.1.2.2.2) is applied with a step size of 1dB.

After the recovery period ~~the ordinary~~ transmit power control resumes using the same algorithm and step size as used in normal mode before the transmission gap. ~~algorithm with step Δ_{TPC} is performed~~.

If algorithm 2 (section 5.1.2.2.3) is being used in normal mode, the sets of slots over which the TPC commands are processed (in section 5.1.2.2.2.3.1) shall remain aligned to the frame boundaries in the compressed frame. In both mode 0 or mode 1, if the transmission gap or the recovery period results in any incomplete sets of TPC commands, no TPC_temp_i command will be determined for those sets of slots which are incomplete, and there will be no change in transmit power level for those sets of slots.

The recovery period length (RL) determination is still FSS and is to be chosen between the two following possibilities:

- The recovery period length is fixed and derived as a function of the Transmission mode parameters mostly the transmission gap period and possibly the spreading factor.
- The recovery period length is adapted and ends when the current and previous received power control commands are opposite or after TGL slots after the transmission gap.