

3GPP TSG RAN WG1#7

Hanover, Germany

August 30th - September 3rd, 1999

Agenda Item: Ad Hoc 15 report from email discussions.

Tdoc R1-(99)B08

Meeting No. 7

Source: Ad Hoc 1 5 Chair (WG1 Chairman)

Ad Hoc 15 report from the email discussions

Introduction

This document summarises the discussions in the Ad Hoc 15 reflector until Tuesday evening, the 24th. The discussions and comments to this report until Friday the 27th will be reflected in the reporting (in slides) in the meeting. As the few issues are not solved yet, this report includes some questions that need comments before conclusions can be drawn.

The items left from the last meeting.

The pilot structures in case of TX diversity. (How to operate with two antennas)

The downlink DPCCH slot structures with spreading factor 256 (and 128 as well?) (Tdoc 968 addresses the issues with EVRC support in the physical layer)

The channel interleaver changes due harmonisation. (Now working assumption taken, this can be challenged until the next meeting when agreement should be concluded. What is currently in the specification as a working assumption becomes agreement if no contributions arise until next meeting. Situation will be reviewed on Day 1)

Discussions on the pilot structures in case of TX diversity

The discussions on the pilot structure were focusing mainly on the secondary CPICH implementation, several suggestions were made on the patterns for the secondary CPICH in case of TX diversity is in use.

- Proposal 1:

Symbol # in slot	1	2	3	4	5	6	7	8	9	10
Normal case	A	A	A	A	A	A	A	A	A	A
Secondary antenna	A	A	A	A	A	-A	-A	-A	-A	-A
Third antenna	A	A	A	-A	-A	-A	-A	-A	A	A
Fourth antenna	A	A	A	-A	-A	-A	A	A	-A	-A

For this it was commented that pattern should be short in order to keep the channel coherence within a block. Also it was noted that in release-99 we are expected to deal with two TX antennas only. It was proposed to have shorter pattern like:

- Proposal 2.

```

slot #15                                slot #1
-----+-----+-----
A  A  A  A  A  A  A  A  A  A  A  | A  A  A  A  A  A  A  A  A  A  A
A -A -A  A  A -A -A  A  A -A  | A -A -A  A  A -A -A  A  A -A  -A

```

In connection with this discussion there was mentioned the alternative approach of different OVFS codes, but support was indicated for the pilot pattern approach.

Also it was commented that why not to have further simplified pattern that does not need to be reset at the frame boundary, such as:

- Proposal 3

```

Antenna 1:      A  A  A  A  A  A  A  A  A  A  A
Antenna 2:      A -A  A -A  A -A  A -A  A -A

```

For this approach the only concern raised (by writing of this) was the frequency estimation in the acquisition phase.

The following example was calculated:

Given the chip rate of 3.84MHz with SF=256, UE is capable of acquiring max of 7.5kHz=3.75ppm given the RF frequency of 2GHz. With the A,-A,A,-A... pilot pattern (equivalent of SF=512 as mentioned), capability is reduced in half (3.75kHz=1.875ppm) unless UE does some pre-processing at despreading stage.

The comment with the example was made that if this is not a problem with another methods or due TXCO properties, then the pattern would be acceptable.

There was not yet follow up comment to this.

CONCLUSIONS:

- If the frequency estimation in the acquisition phase will not be a problem, the pattern in proposal 3 would be used in connection with TX diversity (when pilot signals are needed from two antennas)
- Short pattern is preferred due channel coherence time

Comments are expected to be made on the issue still until the next meeting.

Discussions on the other topics

On the EVRC use there was no discussions since the submission of Tdoc 968 (July 20th) on the reflector.

On the channel interleaver no discussions have taken place since the last meeting. If counter proposals do not appear by the meeting, no discussion is needed and current working assumption becomes an agreement.