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Miami, USA, June 17-19,1999

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Agenda Item: 6.4

Source: Ericsson, Siemens, Nokia

Title: **UE carrier raster to reduce search time**

Document for: Approval

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1 Introduction

This document provides an abstract of a proposal for the definition of the UE carrier raster for UTRA (FDD, TDD), based on earlier contributions from [1][2][3]. The proposal has been derived to provide the required flexibility but also to retain as much as possible simplicity for implementation.

One other solution [4] has been proposed to provide flexibility for carrier frequencies, but would require significant signalling extensions. This document provides information for discussion of the LS by RAN WG4 to TSG-RAN [5].

2 Abstract

3GPP RAN WG 4 has been studying proposals on the carrier raster, with a more efficient selection of the carrier centre frequencies than the plain 200 kHz raster. A subset of the carrier centre frequencies has been proposed, with about 1/5 of the frequencies compared to the complete raster, that could satisfy the expected frequency allocations. Defining a subset of carrier frequencies will give significant performance benefits, eg. reduction the terminal search time for a network.

It was identified from the feedback of certain regulators [6], that the need for additional flexibility to allow usage of other carrier frequencies than defined in the subset is foreseen to cope with the uncertainty of some frequency allocations. Therefore additional flexibility should be provided by UTRA. Based on current understanding it is possible to define the carrier raster for UTRA that meets the requirements, in a similar way as proposed in [1][2].

We propose to define a default set and an extended set of carrier frequencies. What carrier frequencies to include in the extended set is to be studied further, but it could include the complete range of possible carrier frequencies in the raster. If the terminal can not find a suitable network on the default carrier positions, it shall search for other available frequencies (possibly using its own intelligence). Note that this extended set is expected to be needed mainly for temporary frequency allocations during the introduction phase of UTRA.

The network could provide information to the terminal (like actual carrier frequencies of the home and roaming networks etc) in similar ways as proposed in [4], that may be used by the terminal to enhance its search further. However this proposal is not depending on this information and the need for this information is for further study.

3 Proposal

A default set and an extended set of carrier frequencies should be defined for the UTRA carrier raster. The extended set can support the complete flexibility for carrier frequencies based on the carrier raster.

This proposal provides significant performance benefits with additional flexibility to cope with the frequency allocations of UTRA as currently defined in the specifications.

4 References

[1] TSGR4#3 (99) 100; Definition of Channel Raster; Siemens

[2] TSGR4#4 (99) 202; Suitability of Channel Raster for various Scenarios; Siemens

[3] TSGR4#5 (99) 300; Carrier numbering; Ericsson

[4] TSGR4#5 (99) 294; A flexible method for defining RF channels for UMTS, Lucent Technologies

[5] TSGR4#5 (99) 355; LS to TSG RAN on UTRA Carrier Raster, RAN WG 4

[6] TSGR4#4 (99) 188; Response to 3GPP TSG RAN LS on Carrier Frequency Raster; ERC TG1.