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**Datasheet for the decision  
of 2 February 2016**

**Case Number:** T 0240/13 - 3.5.05

**Application Number:** 08780900.0

**Publication Number:** 2171957

**IPC:** H04L27/26

**Language of the proceedings:** EN

**Title of invention:**

Control channel format indicator frequency mapping

**Applicant:**

QUALCOMM Incorporated

**Headword:**

Cell-specific OFDM shift/QUALCOMM

**Relevant legal provisions:**

EPC 1973 Art. 54, 56

**Keyword:**

Novelty - main and first auxiliary requests (no)

Inventive step - second auxiliary request (no)

**Decisions cited:**

**Catchword:**



**Beschwerdekammern  
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Case Number: T 0240/13 - 3.5.05

**D E C I S I O N  
of Technical Board of Appeal 3.5.05  
of 2 February 2016**

**Appellant:** QUALCOMM Incorporated  
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**Decision under appeal:** **Decision of the Examining Division of the  
European Patent Office posted on 7 September  
2012 refusing European patent application  
No. 08780900.0 pursuant to Article 97(2) EPC.**

**Composition of the Board:**

**Chair** A. Ritzka  
**Members:** K. Bengi-Akyuerek  
G. Weiss

## Summary of Facts and Submissions

I. The appeal is against the decision of the examining division to refuse the present European patent application essentially on the grounds of lack of novelty in respect of the claims of a main request and two auxiliary requests and lack of inventive step in respect of the claims of an auxiliary request ("auxiliary request 1a"), having regard to the disclosure of

D1: "RAN1#49 Major Decisions on LTE", pp. 1-4,  
22 May 2007,

whilst another auxiliary request was not admitted into the examination proceedings under Rule 116(1) EPC on the ground that it was late-filed and not clearly allowable under Article 56 EPC.

II. With the statement setting out the grounds of appeal, the appellant filed amended sets of claims according to a main and an auxiliary request ("first auxiliary request"). It requested that the decision of the examining division be set aside and that a patent be granted on the basis of the main request or the first auxiliary request.

III. In an annex to the summons to oral proceedings pursuant to Article 15(1) RPBA, the board gave its preliminary opinion on the appeal. In particular, it introduced prior-art document

D4: "Control Channel Structure and Coding in E-UTRA Downlink", 3GPP TSG RAN WG1#47 Meeting,  
R1-063220, Texas Instruments, pp. 1-9,  
November 2006

into the appeal proceedings under Article 114(1) EPC 1973 due to its relevance for the assessment of novelty and inventive step of the underlying subject-matter, and raised objections under Article 56 EPC 1973, having regard to documents D1 or D4.

- IV. With a letter of reply dated 10 December 2015, the appellant submitted amended claims according to a further auxiliary request ("second auxiliary request") alongside counter-arguments to the objections raised in the board's communication under Article 15(1) RPBA.
- V. Oral proceedings were held as scheduled on 2 February 2016, during which all the pending claim requests were discussed.

The appellant's final request was that the decision under appeal be set aside and that a patent be granted on the basis of the claims of the main request or the first auxiliary request, both submitted with the statement setting out the grounds of appeal, or on the basis of the second auxiliary request filed with letter dated 10 December 2015.

At the end of the oral proceedings, the decision of the board was announced.

- VI. Claim 1 of the **main request** reads as follows:

"A method (500) for transmitting control channel format information in wireless communications networks, comprising:

generating (502) control channel format indicator data that defines a structure of control channels

subsequently transmitted over one or more antennas;  
selecting (504, 506) subcarriers of bandwidth over which the control channel format indicator data is spread based at least in part on shifting subcarriers utilized according to a cell identifier, wherein the shifting is a cell-specific shift of the subcarriers utilized compared to other transmitted symbols in other cells, wherein the subcarriers are of a first orthogonal frequency division multiplexing symbol in a given time transmit interval; and  
transmitting (508) the control channel format indicator data over the selected subcarriers of bandwidth."

Claim 1 of the **first auxiliary request** reads as follows (amendments compared with claim 1 of the main request underlined by the board):

"A method (500) for transmitting control channel format information in wireless communications networks, comprising:

generating (502) control channel format indicator data that defines a structure of control channels subsequently transmitted over one or more antennas;  
selecting (504, 506) subcarriers of bandwidth over which the control channel format indicator data is spread based at least in part on shifting subcarriers utilized according to a cell identifier, wherein the shifting is a cell-specific shift of the subcarriers utilized compared to symbols utilized for transmission of control channel format information in other cells, wherein the subcarriers are of a first orthogonal frequency division multiplexing symbol in a given time transmit interval; and  
transmitting (508) the control channel format indicator data over the selected subcarriers of

bandwidth."

Claim 1 of the **second auxiliary request** comprises all the features of claim 1 of the first auxiliary request and adds the following phrase:

"wherein the control channel format indicator indicates a number of subsequent OFDM symbols comprising control channels".

## **Reasons for the Decision**

### 1. MAIN REQUEST

This request corresponds to "auxiliary request 1a" underlying the appealed decision, which was refused due to lack of inventive step in view of document D1.

#### 1.1 Article 52(1) EPC: novelty and inventive step

In the board's judgment, claim 1 of this request does not meet the requirements of Article 54 EPC 1973, for the reasons set out below:

- 1.1.1 In reaction to the appellant's firm and persistent contention that a "cell-specific shift" as claimed meant that the corresponding shifting was a *single* shift from one cell to another applied to *all* available sub-carriers in a cell and that thus the CCFI data were frequency-mapped by applying the same shift to each of the sub-carriers utilised for CCFI transmission (cf. statement setting out the grounds of appeal, page 7, penultimate paragraph), the board introduced document D4 into the appeal proceedings.

1.1.2 Like the present invention, document D4 is related to signalling frequency-mapped information (of different categories "Cat0" to "Cat3") about the corresponding control-channel structure in OFDM systems (see e.g. section 1) and discloses, with regard to the phraseology of claim 1, the following features:

A method for transmitting control channel format information, CCFI, in wireless communications networks, comprising:

- A) generating CCFI data ("Cat0" data) that defines a structure of control channels ("shared control channels SCCH") subsequently transmitted over antennas (see e.g. section 4 in conjunction with Fig. 5);
- B) selecting sub-carriers of bandwidth (sub-carriers associated with the "reserved RBs"; see Fig. 5) over which the CCFI data is spread based on shifting sub-carriers utilised according to a cell identifier ("cell ID" associated with "Node B1", "Node B2" or Node B3"; see page 6, item b) together with Figs. 5 and 6), wherein the shifting is a cell-specific shift of the sub-carriers utilised compared to other transmitted symbols in other cells and wherein the sub-carriers are of a first OFDM symbol in a given time interval (see in particular Fig. 5, where the sub-carriers carrying the reserved radio blocks, which are sent in the first OFDM symbol interval and which accommodate the "Cat0" data, are shifted from one cell to another cell);
- C) transmitting the CCFI data over the selected sub-carriers of bandwidth (see e.g. Figures 5 and 6).

1.1.3 As regards feature A), the appellant argued at the oral proceedings before the board that the "Cat0" data of D4, based on its disclosure at page 6, item a), involved only information about the number of scheduled downlink and uplink mobile users in each MCS (modulation and coding scheme) region. The board concedes that "Cat0" (i.e. the predecessor in name of "CCFI" concerning 3GPP standardisation drafts) may include also this kind of information. However, it is equally true that this does not mean that said information constitutes the only data which is conveyed by the "Cat0" field. Rather, D4 manifestly teaches that this field also includes information about the structure of the control channels such as the "SCCH size" (see e.g. D4, page 5, penultimate paragraph, third sentence).

1.1.4 As regards feature B) of claim 1, the appellant argued that D4 showed merely that the *reserved radio blocks* rather than the *sub-carriers* themselves were shifted and that it did not provide any consistent teaching on the shifting of those reserved RBs. However, D4 clearly states that the position of the first reserved RB may be dependent on the cell ID (see e.g. page 6, item b), second sentence) and that the reserved RBs may be used to transmit Cat0 to mitigate inter-cell interference (see page 6, item a), last sentence). Furthermore, it is also sketched out that those reserved RBs are shifted relative to each other and from cell to cell, in perfect accordance with the appellant's interpretation of the expression "cell-specific shift of the sub-carriers utilised compared to other transmitted symbols in other cells" in feature B).

In addition, this is done for exactly the same purpose as in the present invention, namely for mitigating



inter-cell interference by the use of interference coordination (see e.g. page 7, section 5). Even though the board concedes that the Cat0 data may have different sizes, as submitted by the appellant, it also points out that, on the one hand, present claim 1 does not happen to indicate any size of the CCFI information and, on the other hand, that the size of that Cat0 data may typically not exceed that of the reserved RBs according to both the overall teaching of D4 and the related standardisation references.

1.1.5 Accordingly, all the limiting features of present claim 1 are found to be disclosed in D4 and thus its subject-matter lacks novelty.

1.2 In conclusion, the main request is not allowable under Article 54 EPC 1973.

## 2. FIRST AUXILIARY REQUEST

Claim 1 of this request differs from claim 1 of the main request in that it, with regard to feature B), now specifies that the shifting is a cell-specific shift of the sub-carriers utilised compared to symbols utilised for transmission of CCFI in other cells (emphasis added). This amendment is supported e.g. by Figure 4 of the application as filed.

2.1 Article 52(1) EPC: novelty and inventive step

2.1.1 The feature analysis concerning the main request set out in point 1.1.2 above applies *mutatis mutandis* to claim 1 of this auxiliary request.

2.1.2 Moreover, D4 palpably demonstrates that the corresponding cell-specific shift of the sub-carriers

is executed relative to the sub-carriers used for transmitting CCFI symbols in other cells (see in particular Figures 5 and 6). Thus, the subject-matter of present claim 1 also lacks novelty.

2.2 Hence, the first auxiliary request is likewise not allowable under Article 54 EPC 1973.

3. SECOND AUXILIARY REQUEST

Although this auxiliary request was submitted for the first time after the appellant had filed its statement setting out the grounds of appeal, i.e. at a relatively late stage of the overall procedure, the board admitted it into the appeal proceedings under Article 13(1) and (3) RPBA, since it was regarded as a legitimate - though unsuccessful (see point 3.1 below) - reaction to the observations made in the board's communication under Article 15(1) RPBA, and since the board was able to deal with it without having to adjourn the oral proceedings.

Claim 1 of this request differs from claim 1 of the first auxiliary request in that it further specifies that

D) the CCFI indicates a number of subsequent OFDM symbols comprising control channels.

Added feature D) is based e.g. on paragraphs [0041] and [0075] of the application as originally filed and thus complies with Article 123(2) EPC.

- 3.1 Article 52(1) EPC: novelty and inventive step
- 3.1.1 The feature analysis and observations concerning the main and first auxiliary requests set out in points 1.1 and 2.1 above apply *mutatis mutandis* to claim 1 of this auxiliary request.
- 3.1.2 As to feature D), document D4 states that "Cat0" is used *inter alia* for indicating the corresponding size of the control channels (see D4, page 5, penultimate paragraph, third sentence: "*Cat0 informs the UEs of the ... SCCH size ...*"). Contrary to the appellant's view that the Cat0 data of D4 conveyed size information via "codewords" rather than through OFDM symbols, the board understands from D4 that OFDM symbols correspond to the lowest granularity of data transmission units in the underlying OFDM system (see in particular Fig. 5). It is also apparent to the board that D1, dealing with similar 3GPP-specific and OFDM-related control signalling aspects to D4, unequivocally refers to the standardised content of "Cat0" (or "CCFI" as renamed in 3GPP standardisation drafts), namely the indication of the number *n* of the first subsequent OFDM symbols used for control signalling (see D1, page 3, section 7, in particular the first bullet point).
- 3.1.3 Consequently, the subject-matter of present claim 1 lacks inventive step over D4 and the skilled person's common general knowledge as exemplified by D1.
- 3.2 In summary, the second auxiliary request is not allowable under Article 56 EPC 1973.

**Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chair:



L. Malécot-Grob

A. Ritzka

Decision electronically authenticated