

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

To:

see form PCT/ISA/220

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/US2010/039522

International filing date (day/month/year)
22.06.2010

Priority date (day/month/year)
22.06.2009

International Patent Classification (IPC) or both national classification and IPC
INV. H04L25/03

Applicant
QUALCOMM Incorporated

1. This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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this opinion

see form
PCT/ISA/210

Authorized Officer

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Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - the international application in the language in which it was filed
 - a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).
2. This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:
 - a. (means)
 - on paper
 - in electronic form
 - b. (time)
 - in the international application as filed
 - together with the international application in electronic form
 - subsequently to this Authority for the purposes of search
4. In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	<u>5-7, 12, 13, 17, 21, 22, 26, 29, 33-36, 40-42, 46</u>
	No: Claims	<u>1-4, 8-11, 14-16, 18-20, 23-25, 27, 28, 30-32, 37-39, 43-45, 47</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-47</u>
Industrial applicability (IA)	Yes: Claims	<u>1-47</u>
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

- D1** WO 2008/115588 A2 (INTERDIGITAL TECH CORP [US]; PAN KYLE JUNG-LIN [US]; GRIECO DONALD M []) 25 September 2008 (2008-09-25)
- D2** MOTOROLA: "Proposal for Dedicated Pilots in Downlink Precoding for EUTRA MIMO",
3RD GENERATION PARTNERSHIP PROJECT (3GPP); TECHNICALSPECIFICATION GROUP (TSG) RADIO ACCESS NETWORK (RAN); WORKINGGROUP 1 (WG1), MEETING #48, 3 GPP TSG RAN WG1 MEETING #48 ST. LOUIS,, [Online]
vol. R1-070770, no. 48, 12 February 2007 (2007-02-12), pages 1-5, XP002494688,
Retrieved from the Internet:
URL:http://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_48/Docs/R1-070770.zip
[retrieved on 2007-02-12]
- D3** US 2008/260059 A1 (PAN KYLE JUNG-LIN [US]) 23 October 2008 (2008-10-23)
- D4** NORTEL: "Rank-1 and Rank-2 Transmission for High Mobility UE",
3GPP DRAFT; R1-073977 (NORTEL-RANK1&2 TRANS HIGH MOBILITY UE), 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE,
vol. RAN WG1, no. Shanghai, China; 20071001, 1 October 2007 (2007-10-01), XP050107535,
[retrieved on 2007-10-01]
- D5** PANASONIC: "Ack/Nack repetition and Implicit Resource Allocation for PUCCH",
3GPP DRAFT; R1-081796, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE,
vol. RAN WG1, no. Kansas City, USA; 20080514, 14 May 2008 (2008-05-14), XP050110175,
[retrieved on 2008-05-14]

1 NOVELTY

The present application does not meet the criteria of **Article 33(1) PCT**, because the subject-matter of **claims 1-4, 8-11, 14-16, 18-20, 27-28, 30-32, 37-39, 43-45 and 47** is not new in the sense of **Article 33(2) PCT**.

1.1 The document **D1** discloses (the references in parentheses applying to this document) the subject-matter of **independent claim 1**:

"A method for wireless communication, comprising:

- receiving one or more signals over resources allocated for a downlink control channel (figure 12);*
- determining a precoder utilized to precode the one or more signals (figure 12, ref 1245); and*
- decoding the one or more signals based at least in part on the precoder (figure 12, ref 1275)"*

Document **D1** (see complete figure 12 and paragraph 51) also discloses the subject-matter of **dependent claims 2-4 and 8**.

As a consequence of this, the subject-matter of **claims 1-4 and 8** cannot be considered novel (**Article 33(2) PCT**) and inventive (**Article 33(3) PCT**).

1.2 The document **D3** discloses (the references in parentheses applying to this document) the subject-matter of **independent claim 23**:

" A method for wireless communication, comprising:

- selecting a precoder for precoding one or more signals for transmission over resources related to a downlink control channel (figure 1b and claim 12);*
- precoding the one or more signals using the precoder to generate one or more precoded signals (figure 1b and paragraph 90); and*
- transmitting the one or more precoded signals to over the resources related to the downlink control channel (figure 1b and paragraph 90)"*

Document **D3** (see see previous citations) also discloses the subject-matter of **dependent claims 24-25**.

As a consequence of this, the subject-matter of **claims 23-25** cannot be considered novel (**Article 33(2) PCT**) and inventive (**Article 33(3) PCT**).

- 1.3 Document **D2** (see figure 2 and section 2 - points 1-9-) also discloses the subject-matter of **claims 1-4, 23-25**; which are also considered not new (**Article 33(2) PCT**) and not inventive (**Article 33(3) PCT**).
- 1.4 Document **D4** (see sections I-II "precoding matrix hopping") also discloses the subject-matter of **claims 23-24, 27-28, 30-31, 37-38, 43-44 and 47**; which are also considered not new (**Article 33(2) PCT**) and not inventive (**Article 33(3) PCT**).
- 1.5 The same reasoning applies, mutatis mutandis, to the subject-matter of the corresponding independent **claims 9-11, 14-16, 18-20, 30-32, 37-39 and 43-45** which therefore are also considered not new (**Article 33(2) PCT**) and not inventive (**Article 33(3) PCT**).

2 INVENTIVE STEP

The present application does not meet the criteria of **Article 33(1) PCT**, because the subject-matter of **claims 5-7, 12-13, 17, 21-22, 26, 29, 33-36, 40-42 and 46** does not involve an inventive step in the sense of **Article 33(3) PCT**.

- 2.1 The document **D1** is regarded as being the closest prior art to the subject-matter of **dependent claims 5-7, 12-13, 17 and 21-22**. The document **D3** is regarded as being the closest prior art to the subject-matter of **dependent claims 29, 34-36 and 40-41**. The additional features claimed by these claims are considered as merely one of several straightforward possibilities from which the skilled person would select without the exercise of inventive skill, in order to select the next precoder to use. More over, some of these additional technical features have been already disclosed in **D4** (see references in point

1.4). Therefore, the subject-matter of **dependent claims 5-7, 12-13, 17, 21-22, 29, 34-36 and 40-41** cannot be considered inventive (**Article 33 (3) PCT**).

2.2 The document **D3** is regarded as being the closest prior art to the subject-matter of **dependent claims 26, 33, 42 and 46**. The additional features claimed by these claims are considered as merely one of several straight-forward possibilities from which the skilled person would select without the exercise of inventive skill. As an example, document **D5** (see section 3) shows already the variation of the aggregation level of control channel elements depending on other parameters of the transmission. Therefore, the subject-matter of **claims 26, 33, 42 and 46** cannot be considered inventive (**Article 33 (3) PCT**).

Re Item VII

Certain defects in the international application

- The features of **claims 1-47** are not provided with reference signs placed in parentheses (**Rule 6.2(b) PCT**).
- Contrary to the requirements of **Rule 5.1 (a)(ii) PCT**, the relevant background art disclosed in **D1, D3 and D4** is not mentioned in the description.

Re Item VIII

Certain observations on the international application

The application does not meet the requirements of **Article 6 PCT**, because **claims 1, 2, 5 and corresponding claims** are not clear.

- **Claim 1 (and corresponding claims)** do not meet the requirements of **Article 6 PCT** in that the matter for which protection is sought is not clearly defined. The expression *"determining a precoder"* is unclear and leaves the reader in doubt as to the meaning of the technical features to which it refers, thereby rendering the definition of the subject-matter of said claims unclear (**Article 6 PCT**). The claim attempts to define the subject-matter in terms of the result to be achieved, which merely amounts

to a statement of the underlying problem, without providing the technical features necessary for achieving this result. It is not clear how the precoder is determined, i.e. by blind detection, because it has been signalled to the wireless terminal from the access point, etc.

- **Claim 1 (and corresponding claims)** do not meet the requirements of **Article 6 PCT** in that the matter for which protection is sought is not clearly defined. The expression "decoding (...) is based at least in part on the precoder" is unclear and leaves the reader in doubt as to the meaning of the technical features to which it refers, thereby rendering the definition of the subject-matter of said claims unclear (**Article 6 PCT**). It is not clear how the decoding is performed; it seems that there are more elements apart from the precoder ("or part of the precoder") necessary for decoding the signals. The same objection applies to all the claims that have the expression "based at least in part of" in their wording.

- **Claim 5 (and corresponding claims)** do not meet the requirements of **Article 6 PCT** in that the matter for which protection is sought is not clearly defined. The expression "next precoder" is unclear and leaves the reader in doubt as to the meaning of the technical features to which it refers, thereby rendering the definition of the subject-matter of said claims unclear (**Article 6 PCT**). It is not clear how the "next precoder" is different from "a precoder". Moreover, it is not clear what is the use of the "next precoder"; i.e. if it is used to precode the "next portion of one or more signals" or another signal... The expression "for at least a portion of one or more signals" in **claim 5** is neither clear.

- In paragraph 6, the applicant explicitly states that the summary which runs from paragraph 6 to paragraph 16, is not intended to set out key or critical features and neither to delineate the scope of such aspects. The summary is, rather, intended to only introduce some concepts which are subsequently to be further described. There is, then, no clear relationship between the subject-matter set out in paragraphs 6-16 and the applicant's invention.

- From paragraph 30 to paragraph 85, the applicant sets out various embodiments, which are, to be understood such as these embodiments can be practised without the specific details described (paragraph 30). It is not clear if any of the features described from paragraph 30 to paragraph 85 should be understood as belonging to the invention.

- Although **claims 9 and 14 / 30 and 37** have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought and/or in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness and as such do not meet the requirements of **Article 6 PCT**.