

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: <p style="text-align: center;">see form PCT/ISA/220</p>
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PCT

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

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
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International application No. PCT/US2018/036303	International filing date (day/month/year) 06.06.2018	Priority date (day/month/year) 09.06.2017
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International Patent Classification (IPC) or both national classification and IPC INV. H04W56/00 H04W8/00 H04W52/02
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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.

Name and mailing address of the ISA: European Patent Office P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Fax: +31 70 340 - 3016	Date of completion of this opinion see form PCT/ISA/210	Authorized Officer Tavakol, Vahid Telephone No. +31 70 340-0	
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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:
 - a. forming part of the international application as filed:
 - in the form of an Annex C/ST.25 text file.
 - on paper or in the form of an image file.
 - b. furnished together with the international application under PCT Rule 13ter.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
 - c. furnished subsequent to the international filing date for the purposes of international search only:
 - in the form of an Annex C/ST.25 text file (Rule 13ter.1(a)).
 - on paper or in the form of an image file (Rule 13ter.1(b) and Administrative Instructions, Section 713).
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 forming part of 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, 6, 8-12, 17, 18, 27, 29, 30</u>
	No: Claims	<u>1-4, 7, 13-16, 19-26, 28</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-30</u>
Industrial applicability (IA)	Yes: Claims	<u>1-30</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

1 **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 2015/109153 A1 (INTERDIGITAL PATENT HOLDINGS [US]) 23 July 2015 (2015-07-23)
- D2 US 2013/250818 A1 (GAAL PETER [US] ET AL) 26 September 2013 (2013-09-26)
- D3 WO 2017/096121 A1 (IDAC HOLDINGS INC [US]) 8 June 2017 (2017-06-08)

1.1 Independent claims suffer from severe lack of clarity and lack several essential features, see Re Item VIII below. The below-mentioned lack of clarity notwithstanding, the subject-matter of independent claims 1, 13, 19, and 22 does not involve an inventive step in the sense of Article 33(3) PCT, and the criteria of Article 33(1) PCT are not met.

1.2 The following reasoning regarding a lack of novelty based on Article 33(1) and (2) PCT is also provided:

D1 discloses (references in parentheses referring to this document):

A method of wireless communications, comprising:

receiving, by a user equipment, UE, a message including information of a

configuration (§0006: "The WTRU may receive a first measurement gap pattern and a second measurement gap pattern (e.g., from the mmW base station). The... second measurement gap pattern may be associated with a second activity. For example... the second activity may include a mmW measurement associated with a first mmW neighbor cell (e.g., a wide beam and/or narrow beam measurement of the first mmW neighbor cell)"),

wherein the configuration includes at least a group of repetitions of one or more synchronization signal, SS, blocks in an SS burst set (As given on §00127: "A Beam-Specific Reference Signal... may be used for beam... timing/frequency synchronization", hence the beam reference signals of D1 are considered reference signals and according to figure 27 the schedule of these

reference signals is requested from the neighbour cell by the serving base station and sent to the UE". Also see §00205: "The WTRU may obtain the association between the neighbor LTE cells and the mmW cells co-sited with the LTE neighbors, for example, from the serving LTE cell. Such association information may also include the timing assistance for mmW... synchronization. The serving mB may configure measurement gap patterns, taking into account... the periodicity of the mmW reference signals". This implies that the UE receives information regarding repetition of beam reference signals which, in D1, are also used as reference signals), wherein the repetitions of the one or more SS-blocks are configured into at least two groups (§00205: "Further the measurement gap patterns may be different for wide beam measurement stage and narrow beam measurement stage.". Also see §00222 and figure 30); and determining, by the UE, which group of the at least two groups to search for during a synchronous neighbor cell search based on the information (§00222 and Figure 30: "Neighbor mB wide beam measurements", and "Neighbor mB narrow beam measurements") and at least one condition at the UE (§00229: "Depending on the mWTRU capability, certain mWTRUs may not use each of the configured measurement gaps").

The subject-matter of claim 1 is therefore not new with respect to Article 33(1) and (2) PCT.

The same reasoning given above applies mutatis mutandis to the subject matter of independent claims 1, 13, 19, and 22, as well as claims 24 and 25, which depend on claim 22 and have corresponding features to independent claim 1. The subject matter of these claims is therefore not new with respect to Article 33(1) and (2) PCT.

- 1.3 Claims 2, 14, and 20 are directed to performing synchronisation on the neighbor cell which is implicit for the UE in D1 which is searching for neighbor cells (see §00205: "The WTRU may obtain the association between the neighbor LTE cells and the mmW cells co-sited with the LTE neighbors, for example, from the serving LTE cell. Such association information may also include the

timing assistance for mmW... synchronization.). The subject-matter of these claims is therefore not new with respect to Article 33(1) and (2) PCT.

- 1.4 Claims 3, 15 and 23 are directed to different beam width (§00205). The subject-matter of these claims is therefore not new with respect to Article 33(1) and (2) PCT.
- 1.5 Claims 4, 16, 21, and 28 are directed to narrow and wide beams. Apart from clarity objections directed to these claims, see 3.9 below, these claims are disclosed in D1 (§00205). The subject-matter of these claims is therefore not new with respect to Article 33(1) and (2) PCT.
- 1.6 Claims 7 and 26 are directed to sending, by the UE, metrics to assist configuring the two groups, where this metric is an indication of a preferred group (see figure 27: "narrow beam measurement report" sent from the UE to the serving base station, also see §00200: "WTRU may trigger a measurement report... such a report may include the preferred mB Tx beam ID"). The subject-matter of these claims is therefore not new with respect to Article 33(1) and (2) PCT.
- 1.7 The inclusion of the features of any of claims 5, 6, 8, 9, 10, 11, 12, 17, 18, 27, 29, or 30 would not, alone, solve the severe lack of clarity and the lack of several essential features directed to the independent claims, see Re Item VIII below. The below-mentioned lack of clarity notwithstanding, the subject-matter of these claims does not involve an inventive step in the sense of Article 33(3) PCT, and the criteria of Article 33(1) PCT are therefore not met. As an example: Claim 11, depending on claims 9 and 10, carries essential features of the invention, see 3.5 below. However inclusion of these essential features is not sufficient to rectify other lack of clarity directed to claim 1, i.e. 3.1-3.4 and 3.6-3.7 below. Notwithstanding these lack of clarity problems directed to the independent claim 1, the subject matter of claim 11 as well as claims 9 and 10 is also not inventive.

2 **Re Item VII**

Certain defects in the international application

- 2.1 Independent claims are not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art being placed in the preamble (Rule 6.3(b)(i) PCT) and the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

In the present case, all features of the independent claims are known in combination from the prior art, discussed above, and belong in the preamble of such claims.

- 2.2 The features of the claims should be provided with reference signs placed in parentheses to increase the intelligibility of the claims (Rule 6.2(b) PCT). In the current drafting of the claims **abbreviations** have also been placed in parentheses. It is recommended that **abbreviations** be introduced outside parentheses, e.g. between commas, to achieve full compliance with (Rule 6.2(b) PCT).
- 2.3 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in D1-D3 is not mentioned in the description, nor are these documents identified therein.

3 **Re Item VIII**

Certain observations on the international application

- 3.1 Claims 1, 13, 19, and 22 do not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. The functional statement "configured in at least two groups" does not enable the skilled person to determine which technical features are necessary to perform the stated function. It is not clear how the two groups differ from each other and therefore the skilled person has no way of making a distinction between the two groups, and therefore has no way of implementing the invention according to the claim.
- 3.2 Claims 1, 13, 19, and 23 do not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. The functional statement "determining, by the UE, which group of the at least two groups to search for... based on the information and at least one condition at the UE" does not enable the skilled person to determine which technical features are necessary to perform the stated function. It is not clear how the determination is based on the information.

- 3.3 Claims 1, 13, 19 do not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. The functional statement "and at least one condition at the UE" does not enable the skilled person to determine which technical features are necessary to perform the stated function. It is not clear what the condition is and therefore the skilled person has no way of implementing the invention according to the claim.
- 3.4 In view of the clarity problem given in 3.1 above and by reading claim 3 it becomes clear that performing the distinction between the two groups is made based on different beam widths. Since independent claims do not contain this feature it does not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT that any independent claim must contain all the technical features essential to the definition of the invention.
- 3.5 In view of the clarity problem given in 3.2 above and by reading claim 11 it becomes clear that the choice of which group to search for is made by restricting to the subgroups based on an estimation at a base station. Since independent claims do not contain this feature it does not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT that any independent claim must contain all the technical features essential to the definition of the invention. It has to be noted that claim 11 depends on claim 9 and 10 which have corresponding features in claims 18, 27, 29, and 30.
- 3.6 In view of the clarity problem given in 3.3 above and by reading claim 6 it becomes clear that the condition in the UE is a battery level condition. Since independent claims do not contain this feature it does not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT that any independent claim must contain all the technical features essential to the definition of the invention.
- 3.7 By reading claim 2, it becomes clear that performing the act of synchronisation is also essential to the definition of the invention, without an act of synchronisation the object of the invention i.e. synchronising to a [neighbour] base station will not be achieved. Since independent claims do not contain this feature it does not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT that any independent claim must contain all the technical features essential to the definition of the invention.

- 3.8 Although claims 13 and 19 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.
- 3.9 The relative terms "broad beam width", "low beamforming gain", "narrow beam width", and "high beamforming gain." used in claims 4, 16, 21, and 28 has no well-recognized meaning and leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject-matter of said claim unclear, Article 6 PCT.