

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
27 December 2007 (27.12.2007)

PCT

(10) International Publication Number
WO 2007/149997 A3

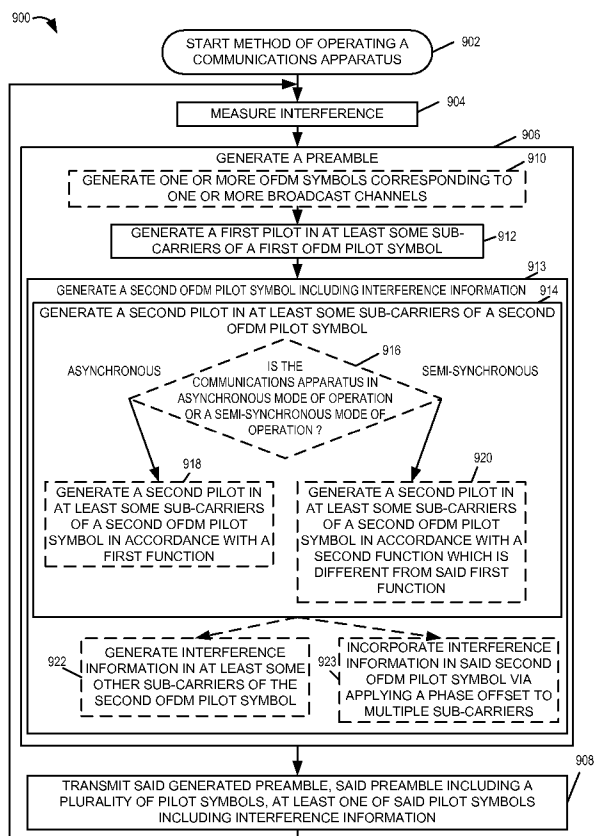
- (51) International Patent Classification:
H04L 1/00 (2006.01) H04B 7/005 (2006.01)
- (21) International Application Number:
PCT/US2007/071821
- (22) International Filing Date: 21 June 2007 (21.06.2007)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/815,664 21 June 2006 (21.06.2006) US
60/815,733 21 June 2006 (21.06.2006) US
60/816,281 23 June 2006 (23.06.2006) US
- (71) Applicant (for all designated States except US): QUALCOMM Incorporated [US/US]; Attn: International IP Administration, 5775 Morehouse Drive, San Diego, California 92121 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): GOROKHOV, Alexei [FR/US]; 12543 El Camino Real, San Diego, California 92130 (US). KHANDEKAR, Aamod [IN/US];

8465 Regents Road, #339, San Diego, California 92122 (US). PALANKI, Ravi [IN/US]; 7699 Palmilla Drive, #3209, San Diego, California 92122 (US). PRAKASH, Rajat [IN/US]; 8730 Costa Verde Blvd., Apt. 2439, San Diego, California 92122 (US).

- (74) Agent: BACHAND, Richard A.; 5775 Morehouse Drive, San Diego, California 92121 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH,

[Continued on next page]

(54) Title: METHODS AND APPARATUS FOR MEASURING, COMMUNICATING AND/OR USING INTERFERENCE INFORMATION



(57) Abstract: Wireless communications methods and apparatus are described. A communications apparatus, e.g., a base station, measures interference information, e.g., other sector interference information. The communications apparatus generates a preamble which includes a plurality of pilot symbols and at least one of the pilot symbols includes interference information. In some embodiments, the preamble is part of a superframe structure, e.g., a recurring superframe structure, including the preamble and a plurality of frames, at least some of the frames used to convey traffic data. The communications apparatus transmits the preamble, thus broadcasting the interference information to access terminals in the vicinity. An access terminal receives the preamble including a plurality of pilot signals, at least one of the pilot signals including interference information. The access terminal recovers the interference information from the received preamble and controls signal transmission based on the recovered interference information.

WO 2007/149997 A3



GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

Published:

— *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

(88) Date of publication of the international search report:
10 April 2008

INTERNATIONAL SEARCH REPORT

| |
|---|
| International application No PCT/US2007/071821 |
|---|

| | | | | |
|--|---|---|---|---|
| A. CLASSIFICATION OF SUBJECT MATTER INV. H04L1/00 H04B7/005 | | | | |
| According to International Patent Classification (IPC) or to both national classification and IPC | | | | |
| B. FIELDS SEARCHED | | | | |
| Minimum documentation searched (classification system followed by classification symbols) H04L H04B | | | | |
| Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched | | | | |
| Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal, WPI Data, IBM-TDB, INSPEC, COMPENDEX | | | | |
| C. DOCUMENTS CONSIDERED TO BE RELEVANT | | | | |
| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. | | |
| X | JIM TOMCIK (QUALCOMM, INCORPORATED): "MBFDD and MBTDD Wideband Mode: Technology Overview" IEEE 802.20 WORKING GROUP ON MOBILE BROADBAND WIRELESS ACCESS, [Online] 6 January 2006 (2006-01-06), pages 1-109, XP002467625 Retrieved from the Internet: URL: http://www.ieee802.org/20/Contribs/C80.2.20-05-68r1.pdf [retrieved on 2008-01-02] * sections 10.1.1 and 10.1.3 in pages 51 and 52 * | 1,8,30, 35,40, 45,54, 63,68,73 | | |
| X | the whole document | 2-7, 9-29, 31-34, 36-39, 41-44, 46-53, -/-- | | |
| <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"><input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.</td> <td style="width: 50%; border: none;"><input checked="" type="checkbox"/> See patent family annex.</td> </tr> </table> | | | <input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. | <input checked="" type="checkbox"/> See patent family annex. |
| <input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. | <input checked="" type="checkbox"/> See patent family annex. | | | |
| * Special categories of cited documents : | | | | |
| <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> *A* document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the International filing date *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) *O* document referring to an oral disclosure, use, exhibition or other means *P* document published prior to the international filing date but later than the priority date claimed </td> <td style="width: 50%; border: none;"> *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. *&* document member of the same patent family </td> </tr> </table> | | | *A* document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the International filing date *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) *O* document referring to an oral disclosure, use, exhibition or other means *P* document published prior to the international filing date but later than the priority date claimed | *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. *&* document member of the same patent family |
| *A* document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the International filing date *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) *O* document referring to an oral disclosure, use, exhibition or other means *P* document published prior to the international filing date but later than the priority date claimed | *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. *&* document member of the same patent family | | | |
| Date of the actual completion of the international search <p style="text-align: center; font-size: 1.2em;">5 February 2008</p> | | Date of mailing of the international search report <p style="text-align: center; font-size: 1.2em;">20/02/2008</p> | | |
| Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016 | | Authorized officer <p style="text-align: center; font-size: 1.2em;">AGUDO CORTADA, E</p> | | |

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2007/071821

| C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT | | |
|--|---|-------------------------------------|
| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
| | | 55-62, 64-67, 69-72, 74-77 |
| X | <p>-----</p> <p>JIM TOMCIK QUALCOMM INCORPORATED: "QFDD Technology Overview Presentation"[Online] 15 November 2005 (2005-11-15), pages 1-73, XP002467626 IEEE 802.20 Working Group on Mobile Broadband Wireless Access Retrieved from the Internet: URL:http://www.ieee802.org/20/Contribs/C80.2.20-05-59r1.pdf> [retrieved on 2008-02-01]</p> | 1-15, 18-77 |
| A | <p>pages 25,28 the whole document</p> | 16,17 |
| A | <p>-----</p> <p>CHOI S H ET AL: "Method and apparatus for confirming multiple frame structure and indicating transmission diversity through phase modulation of forward pilot time slot in nb-tdd cdma communication system" DATABASE WPI, 9 May 2002 (2002-05-09), XP002968161 the whole document</p> | 1-77 |
| A | <p>-----</p> <p>CHELLALI A ET AL: "Computational reduction during idle transmission in DSL modems" ACOUSTICS, SPEECH AND SIGNAL PROCESSING, 1998. PROCEEDINGS OF THE 1998 IEEE INTERNATIONAL CONFERENCE ON SEATTLE, WA, USA 12-15 MAY 1998, NEW YORK, NY, USA,IEEE, US, vol. 6, 12 May 1998 (1998-05-12), pages 3441-3444, XP010279621 ISBN: 0-7803-4428-6 * section 2.2 * abstract</p> | 1-77 |
| A | <p>-----</p> <p>US 7 042 957 B1 (ZIRWAS WOLFGANG [DE]) 9 May 2006 (2006-05-09) column 5, lines 20-27</p> <p>-----</p> | 1-77 |

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2007/071821

| Patent document cited in search report | | Publication date | Patent family member(s) | Publication date |
|--|----|------------------|-------------------------|------------------|
| US 7042957 | B1 | 09-05-2006 | WO 0036769 A1 | 22-06-2000 |
| | | | DE 19857821 A1 | 29-06-2000 |
| | | | EP 1142172 A1 | 10-10-2001 |
| | | | ES 2212660 T3 | 16-07-2004 |
| | | | JP 2003522435 T | 22-07-2003 |
