

(51) International Patent Classification:
H04W 72/04 (2009.01)(21) International Application Number:
PCT/US2009/062898(22) International Filing Date:
31 October 2009 (31.10.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

61/109,978	31 October 2008 (31.10.2008)	US
61/117,851	25 November 2008 (25.11.2008)	US
61/141,638	30 December 2008 (30.12.2008)	US
61/148,818	30 January 2009 (30.01.2009)	US
61/232,531	10 August 2009 (10.08.2009)	US
61/245,734	25 September 2009 (25.09.2009)	US
61/250,097	9 October 2009 (09.10.2009)	US

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, 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, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, 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, 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, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

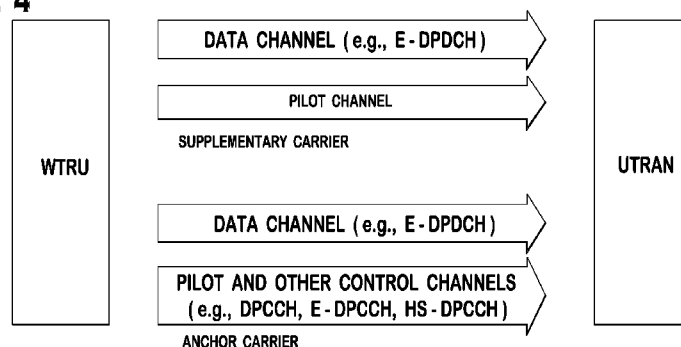
Published:

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

(88) Date of publication of the international search report:
28 October 2010

(54) Title: PROVIDING CONTROL INFORMATION FOR MULTI-CARRIER UPLINK TRANSMISSION

FIG. 4



(57) Abstract: Providing control (scheduling) information for multi-carrier uplink transmission are disclosed. A wireless transmit/receive unit (WTRU) may set a happy bit for enhanced dedicated channel (E-DCH) transmissions on each uplink carrier considering aggregated transmission capability over all uplink carriers. The happy bit is set to "unhappy" if the WTRU is transmitting as much scheduled data as allowed by a current serving grant, the WTRU has enough power available to transmit at a higher rate, and total E-DCH buffer status (TEBS) requires more than a pre-configured period to be transmitted with a current effective data rate aggregated over all uplink carriers. The WTRU may send scheduling information including power headroom measured on the anchor (primary) uplink carrier and/or power headroom measured on the supplementary (secondary) uplink carrier. For power headroom measurements, the WTRU may initiate a short-lived dedicated physical control channel loop on the supplementary carrier.

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2009/062898

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04W72/12
ADD.

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)
H04W

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2007/109964 A1 (KWAK YONG-JUN [KR] ET AL) 17 May 2007 (2007-05-17) paragraphs [0024] - [0032], [0050] - [0055], [0058], [0064] - [0068] figures 4,8,9A	1,2,11,12
A	INTERDIGITAL ET AL: "Happy Bit Setting with Improved L2 for UL" 3GPP DRAFT; 25321_CRXXX_(REL-8)_R2-085128, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE, no. Prague, Czech Republic; 20080922, 22 September 2008 (2008-09-22), XP050319862 the whole document	1,2,11,12

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"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

16 August 2010

Date of mailing of the international search report

30/08/2010

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2009/062898

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P	ERICSSON ET AL: "Definition for the Happy Bit" 3GPP DRAFT; R2-095716, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE, no. Miyazaki; 20091012, 12 October 2009 (2009-10-12), XP050390221 the whole document	1,2,11, 12
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Y	paragraphs 0002-0008, 0051 claims 19,20,39,40	4-10, 14-20
Y	US 2006/221883 A1 (DAMNJANOVIC ALEKSANDAR [US] ET AL) 5 October 2006 (2006-10-05)	4,14
A	paragraphs 0122-0128	5-10, 15-20
Y	SAMSUNG: "UPH transmission for Dual Cell HSDPA" 3GPP DRAFT; R2-085706_UPH, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE, no. Prague, Czech Republic; 20081001, 1 October 2008 (2008-10-01), XP050320479 the whole document	5-10, 15-20
A	US 2007/070908 A1 (GHOSH DONNA [US] ET AL) 29 March 2007 (2007-03-29) paragraphs 0081-0094, 0096, 0099, 0115, 0140, 0189, 0202, 0208-0217, 0228-0233	3-10, 13-20
A	US 2007/097962 A1 (YOON YOUNG C [US] ET AL) 3 May 2007 (2007-05-03) paragraphs 0080-0085, 0088, 0114-0119	3-10, 13-20

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2009/062898

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1, 2, 11, 12

Setting and transmitting happy bits for an E-DCH transmission on each uplink carrier for multi-carrier uplink transmission.

2. claims: 3-10, 13-20

Generating and transmitting scheduling information including at least one of an anchor uplink carrier power headroom and a supplementary uplink carrier power headroom.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2009/062898

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