Abstract: Techniques for transmitting control information in a wireless communication system are described. The system may support acknowledgement (ACK) channels and channel quality indicator (CQI) channels, which may have different target signal-to-noise ratios (SNRs). The ACK and CQI channels from different user equipments (UEs) may be multiplexed on the same resource block. In one design, the transmit power of a CQI channel may be set to achieve a nominal target SNR for CQI when not multiplexed with the ACK channels and may be reduced to achieve a lower target SNR when multiplexed with the ACK channels. In another design, the transmit power of an ACK channel may be set to achieve a nominal target SNR for ACK when not multiplexed with the CQI channels and may be boosted to achieve a higher target SNR when multiplexed with the CQI channels. The CQI channel may randomly hop to mitigate performance degradation.
— 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
INTERNATIONAL SEARCH REPORT

International application No
PCT/US2008/063650

A. CLASSIFICATION OF SUBJECT MATTER

INV. H04B/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)
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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
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<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<td>X</td>
<td>QUALCOMM EUROPE: &quot;Joint Coding with COI and ACK and Performance Evaluation&quot; 3GPP DRAFT; R1-071811, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE, vol. tsg_ran\WG1_RL1\TS6R1_48b\Docs, no. St. Julian; 20070326, 29 March 2007 (2007-03-29), XP050105720 page 1, lines 15,20-22 page 2, lines 3-12,22,23 page 3, lines 10-15 page 4, lines 14,18-20 figures 3,4 page 6, lines 2-9</td>
<td>1,8,9, 11-13, 16-18, 21-24, 27,30,36</td>
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*A* document defining the general state of the art which is not considered to be of particular relevance
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**[X]** Further documents are listed in the continuation of Box C.

**[X]** See patent family annex.

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**[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.

**[B]** document member of the same patent family

Date of the actual completion of the international search
30 January 2009

Date of mailing of the international search report
05/02/2009

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Authorized officer
van der Pol, Edwin
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<td>QUALCOMM EUROPE: &quot;Proposed Structure for UL ACK and CQI&quot; 3GPP DRAFT; R1-070437, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE, vol. tsg_ran\WG1_RL1\TSGR1_47bis\Docs, no. Sorrento, Italy; 20070115, 9 January 2007 (2007-01-09), XP050104468 paragraph [0001]</td>
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<td>US 2004/013103 A1 (ZHANG HANG [CA] ET AL) 22 January 2004 (2004-01-22) claims 1,2 paragraphs [0004] - [0006], [0008], [0011], [0012], [0014], [0031], [0033], [0043], [0044] figures 1,2</td>
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