Abstract:

H04W 52/40 (2009.01) H04W 52/08 (2009.01)

An apparatus and methods for transmitting and receiving data over a cellular network are provided. The methods include a) receiving a TPC command from a core network over a control channel; b) establishing a connection with a remote node; c) setting a transmit power range for a remote node; d) transmitting data to the remote node within the transmit power range; and e) receiving data from the remote node over the control channel. The apparatus includes a processor configured to receive the TPC command, and a transceiver configured to transmit and receive data over the control channel.

Inventors:


Agent:

KOPTIW, Michael, A.; Condo Roccia LLP, One Liberty Place, Suite 2200, 1650 Market Street, Philadelphia, PA 19103 (US).

Designated States (unless otherwise indicated, for every kind of national protection available):


Designated States (unless otherwise indicated, for every kind of regional protection available):


Published:

— with international search report (Art. 21(3))

Title: METHODS, APPARATUS AND SYSTEMS FOR POWER CONTROL AND TIMING ADVANCE

Abstract: A wireless transmit/receive unit (WTRU) establishes communication with a first set of cells and a second set of cells. The first set of cells may be associated with a first scheduler and the second set of cells may be associated with a second scheduler. A plurality of TPC commands are sent from a plurality of schedulers to the WTRU. The WTRU then determines a power for the transmission of a control channel to each scheduler on the basis of the corresponding TPC command received from the respective scheduler.
(88) Date of publication of the international search report:
18 May 2013
## INTERNATIONAL SEARCH REPORT

### A. CLASSIFICATION OF SUBJECT MATTER

**INV.** H04W52/40  
**ADD.** H04W52/14  
H04W52/08

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)

<table>
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<tr>
<th>H04W</th>
<th>H04B</th>
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

### C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
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<tr>
<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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<tr>
<td>A</td>
<td>US 2006/286996 Al (AGEURAWAL A; AGRAWAL A; AVNEESH A; DAVID J J; EDWARD H T; HARRISON T E) 21 December 2006 (2006-12-21) abstract figures 2,9,16 paragraph [0027] - paragraph [0047]</td>
<td>1-5,26, 28</td>
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</table>

* 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 application or patent 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
  * "Z" document member of the same patent family

**Date of the actual completion of the international search**  
26 October 2012

**Date of mailing of the international search report**  
25/04/2013

Name and mailing address of the ISA  
European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040,  
Fax. (+31-70) 340-3016

Authorized officer  
Neeb, Christoph
**DOCUMENTS CONSIDERED TO BE RELEVANT**

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<td>LG ELECTRONICS: &quot;Basic UL power control methods in LTE-Advanced&quot; , 3GPP DRAFT; RI-100216 LTEAJJL PC, 3RD GENERATION PARTNERSHIP PROJECT (3GPP) , MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTI POLIS CEDEX ; FRANCE, vol , RAN WG1 , no. Valencia, Spain; 20100118, 12 January 2010 (2010-01-12) , XP050417908, the whole document</td>
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<td>&quot;LTE; Evolved Universal Terrestrial Radio Access (E-UTRA) ; Physical layer procedures (3GPP TS 36.213 version 10.2.0 Release 10) &quot; , TECHNICAL SPECIFICATION , EUROPEAN TELECOMMUNICATIONS STANDARDS INSTITUTE (ETSI ), 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTI POLIS ; FRANCE, vol . 3GPP RAN 1, no. V10.2.0, 1 June 2011 (2011-06-01) , XP014066384, section 5.1</td>
<td>1-5,26, 28</td>
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</table>
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).

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.:

   1-5, 26, 28

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

1. claims: 1-5, 26, 28
   Control ling an uplink transmit power when transmitting a channel to a plurality of schedulers.

2. claims: 6-12, 29
   Control ling the interference between cells when transmitting to or from two different sets of cells configured for the same wireless transmit/receive unit.

3. claims: 13-17, 27
   Synchronizing the concurrent reception of a control channel at a plurality of different schedulers.

4. claims: 18-25
   Managing power headroom reporting for two different sets of cells configured for the same wireless transmit/receive unit.
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