

Title (en)  
BASE TRANSCEIVER STATION (BTS) SYNCHRONIZATION

Title (de)  
MOBILFUNKBASISSTATION(BTS)-SYNCHRONISIERUNG

Title (fr)  
SYNCHRONISATION DE STATION E/R DE BASE

Publication  
**EP 1847132 A4 20090902 (EN)**

Application  
**EP 05758372 A 20050425**

Priority  
• US 2005014188 W 20050425  
• US 65226505 P 20050211

Abstract (en)  
[origin: WO2006088472A1] In a network overlay wireless location solution for a GSM or UMTS communications network, spectrum utilization can be made far more efficient by synchronizing the BTSs, which can require distributing a timing signal to all BTSs, or installing a satellite-based timing unit in each site. The present invention provides an architecture in which Location Measurement Units (LMUs) are installed at some or all of the BTS sites for the purpose of locating wireless devices. The LMUs are used to measure the timing of various uplink and/or downlink signals in the cellular network in support of various location techniques. These LMUs may include a GPS-based timing reference module, which may be used to synchronize the time bases of all LMUs. To reduce the overall cost of BTS synchronization, the LMU distributes timing signals, including a periodic electrical pulse as well as time description information, on a serial or other interface, which is available for other nodes to use for synchronization. The format of the electrical pulse and time description information is modified through hardware and software to adapt to the various formats required by various BTS types. For example, the BTSs with co-located LMUs can receive a synchronization signal with little or no hardware cost. The External Interface Unit (EIU) described herein may be used to adapt to various BTS hardware formats. For BTS sites not equipped with an LMU, a Timing Measurement Unit (TMU) can be used. The TMU has the single function of providing BTS time signals in the same formats as provided by the LMUs. The time signals provided by the TMUs are synchronous to the signals provided by the LMUs. This timing-only TMU has a lower cost than the LMU because it does not support the uplink or downlink signal measurement functions. This approach allows a cellular operator to synchronize BTSs at a relatively low cost.

IPC 8 full level  
**H04W 4/90** (2018.01)

CPC (source: EP GB KR)  
**H04B 7/2684** (2013.01 - EP); **H04B 7/2693** (2013.01 - EP); **H04L 7/027** (2013.01 - KR); **H04Q 7/20** (2013.09 - GB); **H04Q 7/206** (2013.09 - GB); **H04Q 7/208** (2013.09 - GB); **H04W 56/00** (2013.01 - GB); **H04W 88/00** (2013.01 - GB)

Citation (search report)  
• [I] WO 0155803 A2 20010802 - ERICSSON TELEFON AB L M [SE]  
• [A] JP 2004023350 A 20040122 - MITSUBISHI ELECTRIC CORP  
• See references of WO 2006088472A1

Citation (examination)  
US 2004203429 A1 20041014 - ANDERSON ROBERT J [US], et al

Designated contracting state (EPC)  
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR

DOCDB simple family (publication)  
**WO 2006088472 A1 20060824**; AU 2005327593 A1 20060824; AU 2005327593 B2 20091022; BR PI0520026 A2 20090512; CA 2595365 A1 20060824; CA 2595365 C 20130122; CN 101112107 A 20080123; CN 101112107 B 20111109; EP 1847132 A1 20071024; EP 1847132 A4 20090902; GB 0715498 D0 20070926; GB 2437678 A 20071031; GB 2437678 B 20090610; IL 184979 A0 20071203; IL 184979 A 20121031; JP 2008530901 A 20080807; JP 4750138 B2 20110817; KR 20070114286 A 20071130; MX 2007009322 A 20070921

DOCDB simple family (application)  
**US 2005014188 W 20050425**; AU 2005327593 A 20050425; BR PI0520026 A 20050425; CA 2595365 A 20050425; CN 200580047705 A 20050425; EP 05758372 A 20050425; GB 0715498 A 20050425; IL 18497907 A 20070801; JP 2007555069 A 20050425; KR 20077020599 A 20070907; MX 2007009322 A 20050425