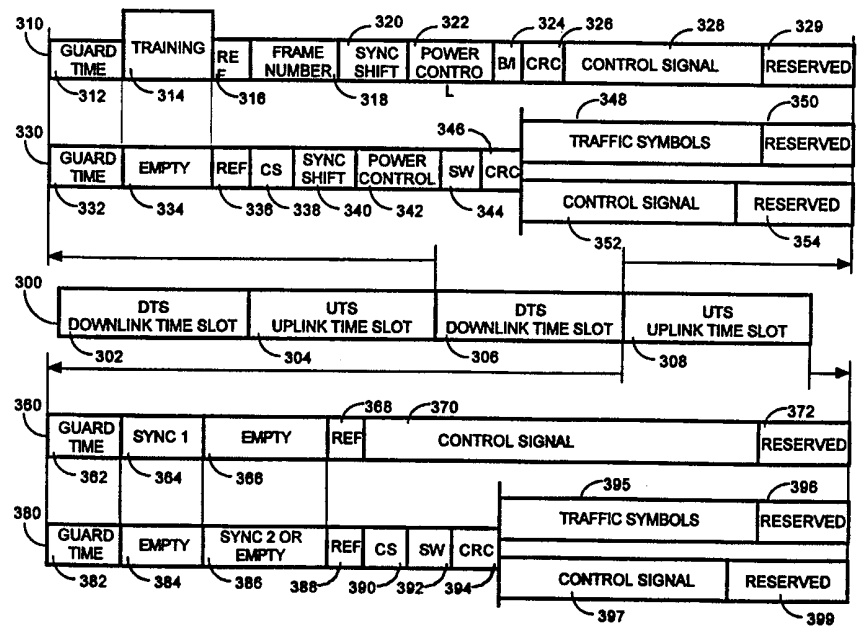




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁶ : H04J 13/00</p>	<p>A3</p>	<p>(11) International Publication Number: WO 99/08451 (43) International Publication Date: 18 February 1999 (18.02.99)</p>
<p>(21) International Application Number: PCT/US98/16407 (22) International Filing Date: 6 August 1998 (06.08.98) (30) Priority Data: 08/908,914 8 August 1997 (08.08.97) US (71) Applicant (for all designated States except US): CWILL TELECOMMUNICATIONS, INC. [US/US]; Suite 310, 11500 Metric Boulevard, Austin, TX 78758 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): XU, Guanghan [CN/US]; 4609 Twin Valley Circle, Austin, TX 78731 (US). GU, Yucong [CN/US]; Apartment K, 1624 W. 6th Street, Austin, TX 78703 (US). CHEN, Wei [CN/US]; 3002 Barton Point, Austin, TX 78733 (US). CHEN, Ying [CN/US]; Apartment 3032, 7205 Hart Lane, Austin, TX 78731 (US). WANG, Peiwei [CN/US]; Apartment 324, 11701 Metric Boulevard, Austin, TX 78731 (US). LI, Shihe [CN/CN]; 40 Xueyana Road, Haidian District, Beijing 100083 (CN). (74) Agent: DELUCA, Michael; Cwill Telecommunications, Inc., Suite 310, 11500 Metric Boulevard, Austin, TX 78758 (US).</p>		<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> (88) Date of publication of the international search report: 29 April 1999 (29.04.99)</p>

(54) Title: SYNCHRONOUS WIRELESS ACCESS PROTOCOL METHOD AND APPARATUS



(57) Abstract
A wireless communication system has a protocol enabling synchronous code division multiple access (CDMA) communication on a time division duplex (TDD) frequency, and provides for a smart antenna system as an integral component of the system. The protocol has downlink time slots (DTS) (302, 306) which provide for synchronization and paging of all remote terminals (10, 20, 30) from a base station (50) and on an omnidirectional code channel and while providing for traffic signals on directional traffic channels. The protocol has uplink time slots (UTS) (304, 308) which enable rapid link request by remote terminals (10, 20, 30), as well as enabling improved spacial estimation, synchronization and power control of remote terminals by the base station (50).

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/16407

A. CLASSIFICATION OF SUBJECT MATTER
 IPC(6) :H04J 13/00
 US CL :455/575, 67.1, 561, 562, 507; 370/350, 476; 340/825.40
 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)
 U.S. : 455/575, 67.1, 561, 562, 507; 370/350, 476; 340/825.40

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 practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,479,397 A (LEE) 26 December 1995, col. 6, lines 10-59.	17, 23 and 26-27
Y	US 5,596,333 A (BRUCKERT) 21 January 1997, col. 3, line 31 to col. 8, line 52.	17, 23 and 26-27
Y, P	US 5,689,525 A (TAKEISHI et al) 18 November 1997, figure 1,	37-40 and 43-47
A, P	US 5,754,542 A (AULT et al) 19 May 1998, figures 2a-s.	37-40 and 43-47
Y, E	US 5,838,669 A (GERAKOULIS) 17 November 1998, figures 3-4.	37-40 and 43-47
Y	US 5,457,735 A (ERICKSON) 10 October 1995, figures 1 and 2.	57-59

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:	*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
A document defining the general state of the art which is not considered to be of particular relevance	*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
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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)	*&* document member of the same patent family
O document referring to an oral disclosure, use, exhibition or other means	
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Date of the actual completion of the international search 20 DECEMBER 1998	Date of mailing of the international search report 23 FEB 1999
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Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer HUY D. VU Telephone No. (703) 308-6092 <i>Joe Hill</i>
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/16407

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,463,617 A (GRUBE et al) 31 October 1995, col. 2, line 13 to col. 5, line 45.	57-59
Y	US 5,579,443 A (TATEMATSU et al) 26 November 1996, figures 1-3.	57-59

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US98/16407

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international 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 II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

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

Please See Extra 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 fee, this Authority did not invite payment of any additional fee.
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.
 No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/16407

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING

This ISA found multiple inventions as follows:

Group I, claims 1-13, drawn to a mobile equipment.

Group II, claims 14-16, drawn to a method of improving spacial signature.

Group III, claims 17-32, drawn to directional transmission by directional antennas.

Group IV, claims 33-36, drawn to a receiving method in a base station.

Group V, claims 37-40 and 43-48, drawn to synchronization in a wireless system.

Group VI, claims 41-42, drawn to a wireless system having transmitter & receiver in separate locations.

Group VII, claims 49-56, drawn to a data protocol format.

Group VIII, claims 57-59, drawn to priority in a wireless system.

The inventions listed as Groups I, II, II, IV, V, VI, VII and VIII do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

Group I has a separate special technical feature such as a mobile terminal operating in an access mode and a traffic mode.

Group II has a separate special technical feature such as estimating spacial signature

Group III has a separate special technical feature such as wide area transmission on a first code channel and directional transmission on a second code channel using directional antennas.

Group IV has a separate special technical feature such as receiving and processing access information including a personal identification signal.

Group V has a separate special technical feature such as providing coarse synchronization on a first code channel and a fine synchronization on a second code channel.

Group VI has a separate special technical feature such as a base station having a combination of receiver, first and second timers, first and second generators and modulator.

Group VII has a separate special technical feature such as data protocol format having access channel and traffic channel.

Group VIII has a separate special technical feature such as transmitting a first priority request signal in response to a priority of a call, determining channel availability and generating a channel access signal in response to a second priority of the call and transmitting a second priority request signal in response to the available channel determination.