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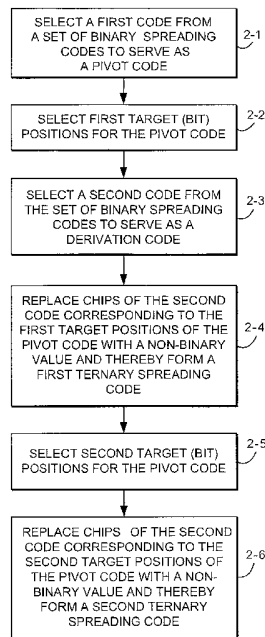
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[Continued on next page]

(54) **Title:** NON-CONTIGUOUS VARIABLE LENGTH ORTHOGONAL CODES



(57) **Abstract:** [00085] Systems (20, 120, 220) for transmitting information symbols utilize ternary codes or pivot codes in conjunction with spread spectrum encoding. The systems comprise at least a first symbol source for supplying an information signal comprising at least a first stream of I,Q bit pairs, means (34)(130, 134)(230, 234) for using either a ternary code or at least one pivot code for spreading the at least first stream of I,Q bit pairs and thereby respectively forming first chips and second chips, and a radio signal modulator (44) for transmitting the first chips and second chips over a radio interface

WO 2006/004550 A3

**Declarations under Rule 4.17:**

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations

Published:

- with international search report
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23 February 2006

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 2005/001129

A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet

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)

IPC: H04B, H04J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL, WPI DATA, PAJ, INSPEC, XPI3E, XPIEE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 20030016733 A1 (SHA, J S), 23 January 2003 (23.01.2003), paragraphs [0006]-[0009] --	1-20
A	WO 03081797 A1 (LINKAIR COMMUNICATIONS, INC), 2 October 2003 (02.10.2003), page 2, line 26 - page 12, line 1 --	1-14
A	US 20020172180 A1 (HALL, E K ET AL), 21 November 2002 (21.11.2002), CLAIMS, ABSTRACT --	1-14
A	US 20020171568 A1 (YANG, G-C), 21 November 2002 (21.11.2002), abstract --	1-14

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
- "&" document member of the same patent family

Date of the actual completion of the international search

20 December 2005

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

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INTERNATIONAL PATENT CLASSIFICATION (IPC):

H04J 13/00 (2006.01)

H04B 1/69 (2006.01)

INTERNATIONAL SEARCH REPORT

International application No.
SE2005/001129

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 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 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.

INTERNATIONAL SEARCH REPORT

International application No.
SE2005/001129

Box No. IV Text of the abstract (Continuation of item 5 of the first sheet)

The following separate inventions were identified:

1: Claims 1-14 directed to generating a ternary code by selecting one code to serve as an pivot code, determining target positions from this pivot code, selecting a binary code and replacing chips of the binary code corresponding to the target positions with null values.

2: Claims 15-20 directed to systems and transmitters that use a ternary spreading code.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 2005/001129

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 20010031010 A1 (SHANBHAG, A G), 18 October 2001 (18.10.2001), abstract, paragraph [0019] --	1-14
X	US 6590889 B1 (ROBERT DAVID PREUSS ET AL), 8 July 2003 (08.07.2003), column 9, line 10 - line 50, abstract	15-16,18-20
A	--	17
A	JAESANG CHA ET AL ZCD-UWB system using enhanced ZCD codes Ultra Wideband Systems, 2004. Joint with Conference on Ultrawideband Systems and Technologies. Joint UWBST & IWUWBS 8065971 INSPEC XP010715178 see paragraph I; abstract -- -----	15-20

INTERNATIONAL SEARCH REPORT

Information on patent family members

26/11/2005

International application No.

PCT/SE 2005/001129

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