A METHOD OF MIXED DATA ASSISTED AND NON DATA ASSISTED NAVIGATION SIGNAL ACQUISITION, TRACKING AND REACQUISITION

FIG. 3

Abstract: The present invention provides systems and methods for enabling a navigation signal receiver to perform both data assisted and non-data assisted integration to provide better integration during signal acquisition, reacquisition and tracking. In data assisted integration mode, a receiver uses known or predicted data bits to remove the modulated data bits of a received signal prior to integration. In non data assisted integration mode, when the data bits are not known or predictable, the receiver uses an optimal estimation or maximum likelihood algorithm to determine the polarities of the modulated data bits of the received signal. This may be done by determining which of various possible bit patterns yields the maximum integrated power. When the modulated data bits are not known or predictable over a limited range, the receiver carries out data assisted integration over the known or predictable data bits and additional non data assisted integration.
# INTERNATIONAL SEARCH REPORT

## A. CLASSIFICATION OF SUBJECT MATTER

**IPC(8)- H03M 7/38 (2008.04)**  
**USPC - 341/51**  
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)  
USPC: 341/51

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
USPC: 341/51; 342/357.05, 357.06, 357.12, 357.15, 361-366 (keyword limited - see terms below)

Electronic database consulted during the international search (name of data base and, where practicable, search terms used)  
PubWEST(USPT,PGPB,EPAB,IPAB); DialogPRO(Engineering); Google Scholar  
Search Terms: GPS, integration, coherent, non-coherent/incoherent, data assisted, non data assisted, optimal, maximum likelihood, predict, retrieve, weak signal, demodulation, data bit, baseband, TLM, HOW, TOW, power, threshold, party check, integrity

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category*</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>US 6,786,249 B1 (Farmer et al.) 07 September 2004 (07.09.2004)</td>
<td>1-50</td>
</tr>
<tr>
<td></td>
<td>abstract, Figs. 1 and 2, col.2,ln.13-30, col.3,ln.28-col.4,ln.63, col.6,ln.59-col.16,ln.54.</td>
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<td>Fig. 8, para [0037], [0046], [0077], [0079]-[0119].</td>
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<tr>
<td>Y</td>
<td>US 2006/0114984 A1 (Gaat et al.) 01 June 2006 (01.06.2006)</td>
<td>4-8, 22, 29-33, 47</td>
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<td></td>
<td>para [0008], [0011], [0035]-[0037], [0043], [0052], [0062], [0063], [0070]-[0088].</td>
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<td>Y</td>
<td>US 5,884,220 A (Farmer et al.) 16 March 1999 (16.03.1999)</td>
<td>9-17 and 34-42</td>
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<td>col.2,ln.3-12, 7-25, col.7,ln.1-15.</td>
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Further documents are listed in the continuation of Box C.

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"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  
"Y" - 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  
"P" - document published prior to the international filing date but later than the priority date claimed  
"&" - document member of the same patent family

### Date of the actual completion of the international search  
18 September 2008 (18.09.2008)

### Date of mailing of the international search report  
25 SEP 2008

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