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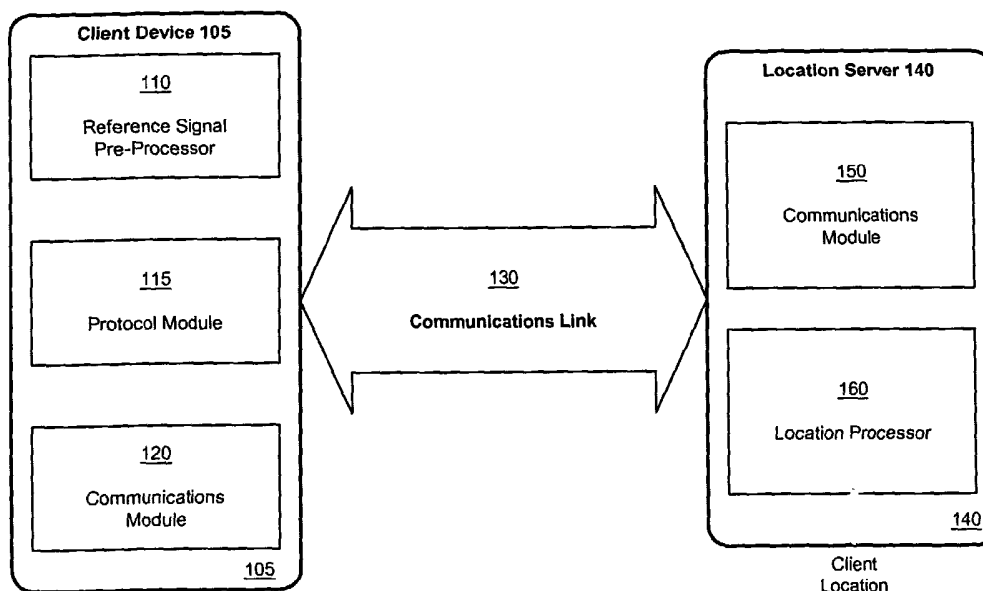
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[Continued on next page]

(54) Title: METHODS AND APPARATUS FOR DYNAMICALLY DETERMINING LOCATION USING A SIMPLIFIED CLIENT DEVICE



(57) Abstract: A location determination system ("LDS") determines the location of a thin-client device from a location server to significantly reduce the computational requirements on the client and to permit implementation of more accurate and efficient location calculations on the location server. The client device pre-processes a reference signal, such as a GPS signal, to generate reference data. The pre-processed reference data is transmitted from the client device to the location server via a communications link, such as a wireless link or a combination wireless and global communications network.



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INTERNATIONAL SEARCH REPORT

 International Application No
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A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G01S5/02 G01S5/14 G01S5/00 G01S1/02

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 7 G01S

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 practical, search terms used)

EPO-Internal, INSPEC, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	WO 99 57576 A (SNAPTRACK INC) 11 November 1999 (1999-11-11) Summary of the Invention page 6, line 6 -page 7, line 15 page 8, line 15 - line 25 page 10, line 2 - line 16 page 13, line 18 - line 24 page 16 --- -/--	1 2-13, 23-34



Further documents are listed in the continuation of box C.



Patent family members are listed in 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 document 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
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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

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

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INTERNATIONAL SEARCH REPORT

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 10307 A (DUPRAY DENNIS JAY ;KARR CHARLES L (US)) 12 March 1998 (1998-03-12)	14-17, 22, 35-38, 43
A	abstract page 12, line 6 -page 13, line 13 page 18, line 11 - line 32 page 53, line 15 -page 54, line 15 page 62, line 27 -page 64, line 11 claims 1,7,30,33 ----	18-21, 39-42
A	US 5 872 539 A (MULLEN ROBERT) 16 February 1999 (1999-02-16) the whole document ----	1-13, 23-34
A	WO 00 19231 A (NOKIA MOBILE PHONES LTD) 6 April 2000 (2000-04-06) the whole document ----	1-13, 23-34
A	GB 2 271 486 A (MOTOROLA LTD) 13 April 1994 (1994-04-13) the whole document ----	1-43
A	WO 97 14054 A (SNAPTRACK INC) 17 April 1997 (1997-04-17) the whole document -----	1-43

INTERNATIONAL SEARCH REPORT

International application No.
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Box I Observations where certain claims were found unsearchable (Continuation of item 1 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 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:

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 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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. Claims: 1-13,23-34

Changing the quality and quantity of the reference data generated at a device.

2. Claims: 14-22,35-43

Improvements to the determination of the location of the device

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9957576	A	11-11-1999	US 6104338 A AU 4406099 A BR 9911439 A CA 2331684 A1 CN 1307684 T EP 1076834 A1 WO 9957576 A1	15-08-2000 23-11-1999 13-02-2002 11-11-1999 08-08-2001 21-02-2001 11-11-1999
WO 9810307	A	12-03-1998	AU 4338597 A AU 4479697 A GB 2354129 A ,B GB 2354387 A ,B GB 2337386 A ,B WO 9810307 A1 WO 9810538 A1 US 6236365 B1 US 2001022558 A1	26-03-1998 26-03-1998 14-03-2001 21-03-2001 17-11-1999 12-03-1998 12-03-1998 22-05-2001 20-09-2001
US 5872539	A	16-02-1999	NONE	
WO 0019231	A	06-04-2000	US 6222483 B1 AU 5993399 A EP 1118016 A1 WO 0019231 A1	24-04-2001 17-04-2000 25-07-2001 06-04-2000
GB 2271486	A	13-04-1994	NONE	
WO 9714054	A	17-04-1997	US 6131067 A AU 1131097 A US 6185427 B1 WO 9714054 A1 AU 7396096 A AU 7396596 A AU 7397396 A AU 7397596 A AU 723615 B2 AU 7662096 A BR 9611701 A CA 2230841 A1 CN 1199468 A CN 1211324 A EP 0880713 A1 EP 0855041 A1 EP 0855039 A2 JP 11513787 T JP 11513788 T US 2002084933 A1 WO 9714053 A1 WO 9714055 A1 WO 9714049 A2 WO 9714056 A1 WO 9714057 A1 US 6064336 A US 6259399 B1 US 6104340 A US 6016119 A US 6400314 B1 US 5874914 A	10-10-2000 30-04-1997 06-02-2001 17-04-1997 30-04-1997 30-04-1997 30-04-1997 30-04-1997 31-08-2000 30-04-1997 28-12-1999 17-04-1997 18-11-1998 17-03-1999 02-12-1998 29-07-1998 29-07-1998 24-11-1999 24-11-1999 04-07-2002 17-04-1997 17-04-1997 17-04-1997 17-04-1997 17-04-1997 16-05-2000 10-07-2001 15-08-2000 18-01-2000 04-06-2002 23-02-1999

International Application No
PCT/US 01/24845

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9714054	A	US 5663734 A	02-09-1997
		US 6133871 A	17-10-2000
		US 2001028321 A1	11-10-2001
		US 5781156 A	14-07-1998
		US 2002044087 A1	18-04-2002
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