UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/771,542	07/22/2014	8786494	AND01 082 C/C	6992

79172 7590 07/02/2014
Duane Morris LLP
505 9th Street, N.W.
Suite 1000
Washington, DC 20004

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Martin Alles, Vienna, VA;
John Carlson, Dulles, VA;
George Maher, Herndon, VA;
Selcuk Mazlum, Leesburg, VA;
ANDREW LLC, Hickory, NC

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

79172 7590 06/02/2014
Duane Morris LLP
505 9th Street, N.W.
Suite 1000
Washington, DC 20004

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/771,542	02/20/2013	Martin Alles	AND01 082 C/C	6992

TITLE OF INVENTION: METHOD TO MODIFY CALIBRATION DATA USED TO LOCATE A MOBILE UNIT

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	09/02/2014

EXAMINER	ART UNIT	CLASS-SUBCLASS
PHAN, DAO LINDA	3646	342-451000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Duane Morris LLP
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Andrew LLC
(B) RESIDENCE: (CITY and STATE OR COUNTRY): Hickory, North Carolina

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
- ☒ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number 04-1679 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ☐ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ☐ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ☐ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Mark C. Comtois/ Date 12 June 2014

Typed or printed name Mark C. Comtois Registration No. 46,285

Electronic Patent Application Fee Transmittal

Application Number:	13771542
Filing Date:	20-Feb-2013
Title of Invention:	METHOD TO MODIFY CALIBRATION DATA USED TO LOCATE A MOBILE UNIT
First Named Inventor/Applicant Name:	Martin Alles
Filer:	Mark Charles Comtois/laureen ponder
Attorney Docket Number:	AND01 082 C/C

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl Issue Fee	1501	1	960	960
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**960**

Electronic Acknowledgement Receipt	
EFS ID:	19283664
Application Number:	13771542
International Application Number:	
Confirmation Number:	6992
Title of Invention:	METHOD TO MODIFY CALIBRATION DATA USED TO LOCATE A MOBILE UNIT
First Named Inventor/Applicant Name:	Martin Alles
Customer Number:	79172
Filer:	Mark Charles Comtois/laureen ponder
Filer Authorized By:	Mark Charles Comtois
Attorney Docket Number:	AND01 082 C/C
Receipt Date:	12-JUN-2014
Filing Date:	20-FEB-2013
Time Stamp:	11:52:11
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$960
RAM confirmation Number	11207
Deposit Account	041679
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	13771542.pdf	86545 7b86206ab7a5248d33405ceaf7c39a4a24aacbd0	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30358 44d3a497b1464380802c09f80eb33d21e675cd38	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	116903		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

79172 7590 06/02/2014
Duane Morris LLP
505 9th Street, N.W.
Suite 1000
Washington, DC 20004

EXAMINER
PHAN, DAO LINDA

ART UNIT	PAPER NUMBER
3646	

DATE MAILED: 06/02/2014

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/771,542	02/20/2013	Martin Alles	AND01 082 C/C	6992

TITLE OF INVENTION: METHOD TO MODIFY CALIBRATION DATA USED TO LOCATE A MOBILE UNIT

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	09/02/2014

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

79172 7590 06/02/2014
Duane Morris LLP
505 9th Street, N.W.
Suite 1000
Washington, DC 20004

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/771,542	02/20/2013	Martin Alles	AND01 082 C/C	6992

TITLE OF INVENTION: METHOD TO MODIFY CALIBRATION DATA USED TO LOCATE A MOBILE UNIT

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	09/02/2014

EXAMINER	ART UNIT	CLASS-SUBCLASS
PHAN, DAO LINDA	3646	342-451000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1_____
2_____
3_____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)
PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.
(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/771,542	02/20/2013	Martin Alles	AND01 082 C/C	6992

79172 7590 06/02/2014
Duane Morris LLP
505 9th Street, N.W.
Suite 1000
Washington, DC 20004

EXAMINER
PHAN, DAO LINDA

ART UNIT	PAPER NUMBER
3646	

DATE MAILED: 06/02/2014

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/771,542	Applicant(s) ALLES ET AL.	
	Examiner Dao Phan	Art Unit 3646	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *2/27/2014*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1-4,6-14,29,30,32-42 and 44-52*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/Dao Phan/
Primary Examiner, Art Unit 3646

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13771542	ALLES ET AL.
	Examiner	**Art Unit**
	DAO PHAN	3646

CPC						
Symbol					**Type**	**Version**
G01S		5	/	0252	F	2013-01-01
G01S		5	/	021	I	2013-01-01
G01S		5	/	0257	I	2013-01-01
H04W		4	/	02	F	2013-01-01
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CPC Combination Sets								
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 35	
/DAO PHAN/ Primary Examiner.Art Unit 3646 (Primary Examiner)	5/28/14 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 7

U.S. Patent and Trademark Office

Part of Paper No. 20140528

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13771542	ALLES ET AL.
	Examiner	**Art Unit**
	DAO PHAN	3646

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION	
CLASS	SUBCLASS	CLAIMED	NON-CLAIMED
342	451	G 0 1 S 3 / 02 (2006.01.01)	

CROSS REFERENCE(S)					
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
342	457				

NONE (Assistant Examiner) (Date)	Total Claims Allowed: 35	
/DAO PHAN/ Primary Examiner.Art Unit 3646 5/28/14 (Primary Examiner) (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 7

U.S. Patent and Trademark Office Part of Paper No. 20140528

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13771542	ALLES ET AL.
	Examiner	**Art Unit**
	DAO PHAN	3646

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☒ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1		17	17	33	32	49								
2	2		18	18	34	33	50								
3	3		19	19	35	34	51								
4	4		20	20	36	35	52								
	5		21	21	37										
5	6		22	22	38										
6	7		23	23	39										
7	8		24	24	40										
8	9		25	25	41										
9	10		26	26	42										
10	11		27		43										
11	12		28	27	44										
12	13	14	29	28	45										
13	14	15	30	29	46										
	15		31	30	47										
	16	16	32	31	48										

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 35	
/DAO PHAN/ Primary Examiner.Art Unit 3646 (Primary Examiner)	5/28/14 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 7

U.S. Patent and Trademark Office Part of Paper No. 20140528

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13771542	ALLES ET AL.
	Examiner	**Art Unit**
	DAO PHAN	3646

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☒ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	05/28/2014								
1	1	=								
2	2	=								
3	3	=								
4	4	=								
	5	-								
5	6	=								
6	7	=								
7	8	=								
8	9	=								
9	10	=								
10	11	=								
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15	30	=								
	31	-								
16	32	=								
17	33	=								
18	34	=								
19	35	=								
20	36	=								

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13771542	ALLES ET AL.
	Examiner	**Art Unit**
	DAO PHAN	3646

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☒ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	05/28/2014								
21	37	=								
22	38	=								
23	39	=								
24	40	=								
25	41	=								
26	42	=								
	43	-								
27	44	=								
28	45	=								
29	46	=								
30	47	=								
31	48	=								
32	49	=								
33	50	=								
34	51	=								
35	52	=								

EAST Search History

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	5297	(((compare$3 or comparing) same calibrat$6) and measur$6).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2014/05/05 15:40
L2	129	(((compare$3 or comparing) same calibrat$6) and (measur$6 with network$2)).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2014/05/05 15:41
L3	87	(((compare$3 or comparing) same calibrat$6) and (measur$6 with network$2) and (transmit$6 or transmission$2)).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2014/05/05 15:42
L4	42	2 not 3	US-PGPUB; USPAT; UPAD	OR	OFF	2014/05/05 15:42

5/5/2014 3:43:53 PM
C:\Users\dphan\Documents\EAST\Workspaces\Default EAST Workspace (Flat Panel LANDSCAPE).wsp

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

BIB DATA SHEET

CONFIRMATION NO. 6992

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
13/771,542	02/20/2013 **RULE**	342	3646	AND01 082 C/C

APPLICANTS
ANDREW LLC, Hickory, NC

INVENTORS
Martin Alles, Vienna, VA;
John Carlson, Dulles, VA;
George Maher, Herndon, VA;
Selcuk Mazlum, Leesburg, VA;

**** CONTINUING DATA ***************************
This application is a CON of 12/424,320 04/15/2009 PAT 8400358 *
and is a CON of 12/026,333 02/05/2008 PAT 7561104
which claims benefit of 60/899,379 02/05/2007
(*)Data provided by applicant is not consistent with PTO records.

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****
03/12/2013

Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☑ No Verified and Acknowledged /DAO LINDA PHAN/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY VA	SHEETS DRAWINGS 10	TOTAL CLAIMS 35	INDEPENDENT CLAIMS 3

ADDRESS
Duane Morris LLP
505 9th Street, N.W.
Suite 1000
Washington, DC 20004
UNITED STATES

TITLE
Method to Modify Calibration Data Used to Locate a Mobile Unit

FILING FEE RECEIVED 2320	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

BIB (Rev. 05/07).

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13771542	ALLES ET AL.
	Examiner	**Art Unit**
	DAO PHAN	3646

CPC- SEARCHED

Symbol	Date	Examiner
G01S5/06, G01S5/0242, G01S5/0252, H04W64/00	12/12/13	dp
Updated	5/28/14	dp

CPC COMBINATION SETS - SEARCHED

Symbol	Date	Examiner

US CLASSIFICATION SEARCHED

Class	Subclass	Date	Examiner
342	451, 457, 463-465	12/12/13	dp
455	456.1, 456.6, 457		
Updated		5/28/14	dp

SEARCH NOTES

Search Notes	Date	Examiner
East text (See attached)	12/12/13	dp
Updated	5/28/14	dp

INTERFERENCE SEARCH

US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
See search history printout		5/28/14	dp

Application Number	Application/Control No.	Applicant(s)/Patent under Reexamination	
	13/771,542	ALLES ET AL.	

Document Code - DISQ	Internal Document – DO NOT MAIL

TERMINAL DISCLAIMER	☒ APPROVED	☐ DISAPPROVED
Date Filed : 02/27/14	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:

2 - Tds both approved.

Angie Walker

U.S. Patent and Trademark Office

PTO/AIA/26 (04-13)
Approved for use through 04/30/2013. OMB 0651-0031
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TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT	Docket Number (Optional) AND01 082 C/C

In re Application of: Martin Alles, et al.

Application No.: 13/771,542

Filed: 20 February 2013

For: Method to Modify Calibration Data Used to Locate A Mobile Device

The applicant, Andrew LLC, owner of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of **prior patent** No. 7,561,104 as the term of said **prior patent** is presently shortened by any terminal disclaimer. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for any during such period that it and the **prior patent** are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the applicant does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the **prior patent**, "as the term of said **prior patent** is presently shortened by any terminal disclaimer," in the event that said **prior patent** later:

expires for failure to pay a maintenance fee;
is held unenforceable;
is found invalid by a court of competent jurisdiction;
is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
has all claims canceled by a reexamination certificate;
is reissued; or
is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. ☐ The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

I hereby acknowledge that any willful false statements made are punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

2. ☑ The undersigned is an attorney or agent of record. Reg. No. 46,285

/Mark C. Comtois/	27 February 2014
Signature	Date

Mark C. Comtois
Typed or printed name

Attorney for Applicant	202.776.5240
Title	Telephone Number

☑ Terminal disclaimer fee under 37 CFR 1.20(d) included.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

This collection of information is required by 37 CFR 1.321. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT	Docket Number (Optional) AND01 082 C/C

In re Application of: Martin Alles, et al.

Application No.: 13/771,542

Filed: 20 February 2013

For: Method to Modify Calibration Data Used to Locate A Mobile Device

The applicant, Andrew LLC, owner of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of **prior patent** No. 8,400,358 as the term of said **prior patent** is presently shortened by any terminal disclaimer. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for any during such period that it and the **prior patent** are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

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expires for failure to pay a maintenance fee;
is held unenforceable;
is found invalid by a court of competent jurisdiction;
is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
has all claims canceled by a reexamination certificate;
is reissued; or
is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. ☐ The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

I hereby acknowledge that any willful false statements made are punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

2. ☑ The undersigned is an attorney or agent of record. Reg. No. 46,285

/Mark C. Comtois/	27 February 2014
Signature	Date

Mark C. Comtois
Typed or printed name

Attorney for Applicant	202.776.5240
Title	Telephone Number

☑ Terminal disclaimer fee under 37 CFR 1.20(d) included.

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Electronic Patent Application Fee Transmittal	
Application Number:	13771542
Filing Date:	20-Feb-2013
Title of Invention:	Method to Modify Calibration Data Used to Locate a Mobile Unit
First Named Inventor/Applicant Name:	Martin Alles
Filer:	Mark Charles Comtois/laureen ponder
Attorney Docket Number:	AND01 082 C/C
Filed as Large Entity	

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Statutory or Terminal Disclaimer	1814	2	160	320
		Total in USD ($)		**320**

Electronic Acknowledgement Receipt	
EFS ID:	18323825
Application Number:	13771542
International Application Number:	
Confirmation Number:	6992
Title of Invention:	Method to Modify Calibration Data Used to Locate a Mobile Unit
First Named Inventor/Applicant Name:	Martin Alles
Customer Number:	79172
Filer:	Mark Charles Comtois/laureen ponder
Filer Authorized By:	Mark Charles Comtois
Attorney Docket Number:	AND01 082 C/C
Receipt Date:	27-FEB-2014
Filing Date:	20-FEB-2013
Time Stamp:	15:42:32
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$320
RAM confirmation Number	2343
Deposit Account	041679
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		82CCTDs.pdf	245852 144ce692f38c5e4becde48cd1854d907b44ee18c	yes	2
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Terminal Disclaimer Filed		1	1	
	Terminal Disclaimer Filed		2	2	
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	29779 d8b64fed7e17cdb37f1b56ec28129bb03313b32b	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	275631		

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<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Continuation Patent Application of Martin Alles, et al.

Serial No.: 13/771,542 Art Unit: 3646

Filed: 20 February 2013 Examiner: Dao L. Phan

Title: METHOD TO MODIFY CALIBRATION DATA USED TO LOCATE A MOBILE DEVICE

AMENDMENT

Commissioner for Patents
Post Office Box 1450
Alexandria VA 22313-1450

Sir:

In response to the Office Action dated 16 December 2013, please amend the subject application as follows:

Amendments to the **Claims** begin on sheet 2 of this paper.

Amendments to the **Specification** begin on sheet 8 of this paper.

Applicant's **Remarks** begin on sheet 9 of this paper.

Amendment to the Claims:

1. (Previously Presented) A method for determining a location of a mobile station, comprising:

providing a database of previously-gathered calibration data for a predetermined region in a wireless network;

collecting observed network measurement data, the observed network measurement data collected by the mobile station and transmitted to the network or collected by the network;

modifying said observed network measurement data; and

comparing said modified network measurement data with said database of calibration data to thereby determine the location of the mobile station.

2. (Original) The method of Claim 1 wherein said database comprises previously-gathered calibration data at one or more predetermined calibration points within said region.

3. (Original) The method of Claim 2 wherein said previously-gathered calibration data at one or more predetermined calibration points is combined to form previously-gathered calibration data for one or more non-uniform grid points within said region.

4. (Original) The method of Claim 1 wherein said database comprises previously-gathered calibration data for one or more non-uniform grid points within said region.

5. (Cancelled).

6. (Original) The method of Claim 1 wherein said previously-gathered calibration data includes signal strength information measured at a predetermined calibration point within said region for a signal transmitted from a known location within or in proximity to said region.

7. (Original) The method of Claim 1 wherein said previously-gathered calibration data includes signal strength information measured by a receiver at a known location within or in proximity to said region for a signal transmitted from a predetermined calibration point within said region.

8. (Original) The method of Claim 1 wherein said previously-gathered calibration data includes round trip time information for signals traveling between a predetermined calibration point within said region and a known location within or in proximity to said region.

9. (Original) The method of Claim 1 wherein said previously-gathered calibration data includes time difference of arrival information for a first signal traveling between a first known location and a predetermined calibration point within said region and a second signal traveling between a second known location and said calibration point.

10. (Original) The method of Claim 1 wherein said previously-gathered calibration data includes information identifying a serving cell of a transmitter transmitting a signal received at a predetermined calibration point within said region.

11. (Original) The method of Claim 1 wherein said previously-gathered calibration data includes information identifying a serving sector of a transmitter transmitting a signal received at a predetermined calibration point within said region.

12. (Original) The method of Claim 1 wherein said previously-gathered calibration data includes information regarding a state of said wireless network.

13. (Original) The method of Claim 1 wherein said previously-gathered calibration data includes calibration data gathered at a predetermined calibration point within said region wherein said predetermined calibration point is not located within a structure.

14. (Original) The method of Claim 13 wherein said observed network measurement data is collected at a mobile station located within a structure.

Claims 15-28 (Cancelled).

29. (Previously Presented) A method for determining a location of a mobile station, comprising:

providing a database of previously-gathered calibration data for a predetermined region in a wireless network, wherein said network includes a serving transmitter;

collecting observed network measurement data including a first signal characteristic from said serving transmitter, the observed network measurement data collected by the mobile station and transmitted to the network or collected by the network;

modifying said observed network measurement data using said first signal characteristic; and

comparing said modified network measurement data with said database of calibration data to thereby determine the location of the mobile station.

30. (Original) The method of Claim 29 wherein said database comprises previously-gathered calibration data for one or more non-uniform grid points within said region.

31. (Cancelled).

32. (Original) The method of Claim 29 wherein said previously-gathered calibration data includes calibration data gathered at a predetermined calibration point within said region wherein said predetermined calibration point is not located within a structure.

33. (Original) The method of Claim 32 wherein said observed network measurement data is collected at a mobile station located within a structure.

34. (Original) The method of Claim 29 wherein said first signal characteristic is signal strength.

35. (Original) The method of Claim 34 wherein said collecting observed network measurement data further includes collecting a second signal characteristic from a neighboring transmitter wherein said second signal characteristic is signal strength.

36. (Original) The method of Claim 35 wherein the modifying of said calibration data uses a difference between said first and second signal characteristics.

37. (Original) The method of Claim 29 wherein said first signal characteristic is signal strength of a control channel transmitted by said serving transmitter and received by said mobile station.

38. (Original) The method of Claim 37 wherein said collecting observed network measurement data further includes collecting a second signal characteristic from a neighboring transmitter wherein said second signal characteristic is signal strength of a control channel transmitted by said neighboring transmitter and received by said mobile station.

39. (Original) The method of Claim 29 wherein said observed network measurement data includes a data set comprising:

$[P_1,\ldots P_n, TA]$

where:

P_1 represents the signal strength of said serving transmitter as measured at said mobile station,

P_n represents a signal strength of at a nth neighboring transmitter as measured at said mobile station, and

TA represents a timing advance parameter;

and wherein said modified network measurement data includes a data set comprising:

$[0,\ldots P_1\text{-}P_{n-1}, P_1\text{-}P_n, TA]$

where:

0 represents a difference between P_1 and P_1,

$P_1\text{-}P_{n-1}$ represents a difference between P_1 and P_{n-1}, and

$P_1\text{-}P_n$ represents a difference between P_1 and P_n.

40. (Original) The method of Claim 39 wherein said first neighboring transmitter is not a member of said wireless network.

41. (Previously Presented) A method for determining a location of a mobile station, comprising:

providing a database of previously-gathered calibration data for a predetermined region in a wireless network;

collecting observed network measurement data from each of a plurality of transmitters including a signal characteristic from each one of said plural transmitters, the observed network measurement data collected by the mobile station and transmitted to the network or collected by the network;

determining an average value for select ones of said signal characteristics;

modifying said observed network measurement data using said average value; and

comparing said modified network measurement data with said database of calibration data to thereby determine the location of the mobile station.

42. (Original) The method of Claim 41 wherein said database comprises previously-gathered calibration data for one or more non-uniform grid points within said region.

43. (Cancelled).

44. (Original) The method of Claim 41 wherein said previously-gathered calibration data includes calibration data gathered at a predetermined calibration point within said region wherein said predetermined calibration point is not located within a structure.

45. (Original) The method of Claim 41 wherein said observed network measurement data is collected at a mobile station located within a structure.

46. (Original) The method of Claim 41 wherein said signal characteristic is signal strength.

47. (Original) The method of Claim 46 wherein the modifying of said calibration data uses a difference between said average value and said signal characteristic for a first one of said plural transmitters.

48. (Original) The method of Claim 41 wherein said signal characteristic is signal strength of a control channel.

49. (Original) The method of Claim 41, wherein the observed network measurement data includes received signal strength of said transmitters as said mobile station.

50. (Currently Amended) The method of Claim 41 wherein said observed network measurement data includes a data set comprising:

$[P_1, P_2, P_3, TA]$

where:

P_1 represents the signal strength of a first one of said plural transmitters as measured at said mobile station,

P_2 represents a signal strength of a second one of said plural transmitters as measured at said mobile station wherein $P_2 > P_1$,

P_3 represents a signal strength of a third one of said plural transmitters as measured at said mobile station wherein $P_2 > P_3$, and

TA represents a timing advance parameter;

and wherein said modified network measurement data includes a data set comprising:

$[P_1\text{-}P_{AVG}, P_2\text{-}P_{AVG}, P_3\text{-}P_{AVG}, TA]$

where:

P_{AVG} represents an average value of P_1, P_2, and P_3,

$P_1\text{-}P_{AVG}$ represents a difference between P_1 and P_{AVG},

$P_2\text{-}P_{AVG}$ represents a difference between P_2 and P_{AVG},

$P_3\text{-}P_{AVG}$ represents a difference between P_3 and P_{AVG}[[,]].

51. (Original) The method of Claim 50 wherein said first transmitter is a serving transmitter for said mobile station and said second and third transmitters are neighboring transmitters.

52. (Original) The method of Claim 41 wherein at least one of said plurality of transmitters is not a member of said wireless network.

Amendment to the Specification

Applicant requests the Office to amend paragraphs [0066] and [0067] of the subject application as shown below. No new matter has been added.

[0066] FIG 8 is another illustration of an embodiment of the present subject matter. A database of previously-gathered calibration data for a predetermined region in a wireless network may be provided (operation 801). Observed network measurement data may be collected which includes a first signal characteristic from the mobile's serving transmitter (operation 803). The observed network measurement data may be modified as a function of the first signal characteristic (operation 805), for example the first signal characteristic may be received power and the modification may be a function of the relative value with respect to the received power. The modified network measurement data may be compared with the database of calibration data to determine the location of the mobile station (operation 807).

[0067] FIG 9 is an illustration of an embodiment of the present subject matter for determining a location of a mobile station. A database of calibration data for a region may be provided (901). Network measurement data from transmitters may be observed and collected including a signal characteristic from each of the transmitters (operation 903). An average value for the signal characteristic among the transmitters may be determined (operation 905). The average for the signal characteristic may be a weighted average. The observed network measurement data may be modified using the determined average value (operation 907) and the modified network measurement data may be compared with the database of calibration data to determine the location of the mobile station (operation 909).

REMARKS

Claims 1-4, 6-14, 29-30, 32-42 and 44-52 are pending with entry of this amendment. The only rejections of these claims is a nonstatutory double patenting rejection over Claims 1-14 of U.S. Patent No. 7,561,104 and over Claims 1-52 of U.S. Patent No. 8,400,358. Appropriate Terminal Disclaimers have been filed.

Claim 50 was objected to for a minor informality and has been amended by replacing the comma at the end of the last line of the claim with a period. No new matter has been added.

The disclosure was objected to for minor informalities, specifically paragraphs [0066] and [0067]. Paragraphs [0066] and [0067] have each been amended by inserting a period at the end of each paragraph. No new matter has been added.

Applicant submits the application is in condition for allowance and, as such, it is requested that Claims 1-4, 6-14, 29-30, 32-42 and 44-52 be allowed to issue in a U.S. Patent.

If the Examiner believes that an in-person or telephonic interview with the Applicant's representatives will expedite the prosecution of the subject patent application, the Examiner is invited to contact the undersigned agents of record. Should any additional fees be necessary in connection with the filing of this paper, or if a petition for extension of time is required for timely acceptance of the same, such a petition is made and the Office is authorized to charge such fees to Deposit Account No. 04-1679.

Respectfully submitted,

/Mark C. Comtois/
Mark C. Comtois
Reg. No. 46,285

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Dated: 27 February 2014

Electronic Acknowledgement Receipt

EFS ID:	18324095
Application Number:	13771542
International Application Number:	
Confirmation Number:	6992
Title of Invention:	Method to Modify Calibration Data Used to Locate a Mobile Unit
First Named Inventor/Applicant Name:	Martin Alles
Customer Number:	79172
Filer:	Mark Charles Comtois/laureen ponder
Filer Authorized By:	Mark Charles Comtois
Attorney Docket Number:	AND01 082 C/C
Receipt Date:	27-FEB-2014
Filing Date:	20-FEB-2013
Time Stamp:	15:51:18
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		AND01082CCFebAmdt.pdf	792897 c04d33570a92442d753bfa01cad6eb4d84fc929c	yes	9

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	7
	Specification	8	8
	Applicant Arguments/Remarks Made in an Amendment	9	9
Warnings:			
Information:			
	Total Files Size (in bytes):	792897	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/771,542	Filing Date 02/20/2013	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT

02/27/2014	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 35	Minus	** 35	= 0	X $80 =	0
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $420 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	**0**

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/JACQUELINE COUPLIN/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/771,542	02/20/2013	Martin Alles	AND01 082 C/C	6992

79172 7590 12/16/2013
Duane Morris LLP
505 9th Street, N.W.
Suite 1000
Washington, DC 20004

EXAMINER
PHAN, DAO LINDA

ART UNIT	PAPER NUMBER
3646	

MAIL DATE	DELIVERY MODE
12/16/2013	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

Office Action Summary	Application No. 13/771,542	Applicant(s) ALLES ET AL.	
	Examiner Dao Phan	Art Unit 3646	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 2/20/2013.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) 1-4,6,29,30,32-42 and 44-52 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) 1-4,6-14,29,30,32-42 and 44-52 is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on 2/20/2013 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

1) The present application is being examined under the pre-AIA first to invent provisions.

2) The disclosure is objected to because of the following informalities: periods are missing at the end of the paragraphs 0066 and 0067.

   Appropriate correction is required.

3) Claim 50 is objected to because of the following informalities: the claim appears to be incompleted. It ends with "$P_{avg,}$". Appropriate correction is required.

4) The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the claims at issue are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory

double patenting ground provided the reference application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

5) The USPTO internet Web site contains terminal disclaimer forms which may be used. Please visit http://www.uspto.gov/forms/. The filing date of the application will determine what form should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to http://www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

6) Claims 1-4, 6-14, 29-30, 32-42, 44-52 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-14 of U.S. Patent No. 7,561,104. Although the claims at issue are not identical, they are not patentably distinct from each other because claims 1-4, 6-14, 29-30, 32-42, 44-52 are generic to all that is recited in claims 1-14 of U.S. Patent No. 7,561,104. In other words, claims 1-14 of U.S. Patent No. 7,561,104 fully encompass the subject matter of claims 1-4, 6-14, 29-30, 32-42, 44-52 of the present application and therefore anticipate claims 1-4, 6-14, 29-30, 32-42, 44-52.

7) Claims 1-4, 6-14, 29-30, 32-42, 44-52 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-52 of U.S. Patent No. 8,400,358. Although the claims at issue are not identical, they are not patentably

distinct from each other because the features of claims 1-4, 6-14, 29-30, 32-42, 44-52 are read over the features of claims 1-52 of U.S. Patent No. 8,400,358.

8) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dao Phan whose telephone number is (571)272-6976. The examiner can normally be reached on M-F 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571)272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dao Phan/
Primary Examiner, Art Unit 3646

Notice of References Cited	Application/Control No. 13/771,542	Applicant(s)/Patent Under Reexamination ALLES ET AL.	
	Examiner Dao Phan	Art Unit 3646	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-7,561,104	07-2009	Alles et al.	342/451
*	B	US-8,400,358	03-2013	Alles et al.	342/451
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
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	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	316613	calibrat$6 and measur$6 and (compare$3 or comparing)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2013/12/05 11:09
L2	4083	(network$2 with measur$6) and ((compare$3 or comparing) same calibrat$6)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2013/12/05 11:23
L3	964	((compare$3 or comparing) same (network$2 with measur$6)) and 2	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2013/12/05 11:26
L4	403	3 and ((transmit$6 or transmission$2) with network$2)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2013/12/05 11:28
L5	561	3 not 4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2013/12/05 11:28

12/5/2013 11:29:53 AM
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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13771542	ALLES ET AL.
	Examiner	**Art Unit**
	DAO PHAN	3646

CPC- SEARCHED		
Symbol	**Date**	**Examiner**
G01S5/06, G01S5/0242, G01S5/0252, H04W64/00	12/12/13	dp

CPC COMBINATION SETS - SEARCHED		
Symbol	**Date**	**Examiner**

US CLASSIFICATION SEARCHED			
Class	**Subclass**	**Date**	**Examiner**
342	451, 457, 463-465	12/12/13	dp
455	456.1, 456.6, 457		

SEARCH NOTES		
Search Notes	**Date**	**Examiner**
East text (See attached)	12/12/13	dp

INTERFERENCE SEARCH			
US Class/ CPC Symbol	**US Subclass / CPC Group**	**Date**	**Examiner**

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/771,542	02/20/2013	Martin Alles	AND01 082 C/C

CONFIRMATION NO. 6992

PUBLICATION NOTICE

OC000000062233552

79172
Duane Morris LLP
505 9th Street, N.W.
Suite 1000
Washington, DC 20004

Title: Method to Modify Calibration Data Used to Locate a Mobile Unit

Publication No.US-2013-0165145-A1
Publication Date:06/27/2013

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently http://pair.uspto.gov/. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/771,542	02/20/2013	Martin Alles	AND01 082 C/C

CONFIRMATION NO. 6992

POA ACCEPTANCE LETTER

79172
Duane Morris LLP
505 9th Street, N.W.
Suite 1000
Washington, DC 20004

OC000000062047033

Date Mailed: 06/20/2013

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 06/13/2013.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/gbien-aime/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Doc Code: PA..
Document Description: Power of Attorney

PTO/AIA/82B(07-12)
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POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in the attached transmittal letter.

[■] I hereby appoint Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A or equivalent): 79172

OR

[ ] I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A or equivalent):

Name	Registration Number	Name	Registration Number

Please recognize or change the correspondence address for the application identified in the attached transmittal letter to:

[ ] The address associated with the above-mentioned Customer Number.
OR
[■] The address associated with Customer Number: 79172
OR

[ ] Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

I am the Applicant:

[ ] Inventor or Joint Inventor
[ ] Legal Representative of a Deceased or Legally Incapacitated Inventor
[■] Assignee or Person to Whom the Inventor is Under an Obligation to Assign
[ ] Person Who Otherwise Shows Sufficient Proprietary Interest (*e.g.*, a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document)

SIGNATURE of Applicant for Patent

Signature	Laura Thomas	Date	3-26-13
Name	Laura Thomas	Telephone	828-324-2200
Title and Company	Assistant Secretary, Andrew, LLC		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms for more than one signature, see below *.

[ ] *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

This Power of Attorney may be revoked at any time.

PTO/AIA/01 (06-12)
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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	Method to Modify Calibration Data Used to Locate A Mobile Unit

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 13/771,542 filed on 20 February 2013.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Martin Alles Date (Optional): 4/23/13

Signature: Martin Alles

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

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LEGAL NAME OF INVENTOR

Inventor: John Carlson Date (Optional): 4/24/2013

Signature:

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Title of Invention	Method to Modify Calibration Data Used to Locate A Mobile Unit

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LEGAL NAME OF INVENTOR

Inventor: George Maher Date (Optional): 4/21/2013

Signature: George C Maher

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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☐ The attached application, or

☒ United States application or PCT international application number 13/771,542 filed on 20 February 2013.

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I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

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LEGAL NAME OF INVENTOR

Inventor: Selcuk Mazlum Date (Optional): 4/19/2013

Signature: C Mazlum

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt

EFS ID:	16030976
Application Number:	13771542
International Application Number:	
Confirmation Number:	6992
Title of Invention:	Method to Modify Calibration Data Used to Locate a Mobile Unit
First Named Inventor/Applicant Name:	Martin Alles
Customer Number:	79172
Filer:	Mark Charles Comtois/laureen ponder
Filer Authorized By:	Mark Charles Comtois
Attorney Docket Number:	AND01 082 CC
Receipt Date:	13-JUN-2013
Filing Date:	20-FEB-2013
Time Stamp:	14:29:36
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		082CCFiling.pdf	1457166 c298c1c138d97d5001547e641e9e8e94f7c68c03	yes	12

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Miscellaneous Incoming Letter	1	1
	Application Data Sheet	2	7
	Power of Attorney	8	8
	Oath or Declaration filed	9	9
	Oath or Declaration filed	10	10
	Oath or Declaration filed	11	11
	Oath or Declaration filed	12	12

Warnings:	
Information:	
Total Files Size (in bytes):	1457166

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

ATTORNEY DOCKET NO.: AND01 082 C/C

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Patent Application of: Martin Alles, et al.

Serial No.: 13/771,542 Art Unit: 2642

Filed: 20 February 2013 Examiner: Not Yet Assigned

Confirmation No: 6992

Title: METHOD TO MODIFY CALIBRATION DATA USED TO LOCATE A MOBILE UNIT

SUBMISSION OF SUBSTITUTE APPLICATION DATA SHEET

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicants submit a Substitute Application Data Sheet to correct the Patent Number under the Domestic Benefit/National Stage Information section from "7561105" to --7561104--.

No fees are believed due, however the commissioner is hereby authorized to charge payment of any fees associated with this communication to Deposit Account No. 04-1679.

Respectfully submitted,

/Mark C. Comtois/
Mark C. Comtois Reg. No. 46,285

DUANE MORRIS LLP
505 9th Street, N.W., Suite 1000
Washington, D.C. 20004
Telephone: 202-776-7800
Facsimile: 202-776-7801

Dated: 13 June 2012

DM2\4309568.1

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	AND01 082 CC
	Application Number	
Title of Invention	Method to Modify Calibration Data Used to Locate a Mobile Device	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Martin		Alles	

Residence Information (Select One) ◉ US Residency ◯ Non US Residency ◯ Active US Military Service

City	Vienna	State/Province	VA	Country of Residence	US

Mailing Address of Inventor:

Address 1	2421 Williams Avenue		
Address 2			
City	Vienna	State/Province	VA
Postal Code	22180	Country i	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	John		Carlson	

Residence Information (Select One) ◉ US Residency ◯ Non US Residency ◯ Active US Military Service

City	Dulles	State/Province	VA	Country of Residence	US

Mailing Address of Inventor:

Address 1	43479 Ogden Place		
Address 2			
City	Dulles	State/Province	VA
Postal Code	20166	Country i	US

Inventor 3 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	George		Maher	

Residence Information (Select One) ◉ US Residency ◯ Non US Residency ◯ Active US Military Service

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	AND01 082 CC
	Application Number	
Title of Invention	Method to Modify Calibration Data Used to Locate a Mobile Device	

City	Herndon	State/Province	VA	Country of Residence i	US

Mailing Address of Inventor:

Address 1	100 Adele Garden Way		
Address 2			
City	Herndon	**State/Province**	Va
Postal Code	20170	**Country** i	US

Inventor 4 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Selcuk		Mazlum	

Residence Information (Select One) ◉ US Residency ◯ Non US Residency ◯ Active US Military Service

City	Leesburg	State/Province	VA	Country of Residence i	US

Mailing Address of Inventor:

Address 1	136 Clubhouse Drive SW Apt 201		
Address 2			
City	Leesburg	**State/Province**	VA
Postal Code	20175	**Country** i	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	79172		
Email Address		Add Email	Remove Email

Application Information:

Title of the Invention	Method to Modify Calibration Data Used to Locate a Mobile Device		
Attorney Docket Number	AND01 082 CC	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		**Sub Class (if any)**	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	10	**Suggested Figure for Publication (if any)**	

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	AND01 082 CC
	Application Number	
Title of Invention	Method to Modify Calibration Data Used to Locate a Mobile Device	

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	79172		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation of	12424320	2009-04-15

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
	Continuation of	12026333	2008-02-05	7561105~~5~~4	2009-07-14

Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	non provisional of	60899379	2007-02-05

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Foreign Priority Information:

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	AND01 082 CC
	Application Number	
Title of Invention	Method to Modify Calibration Data Used to Locate a Mobile Device	

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Priority Claimed
			◉ Yes ◯ No

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Authorization to Permit Access:

☐ Authorization to Permit Access to the Instant Application by the Participating Offices

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

◉ Assignee	◯ Legal Representative under 35 U.S.C. 117	◯ Joint Inventor
◯ Person to whom the inventor is obligated to assign.	◯ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

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	Application Number	
Title of Invention	Method to Modify Calibration Data Used to Locate a Mobile Device	

Name of the Deceased or Legally Incapacitated Inventor :			
If the Applicant is an Organization check here. ☒			
Organization Name	Andrew LLC		
Mailing Address Information:			
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Address 2			
City	Hickory	**State/Province**	NC
Country	US	Postal Code	28602
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button.

Non-Applicant Assignee Information:

Providing assignment information in this section does not subsitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Assignee 1

Complete this section only if non-applicant assignee information is desired to be included on the patent application publication in accordance with 37 CFR 1.215(b). Do not include in this section an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest), as the patent application publication will include the name of the applicant(s).

If the Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Approved for use through 01/31/2014. OMB 0651-0032
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	AND01 082 CC
	Application Number	
Title of Invention	Method to Modify Calibration Data Used to Locate a Mobile Device	

Mailing Address Information:			
Address 1			
Address 2			
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Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee Data may be generated within this form by selecting the Add button.

Signature:

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications

Signature	/Mark C. Comtois/			Date (YYYY-MM-DD)	2013-06-13
First Name	Mark	Last Name	Comtois	Registration Number	46285

Additional Signature may be generated within this form by selecting the Add button.

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number
13/771,542

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	390
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	620
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	250
TOTAL CLAIMS (37 CFR 1.16(i))	35 minus 20 =	* 15			OR	x 62 =	930
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*				x 250 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	2190

APPLICATION AS AMENDED - PART II

AMENDMENT A

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
Application Size Fee (37 CFR 1.16(s))									
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

AMENDMENT B

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
Application Size Fee (37 CFR 1.16(s))									
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/771,542	02/20/2013	2642	2320	AND01 082 CC	35	3

CONFIRMATION NO. 6992

FILING RECEIPT

OC000000059810654

79172
Duane Morris LLP
505 9th Street, N.W.
Suite 1000
Washington, DC 20004

Date Mailed: 03/18/2013

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Martin Alles, Vienna, VA;
John Carlson, Dulles, VA;
George Maher, Herndon, VA;
Selcuk Mazlum, Leesburg, VA;

Applicant(s)

Andrew LLC, Hickory, NC

Assignment For Published Patent Application

ANDREW LLC, Hickory, NC

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 12/424,320 04/15/2009 PAT 8400358 *
and is a CON of 12/026,333 02/05/2008 PAT 7561104
which claims benefit of 60/899,379 02/05/2007
(*)Data provided by applicant is not consistent with PTO records.

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

If Required, Foreign Filing License Granted: 03/12/2013
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/771,542**

Projected Publication Date: 06/27/2013

Non-Publication Request: No

Early Publication Request: No
Title

Method to Modify Calibration Data Used to Locate a Mobile Unit

Preliminary Class

455

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

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Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

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Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/771,542	02/20/2013	Martin Alles	AND01 082 CC

CONFIRMATION NO. 6992

79172
Duane Morris LLP
505 9th Street, N.W.
Suite 1000
Washington, DC 20004

NOTICE

OC000000059810655

Date Mailed: 03/18/2013

INFORMATIONAL NOTICE TO APPLICANT

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

The item(s) indicated below are also required and should be submitted with any reply to this notice to avoid further processing delays.

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
  All
  Applicant may submit the inventor's oath or declaration at any time before the Notice of Allowance and Fee(s) Due, PTOL-85, is mailed.

Electronic Acknowledgement Receipt

EFS ID:	15002619
Application Number:	13771542
International Application Number:	
Confirmation Number:	6992
03/12/2013 CCETIN 00000030 041679 13771542 01 FC:1051 130.00 DA **Title of Invention:**	Method to Modify Calibration Data Used to Locate A Mobile Unit
First Named Inventor/Applicant Name:	Martin Alles
Customer Number:	79172
Filer:	Mark Charles Comtois/laureen ponder
Filer Authorized By:	Mark Charles Comtois
Attorney Docket Number:	AND01 082 CC
Receipt Date:	20-FEB-2013
Filing Date:	
Time Stamp:	14:22:24
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$2190
RAM confirmation Number	683
Deposit Account	041679
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

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Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

1487 US 3 ATTORNEY DOCKET NO. AND01 082 C/C

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Continuation Patent Application of Martin Alles, et al.

Serial No.: Unassigned Art Unit: 3646

Filed: Herewith Examiner: Dao L. Phan

Title: METHOD TO MODIFY CALIBRATION DATA USED TO LOCATE A MOBILE DEVICE

PRELIMINARY AMENDMENT

Commissioner for Patents
Post Office Box 1450
Alexandria VA 22313-1450

Sir:

Preliminary to the examination of the subject application, please amend the subject application as follows:

Amendments to the **Claims** begin on sheet 2 of this paper.

Amendments to the **Specification** begin on sheet 8 of this paper.

Applicant's **Remarks** begin on sheet 9 of this paper.

DM2\4115353.1

Amendment to the Claims:

1. (Currently Amended) A method for determining a location of a mobile station, comprising:

providing a database of previously-gathered calibration data for a predetermined region in a wireless network;

collecting observed network measurement data, the observed network measurement data collected by the mobile station and transmitted to the network or collected by the network;

modifying said observed network measurement data; and

comparing said modified network measurement data with said database of calibration data to thereby determine the location of the mobile station.

2. (Original) The method of Claim 1 wherein said database comprises previously-gathered calibration data at one or more predetermined calibration points within said region.

3. (Original) The method of Claim 2 wherein said previously-gathered calibration data at one or more predetermined calibration points is combined to form previously-gathered calibration data for one or more non-uniform grid points within said region.

4. (Original) The method of Claim 1 wherein said database comprises previously-gathered calibration data for one or more non-uniform grid points within said region.

5. (Cancelled).

6. (Original) The method of Claim 1 wherein said previously-gathered calibration data includes signal strength information measured at a predetermined calibration point within said region for a signal transmitted from a known location within or in proximity to said region.

7. (Original) The method of Claim 1 wherein said previously-gathered calibration data includes signal strength information measured by a receiver at a known location within or in proximity to said region for a signal transmitted from a predetermined calibration point within said region.

8. (Original) The method of Claim 1 wherein said previously-gathered calibration data includes round trip time information for signals traveling between a predetermined calibration point within said region and a known location within or in proximity to said region.

9. (Original) The method of Claim 1 wherein said previously-gathered calibration data includes time difference of arrival information for a first signal traveling between a first known location and a predetermined calibration point within said region and a second signal traveling between a second known location and said calibration point.

10. (Original) The method of Claim 1 wherein said previously-gathered calibration data includes information identifying a serving cell of a transmitter transmitting a signal received at a predetermined calibration point within said region.

11. (Original) The method of Claim 1 wherein said previously-gathered calibration data includes information identifying a serving sector of a transmitter transmitting a signal received at a predetermined calibration point within said region.

12. (Original) The method of Claim 1 wherein said previously-gathered calibration data includes information regarding a state of said wireless network.

13. (Original) The method of Claim 1 wherein said previously-gathered calibration data includes calibration data gathered at a predetermined calibration point within said region wherein said predetermined calibration point is not located within a structure.

14. (Original) The method of Claim 13 wherein said observed network measurement data is collected at a mobile station located within a structure.

Claims 15-28 (Cancelled).

29. (Currently Amended) A method for determining a location of a mobile station, comprising:

providing a database of previously-gathered calibration data for a predetermined region in a wireless network, wherein said network includes a serving transmitter;

collecting observed network measurement data including a first signal characteristic from said serving transmitter, the observed network measurement data

collected by the mobile station and transmitted to the network or collected by the network;

modifying said observed network measurement data using said first signal characteristic; and

comparing said modified network measurement data with said database of calibration data to thereby determine the location of the mobile station.

30. (Original) The method of Claim 29 wherein said database comprises previously-gathered calibration data for one or more non-uniform grid points within said region.

31. (Cancelled).

32. (Original) The method of Claim 29 wherein said previously-gathered calibration data includes calibration data gathered at a predetermined calibration point within said region wherein said predetermined calibration point is not located within a structure.

33. (Original) The method of Claim 32 wherein said observed network measurement data is collected at a mobile station located within a structure.

34. (Original) The method of Claim 29 wherein said first signal characteristic is signal strength.

35. (Original) The method of Claim 34 wherein said collecting observed network measurement data further includes collecting a second signal characteristic from a neighboring transmitter wherein said second signal characteristic is signal strength.

36. (Original) The method of Claim 35 wherein the modifying of said calibration data uses a difference between said first and second signal characteristics.

37. (Original) The method of Claim 29 wherein said first signal characteristic is signal strength of a control channel transmitted by said serving transmitter and received by said mobile station.

38. (Original) The method of Claim 37 wherein said collecting observed network measurement data further includes collecting a second signal characteristic from a neighboring transmitter wherein said second signal characteristic is signal strength of a

control channel transmitted by said neighboring transmitter and received by said mobile station.

39. (Original) The method of Claim 29 wherein said observed network measurement data includes a data set comprising:

$[P_1,\ldots P_n, TA]$

where:

P_1 represents the signal strength of said serving transmitter as measured at said mobile station,

P_n represents a signal strength of at a nth neighboring transmitter as measured at said mobile station, and

TA represents a timing advance parameter;

and wherein said modified network measurement data includes a data set comprising:

$[0,\ldots P_1\text{-}P_{n-1}, P_1\text{-}P_n, TA]$

where:

0 represents a difference between P_1 and P_1,

$P_1\text{-}P_{n-1}$ represents a difference between P_1 and P_{n-1}, and

$P_1\text{-}P_n$ represents a difference between P_1 and P_n.

40. (Original) The method of Claim 39 wherein said first neighboring transmitter is not a member of said wireless network.

41. (Currently Amended) A method for determining a location of a mobile station, comprising:

providing a database of previously-gathered calibration data for a predetermined region in a wireless network;

collecting observed network measurement data from each of a plurality of transmitters including a signal characteristic from each one of said plural transmitters, <u>the observed network measurement data collected by the mobile station and transmitted to the network or collected by the network</u>;

determining an average value for select ones of said signal characteristics;

modifying said observed network measurement data using said average value; and

comparing said modified network measurement data with said database of calibration data to thereby determine the location of the mobile station.

42. (Original) The method of Claim 41 wherein said database comprises previously-gathered calibration data for one or more non-uniform grid points within said region.

43. (Cancelled).

44. (Original) The method of Claim 41 wherein said previously-gathered calibration data includes calibration data gathered at a predetermined calibration point within said region wherein said predetermined calibration point is not located within a structure.

45. (Original) The method of Claim 41 wherein said observed network measurement data is collected at a mobile station located within a structure.

46. (Original) The method of Claim 41 wherein said signal characteristic is signal strength.

47. (Original) The method of Claim 46 wherein the modifying of said calibration data uses a difference between said average value and said signal characteristic for a first one of said plural transmitters.

48. (Original) The method of Claim 41 wherein said signal characteristic is signal strength of a control channel.

49. (Original) The method of Claim 41, wherein the observed network measurement data includes received signal strength of said transmitters as said mobile station.

50. (Original) The method of Claim 41 wherein said observed network measurement data includes a data set comprising:

$[P_1, P_2, P_3, TA]$

where:

P_1 represents the signal strength of a first one of said plural transmitters as measured at said mobile station,

P_2 represents a signal strength of a second one of said plural transmitters as measured at said mobile station wherein $P_2 > P_1$,

P_3 represents a signal strength of a third one of said plural transmitters as measured at said mobile station wherein $P_2 > P_3$, and

TA represents a timing advance parameter;

and wherein said modified network measurement data includes a data set comprising:

$[P_1\text{-}P_{AVG}, P_2\text{-}P_{AVG}, P_3\text{-}P_{AVG}, TA]$

where:

P_{AVG} represents an average value of P_1, P_2, and P_3,

$P_1\text{-}P_{AVG}$ represents a difference between P_1 and P_{AVG},

$P_2\text{-}P_{AVG}$ represents a difference between P_2 and P_{AVG},

$P_3\text{-}P_{AVG}$ represents a difference between P_3 and P_{AVG},

51. (Original) The method of Claim 50 wherein said first transmitter is a serving transmitter for said mobile station and said second and third transmitters are neighboring transmitters.

52. (Original) The method of Claim 41 wherein at least one of said plurality of transmitters is not a member of said wireless network.

Amendment to the Specification

Applicant requests the Office to amend paragraph [0001] of the subject application as shown below. No new matter is added.

[0001] The present application is a continuation application of and claims the priority benefit of co-pending U.S. Application No. 12/424,320 entitled "Method to Modify Calibration Data Used to Locate a Mobile Unit," which is related to and claims the priority benefit of co-pending U.S. Application No. 12/026,333 entitled "Method to Modify Calibration data Used to Locate a Mobile Unit," which is related to and claims the priority benefit of provisional application No. 60/899,379 entitled "Mobile Location Using Network Measurement Reports" filed on February 5, 2007, each of which are hereby incorporated by reference in their entirety.

REMARKS

Claims 1-4, 6-14, 29-30, 32-42 and 44-52 are pending with entry of this preliminary amendment.

Applicant has amended the specification to claim the priority benefit of parent patent application number 12/424,320. No new matter has been added.

Consideration and acceptance of Applicant's amendment is respectfully solicited.

Applicant submits the application is in condition for allowance and, as such, it is requested that Claims 1-4, 6-14, 29-30, 32-42 and 44-52 be allowed to issue in a U.S. Patent.

If the Examiner believes that an in-person or telephonic interview with the Applicant's representatives will expedite the prosecution of the subject patent application, the Examiner is invited to contact the undersigned agents of record.

Should any additional fees be necessary in connection with the filing of this paper, or if a petition for extension of time is required for timely acceptance of the same, such a petition is made and the Office is authorized to charge such fees to Deposit Account No. 04-1679.

Respectfully submitted,

/Mark C. Comtois/

Mark C. Comtois
Reg. No. 46,285
Ryan T. Hardee
Reg. No. 57,515

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Telecopier: (202) 776-7801

Dated: February 20, 2013

UNITED STATES PATENT APPLICATION

of

MARTIN ALLES

JOHN CARLSON

GEORGE MAHER

and

SELCUK MAZLUM

for

METHOD TO MODIFY CALIBRATION DATA USED TO LOCATE A MOBILE UNIT

CROSS REFERENCES

[0001] The present application is a continuation application of and claims the priority benefit of co-pending U.S. Application No. 12/026,333 entitled "Method to Modify Calibration data Used to Locate a Mobile Unit," which is related to and claims the priority benefit of provisional application No. 60/899,379 entitled "Mobile Location Using Network Measurement Reports" filed on February 5, 2007, each of which are hereby incorporated by reference in their entirety.

BACKGROUND

[0002] The use of wireless communication devices such as telephones, pagers, personal digital assistants, laptop computers, etc., hereinafter referred to collectively as "mobile appliances" or "mobiles stations" has become prevalent in today's society. In recent years, at the urging of public safety groups, there has been increased interest in technology which can determine the geographic position or "geo-locate" a mobile station in certain circumstances.

[0003] Estimating the location or "geo-locating" a mobile station may require one or more types of calibration data associated with the mobile station (*e.g.,* signal strength, round trip time, time difference of arrival (TDOA), etc.). Calibration data is typically collected in an outdoor environment. The primary reason for collecting calibration data outdoors is the greater ease of performing automated calibration collection procedures or, in some instances, manual collection procedures along roads. It is more time-consuming

to perform calibration procedures indoors due to the required access to buildings and the inability to utilize automated collection procedures designed for outdoor environments.

[0004] When a wireless device is located indoors, the signal strengths of signals received from the serving and/or neighboring base stations tend to be lower than the strength of the signals received by a wireless device located outdoors. As a result of these lower signal strengths, performing comparisons between the received signal strengths of the indoor wireless device and signal strength data stored in a calibration database may result in a poor estimated location accuracy. Modifying the calibration data obtained outdoors may provide a way to simulate indoor calibration data characteristics. Calibration data collected in areas located adjacent to indoor facilities may be altered to increase the accuracy of location estimates of a mobile station located indoors.

[0005] One embodiment of the present subject matter is a method for determining a location of a mobile station. The method includes providing a database of previously-gathered calibration data for a predetermined region in a wireless network and collecting observed network measurement data. The method also includes modifying the observed network measurements and then comparing the modified data with the database of calibration data to determine the location of the mobile station.

[0006] Another embodiment of the present subject matter is a system for determining a location of a mobile station. The system includes a database of previously-gathered calibration data for a region in a wireless network and circuitry such as a wireless receiver for collecting observed network measurement data. The system includes circuitry, such as a processor, for modifying the observed network measurement

data; and circuitry, such as a processor, for comparing the modified data with the calibration data in the database to determine the location of the mobile station.

[0007] Yet another embodiment of the present subject matter is a method for determining a location of a mobile station. The method includes providing a database of previously-gathered calibration data for a region in a wireless network which includes a serving transmitter. The method collects observed network measurement data including a first network characteristic from said serving transmitter and modifies the observed network measurement data using said first characteristic. The method compares the modified network measurement data with the database of calibration data to thereby determine the location of the mobile station.

[0008] Still yet another embodiment of the present subject matter is a method for determining a location of a mobile station. The method includes providing a database of previously-gathered calibration data for a region in a wireless network including a first transmitter and a second transmitter. The method also includes collecting observed network measurement data including a first and second signal characteristic from the first and second transmitters respectively and determining which of the first and second signal characteristics has a greater magnitude. The observed network measurement data may be modified using the greater magnitude signal characteristic, and the modified network measurement data may be compared with the database of calibration data to determine the location of the mobile station.

[0009] A further embodiment of the present subject matter is a method for determining a location of a mobile station. The method includes providing a database of

previously-gathered calibration data for a region in a wireless network and collecting observed network measurement data from a plurality of transmitters which includes a signal characteristic from each one of said plural transmitters. The method also includes determining an average value for the signal characteristics and modifying the observed network measurement data using the average value. The method may then compare the modified network measurement data with the database of calibration data to determine the location of the mobile station.

[0010] Still a further embodiment of the present subject matter recognizes that it may be desirable to locate a mobile station by obtaining at least one network measurement report representing at least one first signal characteristic of the mobile station's serving base station, and at least one second and third signal characteristics of neighboring base stations. The method may also compute the difference between the at least one first signal characteristic of the mobile station's serving base station and the at least one second signal characteristic of at least one of the neighboring base stations to determine a first solution and determine which neighboring base station has the highest signal power level at a particular location. The difference between the highest signal power and the power levels of the serving base station and the remaining neighboring base stations may be computed to determine a second solution. It may also be determined which neighboring base station has the lowest signal power level at the particular location. The method may also comprise computing an average signal power level intermediary to the difference between the highest signal power level and the lowest signal power level to determine a third solution and determining which of the three

solutions is a most optimal solution based on at least one comparison of the three solutions. At least one signal characteristic of the network measurement report may be adjusted based on the most optimal solution and the modified network measurement report may be utilized to locate a mobile station.

[0011] Another embodiment of the present subject matter is a method for determining a location of a mobile station. The method includes providing a database of previously-gathered outdoor calibration data for a region in a wireless network, collecting network measurement data, and comparing the network measurement data with the database of calibration data to thereby determine several location estimates of the mobile station. The method may also include determining a confidence measure for each of the plurality of location estimates and determining the location of the mobile station based on the plurality of location estimates and their respective confidence measures.

[0012] These and other advantages of the disclosed subject matter over the prior art will be readily apparent to one skilled in the art to which the disclosure pertains from a perusal of the claims, the appended drawings, and the following detailed description of the preferred embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] FIG. 1 illustrates a wireless communications networking environment.

[0014] FIG. 2 illustrates a flow diagram of an exemplary inventive concept.

[0015] FIG. 3 illustrates a flow diagram of another exemplary inventive concept.

[0016] FIG. 4 illustrates a flow diagram of yet another exemplary inventive concept.

[0017] FIG. 5 illustrates a flow diagram of still another exemplary inventive concept.

[0018] FIG. 6 illustrates a flow diagram of still yet another exemplary inventive concept.

[0019] FIG. 7 illustrates a flow diagram of an embodiment of the subject matter.

[0020] FIG. 8 illustrates a flow diagram of another embodiment of the subject matter.

[0021] FIG. 9 illustrates a flow diagram of another embodiment of the subject matter.

[0022] FIG. 10 illustrates a flow diagram of another embodiment of the subject matter.

DETAILED DESCRIPTION

[0023] Calibration data samples obtained outdoors may be used to simulate indoor calibration data to locate a mobile station (MS) in an indoor facility. A method of utilizing calibration data samples to represent indoor and/or outdoor wireless networking environments is described herein.

[0024] Reliably locating a mobile station located indoors, even when the calibration data has been obtained in an outdoor environment, may simplify a calibration collection procedure. Calibration data obtained outdoors may be modified and

substituted for indoor calibration data. In addition network measurement data may be modified for comparison with the outdoor calibration data.

[0025] In general, a non-uniform grid point (NUG) may represent the signal characteristics and/or calibration data over a given region. As illustrated in FIG. 1, a set of NUGs (NUG1, NUG2 and NUG3) are shown as being a part of a larger geographical region (R), which includes various wireless networking components (*e.g.,* (MS 11 and BS 20 - NUG1), (MSs 12-15 - NUG2) and (MSs 16-18 and BS 30 - NUG3)). The NUGs represent an area of collected calibration data, which may be stored in a database for easy retrieval during a calibration data comparison operation between the NUG and a received network measurement report (NMR).

[0026] Calibration data may be obtained from data collection devices during field test operations, and/or from MSs or other communication devices within the general area of the NUG. Cross-NUG communications may occur between MSs and/or BSs located within communication range of one or more of the NUGs. For example, BS 10 may be located outside the region (R) and may communicate with one or more devices located in the various NUGs 1-3. The different NUGs 1-3 may be separately defined by a variety of parameters. For example, geographical areas (*e.g.,* mountains, buildings, roads) may be a factor in deciding the boundaries of a NUG. Additionally, varying concentrations of MSs may be another factor that separates one NUG from another.

[0027] Network measurement reports (NMRs) may be used to represent network characteristics at particular locations within a given region (R). Any point located within a NUG may have corresponding signal strength levels that represent the signal power of

the serving and/or neighboring cell (NC) BSs. An exemplary NMR may be represented by example_data_vector = [P1, P2, P3, TA1]. Referring to FIG. 1, the power level signals (P1-P3) may represent the power levels of the three BSs 10, 20 and 30, as measured at a particular location. The timing advance parameter TA1 (or equivalent parameter) may be used to represent timing information of signals transmitted between the MS and one or more BSs.

[0028] The value of the timing advance (TA) parameter corresponds to the length of time a signal from a MS takes to reach a particular BS. A MS may be configured to transmit data signals at specific timeslot intervals depending on the type of wireless communication protocol employed (*e.g.,* TDMA, GSM, 3GPP etc.). Using the speed of light (c = 3*10^8 m/s) as a reference velocity for the radio waves, the TA parameter may be increased or decreased depending on the distance between the MS and the BS. The TA parameter may be periodically adjusted as the distance from the MS to the BS changes. Of course, a NMR may contain any number and type of parameters, and may be used to estimate the location of a MS.

[0029] For example, NMR(s) may be transmitted from the MS or from other wireless communication components to position determining equipment (PDE) 50, which processes the received NMR information and may attempt to locate the position of the MS. NMR(s) may be periodically generated by MSs or other communication devices to calibrate the NUG. The NUG may also be based entirely on information received from NMR(s) generated by MSs located in the NUG.

[0030] The received Network Measurement data (NM data) may be compared to predetermined calibration data representing one or more NUGs to estimate the location of a MS. In a case where NM data is compared against a NUG, like parameters may be compared to estimate if the target MS 18 is within the NUG. Similarly, NUG parameters may be computed in response to a comparison operation, and then compared to the NM data. Each NUG may have a series of parameters and/or functions characterizing one or more particular locations in the NUG. Given a received set of one or more NMR(s) obtained from some unknown location, an estimate of that unknown location may be calculated using the characterization of the NUG or uniform grid (UG) over that region.

[0031] It may be desirable to use the original unmodified NM data directly without modification when locating a mobile station. Assuming the MS is located in an indoor facility, the data contained in the NMR(s) may be a function of calibration data collected outdoors. In some cases, the unmodified outdoor calibration data used to represent the indoor facility may provide an accurate representation of the location of the target MS 18 (*e.g.,* low distortion structures, open-faced facilities, etc.).

[0032] Referring to FIG. 1, the NM data may be sent from the target MS 18 to the BS 10, where the PDE 50 processes the NMR and performs one or more comparison operations between the NM data and the calibration data of the NUG(s). Once the comparison operation is complete, the location of the target MS 18 may be estimated. A direct comparison of the original NM data may be made against the corresponding NUG(s) characteristics. Alternatively, the NM data may not be modified even if NUG(s) are utilized to estimate the location of the mobile station.

[0033] NM data may also be modified to adjust the power levels received from the serving and/or neighboring cell (NC) base stations. For example, differences in parameters between the serving cell and the NC may be calculated and the quantities used to modify the original NM data.

[0034] If an original NMR received at the PDE 50 had the form NMR1 = [P1, P2, P3, TA1], where P1 is the serving BS power at a particular location, P2 is a first NC power, P3 is a second NC power, and TA1 is the timing advance parameter, the modified NMR may be represented by: NMR_modified = [0, P1-P2, P1-P3, TA1]. The resulting data vector may be used to calculate new relative power levels of the NC BSs by subtracting or adding the NMR_modified parameters from the original NMR1 parameters. In this example, the power of the serving BS may be used as a basis to obtain relative power level modification parameters to modify the NC power level parameters of NMR(s).

[0035] The calculated modified parameters (NMR_modified = [0, P1-P2, P1-P3, TA1]) may also be used to simulate an indoor facility by modifying NMR(s) received from an indoor location. Alternatively, the modified parameters may be used to conduct other calculations to obtain a desired set of modified results. For example, the modified NMR may be compared to one or more of the NUG(s) to provide an estimated location of a MS. Of course, the serving BS power level is not a required parameter to be used as a basis to obtain relative power level modification parameters, and many other parameters may be used to modify the NM data to simulate an indoor facility.

[0036] To further illustrate modification of the NMR, consider a particular implementation where the variable RxLevServing_WD represents the received signal strength of the serving base station's control channel measured by the wireless device at an unknown location. Let RxLevNeigh_i_WD represent the received signal strength of the ith neighbor's control channel, RxLevServing_DB represent the average received signal strength of the serving station's control channel, stored in a database of the PDE 50 during the calibration process, and RxLevNeigh_i_DB represent the average received signal strength of the ith neighbor's control channel stored in the database during a calibration process (i = 1 to N, where N is the number of neighbor cells reported).

[0037] A comparison operation may be conducted between the received signal strengths of the NC-BSs relative to the serving BS's received signal strength. For example, a comparison may include computing the difference between the parameters of the serving base station and the ith neighbor's parameters (*i.e.*, (RxLevServing_WD - RxLevNeigh_i_WD) and (RxLevServing_DB - RxLevNeigh_i_DB)). Once the differences are calculated, the magnitudes of the differences may be compared to a predetermined threshold value used to distinguish between an acceptable difference value requiring no modification to the NM data and a non-acceptable difference value invoking further modification efforts.

[0038] NM data may be modified by an amount relative to the signal strength of a NC-BS. In this example, the NC-BS having the highest signal power may be used as a basis to modify the values of the NM data. The differences between the NC having the

highest cell power and the cell powers of the remaining NC-BSs may be calculated and the quantities thereof used to modify the original NM data.

[0039] An exemplary NMR may have the form NMR = [P1, P2, P3, P4, TA1], where P1 is the serving BS signal power, P2 is a NC having the highest signal power at the intended location of the NMR, P3 and P4 are different NC signal powers, and TAl is a timing advance parameter. In this example, P2 has the highest signal power level and may be used as the basis for modifying the parameters of the NMR. The modified NMR may then be represented by NMR_modified2 = [P2-P1, 0, P2-P3, P2-P4, TA1]. The resulting data vector NMR_modified2 may be used to calculate new power levels of the NC base stations by subtracting or adding the NMR_modified2 parameters to the original NMR parameters.

[0040] The modified NMR may be compared to one or more of the NUG(s). In the previous examples, the power of the serving BS and the NC with the highest signal power level were used to obtain the relative power modification quantities. The signal power level of the serving BS and/or the NC having the highest signal power may be used solely to modify the NMR, and may not be included in comparison operations against the NUG(s). If the serving BS power level parameter and/or the NC having the highest signal power level parameter are excluded from the comparison to the NUG(s), the first and/or additional terms of the NMR may be ignored during the comparison operation. Of course, any other parameter may be utilized and the example above including power level should not limit the scope of the claims appended herewith.

[0041] To further illustrate modification of the NMR, consider a particular implementation where the variable RxLevNeigh_h_WD represents the received signal strength of a neighboring BS's control channel (neighbor A) having the highest signal level, as measured by the wireless device. RxLevNeigh_h_WD may be listed first in a measurement report list containing signal strengths sorted in descending order (h = 1). Let RxLevNeigh_i_WD represent the received signal strength of the ith neighbor's control channel measured (neighbor i, where $i \neq h$), as by the wireless device, and RxLevNeigh_h_DB represent the received signal strength of the neighbor (neighbor A) with the highest received signal strength, as measured by the wireless device, and which may be stored in the PDE 50 database during a calibration process. RxLevNeigh_i_DB may be used to represent the received signal strength of the ith neighboring BS's control channel (neighbor i, where $i \neq h$, and i = 1 to N, and where N is the number of neighbors reported). RxLevNeigh_i_DB may be stored in the PDE 50 database during a calibration process.

[0042] In this example, correlation may be conducted over the received signal strengths of the NC-BSs relative to the NC-BS having the highest received signal strength, as observed by the wireless device. A comparison may include computing the difference between the parameters of the serving BS and the ith neighbor's parameters (i.e. (RxLevNeigh_h_WD - RxLevNeigh_i_WD) and (RxLevNeigh_h_DB - RxLevNeigh_i_DB)). Comparisons may also be conducted for any one, combination of or all of the measured parameters of the NC-BSs.

[0043] NM data may be modified to adjust the power levels received from the serving and/or neighboring cell (NC) base stations by an amount relative to the average signal strength of one or more NC base stations. Each signal power or parameter component of the NMR may also be modified by an average signal power or parameter level based on one or more of the measured NC signal power levels. The average received signal power level may be calculated a number of different ways, for example, the average of the two highest signal powers, the three highest powers, the average of all (N) signal powers, or an intermediary number between one or more of the measured NC signal power components. Modifying the original NMR components may include subtracting or adding to the existing NMR power components by an amount based on the calculated average, or other various known functions.

[0044] To further illustrate modification of the NMR, consider a particular implementation where RxLevNeigh_avg_WD represents the average received signal strength based upon a number of control channel signal powers of neighboring BSs, as measured by the wireless device at an unknown location to be estimated. Let RxLevNeigh_i_WD represent the received signal strength of the ith neighbor's control channel signal power, and RxLevNeigh_avg_DB represent the average received signal strength of data stored during calibration, and computed based on the neighboring BSs, as measured by the wireless device and used in computing the average received signal strength. The same neighboring BSs may be used to represent the average received signal strength of the signal power levels received by the wireless device and for the average received signal strength of calibration data stored in the PDE 50 database. Let

RxLevNeigh_i_DB represent the received signal strength of the ith neighbor's control channel stored in the PDE 50 database during the calibration process (i = 1 to N, where N is the number of neighbors reported).

[0045] In this example, a comparison may be conducted over the received signal strengths of the neighboring BSs relative to the average received signal strength computed for all neighboring BSs observed by the wireless device (*i.e.*, compare between (RxLevNeigh_avg_WD - RxLevNeigh_i_WD)) and for all neighbors previously measured by the wireless device (*i.e.*, compare between (RxLevNeigh_avg_DB - RxLevNeigh_i_DB)). The average signal power level observed over all the neighbor signal power levels may be realized in absolute powers (mW) or in relative powers (dBm).

[0046] Any combination of the above NMR modification procedures may be performed to increase the accuracy of mobile station location estimates. Further, any number of or type of parameters may be utilized in any of the aforementioned procedures and the exemplary parameters of power level, signal strength, etc. should not limit the scope of the claims appended wherewith. Certain factors impacting the modification procedure selection process may include the specific type of cellular technology, the geographical terrain and/or environmental conditions, etc. Further, the present subject matter acknowledges that some NMR modification procedures may be best suited for outdoor location estimation, while others are better suited for indoor location estimation, and some even may be best for mixed (indoor & outdoor) location estimation.

[0047] For example, if the serving BS for a mobile station is known to be in an area where there are no buildings or obstructions then it may be prudent to leave the NM data unmodified or select the NMR modification procedure where the serving base station is used as the basis to calculate NMR modifications. Further, if the serving cell is in a geographical area with known large obstructions (*e.g.,* buildings, mountains etc.) then it may be prudent to use the NMR modification procedure that selects the NC base station having the highest signal power as the basis to calculate NMR modifications. Additionally, if the serving cell is in an area containing both outdoor and indoor facilities, then it may be best to use the average of more than one NC signal power value as the basis to modify the NMR(s).

[0048] Regardless of the type of modification algorithm selected to modify the NM data, a margin of error may still be present when attempting to determine the precise location of a mobile station. Determining the amount of location error may be useful when estimating the likelihood of accurately locating a mobile station. A confidence measure may also be used to represent the accuracy of a mobile station's estimated location.

[0049] The value of a confidence measure may vary depending on the estimated accuracy of the location estimated. If estimated locations derived from mapping NM data to a given location, whether using a NUG or other form of a data source for comparison purposes, agree under any or all combinations, the respective confidence measure "C" may be considered high. A confidence measure may also be represented as a function that increases as the quantity of measured data correctly matches data associated with a

final estimated location. An exemplary confidence measure or function may be represented as a fraction of all locations that are similar to the final estimated location, however, such an example should not limit the scope of the claims appended herewith.

[0050] After one or more of the data modification procedures have been calculated, respective confidence measures may be calculated to represent the likely accuracy of the modification procedures. Confidence measures may then be compared and the best one selected to represent the appropriate modification procedure to implement.

[0051] Certain estimated locations may be assigned weights by using a confidence measure as a weight to represent the probability of locating a mobile station at a given location. For example, confidence measures may be based on one or more calculated parameters, including, but not limited to: a probability density function (PDF), a joint PDF, Mahalanobis distance, distortion measure, ordered number parameter, timing advance (TA) parameter, mobile orientation etc. The calculated parameters may be derived from the NUG calibration data stored in the PDE 50 database. The parameters may be pre-stored in memory or may be calculated during a NMR to NUG comparison operation.

[0052] Probability density functions may be calculated based on an individual NC base station power level, or a set of multiple NC base station power levels. The calculated probability density function may be compared to the set of available NUGs (*i.e.,* NUGS 1-3 of FIG. 1) to determine a probability that the NM data matches a particular NUG location. A joint probability may also be calculated over a set of

probabilities to further estimate the location of the mobile station. The results of the calculated PDF may be used in a number of estimation techniques to locate the mobile station.

[0053] Distortion measures may be determined at a particular location may be included in a NMR and used in a comparison operation to measure the difference in distortion between NUG data and NM data. The distortion measures may be used to estimate a location of a mobile station based on the results of the comparison.

[0054] A Mahalanobis distance may be an exemplary distortion measure and may utilized to assist in identifying and analyzing different patterns in a wireless communications environment. The Mahalanobis distance may also be useful in determining similarities between an unknown sample data set and a known data set.

[0055] Ordering number lists may also be used to organize parameters for comparison purposes. An ordering number list may be a list or table of data parameters organized in a particular order. The power levels may be listed in descending order and compared to similar parameters associated with a NUG(s). A threshold power level may be used to represent an acceptable amount of deviation between a comparison of power levels obtained from a NMR(s) and/or a NUG(s). If one or more power levels in the NMR(s) and the NUG(s) fall within an acceptable range of one another, the location of a mobile station may be measured with a corresponding degree of accuracy.

[0056] Each generated NMR may be used to provide an individual estimate of the mobile station's location. The PDE 50 may receive a number of NMRs over a period of time, a corresponding number of location estimates may be generated based on the

number of NMRs received. These estimates may be combined in a statistical algorithm and may provide a more accurate location estimate than the individual NMRs.

[0057] Given a particular NMR or set of NMR(s) containing data collected outdoors, a selection procedure may be conducted to select the most appropriate modification procedure to use when modifying the NM data. Once one or more of the above described NMR modification procedures have been calculated, (*e.g.,* non-modification, serving cell power level, highest NC power level, average(s) of the NC power levels, etc.) one or more of these calculations may be selected as an optimal solution to be used to modify the NMR.

[0058] One way to determine the optimal solution that should be used to modify the NMR is to calculate a confidence measure for each of the calculated modification procedures. Once the confidence measures have been calculated, the optimal solution may be selected as the modification procedure with the highest confidence measure. Alternatively, a location estimate may be made by weighting the individual solutions by the applicable confidence measure and combining the results into a single NMR solution.

[0059] Combining multiple NMR(s) may generate a location estimate with increased accuracy. When comparing NM data to a NUG, the grid point data that most closely matches the NM data may become the estimated location of the mobile station. In an alternative arrangement, interpolation may be used for determining a location that falls between two grid points to provide an even more accurate location estimate. Applying probabilistic weights, hypotheses and deriving confidence measures may increase the accuracy of the location estimates. Utilizing exemplary probabilistic

measures, the estimated location of a mobile station may be determined within a particular degree of certainty. A similar approach may also be applied to select the appropriate NMR modification procedure to accommodate for varying conditions and other operational variables (*e.g.,* different air standards, varying environmental circumstances, etc.).

[0060] FIG. 2 illustrates a flow diagram 200 of a method to locate a mobile station. Observed network measurement data may be collected (operation 201). The observed data would typically be the same or similar to the data in a network measurement report (NMR). The network measurement data represents at least one network characteristic observed by the mobile station operating at a particular location within a region. The NM data may be compared to calibration database data, where the calibration database data represents calibration data measured within the geographical area of the region (operation 202). The location of the mobile station may be estimated based on the comparison of the modified network measurement data and the calibration database data (operation 203).

[0061] FIG. 3 illustrates a flow diagram 300 of a method to locate a mobile station in an indoor environment. Calibration data samples are collected in an outdoor environment (operation 301). At least one attenuation variable may be applied to the calibration data sample to simulate an indoor environment (operation 302). The modified network measurement data sample may be applied to a mobile station location algorithm (operation 303). The mobile station may be then located in the indoor environment based

on the mobile station location algorithm implementing the at least one modified calibration sample (operation 304).

[0062] FIG. 4 illustrates a flow diagram 400 of a method to locate a mobile station. NM data may be obtained to represent at least one network characteristic of the mobile station's serving base station and at least one second network characteristic of at least one of the mobile station's neighboring base stations (operation 401). The difference between the at least one first signal characteristic and the at least one second signal characteristic may be computed (operation 402). At least one signal characteristic of the NM data may be adjusted based on the computed difference (operation 403). The mobile station may be then located based on the modified network measurement data (operation 404).

[0063] FIG. 5 illustrates a flow diagram 500 of a method to locate a mobile station. NM data may be obtained (operation 501), which represents at least one first network characteristic of the mobile station's serving base station, and at least one second and third network characteristic of the mobile station's at least two neighboring base stations. It may be then determined which base station has the highest signal power at a particular location (operation 502). The difference between the highest signal power at the particular location and the power levels at the particular location of the serving base station and the remaining neighboring base stations may be determined (operation 503). At least one signal characteristic of the NM data may be adjusted based on the computed differences (operation 504). The mobile station may then be located based on the modified NMR (operation 505).

[0064] FIG. 6 illustrates a flow diagram 600 of a method to locate a mobile station. A NMR may be obtained (operation 601), which represents at least one first signal characteristic of the mobile station's serving base station, and at least one second and third signal characteristics of the mobile station's at least two respective neighboring base stations. A difference may be computed between the at least one first signal characteristic of the mobile station's serving base station and the at least one second signal characteristic of at least one of the mobile station's neighboring base stations to determine a first solution (operation 602). It may then be determined which base station has the highest signal power level at a particular location (operation 603). The difference between the highest signal power and the power levels of the serving base station and the remaining neighboring base stations may be determined as a second solution (operation 604). The neighboring base station having the lowest signal power level at the particular location may be determined (operation 605). An average signal power level intermediary to the difference between the highest signal power level and the lowest signal power level may be determined as a third solution (operation 606). It may then be determined which solution is a most optimal solution by comparing the three solutions (operation 607). The signal characteristic of the NM data may then be adjusted based on the most optimal solution (operation 608). The mobile station may then be located based on the adjusted NM data (operation 609).

[0065] FIG 7 illustrates an embodiment of the present subject matter. The method includes providing a database of previously-gathered calibration data for a predetermined region in a wireless network (operation 701). The database may be a collection of data

from uniform or non-uniform grids that contain network measurements with associated location estimates. Network measurement data may be then observed and measured typically by a mobile station or any other wireless device (operation 703). The network measurement data may include received base station power and timing advance, as well as other network characteristics observable by a mobile station. The observed network measurement data may then be modified (operation 705). This modification may include applying an attenuation function to some or all of the network measurement data or converting absolute values into relative values. The modification may be performed by a processor, microprocessor or ASICS. The modified network measurement data may then be compared to the calibration database in order to determine the location of the mobile station (operation 707). The comparison may be performed by a processor, microprocessor or ASICS.

[0066] FIG 8 is another illustration of an embodiment of the present subject matter. A database of previously-gathered calibration data for a predetermined region in a wireless network may be provided (operation 801). Observed network measurement data may be collected which includes a first signal characteristic from the mobile's serving transmitter (operation 803). The observed network measurement data may be modified as a function of the first signal characteristic (operation 805), for example the first signal characteristic may be received power and the modification may be a function of the relative value with respect to the received power. The modified network measurement data may be compared with the database of calibration data to determine the location of the mobile station (operation 807)

[0067] FIG 9 is an illustration of an embodiment of the present subject matter for determining a location of a mobile station. A database of calibration data for a region may be provided (901). Network measurement data from transmitters may be observed and collected including a signal characteristic from each of the transmitters (operation 903). An average value for the signal characteristic among the transmitters may be determined (operation 905). The average for the signal characteristic may be a weighted average. The observed network measurement data may be modified using the determined average value (operation 907) and the modified network measurement data may be compared with the database of calibration data to determine the location of the mobile station (operation 909)

[0068] FIG 10 is an illustration of an embodiment of the present subject matter for determining a location of a mobile station. A database of previously-gathered outdoor calibration data for a predetermined region in a wireless network may be provided (operation 1001). Network measurement data may be observed and collected (operation 1003). The network measurement data may be compared with the database of calibration data to thereby determine a plurality of location estimates for the mobile station (operation 1005). The location estimates may be derived using modified, unmodified, limited signal characteristics, several signal characteristics, etc. For each location estimate, a confidence measure may be determined (operation 1007). A location may be determined based on the plurality of location estimates and their respective confidence measures (1009). For example, the location may be determined based on a weighted average, where the weights are directly proportional to the confidence measures.

[0069] The embodiments described above may be used in communication devices, such as, a base station, having varying configurations that include, but are not limited to: predetermined calibration data collected over varying terrain, different base station configurations, varying cellular communication protocols, etc.

[0070] While preferred embodiments of the present invention have been described, it is to be understood that the embodiments described are illustrative only and the scope of the invention is to be defined solely by the appended claims when accorded a full range of equivalents, many variations and modifications naturally occurring to those skilled in the art from a perusal hereof.

What is claimed is:

1. A method for determining a location of a mobile station, comprising:

providing a database of previously-gathered calibration data for a predetermined region in a wireless network;

collecting observed network measurement data;

modifying said observed network measurement data; and

comparing said modified network measurement data with said database of calibration data to thereby determine the location of the mobile station.

2. The method of Claim 1 wherein said database comprises previously-gathered calibration data at one or more predetermined calibration points within said region.

3. The method of Claim 2 wherein said previously-gathered calibration data at one or more predetermined calibration points is combined to form previously-gathered calibration data for one or more non-uniform grid points within said region.

4. The method of Claim 1 wherein said database comprises previously-gathered calibration data for one or more non-uniform grid points within said region.

5. The method of Claim 1 wherein said observed network measurement data includes data collected at the mobile station.

6. The method of Claim 1 wherein said previously-gathered calibration data includes signal strength information measured at a predetermined calibration point within said region for a signal transmitted from a known location within or in proximity to said region.

7. The method of Claim 1 wherein said previously-gathered calibration data includes signal strength information measured by a receiver at a known location within or in proximity to said region for a signal transmitted from a predetermined calibration point within said region.

8. The method of Claim 1 wherein said previously-gathered calibration data includes round trip time information for signals traveling between a predetermined calibration point within said region and a known location within or in proximity to said region.

9. The method of Claim 1 wherein said previously-gathered calibration data includes time difference of arrival information for a first signal traveling between a first known location and a predetermined calibration point within said region and a second signal traveling between a second known location and said calibration point.

10. The method of Claim 1 wherein said previously-gathered calibration data includes information identifying a serving cell of a transmitter transmitting a signal received at a predetermined calibration point within said region.

11. The method of Claim 1 wherein said previously-gathered calibration data includes information identifying a serving sector of a transmitter transmitting a signal received at a predetermined calibration point within said region.

12. The method of Claim 1 wherein said previously-gathered calibration data includes information regarding a state of said wireless network.

13. The method of Claim 1 wherein said previously-gathered calibration data includes calibration data gathered at a predetermined calibration point within said region wherein said predetermined calibration point is not located within a structure.

14. The method of Claim 13 wherein said observed network measurement data is collected at a mobile station located within a structure.

15. A system for determining a location of a mobile station, comprising:

a database of previously-gathered calibration data for a predetermined region in a wireless network;

circuitry for collecting observed network measurement data;

circuitry for modifying said observed network measurement data; and

circuitry for comparing said modified network measurement data with said database of calibration data to thereby determine the location of the mobile station.

16. The system of Claim 15 wherein said database comprises previously-gathered calibration data at one or more predetermined calibration points within said region.

17. The system of Claim 16 further comprising circuitry for combining said previously-gathered calibration data at one or more predetermined calibration points to thereby form previously-gathered calibration data for one or more non-uniform grid points within said region.

18. The system of Claim 15 wherein said database comprises previously-gathered calibration data for one or more non-uniform grid points within said region.

19. The system of Claim 15 wherein said mobile station includes said circuitry for collecting observed network measurement data.

20. The system of Claim 15 further comprising circuitry for measuring signal strength at a predetermined calibration point within said region for a signal transmitted from a known location within or in proximity to said region.

21. The system of Claim 15 further comprising circuitry for measuring signal strength at a receiver at a known location within or in proximity to said region for a signal transmitted from a predetermined calibration point within said region.

22. The system of Claim 15 further comprising circuitry for determining round trip time for signals traveling between a predetermined calibration point within said region and a known location within or in proximity to said region.

23. The system of Claim 15 further comprising circuitry for determining time difference of arrival for a first signal traveling between a first known location and a predetermined calibration point within said region and a second signal traveling between a second known location and said calibration point.

24. The system of Claim 15 further comprising circuitry for identifying a serving cell of a transmitter transmitting a signal received at a predetermined calibration point within said region.

25. The system of Claim 15 further comprising circuitry for identifying a serving sector of a transmitter transmitting a signal received at a predetermined calibration point within said region.

26. The system of Claim 15 wherein said previously-gathered calibration data includes information regarding a state of said wireless network.

27. The system of Claim 15 wherein said previously-gathered calibration data includes calibration data gathered at a predetermined calibration point within said region wherein said predetermined calibration point is not located within a structure.

28. The system of Claim 27 wherein said observed network measurement data is collected at a mobile station located within a structure.

29. A method for determining a location of a mobile station, comprising:

providing a database of previously-gathered calibration data for a predetermined region in a wireless network, wherein said network includes a serving transmitter;

collecting observed network measurement data including a first signal characteristic from said serving transmitter;

modifying said observed network measurement data using said first signal characteristic; and

comparing said modified network measurement data with said database of calibration data to thereby determine the location of the mobile station.

30. The method of Claim 29 wherein said database comprises previously-gathered calibration data for one or more non-uniform grid points within said region.

31. The method of Claim 29 wherein said observed network measurement data includes data collected at the mobile station.

32. The method of Claim 29 wherein said previously-gathered calibration data includes calibration data gathered at a predetermined calibration point within said region wherein said predetermined calibration point is not located within a structure.

33. The method of Claim 32 wherein said observed network measurement data is collected at a mobile station located within a structure.

34. The method of Claim 29 wherein said first signal characteristic is signal strength.

35. The method of Claim 34 wherein said collecting observed network measurement data further includes collecting a second signal characteristic from a neighboring transmitter wherein said second signal characteristic is signal strength.

36. The method of Claim 35 wherein the modifying of said calibration data uses a difference between said first and second signal characteristics.

37. The method of Claim 29 wherein said first signal characteristic is signal strength of a control channel transmitted by said serving transmitter and received by said mobile station.

38. The method of Claim 37 wherein said collecting observed network measurement data further includes collecting a second signal characteristic from a neighboring transmitter wherein said second signal characteristic is signal strength of a control channel transmitted by said neighboring transmitter and received by said mobile station.

39. The method of Claim 29 wherein said observed network measurement data includes a data set comprising:

$[P_1,... P_n, TA]$

where:

P_1 represents the signal strength of said serving transmitter as measured at said mobile station,

P_n represents a signal strength of at a nth neighboring transmitter as measured at said mobile station, and

TA represents a timing advance parameter;

and wherein said modified network measurement data includes a data set comprising:

$[0,...P_1-P_{n-1}, P_1-P_n, TA]$

where:

0 represents a difference between P_1 and P_1,

P_1-P_{n-1} represents a difference between P_1 and P_{n-1}, and

P_1-P_n represents a difference between P_1 and P_n.

40. The method of Claim 39 wherein said first neighboring transmitter is not a member of said wireless network.

41. A method for determining a location of a mobile station, comprising:

providing a database of previously-gathered calibration data for a predetermined region in a wireless network;

collecting observed network measurement data from each of a plurality of transmitters including a signal characteristic from each one of said plural transmitters;

determining an average value for select ones of said signal characteristics;

modifying said observed network measurement data using said average value; and

comparing said modified network measurement data with said database of calibration data to thereby determine the location of the mobile station.

42. The method of Claim 41 wherein said database comprises previously-gathered calibration data for one or more non-uniform grid points within said region.

43. The method of Claim 41 wherein said observed network measurement data includes data collected at the mobile station.

44. The method of Claim 41 wherein said previously-gathered calibration data includes calibration data gathered at a predetermined calibration point within said region wherein said predetermined calibration point is not located within a structure.

45. The method of Claim 41 wherein said observed network measurement data is collected at a mobile station located within a structure.

46. The method of Claim 41 wherein said signal characteristic is signal strength.

47. The method of Claim 46 wherein the modifying of said calibration data uses a difference between said average value and said signal characteristic for a first one of said plural transmitters.

48. The method of Claim 41 wherein said signal characteristic is signal strength of a control channel.

49. The method of Claim 41, wherein the observed network measurement data includes received signal strength of said transmitters as said mobile station.

50. The method of Claim 41 wherein said observed network measurement data includes a data set comprising:

$[P_1, P_2, P_3, TA]$

where:

P_1 represents the signal strength of a first one of said plural transmitters as measured at said mobile station,

P_2 represents a signal strength of a second one of said plural transmitters as measured at said mobile station wherein $P_2 > P_1$,

P_3 represents a signal strength of a third one of said plural transmitters as measured at said mobile station wherein $P_2 > P_3$, and

TA represents a timing advance parameter;

and wherein said modified network measurement data includes a data set comprising:

$[P_1\text{-}P_{AVG}, P_2\text{-}P_{AVG}, P_3\text{-}P_{AVG}, TA]$

where:

P_{AVG} represents an average value of P_1, P_2, and P_3,

P_1-P_{AVG} represents a difference between P_1 and P_{AVG},

P_2-P_{AVG} represents a difference between P_2 and P_{AVG},

P_3-P_{AVG} represents a difference between P_3 and P_{AVG},

51. The method of Claim 50 wherein said first transmitter is a serving transmitter for said mobile station and said second and third transmitters are neighboring transmitters.

52. The method of Claim 41 wherein at least one of said plurality of transmitters is not a member of said wireless network.

ABSTRACT

A method of modifying calibration data used to geo-locate a mobile station located in an indoor environment is disclosed. When a mobile station is located indoors, the signal strength of signals received and/or transmitted by the mobile station have the tendency to be lower than the strength of the signals received by a mobile station located outdoors. As a result of these lower signal strengths, geo-location efforts which rely on signal strengths may result in unsatisfactory location accuracy. Modifying pre-existing calibration data obtained outdoors may provide a way to simulate indoor calibration data characteristics.

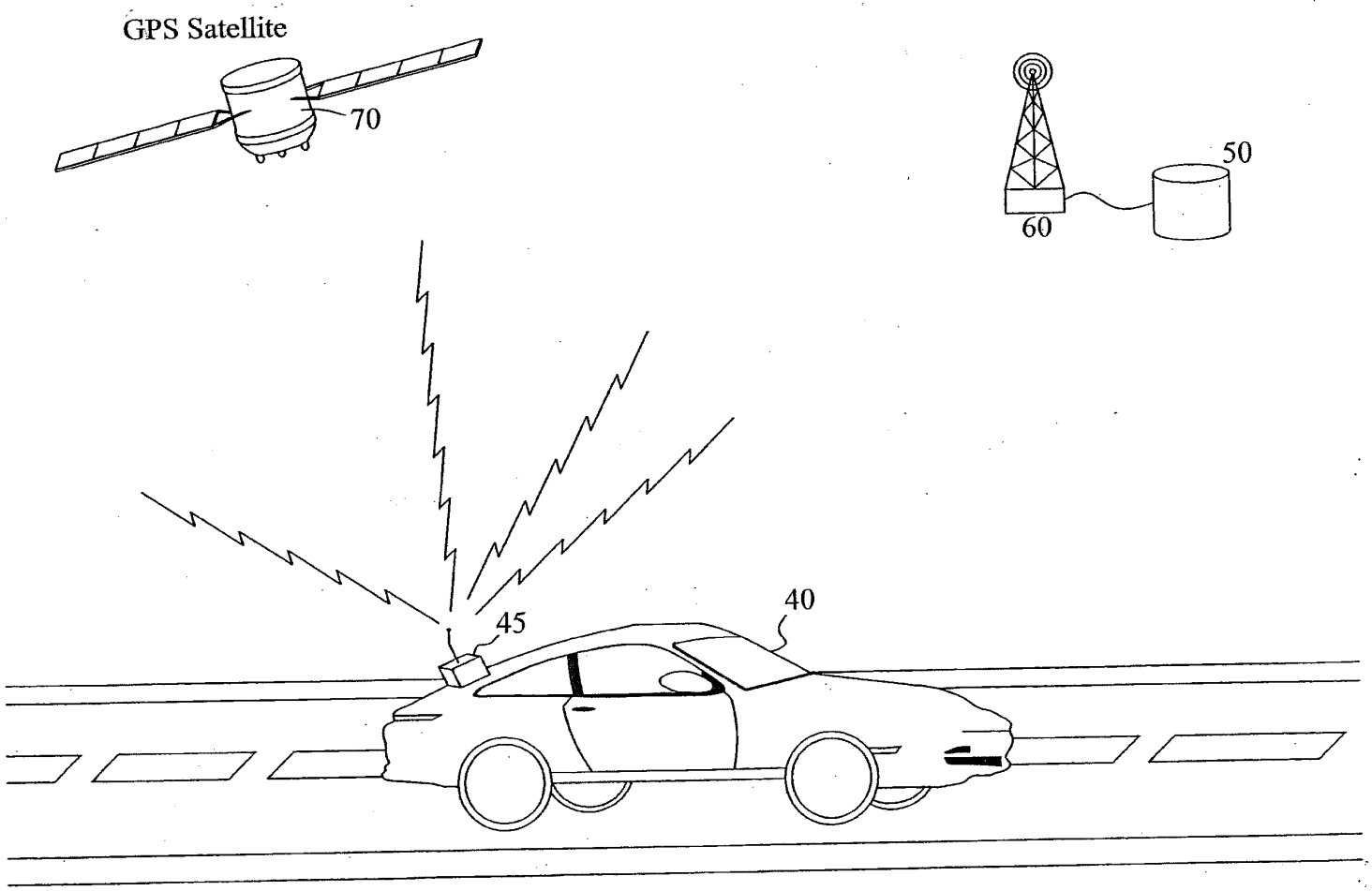

Figure 1

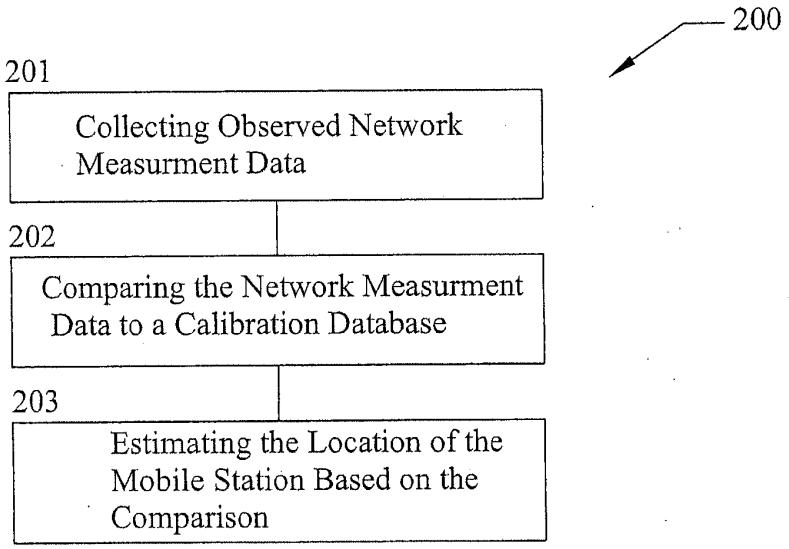
200
201
Collecting Observed Network Measurment Data
202
Comparing the Network Measurment Data to a Calibration Database
203
Estimating the Location of the Mobile Station Based on the Comparison

Figure 2

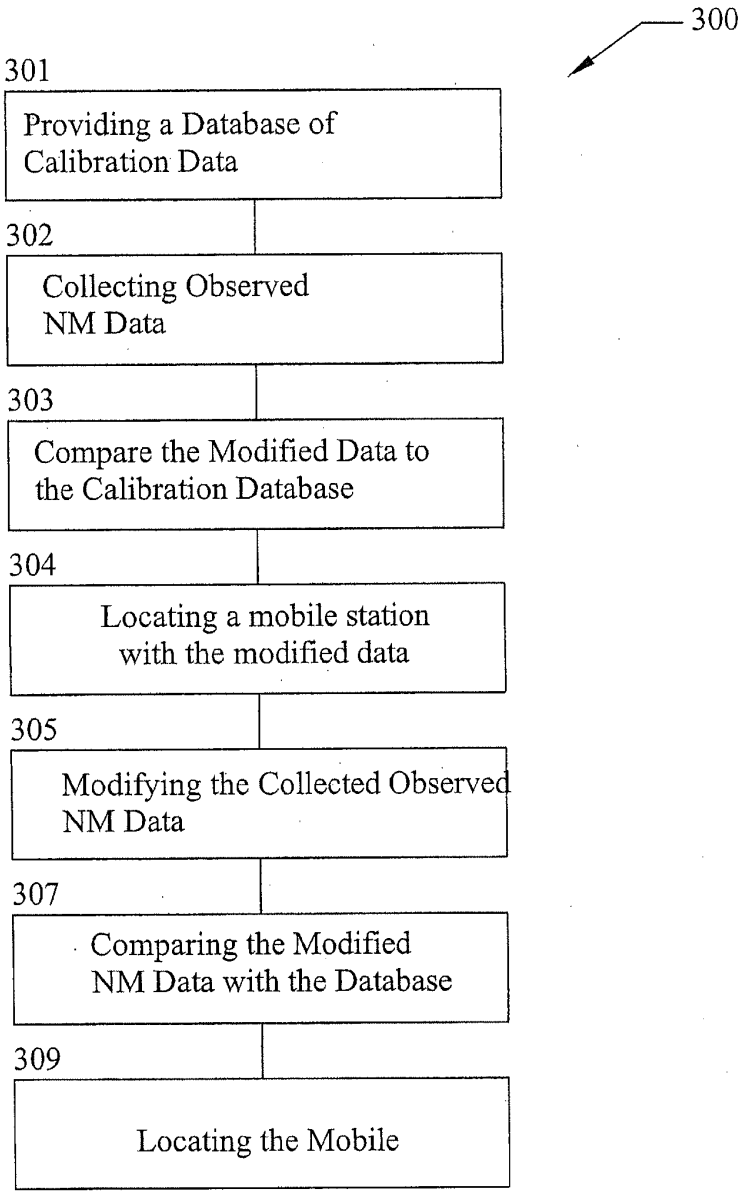
300
301
Providing a Database of Calibration Data
302
Collecting Observed NM Data
303
Compare the Modified Data to the Calibration Database
304
Locating a mobile station with the modified data
305
Modifying the Collected Observed NM Data
307
Comparing the Modified NM Data with the Database
309
Locating the Mobile

Figure 3

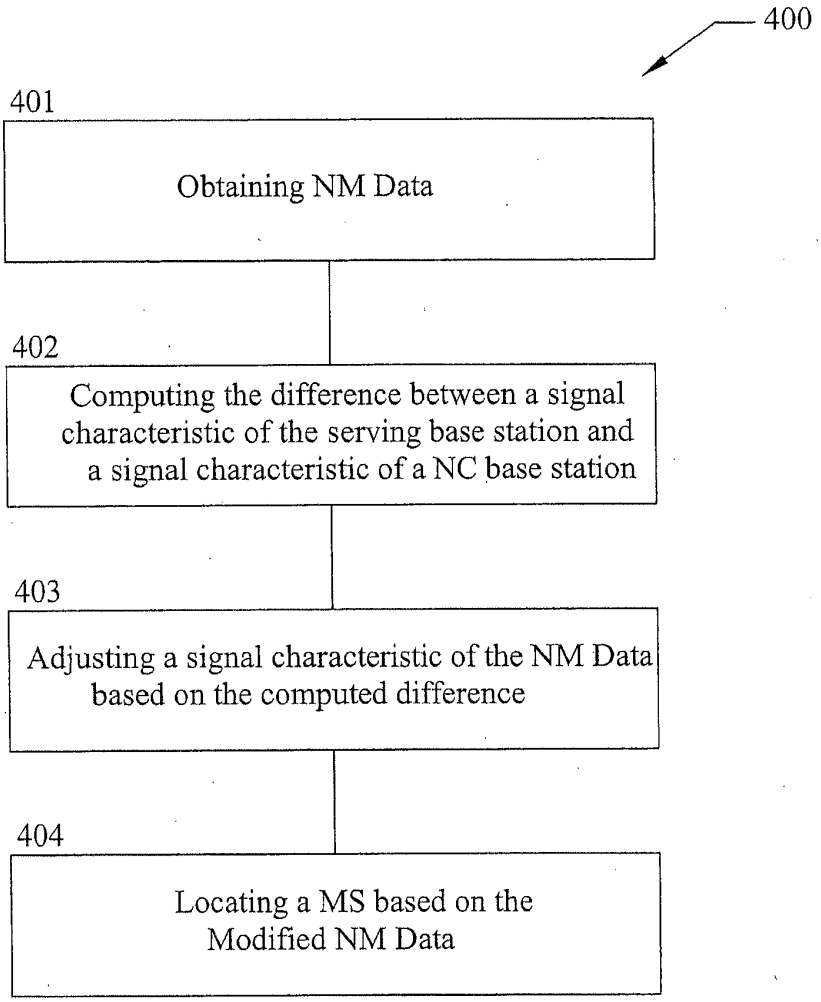
400
401
Obtaining NM Data
402
Computing the difference between a signal characteristic of the serving base station and a signal characteristic of a NC base station
403
Adjusting a signal characteristic of the NM Data based on the computed difference
404
Locating a MS based on the Modified NM Data

Figure 4

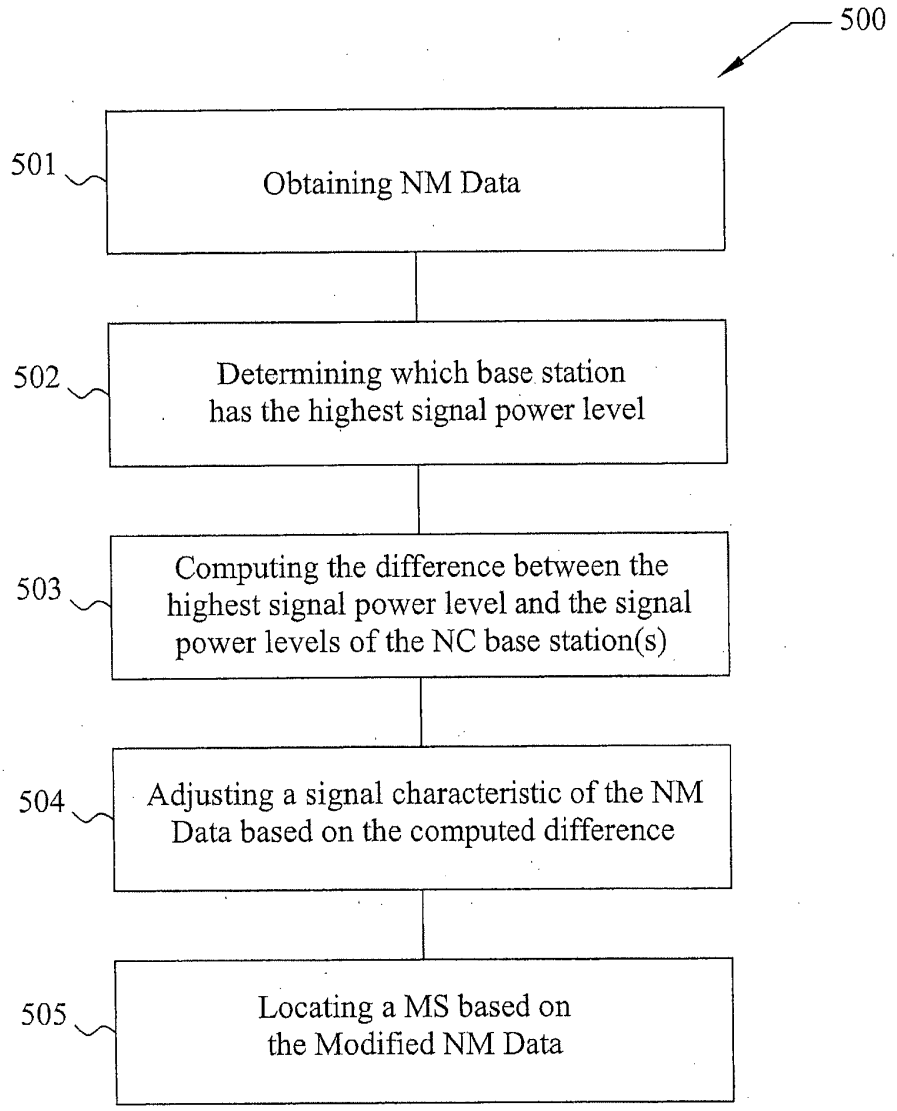
500
501
Obtaining NM Data
502
Determining which base station has the highest signal power level
503
Computing the difference between the highest signal power level and the signal power levels of the NC base station(s)
504
Adjusting a signal characteristic of the NM Data based on the computed difference
505
Locating a MS based on the Modified NM Data

Figure 5

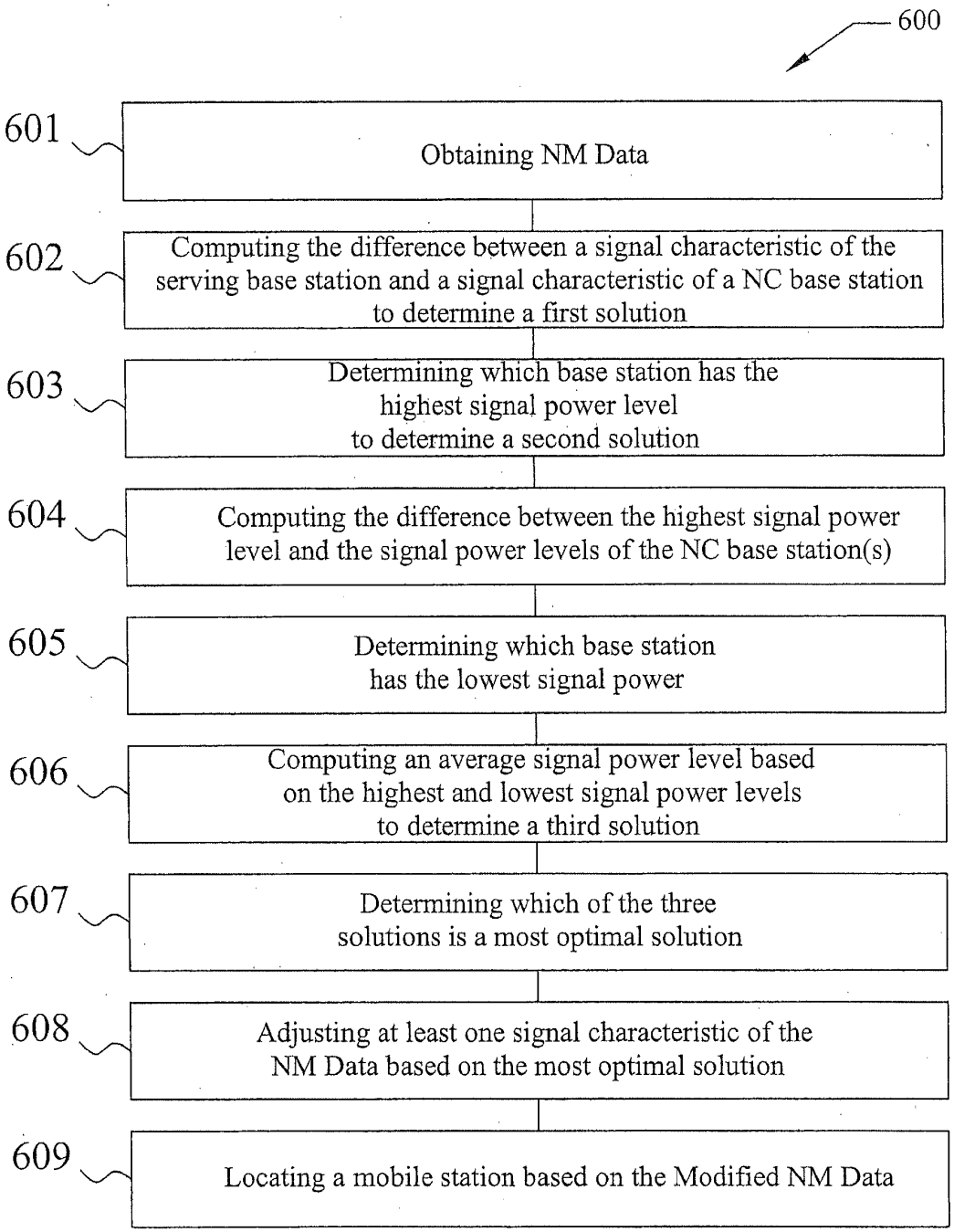
600
601
Obtaining NM Data
602
Computing the difference between a signal characteristic of the serving base station and a signal characteristic of a NC base station to determine a first solution
603
Determining which base station has the highest signal power level to determine a second solution
604
Computing the difference between the highest signal power level and the signal power levels of the NC base station(s)
605
Determining which base station has the lowest signal power
606
Computing an average signal power level based on the highest and lowest signal power levels to determine a third solution
607
Determining which of the three solutions is a most optimal solution
608
Adjusting at least one signal characteristic of the NM Data based on the most optimal solution
609
Locating a mobile station based on the Modified NM Data

Figure 6

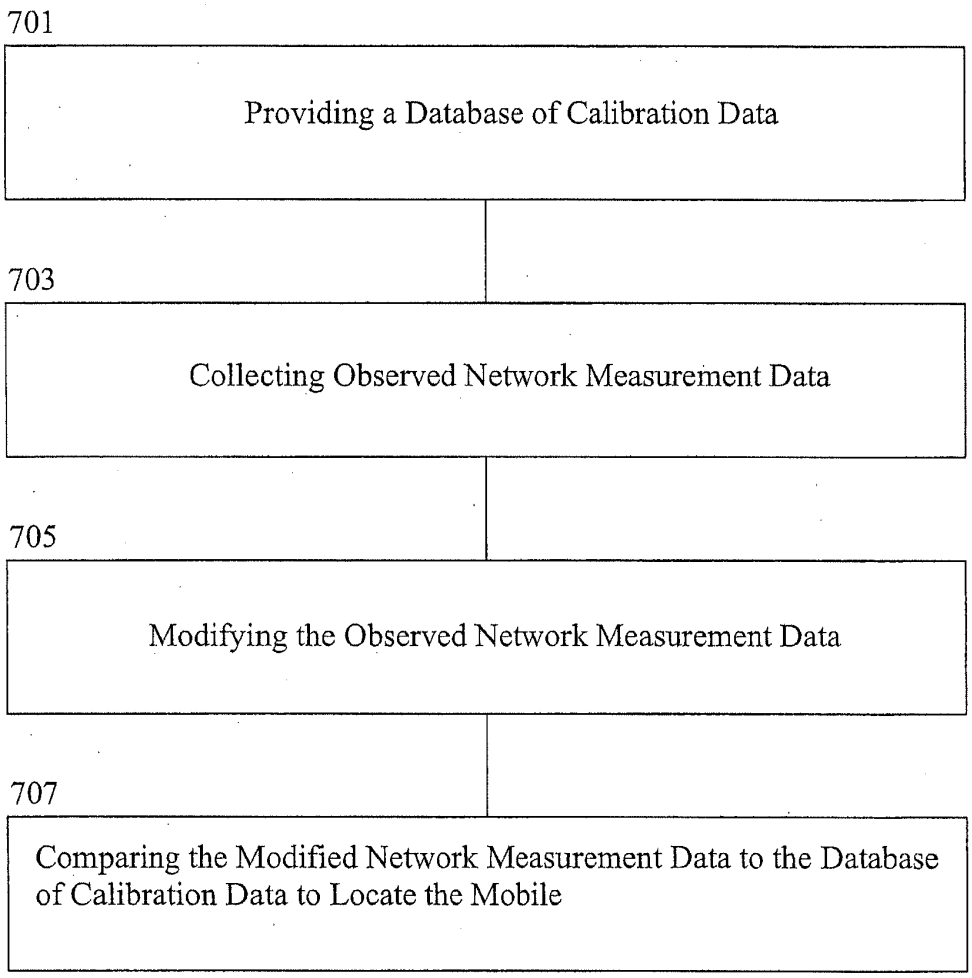
701
Providing a Database of Calibration Data
703
Collecting Observed Network Measurement Data
705
Modifying the Observed Network Measurement Data
707
Comparing the Modified Network Measurement Data to the Database of Calibration Data to Locate the Mobile

Figure 7

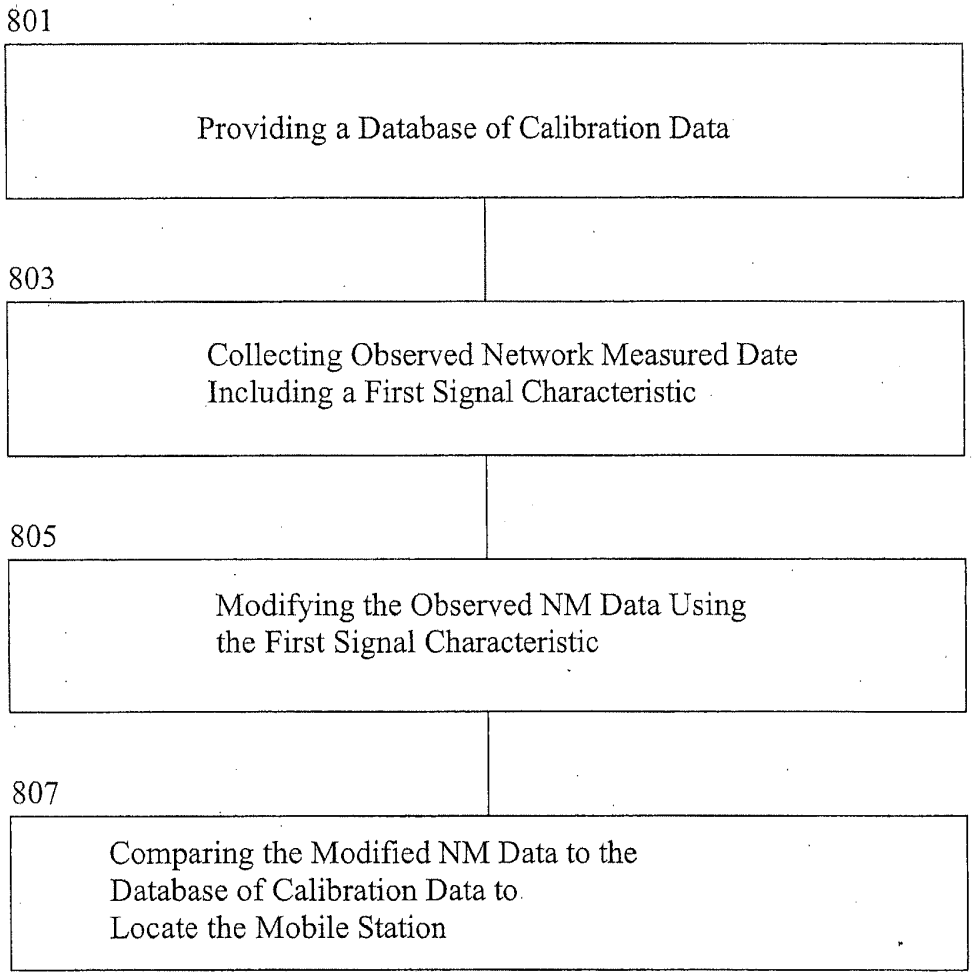
801
Providing a Database of Calibration Data
803
Collecting Observed Network Measured Date Including a First Signal Characteristic
805
Modifying the Observed NM Data Using the First Signal Characteristic
807
Comparing the Modified NM Data to the Database of Calibration Data to Locate the Mobile Station

Figure 8

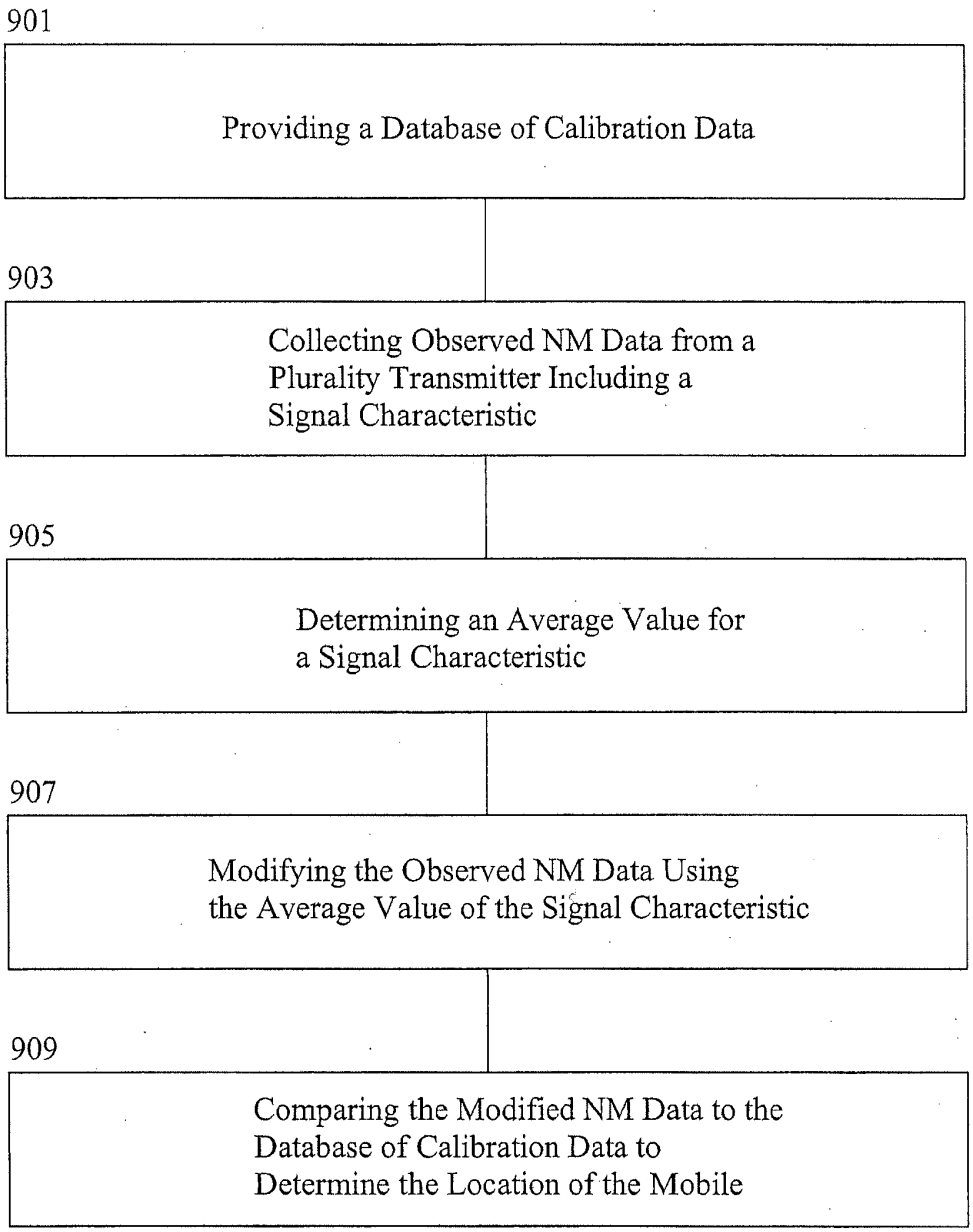
901
Providing a Database of Calibration Data
903
Collecting Observed NM Data from a Plurality Transmitter Including a Signal Characteristic
905
Determining an Average Value for a Signal Characteristic
907
Modifying the Observed NM Data Using the Average Value of the Signal Characteristic
909
Comparing the Modified NM Data to the Database of Calibration Data to Determine the Location of the Mobile

Figure 9

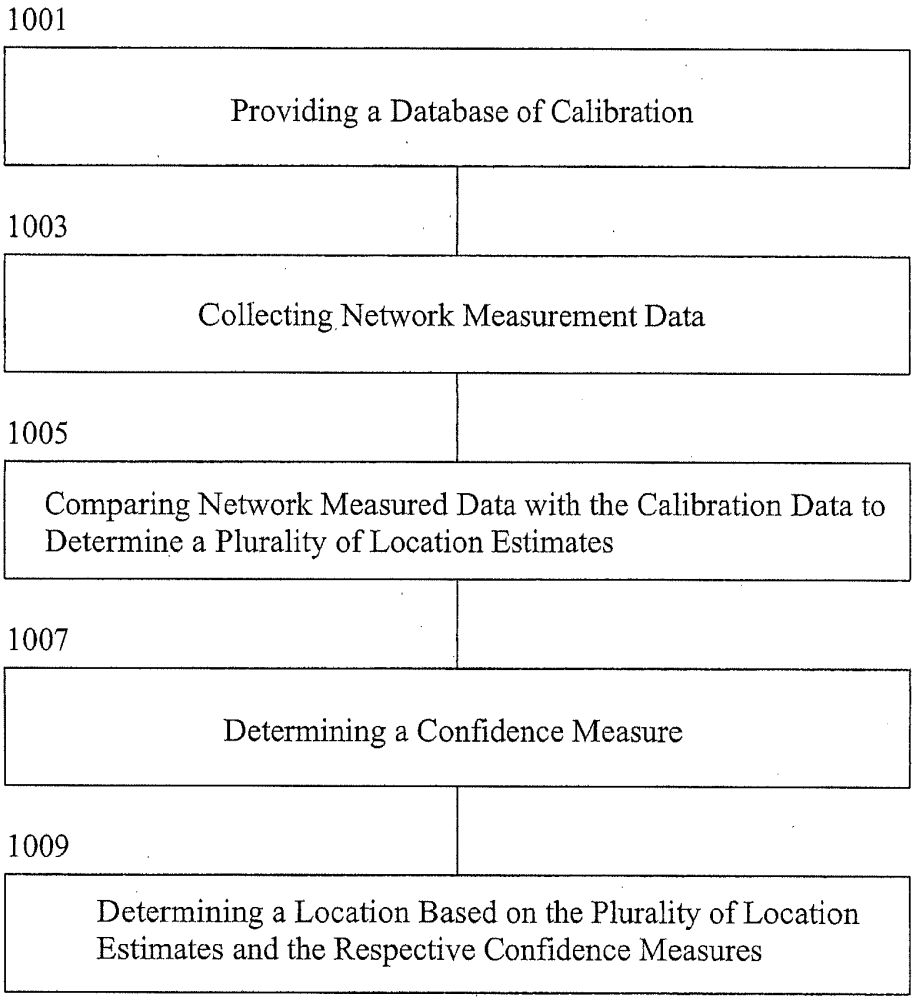
1001
Providing a Database of Calibration
1003
Collecting Network Measurement Data
1005
Comparing Network Measured Data with the Calibration Data to Determine a Plurality of Location Estimates
1007
Determining a Confidence Measure
1009
Determining a Location Based on the Plurality of Location Estimates and the Respective Confidence Measures

Figure 10

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	Method to Modify Calibration Data Used to Locate A Mobile Unit
First Named Inventor/Applicant Name:	Martin Alles
Filer:	Mark Charles Comtois/laureen ponder
Attorney Docket Number:	AND01 082 CC

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility application filing	1011	1	390	390
Utility Search Fee	1111	1	620	620
Utility Examination Fee	1311	1	250	250
Pages:				
Claims:				
Claims in excess of 20	1202	15	62	930
Miscellaneous-Filing:				
Petition:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**2190**

Electronic Acknowledgement Receipt	
EFS ID:	15002619
Application Number:	13771542
International Application Number:	
Confirmation Number:	6992
Title of Invention:	Method to Modify Calibration Data Used to Locate A Mobile Unit
First Named Inventor/Applicant Name:	Martin Alles
Customer Number:	79172
Filer:	Mark Charles Comtois/laureen ponder
Filer Authorized By:	Mark Charles Comtois
Attorney Docket Number:	AND01 082 CC
Receipt Date:	20-FEB-2013
Filing Date:	
Time Stamp:	14:22:24
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$2190
RAM confirmation Number	683
Deposit Account	041679
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	AND01082CCADS.pdf	1433381 76124c4d4c2991ba7e3ef333623dc06032cdaa1a	no	7
Warnings:					
Information:					
2	Preliminary Amendment	AND01082CCPAmdt.pdf	728224 aa0fb838aaac3b45c19da63e5a1978fbc4614c74	no	9
Warnings:					
Information:					
3		AND01082CCAPPDWGS.pdf	3568469 5a34abb49020571b917bac2d54fc2a761affe7f9	yes	47

Multipart Description/PDF files in .zip description

Document Description	Start	End
Specification	1	26
Claims	27	36
Abstract	37	37
Drawings-only black and white line drawings	38	47

Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	36160 c0fc4a372017de9883dc58a495fb570f0cb9a19b	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	5766234	

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/AIA/14 (08-12)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	AND01 082 CC
	Application Number	
Title of Invention	Method to Modify Calibration Data Used to Locate a Mobile Device	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
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Residence Information (Select One) ◉ US Residency ◯ Non US Residency ◯ Active US Military Service

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Inventor 2 Remove

Legal Name

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Residence Information (Select One) ◉ US Residency ◯ Non US Residency ◯ Active US Military Service

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Inventor 3 Remove

Legal Name

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	George		Maher	

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	AND01 082 CC
	Application Number	
Title of Invention	Method to Modify Calibration Data Used to Locate a Mobile Device	

City	Herndon	State/Province	VA	Country of Residence i	US

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Address 1	100 Adele Garden Way		
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City	Herndon	**State/Province**	Va
Postal Code	20170	**Country** i	US

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Legal Name

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	Selcuk		Mazlum	

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Mailing Address of Inventor:

Address 1	136 Clubhouse Drive SW Apt 201		
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City	Leesburg	**State/Province**	VA
Postal Code	20175	**Country** i	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	79172		
Email Address		Add Email	Remove Email

Application Information:

Title of the Invention	Method to Modify Calibration Data Used to Locate a Mobile Device		
Attorney Docket Number	AND01 082 CC	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		**Sub Class (if any)**	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	10	**Suggested Figure for Publication (if any)**	

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	AND01 082 CC
	Application Number	
Title of Invention	Method to Modify Calibration Data Used to Locate a Mobile Device	

Publication Information:

☐	Request Early Publication (Fee required at time of Request 37 CFR 1.219)
☐	**Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	◯ US Patent Practitioner	◯ Limited Recognition (37 CFR 11.9)
Customer Number	79172		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

Prior Application Status	Pending			Remove	
Application Number	Continuity Type		Prior Application Number	Filing Date (YYYY-MM-DD)	
	Continuation of		12424320	2009-04-15	
Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
	Continuation of	12026333	2008-02-05	7561105	2009-07-14
Prior Application Status	Expired			Remove	
Application Number	Continuity Type		Prior Application Number	Filing Date (YYYY-MM-DD)	
	non provisional of		60899379	2007-02-05	

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	AND01 082 CC
	Application Number	
Title of Invention	Method to Modify Calibration Data Used to Locate a Mobile Device	

Remove

Application Number	Country i	Filing Date (YYYY-MM-DD)	Priority Claimed
			◉ Yes ◯ No

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Authorization to Permit Access:

☐ Authorization to Permit Access to the Instant Application by the Participating Offices

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1 Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

◉ Assignee	◯ Legal Representative under 35 U.S.C. 117	◯ Joint Inventor
◯ Person to whom the inventor is obligated to assign.	◯ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	AND01 082 CC
	Application Number	
Title of Invention	Method to Modify Calibration Data Used to Locate a Mobile Device	

Name of the Deceased or Legally Incapacitated Inventor :			
If the Applicant is an Organization check here. ☒			
Organization Name	Andrew LLC		
Mailing Address Information:			
Address 1	1100 CommScope Place		
Address 2			
City	Hickory	**State/Province**	NC
Country i	US	Postal Code	28602
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Non-Applicant Assignee Information:

Providing assignment information in this section does not subsitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Assignee 1

Complete this section only if non-applicant assignee information is desired to be included on the patent application publication in accordance with 37 CFR 1.215(b). Do not include in this section an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest), as the patent application publication will include the name of the applicant(s).

Remove

If the Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	AND01 082 CC
	Application Number	
Title of Invention	Method to Modify Calibration Data Used to Locate a Mobile Device	

Mailing Address Information:			
Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications					
Signature	/Mark C. Comtois/			Date (YYYY-MM-DD)	2013-02-20
First Name	Mark	Last Name	Comtois	Registration Number	46285

Additional Signature may be generated within this form by selecting the Add button. Add

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

REMARKS

Claims 1-4, 6-14, 29-30, 32-42 and 44-52 are pending with entry of this preliminary amendment.

Applicant has amended the specification to claim the priority benefit of parent patent application number 12/424,320. No new matter has been added.

Consideration and acceptance of Applicant's amendment is respectfully solicited.

Applicant submits the application is in condition for allowance and, as such, it is requested that Claims 1-4, 6-14, 29-30, 32-42 and 44-52 be allowed to issue in a U.S. Patent.

If the Examiner believes that an in-person or telephonic interview with the Applicant's representatives will expedite the prosecution of the subject patent application, the Examiner is invited to contact the undersigned agents of record.

Should any additional fees be necessary in connection with the filing of this paper, or if a petition for extension of time is required for timely acceptance of the same, such a petition is made and the Office is authorized to charge such fees to Deposit Account No. 04-1679.

Respectfully submitted,

/Mark C. Comtois/

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Reg. No. 46,285
Ryan T. Hardee
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Dated: February 20, 2013

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/771,542	Filing Date 02/20/2013	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☒ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	**390**
☒ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	**620**
☒ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	**250**
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	**1260**

APPLICATION AS AMENDED – PART II

AMENDMENT

02/20/2013	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 35	Minus	** 52	= 0	X $62 =	0
Independent (37 CFR 1.16(h))	* 3	Minus	***4	= 0	X $250 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	**0**

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LDRC
/WANDA NELSON/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.