

# PATENT ASSIGNMENT

Electronic Version v1.1

Stylesheet Version v1.1

| SUBMISSION TYPE:  | NEW ASSIGNMENT     |               |                    |                     |                  |                  |            |                 |            |              |            |
|---|--------------------|---------------|--------------------|---------------------|------------------|------------------|------------|-----------------|------------|--------------|------------|
| NATURE OF CONVEYANCE:   | ASSIGNMENT         |               |                    |                     |                  |                  |            |                 |            |              |            |
| <b>CONVEYING PARTY DATA</b>   |                    |               |                    |                     |                  |                  |            |                 |            |              |            |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;">Name</th> <th style="width: 30%;">Execution Date</th> </tr> </thead> <tbody> <tr> <td>Ketao Liu</td> <td>06/12/2009</td> </tr> <tr> <td>Qinghong W. Wang</td> <td>06/12/2009</td> </tr> <tr> <td>Douglas H. Hein</td> <td>06/17/2009</td> </tr> </tbody> </table>                     |                    | Name          | Execution Date     | Ketao Liu           | 06/12/2009       | Qinghong W. Wang | 06/12/2009 | Douglas H. Hein | 06/17/2009 |              |            |
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| Ketao Liu   | 06/12/2009         |               |                    |                     |                  |                  |            |                 |            |              |            |
| Qinghong W. Wang  | 06/12/2009         |               |                    |                     |                  |                  |            |                 |            |              |            |
| Douglas H. Hein   | 06/17/2009         |               |                    |                     |                  |                  |            |                 |            |              |            |
| <b>RECEIVING PARTY DATA</b>   |                    |               |                    |                     |                  |                  |            |                 |            |              |            |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">Name:</td> <td>The Boeing Company</td> </tr> <tr> <td>Street Address:</td> <td>100 N. Riverside</td> </tr> <tr> <td>City:</td> <td>Chicago</td> </tr> <tr> <td>State/Country:</td> <td>ILLINOIS</td> </tr> <tr> <td>Postal Code:</td> <td>60606-1596</td> </tr> </table>                      |                    | Name:         | The Boeing Company | Street Address:     | 100 N. Riverside | City:            | Chicago    | State/Country:  | ILLINOIS   | Postal Code: | 60606-1596 |
| Name:   | The Boeing Company |               |                    |                     |                  |                  |            |                 |            |              |            |
| Street Address:   | 100 N. Riverside   |               |                    |                     |                  |                  |            |                 |            |              |            |
| City:   | Chicago            |               |                    |                     |                  |                  |            |                 |            |              |            |
| State/Country:  | ILLINOIS           |               |                    |                     |                  |                  |            |                 |            |              |            |
| Postal Code:  | 60606-1596         |               |                    |                     |                  |                  |            |                 |            |              |            |
| PROPERTY NUMBERS Total: 1   |                    |               |                    |                     |                  |                  |            |                 |            |              |            |
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| Application Number:   | 12486989           |               |                    |                     |                  |                  |            |                 |            |              |            |
| <b>CORRESPONDENCE DATA</b>  |                    |               |                    |                     |                  |                  |            |                 |            |              |            |
| <p>Fax Number: (919)286-8199</p> <p><i>Correspondence will be sent via US Mail when the fax attempt is unsuccessful.</i></p> <p>Phone: 919-286-8000</p> <p>Email: JOANNAJOSLYN@MVALAW.COM</p> <p>Correspondent Name: MOORE AND VAN ALLEN PLLC FOR BOEING</p> <p>Address Line 1: 430 DAVIS DRIVE</p> <p>Address Line 2: SUITE 500</p> <p>Address Line 4: MORRISVILLE, NORTH CAROLINA 27560</p> |                    |               |                    |                     |                  |                  |            |                 |            |              |            |
| ATTORNEY DOCKET NUMBER:   | 08-1207.91         |               |                    |                     |                  |                  |            |                 |            |              |            |
| NAME OF SUBMITTER:  | Charles L. Moore   |               |                    |                     |                  |                  |            |                 |            |              |            |
| <p>Total Attachments: 2</p> <p>source=Assignment#page1.tif</p>  |                    |               |                    |                     |                  |                  |            |                 |            |              |            |

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**500889475**

**PATENT**  
**REEL: 022843 FRAME: 0316**



**ASSIGNMENT**

**WHEREAS**, Ketao Liu, residing at 13726 Kyle Drive, Cerritos, California 90703, Qinghong W. Wang, residing at 1322 Fonthill Avenue, Torrance, California 90503, and Douglas H. Hein, residing at 2545 Cordelia Road, Los Angeles, California 90049, (hereinafter "Assignor") have invented certain new and useful improvements in an **GPS BASED ORBIT DETERMINATION OF A SPACECRAFT IN THE PRESENCE OF THRUSTER MANEUVERS**, (hereinafter "invention") for which Assignor is making or has made application for **LETTERS PATENT OF THE UNITED STATES**, which application has been duly executed by Assignor on date(s) listed below.

**AND WHEREAS**, The Boeing Company, a corporation organized and existing under the laws of the State of Delaware, US, having a place of business at 100 N. Riverside, Chicago, Illinois 60606-1596, with a mailing address of P.O. Box 2515, MC 110-SD54, Seal Beach, California 90740-1515, US (hereinafter called "the Assignee"), is desirous of acquiring the entire right, title and interest in and to said invention within the United States of America and its territorial possessions and all foreign countries any United States or foreign **LETTERS PATENT** that may be granted therefor.

**NOW, THIS INDENTURE WITNESSETH**, that for good and valuable considerations, the receipt whereof is hereby acknowledged, Assignor has assigned, sold and transferred, and does hereby assign, sell and transfer to the said Assignee the entire right, title and interest in and to the said invention, within the United States of America and its territorial possessions and all foreign countries and in and to any **LETTERS PATENT** of the United States and foreign countries, including utility models, inventor's certificates and like government grants, and all divisions reissues, continuations and extensions thereof that may be granted therefor, and the right to apply for **LETTERS PATENT** in foreign countries with full benefit of such priorities as may now or hereafter be granted to Assignor by local laws or by treaty including any international convention, for the protection of industrial property, together with the right to extend the protection of said United States **LETTERS PATENT** to the various territorial possessions now owned or which may be hereafter acquired by the United States of America, all said rights to be held and enjoyed by the Assignee for its own use and benefit and for the use and benefit of its successors or assigns, to the full end of the term for which said **LETTERS PATENT** may be granted, as fully and entirely as the same would have been held and enjoyed by Assignor if this assignment and sale had not been made. And Assignor does hereby request and authorize the Commissioner of Patents and Trademarks, US and its foreign counterparts to issue said **LETTERS PATENT** when granted, in accordance with this assignment.

Assignor further covenants and agrees with the Assignee that Assignor has a full and unencumbered title to the invention hereby assigned, which title Assignor warrants unto the Assignee, and Assignor further agrees that Assignor will, without demanding any further consideration therefor, at the request but at the expense of the Assignee, do all lawful and just acts, including the execution and acknowledgment of instruments, that may be or become necessary for obtaining sustaining, extending, reissuing or reexamining United States and foreign **LETTERS PATENT** or the like for the said invention, and for maintaining and perfecting the Assignee's right to said invention and **LETTERS PATENT** particularly in cases of interference conflict, opposition and litigation.

IN TESTIMONY WHEREOF, we have hereunto set our hands on the date specified below.

Ketao Liu      6/12/2009      Qinghong W. Wang      6/12/2009  
Ketao Liu      (date)      Qinghong W. Wang      (date)

Douglas H. Hein      6/17/2009  
Douglas H. Hein      (date)