PATENT ASSIGNMENT

Electronic Version v1.1 Stylesheet Version v1.1

| SUBMISSION TYPE: | NEW ASSIGNMENT |
|-----------------------|----------------|
| NATURE OF CONVEYANCE: | ASSIGNMENT |

CONVEYING PARTY DATA

| Name | Execution Date |
|---------------------|----------------|
| DAIHYUN LIM | 07/11/2012 |
| MARCEL A. KOSSEL | 07/18/2012 |
| PRADEEP THIAGARAJAN | 07/11/2012 |

RECEIVING PARTY DATA

| Name: | INTERNATIONAL BUSINESS MACHINES CORPORATION | | |
|-----------------|---|--|--|
| Street Address: | NEW ORCHARD ROAD | | |
| City: | ARMONK | | |
| State/Country: | NEW YORK | | |
| Postal Code: | 10504 | | |

PROPERTY NUMBERS Total: 1

| Property Type | Number | |
|---------------------|----------|--|
| Application Number: | 13556237 | |

CORRESPONDENCE DATA

 Fax Number:
 8458926363

 Phone:
 845-894-3363

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Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent

via US Mail.

Correspondent Name: INTERNATIONAL BUSINESS MACHINES CORPORAT

Address Line 1: BLDG. 321-482 Address Line 2: 2070 ROUTE 52

Address Line 4: HOPEWELL JUNCTION, NEW YORK 12533

| ATTORNEY DOCKET NUMBER: | FIS920120089US1 |
|-------------------------|------------------|
| NAME OF SUBMITTER: | lan D. MacKinnon |

Total Attachments: 6

PATENT REEL: 028619 FRAME: 0172 CH \$40.00

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PATENT REEL: 028619 FRAME: 0173

<u>ASSIGNMENT</u>

Whereas, the undersigned Inventor(s) has/have made certain inventions, improvements, and discoveries (herein referred to as the "Invention") in:

Title of the Invention:

PHASE ROTATOR BASED ON VOLTAGE REFERENCING

| | ocket Number provided above in the header of this Assignment, for lates Patent was executed concurrently herewith or was filed having: |
|--|--|
| Serial Number: | (insert series code and serial number here if/when available) |
| Whereas, International Business Ma | schines Corporation, a corporation of New York having a place of |
| business at Armonk, New York (her | rein referred to as "IBM"), desires to acquire, and each undersigned |
| Inventor desires to grant to IBM, the | e entire worldwide right, title, and interest in and to the Invention and |
| in and to any and all patent applicati | ions and patents directed thereto: |

Now, therefore, for good and valuable consideration, the receipt and sufficiency thereof being hereby acknowledged, each undersigned Inventor ("ASSIGNOR") hereby sells, assigns, and otherwise transfers to IBM (the "ASSIGNEE"), its successors, legal representatives, and assigns, the entire worldwide right, title, and interest in and to the Invention, the above-identified United States patent application, and any and all other patent applications and patents for the Invention which may be applied for or granted therefor in the United States and in all foreign countries and jurisdictions, including all divisions, continuations, reissues, reexaminations, renewals, extensions, counterparts, substitutes, and extensions thereof, and all rights of priority resulting from the filing of such applications and granting of such patents. In addition, each undersigned Inventor hereby authorizes and requests the Director of the United States Patent and Trademark Office to issue any United States Patent, and foreign patent authorities to issue any foreign patent, granted for the Invention, to IBM, its successors, legal representatives, and assigns, the entire worldwide right, title, and interest in and to the same to be held and enjoyed by IBM, its successors, legal representatives, and assigns to the full end of the terms for which any and all such patents may be granted, as fully and entirely as would have been held and enjoyed by the undersigned had this Assignment not been made; and each undersigned Inventor agrees to execute any and all documents and instruments and perform all lawful acts reasonably related to recording this Assignment or perfecting title to the Invention and all related patents and applications, in IBM, its successors, legal representatives, and assigns, whenever requested by HBM, its successors, legal representatives, or assigns.

Each undersigned Inventor acknowledges their prior and ongoing obligations to sell, assign, and transfer the rights under this Assignment to IBM and is unaware of any reason why they may not have the full and unencumbered right to sell, assign, and transfer the rights hereby sold, assigned, and transferred, and has not executed, and will not execute, any document or instrument in conflict herewith. Each undersigned Inventor also hereby grants IBM, its successors, legal representatives, and assigns, the right to insert in this Assignment any further identification (including, but not limited to, patent application Serial Number) which may be necessary or desirable for recordation of this Assignment. This Assignment is governed by the substantive laws of the State of New York, and any disputes will be resolved in a New York state court or federal court sited in New York.

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| | Executed by inventor 1 of 3 | |
|--|-----------------------------|------------------|
| Signature: | Daihyun Lim | Date: |
| | Executed by Inventor 2 of 3 | 3 |
| Signature: | Marcel A. Kossel | Date: |
| ************************************** | Executed by Inventor 3 of 3 | 3 |
| Signature: | Pradeep Thiagarajan | Date:07/11/2012_ |

ASSIGNMENT

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Title of the Invention:

PHASE ROTATOR BASED ON VOLTAGE REFERENCING

| and further identified by the IBM Docket Number provided above in the header of this Assignment, for which an application for a United States Patent was executed concurrently herewith or was filed having: | | | | |
|--|--|--|--|--|
| Serial Number: | (insert series code and serial number here if/when available) | | | |
| | ess Machines Corporation, a corporation of New York having a place of | | | |
| | k (herein referred to as "IBM"), desires to acquire, and each undersigned | | | |
| | M, the entire worldwide right, title, and interest in and to the Invention and | | | |
| in and to any and all patent ap | plications and patents directed thereto; | | | |

Now, therefore, for good and valuable consideration, the receipt and sufficiency thereof being hereby acknowledged, each undersigned Inventor ("ASSIGNOR") hereby sells, assigns, and otherwise transfers to IBM (the "ASSIGNEE"), its successors, legal representatives, and assigns, the entire worldwide right, title, and interest in and to the Invention, the above-identified United States patent application, and any and all other patent applications and patents for the Invention which may be applied for or granted therefor in the United States and in all foreign countries and jurisdictions, including all divisions, continuations, reissues, reexaminations, renewals, extensions, counterparts, substitutes, and extensions thereof, and all rights of priority resulting from the filing of such applications and granting of such patents. In addition, each undersigned Inventor hereby authorizes and requests the Director of the United States Patent and Trademark Office to issue any United States Patent, and foreign patent authorities to issue any foreign patent, granted for the Invention, to IBM, its successors, legal representatives, and assigns, the entire worldwide right, title, and interest in and to the same to be held and enjoyed by IBM. its successors, legal representatives, and assigns to the full end of the terms for which any and all such patents may be granted, as fully and entirely as would have been held and enjoyed by the undersigned had this Assignment not been made; and each undersigned Inventor agrees to execute any and all documents and instruments and perform all lawful acts reasonably related to recording this Assignment or perfecting title to the Invention and all related patents and applications, in IBM, its successors, legal representatives. and assigns, whenever requested by IBM, its successors, legal representatives, or assigns.

Each undersigned Inventor acknowledges their prior and ongoing obligations to sell, assign, and transfer the rights under this Assignment to IBM and is unaware of any reason why they may not have the full and unencumbered right to sell, assign, and transfer the rights hereby sold, assigned, and transferred, and has not executed, and will not execute, any document or instrument in conflict herewith. Each undersigned Inventor also hereby grants IBM, its successors, legal representatives, and assigns, the right to insert in this Assignment any further identification (including, but not limited to, patent application Serial Number) which may be necessary or desirable for recordation of this Assignment. This Assignment is governed by the substantive laws of the State of New York, and any disputes will be resolved in a New York state court or federal court sited in New York.

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| Signature: | Daihyun Lim | | Date: _ | indiana ka ka ka mada sa mada s | Manager of the Prince | |
| ******************************* | | Executed by Inventor 2 of 3 | | na a para a na conserva de la conse | - | |
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| Signature: | M. Hossel | | Date: | J484 | 90 | 2012 |
| | Marcel A. Kossel | | | Ų | | |
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| | | | | | | |
| Signature: | | | Date: | | | |
| | Pradeen Thiagarais | ın | | | | |

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ASSIGNMENT

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Title of the Invention:

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and further identified by the IRM Docket Number provided above in the header of this Assignment, for

| • | ted States Patent was executed concurrently herewith or was filed having: |
|----------------------------------|--|
| Serial Number: | (insert series code and serial number here if/when available) |
| | ss Machines Corporation, a corporation of New York having a place of |
| | k (herein referred to as "IBM"), desires to acquire, and each undersigned |
| Inventor desires to grant to IB | M, the entire worldwide right, title, and interest in and to the Invention and |
| in and to any and all patent app | plications and patents directed thereto; |

Now, therefore, for good and valuable consideration, the receipt and sufficiency thereof being hereby acknowledged, each undersigned Inventor ("ASSIGNOR") hereby sells, assigns, and otherwise transfers to IBM (the "ASSIGNEE"), its successors, legal representatives, and assigns, the entire worldwide right, title, and interest in and to the Invention, the above-identified United States patent application, and any and all other patent applications and patents for the Invention which may be applied for or granted therefor in the United States and in all foreign countries and jurisdictions, including all divisions, continuations, reissues, reexaminations, renewals, extensions, counterparts, substitutes, and extensions thereof, and all rights of priority resulting from the filing of such applications and granting of such patents. In addition, each undersigned Inventor hereby authorizes and requests the Director of the United States Patent and Trademark Office to issue any United States Patent, and foreign patent authorities to issue any foreign patent, granted for the Invention, to IBM, its successors, legal representatives, and assigns, the entire worldwide right, title, and interest in and to the same to be held and enjoyed by IBM, its successors, legal representatives, and assigns to the full end of the terms for which any and all such patents may be granted, as fully and entirely as would have been held and enjoyed by the undersigned had this Assignment not been made; and each undersigned Inventor agrees to execute any and all documents and instruments and perform all lawful acts reasonably related to recording this Assignment or perfecting title to the Invention and all related patents and applications, in IBM, its successors, legal representatives, and assigns, whenever requested by IBM, its successors, legal representatives, or assigns.

Each undersigned Inventor acknowledges their prior and ongoing obligations to sell, assign, and transfer the rights under this Assignment to IBM and is unaware of any reason why they may not have the full and unencumbered right to sell, assign, and transfer the rights hereby sold, assigned, and transferred, and has not executed, and will not execute, any document or instrument in conflict herewith. Each undersigned Inventor also hereby grants IBM, its successors, legal representatives, and assigns, the right to insert in this Assignment any further identification (including, but not limited to, patent application Serial Number) which may be necessary or desirable for recordation of this Assignment. This Assignment is governed by the substantive laws of the State of New York, and any disputes will be resolved in a New York state court or federal court sited in New York.

| *************************************** | | Executed by inventor 1 of 3 | ., |
|---|--|-----------------------------|-----------------|
| Signature: | Dafhyun Lim | 2 | Date: 7/11/2012 |
| | | Executed by Inventor 2 of 3 | |
| Signature: | Marcel A. Kossel | | Date: |
| | ······································ | Executed by Inventor 3 of 3 | |
| Signature: | Pradeep Thiagaraja | <u> </u> | Date: |

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PATENT REEL: 028619 FRAME: 0179