

PATENT ASSIGNMENT

Electronic Version v1.1
 Stylesheet Version v1.1

SUBMISSION TYPE:	NEW ASSIGNMENT												
NATURE OF CONVEYANCE:	ASSIGNMENT												
CONVEYING PARTY DATA													
<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>Hao Xu</td> <td>02/28/2012</td> </tr> <tr> <td>Xiliang Luo</td> <td>02/29/2012</td> </tr> <tr> <td>Peter Gaal</td> <td>04/02/2012</td> </tr> <tr> <td>Tingfang Ji</td> <td>02/29/2012</td> </tr> <tr> <td>Kapil Bhattad</td> <td>03/01/2012</td> </tr> </tbody> </table>		Name	Execution Date	Hao Xu	02/28/2012	Xiliang Luo	02/29/2012	Peter Gaal	04/02/2012	Tingfang Ji	02/29/2012	Kapil Bhattad	03/01/2012
Name	Execution Date												
Hao Xu	02/28/2012												
Xiliang Luo	02/29/2012												
Peter Gaal	04/02/2012												
Tingfang Ji	02/29/2012												
Kapil Bhattad	03/01/2012												
RECEIVING PARTY DATA													
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">Name:</td> <td>QUALCOMM Incorporated</td> </tr> <tr> <td>Street Address:</td> <td>5775 Morehouse Drive</td> </tr> <tr> <td>City:</td> <td>San Diego</td> </tr> <tr> <td>State/Country:</td> <td>CALIFORNIA</td> </tr> <tr> <td>Postal Code:</td> <td>92121-1714</td> </tr> </table>		Name:	QUALCOMM Incorporated	Street Address:	5775 Morehouse Drive	City:	San Diego	State/Country:	CALIFORNIA	Postal Code:	92121-1714		
Name:	QUALCOMM Incorporated												
Street Address:	5775 Morehouse Drive												
City:	San Diego												
State/Country:	CALIFORNIA												
Postal Code:	92121-1714												
PROPERTY NUMBERS Total: 2													
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Property Type</th> <th style="width: 70%;">Number</th> </tr> </thead> <tbody> <tr> <td>Application Number:</td> <td>13401660</td> </tr> <tr> <td>Application Number:</td> <td>61445420</td> </tr> </tbody> </table>		Property Type	Number	Application Number:	13401660	Application Number:	61445420						
Property Type	Number												
Application Number:	13401660												
Application Number:	61445420												
CORRESPONDENCE DATA													
Fax Number:	(713)623-4846												
Phone:	713-623-4844												
Email:	tthomas@pattersonsheridan.com, psdocketing@pattersonsheridan.com												
<i>Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent via US Mail.</i>													
Correspondent Name:	Randol Read / Patterson & Sheridan, LLP												
Address Line 1:	3040 Post Oak Blvd.												
Address Line 2:	Suite 1500												
Address Line 4:	Houston, TEXAS 77056												

OP \$80.00 13401660

ATTORNEY DOCKET NUMBER:	QUAL/111129US - TT
NAME OF SUBMITTER:	Randol W. Read
<p>Total Attachments: 9</p> <p>source=Assignment#page1.tif</p> <p>source=Assignment#page2.tif</p> <p>source=Assignment#page3.tif</p> <p>source=Assignment#page4.tif</p> <p>source=Assignment#page5.tif</p> <p>source=Assignment#page6.tif</p> <p>source=Assignment#page7.tif</p> <p>source=Assignment#page8.tif</p> <p>source=Assignment#page9.tif</p>	

ASSIGNMENT

WHEREAS, WE,

1. **Hao Xu**, a citizen of The United States of America, having a mailing address located at 5775 Morehouse Drive, San Diego, CA 92121, US and a resident of San Diego, CA, US,
2. **Xiliang Luo**, a citizen of China, having a mailing address located at 5775 Morehouse Drive, San Diego, CA 92121, US and a resident of Cardiff, CA, US,
3. **Peter Gaal**, a citizen of The United States of America, having a mailing address located at 5775 Morehouse Drive, San Diego, CA 92121, US and a resident of San Diego, CA, US,
4. **Tingfang Ji**, a citizen of China, having a mailing address located at 5775 Morehouse Drive, San Diego, CA 92121, US and a resident of San Diego, CA, US,
5. **Kapil Bhattad**, a citizen of India, having a mailing address located at 5775 Morehouse Drive, San Diego, CA 92121, US and a resident of Bangalore, India,

have conceived of one or more processes, methods, machines, articles of manufacture, designs, compositions of matter, inventions, discoveries or new or useful improvements relating to **DISCOVERY REFERENCE SIGNAL DESIGN FOR COORDINATED MULTIPOINT OPERATIONS IN HETEROGENEOUS NETWORKS** (collectively the "INVENTIONS") for which WE have executed and/or may execute one or more patent applications therefor; and

WHEREAS, QUALCOMM Incorporated (hereinafter "**ASSIGNEE**"), a Delaware corporation, having a place of business at 5775 Morehouse Drive, San Diego, California 92121-1714, U.S.A., desires to acquire or otherwise obtain the entire right, title, and interest in and to said INVENTIONS, including all inventions related thereto or thereof, all patent applications therefor, and all patents that have granted or may be granted hereafter thereon, including but not limited to those identified below.

NOW, THEREFORE, for good and valuable consideration, the receipt of which is hereby acknowledged, WE do hereby acknowledge that WE have sold, assigned, conveyed, and transferred, and by these presents do hereby sell, assign, convey, and transfer, unto ASSIGNEE, its successors, its legal representatives, and its assigns, the entire right, title, and interest throughout the world in and to said INVENTIONS, including all patent applications therefor that may have been filed or may be filed hereafter for said INVENTIONS in the United States, including but not limited to U.S. Application No(s). **13/401,660** filed February 21, 2012, Qualcomm Reference No. 111129, and all provisional applications relating thereto, together with U.S. Provisional Application No(s). **61/445,420**, filed February 22, 2011, Qualcomm Reference No. 111129P1, (and do hereby authorize ASSIGNEE and its representative to hereafter add herein such application number(s) and/or filing date(s) when known), and all divisional applications, renewal applications, continuation applications, continuation-in-part applications, and design applications thereof, and all issued patents of the United States which

may have granted or may be granted hereafter thereon and all reissues, renewals, reexaminations, and extensions to any of the foregoing and all patents issuing thereon in the United States;

AND WE further do acknowledge and agree that WE have sold, assigned, conveyed, and transferred, and by these presents do hereby sell, assign, convey, and transfer, unto ASSIGNEE, its successors, its legal representatives, and its assigns, all rights of priority under International Conventions, Treaties, or Agreements, and the entire right, title, and interest throughout the world in said INVENTIONS, including all inventions related thereto or thereof, and all patent applications therefor that may have been filed or may be filed hereafter for said INVENTIONS in any foreign country, countries, or treaty/union organizations, and all divisional applications, renewal applications, continuation applications, continuation-in-part applications, patent of addition applications, confirmation applications, validation applications, utility model applications, and design applications thereof, and all issued patents which may have granted or may be granted hereafter for said INVENTIONS in any country or countries foreign to the United States, and all reissues, renewals, reexaminations, and extensions thereof;


AND WE DO HEREBY authorize and request the Commissioner of Patents of the United States, and any Official of any country or countries foreign to the United States, whose duty it is to issue patents on applications or registrations, to issue all patents for said INVENTIONS to said ASSIGNEE, its successors, its legal representatives and its assigns, in accordance with the terms of this instrument;

AND WE DO HEREBY sell, assign, transfer, and convey to said ASSIGNEE, its successors, its legal representatives, and its assigns all claims for damages and all remedies arising out of or relating to any violation(s) of any of the rights assigned hereby that have or may have accrued prior to the date of assignment to said ASSIGNEE, or may accrue hereafter, including, but not limited to the right to sue for, seek, obtain, collect, recover, and retain damages and any ongoing or prospective royalties to which WE may be entitled, or that WE may collect for any infringement or from any settlement or agreement related to any of said patents before or after issuance;

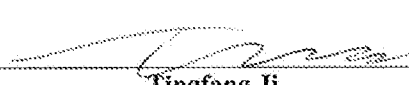
AND WE HEREBY covenant and agree that WE will communicate promptly to said ASSIGNEE, its successors, its legal representatives, and its assigns, any facts known to us respecting said INVENTIONS, and will testify in any legal proceeding, sign all lawful papers, execute all applications and certificates, make all rightful declarations and/or oaths, and provide all lawful assistance to said ASSIGNEE, its successors, its legal representatives and its assigns, to obtain and enforce patent protection for said INVENTIONS in all countries;

AND WE HEREBY represent that WE have full and exclusive, unencumbered right to sell, assign, convey and transfer all subject matter herein, and hereby covenant that WE have not and will not execute any writing or do any act whatsoever conflicting with these presents.

Done at San Diego, on 2/29/2012 
LOCATION DATE Hao Xu

Done at San Diego, on 2/29/2012 
LOCATION DATE Xiliang Luo

Done at _____, on _____
LOCATION DATE Peter Gaal

Done at San Diego, on 2/29/12 
LOCATION DATE Tingfang Ji

Done at _____, on _____
LOCATION DATE Kapil Bhattad

ASSIGNMENT

WHEREAS, WE,

1. **Hao Xu**, a citizen of The United States of America, having a mailing address located at 5775 Morehouse Drive, San Diego, CA 92121, US and a resident of San Diego, CA, US,
2. **Xiliang Luo**, a citizen of China, having a mailing address located at 5775 Morehouse Drive, San Diego, CA 92121, US and a resident of Cardiff, CA, US,
3. **Peter Gaal**, a citizen of The United States of America, having a mailing address located at 5775 Morehouse Drive, San Diego, CA 92121, US and a resident of San Diego, CA, US,
4. **Tingfang Ji**, a citizen of China, having a mailing address located at 5775 Morehouse Drive, San Diego, CA 92121, US and a resident of San Diego, CA, US,
5. **Kapil Bhattad**, a citizen of India, having a mailing address located at 5775 Morehouse Drive, San Diego, CA 92121, US and a resident of Bangalore, India,

have conceived of one or more processes, methods, machines, articles of manufacture, designs, compositions of matter, inventions, discoveries or new or useful improvements relating to **DISCOVERY REFERENCE SIGNAL DESIGN FOR COORDINATED MULTIPOINT OPERATIONS IN HETEROGENEOUS NETWORKS** (collectively the "INVENTIONS") for which WE have executed and/or may execute one or more patent applications therefor; and

WHEREAS, QUALCOMM Incorporated (hereinafter "**ASSIGNEE**"), a Delaware corporation, having a place of business at 5775 Morehouse Drive, San Diego, California 92121-1714, U.S.A., desires to acquire or otherwise obtain the entire right, title, and interest in and to said INVENTIONS, including all inventions related thereto or thereof, all patent applications therefor, and all patents that have granted or may be granted hereafter thereon, including but not limited to those identified below.

NOW, THEREFORE, for good and valuable consideration, the receipt of which is hereby acknowledged, WE do hereby acknowledge that WE have sold, assigned, conveyed, and transferred, and by these presents do hereby sell, assign, convey, and transfer, unto ASSIGNEE, its successors, its legal representatives, and its assigns, the entire right, title, and interest throughout the world in and to said INVENTIONS, including all patent applications therefor that may have been filed or may be filed hereafter for said INVENTIONS in the United States, including but not limited to U.S. Application No(s). 13/401,660 filed February 21, 2012, Qualcomm Reference No. 111129, and all provisional applications relating thereto, together with U.S. Provisional Application No(s). 61/445,420, filed February 22, 2011, Qualcomm Reference No. 111129P1, (and do hereby authorize ASSIGNEE and its representative to hereafter add herein such application number(s) and/or filing date(s) when known), and all divisional applications, renewal applications, continuation applications, continuation-in-part applications, and design applications thereof, and all issued patents of the United States which

may have granted or may be granted hereafter thereon and all reissues, renewals, reexaminations, and extensions to any of the foregoing and all patents issuing thereon in the United States;

AND WE further do acknowledge and agree that WE have sold, assigned, conveyed, and transferred, and by these presents do hereby sell, assign, convey, and transfer, unto ASSIGNEE, its successors, its legal representatives, and its assigns, all rights of priority under International Conventions, Treaties, or Agreements, and the entire right, title, and interest throughout the world in said INVENTIONS, including all inventions related thereto or thereof, and all patent applications therefor that may have been filed or may be filed hereafter for said INVENTIONS in any foreign country, countries, or treaty/union organizations, and all divisional applications, renewal applications, continuation applications, continuation-in-part applications, patent of addition applications, confirmation applications, validation applications, utility model applications, and design applications thereof, and all issued patents which may have granted or may be granted hereafter for said INVENTIONS in any country or countries foreign to the United States, and all reissues, renewals, reexaminations, and extensions thereof;

AND WE DO HEREBY authorize and request the Commissioner of Patents of the United States, and any Official of any country or countries foreign to the United States, whose duty it is to issue patents on applications or registrations, to issue all patents for said INVENTIONS to said ASSIGNEE, its successors, its legal representatives and its assigns, in accordance with the terms of this instrument;

AND WE DO HEREBY sell, assign, transfer, and convey to said ASSIGNEE, its successors, its legal representatives, and its assigns all claims for damages and all remedies arising out of or relating to any violation(s) of any of the rights assigned hereby that have or may have accrued prior to the date of assignment to said ASSIGNEE, or may accrue hereafter, including, but not limited to the right to sue for, seek, obtain, collect, recover, and retain damages and any ongoing or prospective royalties to which WE may be entitled, or that WE may collect for any infringement or from any settlement or agreement related to any of said patents before or after issuance;

AND WE HEREBY covenant and agree that WE will communicate promptly to said ASSIGNEE, its successors, its legal representatives, and its assigns, any facts known to us respecting said INVENTIONS, and will testify in any legal proceeding, sign all lawful papers, execute all applications and certificates, make all rightful declarations and/or oaths, and provide all lawful assistance to said ASSIGNEE, its successors, its legal representatives and its assigns, to obtain and enforce patent protection for said INVENTIONS in all countries;

AND WE HEREBY represent that WE have full and exclusive, unencumbered right to sell, assign, convey and transfer all subject matter herein, and hereby covenant that WE have not and will not execute any writing or do any act whatsoever conflicting with these presents.

Done at _____, on _____
LOCATION DATE Hao Xu

Done at _____, on _____
LOCATION DATE Xiliang Luo

Done at San Diego, on April 2, 2012
LOCATION DATE 
Peter Gaal

Done at _____, on _____
LOCATION DATE Tingfang Ji

Done at _____, on _____
LOCATION DATE Kapil Bhattad

ASSIGNMENT

WHEREAS, WE,

1. **Hao Xu**, a citizen of The United States of America, having a mailing address located at 5775 Morehouse Drive, San Diego, CA 92121, US and a resident of San Diego, CA, US,
2. **Xiliang Luo**, a citizen of China, having a mailing address located at 5775 Morehouse Drive, San Diego, CA 92121, US and a resident of Cardiff, CA, US,
3. **Peter Gaal**, a citizen of The United States of America, having a mailing address located at 5775 Morehouse Drive, San Diego, CA 92121, US and a resident of San Diego, CA, US,
4. **Tingfang Ji**, a citizen of China, having a mailing address located at 5775 Morehouse Drive, San Diego, CA 92121, US and a resident of San Diego, CA, US,
5. **Kapil Bhattad**, a citizen of India, having a mailing address located at 5775 Morehouse Drive, San Diego, CA 92121, US and a resident of Bangalore, India,

have conceived of one or more processes, methods, machines, articles of manufacture, designs, compositions of matter, inventions, discoveries or new or useful improvements relating to **DISCOVERY REFERENCE SIGNAL DESIGN FOR COORDINATED MULTIPOINT OPERATIONS IN HETEROGENEOUS NETWORKS** (collectively the "INVENTIONS") for which WE have executed and/or may execute one or more patent applications therefor; and

WHEREAS, QUALCOMM Incorporated (hereinafter "**ASSIGNEE**"), a Delaware corporation, having a place of business at 5775 Morehouse Drive, San Diego, California 92121-1714, U.S.A., desires to acquire or otherwise obtain the entire right, title, and interest in and to said INVENTIONS, including all inventions related thereto or thereof, all patent applications therefor, and all patents that have granted or may be granted hereafter thereon, including but not limited to those identified below.

NOW, THEREFORE, for good and valuable consideration, the receipt of which is hereby acknowledged, WE do hereby acknowledge that WE have sold, assigned, conveyed, and transferred, and by these presents do hereby sell, assign, convey, and transfer, unto ASSIGNEE, its successors, its legal representatives, and its assigns, the entire right, title, and interest throughout the world in and to said INVENTIONS, including all patent applications therefor that may have been filed or may be filed hereafter for said INVENTIONS in the United States, including but not limited to U.S. Application No(s). **13/401,660** filed February 21, 2012, Qualcomm Reference No. 111129, and all provisional applications relating thereto, together with U.S. Provisional Application No(s). **61/445,420**, filed February 22, 2011, Qualcomm Reference No. 111129P1, (and do hereby authorize ASSIGNEE and its representative to hereafter add herein such application number(s) and/or filing date(s) when known), and all divisional applications, renewal applications, continuation applications, continuation-in-part applications, and design applications thereof, and all issued patents of the United States which

may have granted or may be granted hereafter thereon and all reissues, renewals, reexaminations, and extensions to any of the foregoing and all patents issuing thereon in the United States;

AND WE further do acknowledge and agree that WE have sold, assigned, conveyed, and transferred, and by these presents do hereby sell, assign, convey, and transfer, unto ASSIGNEE, its successors, its legal representatives, and its assigns, all rights of priority under International Conventions, Treaties, or Agreements, and the entire right, title, and interest throughout the world in said INVENTIONS, including all inventions related thereto or thereof, and all patent applications therefor that may have been filed or may be filed hereafter for said INVENTIONS in any foreign country, countries, or treaty/union organizations, and all divisional applications, renewal applications, continuation applications, continuation-in-part applications, patent of addition applications, confirmation applications, validation applications, utility model applications, and design applications thereof, and all issued patents which may have granted or may be granted hereafter for said INVENTIONS in any country or countries foreign to the United States, and all reissues, renewals, reexaminations, and extensions thereof;

AND WE DO HEREBY authorize and request the Commissioner of Patents of the United States, and any Official of any country or countries foreign to the United States, whose duty it is to issue patents on applications or registrations, to issue all patents for said INVENTIONS to said ASSIGNEE, its successors, its legal representatives and its assigns, in accordance with the terms of this instrument;

AND WE DO HEREBY sell, assign, transfer, and convey to said ASSIGNEE, its successors, its legal representatives, and its assigns all claims for damages and all remedies arising out of or relating to any violation(s) of any of the rights assigned hereby that have or may have accrued prior to the date of assignment to said ASSIGNEE, or may accrue hereafter, including, but not limited to the right to sue for, seek, obtain, collect, recover, and retain damages and any ongoing or prospective royalties to which WE may be entitled, or that WE may collect for any infringement or from any settlement or agreement related to any of said patents before or after issuance;

AND WE HEREBY covenant and agree that WE will communicate promptly to said ASSIGNEE, its successors, its legal representatives, and its assigns, any facts known to us respecting said INVENTIONS, and will testify in any legal proceeding, sign all lawful papers, execute all applications and certificates, make all rightful declarations and/or oaths, and provide all lawful assistance to said ASSIGNEE, its successors, its legal representatives and its assigns, to obtain and enforce patent protection for said INVENTIONS in all countries;

AND WE HEREBY represent that WE have full and exclusive, unencumbered right to sell, assign, convey and transfer all subject matter herein, and hereby covenant that WE have not and will not execute any writing or do any act whatsoever conflicting with these presents.

PATENT

QUALCOMM Ref. No. 111129

Page 3 of 3

Done at _____, on _____
LOCATION DATE

Hao Xu

Done at _____, on _____
LOCATION DATE

Xiliang Luo

Done at _____, on _____
LOCATION DATE

Peter Gaal

Done at _____, on _____
LOCATION DATE

Tingfang Ji

Done at Bangalore India, on 3/1/2012
LOCATION DATE

Kapil
Kapil Bhattad

PATENT

RECORDED: 04/18/2012

REEL: 028064 FRAME: 0048