AO 120 (Rev. 08/10)

TO:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court District of Delaware on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
15-cv-615-RGA	7/17/2015	District of Delaware

PLAINTIFF	DEFENDANT
TQ Delta, LLC	Time Warner Cable Inc. and Time Warner Cable Enterprises LLC

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	See Attached		
2			
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In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY				
9/9/2015	☑ Amendment	☐ Answer	☐ Cross Bill	☐ Other Pleading	
	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK		
1	US 9,094,268 B2	7/28/2015	TQ Delta, LLC		
2					
3					
4					
5					

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	US 6,961,369 B1	11/1/2005	TQ Delta, LLC
2	US 8,718,158 B2	5/6/2014	TQ Delta, LLC
3	US 9,014,243 B2	4/21/2015	TQ Delta, LLC
4	US 7,835,430 B2	11/16/2010	TQ Delta, LLC
5	US 8,238,412 B2	8/7/2012	TQ Delta, LLC
6	US 8,432,956 B2	4/30/2013	TQ Delta, LLC
7	US 8,611,404 B2	12/17/2013	TQ Delta, LLC

AO 120 (Rev. 08/10)

TO:	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court District of Delaware on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
15-cv-616-RGA	7/17/2015	District of Delaware

PLAINTIFF	DEFENDANT
TQ Delta, LLC	Verizon Communications Inc., Verizon Services Corp., Verizon Online LLC, Verizon Business Network Services Inc., Verizon Delaware LLC, and Verizon Information Technologies LLC

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	See Attached		
2			
3			
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In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY
9/9/2015	☑ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	US 9,094,268 B2	7/28/2015	TQ Delta, LLC
2			
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	US 6,961,369 B1	11/1/2005	TQ Delta, LLC
2	US 8,718,158 B2	5/6/2014	TQ Delta, LLC
3	US 9,014,243 B2	4/21/2015	TQ Delta, LLC
4	US 7,835,430 B2	11/16/2010	TQ Delta, LLC
5	US 8,238,412 B2	8/7/2012	TQ Delta, LLC
6	US 8,432,956 B2	4/30/2013	TQ Delta, LLC
7	US 8,611,404 B2	12/17/2013	TQ Delta, LLC

AO 120 (Rev. 08/10)

TO:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Middle District of Florida, Orlando Division on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
6:14-cv-1027	6/26/2014	Middle District of Florida, Orlando Division

PLAINTIFF	DEFENDANT
Orlando Communications LLC	LG Electronics, Inc., et al

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	5,687,1296	11/11/1997	James Arthur Proctor, Jr., James Carl Otto
2	6,0009,553	12/28/0199	Dennis Martinez, Thomas Hengeveld, Michael Axford
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In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT
Order of Dismissal

CLERK	(BY) DEPUTY CLERK	DATE
Sheryl Loesch	R. Olsen	9/9/2015

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

AO 120 (Rev. 08/10)

TO:	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Middle District of Florida, Orlando Division on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
6:14-cv-1026	6/26/2014	Middle District of Florida, Orlando Division

PLAINTIFF	DEFENDANT
Orlando Communications LLC	LG Electronics, Inc., et al

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	5,687,1296	11/11/1997	James Arthur Proctor, Jr., James Carl Otto
2	6,0009,553	12/28/0199	Dennis Martinez, Thomas Hengeveld, Michael Axford
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In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT
Order of Dismissal

CLERK	(BY) DEPUTY CLERK	DATE
Sheryl Loesch	R. Olsen	9/9/2015

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

AO 120 (Rev. 08/10)

TO:	**Mail Stop 8** **Director of the U.S. Patent and Trademark Office** **P.O. Box 1450** **Alexandria, VA 22313-1450**	**REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK**

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Middle District of Florida, Orlando Division on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
6:14-cv-1028	6/26/2014	Middle District of Florida, Orlando Division

PLAINTIFF	DEFENDANT
Orlando Communications LLC	HTC Corporation, et al

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	5,687,1296	11/11/1997	James Arthur Proctor, Jr., James Carl Otto
2	6,0009,553	12/28/0199	Dennis Martinez, Thomas Hengeveld, MIchael Axford
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In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT
Order of Dismissal

CLERK	(BY) DEPUTY CLERK	DATE
Sheryl Loesch	R. Olsen	9/9/2015

Copy 1—Upon initiation of action, mail this copy to Director **Copy 3—Upon termination of action, mail this copy to Director**
Copy 2—Upon filing document adding patent(s), mail this copy to Director **Copy 4—Case file copy**

AO 120 (Rev. 08/10)

TO:	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
Mail Stop 8 **Director of the U.S. Patent and Trademark Office** **P.O. Box 1450** **Alexandria, VA 22313-1450**	

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Delaware on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
	9/4/2013	Delaware

PLAINTIFF	DEFENDANT
ROCHE PALO ALTO LLC and GENENTECH, INC.	WATSON LABORATORIES, INC. – FLORIDA

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	6,083,953	7/4/2000	Roche Palo Alto LLC
2			
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In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT
Dismissed – See Attached

CLERK	(BY) DEPUTY CLERK	DATE
John A Cerino, Clerk United States District Court 844 N. King Street, Unit 18 Wilmington, DE 19801		7/17/15

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

AO 120 (Rev. 08/10)

TO:	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court District of Delaware on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
	7/17/2015	District of Delaware

PLAINTIFF	DEFENDANT
TQ Delta, LLC	Verizon Communications Inc., Verizon Services Corp., Verizon Online LLC, Verizon Business Network Services Inc., Verizon Delaware LLC, and Verizon Information Technologies LLC

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	See Attached		
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In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	US 6,961,369 B1	11/1/2005	TQ Delta, LLC
2	US 8,718,158 B2	5/6/2014	TQ Delta, LLC
3	US 9,014,243 B2	4/21/2015	TQ Delta, LLC
4	US 7,835,430 B2	11/16/2010	TQ Delta, LLC
5	US 8,238,412 B2	8/7/2012	TQ Delta, LLC
6	US 8,432,956 B2	4/30/2013	TQ Delta, LLC
7	US 8,611,404 B2	12/17/2013	TQ Delta, LLC

AO 120 (Rev. 3/04)

TO:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Massachusetts on the following G Patents or G Trademarks:

DOCKET NO.	DATE FILED 7/17/2015	U.S. DISTRICT COURT Massachusetts
PLAINTIFF BOSTON PROPERTIES LIMITED PARTNERSHIP		DEFENDANT CLAUDETTE MOUSSA, d/b/a Boston Properties Advisors

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	2,527,181	1/8/2002	BOSTON PROPERTIES LIMITED PARTNERSHIP
2			
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In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY G Amendment G Answer G Cross Bill G Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

Copy 1—Upon initiation of action, mail this copy to Director **Copy 3—Upon termination of action, mail this copy to Director**
Copy 2—Upon filing document adding patent(s), mail this copy to Director **Copy 4—Case file copy**

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.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/718,016	04/21/2015	9014243	6936-47-CON-DIV-CON-3	4520

62574 7590 04/01/2015

Jason H. Vick
Sheridan Ross, PC
Suite # 1200
1560 Broadway
Denver, CO 80202

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):

Marcos C. Tzannes, Orinda, CA;
TQ DELTA, LLC, Austin, TX

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.
13/718,016	12/18/2012	Marcos C. Tzannes	6936-47-CON-DIV-CON-3	4520

62574 7590 03/20/2015

Jason H. Vick
Sheridan Ross, PC
Suite # 1200
1560 Broadway
Denver, CO 80202

EXAMINER	
JOSEPH, JAISON	

ART UNIT	PAPER NUMBER
2633	

NOTIFICATION DATE	DELIVERY MODE
03/20/2015	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jvick@sheridanross.com

Response to Rule 312 Communication	Application No.	Applicant(s)
	13/718,016	TZANNES, MARCOS C.
	Examiner	Art Unit
	JAISON JOSEPH	2633

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

1. ☒ The amendment filed on *26 February 2015* under 37 CFR 1.312 has been considered, and has been:

a) ☒ entered.

b) ☐ entered as directed to matters of form not affecting the scope of the invention.

c) ☐ disapproved because the amendment was filed after the payment of the issue fee.
Any amendment filed after the date the issue fee is paid must be accompanied by a petition under 37 CFR 1.313(c)(1) and the required fee to withdraw the application from issue.

d) ☐ disapproved. See explanation below.

e) ☐ entered in part. See explanation below.

Attached: IDS

/JAISON JOSEPH/
Primary Examiner, Art Unit 2633

Substitute for form 1449A/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/718,016
				Filing Date	December 18, 2012
				First Named Inventor	Marcos C. Tzannes
				Art Unit	2633
				Examiner Name	JOSEPH, JAISON
Sheet	1	of	4	Attorney Docket Number	6936-47-CON-DIV-CON-3

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-kind Code [2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee of Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]; Number[4]; Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

OTHER ART (Including Author, Title, Date, Pertinent Pages, etc.)		
Examiner Initials*	Cite No.[1]	
/JJ/	1	TQ Delta LLC's Mandatory Notices Under 37 C.F.R. 42.8(a)(2) for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00247 filed November 26, 2014 (Attorney's Ref. No.: 6936-47-CON-IPR) (5 pages)
/JJ/	2	Notice of Filing Date Accorded to Petition and Time for Filing Patent Owner Preliminary Response for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00247 filed December 1, 2014 (Attorney's Ref. No.: 6936-47-CON-IPR) (4 pages)
/JJ/	3	ORDER - Authorization to File a Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00247 filed December 5, 2014 (Attorney's Ref. No.: 6936-47-CON-IPR) (3 pages)
/JJ/	4	2Wire, Inc.'s Motion to Correct Filing Date (Including Exhibits 1023-1030) for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00247 filed December 12, 2014 (Attorney's Ref. No.: 6936-47-CON-IPR) (57 pages)
/JJ/	5	TQ Delta LLC's Opposition to Petitioner's Motion to Change the Petition Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00247 filed December 19, 2014 (Attorney's Ref. No.: 6936-47-CON-IPR) (7 pages)
/JJ/	6	DECISION - Motion to Correct Filing Date 37 C.F.R § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00247 filed January 15, 2015 (Attorney's Ref. No.: 6936-47-CON-IPR) (9 pages)

Examiner Signature	/Jaison Joseph/	Date Considered	03/16/2015

*EXAMINER: Initial if reference is considered, whether or not citation is in conformance and not considered. Include copy of this form with next communication to applicant.

Substitute for form 1449A/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/718,016
				Filing Date	December 18, 2012
				First Named Inventor	Marcos C. Tzannes
				Art Unit	2633
				Examiner Name	JOSEPH, JAISON
Sheet	2	of	4	Attorney Docket Number	6936-47-CON-DIV-CON-3

/JJ/	7	TQ Delta LLC's Mandatory Notices Under 37 C.F.R. 42.8(a)(2) for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00239 filed November 26, 2014 (Attorney's Ref. No.: 6936-47-CON-2-IPR) (5 pages)
/JJ/	8	Notice of Filing Date Accorded to Petition and Time for Filing Patent Owner Preliminary Response for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00239 filed December 1, 2014 (Attorney's Ref. No.: 6936-47-CON-2-IPR) (4 pages)
/JJ/	9	ORDER - Authorization to File a Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00239 filed Dec. 5 2014 (Attorney's Ref. No.: 6936-47-CON-2-IPR) (3 pages)
/JJ/	10	2Wire, Inc.'s Motion to Correct Filing Date (Including Exhibits 1023-1030) for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00239 filed Dec. 12, 2014 (Attorney's Ref. No.: 6936-47-CON-2-IPR) (57 pages)
/JJ/	11	TQ Delta LLC's Opposition to Petitioner's Motion to Change the Petition Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00239 filed Dec. 19, 2014 (Attorney's Ref. No.: 6936-47-CON-2-IPR) (7 pages)
/JJ/	12	Decision - Motion to Correct Filing Date 37 C.F.R § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00239 filed Jan. 15, 2015 (Attorney's Ref. No.: 6936-47-CON-2-IPR) (9 pages)
/JJ/	13	TQ Delta LLC's Mandatory Notices Under 37 C.F.R 42.8(a)(2) for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00240 filed Nov. 26, 2014 (Attorney's Ref. No.: 6936-47-CON-4-IPR) (5 pages)
/JJ/	14	Notice of Filing Date Accorded to Petition and Time for Filing Patent Owner Preliminary Response for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00240 filed Dec. 1, 2014 (Attorney's Ref. No.: 6936-47-CON-4-IPR) (4 pages)
/JJ/	15	ORDER: Authorization to File a Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00240 filed Dec. 5, 2014 (Attorney's Ref. No.: 6936-47-CON-4-IPR) (3 pages)
/JJ/	16	2Wire, Inc.'s Motion to Correct Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00240 filed Dec. 12, 2014 (Attorney's Ref. No.: 6936-47-CON-4-IPR) (57 pages)
/JJ/	17	TQ Delta LLC's Opposition to Petitioner's Motion to Change the Petition Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00240 filed Dec. 19, 2014 (Attorney's Ref. No.: 6936-47-CON-4-IPR) (7 pages)

Examiner Signature	/Jaison Joseph/	Date Considered	03/16/2015

*EXAMINER: Initial if reference is considered, whether or not citation is in conformance and not considered. Include copy of this form with next communication to applicant.

Substitute for form 1449A/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/718,016
				Filing Date	December 18, 2012
				First Named Inventor	Marcos C. Tzannes
				Art Unit	2633
				Examiner Name	JOSEPH, JAISON
Sheet	3	of	4	Attorney Docket Number	6936-47-CON-DIV-CON-3

/JJ/	18	Decision: Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00240 filed Jan. 15, 2015 (Attorney's Ref. No.: 6936-47-CON-4-IPR) (9 pages)
/JJ/	19	TQ Delta LLC's Mandatory Notices Under 37 C.F.R. 42.8(a)(2) for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00241 filed Nov. 26, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-IPR) (5 pages)
/JJ/	20	Notice of Filing Date Accorded to Petition and Time for Filing Patent Owner Preliminary Response for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00241 filed Dec. 1, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-IPR) (4 pages)
/JJ/	21	ORDER: Authorization to File a Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00241 filed Dec. 5, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-IPR) (3 pages)
/JJ/	22	2Wire, Inc.'s Motion to Correct Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00241 filed Dec. 12, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-IPR) (57 pages)
/JJ/	23	TQ Delta LLC's Opposition to Petitioner's Motion to Change the Petition Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00241 filed Dec. 19, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-IPR) (7 pages)
/JJ/	24	Decision: Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00241 filed Jan. 15, 2015 (Attorney's Ref. No.: 6936-47-CON-DIV-IPR) (9 pages)
/JJ/	25	TQ Delta LLC's Mandatory Notices Under 37 C.F.R. 42.8(a)(2) for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00242 filed Nov. 26, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-IPR) (5 pages)
/JJ/	26	Notice of Filing Date Accorded to Petition and Time for Filing Patent Owner Preliminary Response for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00242 filed Dec. 1, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-IPR) (4 pages)
/JJ/	27	ORDER: Authorization to File a Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00242 filed Dec. 5, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-IPR) (3 pages)
/JJ/	28	2Wire, Inc.'s Motion to Correct Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00242 filed Dec. 12, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-IPR) (57 pages)
/JJ/	29	TQ Delta LLC's Opposition to Petitioner's Motion to Change the Petition Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00242 filed Dec. 19, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-IPR) (7 pages)

Examiner Signature	/Jaison Joseph/	Date Considered	03/16/2015

*EXAMINER: Initial if reference is considered, whether or not citation is in conformance and not considered. Include copy of this form with next communication to applicant.

Substitute for form 1449A/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/718,016
				Filing Date	December 18, 2012
				First Named Inventor	Marcos C. Tzannes
				Art Unit	2633
				Examiner Name	JOSEPH, JAISON
Sheet	4	of	4	Attorney Docket Number	6936-47-CON-DIV-CON-3

/JJ/	30	Decision: Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00242 filed Jan. 15, 2015 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-IPR) (9 pages)
/JJ/	31	TQ Delta LLC's Mandatory Notices Under 37 C.F.R. 42.8(a)(2) for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00243 filed Nov. 26, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-2-IPR) (5 pages)
/JJ/	32	Notice of Filing Date Accorded to Petition and Time for Filing Patent Owner Preliminary Response for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00243 filed Dec. 1, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-2-IPR) (4 pages)
/JJ/	33	ORDER: Authorization to File a Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00243 filed Dec. 5, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-2-IPR) (3 pages)
/JJ/	34	2Wire, Inc.'s Motion to Correct Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00243 filed Dec. 12, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-2-IPR) (57 pages)
/JJ/	35	TQ Delta LLC's Opposition to Petitioner's Motion to Change the Petition Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00243 filed Dec. 19, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-2-IPR) (7 pages)
/JJ/	36	Decision: Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00243 filed Jan. 15, 2015 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-2-IPR) (9 pages)

Examiner Signature	/Jaison Joseph/	Date Considered	03/16/2015

*EXAMINER: Initial if reference is considered, whether or not citation is in conformance and not considered. Include copy of this form with next communication to applicant.

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)

62574 7590 12/05/2014

Jason H. Vick
Sheridan Ross, PC
Suite # 1200
1560 Broadway
Denver, CO 80202

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.
13/718,016	12/18/2012	Marcos C. Tzannes	6936-47-CON-DIV-CON-3	4520

TITLE OF INVENTION: SYSTEM AND METHOD FOR DESCRAMBLING THE PHASE OF CARRIERS IN A MULTICARRIER COMMUNICATIONS SYSTEM

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	03/05/2015

EXAMINER	ART UNIT	CLASS-SUBCLASS
JOSEPH, JAISON	2633	375-222000

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 Jason H. Vick
2 Sheridan Ross, PC
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: TQ DELTA, LLC

(B) RESIDENCE: (CITY and STATE OR COUNTRY): AUSTIN, TX

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 19-1970 (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 /Jason H. Vick/ Date February 26, 2015

Typed or printed name Jason H. Vick Registration No. 45,285

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of: Marcos C. Tzannes	)	Group Art Unit: 2633
Application No.: 13/718,016	)	Examiner: JOSEPH, Jaison
Filed: December 18, 2012	)	Confirmation No.: 4520
Atty. File No.: 6936-47-CON-DIV-CON-3	)	

For: SYSTEM AND METHOD FOR SCRAMBLING USING A BIT SCRAMBLER AND A PHASE SCRAMBLER

AMENDMENT AFTER ALLOWANCE UNDER 37 C.F.R. 1.312

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

Madam:

Applicants submit this Amendment After Allowance pursuant to 37 C.F.R. 1.312 in response to the Notice of Allowance having a mailing date of December 5, 2014. While Applicants believe that no fees are due with the filing of this response, the undersigned hereby authorizes the charge of any fees deemed necessary to Deposit Account No. 19-1970.

An amendment may be entered after the mailing of a Notice of Allowance but prior to payment of the issue fee upon recommendation of the primary Examiner. Therefore, it is respectfully requested that the above-referenced application be amended as follows:

Amendments to the Specification begin on page 2 of this paper.

Amendments to the Claims are shown in the listing of claims which begins on page 3 of this paper.

Remarks begin on page 7 of this paper.

AMENDMENTS TO THE SPECIFICATION

Please amend the first paragraph of the application beneath the heading "RELATED APPLICATIONS":

This application is a Continuation of U.S. Application No. 13/439,605, filed April 4, 2012, now U.S. Patent No. 8,355,427, which is a Continuation of U.S. Application No. 13/284,549, filed October 28, 2011, now U.S. Patent No. 8,218,610, which is a continuation of 11/860,080, filed September 24, 2007, now U.S. Patent No. 8,073,041, which is a divisional of U.S. Application No. 11/211,535, filed August 26, 2005, now U.S. Patent No. 7,292,627, which is a continuation of U.S. Application No. 09/710,310, filed on November 9, 2000, now U.S. Patent No. 6,961,369, which claims the benefit of the filing date of copending U.S. Provisional Application, Serial No. 60/164,134, filed November 9, 1999, entitled "A Method For Randomizing The Phase Of The Carriers In A Multicarrier Communications System To Reduce The Peak To Average Power Ratio Of The Transmitted Signal," each which are incorporated by reference herein in their entirety.

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.-20. (Cancelled)

21. (Previously Presented) A method, in a multicarrier communications transceiver comprising a bit scrambler followed by a phase scrambler, comprising:

scrambling, using the bit scrambler, a plurality of input bits to generate a plurality of scrambled output bits, wherein at least one scrambled output bit is different than a corresponding input bit;

scrambling, using the phase scrambler, a plurality of carrier phases associated with the plurality of scrambled output bits;

transmitting at least one scrambled output bit on a first carrier; and

transmitting the at least one scrambled output bit on a second carrier.

22. (Previously Presented) The method of claim 21, wherein the transceiver is a cable transceiver.

23. (Previously Presented) The method of claim 21, wherein the transceiver is a DSL transceiver.

24. (Previously Presented) The method of claim 21, wherein the transceiver is a wireless transceiver.

25. (Previously Presented) The method of claim 21, wherein the transceiver is operable for high speed internet access.

26. (Previously Presented) The method of claim 21, wherein the transceiver is operable to transport video.

27. (Cancelled)

28. (Previously Presented) A multicarrier communications transceiver comprising:

a bit scrambler operable to scramble a plurality of input bits to generate a plurality of scrambled output bits, wherein at least one scrambled output bit is different than a corresponding input bit;

a phase scrambler operable to scramble a plurality of carrier phases associated with the plurality of scrambled output bits; and

a transmitter portion operable to transmit at least one scrambled output bit on a first carrier and to transmit the at least one scrambled output bit on a second carrier.

29. (Previously Presented) The transceiver of claim 28, wherein the transceiver is a cable transceiver.

30. (Previously Presented) The transceiver of claim 28, wherein the transceiver is a DSL transceiver.

31. (Previously Presented) The transceiver of claim 28, wherein the transceiver is a wireless transceiver.

32. (Previously Presented) The transceiver of claim 28, wherein the transceiver is operable for high speed internet access.

33. (Previously Presented) The transceiver of claim 28, wherein the transceiver is operable to transport video.

34-41. (Cancelled)

42. (Previously Presented) A communication device comprising:

a multicarrier transmitter operable to support a bit scrambler and a phase scrambler for transmission of a plurality of input bits, wherein the bit scrambler is operable to scramble the plurality of input bits to generate a plurality of scrambled output bits, wherein at least one scrambled output bit is different than a corresponding input bit, and wherein the phase scrambler is operable to scramble a plurality of phases associated with the plurality of input bits.

43 (Currently Amended) The communication~~communications~~ device of claim 42, wherein the multicarrier transmitter is further operable to transmit at least one scrambled output bit on a first carrier and transmit the at least one scrambled output bit on a second carrier.

44. (Previously Presented) The communication device of claim 43, wherein the transceiver is a cable transceiver.

45. (Previously Presented) The communication device of claim 43, wherein the transceiver is a DSL transceiver.

46. (Previously Presented) The communication device of claim 43, wherein the transceiver is a wireless transceiver.

47. (Previously Presented) The communication device of claim 43, wherein the communication device is operable for high speed internet access.

48. (Previously Presented) The communication device of claim 43, wherein the communication device is operable to transport video.

49. (Previously Presented) A method comprising:

supporting, in a communication device comprising a multicarrier communications transceiver, a bit scrambler and a phase scrambler for transmission of a plurality of input bits wherein the bit scrambler scrambles the plurality of input bits to generate a plurality of scrambled output bits, wherein at least one scrambled output bit is different than a corresponding

input bit, and wherein the phase scrambler scrambles a plurality of phases associated with the plurality of input bits.

50. (Previously Presented) The method of claim 49 further comprising:
transmitting at least one scrambled output bit on a first carrier; and
transmitting the at least one scrambled output bit on a second carrier.

51. (Currently Amended) The method~~communication device~~ of claim 49, wherein the transceiver is a DSL transceiver.

52. (Currently Amended) The method~~communication device~~ of claim 49, wherein the transceiver is a wireless transceiver.

53. (Currently Amended) The method~~communication device~~ of claim 49, wherein the communication device is operable for high speed internet access.

54. (Currently Amended) The method~~communication device~~ of claim 49, wherein the communication device is operable to transport video.

REMARKS

By this amendment, the Related Applications has been updated. No new matter is believed to be introduced by this amendment.

Claims 43 and 51-54 has been amended to correct grammatical errors. No new matter is believed to be introduced by this amendment.

The Commissioner is hereby authorized to charge to deposit account number 19-1970 any fees under 37 CFR § 1.16 and 1.17 that may be required by this paper and to credit any overpayment to that Account. If any extension of time is required in connection with the filing of this paper and has not been separately requested, such extension is hereby petitioned.

Respectfully submitted,

SHERIDAN ROSS P.C.

Date: February 26, 2015

By: /Jason H. Vick/

Jason H. Vick
Reg. No. 45,285
1560 Broadway, Suite 1200
Denver, Colorado 80202
Telephone: 303-863-9700

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of:	)	Group Art Unit: 2633
Marcos C. Tzannes	)	Confirmation No.: 4520
Serial No.: 13/718,016	)	Examiner: JOSEPH, Jaison
Filed: December 18, 2012	)	
Atty. File No.: 6936-47-CON-DIV-CON-3	)	REQUEST FOR CONSIDERATION OF REFERENCES CITED IN INFORMATION DISCLOSURE STATEMENT OF **FEBRUARY 13, 2015**
Entitled: "SYSTEM AND METHOD FOR SCRAMBLING USING A BIT SCRAMBLER AND A PHASE SCRAMBLER"	)	

Electronically Submitted

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

Dear Madam:

On February 13, 2015, Applicant's representative filed an Information Disclosure Statement ("IDS") pursuant to 37 CFR 1.97(d) in the above-identified patent application. A copy of the IDS is attached hereto as Exhibit A. Copies of the non-patent literature were provided to the USPTO with the IDS and may be viewed in the image file wrapper.

The IDS of February 13, 2015, was properly submitted to the USPTO pursuant to 37 CFR §§ 1.97(d). Applicants hereby respectfully request that the reference cited therein be considered by the Examiner.

Although no fees are believed due in connection with this communication, please charge any fees deemed necessary to Deposit Account No. 19-1970. If additional information is required please contact the undersigned

Respectfully submitted,

SHERIDAN ROSS P.C.

Date: February 26, 2015

By: /Jason H. Vick/

Jason H. Vick
Reg. No. 45,285
1560 Broadway, Suite 1200
Denver, Colorado 80202
Telephone: 303-863-9700

EXHIBIT A

Electronic Acknowledgement Receipt	
EFS ID:	21501296
Application Number:	13718016
International Application Number:	
Confirmation Number:	4520
Title of Invention:	SYSTEM AND METHOD FOR SCRAMBLING USING A BIT SCRAMBLER AND A PHASE SCRAMBLER
First Named Inventor/Applicant Name:	Marcos C. Tzannes
Customer Number:	62574
Filer:	Jason Vick/Joanne Vos
Filer Authorized By:	Jason Vick
Attorney Docket Number:	6936-47-CON-DIV-CON-3
Receipt Date:	13-FEB-2015
Filing Date:	18-DEC-2012
Time Stamp:	17:07:03
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$180
RAM confirmation Number	3827
Deposit Account	191970
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 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		IDS_06.pdf	631124 0957ec215bf98a28b3aec012f5c683640a4560f2	yes	7
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Transmittal Letter		1	3	
	Information Disclosure Statement (IDS) Form (SB08)		4	7	
Warnings:					
Information:					
2	Non Patent Literature	6936-47-CON-IPR_TQD_Mandatory_Notices_11-26-2014.pdf	164042 addcc46b2e4104cd6280c8572a07fb12cbc8f249	no	5
Warnings:					
Information:					
3	Non Patent Literature	6936-47-CON-IPR_Notice_of_Filing_Date_12-01-2014.pdf	120901 af59331c7aabdc77387f80a6dc493836d7e0b487	no	4
Warnings:					
Information:					
4	Non Patent Literature	6936-47-CON-IPR_ORDER_12-05-2014.pdf	93617 78f844ff5855ca1fc8caa26a8c29505d5d98c98b	no	3
Warnings:					
Information:					
5	Non Patent Literature	6936-47-CON-IPR_2Wire_Motion_to_Correct_Filing_Date_12-12-2014.pdf	3031349 cbfd6ee96a3b938b9013b26b28ab1ddb35ee6e7c	no	57
Warnings:					
Information:					
6	Non Patent Literature	6936-47-CON-IPR_TQD_Opposition_12-19-2014.pdf	167863 2b07b774c3f8067fcc88830b727ef9d66716b2c4	no	7
Warnings:					
Information:					

7	Non Patent Literature	6936-47-CON-IPR_Decision_01-15-2015.pdf	91800 5a9a7411d18be989396edf1e6d91162024ab25d3	no	9
Warnings:					
Information:					
8	Non Patent Literature	6936-47-CON-2-IPR_TQD_Mandatory_Notices_11-26-2014.pdf	160631 e79737541b49c4a2846a8e909e09a509ad4c58887	no	5
Warnings:					
Information:					
9	Non Patent Literature	6936-47-CON-2-IPR_Notice_of_Filing_Date_12-01-2014.pdf	120864 e1fc7601bb34e9204473b152c08f2bf7cdd1ad44	no	4
Warnings:					
Information:					
10	Non Patent Literature	6936-47-CON-2-IPR_ORDER_12-05-2014.pdf	93586 60608a942a46083d2567db4278b9f1fd45a863cc	no	3
Warnings:					
Information:					
11	Non Patent Literature	6936-47-CON-2-IPR_2Wire_Motion_filing_date_12-12-2014.pdf	4398015 f23d3398d6f503921b1b2c8d8a9cc6561a791be6	no	57
Warnings:					
Information:					
12	Non Patent Literature	6936-47-CON-2-IPR_TQD_Opposition_12-19-2014.pdf	168218 ac8c131f14636cd3fbc0595c123c3f51b0ba3009	no	7
Warnings:					
Information:					
13	Non Patent Literature	6936-47-CON-2-IPR_Decision_01-15-2015.pdf	91800 bf7acc774acc49316d02be788a88d766ff394d36	no	9
Warnings:					
Information:					
14	Non Patent Literature	6936-47-CON-4-IPR_TQD_Mandatory_Notices_11-26-2014.pdf	160275 eebbb19c0e8c4ab676f75b2656e7b3256dd838f16	no	5
Warnings:					
Information:					
15	Non Patent Literature	6936-47-CON-4-IPR_Notice_of_Filing_Date_12-01-2014.pdf	120901 c875fffeb90a79d8a2846bc12f931e8dacd385e1	no	4
Warnings:					
Information:					

16	Non Patent Literature	6936-47-CON-4-IPR_Order_to_File_Motion_12-05-2014.pdf	93577 7696217203bc51f114caff3e420b7593e9bf6eda	no	3
Warnings:					
Information:					
17	Non Patent Literature	6936-47-CON-4-IPR_2Wire_Motion_to_Correct_Filing_Date_12-12-2014.pdf	3049224 f7447b6e0211a7aa1340413a0268f330c9dd122db	no	57
Warnings:					
Information:					
18	Non Patent Literature	6936-47-CON-4-IPR_TQD_Opposition_to_Motion_12-19-2014.pdf	167708 abd7cc0fdfd19ad49c5553caa8788ce92efc15c0	no	7
Warnings:					
Information:					
19	Non Patent Literature	6936-47-CON-4-IPR_Decision_01-15-2015.pdf	91804 a6a7ddac83e1459e6df62fdf1cbea011cab5d48b	no	9
Warnings:					
Information:					
20	Non Patent Literature	6936-47-CON-DIV-IPR_TQD_Mandatory_Notices_11-26-2014.pdf	160653 0e1baa56784a6b9388879053ee90efaf8b8e0088	no	5
Warnings:					
Information:					
21	Non Patent Literature	6936-47-CON-DIV-IPR_Notice_of_Filing_Date_12-01-2014.pdf	120892 c8d206da75488f611d2d5baad8acb5dc4f456702f	no	4
Warnings:					
Information:					
22	Non Patent Literature	6936-47-CON-DIV-IPR_Order_Correct_Filing_Date_12-05-2014.pdf	93568 dad83c504ee812bd931b73d1816320423ac4d276	no	3
Warnings:					
Information:					
23	Non Patent Literature	6936-47-CON-DIV-IPR_2Wires_Motion_to_Correct_Filing_Date_12-12-2014.pdf	3029117 aefdfeda14d78266be089a9bea8e4f072ee97e0e	no	57
Warnings:					
Information:					
24	Non Patent Literature	6936-47-CON-DIV-IPR_TQD_Opposition_12-19-2014.pdf	167724 258583d3825be9877ed99963b86afc445895bbd3	no	7
Warnings:					
Information:					

25	Non Patent Literature	6936-47-CON-DIV-IPR_Decision_Motion_to_Correct_Filing_Date_01-15-2015.pdf	91805 d3842248c9b37ff208ec98613b1198f632d8379e	no	9
Warnings:					
Information:					
26	Non Patent Literature	6936-47-CON-DIV-CON-IPR_TQDs_Mandatory_Notices_11-26-2014.pdf	160400 bfd255226fcf6e24e42e47f42fb6dc0e245e12f4	no	5
Warnings:					
Information:					
27	Non Patent Literature	6936-47-CON-DIV-CON-IPR_Notice_of_Filing_Date_12-01-2014.pdf	120893 3d45a18cc7283e63abef9b9211781c85b0db866f	no	4
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28	Non Patent Literature	6936-47-CON-DIV-CON-IPR_Order_12-08-2014.pdf	93581 d6390ee1a829a5d2abc93ae0a70a1837b565b18d	no	3
Warnings:					
Information:					
29	Non Patent Literature	6936-47-CON-DIV-CON-IPR_2Wire_Motion_to_correct_filing_Date_12-12-2014.pdf	2923195 4d1e491fd8c9f62d6c20bcde9611da579a68312f	no	57
Warnings:					
Information:					
30	Non Patent Literature	6936-47-CON-DIV-CON-IPR_TQDs_opposition_12-19-2014.pdf	167716 b0ba15e53112a098f7e63f692ef15065f9257ab1	no	7
Warnings:					
Information:					
31	Non Patent Literature	6936-47-CON-DIV-CON-IPR_Decision_01-15-2015.pdf	91801 2006732663eab83f1b80a99815bc81b692df1936	no	9
Warnings:					
Information:					
32	Non Patent Literature	6936-47-CON-DIV-CON-2-IPR_TQDs_Mandatory_Notices_11-26-2014.pdf	163747 1767d4285f905957b8429c4710225332923aa6ae	no	5
Warnings:					
Information:					
33	Non Patent Literature	6936-47-CON-DIV-CON-2-IPR_Notice_of_Filing_Date_12-01-2014.pdf	120894 5f8a44342ffb0291a1684dbec0457c744d827db9	no	4
Warnings:					
Information:					

34	Non Patent Literature	6936-47-CON-DIV-CON-2-IPR_Order_12-05-2014.pdf	93583 ceeac2c36f8bbb52904550954f016a3ff80d8eae	no	3
Warnings:					
Information:					
35	Non Patent Literature	6936-47-CON-DIV-CON-2-IPR_2Wire_Motion_to_Correct_Filing_Date_12-12-2014.pdf	3037059 f6ae5b8550fc4fa9c6a21587c47e452327c2cb0	no	57
Warnings:					
Information:					
36	Non Patent Literature	6936-47-CON-DIV-CON-2-IPR_TQDs_Opposition_12-19-2014.pdf	168078 91f7a0be23885f013d4591b0a7efe44f385242d5	no	7
Warnings:					
Information:					
37	Non Patent Literature	6936-47-CON-DIV-CON-2-IPR_Decision_01-15-2015.pdf	91805 f04a04d26aa2ce0a52425e3be622fa41740ef1e4	no	9
Warnings:					
Information:					
38	Fee Worksheet (SB06)	fee-info.pdf	30789 a0934dbb32431 1b394669fd1fb53387bc7da59b	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	23944599		

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of:	)	Group Art Unit: 2633
Marcos C. Tzannes	)	
	)	Confirmation No.: 4520
Serial No.: 13/718,016	)	Examiner: JOSEPH, JAISON
Filed: December 18, 2012	)	
	)	SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT
Atty. File No.: 6936-47-CON-DIV-CON-3	)	
Entitled: "SYSTEM AND METHOD FOR SCRAMBLING USING A BIT SCRAMBLER AND A PHASE SCRAMBLER"	)	Electronically Submitted

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

Dear Sir:

The references cited on attached Form PTO-1449 are being called to the attention of the Examiner.

☒ Copies of the cited non-patent and/or foreign references are enclosed herewith.

☐ Copies of the cited U.S. patents and/or patent applications are enclosed herewith.

☐ Copies of the cited U.S. patents/unpublished patent applications/patent application publications are not enclosed in accordance with 37 C.F.R. § 1.98(a).

☐ Copies of the cited references are not enclosed, in accordance with 37 C.F.R. § 1.98(d), because the references were cited by or submitted to the U.S. Patent and Trademark Office in prior application Serial No. _____ filed _____, which is relied upon for an earlier filing date under 35 U.S.C. § 120.

☐ To the best of applicants' belief, the pertinence of the foreign-language references are believed to be summarized in the attached English translation/abstracts and/or in the figures, although applicants do not necessarily vouch for the accuracy of the translation.

☐ Examiner's attention is drawn to the following related applications:

- Serial No. _____ filed _____ (Attorney Ref. No. _____)

☐ Other:_____

Submission of the above information is not intended as an admission that any item is citable under the statutes or rules to support a rejection, that any item disclosed represents analogous art, or that those skilled in the art would refer to or recognize the pertinence of any reference without the benefit of hindsight, nor should an inference be

drawn as to the pertinence of the references based on the order in which they are presented. Submission of this statement should not be taken as an indication that a search has been conducted, or that no better art exists.

It is respectfully requested that the cited information be expressly considered during the prosecution of this application and the references made of record therein.

FEES

☐	**37 CFR 1.97(b)**: No fee is believed due in connection with this submission, because the information disclosure statement submitted herewith is satisfied by one of the following conditions ("X" indicates satisfaction): ☐ Within three months of the filing date of a national application other than a continued prosecution application under 37 CFR 1.53(d), or ☐ Within three months of the date of entry into the national stage of an international application as set forth in 37 CFR 1.491 or ☐ Before the mailing date of a first Office Action on the merits, or ☐ Before the mailing of a first Office action after the filing of a request for continued examination under 37 CFR 1.114. Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970.
☐	**37 CFR 1.97(c)**: The information disclosure statement transmitted herewith is being filed after all the above conditions (37 CFR 1.97(b)), but before the mailing date of one of the following conditions: (1) a final action under 37 C.F.R. 1.113 or (2) a notice of allowance under 37 C.F.R. 1.311, or (3) an action that otherwise closes prosecution in the application. This Information Disclosure Statement is accompanied by: ☐ A Certification (below) as specified by 37 C.F.R. 1.97(e). Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970. OR ☐ Please charge Deposit Account 19-1970 in the amount of $180.00 for the fee set forth in 37 C.F.R. 1.17(p) for submission of an information disclosure statement. Please credit any overpayment or charge any underpayment to Deposit Account 19-1970.
☒	**37 CFR 1.97(d)**: This Information Disclosure Statement is being submitted after the period specified in 37 CFR 1.97(c). ☒ This information Disclosure Statement includes a Certification (below) as specified by 37 C.F.R. 1.97(e) AND ☒ Applicants hereby requests consideration of the reference(s) disclosed herein. Please charge Deposit Account 19-1970 in the amount of $180.00 under 37 C.F.R. 1.17(p). Please credit any overpayment or charge any underpayment to Deposit Account 19-1970. Election to pay the fee should not be taken as an indication that applicant(s) cannot execute a certification.

Certification (37 C.F.R. 1.97(e))
(Applicable only if checked)

☒ The undersigned certifies that:

☐ Each item of information contained in this information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(1).

☐ A copy of the communication from the foreign patent office is enclosed.

OR

☒ No item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in this Information Disclosure Statement was known to any individual designated in 37 C.F.R. 1.56(c) more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(2).

Respectfully submitted,

SHERIDAN ROSS P.C.

By: _____
Jason H. Vick
Registration No. 45,285
1560 Broadway, Suite 1200
Denver, Colorado 80202-5141
(303) 863-9700

Date: 12 Feb '5

Substitute for form 1449A/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/718,016
				Filing Date	December 18, 2012
				First Named Inventor	Marcos C. Tzannes
				Art Unit	2633
				Examiner Name	JOSEPH, JAISON
Sheet	1	of	4	Attorney Docket Number	6936-47-CON-DIV-CON-3

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-kind Code [2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee of Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]; Number[4]; Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

OTHER ART (Including Author, Title, Date, Pertinent Pages, etc.)		
Examiner Initials*	Cite No.[1]	
	1	TQ Delta LLC's Mandatory Notices Under 37 C.F.R. 42.8(a)(2) for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00247 filed November 26, 2014 (Attorney's Ref. No.: 6936-47-CON-IPR) (5 pages)
	2	Notice of Filing Date Accorded to Petition and Time for Filing Patent Owner Preliminary Response for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00247 filed December 1, 2014 (Attorney's Ref. No.: 6936-47-CON-IPR) (4 pages)
	3	ORDER - Authorization to File a Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00247 filed December 5, 2014 (Attorney's Ref. No.: 6936-47-CON-IPR) (3 pages)
	4	2Wire, Inc.'s Motion to Correct Filing Date (Including Exhibits 1023-1030) for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00247 filed December 12, 2014 (Attorney's Ref. No.: 6936-47-CON-IPR) (57 pages)
	5	TQ Delta LLC's Opposition to Petitioner's Motion to Change the Petition Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00247 filed December 19, 2014 (Attorney's Ref. No.: 6936-47-CON-IPR) (7 pages)
	6	DECISION - Motion to Correct Filing Date 37 C.F.R § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00247 filed January 15, 2015 (Attorney's Ref. No.: 6936-47-CON-IPR) (9 pages)

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference is considered, whether or not citation is in conformance and not considered. Include copy of this form with next communication to applicant.

Substitute for form 1449A/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/718,016
				Filing Date	December 18, 2012
				First Named Inventor	Marcos C. Tzannes
				Art Unit	2633
				Examiner Name	JOSEPH, JAISON
Sheet	2	of	4	Attorney Docket Number	6936-47-CON-DIV-CON-3

	7	TQ Delta LLC's Mandatory Notices Under 37 C.F.R. 42.8(a)(2) for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00239 filed November 26, 2014 (Attorney's Ref. No.: 6936-47-CON-2-IPR) (5 pages)
	8	Notice of Filing Date Accorded to Petition and Time for Filing Patent Owner Preliminary Response for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00239 filed December 1, 2014 (Attorney's Ref. No.: 6936-47-CON-2-IPR) (4 pages)
	9	ORDER - Authorization to File a Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00239 filed Dec. 5 2014 (Attorney's Ref. No.: 6936-47-CON-2-IPR) (3 pages)
	10	2Wire, Inc.'s Motion to Correct Filing Date (Including Exhibits 1023-1030) for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00239 filed Dec. 12, 2014 (Attorney's Ref. No.: 6936-47-CON-2-IPR) (57 pages)
	11	TQ Delta LLC's Opposition to Petitioner's Motion to Change the Petition Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00239 filed Dec. 19, 2014 (Attorney's Ref. No.: 6936-47-CON-2-IPR) (7 pages)
	12	Decision - Motion to Correct Filing Date 37 C.F.R § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00239 filed Jan. 15, 2015 (Attorney's Ref. No.: 6936-47-CON-2-IPR) (9 pages)
	13	TQ Delta LLC's Mandatory Notices Under 37 C.F.R 42.8(a)(2) for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00240 filed Nov. 26, 2014 (Attorney's Ref. No.: 6936-47-CON-4-IPR) (5 pages)
	14	Notice of Filing Date Accorded to Petition and Time for Filing Patent Owner Preliminary Response for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00240 filed Dec. 1, 2014 (Attorney's Ref. No.: 6936-47-CON-4-IPR) (4 pages)
	15	ORDER: Authorization to File a Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00240 filed Dec. 5, 2014 (Attorney's Ref. No.: 6936-47-CON-4-IPR) (3 pages)
	16	2Wire, Inc.'s Motion to Correct Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00240 filed Dec. 12, 2014 (Attorney's Ref. No.: 6936-47-CON-4-IPR) (57 pages)
	17	TQ Delta LLC's Opposition to Petitioner's Motion to Change the Petition Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00240 filed Dec. 19, 2014 (Attorney's Ref. No.: 6936-47-CON-4-IPR) (7 pages)

Examiner Signature		Date Considered	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/718,016
				Filing Date	December 18, 2012
				First Named Inventor	Marcos C. Tzannes
				Art Unit	2633
				Examiner Name	JOSEPH, JAISON
Sheet	3	of	4	Attorney Docket Number	6936-47-CON-DIV-CON-3

	18	Decision: Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00240 filed Jan. 15, 2015 (Attorney's Ref. No.: 6936-47-CON-4-IPR) (9 pages)
	19	TQ Delta LLC's Mandatory Notices Under 37 C.F.R. 42.8(a)(2) for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00241 filed Nov. 26, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-IPR) (5 pages)
	20	Notice of Filing Date Accorded to Petition and Time for Filing Patent Owner Preliminary Response for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00241 filed Dec. 1, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-IPR) (4 pages)
	21	ORDER: Authorization to File a Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00241 filed Dec. 5, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-IPR) (3 pages)
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	25	TQ Delta LLC's Mandatory Notices Under 37 C.F.R. 42.8(a)(2) for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00242 filed Nov. 26, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-IPR) (5 pages)
	26	Notice of Filing Date Accorded to Petition and Time for Filing Patent Owner Preliminary Response for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00242 filed Dec. 1, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-IPR) (4 pages)
	27	ORDER: Authorization to File a Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00242 filed Dec. 5, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-IPR) (3 pages)
	28	2Wire, Inc.'s Motion to Correct Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00242 filed Dec. 12, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-IPR) (57 pages)
	29	TQ Delta LLC's Opposition to Petitioner's Motion to Change the Petition Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00242 filed Dec. 19, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-IPR) (7 pages)

Examiner Signature		Date Considered	

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Substitute for form 1449A/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/718,016
				Filing Date	December 18, 2012
				First Named Inventor	Marcos C. Tzannes
				Art Unit	2633
				Examiner Name	JOSEPH, JAISON
Sheet	4	of	4	Attorney Docket Number	6936-47-CON-DIV-CON-3

	30	Decision: Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00242 filed Jan. 15, 2015 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-IPR) (9 pages)
	31	TQ Delta LLC's Mandatory Notices Under 37 C.F.R. 42.8(a)(2) for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00243 filed Nov. 26, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-2-IPR) (5 pages)
	32	Notice of Filing Date Accorded to Petition and Time for Filing Patent Owner Preliminary Response for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00243 filed Dec. 1, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-2-IPR) (4 pages)
	33	ORDER: Authorization to File a Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00243 filed Dec. 5, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-2-IPR) (3 pages)
	34	2Wire, Inc.'s Motion to Correct Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00243 filed Dec. 12, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-2-IPR) (57 pages)
	35	TQ Delta LLC's Opposition to Petitioner's Motion to Change the Petition Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00243 filed Dec. 19, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-2-IPR) (7 pages)
	36	Decision: Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00243 filed Jan. 15, 2015 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-2-IPR) (9 pages)

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference is considered, whether or not citation is in conformance and not considered. Include copy of this form with next communication to applicant.

Electronic Patent Application Fee Transmittal					
Application Number:	13718016				
Filing Date:	18-Dec-2012				
Title of Invention:	SYSTEM AND METHOD FOR SCRAMBLING USING A BIT SCRAMBLER AND A PHASE SCRAMBLER				
First Named Inventor/Applicant Name:	Marcos C. Tzannes				
Filer:	Jason Vick/Joanne Vos				
Attorney Docket Number:	6936-47-CON-DIV-CON-3				
Filed as Large Entity					
Filing Fees for Utility under 35 USC 111(a)					
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

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

Electronic Acknowledgement Receipt	
EFS ID:	21606013
Application Number:	13718016
International Application Number:	
Confirmation Number:	4520
Title of Invention:	SYSTEM AND METHOD FOR SCRAMBLING USING A BIT SCRAMBLER AND A PHASE SCRAMBLER
First Named Inventor/Applicant Name:	Marcos C. Tzannes
Customer Number:	62574
Filer:	Jason Vick/Joanne Vos
Filer Authorized By:	Jason Vick
Attorney Docket Number:	6936-47-CON-DIV-CON-3
Receipt Date:	26-FEB-2015
Filing Date:	18-DEC-2012
Time Stamp:	11:55:00
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	13342
Deposit Account	191970
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 1.21 (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)	Issue_Fee_Payment.pdf	1620371 2490a20ec7268a65c6dbe2de54107037ecc7b2de	no	1
Warnings:					
Information:					
2		AMEND_312.pdf	87300 1ecc55256fa57bd29f4ea530b575e9da59117e7d	yes	7

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment after Notice of Allowance (Rule 312)	1	1
Specification	2	2
Claims	3	6
Applicant Arguments/Remarks Made in an Amendment	7	7

Warnings:					
Information:					
3	Miscellaneous Incoming Letter	Request_for_Consideration_of_IDS.pdf	10450137 3ee5273de7a28ed9fd06b74ae7367f8a382e1b85	no	16
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30788 856bd6eb7d4a591133b34c97823623bd2fe5cb1d	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	12188596		

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.

Substitute for form 1449A/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/718,016
				Filing Date	December 18, 2012
				First Named Inventor	Marcos C. Tzannes
				Art Unit	2633
				Examiner Name	JOSEPH, JAISON
Sheet	1	of	4	Attorney Docket Number	6936-47-CON-DIV-CON-3

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-kind Code [2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee of Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]; Number[4]; Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

OTHER ART (Including Author, Title, Date, Pertinent Pages, etc.)		
Examiner Initials*	Cite No.[1]	
	1	TQ Delta LLC's Mandatory Notices Under 37 C.F.R. 42.8(a)(2) for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00247 filed November 26, 2014 (Attorney's Ref. No.: 6936-47-CON-IPR) (5 pages)
	2	Notice of Filing Date Accorded to Petition and Time for Filing Patent Owner Preliminary Response for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00247 filed December 1, 2014 (Attorney's Ref. No.: 6936-47-CON-IPR) (4 pages)
	3	ORDER - Authorization to File a Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00247 filed December 5, 2014 (Attorney's Ref. No.: 6936-47-CON-IPR) (3 pages)
	4	2Wire, Inc.'s Motion to Correct Filing Date (Including Exhibits 1023-1030) for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00247 filed December 12, 2014 (Attorney's Ref. No.: 6936-47-CON-IPR) (57 pages)
	5	TQ Delta LLC's Opposition to Petitioner's Motion to Change the Petition Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00247 filed December 19, 2014 (Attorney's Ref. No.: 6936-47-CON-IPR) (7 pages)
	6	DECISION - Motion to Correct Filing Date 37 C.F.R § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00247 filed January 15, 2015 (Attorney's Ref. No.: 6936-47-CON-IPR) (9 pages)

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference is considered, whether or not citation is in conformance and not considered. Include copy of this form with next communication to applicant.

Substitute for form 1449A/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/718,016
				Filing Date	December 18, 2012
				First Named Inventor	Marcos C. Tzannes
				Art Unit	2633
				Examiner Name	JOSEPH, JAISON
Sheet	2	of	4	Attorney Docket Number	6936-47-CON-DIV-CON-3

	7	TQ Delta LLC's Mandatory Notices Under 37 C.F.R. 42.8(a)(2) for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00239 filed November 26, 2014 (Attorney's Ref. No.: 6936-47-CON-2-IPR) (5 pages)
	8	Notice of Filing Date Accorded to Petition and Time for Filing Patent Owner Preliminary Response for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00239 filed December 1, 2014 (Attorney's Ref. No.: 6936-47-CON-2-IPR) (4 pages)
	9	ORDER - Authorization to File a Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00239 filed Dec. 5 2014 (Attorney's Ref. No.: 6936-47-CON-2-IPR) (3 pages)
	10	2Wire, Inc.'s Motion to Correct Filing Date (Including Exhibits 1023-1030) for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00239 filed Dec. 12, 2014 (Attorney's Ref. No.: 6936-47-CON-2-IPR) (57 pages)
	11	TQ Delta LLC's Opposition to Petitioner's Motion to Change the Petition Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00239 filed Dec. 19, 2014 (Attorney's Ref. No.: 6936-47-CON-2-IPR) (7 pages)
	12	Decision - Motion to Correct Filing Date 37 C.F.R § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00239 filed Jan. 15, 2015 (Attorney's Ref. No.: 6936-47-CON-2-IPR) (9 pages)
	13	TQ Delta LLC's Mandatory Notices Under 37 C.F.R 42.8(a)(2) for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00240 filed Nov. 26, 2014 (Attorney's Ref. No.: 6936-47-CON-4-IPR) (5 pages)
	14	Notice of Filing Date Accorded to Petition and Time for Filing Patent Owner Preliminary Response for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00240 filed Dec. 1, 2014 (Attorney's Ref. No.: 6936-47-CON-4-IPR) (4 pages)
	15	ORDER: Authorization to File a Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00240 filed Dec. 5, 2014 (Attorney's Ref. No.: 6936-47-CON-4-IPR) (3 pages)
	16	2Wire, Inc.'s Motion to Correct Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00240 filed Dec. 12, 2014 (Attorney's Ref. No.: 6936-47-CON-4-IPR) (57 pages)
	17	TQ Delta LLC's Opposition to Petitioner's Motion to Change the Petition Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00240 filed Dec. 19, 2014 (Attorney's Ref. No.: 6936-47-CON-4-IPR) (7 pages)

Examiner Signature		Date Considered	

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Substitute for form 1449A/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/718,016
				Filing Date	December 18, 2012
				First Named Inventor	Marcos C. Tzannes
				Art Unit	2633
				Examiner Name	JOSEPH, JAISON
Sheet	3	of	4	Attorney Docket Number	6936-47-CON-DIV-CON-3

	18	Decision: Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00240 filed Jan. 15, 2015 (Attorney's Ref. No.: 6936-47-CON-4-IPR) (9 pages)
	19	TQ Delta LLC's Mandatory Notices Under 37 C.F.R. 42.8(a)(2) for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00241 filed Nov. 26, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-IPR) (5 pages)
	20	Notice of Filing Date Accorded to Petition and Time for Filing Patent Owner Preliminary Response for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00241 filed Dec. 1, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-IPR) (4 pages)
	21	ORDER: Authorization to File a Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00241 filed Dec. 5, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-IPR) (3 pages)
	22	2Wire, Inc.'s Motion to Correct Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00241 filed Dec. 12, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-IPR) (57 pages)
	23	TQ Delta LLC's Opposition to Petitioner's Motion to Change the Petition Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00241 filed Dec. 19, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-IPR) (7 pages)
	24	Decision: Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00241 filed Jan. 15, 2015 (Attorney's Ref. No.: 6936-47-CON-DIV-IPR) (9 pages)
	25	TQ Delta LLC's Mandatory Notices Under 37 C.F.R. 42.8(a)(2) for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00242 filed Nov. 26, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-IPR) (5 pages)
	26	Notice of Filing Date Accorded to Petition and Time for Filing Patent Owner Preliminary Response for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00242 filed Dec. 1, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-IPR) (4 pages)
	27	ORDER: Authorization to File a Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00242 filed Dec. 5, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-IPR) (3 pages)
	28	2Wire, Inc.'s Motion to Correct Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00242 filed Dec. 12, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-IPR) (57 pages)
	29	TQ Delta LLC's Opposition to Petitioner's Motion to Change the Petition Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00242 filed Dec. 19, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-IPR) (7 pages)

Examiner Signature		Date Considered	

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Substitute for form 1449A/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/718,016
				Filing Date	December 18, 2012
				First Named Inventor	Marcos C. Tzannes
				Art Unit	2633
				Examiner Name	JOSEPH, JAISON
Sheet	4	of	4	Attorney Docket Number	6936-47-CON-DIV-CON-3

	30	Decision: Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00242 filed Jan. 15, 2015 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-IPR) (9 pages)
	31	TQ Delta LLC's Mandatory Notices Under 37 C.F.R. 42.8(a)(2) for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00243 filed Nov. 26, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-2-IPR) (5 pages)
	32	Notice of Filing Date Accorded to Petition and Time for Filing Patent Owner Preliminary Response for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00243 filed Dec. 1, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-2-IPR) (4 pages)
	33	ORDER: Authorization to File a Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00243 filed Dec. 5, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-2-IPR) (3 pages)
	34	2Wire, Inc.'s Motion to Correct Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00243 filed Dec. 12, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-2-IPR) (57 pages)
	35	TQ Delta LLC's Opposition to Petitioner's Motion to Change the Petition Filing Date for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00243 filed Dec. 19, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-2-IPR) (7 pages)
	36	Decision: Motion to Correct Filing Date 37 C.F.R. § 42.5 for 2Wire, Inc. v. TQ Delta, LLC, United States Patent and Trademark Office - Before the Patent Trial and Appeal Board, Case No.: IPR 2015-00243 filed Jan. 15, 2015 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-2-IPR) (9 pages)

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference is considered, whether or not citation is in conformance and not considered. Include copy of this form with next communication to applicant.

Electronic Patent Application Fee Transmittal	
Application Number:	13718016
Filing Date:	18-Dec-2012
Title of Invention:	SYSTEM AND METHOD FOR SCRAMBLING USING A BIT SCRAMBLER AND A PHASE SCRAMBLER
First Named Inventor/Applicant Name:	Marcos C. Tzannes
Filer:	Jason Vick/Joanne Vos
Attorney Docket Number:	6936-47-CON-DIV-CON-3
Filed as Large Entity	
Filing Fees for **Utility under 35 USC 111(a)**	

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($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt	
EFS ID:	21501296
Application Number:	13718016
International Application Number:	
Confirmation Number:	4520
Title of Invention:	SYSTEM AND METHOD FOR SCRAMBLING USING A BIT SCRAMBLER AND A PHASE SCRAMBLER
First Named Inventor/Applicant Name:	Marcos C. Tzannes
Customer Number:	62574
Filer:	Jason Vick/Joanne Vos
Filer Authorized By:	Jason Vick
Attorney Docket Number:	6936-47-CON-DIV-CON-3
Receipt Date:	13-FEB-2015
Filing Date:	18-DEC-2012
Time Stamp:	17:07:03
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$180
RAM confirmation Number	3827
Deposit Account	191970
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 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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	Multipart Description/PDF files in .zip description				
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	Transmittal Letter		1	3	
	Information Disclosure Statement (IDS) Form (SB08)		4	7	
Warnings:					
Information:					
2	Non Patent Literature	6936-47-CON-IPR_TQD_Mandatory_Notices_11-26-2014.pdf	164042 addcc46b2e4104cd6280c8572a07fb12cbc8f249	no	5
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3	Non Patent Literature	6936-47-CON-IPR_Notice_of_Filing_Date_12-01-2014.pdf	120901 af59331c7aabdc77387f80a6dc493836d7e0b487	no	4
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Information:					
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Information:					
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14	Non Patent Literature	6936-47-CON-4-IPR_TQD_Mandatory_Notices_11-26-2014.pdf	160275 eebbb19c0e8c4abf76f75b2656e7b3256dd38f16	no	5
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Information:					

16	Non Patent Literature	6936-47-CON-4-IPR_Order_to_File_Motion_12-05-2014.pdf	93577 7696217203bc51f114caff3e420b7593e9bf6cda	no	3
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Information:					
17	Non Patent Literature	6936-47-CON-4-IPR_2Wire_Motion_to_Correct_Filing_Date_12-12-2014.pdf	3049224 f7447bde0211a7aa134041a0268f330c9dd122db	no	57
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Information:					
18	Non Patent Literature	6936-47-CON-4-IPR_TQD_Opposition_to_Motion_12-19-2014.pdf	167708 abd7cc0fdfd19ad49c5553caa8788ce92efc15c0	no	7
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19	Non Patent Literature	6936-47-CON-4-IPR_Decision_01-15-2015.pdf	91804 ada7ddac83e1459e0d82ddf1cbea011cab5d48fb	no	9
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20	Non Patent Literature	6936-47-CON-DIV-IPR_TQD_Mandatory_Notices_11-26-2014.pdf	160653 0e1baa56784a6b9388879053ee90efaf8b8e0088	no	5
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Information:					
21	Non Patent Literature	6936-47-CON-DIV-IPR_Notice_of_Filing_Date_12-01-2014.pdf	120892 c8d206da7548f611d2d5baad8acb5dc4f456702f	no	4
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Information:					
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24	Non Patent Literature	6936-47-CON-DIV-IPR_TQD_Opposition_12-19-2014.pdf	167724 258563d3825be9877ed99963b86afc445895bbd3	no	7
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Information:					

25	Non Patent Literature	6936-47-CON-DIV-IPR_Decision_Motion_to_Correct_Filing_Date_01-15-2015.pdf	91805 d3842248c9b37ff208ec98613b1198f632d4379e	no	9
Warnings:					
Information:					
26	Non Patent Literature	6936-47-CON-DIV-CON-IPR_TQDs_Mandatory_Notices_11-26-2014.pdf	160400 bfd355226fcf6e24e42e47f42fb6dc0e245e12f4	no	5
Warnings:					
Information:					
27	Non Patent Literature	6936-47-CON-DIV-CON-IPR_Notice_of_Filing_Date_12-01-2014.pdf	120893 3d45a18cc7283e63abef9b9211781c85b0db866f	no	4
Warnings:					
Information:					
28	Non Patent Literature	6936-47-CON-DIV-CON-IPR_Order_12-08-2014.pdf	93581 d6390ee1a829a5d2abc93ae0a70a1837b565b18d	no	3
Warnings:					
Information:					
29	Non Patent Literature	6936-47-CON-DIV-CON-IPR_2Wire_Motion_to_correct_filing_Date_12-12-2014.pdf	2923195 4d1e491fd8c9f62d6c20bcde9611da579a6f312f	no	57
Warnings:					
Information:					
30	Non Patent Literature	6936-47-CON-DIV-CON-IPR_TQDs_opposition_12-19-2014.pdf	167716 b0ba15e53112a098f7e63f692ef15065f9257ab1	no	7
Warnings:					
Information:					
31	Non Patent Literature	6936-47-CON-DIV-CON-IPR_Decision_01-15-2015.pdf	91801 2006732663eab83f1b80a99815bc81b692df1936	no	9
Warnings:					
Information:					
32	Non Patent Literature	6936-47-CON-DIV-CON-2-IPR_TQDs_Mandatory_Notices_11-26-2014.pdf	163747 1767d4285ff905957b8429c471022533292aa6ae	no	5
Warnings:					
Information:					
33	Non Patent Literature	6936-47-CON-DIV-CON-2-IPR_Notice_of_Filing_Date_12-01-2014.pdf	120894 5f8a44342ffb0291a1684dbec0457c744d827db9	no	4
Warnings:					
Information:					

34	Non Patent Literature	6936-47-CON-DIV-CON-2-IPR_Order_12-05-2014.pdf	93583 ceeac2c36f8bbb5290455095 4ff016a3ff80d8eae	no	3
Warnings:					
Information:					
35	Non Patent Literature	6936-47-CON-DIV-CON-2-IPR_2Wire_Motion_to_Correct_Filing_Date_12-12-2014.pdf	3037059 f6ae5b8550fc4faf9cfa21587c47e452327c2cb0	no	57
Warnings:					
Information:					
36	Non Patent Literature	6936-47-CON-DIV-CON-2-IPR_TQDs_Opposition_12-19-2014.pdf	168078 91f7a0be23885f013d4591b0a7efc44f385242d5	no	7
Warnings:					
Information:					
37	Non Patent Literature	6936-47-CON-DIV-CON-2-IPR_Decision_01-15-2015.pdf	91805 f04a04d26aa2ce0a52425e3beb22fa41740ef1e4	no	9
Warnings:					
Information:					
38	Fee Worksheet (SB06)	fee-info.pdf	30789 a093f4cbb324311b394669fd1fb53387bc7da59b	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	23944599		

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of:	)	Group Art Unit: 2633
Marcos C. Tzannes	)	Confirmation No.: 4520
Serial No.: 13/718,016	)	Examiner: JOSEPH, JAISON
Filed: December 18, 2012	)	SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT
Atty. File No.: 6936-47-CON-DIV-CON-3	)	
Entitled: "SYSTEM AND METHOD FOR SCRAMBLING USING A BIT SCRAMBLER AND A PHASE SCRAMBLER"	)	Electronically Submitted

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

Dear Sir:

The references cited on attached Form PTO-1449 are being called to the attention of the Examiner.

☒ Copies of the cited non-patent and/or foreign references are enclosed herewith.

☐ Copies of the cited U.S. patents and/or patent applications are enclosed herewith.

☐ Copies of the cited U.S. patents/unpublished patent applications/patent application publications are not enclosed in accordance with 37 C.F.R. § 1.98(a).

☐ Copies of the cited references are not enclosed, in accordance with 37 C.F.R. § 1.98(d), because the references were cited by or submitted to the U.S. Patent and Trademark Office in prior application Serial No. _____ filed _____, which is relied upon for an earlier filing date under 35 U.S.C. § 120.

☐ To the best of applicants' belief, the pertinence of the foreign-language references are believed to be summarized in the attached English translation/abstracts and/or in the figures, although applicants do not necessarily vouch for the accuracy of the translation.

☐ Examiner's attention is drawn to the following related applications:

- Serial No. _____ filed _____ (Attorney Ref. No. _____)

☐ Other:_____

Submission of the above information is not intended as an admission that any item is citable under the statutes or rules to support a rejection, that any item disclosed represents analogous art, or that those skilled in the art would refer to or recognize the pertinence of any reference without the benefit of hindsight, nor should an inference be

drawn as to the pertinence of the references based on the order in which they are presented. Submission of this statement should not be taken as an indication that a search has been conducted, or that no better art exists.

It is respectfully requested that the cited information be expressly considered during the prosecution of this application and the references made of record therein.

FEES

☐	**37 CFR 1.97(b)**: No fee is believed due in connection with this submission, because the information disclosure statement submitted herewith is satisfied by one of the following conditions ("X" indicates satisfaction): ☐ Within three months of the filing date of a national application other than a continued prosecution application under 37 CFR 1.53(d), or ☐ Within three months of the date of entry into the national stage of an international application as set forth in 37 CFR 1.491 or ☐ Before the mailing date of a first Office Action on the merits, or ☐ Before the mailing of a first Office action after the filing of a request for continued examination under 37 CFR 1.114. Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970.
☐	**37 CFR 1.97(c)**: The information disclosure statement transmitted herewith is being filed after all the above conditions (37 CFR 1.97(b)), but before the mailing date of one of the following conditions: (1) a final action under 37 C.F.R. 1.113 or (2) a notice of allowance under 37 C.F.R. 1.311, or (3) an action that otherwise closes prosecution in the application. This Information Disclosure Statement is accompanied by: ☐ A Certification (below) as specified by 37 C.F.R. 1.97(e). Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970. OR ☐ Please charge Deposit Account 19-1970 in the amount of $180.00 for the fee set forth in 37 C.F.R. 1.17(p) for submission of an information disclosure statement. Please credit any overpayment or charge any underpayment to Deposit Account 19-1970.
☒	**37 CFR 1.97(d)**: This Information Disclosure Statement is being submitted after the period specified in 37 CFR 1.97(c). ☒ This information Disclosure Statement includes a Certification (below) as specified by 37 C.F.R. 1.97(e) AND ☒ Applicants hereby requests consideration of the reference(s) disclosed herein. Please charge Deposit Account 19-1970 in the amount of $180.00 under 37 C.F.R. 1.17(p). Please credit any overpayment or charge any underpayment to Deposit Account 19-1970. Election to pay the fee should not be taken as an indication that applicant(s) cannot execute a certification.

Certification (37 C.F.R. 1.97(e))
(Applicable only if checked)

☒ The undersigned certifies that:

☐ Each item of information contained in this information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(1).

☐ A copy of the communication from the foreign patent office is enclosed.

OR

☒ No item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in this Information Disclosure Statement was known to any individual designated in 37 C.F.R. 1.56(c) more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(2).

Respectfully submitted,

SHERIDAN ROSS P.C.

By: _____

Jason H. Vick
Registration No. 45,285
1560 Broadway, Suite 1200
Denver, Colorado 80202-5141
(303) 863-9700

Date: 17 Feb '5

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 NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/718,016	12/18/2012	2633	1304	6936-47-CON-DIV-CON-3	21	3

CONFIRMATION NO. 4520

CORRECTED FILING RECEIPT

62574
Jason H. Vick
Sheridan Ross, PC
Suite # 1200
1560 Broadway
Denver, CO 80202

Date Mailed: 01/20/2015

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)

Marcos C. Tzannes, Orinda, CA;

Applicant(s)

TQ DELTA, LLC, Austin, TX

Assignment For Published Patent Application

TQ DELTA, LLC, AUSTIN, TX

Power of Attorney: The patent practitioners associated with Customer Number 62574

Domestic Priority data as claimed by applicant

This application is a CON of 13/439,605 04/04/2012 PAT 8355427
which is a CON of 13/284,549 10/28/2011 PAT 8218610
which is a CON of 11/860,080 09/24/2007 PAT 8073041
which is a DIV of 11/211,535 08/26/2005 PAT 7292627
which is a CON of 09/710,310 11/09/2000 PAT 6961369
which claims benefit of 60/164,134 11/09/1999

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: 02/07/2013
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/718,016**
Projected Publication Date: Not Applicable

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

SYSTEM AND METHOD FOR SCRAMBLING USING A BIT SCRAMBLER AND A PHASE SCRAMBLER

Preliminary Class

375

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

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 (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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

NOTICE OF ALLOWANCE AND FEE(S) DUE

62574 7590 12/05/2014

Jason H. Vick
Sheridan Ross, PC
Suite # 1200
1560 Broadway
Denver, CO 80202

EXAMINER	
JOSEPH, JAISON	
ART UNIT	PAPER NUMBER
2633	

DATE MAILED: 12/05/2014

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/718,016	12/18/2012	Marcos C. Tzannes	6936-47-CON-DIV-CON-3	4520

TITLE OF INVENTION: SYSTEM AND METHOD FOR DESCRAMBLING THE PHASE OF CARRIERS IN A MULTICARRIER COMMUNICATIONS SYSTEM

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	03/05/2015

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)

62574 7590 12/05/2014

Jason H. Vick
Sheridan Ross, PC
Suite # 1200
1560 Broadway
Denver, CO 80202

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.
13/718,016	12/18/2012	Marcos C. Tzannes	6936-47-CON-DIV-CON-3	4520

TITLE OF INVENTION: SYSTEM AND METHOD FOR DESCRAMBLING THE PHASE OF CARRIERS IN A MULTICARRIER COMMUNICATIONS SYSTEM

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	03/05/2015

EXAMINER	ART UNIT	CLASS-SUBCLASS
JOSEPH, JAISON	2633	375-222000

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. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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.
13/718,016	12/18/2012	Marcos C. Tzannes	6936-47-CON-DIV-CON-3	4520

62574 7590 12/05/2014

Jason H. Vick
Sheridan Ross, PC
Suite # 1200
1560 Broadway
Denver, CO 80202

EXAMINER	
JOSEPH, JAISON	

ART UNIT	PAPER NUMBER
2633	

DATE MAILED: 12/05/2014

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. 13/718,016	Applicant(s) TZANNES, MARCOS C.	
	Examiner JAISON JOSEPH	Art Unit 2633	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 *11/18/2014*.
   ☐ 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 *21-26,28-33,42-54 renumbered as 1 - 25 respectively*. 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 _____.

/JAISON JOSEPH/
Primary Examiner, Art Unit 2633

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13718016	TZANNES ET AL.
	Examiner	Art Unit
	JAISON JOSEPH	2633

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
375	222, 340, 341	5/5/2013	JJ
	Updated search	1/27/2014	JJ
	Updated Search	7/31/2014	JJ
	Updated search	11/30/2014	JJ

SEARCH NOTES		
Search Notes	Date	Examiner
Inventor name search	5/5/2013	JJ
East	5/5/2013	JJ
East updated	1/27/2014	JJ
East Updated	7/14/2014	JJ
East Updated	12/1/2014	JJ

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
375	220,340,341	11/30/2014	JJ

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13718016	TZANNES ET AL.
	Examiner	Art Unit
	JAISON JOSEPH	2633

✓	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	05/05/2013	01/27/2014	07/14/2014	12/01/2014					
	1	-	-	-	-					
	2	-	-	-	-					
	3	-	-	-	-					
	4	-	-	-	-					
	5	-	-	-	-					
	6	-	-	-	-					
	7	-	-	-	-					
	8	-	-	-	-					
	9	-	-	-	-					
	10	-	-	-	-					
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	19	-	-	-	-					
	20	-	-	-	-					
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2	22	✓	✓	✓	=					
3	23	✓	✓	✓	=					
4	24	✓	✓	✓	=					
5	25	✓	✓	✓	=					
6	26	✓	✓	✓	=					
	27	✓	✓	-	-					
7	28	✓	✓	✓	=					
8	29	✓	✓	✓	=					
9	30	✓	✓	✓	=					
10	31	✓	✓	✓	=					
11	32	✓	✓	✓	=					
12	33	✓	✓	✓	=					
	34	✓	✓	-	-					
	35	✓	✓	-	-					
	36	✓	✓	-	-					

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13718016	TZANNES ET AL.
	Examiner	**Art Unit**
	JAISON JOSEPH	2633

✓	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	05/05/2013	01/27/2014	07/14/2014	12/01/2014					
	37	✓	✓	-	-					
	38	✓	✓	-	-					
	39	✓	✓	-	-					
	40	✓	✓	-	-					
	41	✓	✓	-	-					
13	42			✓	=					
14	43			✓	=					
15	44			✓	=					
16	45			✓	=					
17	46			✓	=					
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19	48			✓	=					
20	49			✓	=					
21	50			✓	=					
22	51			✓	=					
23	52			✓	=					
24	53			✓	=					
25	54			✓	=					

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13718016	TZANNES, MARCOS C.
	Examiner	**Art Unit**
	JAISON JOSEPH	2633

CPC						
Symbol					**Type**	**Version**
H04L		27	/	2627	F	2013-01-01
H04L		25	/	03866	I	2013-01-01
H04L		27	/	2614	I	2013-01-01
H04L		27	/	2621	I	2013-01-01
H04B		1	/	40	I	2013-01-01
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			/			
			/			

CPC Combination Sets						
Symbol				**Type**	**Set**	**Ranking**	**Version**
		/					
		/					

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	25	
/JAISON JOSEPH/ Primary Examiner.Art Unit 2633	12/01/2014	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13718016	TZANNES, MARCOS C.
	Examiner	**Art Unit**
	JAISON JOSEPH	2633

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION										
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED					
375	220	H	0	4	L	27 / 26 (2006.01.01)						

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

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	25	
/JAISON JOSEPH/ Primary Examiner.Art Unit 2633	12/01/2014	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13718016	TZANNES, MARCOS C.
	Examiner	**Art Unit**
	JAISON JOSEPH	2633

☒ 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

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	25	
/JAISON JOSEPH/ Primary Examiner.Art Unit 2633	12/01/2014	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	0	13/718016	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/05/05 18:43
S2	8	09/710310	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/05/05 18:44
S3	18	"6590860"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/05/05 19:00
S4	642	phase adj2 shift near3 carrier same number	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/05/05 19:05
S5	43	phase adj2 shift near3 carrier near2 number	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/05/05 19:05
S6	6	("5742679" "6781951" "20020172146").pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/27 12:30
S7	133	pseudo adj2 random adj2 phase adj2 shift	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/27 12:48
S8	8341288	pseudo adj2 random adj2 phase adj2 shift indicat$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/27 12:48
S9	5	pseudo adj2 random adj2 phase adj2 shift same indicat$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/27 12:48
S10	5527787	transmit pohase shift indicator	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/27 12:51

S11	5544755	transmi$4 phase near2 shift near2 indicator	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/27 12:51
S12	233	transmi$4 near4 phase near2 shift near2 (indicator value)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/27 12:52
S13	1	transmi$4 near4 phase near2 shift near2 (indicator value) same random adj2 phase adj2 shift	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/27 12:52
S14	1	13/718016	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/27 13:35
S15	40	("3742498" | "4041391" | "4481640" | "5541552" | "5677927" | "5694415").PN. OR ("5903614").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 09:19
S16	2	13/718016	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/07/14 09:20
S17	137	(mitsuhiro near2 suzuki).in. and phase	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 09:44
S18	55	(mitsuhiro near2 suzuki).in. and phase and interleav$5	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 09:44
S20	23	(mitsuhiro near2 suzuki).in. and phase adj2 shift same interleav$5	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 09:48
S21	0	(mitsuhiro near2 suzuki).in. and (carrier near5 phase adj2 shift) same (scrambl$5 or interleav$5)	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 11:11
S22	0	(mitsuhiro near2 suzuki).in. and ((carrier near5 phase adj2 shift) same (scrambl$5 or interleav$5))	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 11:11
S23	1	(mitsuhiro near2 suzuki).in. and ((carrier same phase adj2 shift) same (scrambl$5 or interleav$5))	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 11:11
S24	1373	((carrier same phase adj2 (shift or offset)) same (scrambl$5 or interleav$5))	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 11:13
S25	85	((carrier near4 phase adj2 (shift or offset)) same (scrambl$5 or interleav$5))	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 11:13
S26	105	(mitsuhiro near2 suzuki).in. and phase adj shift	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 11:54
S27	2	(mitsuhiro near2 suzuki).in. and phase adj shift same	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 11:57

		number near2 carrier				
S28	2	(mitsuhiro near2 suzuki) and phase adj shift same number near2 carrier	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 11:57
S29	22	(suzuki) and phase adj shift same number near2 carrier	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 11:57
S30	2	(Sakoda near2 Kazuyuki) and phase adj shift same number near2 carrier	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 12:02
S31	16	(Sakoda) and phase adj shift same number near2 carrier	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 12:02
S32	307	(Sakoda) and phase adj shift	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 12:03
S33	31	(Sakoda) and phase adj shift same interleav$5	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 12:03
S34	50	(mitsuhiro near2 suzuki).in. and phase adj2 shift and interleav$5	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 12:07
S35	0	"6,173,016."	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/07/14 12:42
S36	20	"6173016"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/07/14 12:42
S37	3	("5541552" | "5896419" | "6044067").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 12:43
S38	6	"20110058632"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/07/21 12:26
S39	0	13/751267	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/07/21 15:17
S40	1071064	spatial modulation	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/24 11:05
S41	7067	spatial adj2 modulation	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/24 11:05
S42	144	spatial adj2 modulation same antenna	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/24 11:05
S43	9	"20020094783" "20080037673"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/07/25 15:26
S44	12	"5896419"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/11/05 16:14
S45	687	interleav$4 near2 randomiz$4	US-PGPUB; USPAT;	OR	ON	2014/11/06

			USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			15:23
S46	2	13/718016	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/11/06 15:32

EAST Search History (Interference)

<This search history is empty>

12/1/2014 12:30:53 AM
C:\Users\jjoseph1\Documents\EAST\Workspaces\13718016.wsp

Substitute for form 1449A/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/718,016
				Filing Date	December 18, 2012
				First Named Inventor	Marcos C. Tzannes
				Art Unit	2633
				Examiner Name	JOSEPH, JAISON
Sheet	1	of	1	Attorney Docket Number	6936-47-CON-DIV-CON-3

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-kind Code [2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee of Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]; Number[4]; Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

OTHER ART (Including Author, Title, Date, Pertinent Pages, etc.)		
Examiner Initials*	Cite No.[1]	
/JJ/	1	Official Action for U.S. Patent Application No. 14/256,677 mailed Sept. 18, 2014 (Attorney Ref. No. 6936-47-CON-6)

Examiner Signature	/Jaison Joseph/	Date Considered	11/30/2014

*EXAMINER: Initial if reference is considered, whether or not citation is in conformance and not considered. Include copy of this form with next communication to applicant.

Substitute for form 1449A/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/718,016
				Filing Date	December 18, 2012
				First Named Inventor	Marcos C. Tzannes
				Art Unit	2633
				Examiner Name	JOSEPH, JAISON
Sheet	1	of	2	Attorney Docket Number	6936-47-CON-DIV-CON-3

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-kind Code [2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee of Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

UNPUBLISHED U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-kind Code [2] (If known)	Filing Date MM-DD-YYYY	Name of Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
/JJ/	1	14/540332	11-13-2014	Tzannes	

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]; Number[4]; Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

OTHER ART (Including Author, Title, Date, Pertinent Pages, etc.)		
Examiner Initials*	Cite No.[1]	
/JJ/	2	Notice of Allowance for U.S. Patent Application No. 14/256,677 mailed Nove. 17, 2014 (Attorney Ref. No. 6936-47-CON-6)
/JJ/	3	Petition for *Inter Partes* Review of Claims 20 and 26 of U.S. Patent No. 7,292,627 Under 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42, including Exhibits 1001 - 1022, Case No. IPR2015-00247, filed Nov. 7, 2014 (Attorney's Ref. No.: 6936-47-CON-IPR) (786 pages)
/JJ/	4	Petition for *Inter Partes* Review of Claim 1 of U.S. Patent No. 7,471,721 Under 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42, including Exhibits 1001 - 1022, Case No. IPR2015-00239, filed Nov. 7, 2014 (Attorney's Ref. No.: 6936-47-CON-2-IPR) (775 pages)
/JJ/	5	Petition for *Inter Partes* Review of Claims 1 and 14 of U.S. Patent No. 8,090,008 Under 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42, including Exhibits 1001 - 1021, Case No. IPR2015-00240, filed Nov. 7, 2014 (Attorney's Ref. No.: 6936-47-CON-4-IPR) (830 pages)
/JJ/	6	Petition for *Inter Partes* Review of Claims 1 and 14 of U.S. Patent No. 8,073,041 Under 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42, including Exhibits 1001 - 1022, Case No. IPR2015-00241, filed Nov. 7, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-IPR) (815 pages)

Examiner Signature	/Jaison Joseph/	Date Considered	11/30/2014

*EXAMINER: Initial if reference is considered, whether or not citation is in conformance and not considered. Include copy of this form with next communication to applicant.

Substitute for form 1449A/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/718,016
				Filing Date	December 18, 2012
				First Named Inventor	Marcos C. Tzannes
				Art Unit	2633
				Examiner Name	JOSEPH, JAISON
Sheet	2	of	2	Attorney Docket Number	6936-47-CON-DIV-CON-3

/JJ/	7	Petition for *Inter Partes* Review of Claims 1, 6, 7, and 31 of U.S. Patent No. 8,218,610 Under 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42, including Exhibits 1001 - 1021, Case No. IPR2015-00242, filed Nov. 7, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-IPR) (882 pages)
/JJ/	8	Petition for *Inter Partes* Review of Claims 1, 6, 7, and 29 of U.S. Patent No. 8,355,427 Under 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42, including Exhibits 1001 - 1022, Case No. IPR2015-00243, filed Nov. 7, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-2-IPR) (909 pages)

Examiner Signature	/Jaison Joseph/	Date Considered	11/30/2014

*EXAMINER: Initial if reference is considered, whether or not citation is in conformance and not considered. Include copy of this form with next communication to applicant.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of: Marcos C. Tzannes	Group Art Unit: 2633
Application No.: 13/718,016	Examiner: JOSEPH, Jaison
Filed: December 18, 2012	Confirmation No.: 4520
Atty. File No.: 6936-47-CON-DIV-CON-3	

For: SYSTEM AND METHOD FOR SCRAMBLING USING A BIT SCRAMBLER AND A PHASE SCRAMBLER

AMENDMENT AND RESPONSE

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

Madam:

Applicants submit this Amendment and Response to address the Office Action having a mailing date of July 24, 2014. Please credit any overpayment or charge any underpayment to Deposit Account No. 19-1970.

Please amend the above-identified patent application as follows:

Amendments to the Claims are shown in the listing of claims which begins on page 2 of this paper.

Remarks begin on page 6 of this paper.

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.-20. (Cancelled)

21. (Currently Amended) A method, in a multicarrier communications transceiver comprising a bit scrambler followed by a phase scrambler, comprising:

scrambling, using the bit scrambler, a plurality of input bits to generate a plurality of scrambled output bits, wherein at least one scrambled output bit is different than a corresponding input bit;

scrambling, using the phase scrambler, a plurality of carrier phases associated with the plurality of scrambled output bits;

transmitting at least one scrambled output bit on a first carrier; and

transmitting the at least one scrambled output bit on a second carrier.

22. (Previously Presented) The method of claim 21, wherein the transceiver is a cable transceiver.

23. (Previously Presented) The method of claim 21, wherein the transceiver is a DSL transceiver.

24. (Previously Presented) The method of claim 21, wherein the transceiver is a wireless transceiver.

25. (Previously Presented) The method of claim 21, wherein the transceiver is operable for high speed internet access.

26. (Previously Presented) The method of claim 21, wherein the transceiver is operable to transport video.

27. (Cancelled)

28. (Currently Amended) A multicarrier communications transceiver comprising:

a bit scrambler operable to scramble a plurality of input bits to generate a plurality of scrambled output bits, wherein at least one scrambled output bit is different than a corresponding input bit;

a phase scrambler operable to scramble a plurality of carrier phases associated with the plurality of scrambled output bits; and

a transmitter portion operable to transmit at least one scrambled output bit on a first carrier and to transmit the at least one scrambled output bit on a second carrier.

29. (Previously Presented) The transceiver of claim 28, wherein the transceiver is a cable transceiver.

30. (Previously Presented) The transceiver of claim 28, wherein the transceiver is a DSL transceiver.

31. (Previously Presented) The transceiver of claim 28, wherein the transceiver is a wireless transceiver.

32. (Previously Presented) The transceiver of claim 28, wherein the transceiver is operable for high speed internet access.

33. (Previously Presented) The transceiver of claim 28, wherein the transceiver is operable to transport video.

34-41. (Cancelled)

42. (Currently Amended) A communication device comprising:

a multicarrier transmitter operable to support a bit scrambler and a phase scrambler for transmission of a plurality of input bits, wherein the bit scrambler is operable to scramble the plurality of input bits to generate a plurality of scrambled output bits, wherein at least one scrambled output bit is different than a corresponding input bit, and wherein the phase scrambler is operable to scramble a plurality of phases associated with the plurality of input bits.

43 (Previously Presented) The communications device of claim 42, wherein the multicarrier transmitter is further operable to transmit at least one scrambled output bit on a first carrier and transmit the at least one scrambled output bit on a second carrier.

44. (Previously Presented) The communication device of claim 43, wherein the transceiver is a cable transceiver.

45. (Previously Presented) The communication device of claim 43, wherein the transceiver is a DSL transceiver.

46. (Previously Presented) The communication device of claim 43, wherein the transceiver is a wireless transceiver.

47. (Previously Presented) The communication device of claim 43, wherein the communication device is operable for high speed internet access.

48. (Previously Presented) The communication device of claim 43, wherein the communication device is operable to transport video.

49. (Currently Amended) A method comprising:

supporting, in a communication device comprising a multicarrier communications transceiver, a bit scrambler and a phase scrambler for transmission of a plurality of input bits wherein the bit scrambler scrambles the plurality of input bits to generate a plurality of scrambled output bits, wherein at least one scrambled output bit is different than a corresponding

input bit, and wherein the phase scrambler scrambles a plurality of phases associated with the plurality of input bits.

50. (Previously Presented) The method of claim 49 further comprising:
transmitting at least one scrambled output bit on a first carrier; and
transmitting the at least one scrambled output bit on a second carrier.

51. (Previously Presented) The communication device of claim 49, wherein the transceiver is a DSL transceiver.

52. (Previously Presented) The communication device of claim 49, wherein the transceiver is a wireless transceiver.

53. (Previously Presented) The communication device of claim 49, wherein the communication device is operable for high speed internet access.

54. (Previously Presented) The communication device of claim 49, wherein the communication device is operable to transport video.

REMARKS

Applicant respectfully requests reconsideration of this application as amended.

Applicant would like to thank Ex. Joseph for the courtesies extended during the 6 November Personal Interview and the 18 November telephone Interview. During the interviews, the operation of a scrambler was contrasted with that of an interleaver.

It was agreed that if Applicant amended the independent claims to clarify scrambled output bits, that the claims were distinguishable from Suzuki which discloses an output of the convolution encoder **101** is supplied to a four-frame interleave buffer **102** in which data interleave is carried out over four frames (20 msec.).

As discussed in Wikipedia, "A scrambler (or randomizer) can be either: An algorithm that converts an input string into a seemingly random output string of the same length (e.g., by pseudo-randomly selecting bits to invert), thus avoiding long sequences of bits of the same value; in this context, a randomizer is also referred to as a scrambler...."

Based on the outcome of the Personal Interview and the known definition of scrambler, Applicant respectfully submits the 35 U.S.C. §102 and 103 rejections are moot.

Withdrawal of the rejections is respectfully requested.

A prompt Notice of Allowance is respectfully solicited.

Should the Examiner believe anything further is desirable in order to place the application in even better condition for allowance, the Examiner is encouraged to contact Applicants undersigned representative at the telephone number listed below.

The Commissioner is hereby authorized to charge to deposit account number 19-1970 any fees under 37 CFR § 1.16 and 1.17 that may be required by this paper and to credit any overpayment to that Account. If any extension of time is required in connection with the filing of this paper and has not been separately requested, such extension is hereby Petitioned.

Respectfully submitted,

SHERIDAN ROSS P.C.

Date: 18 Nov '14

By: _____

Jason H. Vick
Reg. No. 45,285
1560 Broadway, Suite 1200
Denver, Colorado 80202
Telephone: 303-863-9700

PTO/AIA/22 (03-13)
Approved for use through 7/31/2016. OMB 0651-0031
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.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)	Docket Number (Optional) 6936-47-CON-DIV-CON-3
Application Number 13/718,016	Filed December 18, 2012
For SYSTEM AND METHOD FOR SCRAMBLING USING A BIT SCRAMBLER AND A PHASE SCRAMBLER	
Art Unit 2633	Examiner JOSEPH, JAISON

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

		Fee	Small Entity Fee	Micro Entity Fee	
☑	One month (37 CFR 1.17(a)(1))	$200	$100	$50	$ 200
☐	Two months (37 CFR 1.17(a)(2))	$600	$300	$150	$
☐	Three months (37 CFR 1.17(a)(3))	$1,400	$700	$350	$
☐	Four months (37 CFR 1.17(a)(4))	$2,200	$1,100	$550	$
☐	Five months (37 CFR 1.17(a)(5))	$3,000	$1,500	$750	$

☐ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☑ The Director has already been authorized to charge fees in this application to a Deposit Account.

☑ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 19-1970.

☑ Payment made via EFS-Web.

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.

I am the

☐ applicant.

☑ attorney or agent of record. Registration number 45,285.

☐ attorney or agent acting ~~under 37 CFR~~ 1.34. Registration number _____.

Signature	18 Nov '14 Date
Jason H. Vick Typed or printed name	303-863-9700 Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.

☑ * Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.136(a). 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 6 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: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of:	)	Group Art Unit: 2633
Marcos C. Tzannes	)	Confirmation No.: 4520
Serial No.: 13/718,016	)	Examiner: JOSEPH, JAISON
Filed: December 18, 2012	)	
Atty. File No.: 6936-47-CON-DIV-CON-3	)	SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT
Entitled: "SYSTEM AND METHOD FOR DESCRAMBLING THE PHASE OF CARRIERS IN A MULTICARRIER COMMUNICATIONS SYSTEM"	)	Electronically Submitted

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

Dear Sir:

The references cited on attached Form PTO-1449 are being called to the attention of the Examiner.

☒ Copies of the cited non-patent and/or foreign references are enclosed herewith.

☐ Copies of the cited U.S. patents and/or patent applications are enclosed herewith.

☒ Copies of the cited U.S. patents/unpublished patent applications/patent application publications are not enclosed in accordance with 37 C.F.R. § 1.98(a).

☐ Copies of the cited references are not enclosed, in accordance with 37 C.F.R. § 1.98(d), because the references were cited by or submitted to the U.S. Patent and Trademark Office in prior application Serial No. _____ filed _____, which is relied upon for an earlier filing date under 35 U.S.C. § 120.

☐ To the best of applicants' belief, the pertinence of the foreign-language references are believed to be summarized in the attached English translation/abstracts and/or in the figures, although applicants do not necessarily vouch for the accuracy of the translation.

☒ Examiner's attention is drawn to the following related applications:

- Serial No. 14/540,332 filed Nov. 13, 2014 (Attorney Ref. No. 6936-47-CON-7)

☐ Other:_____

Submission of the above information is not intended as an admission that any item is citable under the statutes or rules to support a rejection, that any item disclosed represents analogous art, or that those skilled in the art would refer to or recognize the

pertinence of any reference without the benefit of hindsight, nor should an inference be drawn as to the pertinence of the references based on the order in which they are presented. Submission of this statement should not be taken as an indication that a search has been conducted, or that no better art exists.

It is respectfully requested that the cited information be expressly considered during the prosecution of this application and the references made of record therein.

FEES

☐	**37 CFR 1.97(b)**: No fee is believed due in connection with this submission, because the information disclosure statement submitted herewith is satisfied by one of the following conditions ("X" indicates satisfaction): ☐ Within three months of the filing date of a national application other than a continued prosecution application under 37 CFR 1.53(d), or ☐ Within three months of the date of entry into the national stage of an international application as set forth in 37 CFR 1.491 or ☐ Before the mailing date of a first Office Action on the merits, or ☐ Before the mailing of a first Office action after the filing of a request for continued examination under 37 CFR 1.114. Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970.
☒	**37 CFR 1.97(c)**: The information disclosure statement transmitted herewith is being filed after all the above conditions (37 CFR 1.97(b)), but before the mailing date of one of the following conditions: (1) a final action under 37 C.F.R. 1.113 or (2) a notice of allowance under 37 C.F.R. 1.311, or (3) an action that otherwise closes prosecution in the application. This Information Disclosure Statement is accompanied by: ☒ A Certification (below) as specified by 37 C.F.R. 1.97(e). Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970. OR ☐ Please charge Deposit Account 19-1970 in the amount of $180.00 for the fee set forth in 37 C.F.R. 1.17(p) for submission of an information disclosure statement. Please credit any overpayment or charge any underpayment to Deposit Account 19-1970.
☐	**37 CFR 1.97(d)**: This Information Disclosure Statement is being submitted after the period specified in 37 CFR 1.97(c). ☐ This information Disclosure Statement includes a Certification (below) as specified by 37 C.F.R. 1.97(e) AND ☐ Applicants hereby requests consideration of the reference(s) disclosed herein. Please charge Deposit Account 19-1970 in the amount of $180.00 under 37 C.F.R. 1.17(p). Please credit any overpayment or charge any underpayment to Deposit Account 19-1970. Election to pay the fee should not be taken as an indication that applicant(s) cannot execute a certification.

Certification (37 C.F.R. 1.97(e))
(Applicable only if checked)

☒ The undersigned certifies that:

☐ Each item of information contained in this information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(1).

☐ A copy of the communication from the foreign patent office is enclosed.

OR

☒ No item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in this Information Disclosure Statement was known to any individual designated in 37 C.F.R. 1.56(c) more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(2).

Respectfully submitted,

SHERIDAN ROSS P.C.

By: _____

Jason H. Vick
Registration No. 45,285
1560 Broadway, Suite 1200
Denver, Colorado 80202-5141
(303) 863-9700

Date: 18 Nov 14

Substitute for form 1449A/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/718,016
				Filing Date	December 18, 2012
				First Named Inventor	Marcos C. Tzannes
				Art Unit	2633
				Examiner Name	JOSEPH, JAISON
Sheet	1	of	2	Attorney Docket Number	6936-47-CON-DIV-CON-3

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-kind Code [2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee of Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

UNPUBLISHED U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-kind Code [2] (If known)	Filing Date MM-DD-YYYY	Name of Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1	14/540332	11-13-2014	Tzannes	

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]; Number[4]; Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

OTHER ART (Including Author, Title, Date, Pertinent Pages, etc.)		
Examiner Initials*	Cite No.[1]	
	2	Notice of Allowance for U.S. Patent Application No. 14/256,677 mailed Nove. 17, 2014 (Attorney Ref. No. 6936-47-CON-6)
	3	Petition for *Inter Partes* Review of Claims 20 and 26 of U.S. Patent No. 7,292,627 Under 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42, including Exhibits 1001 - 1022, Case No. IPR2015-00247, filed Nov. 7, 2014 (Attorney's Ref. No.: 6936-47-CON-IPR) (786 pages)
	4	Petition for *Inter Partes* Review of Claim 1 of U.S. Patent No. 7,471,721 Under 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42, including Exhibits 1001 - 1022, Case No. IPR2015-00239, filed Nov. 7, 2014 (Attorney's Ref. No.: 6936-47-CON-2-IPR) (775 pages)
	5	Petition for *Inter Partes* Review of Claims 1 and 14 of U.S. Patent No. 8,090,008 Under 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42, including Exhibits 1001 - 1021, Case No. IPR2015-00240, filed Nov. 7, 2014 (Attorney's Ref. No.: 6936-47-CON-4-IPR) (830 pages)
	6	Petition for *Inter Partes* Review of Claims 1 and 14 of U.S. Patent No. 8,073,041 Under 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42, including Exhibits 1001 - 1022, Case No. IPR2015-00241, filed Nov. 7, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-IPR) (815 pages)

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference is considered, whether or not citation is in conformance and not considered. Include copy of this form with next communication to applicant.

Substitute for form 1449A/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/718,016
				Filing Date	December 18, 2012
				First Named Inventor	Marcos C. Tzannes
				Art Unit	2633
				Examiner Name	JOSEPH, JAISON
Sheet	2	of	2	Attorney Docket Number	6936-47-CON-DIV-CON-3

	7	Petition for *Inter Partes* Review of Claims 1, 6, 7, and 31 of U.S. Patent No. 8,218,610 Under 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42, including Exhibits 1001 - 1021, Case No. IPR2015-00242, filed Nov. 7, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-IPR) (882 pages)
	8	Petition for *Inter Partes* Review of Claims 1, 6, 7, and 29 of U.S. Patent No. 8,355,427 Under 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42, including Exhibits 1001 - 1022, Case No. IPR2015-00243, filed Nov. 7, 2014 (Attorney's Ref. No.: 6936-47-CON-DIV-CON-2-IPR) (909 pages)

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference is considered, whether or not citation is in conformance and not considered. Include copy of this form with next communication to applicant.

Electronic Patent Application Fee Transmittal	
Application Number:	13718016
Filing Date:	18-Dec-2012
Title of Invention:	SYSTEM AND METHOD FOR DESCRAMBLING THE PHASE OF CARRIERS IN A MULTICARRIER COMMUNICATIONS SYSTEM
First Named Inventor/Applicant Name:	Marcos C. Tzannes
Filer:	Jason Vick/Joanne Vos
Attorney Docket Number:	6936-47-CON-DIV-CON-3
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:				
Extension - 1 month with $0 paid	1251	1	200	200

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
		Total in USD ($)		**200**

Electronic Acknowledgement Receipt	
EFS ID:	20733460
Application Number:	13718016
International Application Number:	
Confirmation Number:	4520
Title of Invention:	SYSTEM AND METHOD FOR DESCRAMBLING THE PHASE OF CARRIERS IN A MULTICARRIER COMMUNICATIONS SYSTEM
First Named Inventor/Applicant Name:	Marcos C. Tzannes
Customer Number:	62574
Filer:	Jason Vick/Joanne Vos
Filer Authorized By:	Jason Vick
Attorney Docket Number:	6936-47-CON-DIV-CON-3
Receipt Date:	18-NOV-2014
Filing Date:	18-DEC-2012
Time Stamp:	17:32:24
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$200
RAM confirmation Number	4141
Deposit Account	191970
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 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		AMEND_03v2.pdf	915275 30db613d3e879a4ec15067156e66f85c7180b2e9	yes	8

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Amendment/Req. Reconsideration-After Non-Final Reject	1	1
Claims	2	5
Applicant Arguments/Remarks Made in an Amendment	6	7
Extension of Time	8	8

Warnings:

Information:

2		IDS_05.pdf	706440 96b301de079aa4ef6bebe2cfb907be8c5ccb094d	yes	5

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Transmittal Letter	1	3
Information Disclosure Statement (IDS) Form (SB08)	4	5

Warnings:

Information:

3	Non Patent Literature	6936-47-CON-6_NOA_11-17-2014.pdf	392739 40835528d6e177536c7e143784359228c2b27da2	no	6

Warnings:

Information:

4	Non Patent Literature	6936-47-CON-IPR_0001.pdf	8229847 423693736b70814dff8418020b89392b64390a37b	no	205

Warnings:

Information:

5	Non Patent Literature	6936-47-CON-IPR_0002.pdf	7153946 5d228eab5a2c46658dc9d5805144059bc7542fd6	no	313
Warnings:					
Information:					
6	Non Patent Literature	6936-47-CON-IPR_0003.pdf	11570199 1c240a2f8bc0212eb4ef59cd77455e924c9324dc	no	159
Warnings:					
Information:					
7	Non Patent Literature	6936-47-CON-IPR_0004.pdf	14635614 8eca261a914a40b72e449c5fa1a6541e838063fd	no	109
Warnings:					
Information:					
8	Non Patent Literature	6936-47-CON-2-IPR_0001.pdf	9199444 d2cbd976cdd1a3b884c14792fe26cc9df9eba1c1	no	208
Warnings:					
Information:					
9	Non Patent Literature	6936-47-CON-2-IPR_0002.pdf	6291877 a9cf750a7884275522fff5ceefc908e481026314	no	303
Warnings:					
Information:					
10	Non Patent Literature	6936-47-CON-2-IPR_0003.pdf	9984666 f25b2f1bd0be6f8ae34a997ed4ce93a390413312	no	92
Warnings:					
Information:					
11	Non Patent Literature	6936-47-CON-2-IPR_0004.pdf	15474466 c58838088870a387ed2f7a9c2d62f763130b3a40c	no	172
Warnings:					
Information:					
12	Non Patent Literature	6936-47-CON-4-IPR_0001.pdf	11507072 031d6f792a17939ca6d64a22b29354153ceb05c5	no	280
Warnings:					
Information:					
13	Non Patent Literature	6936-47-CON-4-IPR_0002.pdf	7078942 0428a3e5ae5a0dce60cbb9a6c85e75a25bbd9441	no	309
Warnings:					
Information:					

14	Non Patent Literature	6936-47-CON-4-IPR_0003.pdf	10687785 db03a6558699ed5d062c7fb54f79f8396ce96c8d	no	145
Warnings:					
Information:					
15	Non Patent Literature	6936-47-CON-4-IPR_0004.pdf	12886422 48a11adc72721a83235b97222cad1c971b324b50	no	96
Warnings:					
Information:					
16	Non Patent Literature	6936-47-CON-DIV-IPR_0001.pdf	11323934 8ce3a6cbde090102a8952887ce202509a17b14f1	no	296
Warnings:					
Information:					
17	Non Patent Literature	6936-47-CON-DIV-IPR_0002.pdf	6397302 481f8f09c55d3960f000385ac9bf378bfa4d239e	no	303
Warnings:					
Information:					
18	Non Patent Literature	6936-47-CON-DIV-IPR_0003.pdf	11425714 6e96d652c5b41d8bf61c72bf435811a206c8b49d	no	159
Warnings:					
Information:					
19	Non Patent Literature	6936-47-CON-DIV-IPR_0004.pdf	8532845 74edc9663383b6abf94988fd58f9d50d9b393399	no	57
Warnings:					
Information:					
20	Non Patent Literature	6936-47-CON-DIV-CON-IPR_0001.pdf	13085884 47b258db84ab6adf410de58291e2475d34ab2edf	no	358
Warnings:					
Information:					
21	Non Patent Literature	6936-47-CON-DIV-CON-IPR_0002.pdf	7191644 4f61b9e6cad066bc0a0312ed62140355131a4b40	no	309
Warnings:					
Information:					
22	Non Patent Literature	6936-47-CON-DIV-CON-IPR_0003.pdf	9683931 d3004d0af20450a943445d8eda71668ce8484e44	no	145
Warnings:					
Information:					

23	Non Patent Literature	6936-47-CON-DIV-CON-IPR_0004.pdf	9774074 4f5d081181b95180f6469f49fd919f57743d99e2	no	70
Warnings:					
Information:					
24	Non Patent Literature	6936-47-CON-DIV-CON-2-IPR_0001.pdf	12459176 e865684872b753c312a498658d7b5a380bb50118	no	355
Warnings:					
Information:					
25	Non Patent Literature	6936-47-CON-DIV-CON-2-IPR_0002.pdf	7084111 f14801d7e786c2b21d8e0d9f587d90f5b99a2917	no	309
Warnings:					
Information:					
26	Non Patent Literature	6936-47-CON-DIV-CON-2-IPR_0003.pdf	11590764 ad8e4512e7173795140a46d97bcaa7a0e43a5bd8	no	153
Warnings:					
Information:					
27	Non Patent Literature	6936-47-CON-DIV-CON-2-IPR_0004.pdf	13678254 4ff41b98d2c690d99e28ae5a438943b7814a122e	no	92
Warnings:					
Information:					
28	Fee Worksheet (SB06)	fee-info.pdf	30797 84f6c45afdcf09f407b13db30e7561cc0891bf23	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	248973164		

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.

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

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/718,016	Filing Date 12/18/2012	☐ 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	11/18/2014	(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))	* 25	Minus	** 25	= 0	X $40 =	0
	Independent (37 CFR 1.16(h))	* 4	Minus	***4	= 0	X $210 =	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
/HALLEY MASSEY/

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/718,016	12/18/2012	Marcos C. Tzannes	6936-47-CON-DIV-CON-3	4520

62574 7590 11/13/2014

Jason H. Vick
Sheridan Ross, PC
Suite # 1200
1560 Broadway
Denver, CO 80202

EXAMINER	
JOSEPH, JAISON	

ART UNIT	PAPER NUMBER
2633	

NOTIFICATION DATE	DELIVERY MODE
11/13/2014	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jvick@sheridanross.com

Applicant-Initiated Interview Summary	**Application No.** 13/718,016	**Applicant(s)** TZANNES, MARCOS C.	
	Examiner JAISON JOSEPH	**Art Unit** 2633	

All participants (applicant, applicant's representative, PTO personnel):

(1) *JAISON JOSEPH*. (3)_____.

(2) *Jason H. Vick*. (4)_____.

Date of Interview: *06 November 2014*.

Type: ☐ Telephonic ☐ Video Conference
☒ Personal [copy given to: ☐ applicant ☒ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☐ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☒102 ☒103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: _____.

Identification of prior art discussed: *US 5,903,614 and Us5,896,419*.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Applicant explained the difference between "scrambler" and interleaver. Examiner agreed that scramber randomize the bits. Applicant agreed to amend the claim to "generate a plurality of randomized scrambled output bits". Applicant intent to file an amendment and resubmit the claims. Examiner will consider the amendment upon the submission of the official amendment..

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/JAISON JOSEPH/ Primary Examiner, Art Unit 2633	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

———

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

Substitute for form 1449A/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/718,016
				Filing Date	December 18, 2012
				First Named Inventor	Marcos C. Tzannes
				Art Unit	2633
				Examiner Name	JOSEPH, JAISON
Sheet	1	of	1	Attorney Docket Number	6936-47-CON-DIV-CON-3

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-kind Code [2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee of Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]; Number[4]; Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

OTHER ART (Including Author, Title, Date, Pertinent Pages, etc.)		
Examiner Initials*	Cite No.[1]	
	1	Official Action for U.S. Patent Application No. 14/256,677 mailed Sept. 18, 2014 (Attorney Ref. No. 6936-47-CON-6)

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference is considered, whether or not citation is in conformance and not considered. Include copy of this form with next communication to applicant.

Electronic Acknowledgement Receipt	
EFS ID:	20488181
Application Number:	13718016
International Application Number:	
Confirmation Number:	4520
Title of Invention:	SYSTEM AND METHOD FOR DESCRAMBLING THE PHASE OF CARRIERS IN A MULTICARRIER COMMUNICATIONS SYSTEM
First Named Inventor/Applicant Name:	Marcos C. Tzannes
Customer Number:	62574
Filer:	Jason Vick/Joanne Vos
Filer Authorized By:	Jason Vick
Attorney Docket Number:	6936-47-CON-DIV-CON-3
Receipt Date:	22-OCT-2014
Filing Date:	18-DEC-2012
Time Stamp:	15:48:06
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		IDS_04.pdf	529653 f328be73edba8c80ed6e13bcf453c49f7f489e9e	yes	4

	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Transmittal Letter		1	3	
	Information Disclosure Statement (IDS) Form (SB08)		4	4	
Warnings:					
Information:					
2	Non Patent Literature	6936-47-CON-6_OA_09-18-2014.pdf	293421 63090c76062ffa7f4e617b7334d7d7bc29532619	no	8
Warnings:					
Information:					
		Total Files Size (in bytes):	823074		

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of:	)	Group Art Unit: 2633
Marcos C. Tzannes	)	Confirmation No.: 4520
Serial No.: 13/718,016	)	Examiner: JOSEPH, JAISON
Filed: December 18, 2012	)	
Atty. File No.: 6936-47-CON-DIV-CON-3	)	SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT
Entitled: "SYSTEM AND METHOD FOR DESCRAMBLING THE PHASE OF CARRIERS IN A MULTICARRIER COMMUNICATIONS SYSTEM"	)	Electronically Submitted

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

Dear Sir:

The references cited on attached Form PTO-1449 are being called to the attention of the Examiner.

☒ Copies of the cited non-patent and/or foreign references are enclosed herewith.

☐ Copies of the cited U.S. patents and/or patent applications are enclosed herewith.

☐ Copies of the cited U.S. patents/unpublished patent applications/patent application publications are not enclosed in accordance with 37 C.F.R. § 1.98(a).

☐ Copies of the cited references are not enclosed, in accordance with 37 C.F.R. § 1.98(d), because the references were cited by or submitted to the U.S. Patent and Trademark Office in prior application Serial No. _____ filed _____, which is relied upon for an earlier filing date under 35 U.S.C. § 120.

☐ To the best of applicants' belief, the pertinence of the foreign-language references are believed to be summarized in the attached English translation/abstracts and/or in the figures, although applicants do not necessarily vouch for the accuracy of the translation.

☐ Examiner's attention is drawn to the following related applications:

- Serial No. _____ filed _____(Attorney Ref. No. _____)

☐ Other:_____

Submission of the above information is not intended as an admission that any item is citable under the statutes or rules to support a rejection, that any item disclosed represents analogous art, or that those skilled in the art would refer to or recognize the

pertinence of any reference without the benefit of hindsight, nor should an inference be drawn as to the pertinence of the references based on the order in which they are presented. Submission of this statement should not be taken as an indication that a search has been conducted, or that no better art exists.

It is respectfully requested that the cited information be expressly considered during the prosecution of this application and the references made of record therein.

FEES

☐	**37 CFR 1.97(b)**: No fee is believed due in connection with this submission, because the information disclosure statement submitted herewith is satisfied by one of the following conditions ("X" indicates satisfaction): ☐ Within three months of the filing date of a national application other than a continued prosecution application under 37 CFR 1.53(d), or ☐ Within three months of the date of entry into the national stage of an international application as set forth in 37 CFR 1.491 or ☐ Before the mailing date of a first Office Action on the merits, or ☐ Before the mailing of a first Office action after the filing of a request for continued examination under 37 CFR 1.114. Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970.
☒	**37 CFR 1.97(c)**: The information disclosure statement transmitted herewith is being filed after all the above conditions (37 CFR 1.97(b)), but before the mailing date of one of the following conditions: (1) a final action under 37 C.F.R. 1.113 or (2) a notice of allowance under 37 C.F.R. 1.311, or (3) an action that otherwise closes prosecution in the application. This Information Disclosure Statement is accompanied by: ☒ A Certification (below) as specified by 37 C.F.R. 1.97(e). Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970. OR ☐ Please charge Deposit Account 19-1970 in the amount of $180.00 for the fee set forth in 37 C.F.R. 1.17(p) for submission of an information disclosure statement. Please credit any overpayment or charge any underpayment to Deposit Account 19-1970.
☐	**37 CFR 1.97(d)**: This Information Disclosure Statement is being submitted after the period specified in 37 CFR 1.97(c). ☐ This information Disclosure Statement includes a Certification (below) as specified by 37 C.F.R. 1.97(e) AND ☐ Applicants hereby requests consideration of the reference(s) disclosed herein. Please charge Deposit Account 19-1970 in the amount of $180.00 under 37 C.F.R. 1.17(p). Please credit any overpayment or charge any underpayment to Deposit Account 19-1970. Election to pay the fee should not be taken as an indication that applicant(s) cannot execute a certification.

Certification (37 C.F.R. 1.97(e))
(Applicable only if checked)

☒ The undersigned certifies that:

☐ Each item of information contained in this information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(1).

☐ A copy of the communication from the foreign patent office is enclosed.

OR

☒ No item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in this Information Disclosure Statement was known to any individual designated in 37 C.F.R. 1.56(c) more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(2).

Respectfully submitted,

SHERIDAN ROSS P.C.

By: _____

Jason H. Vick
Registration No. 45,285
1560 Broadway, Suite 1200
Denver, Colorado 80202-5141
(303) 863-9700

Date: 22 Oct 17

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/718,016	12/18/2012	Marcos C. Tzannes	6936-47-CON-DIV-CON-3	4520

62574 7590 07/24/2014

Jason H. Vick
Sheridan Ross, PC
Suite # 1200
1560 Broadway
Denver, CO 80202

EXAMINER	
JOSEPH, JAISON	
ART UNIT	PAPER NUMBER
2633	

NOTIFICATION DATE	DELIVERY MODE
07/24/2014	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jvick@sheridanross.com

Office Action Summary	Application No. 13/718,016	Applicant(s) TZANNES, MARCOS C.	
	Examiner JAISON JOSEPH	Art Unit 2633	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 *06/18/2014*.

☐ 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) *21-26,28-33 and 42-54* 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) *21-26,28-33 and 42-54* 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 _____ 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: _____.

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

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 42, 43, 46, 50, and 52 are rejected under pre-AIA 35 U.S.C. 102(a) as being anticipated by Suzuki (US 5,896,419).

Regarding claim 42, Suzuki teaches a communication device (see figure 7) comprising: a multicarrier transmitter operable to support a bit scrambler and a phase scrambler for transmission of a plurality of input bits (see figure 7), wherein the bit scrambler is operable to scramble the plurality of input bits to generate a plurality of scrambled output bits (see figure 7, component 102) and wherein the phase scrambler is operable to scramble a plurality of phases associated with the plurality of input bits (see figure 7, component 103 and 104).

Regarding claim 43, which inherits the limitations of claim 42, Suzuki further teaches wherein the multicarrier transmitter is further operable to transmit at least one scrambled output bit on a first carrier and transmit the at least one scrambled output bit on a second carrier (see figure 7).

Regarding claim 46, which inherits the limitations of claim 43, Suzuki further teaches wherein the transceiver is a wireless transceiver (see abstract).

Regarding claim 49, the method including the features corresponds to subject matter mentioned above in the rejection of claim 42 is applicable hereto.

Regarding claim 50, which inherits the limitations of claim 49, the claimed method including the features corresponds to subject matter mentioned above in the rejection of claim 43 is applicable hereto.

Regarding claim 52, which inherits the limitations of claim 49, the claimed method including the features corresponds to subject matter mentioned above in the rejection of claim 46 is applicable hereto.

Claim Rejections - 35 USC § 103

The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 44, 45, 47, 48, 51, 53, and 54 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Suzuki (US 5,896,419).

Regarding claim 44, Suzuki in view of Suzuki et al does not expressly teach cable transceiver. However there is no criticality in these limitations. It is well known in the art that applying Suzuki et al in a cable transceiver is within the scope of one of ordinary skilled in the art.

Regarding claim 45, Suzuki in view of Suzuki et al does not expressly teach DSL transceiver. However there is no criticality in these limitations. It is well known in the art that Applying Suzuki et al in a DSL transceiver are within the scope of one of ordinary skilled in the art.

Regarding claim 47, Suzuki in view of Suzuki et al does not expressly teach high speed internet access transceiver. However there is no criticality in these limitations. It is well known in the art that Applying Suzuki et al for high speed internet access are within the scope of one of ordinary skilled in the art.

Regarding claim 48, Suzuki in view of Suzuki et al does not expressly teach the transceiver is for transporting video. However there is no criticality in these limitations. It is well known in the art that applying Suzuki et al for transporting video are within the scope of one of ordinary skilled in the art.

Regarding claim 51, the claimed multicarrier communications transceiver including the features corresponds to subject matter mentioned above in the rejection of claim 45 is applicable hereto.

Regarding claim 53, which inherits the limitations of claim 49, the claimed multicarrier communications transceiver including the features corresponds to subject matter mentioned above in the rejection of claim 47 is applicable hereto.

Regarding claim 54, which inherits the limitations of claim 49, the claimed multicarrier communications transceiver including the features corresponds to subject matter mentioned above in the rejection of claim 48 is applicable hereto.

Claims 21 – 26 and 28 – 33 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Suzuki (US 5,896,419) in view of Suzuki et al (US 5,903,614).

Regarding claim 21, Suzuki teaches method in a multicarrier communications transceiver (see figure 7) comprising, a bit scrambler followed by a phase scrambler (see figure 6, component 102, 103 and 104), comprising: scrambling, using the bit scrambler, a plurality of input bits to generate a plurality of scrambled output bits (See figure 6, component 102); scrambling, using the phase scrambler, a plurality of phases associated with the plurality of scrambled output bits (see figure 7, component 103 and 104); transmitting at least one scrambled output bit on a first carrier; and transmitting the at least one scrambled output bit on a second carrier (see figure 7). Suzuki et al does not expressly teach scrambling the phases of the carrier. However in analogous art, Suzuki et al teach scrambling plurality of phases of the carrier (see figure 7). Therefore it would have been obvious to an ordinary skilled in the art at the time the invention was made to scramble the phases of the carrier. The motivation or suggestion to do so is to reduce PAPR of the transmitted signal.

Regarding claim 22, Suzuki in view of Suzuki et al does not expressly teach cable transceiver. However there is no criticality in these limitations. It is well known in the art that applying Suzuki et al in a cable transceiver is within the scope of one of ordinary skilled in the art.

Regarding claim 23, Suzuki in view of Suzuki et al does not expressly teach DSL transceiver. However there is no criticality in these limitations. It is well known in the art

that Applying Suzuki et al in a DSL transceiver are within the scope of one of ordinary skilled in the art.

Regarding claim 24, which inherits the limitations of claim 21, Suzuki et al teach wherein the transceiver is a wireless transceiver (column 2, lines 57-60).

Regarding claim 25, Suzuki in view of Suzuki et al does not expressly teach high speed internet access transceiver. However there is no criticality in these limitations. It is well known in the art that Applying Suzuki et al for high speed internet access are within the scope of one of ordinary skilled in the art.

Regarding claim 26, Suzuki in view of Suzuki et al does not expressly teach the transceiver is for transporting video. However there is no criticality in these limitations. It is well known in the art that applying Suzuki et al for transporting video are within the scope of one of ordinary skilled in the art.

Regarding claim 28, the claimed multicarrier communications transceiver including the features corresponds to subject matter mentioned above in the rejection of claim 21 is applicable hereto.

Regarding claim 29, which inherits the limitations of claim 28, the claimed multicarrier communications transceiver including the features corresponds to subject matter mentioned above in the rejection of claim 22 is applicable hereto.

Regarding claim 30, which inherits the limitations of claim 28, the claimed multicarrier communications transceiver including the features corresponds to subject matter mentioned above in the rejection of claim 23 is applicable hereto.

Regarding claim 31, which inherits the limitations of claim 28, the claimed multicarrier communications transceiver including the features corresponds to subject matter mentioned above in the rejection of claim 24 is applicable hereto.

Regarding claim 32, which inherits the limitations of claim 28, the claimed multicarrier communications transceiver including the features corresponds to subject matter mentioned above in the rejection of claim 25 is applicable hereto.

Regarding claim 33, which inherits the limitations of claim 28, the claimed multicarrier communications transceiver including the features corresponds to subject matter mentioned above in the rejection of claim 26 is applicable hereto.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAISON JOSEPH whose telephone number is (571)272-6041. The examiner can normally be reached on M,TH, F 7 - 7:30 and S8 - 12.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sam K. Ahn can be reached on (571) 272-3044. 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.

/JAISON JOSEPH/
Primary Examiner, Art Unit 2633

Notice of References Cited	Application/Control No. 13/718,016	Applicant(s)/Patent Under Reexamination TZANNES, MARCOS C.	
	Examiner JAISON JOSEPH	Art Unit 2633	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,896,419	04-1999	Suzuki, Mitsuhiro	375/219
	B	US-			
	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	
	W	
	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.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13718016	TZANNES ET AL.
	Examiner	Art Unit
	JAISON JOSEPH	2633

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
375	222, 340, 341	5/5/2013	JJ
	Updated search	1/27/2014	JJ
	Updated Search	7/31/2014	JJ

SEARCH NOTES		
Search Notes	Date	Examiner
Inventor name search	5/5/2013	JJ
East	5/5/2013	JJ
East updated	1/27/2014	JJ
East Updated	7/14/2014	JJ

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

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13718016	TZANNES ET AL.
	Examiner	Art Unit
	JAISON JOSEPH	2633

✓	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	05/05/2013	01/27/2014	07/14/2014						
	1	-	-	-						
	2	-	-	-						
	3	-	-	-						
	4	-	-	-						
	5	-	-	-						
	6	-	-	-						
	7	-	-	-						
	8	-	-	-						
	9	-	-	-						
	10	-	-	-						
	11	-	-	-						
	12	-	-	-						
	13	-	-	-						
	14	-	-	-						
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	16	-	-	-						
	17	-	-	-						
	18	-	-	-						
	19	-	-	-						
	20	-	-	-						
	21	✓	✓	✓						
	22	✓	✓	✓						
	23	✓	✓	✓						
	24	✓	✓	✓						
	25	✓	✓	✓						
	26	✓	✓	✓						
	27	✓	✓	-						
	28	✓	✓	✓						
	29	✓	✓	✓						
	30	✓	✓	✓						
	31	✓	✓	✓						
	32	✓	✓	✓						
	33	✓	✓	✓						
	34	✓	✓	-						
	35	✓	✓	-						
	36	✓	✓	-						

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13718016	TZANNES ET AL.
	Examiner	**Art Unit**
	JAISON JOSEPH	2633

✓	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	05/05/2013	01/27/2014	07/14/2014						
	37	✓	✓	-						
	38	✓	✓	-						
	39	✓	✓	-						
	40	✓	✓	-						
	41	✓	✓	-						
	42			✓						
	43			✓						
	44			✓						
	45			✓						
	46			✓						
	47			✓						
	48			✓						
	49			✓						
	50			✓						
	51			✓						
	52			✓						
	53			✓						
	54			✓						

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	0	(mitsuhiro near2 suzuki).in. and (carrier near5 phase adj2 shift) same (scrambl$5 or interleav$5)	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 11:11
L3	0	(mitsuhiro near2 suzuki).in. and ((carrier near5 phase adj2 shift) same (scrambl$5 or interleav$5))	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 11:11
L4	1	(mitsuhiro near2 suzuki).in. and ((carrier same phase adj2 shift) same (scrambl$5 or interleav$5))	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 11:11
L5	1373	((carrier same phase adj2 (shift or offset)) same (scrambl$5 or interleav$5))	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 11:13
L6	85	((carrier near4 phase adj2 (shift or offset)) same (scrambl$5 or interleav$5))	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 11:13
L9	105	(mitsuhiro near2 suzuki).in. and phase adj shift	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 11:54
L10	2	(mitsuhiro near2 suzuki).in. and phase adj shift same number near2 carrier	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 11:57
L11	2	(mitsuhiro near2 suzuki) and phase adj shift same number near2 carrier	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 11:57
L12	22	(suzuki) and phase adj shift same number near2 carrier	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 11:57
L13	2	(Sakoda near2 Kazuyuki) and phase adj shift same number near2 carrier	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 12:02
L14	16	(Sakoda) and phase adj shift same number near2 carrier	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 12:02
L15	307	(Sakoda) and phase adj shift	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 12:03
L16	31	(Sakoda) and phase adj shift same interleav$5	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 12:03
L17	50	(mitsuhiro near2 suzuki).in. and phase adj2 shift and interleav$5	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 12:07
L18	0	"6,173,016."	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/07/14 12:42
L19	20	"6173016"	US-PGPUB; USPAT; USOCR; FPRS;	OR	ON	2014/07/14 12:42

			EPO; JPO; DERWENT; IBM_TDB			
L20	3	("5541552" | "5896419" | "6044067").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 12:43
S1	0	13/718016	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/05/05 18:43
S2	8	09/710310	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/05/05 18:44
S3	18	"6590860"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/05/05 19:00
S4	642	phase adj2 shift near3 carrier same number	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/05/05 19:05
S5	43	phase adj2 shift near3 carrier near2 number	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/05/05 19:05
S6	6	("5742679" "6781951" "20020172146").pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/27 12:30
S7	133	pseudo adj2 random adj2 phase adj2 shift	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/27 12:48
S8	8341288	pseudo adj2 random adj2 phase adj2 shift indicat$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/27 12:48
S9	5	pseudo adj2 random adj2 phase adj2 shift same indicat$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/27 12:48
S10	5527787	transmit pohase shift indicator	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/27 12:51
S11	5544755	transmi$4 phase near2 shift near2 indicator	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/27 12:51

S12	233	transmi$4 near4 phase near2 shift near2 (indicator value)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/27 12:52
S13	1	transmi$4 near4 phase near2 shift near2 (indicator value) same random adj2 phase adj2 shift	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/27 12:52
S14	1	13/718016	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/27 13:35
S15	40	("3742498" | "4041391" | "4481640" | "5541552" | "5677927" | "5694415").PN. OR ("5903614").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 09:19
S16	2	13/718016	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/07/14 09:20
S17	137	(mitsuhiro near2 suzuki).in. and phase	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 09:44
S18	55	(mitsuhiro near2 suzuki).in. and phase and interleav$5	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 09:44
S20	23	(mitsuhiro near2 suzuki).in. and phase adj2 shift same interleav$5	US-PGPUB; USPAT; USOCR	OR	ON	2014/07/14 09:48

EAST Search History (Interference)

<This search history is empty>

7/14/2014 1:43:36 PM
C:\Users\jjoseph1\Documents\EAST\Workspaces\13718016.wsp

Substitute for form 1449A/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/718,016
				Filing Date	December 18, 2012
				First Named Inventor	Marcos C. Tzannes
				Art Unit	2633
				Examiner Name	JOSEPH, JAISON
Sheet	1	of	1	Attorney Docket Number	6936-47-CON-DIV-CON-3

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-kind Code [2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee of Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
/JJ/	1	6259685	07-10-2001	Rinne et al.	
/JJ/	2	2003/0128673	07-10-2003	Lee et al.	

UNPUBLISHED U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-kind Code [2] (if known)	Filing Date MM-DD-YYYY	Name of Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
/JJ/	3	14/256677	04-18-2014	Tzannes	

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]; Number[4]; Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
/JJ/	4	EP 1542488	06-15-2005	ERICSSON TELEFON AB L M		

OTHER ART (Including Author, Title, Date, Pertinent Pages, etc.)		
Examiner Initials*	Cite No.[1]	
/JJ/	5	Notice of Allowance for U.S. Patent Application No. 13/303,417, mailed Feb. 7, 2014 (Attorney Ref. No. 6936-47-CON-5)

Examiner Signature	/Jaison Joseph/	Date Considered	06/28/2014

*EXAMINER: Initial if reference is considered, whether or not citation is in conformance and not considered. Include copy of this form with next communication to applicant.

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	13/718,016	Filing Date	2012-12-18	Docket Number (if applicable)	6936-47-CON-DIV-CON-3	Art Unit	2633
First Named Inventor	Marcos C. Tzannes			Examiner Name	JOSEPH, Jaison		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ☐ Other _____

☒ Enclosed

- ☒ Amendment/Reply
- ☐ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/ Declaration(s)
- ☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____ (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

☒ The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 191970

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Signature of Registered U.S. Patent Practitioner			
Signature	/Jason H. Vick/	Date (YYYY-MM-DD)	2014-06-18
Name	Jason H. Vick	Registration Number	45285

This collection of information is required by 37 CFR 1.114. 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.

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

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.

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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.

Electronic Patent Application Fee Transmittal	
Application Number:	13718016
Filing Date:	18-Dec-2012
Title of Invention:	SYSTEM AND METHOD FOR DESCRAMBLING THE PHASE OF CARRIERS IN A MULTICARRIER COMMUNICATIONS SYSTEM
First Named Inventor/Applicant Name:	Marcos C. Tzannes
Filer:	Jason Vick/Joanne Vos
Attorney Docket Number:	6936-47-CON-DIV-CON-3
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:				
Claims in Excess of 20	1202	4	80	320
Independent claims in excess of 3	1201	1	420	420
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Extension - 2 months with $0 paid	1252	1	600	600
Miscellaneous:				
Request for Continued Examination	1801	1	1200	1200
		Total in USD ($)		**2540**

Electronic Acknowledgement Receipt	
EFS ID:	19337726
Application Number:	13718016
International Application Number:	
Confirmation Number:	4520
Title of Invention:	SYSTEM AND METHOD FOR DESCRAMBLING THE PHASE OF CARRIERS IN A MULTICARRIER COMMUNICATIONS SYSTEM
First Named Inventor/Applicant Name:	Marcos C. Tzannes
Customer Number:	62574
Filer:	Jason Vick/Joanne Vos
Filer Authorized By:	Jason Vick
Attorney Docket Number:	6936-47-CON-DIV-CON-3
Receipt Date:	18-JUN-2014
Filing Date:	18-DEC-2012
Time Stamp:	12:17:55
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$2540
RAM confirmation Number	9042
Deposit Account	191970
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 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		AMEND_02_AF.pdf	984636 0c8f0be9b46dba62d4dd6f9314263313cd2ae5e0	yes	9

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment Submitted/Entered with Filing of CPA/RCE	1	1
Specification	2	2
Claims	3	6
Applicant Arguments/Remarks Made in an Amendment	7	8
Extension of Time	9	9

Warnings:

Information:

2	Request for Continued Examination (RCE)	RCE_01.pdf	697615 a73f56b5bccb0662dd6339aa3da80c3d5431aae5	no	3

Warnings:

Information:

3	Fee Worksheet (SB06)	fee-info.pdf	35710 f76c846dce47c06370ae057f4c9a5c6521b1708d	no	2

Warnings:

Information:

Total Files Size (in bytes):	1717961

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of: Marcos C. Tzannes	Group Art Unit: 2633
Application No.: 13/718,016	Examiner: JOSEPH, Jaison
Filed: December 18, 2012	Confirmation No.: 4520
Atty. File No.: 6936-47-CON-DIV-CON-3	

For: SYSTEM AND METHOD FOR SCRAMBLING USING A BIT SCRAMBLER AND A PHASE SCRAMBLER

AMENDMENT AFTER FINAL

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

Madam:

Applicants submit this Amendment After Final to address the Final Office Action having a mailing date of February 4, 2014. Please credit any overpayment or charge any underpayment to Deposit Account No. 19-1970.

Please amend the above-identified patent application as follows:

Amendments to the Specification begin on page 2 of this paper.

Amendments to the Claims are shown in the listing of claims which begins on page 3 of this paper.

Remarks begin on page 7 of this paper.

Amendments to the Specification:

In the title:

Please change the title to read as follows:

SYSTEM AND METHOD FOR SCRAMBLING~~DETERMINING PHASE SHIFTS~~ USING A BIT SCRAMBLER AND A PHASE SCRAMBLER~~PSEUDO-RANDOM NUMBER GENERATOR~~

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.-20. (Cancelled)

21. (Currently Amended) A method, ~~for scrambling a phase characteristic of a plurality of carriers~~ in a multicarrier communications transceiver comprising a bit scrambler followed by a phase scrambler, comprising:

scrambling, using the bit scrambler, a plurality of input bits to generate a plurality of scrambled output bits~~determining a first phase shift for a first carrier of the plurality of carriers~~;

scrambling, using the phase scrambler, a plurality of carrier phases associated with the plurality of scrambled output bits;~~determining a second phase shift for a second carrier of the plurality of carriers,~~

transmitting at least one scrambled output bit on a ~~wherein the phase shift of the~~ first carrier ~~of the plurality of carriers is different than the phase shift of the second carrier of the plurality of carriers, and~~

~~wherein the first and second phase shifts are determined using a pseudo-random number generator~~; and

transmitting the~~, to a remote transceiver,~~ at least one scrambled output bit on a~~value associated with the pseudo-random number generator to enable the remote transceiver to determine the first and~~ second carrier~~phase shifts~~.

22. (Previously Presented) The method of claim 21, wherein the transceiver is a cable transceiver.

23. (Previously Presented) The method of claim 21, wherein the transceiver is a DSL transceiver.

24. (Previously Presented) The method of claim 21, wherein the transceiver is a wireless transceiver.

25. (Currently Amended) The method of claim 21, wherein the transceiver is operable for high speed internet access.

26. (Currently Amended) The method of claim 21, wherein the transceiver is operable to transport~~for transporting~~ video.

27. (Cancelled)

28. (Currently Amended) A multicarrier communications transceiver comprising ~~that scrambles a phase characteristic of a plurality of carriers, the transceiver operable to~~:

~~determine a first phase shift for a first carrier of the plurality of carriers;~~

~~determine a second phase shift for a second carrier of the plurality of carriers,~~

~~wherein the phase shift of the first carrier of the plurality of carriers is different than the phase shift of the second carrier of the plurality of carriers, and wherein the first and second phase shifts are determined using a pseudo-random number generator; and~~a bit scrambler operable to scramble a plurality of input bits to generate a plurality of scrambled output bits;

a phase scrambler operable to scramble a plurality of carrier phases associated with the plurality of scrambled output bits; and

a transmitter portion operable to transmit at least one scrambled output bit on a first carrier and to transmit the at least one scrambled output bit on a second carrier~~transmit, to a remote transceiver, at least one value associated with the pseudo-random number generator to enable the remote transceiver to determine the first and second phase shifts~~.

29. (Previously Presented) The transceiver of claim 28, wherein the transceiver is a cable transceiver.

30. (Previously Presented) The transceiver of claim 28, wherein the transceiver is a DSL transceiver.

31. (Previously Presented) The transceiver of claim 28, wherein the transceiver is a wireless transceiver.

32. (Currently Amended) The transceiver of claim 28, wherein the transceiver is operable for high speed internet access.

33. (Currently Amended) The transceiver of claim 28, wherein the transceiver is operable to transport~~for transporting~~ video.

34-41. (Cancelled)

42. (New) A communication device comprising:

a multicarrier transmitter operable to support a bit scrambler and a phase scrambler for transmission of a plurality of input bits, wherein the bit scrambler is operable to scramble the plurality of input bits to generate a plurality of scrambled output bits and wherein the phase scrambler is operable to scramble a plurality of phases associated with the plurality of input bits.

43 (New) The communications device of claim 42, wherein the multicarrier transmitter is further operable to transmit at least one scrambled output bit on a first carrier and transmit the at least one scrambled output bit on a second carrier.

44. (New) The communication device of claim 43, wherein the transceiver is a cable transceiver.

45. (New) The communication device of claim 43, wherein the transceiver is a DSL transceiver.

46. (New) The communication device of claim 43, wherein the transceiver is a wireless transceiver.

47. (New) The communication device of claim 43, wherein the communication device is operable for high speed internet access.

48. (New) The communication device of claim 43, wherein the communication device is operable to transport video.

49. (New) A method comprising:

supporting, in a communication device comprising a multicarrier communications transceiver, a bit scrambler and a phase scrambler for transmission of a plurality of input bits wherein the bit scrambler scrambles the plurality of input bits to generate a plurality of scrambled output bits and wherein the phase scrambler scrambles a plurality of phases associated with the plurality of input bits.

50. (New) The method of claim 49 further comprising:

transmitting at least one scrambled output bit on a first carrier; and

transmitting the at least one scrambled output bit on a second carrier.

51. (New) The communication device of claim 49, wherein the transceiver is a DSL transceiver.

52. (New) The communication device of claim 49, wherein the transceiver is a wireless transceiver.

53. (New) The communication device of claim 49, wherein the communication device is operable for high speed internet access.

54. (New) The communication device of claim 49, wherein the communication device is operable to transport video.

REMARKS

Applicant respectfully requests reconsideration of this application as amended.

Without concession as to the propriety of the outstanding rejection, the independent claims have been amended to be directed toward more specific aspects of the invention.

Specifically, amended Independent claim 21 generally recites scrambling, using the bit scrambler, a plurality of input bits to generate a plurality of scrambled output bits;

scrambling, using the phase scrambler, a plurality of carrier phases associated with the plurality of scrambled output bits;

transmitting at least one scrambled output bit on a first carrier; and

transmitting the at least one scrambled output bit on a second carrier.

Neither Suzuki nor Olafsson teach, suggest or disclose the above combination of features.

With comparable arguments being applicable to claims with similar features, applicant respectfully submits the claims are distinguishable from the references – withdrawal of the 35 U.S.C. §103 rejection is respectfully requested.

With the rejection having been overcome, Applicant respectfully submits the application is in condition for allowance.

A prompt notice of allowance is respectfully solicited.

Should the Examiner believe anything further is desirable in order to place the application in even better condition for allowance, the Examiner is encouraged to contact Applicants undersigned representative at the telephone number listed below.

The Commissioner is hereby authorized to charge to deposit account number 19-1970 any fees under 37 CFR § 1.16 and 1.17 that may be required by this paper and to credit any overpayment to that Account. If any extension of time is required in connection with the filing of this paper and has not been separately requested, such extension is hereby Petitioned.

Respectfully submitted,

SHERIDAN ROSS P.C.

Date: 18 Jun 14

By: _____

Jason H. Vick
Reg. No. 45,285
1560 Broadway, Suite 1200
Denver, Colorado 80202
Telephone: 303-863-9700

PTO/AIA/22 (03-13)
Approved for use through 7/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)	Docket Number (Optional) 6936-47-CON-DIV-CON-3
Application Number 13/718,016	Filed December 18, 2012
For SYSTEM AND METHOD FOR SCRAMBLING USING A BIT SCRAMBLER AND A PHASE SCRAMBLER	
Art Unit 2633	Examiner JOSEPH, JAISON

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

		Fee	Small Entity Fee	Micro Entity Fee	
☐	One month (37 CFR 1.17(a)(1))	$200	$100	$50	$
☑	Two months (37 CFR 1.17(a)(2))	$600	$300	$150	$ 600
☐	Three months (37 CFR 1.17(a)(3))	$1,400	$700	$350	$
☐	Four months (37 CFR 1.17(a)(4))	$2,200	$1,100	$550	$
☐	Five months (37 CFR 1.17(a)(5))	$3,000	$1,500	$750	$

☐ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☑ The Director has already been authorized to charge fees in this application to a Deposit Account.

☑ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 19-1970.

☑ Payment made via EFS-Web.

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.

I am the

☐ applicant.

☑ attorney or agent of record. Registration number 45,285.

☐ attorney or agent acting under 37 CFR 1.34. Registration number _____.

Signature	18 Jan 14 Date
Jason H. Vick Typed or printed name	303-863-9700 Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.

☑ * Total of 1 forms are submitted.

Substitute for form 1449A/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/718,016
				Filing Date	December 18, 2012
				First Named Inventor	Marcos C. Tzannes
				Art Unit	2633
				Examiner Name	JOSEPH, JAISON
Sheet	1	of	1	Attorney Docket Number	6936-47-CON-DIV-CON-3

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-kind Code [2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee of Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1	6259685	07-10-2001	Rinne et al.	
	2	2003/0128673	07-10-2003	Lee et al.	

UNPUBLISHED U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-kind Code [2] (if known)	Filing Date MM-DD-YYYY	Name of Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	3	14/256677	04-18-2014	Tzannes	

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]; Number[4]; Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	4	EP 1542488	06-15-2005	ERICSSON TELEFON AB L M		

OTHER ART (Including Author, Title, Date, Pertinent Pages, etc.)		
Examiner Initials*	Cite No.[1]	
	5	Notice of Allowance for U.S. Patent Application No. 13/303,417, mailed Feb. 7, 2014 (Attorney Ref. No. 6936-47-CON-5)

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference is considered, whether or not citation is in conformance and not considered. Include copy of this form with next communication to applicant.

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 542 488 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
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(54) Method and apparatus for allocating a pilot signal adapted to the channel characteristics

(57) A set of different pilot structures are designed for use in different environments and/or different user behaviours that are expected to occur in a cell. The radio conditions for a user are estimated. Each user is then assigned an area (108A-E) in resource space for its communication, which has a suitable pilot configuration. In one embodiment, the entire resource space is provided with different pilot structures in different parts (110A-D) in advance and allocation of resources to the users are then performed in order to match estimated radio conditions to the provided pilot structure. In another embodiment, allocation is performed first, and then the actual pilot structure is adapted within the allocated resource space area to suit the environmental conditions.

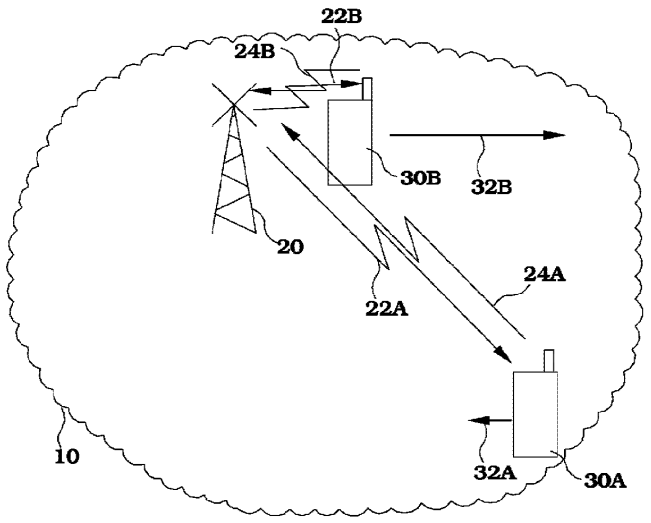


Fig. 1

EP 1 542 488 A1

Printed by Jouve, 75001 PARIS (FR)

Description

TECHNICAL FIELD

[0001] The present invention relates generally to wireless multi-carrier communications systems and in particular to resource allocation and pilot signals of such systems.

BACKGROUND

[0002] In a cellular multi-user, multi-carrier wireless communications system, the base station must accommodate many users that each experiences different channel characteristics due to fading in time and frequency. Furthermore, different users travel at different speeds and thus experience different Doppler shifts. In most wireless systems, e.g. GSM (Global System for Mobile communications), WCDMA (Wideband Code Division Multiple Access), WLAN (Wireless Local Area Network), special well known training sequences or pilot signals are transmitted so that the receiver can estimate the channel parameters sufficiently well for detection of the data signal. Several methods exist to do this, some use user specific pilots and some use common pilots or combinations. Some pilots are code spread and overlaid with user data, others have dedicated time-frequency slots when pilots are transmitted. In any case, some part of the available radio resources must be allocated for pilots resulting in overhead that cannot be used for data.

[0003] Today, there are a few multi-carrier systems in use. However, they are not particularly designed for the difficult, ever changing, hard-to-predict multi-user environments that are envisioned for future wireless systems.

[0004] For example, the systems for DVB/DAB (Digital Video Broadcasting/Digital Audio Broadcasting) are broadcast systems that cannot take into account the need for individual users. Such systems must design their pilot structure according to the worst-case scenario so that detection becomes possible even under the worst possible conditions. Such a pilot structure gives rise to a substantial pilot overhead, and is indeed necessary in these worst-case scenarios. However, whenever the situation is better than the worst case, which typically is the case most of the time, the pilot structure is unnecessarily extensive, giving an unnecessary pilot overhead for most users. The pilot overhead can indeed be substantial. This reduces data capacity in the own cell and furthermore increases the interference to the neighbouring cells (so called "pilot pollution").

[0005] Another example of a multi-carrier system is WLAN (i.e. IEEE 802.11a, IEEE 802.11g). Such a system is designed for a limited geographical area in which the users are stationary or slowly moving. The design is not intended for conditions in which the user is moving quickly or for handling mobility in a multi-cellular environment.

SUMMARY

[0006] The main problems with existing solutions are that pilot structures are either not at all suitable for considerably changing radio conditions or that they are designed for worst cases which in turn results in vast pilot overhead and "pilot pollution".

[0007] An objective of the present invention is to provide methods and devices for multi-user multi-carrier wireless communications system, which are capable to provide all users with sufficient pilots without causing unnecessary pilot overhead and pilot pollution. A further objective of the present invention is to provide such methods and devices, which are easy to implement within present and planned wireless systems.

[0008] The above objectives are achieved by methods and devices according to the enclosed patent claims. In general words, a set of different pilot structures are designed for use in different environments and/or different general radio characteristics that are expected to occur in the cell. The radio conditions for a user are estimated, either from direct measurements or from knowledge about the cell characteristics, possibly combined with position information. Each user is then assigned an area in resource space for its communication, which has a suitable pilot configuration. In one embodiment, the entire resource space is provided with different pilot structures in different parts in advance and allocation of resources to the users are then performed in order to match estimated radio conditions to the provided pilot structure. In another embodiment, allocation is performed first, and then the actual pilot structure is adapted within the allocated resource space area to suit the environmental conditions. For best performance, depending on such things as frequency selectivity, time selectivity (e.g. time dispersion and Doppler shift), and path loss the amount of pilot energy should be adapted and the 'distance' between pilots in the time-frequency domain needs to be changed.

[0009] The radio resource space can have different dimensions. In multi-carrier systems, frequency is one dimension. Other dimensions that could be utilised within the present invention are time, code, antenna and/or spatial dimensions. One or several of these dimensions span the radio resource space, in which the present invention is applied.

[0010] By adapting the pilot structure to the environment or set of environments likely to occur in the cell and allocating these pilots to the users most likely to benefit from them, an overall efficiency is achieved. The amount of pilot overhead is then connected to the actual environments being accommodated. Difficult environments require more overhead than simpler ones and hence pilot pollution is reduced on the average.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The invention, together with further objects

and advantages thereof, may best be understood by making reference to the following description taken together with the accompanying drawings, in which:

FIG. 1 is a schematic illustration of a multi-user wireless communication system;
FIGS. 2A and 2B are illustrations of pilot structures in time-frequency space, and the allocation of different users to subspaces;
FIG. 3A illustrates a radio resource space having a code dimension;
FIG. 3B is an illustration of a pilot structure in the frequency-code sub-space;
FIG. 4 is a flow diagram illustrating an embodiment of a method according to the present invention;
FIGS. 5A, 5B and 6 are diagrams illustrating pilot structures in time-frequency space, and the allocation of different users to subspaces according to embodiments of the present invention;
FIGS. 7A and 7B are flow diagrams illustrating other embodiments of a method according to the present invention;
FIG. 8 is a flow diagram illustrating a part of a further embodiment of a method according to the present invention;
FIGS. 9A to 9C are block diagrams of downlink radio management devices of network nodes according to embodiments of the present invention;
FIG. 10 is a block diagram of uplink radio management devices of network nodes according to embodiments of the present invention;
FIG. 11 is a diagram illustrating pilot structures in time-frequency space having different intensities, and the allocation of different users to subspaces according to an embodiment of the present invention; and
FIGS. 12 and 13 are diagrams illustrating limited data descriptions of regular pilot structure.

DETAILED DESCRIPTION

[0012] In the following description, OFDM (Orthogonal Frequency Division Multiplexing) systems are used for exemplifying the present invention. However, the present invention can also be applied to other multi-carrier wireless communications systems.

[0013] Fig. 1 illustrates a multi-user multi-carrier wireless communications system 10, in this particular embodiment intended to be an OFDM system. Nonexclusive examples of other communications systems, in which the present invention is advantageously applicable, are EFDMA (Interleaved Frequency Division Multiple Access) systems, non-orthogonal or bi-orthogonal multi-carrier systems. A base station or access point 20 communicates with two mobile stations or user equipments 30A, 30B. There is a downlink connection 22A between the access point 20 and the user equipment 30A and an uplink connection 24A between the same nodes. Likewise, there is a downlink connection 22B between the access point 20 and the user equipment 30B and an uplink connection 24B between the same nodes. User equipment 30A is located at a relatively large distance from the access point 20, but the speed 32A (illustrated as an arrow) of the user equipment 30A is small. User equipment 30b is located closer to the access point 20, but has a high speed 32B (also illustrated as an arrow). The user equipment 30A may have a relatively high need for repetitive pilots in the frequency dimension, since the propagation conditions for the different carriers may differ considerably over the bandwidth in case of multi-path propagation with large delay spread. However, the radio conditions are probably quite slowly varying with time due to the small speed of user equipment 30A. The user equipment 30B is close to the access point, and a pilot on one frequency can probably be used for channel estimations for many neighbouring carriers. However, the radio conditions are probably changing rapidly in time, whereby frequent pilots in time dimension are required.

[0014] Fig. 2A is a diagram of a time-frequency space. This can represent a limited portion of the entire available radio resource space 100 in these two dimensions. Data is transmitted in quantities limited in time and frequency. These data quantities correspond to the small squares 104 in the diagram. Selected ones 102 of these data quantities contain pilot data and are illustrated in the diagram with hatching. The pilot structure is in this embodiment dispersed over the time-frequency space relatively uniformly. With this distribution, one data quantity out of 11 is occupied by pilot data.

[0015] The useful data transmission rate is thereby reduced by 1/11. The users of the user equipments 30A and 30B (Fig. 1) have allocated radio resources within the available radio resource space 100. User equipment 30A is allocated the resource sub-space indicated by 108A, while user equipment 30B is allocated the resource sub-space indicated by 108B. Both users are experiencing the same pilot density and the uniform distribution between the frequency and time dimensions.

[0016] User 30B moves fast. The time between two consecutive pilot messages in time dimension is 11 time slots, and even if information from neighbouring frequencies are used for channel estimation in the meantime, at least 4 time slots will pass between two consecutive updates. The speed of user 30B is so high that this pilot structure is not sufficient for an acceptable quality of service.

[0017] However, arranging the pilot structure as in Fig. 2B will change the situation. Here, there is a new update in time dimension every second time slot, which well supports the fast moving user equipment. Despite this increased density in time direction, the total amount of pilot data quantities is reduced somewhat. Now only one data quantity out of 12 comprises a pilot. The overhead has decreased from 1/11 to 1/12 (about 9%).

[0018] However, user equipment 30A now achieves

problems. This user equipment 30A moves slowly and is of limited use of the frequent updating in time. However, it has need for more closely located pilots in frequency dimension instead. The pilot structure of Fig. 2B becomes very unsuitable for user equipment 30A.

[0019] So far, only two dimensions, time and frequency, have been discussed. Fig. 3A illustrates a radio resource space in three dimensions, time, frequency and code. In such a system, each data quantity will instead correspond to a small cube 104. Generalisation can be performed to higher order spaces, comprising e.g. antenna or space dimensions. In general, any radio resource space in at least two dimensions, of which one is frequency, can be used with the present invention.

[0020] Fig. 3B illustrates a pilot pattern in a frequency-code space for a specified time. In this example 16 different codes are available and also 16 different frequencies. The illustrated pilot pattern leads to that the pilots are transmitted on all frequencies during the specified time duration, however, spread out in the code dimension. One code in each frequency is occupied by a pilot, whereas the remaining 15 codes are used for data transmission.

[0021] As mentioned briefly above, more generally the antenna or spatial dimensions could also be part of the resource space. One example is that different frequency bands are allocated to different beams of a multi-sector or fixed beam site. In this case, the spatial dimension is part of the description since different pilot patterns may be deployed for the different beams that overlap in the spatial domain. With the grouping of resources in terms of antenna sectors or beams the pilots allocated to different users can change dynamically when the user for example moves between sectors and the sectors have different frequency bands allocated to them. In such cases, antenna or spatial dimension can also be used as additional dimensions in a total resource space.

[0022] The flow diagram of Fig. 4 illustrates the main steps of an embodiment of a method according to the present invention. The procedure starts in step 200. In step 202, a number of pilot configurations are provided, which are believed to suit different radio conditions appearing in the cell in question. At least two such pilot configurations are available, i.e. they can be handled by both sides of the transmission connection. The transmitter manages the sending of pilots according to this configurations and the receiver is capable of performing channel estimation based on the at least two pilot configurations. In step 204, an estimation of the radio conditions at the receiver is obtained. This estimation can be provided in many different ways. The actual radio conditions can be measured and evaluated. Another possibility is to assume an estimate from knowledge about the characteristics in the cell and possibly based on e.g. location and/or speed of the receiver relative the transmitter.

[0023] In step 206, a user is allocated resources in resource space, which have a pilot configuration that is matched to the estimated radio conditions. This matching can be performed in different manners, described more in detail further below. The procedure stops in step 299. Anyone skilled in the art realises that step 202 preferably is performed once, and the provided pilot structures can then be used for any future allocation of users, or re-allocation of existing users.

[0024] A few examples, using OFDM as an example system, will be used to visualise the effect of the present invention. The basic setup in Fig. 5A is assumed as follows. During a certain time period and seen over all frequency resources, the available radio resources constitute a grid of basic resources that can be used for data, control signalling or pilot signals or other signals as discussed earlier. The resolution in frequency dimension is one OFDM carrier and in time it is one OFDM symbol. Pilot symbols are as above depicted with hatched boxes.

[0025] The transmitter side, in this example assumed to be the base station, determines a number of different pilot patterns and assigns these pilot patterns to different parts of the entire radio resource space. The pilot patterns may for example be periodically recurring with some period or pseudo-randomly designed. This means that different parts of the radio resource space have a denser or at least differing pilot pattern than other parts. Each pilot pattern is intended to accommodate users experiencing different channel characteristics.

[0026] This is illustrated in Fig. 5A. The entire radio resource space illustrated is divided into four rectangular parts, 110A-D. The resource space part 110A has a pilot pattern, having a dense occurrence in time dimension (every second OFDM symbol at certain carriers), but a more dispersed behaviour in the frequency dimension (only every sixth OFDM carrier). The resource space part 110B has a very diluted pilot pattern, having only one pilot in 36 resource units, evenly spread in time and frequency dimensions. The resource space part 110C is the opposite of part 110A, with a dense pilot pattern in frequency dimension, but sparse in time dimension. Finally, resource space part 110D has a very dense pilot structure in both dimensions, comprising a pilot symbol in every fourth resource unit.

[0027] According to one embodiment of the invention, the users are now allocated to the different parts of the radio resource space dependent on their estimated radio conditions. In other words, whenever a certain user has certain demands, the user is assigned resources in the resource space where pilots with the appropriate density can be utilised for channel estimation. In the situation in Fig. 5A, there are pilot structures suitable for typically four combinations of Doppler and delay spread. In part 110A, the pilot structure is intended for a large Doppler and low delay spread. In part 110B, the pilot structure is intended for a low Doppler and low delay spread. In part 110C, the pilot structure is intended for a low Doppler and high delay spread. In part 110D, the

pilot structure is intended for a high Doppler and high delay spread.

[0028] A first user, having radio conditions demanding a high density of pilots in both dimensions is allocated to the resource sub-space 108A within the part 110D. A second user, only having need for dense pilot in the time dimension is allocated resources in a resource sub-space 108B within the part 110A. A third user with very favourable radio conditions is allocated to a resource sub-space 108C in part 110B. Finally, two more users, having high demands on pilot density are given resources in two sub-spaces 108D and 108E, respectively in part 110D. One realises that each user has achieved a pilot pattern that is suited to its individual needs. It is beneficial, e.g. to assign resources for mobiles with certain fast varying channel or Doppler conditions in the dense parts of the pilot pattern and users with more slowly varying conditions in the less dense parts.

[0029] Note that the base station does not need to transmit all pilots at all times. Only pilots that in fact can be utilised by any user needs to be transmitted. If a pilot resource at time of transmission cannot be utilised by any data symbol that some user need to detect with the help of said pilot, then the pilot need not be transmitted. In such a way, the overall pilot pollution is reduced, and so is the average transmission power.

[0030] In Fig. 5B, a further embodiment of the present invention is illustrated. Assume the same situation as was present in Fig. 5A. Three users are occupying all resources in the densest part 110D. If yet another user with need for a very dense pilot configuration appears, the pre-defined pilot configuration plan of Fig. 5A becomes insufficient. However, the new user can be allocated to a free resource sub-space 108F, preferably in connection with the part 110D. This sub-space 108F had originally a pilot pattern according to part 110C, but when allocating the user, the pilot pattern is adjusted to match the demands put by the new user. In such a way, the original pre-determined division into different parts in the resource space can be adapted to the actual need. However, if a good initial configuration is used, most cases are covered and the frequency of adjustments is low.

[0031] Now, return to the situation of Fig. 5A. If the user having the allocation of sub-space 108E slows down, the estimated radio conditions change, and the need for pilots is reduced. The user can then be reallocated to another sub-space of the resource space, having a more suitable pilot configuration for the new estimated radio conditions, e.g. to part 110C. An alternative is to keep the allocated sub-space but instead change the pilot pattern to a more suitable one for the new conditions.

[0032] The ideas of adjusting or adapting the pilot configuration when needed can also be brought to the extreme end, where no pilot pattern at all is preconfigured for the different parts of the resource space. Instead, there is always an adjustment of pilot pattern for all users. This is schematically illustrated in Fig. 6. Here, a first user was assigned a sub-space 108A, without associated pre-defined pilot pattern. The pilot pattern was then adjusted according to the actual needs as concluded from the estimated radio conditions. In this case a dense pattern was selected. A second user was allocated to sub-space 108B and subsequently, a suitable pilot pattern was selected for this sub-space. In such a way, all the sub-spaces 108A-F were associated with pilot configurations suitable for each individual need. Sub-spaces not allocated to any user do not comprise any pilots in such an approach. A user with certain estimated properties is thus allocated to use certain resources and the pilot pattern is designed accordingly. The result is the same as the previous embodiments, pilot patterns and user characteristics are matched.

[0033] The above embodiments can also be expressed in flow diagrams. In Fig. 7A, a flow diagram corresponding to the situation in Fig. 5A is illustrated. The resource space is in step 203 provided with at least two different pre-determined pilot configurations at different parts of the resource space. Step 204 is unchanged compared to Fig. 4. In step 207, the matching of the radio conditions and pilot structures is performed by selecting a suitable resource space.

[0034] The situation in Fig. 5B is illustrated by the flow diagram of Fig. 7B. Also here, pre-defined pilot configurations are associated with different parts of the resource space in step 203. In step 205, it is determined whether there is any available resources in parts that are suitable for the particular estimated radio conditions for the user to be allocated. If there are resources with suitable pilot structures available, the procedure continues to step 207, as in Fig. 7A. If no resource space with appropriate pilot structure is available, any free resource space is allocated in step 209, however, preferably in the vicinity of the part having a suitable pilot pattern. In step 210, the pilot configuration is adapted within the selected resource sub-space to match the estimated radio conditions.

[0035] The embodiment illustrated in Fig. 6 can similarly be illustrated by the part flow diagram of Fig. 8. Here, the step 206 in Fig. 4 is described in more detail. In step 208, an area is selected as a resource sub-space for the user. In step 210, the pilot configuration in the selected area is adapted to the need connected to the estimated radio conditions of the user. Note the similarities between Fig. 7B and Fig. 8.

[0036] The present invention can be implemented for wireless communication between any nodes in a communications system. Such nodes can be e.g. user equipment, mobile station, base station, access point or relay. In the examples below, the most straightforward situation with communication between a base station and a user equipment will be discussed as an example. The scope of the claims should, however, not be affected by this example.

[0037] Multi-carrier communication is typically most

applied in downlink connections. In Fig. 9A, a wireless communications system according to an embodiment of the present invention is illustrated. A base station 20 communicates with a mobile terminal 30 via an uplink 24 and a downlink 22 connection. In the downlink communication, the ideas of the present invention are implemented. The base station 20 comprises a downlink control unit 25, which is enlarged in the lower part of Fig. 9A. The downlink control unit 25 is responsible for allocating resources for communication on the downlink 22 between the base station 20 and the mobile terminal 30 and comprises in turn a pilot manager 26 and a radio condition processor 28. Similarly, the mobile terminal or user equipment 30 also comprises a downlink control unit 35, also enlarged in the lower part of Fig. 9A. The downlink control unit 35 comprises a channel estimator 36 and a measurement unit 38 for radio conditions.

[0038] The radio conditions measurement unit 38 measures the actual radio conditions at the user equipment 30. Such measurements can comprise e.g. Doppler shift and signal strength as well as power delay profile, channel impulse response, time and frequency selectivity measurements and interference levels. The results of the measurements are transferred to the radio conditions processor 28 of the base station 20, preferably by the uplink communication link 24. The radio conditions processor 28 evaluates the measured conditions and translates it to estimated radio conditions for the user equipment 30. In other words, the radio conditions processor 28 obtains data associated with estimated radio conditions for the user equipment 30. In a basic version, the estimated radio conditions could e.g. comprise two flags, one indicating low or high Doppler shift and one indicating small or large delay spread. When having a radio resource space in frequency and time dimensions, quantities associated with coherence bandwidth and coherence time, respectively, are of interest. The estimated radio conditions are forwarded to the pilot manager 26, which performs the actual selection and/or adjustment of resource sub-spaces. The pilot manager 26 thus provides access to the use of the different pilot configurations. When pre-defined pilot patterns are used, the pilot manager selects in which part of the multi-carrier space the allocated resource sub-space will be placed. Without pre-defined patterns in different parts of the multi-carrier space, the pilot manager 26 comprises functionalities for selecting a multi-carrier sub-space for allocation and functionalities to adapt the pilot pattern of that selected sub-space according to the estimated radio conditions. When the pilot manager has decided what pilot pattern to apply, the user equipment 30 has to be informed about the selection, in order to be able to perform the right channel estimation upon reception of the data. The pilot manager 26 thus comprises means for transferring suitable data to the channel estimator 36.

[0039] In Fig. 9B, another embodiment is illustrated, where the base station 20 has the entire responsibility for the selection of pilot structure. The downlink control unit 25 here also comprises a position estimator 29. The position estimator 29 provides an estimation of the position of the user equipment 30 and preferably also the velocity. This can be performed in any manner, e.g. according to prior art methods, and is not further discussed here. The position is forwarded to the radio condition processor 28. The radio condition processor 28 has access to knowledge about the different environments within the cell. A cell could e.g. cover a first area having generally slowly moving user equipments, and a second area, were the average speed is considerably higher. The position estimation could reveal the location of the user equipment, i.e. if it is situated in the high- or low-speed area. From such information, the radio condition processor 28 can conclude what radio conditions that should be assumed for the user equipment. Such estimation then forms the base on which the pilot pattern is selected.

[0040] In Fig. 9C, yet another embodiment is illustrated. In this embodiment, the user equipment 30 makes more efforts in the procedure to find suitable pilot structures. The downlink control unit 35 here additionally comprises a radio conditions processor 39. This means that both the measurements and the evaluation of the measurements are performed in the user equipment 30. The estimated radio conditions are reported to the base station 20, e.g. in the form of data representing coherence bandwidth and coherence time, respectively. Alternatively, the radio conditions processor 39 can also select an appropriate pilot pattern and transmit a request to use such a pattern to the base station 20. The base station 20 can in such a case either follow the recommendation or overrule it and make an own decision.

[0041] Fig. 10 illustrates one possible configuration for uplink communication. The base station 20 comprises an uplink control unit 45, in turn comprising a radio conditions measurement unit 21, a radio conditions processor 28 and a pilot manager 26. The operations of the units are similar to the ones in the downlink case, but adapted for uplink communication instead, i.e. it is the radio conditions of the received signals from the user equipment 30 that are of importance. The pilot manager 26 decides which pilot pattern that is appropriate to apply, and transmits a request to an uplink control unit 55 in the user equipment 30. In a basic version, the uplink control unit 55 simply applies the proposed pilot pattern on its uplink traffic. The uplink control unit 35 of the base station 20 also comprises a channel estimator 27 in order to be able to detect the data sent on the uplink. This channel estimator 27 is also informed about the pilot structure to use.

[0042] Fig. 11 illustrates yet another embodiment of the present invention, in which one makes use of the possibilities to vary the intensity to reduce pilot pollution. In parts 110A and 110D, all or some of the pilot data is marked to be transmitted with a lower (or zero) intensity. If a user equipment using the pilot signals is close to the

base station, the transmission power does not have to be equally high to obtain a reasonable channel estimation compared with user equipments situated further away from the base station, In such a way, it is also possible to vary the pilot intensity throughout the resource space. Such intensity configurations can as above be performed either in advance or as adjustment procedures.

[0043] The pilot symbols can also be transmitted with different power for different classes of users and depending on path loss. The power levels can either be dynamically varying between zero and a given number P_{max} or be defined in advance. Note that a power level equal to zero is equivalent to no pilots for this slot, enabling the use of this slot for other purposes, such as data. If the power is dynamically varying, the power levels have to be signalled to the receiver for appropriate treatment.

[0044] When there are several possible pilot patterns to use in a system, the receiver has to be informed about which one is actually used. If a numbered set of predetermined pilot patterns are used, the identification number of the pilot pattern is sufficient. However, more elaborate systems can use different pilot patterns for different cells and the numbering of patterns can be difficult to manage. In such a case, a solution is to transfer a complete description of the pilot pattern to be used. For regular pilot patterns, the amount of data that is needed to uniquely define the patterns is quite limited.

[0045] In Fig. 12, a pilot pattern is illustrated within a resource sub-space in frequency and time dimensions. The resource sub-space is reported anyway, and is typically defined by frequency and time "coordinates" and the number of frequency DF and time DT slots that are comprised in the sub-space. The pilot pattern is then easily characterised by only three vectors in the (two-dimensional) resource space. A first vector V0 defines the "distance" in frequency and time, respectively, between a well-defined position in the sub-space, e.g. the lower left corner as illustrated in the picture, and any pilot data within the pattern. A second vector V1 defines a "relative distance" between the two closest pilots in the pattern. A third vector V2 defines a "relative distance" between the second closest pilots, that is not aligned with the first vector V1. By knowing only these vectors, the entire pilot pattern can easily be calculated.

[0046] Also somewhat more complicated patterns can be fit into a similar model. In Fig. 13, a pattern having two neighbour pilots distributed in pairs over the resource space. In order to describe this pattern, only one extra vector is needed, the relative vector between the two pilots in each pair. Anyone skilled in the art realises that with a very limited number of data, rather complex pilot patterns can easily be defined.

[0047] It will be understood by those skilled in the art that various modifications and changes may be made to the present invention without departure from the scope thereof, which is defined by the appended claims.

Claims

1. Method for wireless communication in a multi-user, multi-carrier communications system (10), comprising the steps of:

   - allocating a first resource sub-space (108A-F) of an entire multi-carrier resource space (100) for communication between a first node (20, 30; 30A-B) and a second node (20, 30; 30A-B),

   characterised by the further step of:

   - obtaining data associated with estimated radio conditions for the second node (20, 30; 30A-B).
   - providing access to the use of at least two pilot resource configurations, intended for different estimated node radio conditions,

     whereby the first resource sub-space is associated a first pilot resource configuration, being in agreement with pilot need for the estimated radio conditions for the second node (20, 30; 30A-B) .

2. Method according to claim 1, **characterised in that** the entire multi-carrier resource space (100) being divided into parts (110A-D) having different pilot resource configurations;

   whereby the step of allocating comprises the step of selecting the first resource sub-space (108A-F) in a part having a pilot resource configuration suitable for the estimated radio conditions for the second node (20, 30; 30A-B).

3. Method according to claim 2, **characterised by** the further steps of:

   - selecting, if no resource space part (110A-D) having a pilot resource configuration suitable for the estimated radio conditions for the second node (20, 30; 30A-B) is available, an arbitrary first multi-carrier resource sub-space; and
   - adapting the pilot resource configuration within the first multi-carrier resource sub-space to suit the estimated radio conditions for the second node (20, 30; 30A-B).

4. Method according to claim 1, **characterised by** the step of:

   - selecting the first multi-carrier resource sub-space; and
   - adapting the pilot resource configuration within the first multi-carrier resource sub-space to suit the estimated radio conditions for the second node (20, 30; 30A-B) after the step of selecting.

5. Method according to any of the claims 1 to 4, **char-**

acterised in that the multi-carrier resource space (100) has a time dimension.

6. Method according to any of the claims 1 to 5, **characterised in that** the multi-carrier resource space (100) has a code dimension.

7. Method according to any of the claims 1 to 6, **characterised in that** the multi-carrier resource space (100) has a spatial dimension.

8. Method according to any of the claims 1 to 7, **characterised in that** the step of obtaining in turn comprises the step of estimating a set of estimated radio conditions.

9. Method according to claim 8, **characterised in that** the set of estimated radio conditions comprises at least Doppler conditions.

10. Method according to claim 8 or 9, **characterised in that** the set of estimated radio conditions comprises at least delay spread conditions.

11. Method according to any of the claims 8 to 10, **characterised in that** the step of estimating is based on position and/or velocity information concerning the second node (20, 30; 30A-B).

12. Method according to any of the claims 1 to 11, **characterised in that** the step of obtaining comprises the step of receiving instructions and/or suggestions about preferred pilot resource configuration.

13. Method according to any of the claims 1 to 12, **characterised in that** the first node is selected from the group of:

    user equipment;
    mobile station;
    base station;
    access point; and
    relay.

14. Method according to any of the claims 1 to 13, **characterised in that** the second node is selected from the group of:

    user equipment;
    mobile station;
    base station;
    access point; and
    relay.

15. Method according to any of the claims 1 to 14, **characterised in that** resources of the first resource sub-space are allocated for downlink communication (22; 22A-B).

16. Method according to claim 15, **characterised in that** the step of obtaining data associated with estimated radio conditions for the second node (20, 30; 30A-B) is performed in a base station or access point (20).

17. Method according to claim 16, **characterised by** the further step of transferring data characterising the first pilot resource configuration from the base station or access point (20) to the second node (20, 30; 30A-B).

18. Method according to any of the claims 1 to 12, **characterised in that** resources of the first resource sub-space are allocated for uplink communication (24; 24A-B).

19. Method according to claim 18, **characterised in that** the step of obtaining data associated with estimated radio conditions for the second node (30; 30A-B) is performed in a base station or access point (20), followed by the step of transferring the data associated with estimated radio conditions for the second node (30; 30A-B) to the second node (30; 30A-B).

20. Method according to claim 18, **characterised in that** the step of obtaining data associated with estimated radio conditions for the second node (30; 30A-B) is performed in the second node (30; 30A-B).

21. Method according to claim 20, **characterised by** the further step of transferring data characterising the first pilot resource configuration from the second node (30; 30A-B) to the first node (20, 30; 30A-B).

22. Method according to any of the claims 1 to 21, **characterised in that** retraining from transmitting pilots in areas of the entire multi-carrier resource space (100) not being allocated.

23. Method according to any of the claims 1 to 22, **characterised in that** the wireless communication utilises OFDM.

24. Method according to any of the claims 1 to 23, **characterised in that** the available at least two pilot resource configurations comprises different distribution patterns of pilot symbols in the multi-carrier resource space (100).

25. Method according to claim 24, **characterised in that** the available at least two pilot resource configurations further comprises transmission of pilot symbols with differing intensity.

26. Arrangement being or comprising a first node (20,

30; 30A-B) of a multi-user, multi-carrier wireless communications system (10), the first node (20, 30; 30A-B) comprising:

- means (25) for allocating a first resource sub-space of an entire multi-carrier resource space (100) for communication between the first node (20, 30; 30A-B) and a second node (20, 30; 30A-B).

characterised by

- means (28, 29, 38, 39) for obtaining data associated with estimated radio conditions for the second node (20, 30; 30A-B), and
- means (26) for providing access to the use of at least two pilot resource configurations, intended for different estimated node radio conditions,

whereby the first resource sub-space comprises a first pilot resource configuration, being in agreement with pilot need for the estimated radio conditions for the second node (20, 30; 30A-B) .

27. Arrangement according to claim 26, **characterised in that** the entire multi-carrier resource space (100) being divided into parts (110A-D) having different pilot resource configurations;

whereby the means (25) for allocating being arranged for selecting the first resource sub-space in a part having a pilot resource configuration suitable for the estimated radio conditions for the second node (20, 30; 30A-B).

28. Arrangement according to claim 26, **characterised in that** the first node (20, 30; 30A-B) further comprises:

means for selecting the first multi-carrier resource sub-space; and
means for adapting the pilot resource configuration within the first multi-carrier resource sub-space to suit the estimated radio conditions for the second node (20, 30; 30A-B), the means for adapting being connected to an output of the means for selecting.

29. Arrangement according to any of the claims 26 to 28,
characterised in that the first node (20, 30; 30A-B) further comprises:

means for transferring data characterising the first pilot resource configuration from the first node (20, 30; 30A-B) to the second node (20, 30; 30A-B).

30. Arrangement according to any of the claims 26 to 29,
characterised in that the means (28, 29, 38, 39) for obtaining data associated with estimated radio conditions for the second node (20, 30; 30A-B) in turn comprises a receiver for receiving instructions and/or suggestions about preferred pilot resource configuration from the second node (20, 30; 30A-B).

31. Arrangement according to any of the claims 26 to 30,
characterised in that the arrangement is a wireless communications system (10).

32. Arrangement according to any of the claims 26 to 31,
characterised in that the arrangement utilises OFDM.

33. Arrangement according to any of the claims 26 to 32,
characterised in that the first node is selected from the group of:

user equipment;
mobile station;
base station;
access point; and
relay.

34. Arrangement according to any of the claims 26 to 33,
characterised in that the second node is selected from the group of:

user equipment;
mobile station;
base station;
access point; and
relay.

35. User equipment capable of being connected to a multi-user, multi-carrier wireless communications system, comprising:

- means (35) for communication between the user equipment (30) and a node (20, 30; 30A-B) utilising a first resource sub-space (108A-F) of an entire multi-carrier resource space (100),

characterised in that

the first resource sub-space (108A-F) comprises a first pilot resource configuration, out of a set of at least two different pilot resource configurations, and

whereby the first pilot resource configuration

being in agreement with pilot need for estimated radio conditions for the user equipment (30).

36. User equipment according to claim 35, **characterised by**

- receiver for receiving data characterising the first pilot resource configuration from the node (20, 30; 30A-B);
- means (36) for channel estimation, connected to the receiver,

whereby the means for channel estimation (36) is arranged to perform channel estimation based on the received data characterising the first pilot resource configuration.

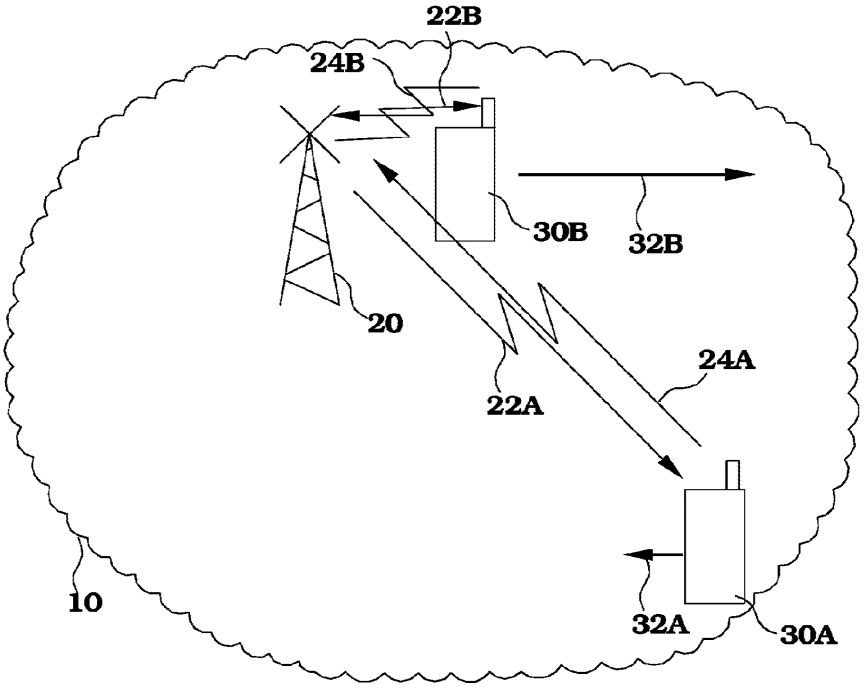

22B
24B
30B
32B
20
24A
22A
10
32A
30A

Fig. 1

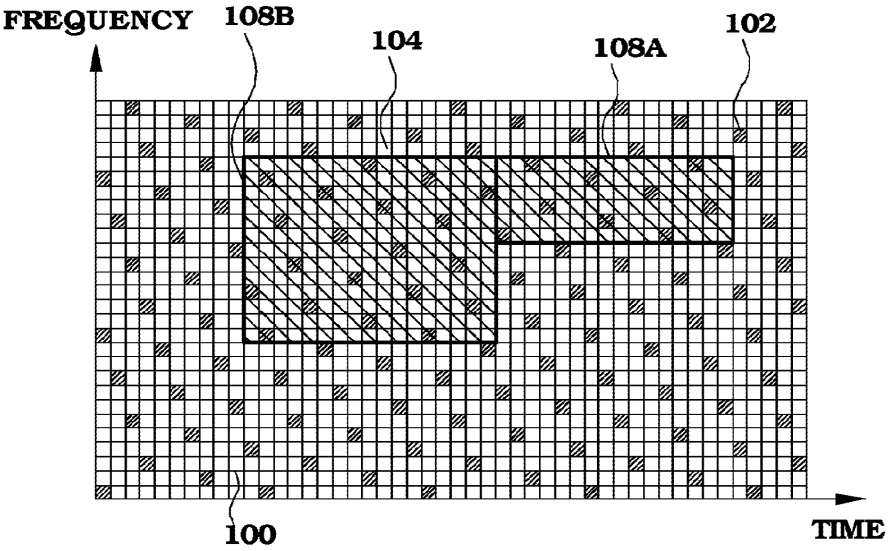

FREQUENCY
108B
104
108A
102
100
TIME

Fig. 2A

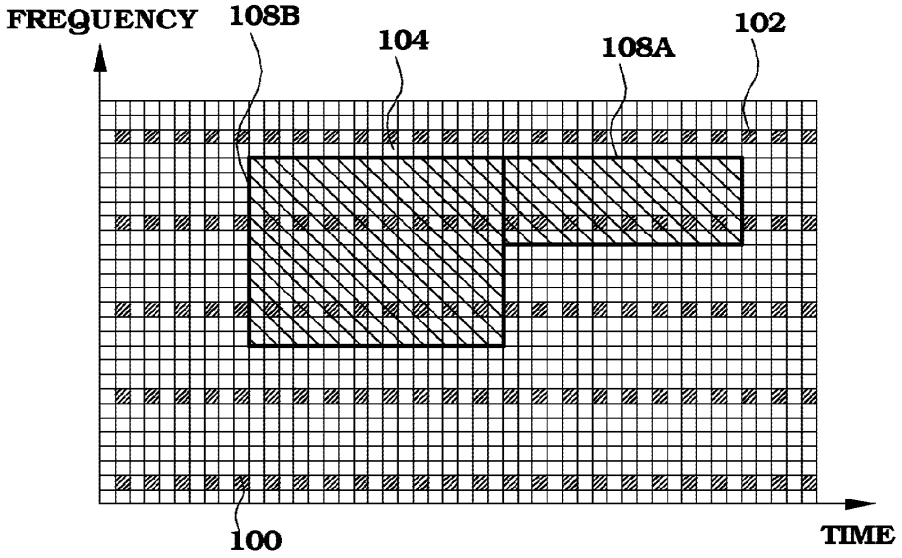


Fig. 2B

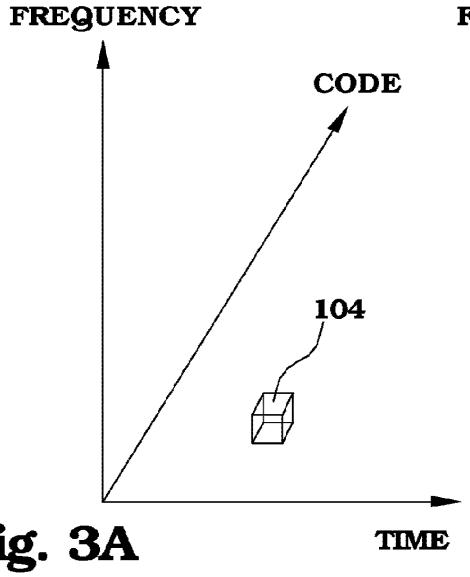


Fig. 3A

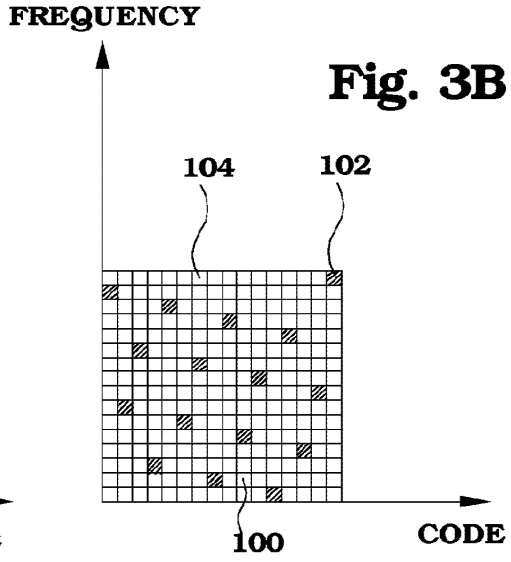


Fig. 3B

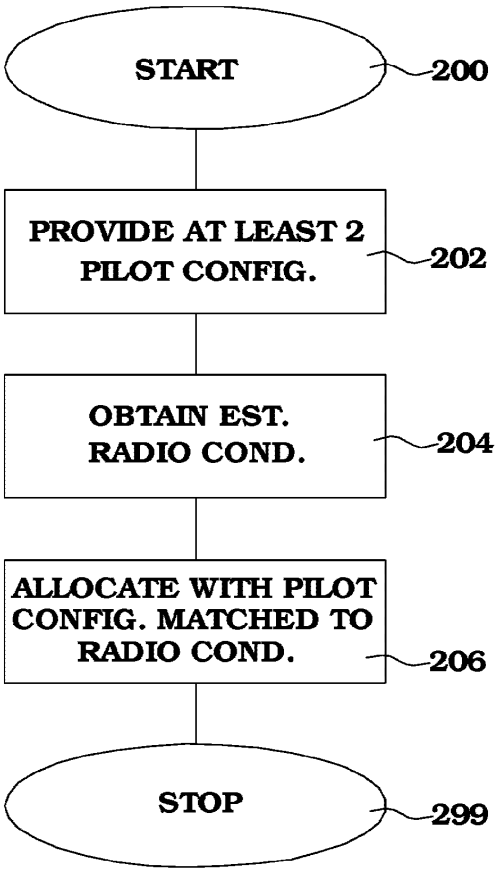

START
200
PROVIDE AT LEAST 2 PILOT CONFIG.
202
OBTAIN EST. RADIO COND.
204
ALLOCATE WITH PILOT CONFIG. MATCHED TO RADIO COND.
206
STOP
299

Fig. 4

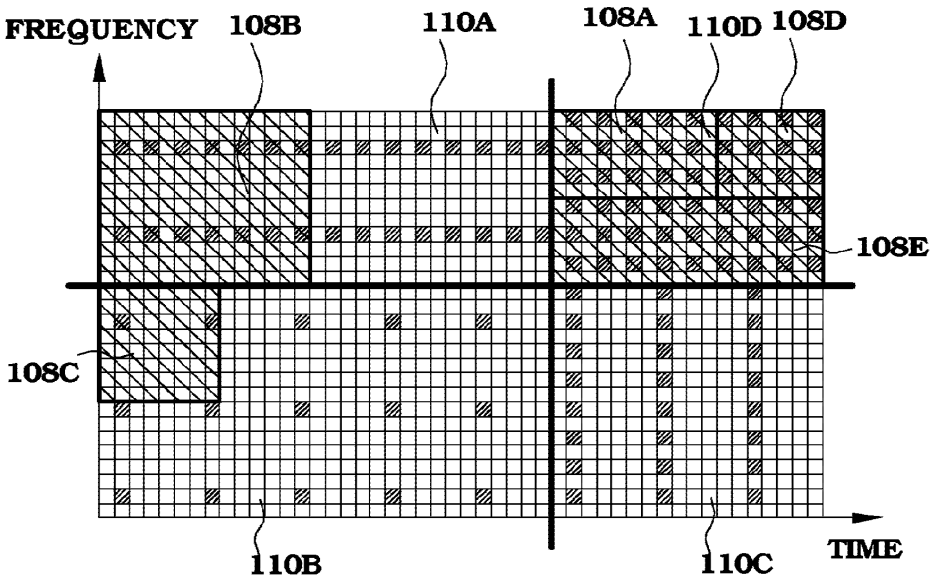

FREQUENCY
108B
110A
108A
110D
108D
108E
108C
110B
110C
TIME

Fig. 5A

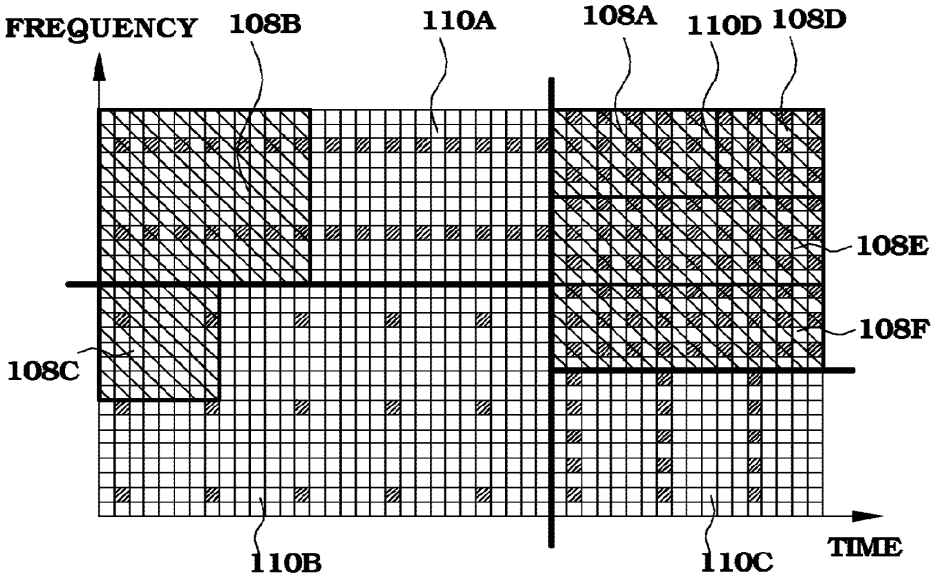
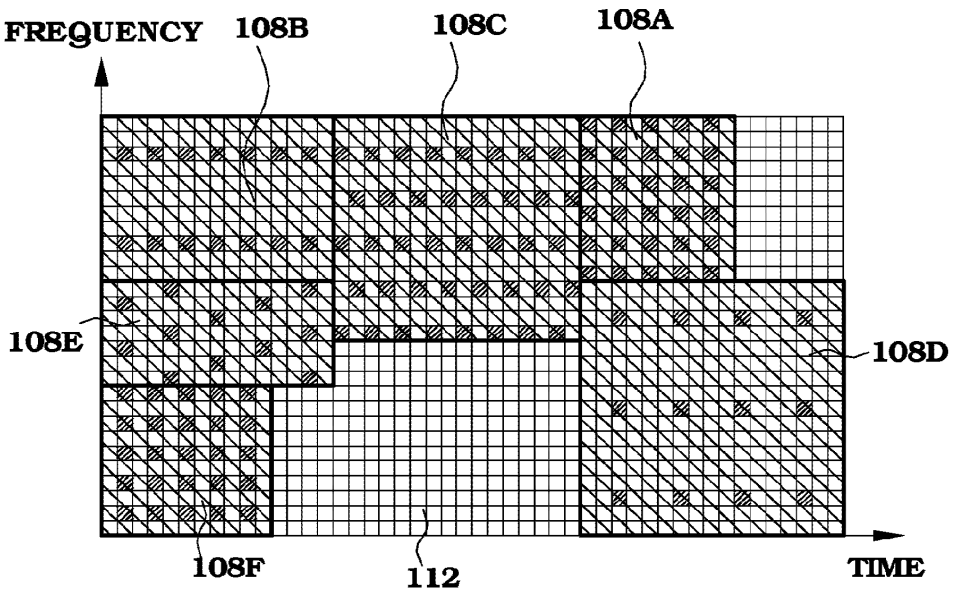

FREQUENCY
108B
110A
108A
110D
108D
108E
108F
108C
110B
110C
TIME

Fig. 5B


FREQUENCY
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108C
108A
108E
108D
108F
112
TIME

Fig. 6

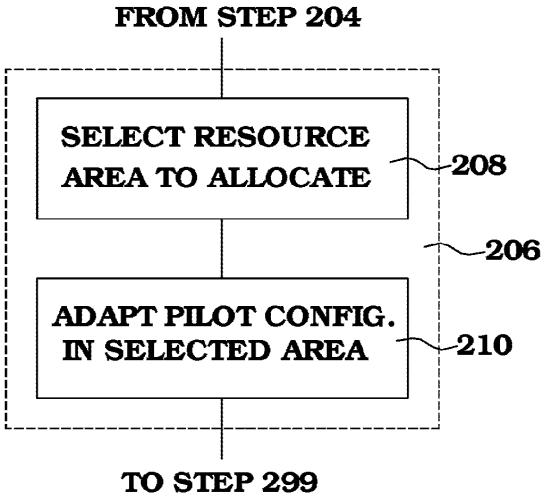
FROM STEP 204
SELECT RESOURCE AREA TO ALLOCATE
208
206
ADAPT PILOT CONFIG. IN SELECTED AREA
210
TO STEP 299

Fig. 8

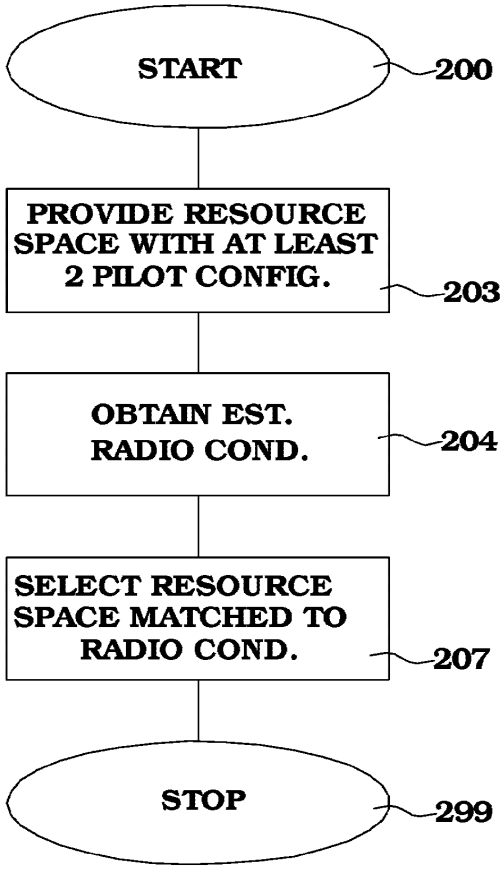
START
200
PROVIDE RESOURCE SPACE WITH AT LEAST 2 PILOT CONFIG.
203
OBTAIN EST. RADIO COND.
204
SELECT RESOURCE SPACE MATCHED TO RADIO COND.
207
STOP
299

Fig. 7A

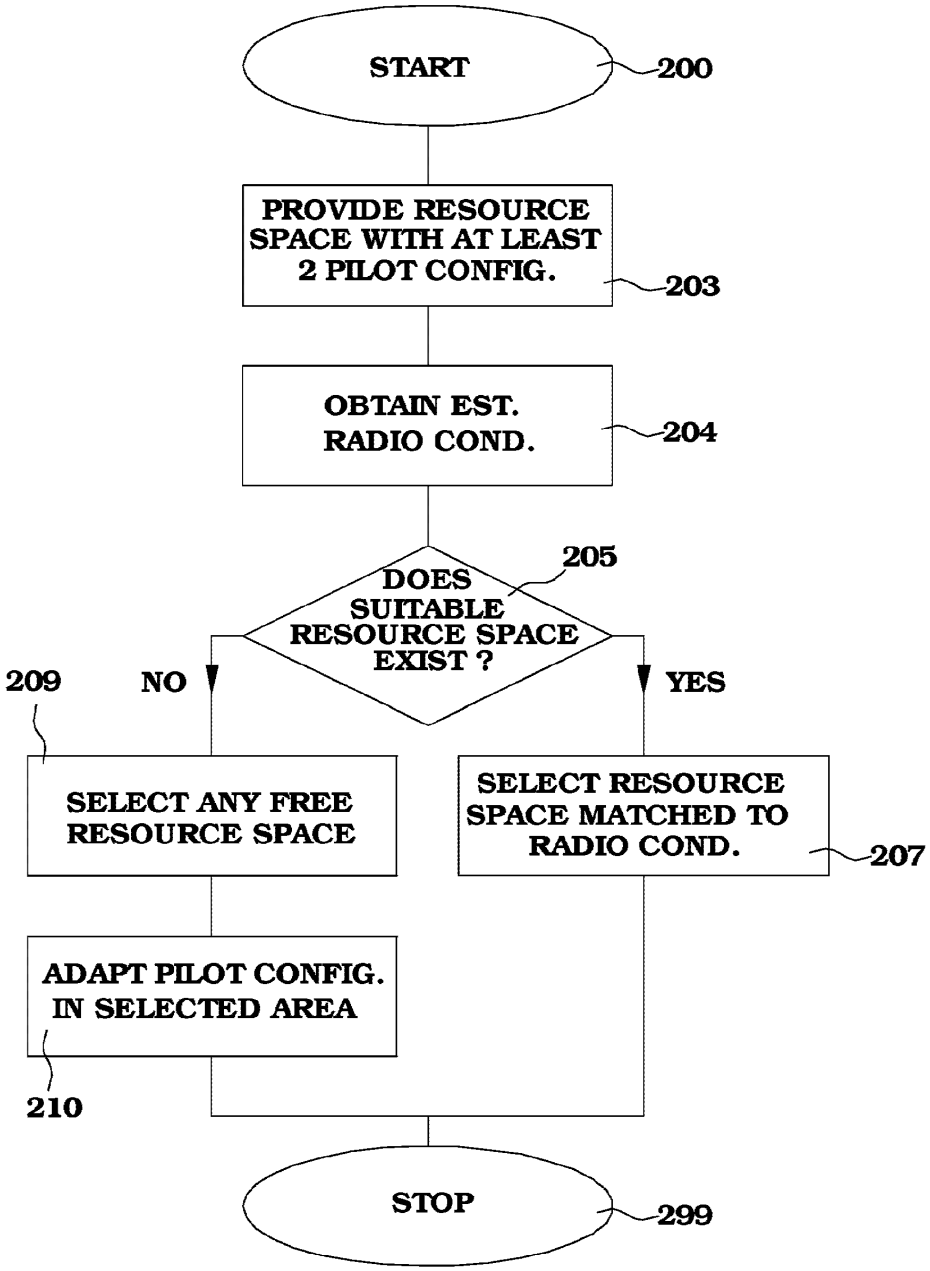
START
200
PROVIDE RESOURCE SPACE WITH AT LEAST 2 PILOT CONFIG.
203
OBTAIN EST. RADIO COND.
204
DOES SUITABLE RESOURCE SPACE EXIST ?
205
NO
YES
209
SELECT ANY FREE RESOURCE SPACE
SELECT RESOURCE SPACE MATCHED TO RADIO COND.
207
ADAPT PILOT CONFIG. IN SELECTED AREA
210
STOP
299

Fig. 7B

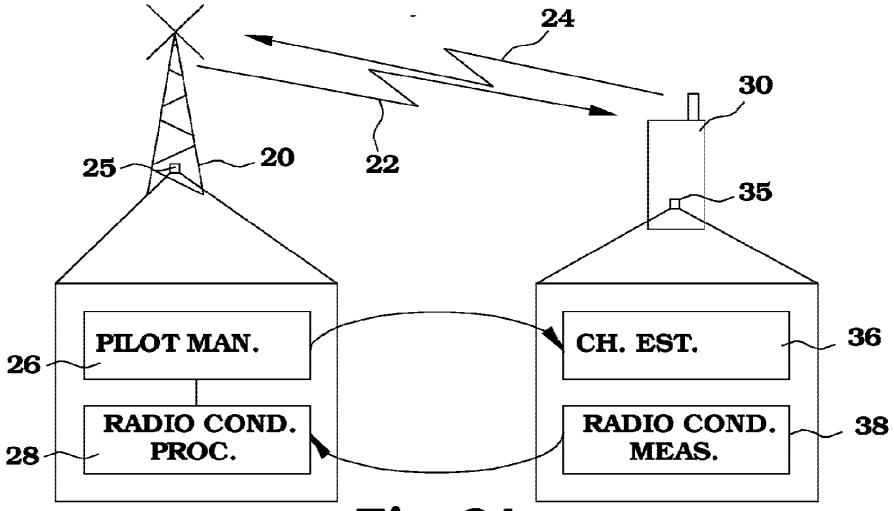

Fig. 9A

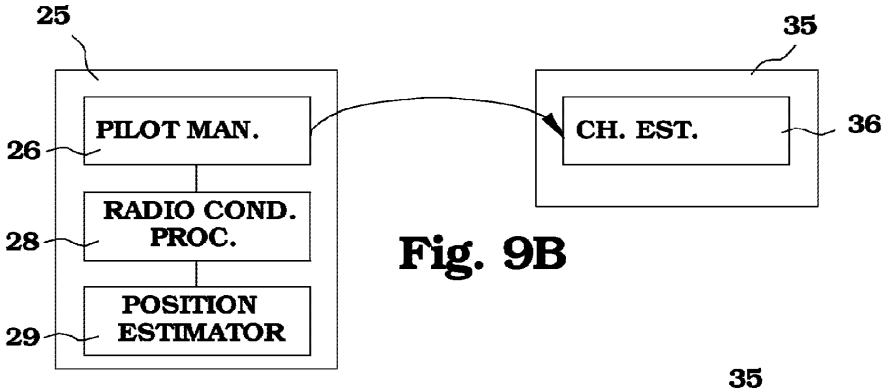

Fig. 9B

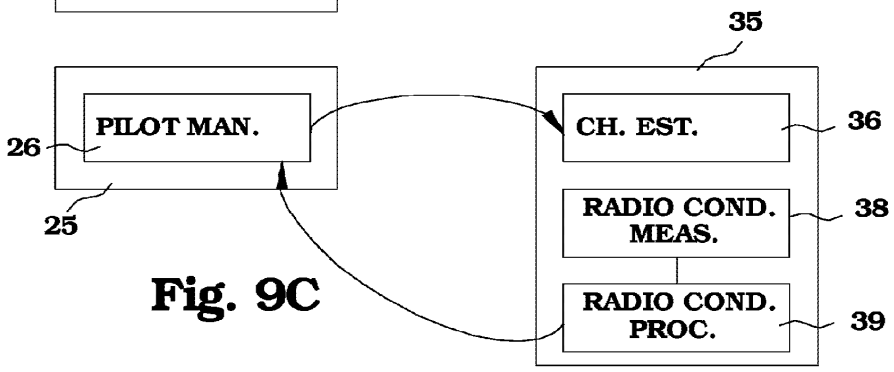

Fig. 9C

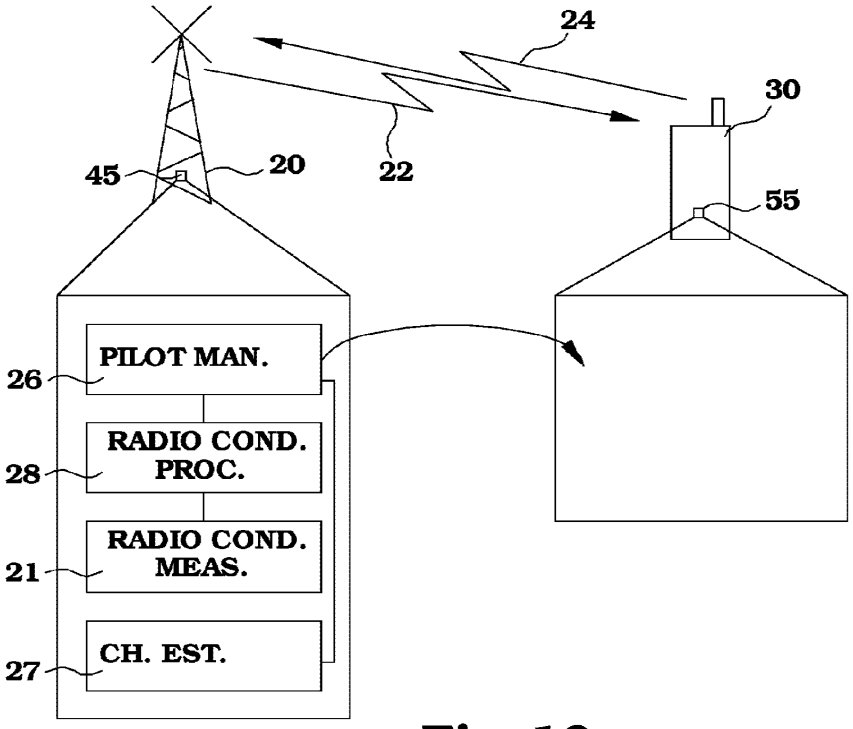
24
30
45
20
22
55
PILOT MAN.
26
RADIO COND. PROC.
28
RADIO COND. MEAS.
21
CH. EST.
27

Fig. 10

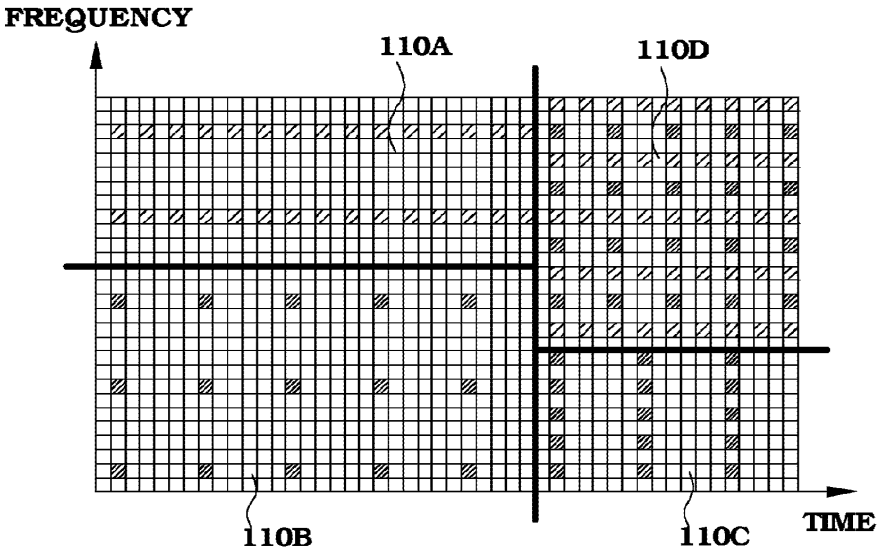
FREQUENCY
110A
110D
110B
110C
TIME

Fig. 11

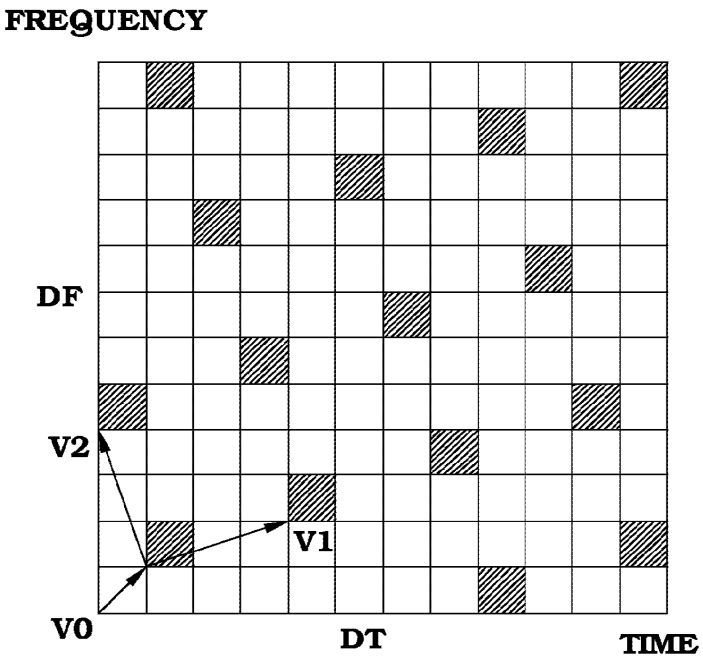

Fig. 12

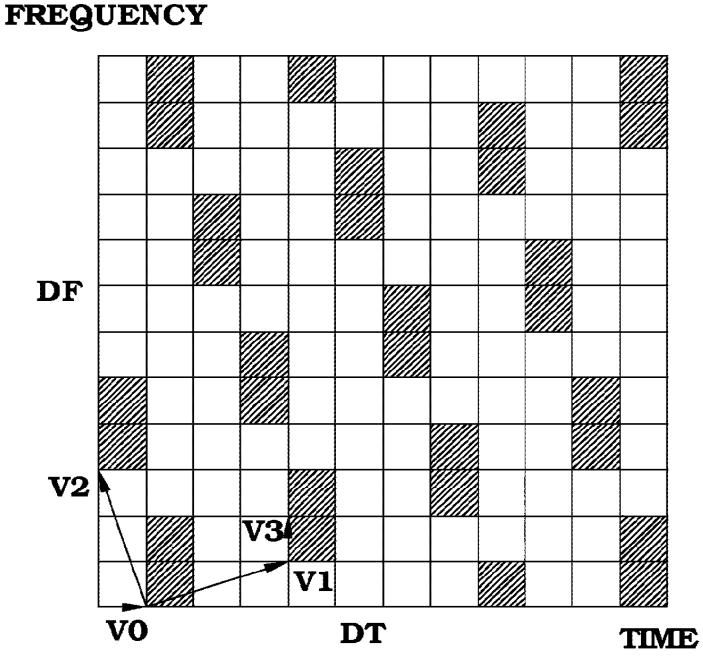

Fig. 13

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 10 4661

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X Y	US 6 452 936 B1 (SHIINO HARUHIRO) 17 September 2002 (2002-09-17) * column 1, line 1-26 * * column 2, line 38 - column 3, line 3 * * column 3, line 4-61 * * column 4, line 8-67 * * column 5 * * column 6 * * column 7, line 11-46 * * figures 1,3 * ---	35,36 1-34	H04Q7/38
Y	US 2003/215021 A1 (SIMMONDS CHRISTOPHER MARTIN) 20 November 2003 (2003-11-20) * paragraphs [0021]-[0024] * * paragraphs [0031]-[0034] * ---	1-34	
A	EP 0 862 343 A (LUCENT TECHNOLOGIES INC) 2 September 1998 (1998-09-02) * abstract * ---	1-36	
A	US 2003/072395 A1 (MA JIANGLEI ET AL) 17 April 2003 (2003-04-17) * abstract * -----	1-36	TECHNICAL FIELDS SEARCHED (Int.Cl.7) H04Q H04L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	2 June 2004	Mele, M

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 03 10 4661

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

02-06-2004

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6452936 B1	17-09-2002	JP 3335570 B2	21-10-2002
		JP 11150521 A	02-06-1999
US 2003215021 A1	20-11-2003	GB 2386519 A	17-09-2003
		WO 03077492 A1	18-09-2003
EP 0862343 A	02-09-1998	US 6122266 A	19-09-2000
		CA 2227468 A1	19-08-1998
		EP 0862343 A2	02-09-1998
		JP 3373777 B2	04-02-2003
		JP 10243449 A	11-09-1998
US 2003072395 A1	17-04-2003	WO 03034646 A2	24-04-2003

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

Electronic Patent Application Fee Transmittal	
Application Number:	13718016
Filing Date:	18-Dec-2012
Title of Invention:	SYSTEM AND METHOD FOR DESCRAMBLING THE PHASE OF CARRIERS IN A MULTICARRIER COMMUNICATIONS SYSTEM
First Named Inventor/Applicant Name:	Marcos C. Tzannes
Filer:	Jason Vick/Joanne Vos
Attorney Docket Number:	6936-47-CON-DIV-CON-3
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($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt	
EFS ID:	18888287
Application Number:	13718016
International Application Number:	
Confirmation Number:	4520
Title of Invention:	SYSTEM AND METHOD FOR DESCRAMBLING THE PHASE OF CARRIERS IN A MULTICARRIER COMMUNICATIONS SYSTEM
First Named Inventor/Applicant Name:	Marcos C. Tzannes
Customer Number:	62574
Filer:	Jason Vick/Joanne Vos
Filer Authorized By:	Jason Vick
Attorney Docket Number:	6936-47-CON-DIV-CON-3
Receipt Date:	29-APR-2014
Filing Date:	18-DEC-2012
Time Stamp:	13:05:43
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$180
RAM confirmation Number	12552
Deposit Account	191970
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 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		IDS_03.pdf	551212 18fa9ef1924c2fd874abc7f01504d45a2fae170f	yes	4
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Transmittal Letter		1	3	
	Information Disclosure Statement (IDS) Form (SB08)		4	4	
Warnings:					
Information:					
2	Foreign Reference	EP1542488.pdf	1049528 d0d92b19247aafa4b5c91118d9aaf656e4027db5	no	22
Warnings:					
Information:					
3	Non Patent Literature	6936-47-CON-5_NOA_02-07-2014.pdf	441800 18f556a94a076ec27a975c8fa0e05af025a64bed	no	8
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30559 62b9cda97a4d9239ae6ce3f4c2066b05f67b9601	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	2073099		

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of:	)	Group Art Unit: 2633
Marcos C. Tzannes	)	Confirmation No.: 4520
Serial No.: 13/718,016	)	Examiner: JOSEPH, JAISON
Filed: December 18, 2012	)	
Atty. File No.: 6936-47-CON-DIV-CON-3	)	SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT
Entitled: "SYSTEM AND METHOD FOR DESCRAMBLING THE PHASE OF CARRIERS IN A MULTICARRIER COMMUNICATIONS SYSTEM"	)	Electronically Submitted

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

Dear Sir:

The references cited on attached Form PTO-1449 are being called to the attention of the Examiner.

☒ Copies of the cited non-patent and/or foreign references are enclosed herewith.

☐ Copies of the cited U.S. patents and/or patent applications are enclosed herewith.

☒ Copies of the cited U.S. patents/unpublished patent applications/patent application publications are not enclosed in accordance with 37 C.F.R. § 1.98(a).

☐ Copies of the cited references are not enclosed, in accordance with 37 C.F.R. § 1.98(d), because the references were cited by or submitted to the U.S. Patent and Trademark Office in prior application Serial No. _____ filed _____, which is relied upon for an earlier filing date under 35 U.S.C. § 120.

☐ To the best of applicants' belief, the pertinence of the foreign-language references are believed to be summarized in the attached English translation/abstracts and/or in the figures, although applicants do not necessarily vouch for the accuracy of the translation.

☐ Examiner's attention is drawn to the following related applications:

- Serial No. _____ filed _____(Attorney Ref. No. _____)

☐ Other:_____

Submission of the above information is not intended as an admission that any item is citable under the statutes or rules to support a rejection, that any item disclosed represents analogous art, or that those skilled in the art would refer to or recognize the

pertinence of any reference without the benefit of hindsight, nor should an inference be drawn as to the pertinence of the references based on the order in which they are presented. Submission of this statement should not be taken as an indication that a search has been conducted, or that no better art exists.

It is respectfully requested that the cited information be expressly considered during the prosecution of this application and the references made of record therein.

FEES

☐	**37 CFR 1.97(b)**: No fee is believed due in connection with this submission, because the information disclosure statement submitted herewith is satisfied by one of the following conditions ("X" indicates satisfaction): ☐ Within three months of the filing date of a national application other than a continued prosecution application under 37 CFR 1.53(d), or ☐ Within three months of the date of entry into the national stage of an international application as set forth in 37 CFR 1.491 or ☐ Before the mailing date of a first Office Action on the merits, or ☐ Before the mailing of a first Office action after the filing of a request for continued examination under 37 CFR 1.114. Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970.
☐	**37 CFR 1.97(c)**: The information disclosure statement transmitted herewith is being filed after all the above conditions (37 CFR 1.97(b)), but before the mailing date of one of the following conditions: (1) a final action under 37 C.F.R. 1.113 or (2) a notice of allowance under 37 C.F.R. 1.311, or (3) an action that otherwise closes prosecution in the application. This Information Disclosure Statement is accompanied by: ☐ A Certification (below) as specified by 37 C.F.R. 1.97(e). Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970. OR ☐ Please charge Deposit Account 19-1970 in the amount of $180.00 for the fee set forth in 37 C.F.R. 1.17(p) for submission of an information disclosure statement. Please credit any overpayment or charge any underpayment to Deposit Account 19-1970.
☒	**37 CFR 1.97(d)**: This Information Disclosure Statement is being submitted after the period specified in 37 CFR 1.97(e). ☒ This information Disclosure Statement includes a Certification (below) as specified by 37 C.F.R. 1.97(e) AND ☒ Applicants hereby requests consideration of the reference(s) disclosed herein. Please charge Deposit Account 19-1970 in the amount of $180.00 under 37 C.F.R. 1.17(p). Please credit any overpayment or charge any underpayment to Deposit Account 19-1970. Election to pay the fee should not be taken as an indication that applicant(s) cannot execute a certification.

Certification (37 C.F.R. 1.97(e))
(Applicable only if checked)

☒ The undersigned certifies that:

☐ Each item of information contained in this information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(1).

☐ A copy of the communication from the foreign patent office is enclosed.

OR

☒ No item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in this Information Disclosure Statement was known to any individual designated in 37 C.F.R. 1.56(c) more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(2).

Respectfully submitted,

SHERIDAN ROSS P.C.

By: _____

Jason H. Vick
Registration No. 45,285
1560 Broadway, Suite 1200
Denver, Colorado 80202-5141
(303) 863-9700

Date: 29 Apr '14

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/718,016	12/18/2012	Marcos C. Tzannes	6936-47-CON-DIV-CON-3	4520

62574 7590 02/04/2014

Jason H. Vick
Sheridan Ross, PC
Suite # 1200
1560 Broadway
Denver, CO 80202

EXAMINER	
JOSEPH, JAISON	
ART UNIT	PAPER NUMBER
2633	

NOTIFICATION DATE	DELIVERY MODE
02/04/2014	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jvick@sheridanross.com

Office Action Summary	Application No. 13/718,016	Applicant(s) TZANNES, MARCOS C.	
	Examiner JAISON JOSEPH	Art Unit 2633	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 *11/12/2013*.

☐ 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) *21-41* 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) *21-41* 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 _____ 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: _____.

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

Response to Arguments

Applicant's arguments with respect to claims 21 - 41 have been considered but are moot because the arguments do not apply to any of the references being used in the current rejection.

Regarding independent claims, Applicant's arguments directed toward newly amended limitations which was not present in the previous rejection. Furthermore newly made amendments have changed the scope of the claims. However, upon further consideration, a new ground(s) of rejection is made in view of Nystrom et al (EP 1542488 A1), Rinne et al 9US 6,259,685 and Lee et al (US 2003/0128673).

With respect all other claims the Applicant makes same argument as the argument applied to claim 21. Therefore the same response applied to the argument with respect to independent claims above is applied here.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 21 – 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al (US 5,903,614) in view of Olafsson (US 5,742,679).

Regarding claim 21, Suzuki et al teach a method for scrambling a phase characteristic of a plurality of carriers in a multicarrier communications transceiver (see abstract) comprising: determining a first phase shift for a first carrier of the plurality of carriers (column 2, lines 57-60 and figure 6), determining asecond phase shift for a second carrier of the plurality of carriers (see figure 6) wherein the phase shift of first carrier if the plurality of carriers is different than the phase shift of the second carrier of the plurality of carriers (see figure 6). Suzuki et la does not expressly teach that the phase shifts are determined based on a pseudo random manner. However in analogous art, Olafsson teaches generating phase shifts based on a pseudo random number generator (see figure 4(a)) and transmitting to a remote transceiver, at least one value associated with the pseudo random number generator to enable the remote transceiver to determine the first and second phase shifts (see column 5, liunes 40 – 55). Therefore it would have been obvious to an ordinary skilled in the art at the time the invention was made to use a PRN generator to determine the phase shifts. The motivation or suggestion to do so is to reduce the interference and accurately transmit the data.

Regarding claim 22, Suzuki et la does not expressly teach cable transceiver. However there is no criticality in these limitations. It is well known in the art that OFDM Applying Suzuki et al for the limitations are within the scope of one of ordinary skilled in the art.

Regarding claim 23, Suzuki et la does not expressly teach DSL transceiver. However there is no criticality in these limitations. It is well known in the art that OFDM

Applying Suzuki et al for the limitations are within the scope of one of ordinary skilled in the art.

Regarding claim 24, which inherits the limitations of claim 21, Suzuki et al teach wherein the transceiver is a wireless transceiver (column 2, lines 57-60).

Regarding claim 25, Suzuki et la does not expressly teach for high speed internet access. However there is no criticality in these limitations. It is well known in the art that OFDM Applying Suzuki et al for the limitations are within the scope of one of ordinary skilled in the art.

Regarding claim 26, Suzuki et al does not expressly teach the transceiver is for transporting video. However there is no criticality in these limitations. It is well known in the art that OFDM Applying Suzuki et al for the limitations are within the scope of one of ordinary skilled in the art.

Regarding claim 27, Suzuki et la does not expressly teach a DSL transceiver connected to a pair of twisted wires of a telephone subscriber system. However there is no criticality in these limitations. It is well known in the art that OFDM Applying Suzuki et al for the limitations are within the scope of one of ordinary skilled in the art.

Regarding claim 28, the claimed multicarrier communications transceiver including the features corresponds to subject matter mentioned above in the rejection of claim 21 is applicable hereto.

Regarding claim 29, which inherits the limitations of claim 28, the claimed multicarrier communications transceiver including the features corresponds to subject matter mentioned above in the rejection of claim 22 is applicable hereto.

Regarding claim 30, which inherits the limitations of claim 28, the claimed multicarrier communications transceiver including the features corresponds to subject matter mentioned above in the rejection of claim 23 is applicable hereto.

Regarding claim 31, which inherits the limitations of claim 28, the claimed multicarrier communications transceiver including the features corresponds to subject matter mentioned above in the rejection of claim 24 is applicable hereto.

Regarding claim 32, which inherits the limitations of claim 28, the claimed multicarrier communications transceiver including the features corresponds to subject matter mentioned above in the rejection of claim 25 is applicable hereto.

Regarding claim 33, which inherits the limitations of claim 28, the claimed multicarrier communications transceiver including the features corresponds to subject matter mentioned above in the rejection of claim 26 is applicable hereto.

Regarding claim 34, which inherits the limitations of claim 28, the claimed multicarrier communications transceiver including the features corresponds to subject matter mentioned above in the rejection of claim 27 is applicable hereto.

Regarding claim 35, the claimed non-transitory computer readable media including the features corresponds to subject matter mentioned above in the rejection of claim 21 is applicable hereto.

Regarding claim 36, which inherits the limitations of claim 35, the claimed multicarrier communications transceiver including the features corresponds to subject matter mentioned above in the rejection of claim 22 is applicable hereto.

Regarding claim 37, which inherits the limitations of claim 35, the claimed multicarrier communications transceiver including the features corresponds to subject matter mentioned above in the rejection of claim 23 is applicable hereto.

Regarding claim 38, which inherits the limitations of claim 35, the claimed multicarrier communications transceiver including the features corresponds to subject matter mentioned above in the rejection of claim 24 is applicable hereto.

Regarding claim 39, which inherits the limitations of claim 35, the claimed multicarrier communications transceiver including the features corresponds to subject matter mentioned above in the rejection of claim 25 is applicable hereto.

Regarding claim 40, which inherits the limitations of claim 35, the claimed multicarrier communications transceiver including the features corresponds to subject matter mentioned above in the rejection of claim 26 is applicable hereto.

Regarding claim 41, which inherits the limitations of claim 35, the claimed multicarrier communications transceiver including the features corresponds to subject matter mentioned above in the rejection of claim 27 is applicable hereto.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAISON JOSEPH whose telephone number is (571)272-6041. The examiner can normally be reached on M,TH, F 7 - 7:30 and S8 - 12.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sam K. Ahn can be reached on (571) 272-3044. 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.

/JAISON JOSEPH/
Primary Examiner, Art Unit 2633

Notice of References Cited	Application/Control No. 13/718,016	Applicant(s)/Patent Under Reexamination TZANNES, MARCOS C.	
	Examiner JAISON JOSEPH	Art Unit 2633	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,742,679	04-1998	Olafsson, Sverrir	370/527
	B	US-			
	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	
	W	
	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.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13718016	TZANNES ET AL.
	Examiner	Art Unit
	JAISON JOSEPH	2633

✓	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	05/05/2013	01/27/2014							
	1	-	-							
	2	-	-							
	3	-	-							
	4	-	-							
	5	-	-							
	6	-	-							
	7	-	-							
	8	-	-							
	9	-	-							
	10	-	-							
	11	-	-							
	12	-	-							
	13	-	-							
	14	-	-							
	15	-	-							
	16	-	-							
	17	-	-							
	18	-	-							
	19	-	-							
	20	-	-							
	21	✓	✓							
	22	✓	✓							
	23	✓	✓							
	24	✓	✓							
	25	✓	✓							
	26	✓	✓							
	27	✓	✓							
	28	✓	✓							
	29	✓	✓							
	30	✓	✓							
	31	✓	✓							
	32	✓	✓							
	33	✓	✓							
	34	✓	✓							
	35	✓	✓							
	36	✓	✓							

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13718016	TZANNES ET AL.
	Examiner	Art Unit
	JAISON JOSEPH	2633

✓	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	05/05/2013	01/27/2014							
	37	✓	✓							
	38	✓	✓							
	39	✓	✓							
	40	✓	✓							
	41	✓	✓							

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	6	("5742679" "6781951" "20020172146").pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/27 12:30
L3	133	pseudo adj2 random adj2 phase adj2 shift	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/27 12:48
L4	8341288	pseudo adj2 random adj2 phase adj2 shift indicat$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/27 12:48
L5	5	pseudo adj2 random adj2 phase adj2 shift same indicat$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/27 12:48
L6	5527787	transmit pohase shift indicator	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/27 12:51
L7	5544755	transmi$4 phase near2 shift near2 indicator	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/27 12:51
L8	233	transmi$4 near4 phase near2 shift near2 (indicator value)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/27 12:52
L9	1	transmi$4 near4 phase near2 shift near2 (indicator value) same random adj2 phase adj2 shift	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/27 12:52
S1	0	13/718016	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/05/05 18:43
S2	8	09/710310	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/05/05 18:44
S3	18	"6590860"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/05/05 19:00
S4	642	phase adj2 shift near3 carrier same number	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/05/05 19:05

S5	43	phase adj2 shift near3 carrier near2 number	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/05/05 19:05

EAST Search History (Interference)

< This search history is empty>

1/ 27/ 2014 1:12:06 PM
C:\ Users\ jjoseph1\ Documents\ EAST\ Workspaces\ 13718016.wsp

Substitute for form 1449A/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/718,016
				Filing Date	December 18, 2012
				First Named Inventor	Marcos C. Tzannes
				Art Unit	2633
				Examiner Name	Joseph, Jaison
Sheet	1	of	1	Attorney Docket Number	6936-47-CON-DIV-CON-3

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-kind Code [2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee of Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
/JJ/	1	5742679	04-21-1998	Olafsson	
/JJ/	2	6781951	08-24-2004	Fifield	
/JJ/	3	2002/0172146	11-21-2002	Wu et al.	

UNPUBLISHED U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-kind Code [2] (if known)	Filing Date MM-DD-YYYY	Name of Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]; Number[4]; Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

OTHER ART (Including Author, Title, Date, Pertinent Pages, etc.)		
Examiner Initials*	Cite No.[1]	
/JJ/	4	Official Action for U.S. Patent Application No. 13/303,417, mailed July 5, 2013 (Attorney Ref. No. 6936-47-CON-5)

Examiner Signature	/Jaison Joseph/	Date Considered	01/27/2014

*EXAMINER: Initial if reference is considered, whether or not citation is in conformance and not considered. Include copy of this form with next communication to applicant.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13718016	TZANNES ET AL.
	Examiner	Art Unit
	JAISON JOSEPH	2633

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
375	222, 340, 341	5/5/2013	JJ
	Updated search	1/27/2014	JJ

SEARCH NOTES		
Search Notes	Date	Examiner
Inventor name search	5/5/2013	JJ
East	5/5/2013	JJ
East updated	1/27/2014	JJ

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

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/718,016	12/18/2012	Marcos C. Tzannes	6936-47-CON-DIV-CON-3	4520

62574 7590 11/13/2013

Jason H. Vick
Sheridan Ross, PC
Suite # 1200
1560 Broadway
Denver, CO 80202

EXAMINER	
JOSEPH, JAISON	
ART UNIT	PAPER NUMBER
2633	

NOTIFICATION DATE	DELIVERY MODE
11/13/2013	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jvick@sheridanross.com

Applicant-Initiated Interview Summary	**Application No.** 13/718,016	**Applicant(s)** TZANNES, MARCOS C.	
	Examiner JAISON JOSEPH	**Art Unit** 2633	

All participants (applicant, applicant's representative, PTO personnel):

(1) *JAISON JOSEPH*. (3)_____.

(2) *Jason H. Vick*. (4)_____.

Date of Interview: *07 November 2013*.

Type: ☐ Telephonic ☐ Video Conference
☒ Personal [copy given to: ☐ applicant ☒ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☒102 ☐103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *21*.

Identification of prior art discussed: *Suzuki et al (US 5,903,614)*.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Discussed claim 21 and figures 5 -7. No agreement was reached. Applicnt intent to fila an amendment and resubmit the claims. Examiner will consider the amendment upon the official submission of amendments. .

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/Jaison Joseph/ Primary Examiner, Art Unit 2633	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

———

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of: Marcos C. Tzannes	Group Art Unit: 2633
Application No.: 13/718,016	Examiner: JOSEPH, Jaison
Filed: December 18, 2012	Confirmation No.: 4520
Atty. File No.: 6936-47-CON-DIV-CON-3	

For: SYSTEM AND METHOD FOR DETERMINING PHASE SHIFTS USING A PSEUDO-RANDOM NUMBER GENERATOR

AMENDMENT AND RESPONSE

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

Madam:

Applicants submit this Amendment and Response to address the Office Action having a mailing date of May 9, 2013. Please credit any overpayment or charge any underpayment to Deposit Account No. 19-1970.

Please amend the above-identified patent application as follows:

Amendments to the Specification begin on page 2 of this paper.

Amendments to the Claims are shown in the listing of claims which begins on page 3 of this paper.

Remarks begin on page 7 of this paper.

Amendments to the Specification:

In the title:

Please change the title to read as follows:

SYSTEM AND METHOD FOR DETERMINING~~DESCRAMBLING THE~~ PHASE SHIFTS USING A PSEUDO-RANDOM NUMBER GENERATOR~~OF CARRIERS IN A MULTICARRIER COMMUNICATIONS SYSTEM~~

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.-20. (Cancelled)

21. (Currently Amended) A method for scramblingadjusting a phase characteristic of a plurality of carriers in a multicarrier communications transceiver comprising:

assigning, by the transceiver, determining a first phase shift for a first carrier ofnumbers to the plurality of carriers; and

assigning, by the transceiver, a phase shift to the plurality of carriers;

wherein thedetermining a second phase shift is based onfor a predetermined equation that depends on thesecond carrier of the plurality of carriers number,

wherein the phase shift is independent of any bit value carried by the plurality of carriers, and

wherein the phase shift of thea first carrier of the plurality of carriers is different than the phase shift of thea second carrier of the plurality of carriers, and

wherein the first and second phase shifts are determined using a pseudo-random number generator; and

transmitting, to a remote transceiver, at least one value associated with the pseudo-random number generator to enable the remote transceiver to determine the first and second phase shifts.

22. (Previously Presented) The method of claim 21, wherein the transceiver is a cable transceiver.

23. (Previously Presented) The method of claim 21, wherein the transceiver is a DSL transceiver.

24. (Previously Presented) The method of claim 21, wherein the transceiver is a wireless transceiver.

25. (Previously Presented) The method of claim 21, wherein the transceiver is for high speed internet access.

26. (Previously Presented) The method of claim 21, wherein the transceiver is for transporting video.

27. (Previously Presented) The method of claim 21, wherein the transceiver is a DSL transceiver connected to a pair of twisted wires of a telephone subscriber system.

28. (Currently Amended) A multicarrier communications transceiver ~~capable of adjusting~~ that scrambles a phase characteristic of a plurality of carriers, the transceiver operable to:

determine a first phase shift for a first carrier of the plurality of carriers;

determine a second phase shift for a second carrier of the plurality of carriers,

wherein the phase shift of the first carrier of the plurality of carriers is different than the phase shift of the second carrier of the plurality of carriers, and wherein the first and second phase shifts are determined using a pseudo-random number generator; and

transmit, to a remote transceiver, at least one value associated with the pseudo-random number generator to enable the remote transceiver to determine the first and second phase shifts~~capable of assigning carrier numbers to the plurality of carriers and assigning a phase shift to the plurality of carriers wherein the phase shift is based on a predetermined equation that depends on the carrier number, the phase shift is independent of any bit value carried by the plurality of carriers, and wherein the phase shift of a first carrier of the plurality of carriers is different than the phase shift of a second carrier of the plurality of carriers~~.

29. (Previously Presented) The transceiver of claim 28, wherein the transceiver is a cable transceiver.

30. (Previously Presented) The transceiver of claim 28, wherein the transceiver is a DSL transceiver.

31. (Previously Presented) The transceiver of claim 28, wherein the transceiver is a wireless transceiver.

32. (Previously Presented) The transceiver of claim 28, wherein the transceiver is for high speed internet access.

33. (Previously Presented) The transceiver of claim 28, wherein the transceiver is for transporting video.

34. (Previously Presented) The transceiver of claim 28, wherein the transceiver is a DSL transceiver connected to a pair of twisted wires of a telephone subscriber system.

35. (Currently Amended) A non-transitory computer readable information storage media, having stored thereon instructions, that when executed by one or more processors, cause to be performed ~~that perform~~ a method for scramblingadjusting a phase characteristic of a plurality of carriers in a multicarrier communications transceiver comprising:

~~assigning, by the transceiver,~~determining a first phase shift for a first carrier ~~numbers to~~ of the plurality of carriers;~~ and~~

~~assigning, by the transceiver, a phase shift to the plurality of carriers;~~

~~wherein the~~determining a second phase shift for a~~is based on a predetermined equation that depends on the~~ second carrier of the plurality of carriers~~number~~,

~~wherein the phase shift is independent of any bit value carried by the plurality of carriers, and~~

wherein the phase shift of the~~a~~ first carrier of the plurality of carriers is different than the phase shift of the~~a~~ second carrier of the plurality of carriers, and

wherein the first and second phase shifts are determined using a pseudo-random number generator; and

transmitting, to a remote transceiver, at least one value associated with the pseudo-random number generator to enable the remote transceiver to determine the first and second phase shifts.

36. (Previously Presented) The media of claim 35, wherein the transceiver is a cable transceiver.

37. (Previously Presented) The media of claim 35, wherein the transceiver is a DSL transceiver.

38. (Previously Presented) The media of claim 35, wherein the transceiver is a wireless transceiver.

39. (Previously Presented) The media of claim 35, wherein the transceiver is for high speed internet access.

40. (Previously Presented) The media of claim 35, wherein the transceiver is for transporting video.

41. (Previously Presented) The media of claim 35, wherein the transceiver is a DSL transceiver connected to a pair of twisted wires of a telephone subscriber system.

REMARKS

Applicant respectfully requests reconsideration of this application as amended.

Claims 21-41 are pending.

Applicant would like to thank Ex. Joseph for the courtesies extended during the 7 November Personal Interview. During the Interview, a general overview of the claimed technology was presented and contrasted with Suzuki. Applicant presented arguments that Suzuki at least failed to teach, suggest or disclose the predetermined equation and that the phase shift is independent as recited in the claims. No agreement was reached.

Amended claim 21 recites: ...determining a first phase shift for a first carrier of the plurality of carriers;

determining a second phase shift for a second carrier of the plurality of carriers,

wherein the phase shift of the first carrier of the plurality of carriers is different than the phase shift of the second carrier of the plurality of carriers, and

wherein the first and second phase shifts are determined using a pseudo-random number generator; and

transmitting, to a remote transceiver, at least one value associated with the pseudo-random number generator to enable the remote transceiver to determine the first and second phase shifts.

Applicant respectfully submits Suzuki does not disclose this combination of features.

More specifically, Suzuki at least fails to teach, suggest or disclose wherein the phase shift of the first carrier of the plurality of carriers is different than the phase shift of the second carrier of the plurality of carriers, and

wherein the first and second phase shifts are determined using a pseudo-random number generator; and

transmitting, to a remote transceiver, at least one value associated with the pseudo-random number generator to enable the remote transceiver to determine the first and second phase shifts.

In contrast, in Suzuki, the phase shift amounts are fixed as shown in Fig. 6

At least based on the above, claim 21 is distinguishable from the reference. With comparable arguments applying to claims 28 and 25, Applicant respectfully submits all independent claims are distinguishable from the references.

Withdrawal of the rejection is respectfully requested.

The dependent claims are even further distinguishable at least based on the above and the additional feature(s) recited therein.

With all objections and rejections having been overcome, Applicant respectfully submits the application is in condition for allowance.

A prompt notice of allowance is respectfully solicited.

Should the Examiner believe anything further is desirable in order to place the application in even better condition for allowance, the Examiner is encouraged to contact Applicants undersigned representative at the telephone number listed below.

The Commissioner is hereby authorized to charge to deposit account number 19-1970 any fees under 37 CFR § 1.16 and 1.17 that may be required by this paper and to credit any overpayment to that Account. If any extension of time is required in connection with the filing of this paper and has not been separately requested, such extension is hereby petitioned.

Respectfully submitted,

SHERIDAN ROSS P.C.

Date: 12 Nov '10

By: _____

Jason H. Vick
Reg. No. 45,285
1560 Broadway, Suite 1200
Denver, Colorado 80202
Telephone: 303-863-9700

PTO/SB/22 (03-13)
Approved for use through 3/31/2013. OMB 0651-0031
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.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)	Docket Number (Optional) 6936-47-CON-DIV-CON-3
Application Number 13/718,016	Filed December 18, 2012
For SYSTEM AND METHOD FOR DESCRAMBLING THE PHASE OF CARRIERS IN A MULTICARRIER COMMUNICATIONS SYSTEM	
Art Unit 2633	Examiner JOSEPH, Jaison

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

		Fee	Small Entity Fee	Micro Entity Fee	
☐	One month (37 CFR 1.17(a)(1))	$200	$100	$50	$
☐	Two months (37 CFR 1.17(a)(2))	$600	$300	$150	$
☑	Three months (37 CFR 1.17(a)(3))	$1,400	$700	$350	$ 1400
☐	Four months (37 CFR 1.17(a)(4))	$2,200	$1,100	$550	$
☐	Five months (37 CFR 1.17(a)(5))	$3,000	$1,500	$750	$

☐ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☑ The Director has already been authorized to charge fees in this application to a Deposit Account.

☑ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 19-1970.

☑ Payment made via EFS-Web.

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.

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71. 37 CFR 3.73(b) statement is enclosed (Form PTO/SB/96).

☑ attorney or agent of record. Registration number 45,285.

☐ attorney or agent acting under 37 CFR 1.34. Registration number _____.

Signature	Date
Jason H. Vick	303-863-9700
Typed or printed name	Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.

☑ * Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.136(a). 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 6 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.

Electronic Patent Application Fee Transmittal	
Application Number:	13718016
Filing Date:	18-Dec-2012
Title of Invention:	SYSTEM AND METHOD FOR DESCRAMBLING THE PHASE OF CARRIERS IN A MULTICARRIER COMMUNICATIONS SYSTEM
First Named Inventor/Applicant Name:	Marcos C. Tzannes
Filer:	Jason Vick/Joanne Vos
Attorney Docket Number:	6936-47-CON-DIV-CON-3
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:				
Extension - 3 months with $0 paid	1253	1	1400	1400

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**1400**

Electronic Acknowledgement Receipt	
EFS ID:	17380762
Application Number:	13718016
International Application Number:	
Confirmation Number:	4520
Title of Invention:	SYSTEM AND METHOD FOR DESCRAMBLING THE PHASE OF CARRIERS IN A MULTICARRIER COMMUNICATIONS SYSTEM
First Named Inventor/Applicant Name:	Marcos C. Tzannes
Customer Number:	62574
Filer:	Jason Vick/Joanne Vos
Filer Authorized By:	Jason Vick
Attorney Docket Number:	6936-47-CON-DIV-CON-3
Receipt Date:	12-NOV-2013
Filing Date:	18-DEC-2012
Time Stamp:	16:32:32
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1400
RAM confirmation Number	4091
Deposit Account	191970
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 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		AMEND_01v2.pdf	1110800 77b4a32df9f3d2d8e1260a0e22e0b22ab05260e7	yes	9

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment/Req. Reconsideration-After Non-Final Reject	1	1
Specification	2	2
Claims	3	6
Applicant Arguments/Remarks Made in an Amendment	7	8
Extension of Time	9	9

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	30795 0bebaf88fdafe4d461e72b6bb82d979ff4e6b5f2	no	2

Warnings:

Information:

Total Files Size (in bytes):	1141595

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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/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 13/718,016	Filing Date 12/18/2012	☐ 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	11/12/2013	(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))	* 21	Minus	** 21	= 0	X $40 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $210 =	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
/RENEE COLLINS/

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.

Substitute for form 1449A/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/718,016
				Filing Date	December 18, 2012
				First Named Inventor	Marcos C. Tzannes
				Art Unit	2633
				Examiner Name	Joseph, Jaison
Sheet	1	of	1	Attorney Docket Number	6936-47-CON-DIV-CON-3

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-kind Code [2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee of Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1	5742679	04-21-1998	Olafsson	
	2	6781951	08-24-2004	Fifield	
	3	2002/0172146	11-21-2002	Wu et al.	

UNPUBLISHED U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-kind Code [2] (if known)	Filing Date MM-DD-YYYY	Name of Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]; Number[4]; Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

OTHER ART (Including Author, Title, Date, Pertinent Pages, etc.)		
Examiner Initials*	Cite No.[1]	
	4	Official Action for U.S. Patent Application No. 13/303,417, mailed July 5, 2013 (Attorney Ref. No. 6936-47-CON-5)

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference is considered, whether or not citation is in conformance and not considered. Include copy of this form with next communication to applicant.

Electronic Acknowledgement Receipt	
EFS ID:	16498640
Application Number:	13718016
International Application Number:	
Confirmation Number:	4520
Title of Invention:	SYSTEM AND METHOD FOR DESCRAMBLING THE PHASE OF CARRIERS IN A MULTICARRIER COMMUNICATIONS SYSTEM
First Named Inventor/Applicant Name:	Marcos C. Tzannes
Customer Number:	62574
Filer:	Jason Vick/Joanne Vos
Filer Authorized By:	Jason Vick
Attorney Docket Number:	6936-47-CON-DIV-CON-3
Receipt Date:	05-AUG-2013
Filing Date:	18-DEC-2012
Time Stamp:	13:32:13
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		IDS_02.pdf	352828 5b50c69140c06acd9860fa289607a613086806c3	yes	4

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	3
	Information Disclosure Statement (IDS) Form (SB08)	4	4

Warnings:					
Information:					
2	Non Patent Literature	6936-47-CON-5_OA_07-05-2013.pdf	491180 a2cf5393baf0258856f069821913d8b92003f448	no	14
Warnings:					
Information:					
		Total Files Size (in bytes):	844008		

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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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of: Marcos C. Tzannes	)	Group Art Unit: 2633
Serial No.: 13/718,016	)	Confirmation No.: 4520
Filed: December 18, 2012	)	Examiner: JOSEPH, Jaison
Atty. File No.: 6936-47-CON-DIV-CON-3	)	
Entitled: "System and Method for Descrambling the Phase of Carriers in a Multicarrier Communications System"	)	SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT
	)	Electronically Submitted

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

Dear Sir:

The references cited on attached Form PTO-1449 are being called to the attention of the Examiner.

☒ Copies of the cited non-patent and/or foreign references are enclosed herewith.

☐ Copies of the cited U.S. patents and/or patent applications are enclosed herewith.

☒ Copies of the cited U.S. patents/unpublished patent applications/patent application publications are not enclosed in accordance with 37 C.F.R. § 1.98(a).

☐ Copies of the cited references are not enclosed, in accordance with 37 C.F.R. § 1.98(d), because the references were cited by or submitted to the U.S. Patent and Trademark Office in prior application Serial No. _____ filed _____, which is relied upon for an earlier filing date under 35 U.S.C. § 120.

☐ To the best of applicants' belief, the pertinence of the foreign-language references are believed to be summarized in the attached English translation/abstracts and/or in the figures, although applicants do not necessarily vouch for the accuracy of the translation.

☐ Examiner's attention is drawn to the following related applications:

- Serial No. _____ filed _____(Attorney Ref. No. _____)

☐ Other:_____

Submission of the above information is not intended as an admission that any item is citable under the statutes or rules to support a rejection, that any item disclosed represents analogous art, or that those skilled in the art would refer to or recognize the pertinence of any reference without the benefit of hindsight, nor should an inference be drawn as to the pertinence of the references based on the order in which they are presented.

Submission of this statement should not be taken as an indication that a search has been conducted, or that no better art exists.

It is respectfully requested that the cited information be expressly considered during the prosecution of this application and the references made of record therein.

FEES

☐	**37 CFR 1.97(b)**: No fee is believed due in connection with this submission, because the information disclosure statement submitted herewith is satisfied by one of the following conditions ("X" indicates satisfaction): ☐ Within three months of the filing date of a national application other than a continued prosecution application under 37 CFR 1.53(d), or ☐ Within three months of the date of entry into the national stage of an international application as set forth in 37 CFR 1.491 or ☐ Before the mailing date of a first Office Action on the merits, or ☐ Before the mailing of a first Office action after the filing of a request for continued examination under 37 CFR 1.114. Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970.
☒	**37 CFR 1.97(c)**: The information disclosure statement transmitted herewith is being filed after all the above conditions (37 CFR 1.97(b)), but before the mailing date of one of the following conditions: (1) a final action under 37 C.F.R. 1.113 or (2) a notice of allowance under 37 C.F.R. 1.311, or (3) an action that otherwise closes prosecution in the application. This Information Disclosure Statement is accompanied by: ☒ A Certification (below) as specified by 37 C.F.R. 1.97(e). Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970. OR ☐ Please charge Deposit Account 19-1970 in the amount of $180.00 for the fee set forth in 37 C.F.R. 1.17(p) for submission of an information disclosure statement. Please credit any overpayment or charge any underpayment to Deposit Account 19-1970.
☐	**37 CFR 1.97(d)**: This Information Disclosure Statement is being submitted after the period specified in 37 CFR 1.97(c). ☐ This information Disclosure Statement includes a Certification (below) as specified by 37 C.F.R. 1.97(e) AND ☐ Applicants hereby requests consideration of the reference(s) disclosed herein. Please charge Deposit Account 19-1970 in the amount of $180.00 under 37 C.F.R. 1.17(p). Please credit any overpayment or charge any underpayment to Deposit Account 19-1970. Election to pay the fee should not be taken as an indication that applicant(s) cannot execute a certification.

Certification (37 C.F.R. 1.97(e))
(Applicable only if checked)

☒ The undersigned certifies that:

☐ Each item of information contained in this information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(1).

☐ A copy of the communication from the foreign patent office is enclosed.

OR

☒ No item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in this Information Disclosure Statement was known to any individual designated in 37 C.F.R. 1.56(c) more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(2).

Respectfully submitted,

SHERIDAN ROSS P.C.

By: _____

Jason H. Vick
Registration No. 45,285
1560 Broadway, Suite 1200
Denver, Colorado 80202-5141
(303) 863-9700

Date: 5/4/17

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/718,016	12/18/2012	Marcos C. Tzannes	6936-47-CON-DIV-CON-3

CONFIRMATION NO. 4520

62574
Jason H. Vick
Sheridan Ross, PC
Suite # 1200
1560 Broadway
Denver, CO 80202

PUBLICATION NOTICE

OC000000061593215

Title:SYSTEM AND METHOD FOR DESCRAMBLING THE PHASE OF CARRIERS IN A MULTICARRIER COMMUNICATIONS SYSTEM

Publication No.US-2013-0136160-A1
Publication Date:05/30/2013

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/718,016	12/18/2012	Marcos C. Tzannes	6936-47-CON-DIV-CON-3	4520

62574 7590 05/09/2013

Jason H. Vick
Sheridan Ross, PC
Suite # 1200
1560 Broadway
Denver, CO 80202

EXAMINER	
JOSEPH, JAISON	
ART UNIT	PAPER NUMBER
2633	

NOTIFICATION DATE	DELIVERY MODE
05/09/2013	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jvick@sheridanross.com

Office Action Summary	Application No. 13/718,016	Applicant(s) TZANNES ET AL.	
	Examiner JAISON JOSEPH	Art Unit 2633	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* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 *18 December 2012*.

☐ 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) *21-41* 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) *21-41* 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 _____ 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.

Interim copies:

a)☐ All b)☐ Some c)☐ None of the: Interim copies of the priority documents have been received.

Attachment(s)

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

2) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

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

4) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 21, 24, 28, 31, 35, and 38 are rejected under 35 U.S.C. 102(a and/or e) as being anticipated by Suzuki et al (US 5,903,614).

Regarding claim 21, Suzuki et al teach a method for adjusting a phase characteristic of a plurality of carriers in a multicarrier communications transceiver (see abstract) comprising: assigning, by the transceiver (column 2, lines 57-60), carrier numbers to the plurality of carriers; and assigning, by the transceiver, a phase shift to the plurality of carriers (see figure 6); wherein the phase shift is based on a predetermined equation that depends on the carrier number (see figure 6 and 7), wherein the phase shift is independent of any bit value carried by the plurality of carriers (see figure 6 and 7), and wherein the phase shift of a first carrier of the plurality of carriers is different than the phase shift of a second carrier of the plurality of carriers (see figure 6 and 7).

Regarding claim 24, which inherits the limitations of claim 21, Suzuki et al teach wherein the transceiver is a wireless transceiver (column 2, lines 57-60).

Regarding claim 28, Suzuki et al further teach a multicarrier communications transceiver capable of adjusting a phase characteristic of a plurality of carriers (column 2, lines 57-60), the transceiver capable of assigning carrier numbers to the plurality of carriers (see figure 6) and assigning a phase shift to the plurality of carriers wherein the phase shift is based on a predetermined equation that depends on the carrier number (see figure 6 and 7), the phase shift is independent of any bit value carried by the plurality of carriers (see figure 6 and 7), and wherein the phase Shift of a first carrier of the plurality of carriers is different than the phase shift of a second carrier of the plurality of carriers (see figure 6 and 7).

Regarding claim 31, which inherits the limitations of claim 28, Suzuki et al teach wherein the transceiver is a wireless transceiver (column 2, lines 57-60).

Regarding claim 35, Suzuki et al teach a non-transitory computer readable information storage media, having stored thereon instructions, that when executed by one or more processors, cause to be performed that perform a method for adjusting a phase characteristic of a plurality of carriers in a multicarrier communications transceiver comprising: assigning, by the transceiver, carrier numbers to the plurality of carriers (see figure 6); and assigning, by the transceiver, a phase shift to the plurality of carriers (see figure 6 and 7); wherein the phase shift is based on a predetermined equation that depends on the carrier number (see figure 6 and 7), wherein the phase shift is independent of any bit value carried by the plurality of carriers (see figure 6 and

7), and wherein the phase shift of a first carrier of the plurality of carriers is different than the phase shift of a second carrier of the plurality of carriers (see figure 6 and 7).

Regarding claim 38, which inherits the limitations of claim 35, Suzuki et al teach wherein the transceiver is a wireless transceiver (column 2, lines 57-60).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 22, 23, 25 – 27, 29, 30, 32 – 34, 36, 37, and 39 – 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al (US 5,903,614).

Regarding claims 22, 23, 25 – 27, 29, 30, 32 – 34, 36, 37, and 39 – 41, Suzuki et la does not expressly teach cable transceiver, DSL transceiver, for high speed internet access, for transporting video, or a DSL transceiver connected to a pair of twisted wires of a telephone subscriber system. However there is no criticality in these limitations. It is well known in the art that OFDM Applying Suzuki et al for the limitations are within the scope of one of ordinary skilled in the art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAISON JOSEPH whose telephone number is (571)272-6041. The examiner can normally be reached on M,TH, F 7 - 7:30 and S8 - 12.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sam K. Ahn can be reached on (571) 272-3044. 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.

/Jaison Joseph/
Primary Examiner, Art Unit 2633

Notice of References Cited	Application/Control No. 13/718,016	Applicant(s)/Patent Under Reexamination TZANNES ET AL.	
	Examiner JAISON JOSEPH	Art Unit 2633	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,903,614 A	05-1999	Suzuki et al.	375/340
*	B	US-5,914,932 A	06-1999	Suzuki et al.	370/203
*	C	US-6,590,860 B1	07-2003	Sakoda et al.	370/203
	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	
	W	
	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	0	13/718016	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/05/05 18:43
L2	8	09/710310	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/05/05 18:44
L3	18	"6590860"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/05/05 19:00
L4	642	phase adj2 shift near3 carrier same number	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/05/05 19:05
L5	43	phase adj2 shift near3 carrier near2 number	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/05/05 19:05

EAST Search History (Interference)

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CONFIRMATION NO. 4520

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
13/718,016	12/18/2012 RULE	375	2633	6936-47-CON-DIV-CON-3

APPLICANTS

Marcos C. Tzannes, Orinda, CA;
TQ DELTA, LLC, Austin, TX

**** CONTINUING DATA ***************************

This application is a CON of 13/439,605 04/04/2012 PAT 8355427
which is a CON of 13/284,549 10/28/2011 PAT 8218610
which is a CON of 11/860,080 09/24/2007 PAT 8073041
which is a DIV of 11/211,535 08/26/2005 PAT 7292627
which is a CON of 09/710,310 11/09/2000 PAT 6961369
which claims benefit of 60/164,134 11/09/1999

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

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **** ** SMALL ENTITY **
02/07/2013

Foreign Priority claimed	35 USC 119(a-d) conditions met	Verified and Acknowledged	Met after Allowance	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
☐ Yes ☑ No	☐ Yes ☑ No	/JAISON JOSEPH/ Examiner's Signature	☐ Initials	CA	1	21	3

ADDRESS

Jason H. Vick
Sheridan Ross, PC
Suite # 1200
1560 Broadway
Denver, CO 80202
UNITED STATES

TITLE

SYSTEM AND METHOD FOR Ddescrambling THE PHASE OF CARRIERS IN A MULTICARRIER COMMUNICATIONS SYSTEM

FILING FEE RECEIVED		
564	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
	13718016	TZANNES ET AL.
	Examiner	Art Unit
	JAISON JOSEPH	2633

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
375	222, 340, 341	5/5/2013	JJ

SEARCH NOTES		
Search Notes	Date	Examiner
Inventor name search	5/5/2013	JJ
East	5/5/2013	JJ

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

Substitute for form 1449A/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/718,016
				Filing Date	December 18, 2012
				First Named Inventor	Marcos C. Tzannes
				Art Unit	
				Examiner Name	WILLIAMS, Lawrence
Sheet	1	of	4	Attorney Docket Number	6936-47-CON-DIV-CON-3

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-kind Code [2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee of Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
/JJ/	1	3898566	08-05-1975	Switzer et al.	
/JJ/	2	3955141	05-01-1976	Lyon et al.	
/JJ/	3	4069392	01-17-1978	Goldenberg et al.	
/JJ/	4	4358853	11-09-1982	Qureshi	
/JJ/	5	4985900	01-01-1991	Rhind et al.	
/JJ/	6	5381449	01-10-1995	Jasper et al.	
/JJ/	7	5682376	10-28-1997	Hayashino et al.	
/JJ/	8	5694395	12-02-1997	Myer et al.	
/JJ/	9	5748677	05-01-1998	Kumar	
/JJ/	10	5870016	02-09-1999	Shrestha	
/JJ/	11	5937010	08-10-1999	Petranovich et al.	
/JJ/	12	5991262	11-23-1999	Laird et al.	
/JJ/	13	6128350	10-03-2000	Shastri et al.	
/JJ/	14	6256355	07-03-2001	Sakoda et al.	
/JJ/	15	6366555	04-02-2002	Gatherer et al.	
/JJ/	16	6507585	01-01-2003	Dobson	
/JJ/	17	6519292	02-11-2003	Sakoda et al.	
/JJ/	18	6590860	07-8-2003	Sakoda et al.	
/JJ/	19	6704317	03-01-2004	Dobson	
/JJ/	20	6757299	06-29-2004	Verma	
/JJ/	21	6961369	11-01-2005	Tzannes	
/JJ/	22	6967997	11-22-2005	Humphrey	
/JJ/	23	7257168	08-14-2007	Goldstein et al.	
/JJ/	24	7286614	10-23-2007	Goldstein et al.	
/JJ/	25	7292627	11-06-2007	Tzannes	
/JJ/	26	7471721	12-30-2008	Tzannes	
/JJ/	27	7610028	10-27-2009	Cimini, Jr. et al.	
/JJ/	28	7769104	08-03-2010	Tzannes	
/JJ/	29	8073041	12-06-2011	Tzannes	
/JJ/	30	8090008	01-03-2012	Tzannes	
/JJ/	31	8218610	07-10-2012	Tzannes	
/JJ/	32	2005/0141410	06-30-2005	Zhang et al.	
/JJ/	33	2006/0092902	05-04-2006	Schmidt	
/JJ/	34	2006/0140288	06-29-2006	Holden	

Examiner Signature	/Jaison Joseph/	Date Considered	05/05/2013

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Substitute for form 1449A/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	13/718,016
				Filing Date	December 18, 2012
				First Named Inventor	Marcos C. Tzannes
				Art Unit	
				Examiner Name	WILLIAMS, Lawrence
Sheet	2	of	4	Attorney Docket Number	6936-47-CON-DIV-CON-3

/JJ/	35	2010/0190507	07-29-2010	Karabinis et al	
/JJ/	36	2012/0069878	03-22-2012	Tzannes	
/JJ/	37	2012/0195353	08-02-2012	Tzannes	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]; Number[4]; Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
/JJ/	38	EP 0584534	03-02-1994	ALCATEL ITALIA		
/JJ/	39	EP 0719004	06-26-1996	MATSUSHITA ELECTRIC IND CO LTD		
/JJ/	40	GB 2330491	04-21-1999	BRITISH BROADCASTING CORP		
/JJ/	41	JP H10(1998)-084329	03-31-1998	NIPPON HOSO KYOKAI		(Translated Abstract and partial translation)
/JJ/	42	JP H08(1996)-321820	12-03-1996	MATSUSHITA ELECTRIC IND CO LTD		(Translated Abstract)
/JJ/	43	WO 98/32065	07-23-1998	FORTRESS TECHNOLOGIES INC		
/JJ/	44	WO 99/22463	05-06-1999	MOTOROLA INC		
/JJ/	45	WO 99/29078	06-10-1999	TELIA AB		

OTHER ART (Including Author, Title, Date, Pertinent Pages, etc.)

Examiner Initials*	Cite No.[1]	

Examiner Signature	/Jaison Joseph/	Date Considered	05/05/2013

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				Art Unit	
				Examiner Name	WILLIAMS, Lawrence
Sheet	3	of	4	Attorney Docket Number	6936-47-CON-DIV-CON-3

/JJ/	46	BÄUML et al., "Reducing The Peak-To-Average Power Ratio Of Multicarrier Modulation By Selected Mapping," Electronics Letters, GB, IEE Stevenage, Vol. 32(22), Oct. 24, 1996, pp. 2056-2057, XP000643915 ISSN: 0013-5194
/JJ/	47	HENKEL, "Analog Codes for Peak-to-Average Ratio Reduction," in Proceedings 3rd ITG Conf. Source and Channel Coding, Munich, Germany, Jan. 2000, 5 pages
/JJ/	48	NARAHASHI et al., "New phasing scheme of N multiple carriers for reducing peak-to-average power ratio," Electronics Letters, Aug. 1994, Vol. 30(17), pp. 1382-83
/JJ/	49	TELLADO et al., "Revisiting DMT's Peak-to-Average Ratio," Antwerp, Apr. 20-24, 1998, pp. 1-14
/JJ/	50	TELLAMBURA, "A coding technique for reducing peak-to-average power ratio in OFDM," In the Proceedings of Global Telecommunications Conference, IEEE, Nov. 1998, pp. 2783-2787
/JJ/	51	TELLAMBURA, "Phase optimisation criterion for reducing peak-to-average power ratio in OFDM," Electronics Letters, Jan. 1998, Vol. 34(2), pp. 169-170
/JJ/	52	VAN EETVELT et al., "Peak to average power reduction for OFDM schemes by selective scrambling," Electronics Letters, Oct. 1996, Vol. 32(21), pp. 1963-64
/JJ/	53	Invitation to Pay Additional Fees for International (PCT) Patent Application No. PCT/US00/30958, mailed March 23, 2001 (Attorney Ref. No. 6936-47-PCT)
/JJ/	54	Invitation to Restrict or to Pay Additional Fees for International (PCT) Patent Application No. PCT/US00/30958, mailed Nov. 14, 2001 (Attorney Ref. No. 6936-47-PCT)
/JJ/	55	Copy of Annex to Form PCT/ISA/206 for PCT/US00/30958, Mar. 23, 2001, 3 pages (6936-47-PCT)
/JJ/	56	International Search Report for International (PCT) Patent Application No. PCT/US00/30958, mailed Jun. 12, 2001 (Attorney Ref. No. 6936-47-PCT)
/JJ/	57	International Preliminary Examination Report for International (PCT) Patent Application No. PCT/US00/30958, completed March 4, 2002 (Attorney Ref. No. 6936-47-PCT)
/JJ/	58	Written Opinion for International (PCT) Patent Application No. PCT/US00/30958, mailed Dec. 18, 2001 (Attorney Ref. No. 6936-47-PCT)
/JJ/	59	Notification of Reasons for Refusal (including translation) for Japanese Patent Application No. 2001-537217, date of dispatch, Mar. 3, 2008 (Attorney Ref. No. 6936-47-PJP)
/JJ/	60	Decision of Refusal (including translation) for Japanese Patent Application No. 2001-537217, date of dispatch, Nov. 4, 2008 (Attorney Ref. No. 6936-47-PJP)
/JJ/	61	Notice of Preliminary Rejection (translation only) for Korean Patent Application No. 7005830/2002 dated Nov. 22, 2006 (Attorney Ref. No. 6936-47-PKR)

Examiner Signature	/Jaison Joseph/	Date Considered	05/05/2013

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				Filing Date	December 18, 2012
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				Art Unit	
				Examiner Name	WILLIAMS, Lawrence
Sheet	4	of	4	Attorney Docket Number	6936-47-CON-DIV-CON-3

/JJ/	62	Official Action for U.S. Patent Application No. 09/710,310, mailed May 4, 2004 (Attorney Ref. No. 6936-47)
/JJ/	63	Notice of Allowance for U.S. Patent Application No. 09/710,310, mailed Jul 5, 2005 (Attorney Ref. No. 6936-47)
/JJ/	64	Notice of Allowance for U.S. Patent Application No. 11/211,535, mailed Sep. 6, 2007 (Attorney Ref. No. 6936-47-CON)
/JJ/	65	Notice of Allowance for U.S. Patent Application No. 11/860,080, mailed Oct. 17, 2011 (Attorney Ref. No. 6936-47-CON-DIV)
/JJ/	66	Notice of Allowance for U.S. Patent Application No. 13/284,549, mailed March 20, 2012 (Attorney Ref. No. 6936-47-CON-DIV-CON)
/JJ/	67	Notice of Allowance for U.S. Patent Application No. 13/439,605, mailed Sept. 14, 2012 (Attorney Ref. No. 6936-47-CON-DIV-CON-2)
/JJ/	68	Official Action for U.S. Patent Application No. 11/863,581, mailed Feb. 6, 2008 (Attorney Ref. No. 6936-47-CON-2)
/JJ/	69	Notice of Allowance for U.S. Patent Application No. 11/863,581, mailed Oct. 8, 2008 (Attorney Ref. No. 6936-47-CON-2)
/JJ/	70	Official Action for U.S. Patent Application No. 12/255,713, mailed Oct. 15, 2009 (Attorney Ref. No. 6936-47-CON-3)
/JJ/	71	Notice of Allowance for U.S. Patent Application No. 12/255,713, mailed May 18, 2010 (Attorney Ref. No. 6936-47-CON-3)
/JJ/	72	Notice of Allowance for U.S. Patent Application No. 12/783,725, mailed Nov. 17, 2011 (Attorney Ref. No. 6936-47-CON-4)

Examiner Signature	/Jaison Joseph/	Date Considered	05/05/2013

*EXAMINER: Initial if reference is considered, whether or not citation is in conformance and not considered. Include copy of this form with next communication to applicant.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13718016	TZANNES ET AL.
	Examiner	Art Unit
	JAISON JOSEPH	2633

✓	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	05/05/2013								
	1	-								
	2	-								
	3	-								
	4	-								
	5	-								
	6	-								
	7	-								
	8	-								
	9	-								
	10	-								
	11	-								
	12	-								
	13	-								
	14	-								
	15	-								
	16	-								
	17	-								
	18	-								
	19	-								
	20	-								
	21	✓								
	22	✓								
	23	✓								
	24	✓								
	25	✓								
	26	✓								
	27	✓								
	28	✓								
	29	✓								
	30	✓								
	31	✓								
	32	✓								
	33	✓								
	34	✓								
	35	✓								
	36	✓								

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13718016	TZANNES ET AL.
	Examiner	**Art Unit**
	JAISON JOSEPH	2633

✓	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	05/05/2013								
	37	✓								
	38	✓								
	39	✓								
	40	✓								
	41	✓								

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of: Marcos C. Tzannes	)	Group Art Unit: 2631
Application No.: 13/718,016	)	Examiner:
Filed: December 18, 2012	)	Confirmation No.: 4520
Atty. File No.: 6936-47-CON-DIV-CON-3	)	

For: SYSTEM AND METHOD FOR DESCRAMBLING THE PHASE OF CARRIERS IN A MULTICARRIER COMMUNICATIONS SYSTEM

NOTIFICATION OF LOSS OF ENTITLEMENT OF SMALL ENTITY STATUS UNDER 37 CFR §§ 1.27 (g)(2) and 1.28(c)

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

Madam:

On December 18, 2012 Applicants filed the above referenced application and Asserted that the Applicant was entitled to Small Entity Status. Applicants filed the Assertion in good faith, and paid the fees associated with the application as a small entity in good faith. It was later discovered that the Applicant should not have been entitled to small entity status and the Assertion was established in error.

Pursuant to 37 CFR §§ 1.27(g)(2) and 1.28(c), Applicants are informing the Office that the referenced application is no longer entitled to Small Entity Status.

Furthermore, pursuant to 37 C.F.R. §1.28(c)(1)(2), on December 18, 2012, Applicants submitted a payment of $564 at the small entity rate for the following payments:

- Utility Filing Fee (Electronic Filing) – $98
- Utility Search Fee – $310
- Utility Examination Fee – $125
- 1 Claim in Excess of 20 – $31

The current fees for the referenced payments are listed below for a total of $1,680:

- Utility Filing Fee – $280
- Utility Search Fee – $600
- Utility Examination Fee – $720
- 1 Claim in Excess of 20 – $80

Therefore, the Commissioner is hereby authorized to charge to deposit account number 19-1970 **$1,116.00** for the deficiency owed.

The Commissioner is also hereby authorized to charge to deposit account number 19-1970 any fees under 37 CFR § 1.16 and 1.17 that may be required by this paper and to credit any overpayment to that Account.

Respectfully submitted,
SHERIDAN ROSS P.C.

Date: March 25, 2013

By: /Jason H. Vick/
Jason H. Vick
Reg. No. 45,285
1560 Broadway, Suite 1200
Denver, Colorado 80202
Telephone: 303-863-9700

Electronic Acknowledgement Receipt	
EFS ID:	15345983
Application Number:	13718016
International Application Number:	
Confirmation Number:	4520
Title of Invention:	SYSTEM AND METHOD FOR DESCRAMBLING THE PHASE OF CARRIERS IN A MULTICARRIER COMMUNICATIONS SYSTEM
First Named Inventor/Applicant Name:	Marcos C. Tzannes
Customer Number:	62574
Filer:	Jason Vick/Joanne Vos
Filer Authorized By:	Jason Vick
Attorney Docket Number:	6936-47-CON-DIV-CON-3
Receipt Date:	25-MAR-2013
Filing Date:	18-DEC-2012
Time Stamp:	16:22:09
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	Notification of loss of entitlement to small entity status	Loss_of_Entitlement_of_Small_Entity_Status.pdf	86372 b32f27ad6e582170d873d2722b10ff7539f409f8	no	2

Warnings:
Information:

Total Files Size (in bytes):	86372

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
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/718,016	12/18/2012	2631	564	6936-47-CON-DIV-CON-3	21	3

CONFIRMATION NO. 4520

62574
Jason H. Vick
Sheridan Ross, PC
Suite # 1200
1560 Broadway
Denver, CO 80202

FILING RECEIPT

OC000000059182999

Date Mailed: 02/21/2013

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)

Marcos C. Tzannes, Orinda, CA;

Applicant(s)

TQ DELTA, LLC, Austin, TX

Assignment For Published Patent Application

TQ DELTA, LLC, AUSTIN, TX

Power of Attorney: The patent practitioners associated with Customer Number 62574

Domestic Priority data as claimed by applicant

This application is a CON of 13/439,605 04/04/2012 PAT 8355427
which is a CON of 13/284,549 10/28/2011 PAT 8218610
which is a CON of 11/860,080 09/24/2007 PAT 8073041
which is a DIV of 11/211,535 08/26/2005 PAT 7292627
which is a CON of 09/710,310 11/09/2000 PAT 6961369
which claims benefit of 60/164,134 11/09/1999

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: 02/07/2013
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/718,016**
Projected Publication Date: 05/30/2013

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

SYSTEM AND METHOD FOR DESCRAMBLING THE PHASE OF CARRIERS IN A MULTICARRIER COMMUNICATIONS SYSTEM

Preliminary Class

375

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.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

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).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 13/718,016

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	98		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	310		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	125		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	21 minus 20 =	* 1	x 31 =	31	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	x 125 =	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	564		TOTAL	

APPLICATION AS AMENDED - PART II

		(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($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	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	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)	OR	RATE($)	ADDITIONAL FEE($)
AMENDMENT B	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.

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/718,016	12/18/2012	Marcos C. Tzannes	6936-47-CON-DIV-CON-3

CONFIRMATION NO. 4520

POA ACCEPTANCE LETTER

62574
Jason H. Vick
Sheridan Ross, PC
Suite # 1200
1560 Broadway
Denver, CO 80202

OC000000059182992

Date Mailed: 02/13/2013

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 12/18/2012.

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.

/hchristian/

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/718,016	12/18/2012	2631	564	6936-47-CON-DIV-CON-3	21	3

CONFIRMATION NO. 4520

62574
Jason H. Vick
Sheridan Ross, PC
Suite # 1200
1560 Broadway
Denver, CO 80202

FILING RECEIPT

OC000000059182999

Date Mailed: 02/13/2013

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Inventor(s)

Marcos C. Tzannes, Orinda, CA;

Applicant(s)

TQ DELTA, LLC, Austin, TX

Assignment For Published Patent Application

TQ DELTA, LLC, AUSTIN, TX

Power of Attorney: The patent practitioners associated with Customer Number 62574

Domestic Priority data as claimed by applicant

This application is a CON of 13/439,605 04/04/2012 PAT 8355427
which is a CON of 13/284,549 10/28/2011 PAT 8218610
which is a CON of 11/860,080 09/24/2007 PAT 8073041
which is a DIV of 11/211,535 08/26/2005 PAT 7292627
which is a CON of 09/710,310 11/09/2000 PAT 6961369
which claims benefit of 60/164,134 11/09/1999

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: 02/07/2013
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/718,016**
Projected Publication Date: Perfected

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

SYSTEM AND METHOD FOR DESCRAMBLING THE PHASE OF CARRIERS IN A MULTICARRIER COMMUNICATIONS SYSTEM

Preliminary Class

375

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

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LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

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This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 13/718,016

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	98		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	310		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	125		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	21 minus 20 =	* 1	x 31 =	31	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	x 125 =	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	564		TOTAL	

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	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	

* 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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of: Marcos C. Tzannes	)	Group Art Unit:
Application No.:	)	Examiner: WILLIAMS, Lawrence B.
Filed: Herewith	)	Confirmation No.:
Atty. File No.: 6936-47-CON-DIV-CON-3	)	

For: SYSTEM AND METHOD FOR DESCRAMBLING THE PHASE OF CARRIERS IN A MULTICARRIER COMMUNICATIONS SYSTEM

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

PRELIMINARY AMENDMENT

Dear Madam:

Prior to the initial review of the above-identified patent application by the Examiner, please enter the following Preliminary Amendment. Although Applicants do not believe that any fees are due based upon the filing of this Preliminary Amendment, please charge any such fees to Deposit Account 19-1970.

Please amend the above-identified patent application as follows:

Amendments to the Specification begin on page 2 of this paper.

Amendments to the Drawings begin on page 3 of this paper and include both an attached replacement sheet and an annotated sheet showing changes.

Amendments to the Claims are shown in the listing of claims which begin on page 4 of this paper.

Remarks begin on page 7 of this paper.

AMENDMENTS TO THE SPECIFICATION

Submitted herewith is a marked-up and clean version of a substitute specification. No new matter is believed to have been added therein.

AMENDMENTS TO THE DRAWINGS:

The attached drawing sheet(s) include(s) changes to Figure 1. This sheet, which includes Figure 1, replaces the originally submitted sheet.

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1.-20. (Cancelled)

21. (New) A method for adjusting a phase characteristic of a plurality of carriers in a multicarrier communications transceiver comprising:

assigning, by the transceiver, carrier numbers to the plurality of carriers; and

assigning, by the transceiver, a phase shift to the plurality of carriers;

wherein the phase shift is based on a predetermined equation that depends on the carrier number,

wherein the phase shift is independent of any bit value carried by the plurality of carriers, and

wherein the phase shift of a first carrier of the plurality of carriers is different than the phase shift of a second carrier of the plurality of carriers.

22. (New) The method of claim 21, wherein the transceiver is a cable transceiver.

23. (New) The method of claim 21, wherein the transceiver is a DSL transceiver.

24. (New) The method of claim 21, wherein the transceiver is a wireless transceiver.

25. (New) The method of claim 21, wherein the transceiver is for high speed internet access.

26. (New) The method of claim 21, wherein the transceiver is for transporting video.

27. (New) The method of claim 21, wherein the transceiver is a DSL transceiver connected to a pair of twisted wires of a telephone subscriber system.

28. (New) A multicarrier communications transceiver capable of adjusting a phase characteristic of a plurality of carriers, the transceiver capable of assigning carrier numbers to the plurality of carriers and assigning a phase shift to the plurality of carriers wherein the phase shift is based on a predetermined equation that depends on the carrier number, the phase shift is independent of any bit value carried by the plurality of carriers, and wherein the phase shift of a first carrier of the plurality of carriers is different than the phase shift of a second carrier of the plurality of carriers.

29. (New) The transceiver of claim 28, wherein the transceiver is a cable transceiver.

30. (New) The transceiver of claim 28, wherein the transceiver is a DSL transceiver.

31. (New) The transceiver of claim 28, wherein the transceiver is a wireless transceiver.

32. (New) The transceiver of claim 28, wherein the transceiver is for high speed internet access.

33. (New) The transceiver of claim 28, wherein the transceiver is for transporting video.

34. (New) The transceiver of claim 28, wherein the transceiver is a DSL transceiver connected to a pair of twisted wires of a telephone subscriber system.

35. (New) A non-transitory computer readable information storage media, having stored thereon instructions, that when executed by one or more processors, cause to be performed that perform a method for adjusting a phase characteristic of a plurality of carriers in a multicarrier communications transceiver comprising:

assigning, by the transceiver, carrier numbers to the plurality of carriers; and

assigning, by the transceiver, a phase shift to the plurality of carriers;

wherein the phase shift is based on a predetermined equation that depends on the carrier number,

wherein the phase shift is independent of any bit value carried by the plurality of carriers, and

wherein the phase shift of a first carrier of the plurality of carriers is different than the phase shift of a second carrier of the plurality of carriers.

36. (New) The media of claim 35, wherein the transceiver is a cable transceiver.

37. (New) The media of claim 35, wherein the transceiver is a DSL transceiver.

38. (New) The media of claim 35, wherein the transceiver is a wireless transceiver.

39. (New) The media of claim 35, wherein the transceiver is for high speed internet access.

40. (New) The media of claim 35, wherein the transceiver is for transporting video.

41. (New) The media of claim 35, wherein the transceiver is a DSL transceiver connected to a pair of twisted wires of a telephone subscriber system.

REMARKS/ARGUMENTS

By this amendment, claims 1-20 are canceled without prejudice or disclaimer and new claims 21-41 have been added.

Additionally, a substitute specification is provided herewith that amends the specification in the same manner as the patent application.

Applicant requests examination on the merits.

Applicant believes that the pending claims are in condition for allowance and such disposition is respectfully requested. In the event that a telephone conversation would further prosecution and/or expedite allowance, the Examiner is invited to contact the undersigned.

The Commissioner is hereby authorized to charge to Deposit Account No. 19-1970 any fees under 37 C.F.R. §§ 1.16 and 1.17 that may be required by this paper and to credit any overpayment to that Account. If any extension of time is required in connection with the filing of this paper and has not been separately requested, such extension is hereby Petitioned.

Respectfully submitted,

SHERIDAN ROSS P.C.

By: _____

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Date: 18 Dec. '12

A System and Method for Scrambling the Phase of the Carriers in a Multicarrier Communications System

Related Application

This application claims the benefit of the filing date of copending U.S. Provisional Application, Serial No. 60/164,134, filed November 9, 1999, entitled "A Method For Randomizing The Phase Of The Carriers In A Multicarrier Communications System To Reduce The Peak To Average Power Ratio Of The Transmitted Signal," the entirety of which provisional application is incorporated by reference herein.

Field of the Invention

This invention relates to communications systems using multicarrier modulation. More particularly, the invention relates to multicarrier communications systems that lower the peak-to-average power ratio (PAR) of transmitted signals.

Background of the Invention

In a conventional multicarrier communications system, transmitters communicate over a communication channel using multicarrier modulation or Discrete Multitone Modulation (DMT). Carrier signals (carriers) or sub-channels spaced within a usable frequency band of the communication channel are modulated at a symbol (i.e., block) transmission rate of the system. An input signal, which includes input data bits, is sent to a DMT transmitter, such as a DMT modem. The DMT transmitter typically modulates the phase characteristic, or phase, and amplitude of the

carrier signals using an Inverse Fast Fourier Transform (IFFT) to generate a time domain signal, or transmission signal, that represents the input signal. The DMT transmitter transmits the transmission signal, which is a linear combination of the multiple carriers, to a DMT receiver over the communication channel.

The phase and amplitude of the carrier signals of DMT transmission signal can be considered random because the phase and amplitude result from the modulation of an arbitrary sequence of input data bits comprising the transmitted information. Therefore, under the condition that the modulated data bit stream is random, the DMT transmission signal can be approximated as having a Gaussian probability distribution. A bit scrambler is often used in the DMT transmitter to scramble the input data bits before the bits are modulated to assure that the transmitted data bits are random and, consequently, that the modulation of those bits produces a DMT transmission signal with a Gaussian probability distribution.

With an appropriate allocation of transmit power levels to the carriers or sub-channels, such a system provides a desirable performance. Further, generating a transmission signal with a Gaussian probability distribution is important in order to transmit a transmission signal with a low peak-to-average ratio (PAR), or peak-to-average power ratio. The PAR of a transmission signal is the ratio of the instantaneous peak value (i.e., maximum magnitude) of a signal parameter (e.g., voltage, current, phase, frequency, power) to the time-averaged value of the signal parameter. In DMT systems, the PAR of the transmitted signal is determined by the probability of the random transmission signal reaching a certain peak voltage during the time interval required for a certain number of symbols. An example of the PAR of a transmission signal transmitted from a DMT transmitter is 14.5 dB, which is equivalent to having a 1E-7 probability of clipping. The PAR of a

transmission signal transmitted and received in a DMT communication system is an important consideration in the design of the DMT communication system because the PAR of a signal affects the communication system's total power consumption and component linearity requirements of the system.

If the phase of the modulated carriers is not random, then the PAR can increase greatly. Examples of cases where the phases of the modulated carrier signals are not random are when bit scramblers are not used, multiple carrier signals are used to modulate the same input data bits, and the constellation maps, which are mappings of input data bits to the phase of a carrier signal, used for modulation are not random enough (i.e., a zero value for a data bit corresponds to a 90 degree phase characteristic of the DMT carrier signal and a one value for a data bit corresponds to a –90 degree phase characteristic of the DMT carrier signal). An increased PAR can result in a system with high power consumption and/or with high probability of clipping the transmission signal. Thus, there remains a need for a system and method that can effectively scramble the phase of the modulated carrier signals in order to provide a low PAR for the transmission signal.

Summary of the Invention

The present invention features a system and method that scrambles the phase characteristics of the modulated carrier signals in a transmission signal. In one aspect, a value is associated with each carrier signal. A phase shift is computed for each carrier signal based on the value associated with that carrier signal. The value is determined independently of any input bit value carried by that carrier signal. The phase shift computed for each carrier signal is combined with the phase characteristic of that carrier signal to substantially scramble the phase characteristics of the carrier signals.

In one embodiment, the input bit stream is modulated onto the carrier signals having the substantially scrambled phase characteristic to produce a transmission signal with a reduced peak-to-average power ratio (PAR). The value is derived from a predetermined parameter, such as a random number generator, a carrier number, a DMT symbol count, a superframe count, and a hyperframe count. In another embodiment, a predetermined transmission signal is transmitted when the amplitude of the transmission signal exceeds a certain level.

In another aspect, the invention features a method wherein a value is associated with each carrier signal. The value is determined independently of any input bit value carried by that carrier signal. A phase shift for each carrier signal is computed based on the value associated with that carrier signal. The transmission signal is demodulated using the phase shift computed for each carrier signal.

In another aspect, the invention features a system comprising a phase scrambler that computes a phase shift for each carrier signal based on a value associated with that carrier signal. The phase scrambler also combines the phase shift computed for each carrier signal with the phase characteristic of that carrier signal to substantially scramble the phase characteristic of the carrier signals. In one embodiment, a modulator, in communication with the phase scrambler, modulates bits of an input signal onto the carrier signals having the substantially scrambled phase characteristics to produce a transmission signal with a reduced PAR.

Description of the Drawings

The invention is pointed out with particularity in the appended claims. The advantages of the invention described above, as well as further advantages of the invention, may be better understood

by reference to the following description taken in conjunction with the accompanying drawings, in which:

Fig. 1 is a block diagram of an embodiment of a digital subscriber line communications system including a DMT (discrete multitone modulation) transceiver, in communication with a remote transceiver, having a phase scrambler for substantially scrambling the phase characteristics of carrier signals; and

Fig. 2 is a flow diagram of an embodiment of a process for scrambling the phase characteristics of the carrier signals in a transmission signal.

Detailed Description

Fig. 1 shows a digital subscriber line (DSL) communication system 2 including a discrete multitone (DMT) transceiver 10 in communication with a remote transceiver 14 over a communication channel 18 using a transmission signal 38 having a plurality of carrier signals. The DMT transceiver 10 includes a DMT transmitter 22 and a DMT receiver 26. The remote transceiver 14 includes a transmitter 30 and a receiver 34. Although described with respect to discrete multitone modulation, the principles of the invention apply also to other types of multicarrier modulation, such as, but not limited to, orthogonally multiplexed quadrature amplitude modulation (OQAM), discrete wavelet multitone (DWMT) modulation, and orthogonal frequency division multiplexing (OFDM).

The communication channel 18 provides a downstream transmission path from the DMT transmitter 22 to the remote receiver 34, and an upstream transmission path from the remote transmitter 30 to the DMT receiver 26. In one embodiment, the communication channel 18 is a pair of twisted wires of a telephone subscriber line. In other embodiments, the communication channel 18 can be a fiber optic wire, a quad cable, consisting of two pairs of twisted wires, or a quad cable

that is one of a star quad cable, a Dieselhorst-Martin quad cable, and the like. In a wireless communication system wherein the transceivers 10, 14 are wireless modems, the communication channel 18 is the air through which the transmission signal 38 travels between the transceivers 10, 14.

By way of example, the DMT transmitter 22 shown in Fig. 1 includes a quadrature amplitude modulation (QAM) encoder 42, a modulator 46, a bit allocation table (BAT) 44, and a phase scrambler 66. The DMT transmitter 22 can also include a bit scrambler 74, as described further below. The remote transmitter 30 of the remote transceiver 14 comprises equivalent components as the DMT transmitter 22. Although this embodiment specifies a detailed description of the DMT transmitter 22, the inventive concepts apply also to the receivers 34, 36 which have similar components to that of the DMT transmitter 22, but perform inverse functions in a reverse order.

The QAM encoder 42 has a single input for receiving an input serial data bit stream 54 and multiple parallel outputs to transmit QAM symbols 58 generated by the QAM encoder 42 from the bit stream 54. In general, the QAM encoder 42 maps the input serial bit-stream 54 in the time domain into parallel QAM symbols 58 in the frequency domain. In particular, the QAM encoder 42 maps the input serial data bit stream 54 into N parallel quadrature amplitude modulation (QAM) constellation points 58, or QAM symbols 58, where N represents the number of carrier signals generated by the modulator 46. The BAT 44 is in communication with the QAM encoder 42 to specify the number of bits carried by each carrier signal. The QAM symbols 58 represent the amplitude and the phase characteristic of each carrier signal.

The modulator 46 provides functionality associated with the DMT modulation and transforms the QAM symbols 58 into DMT symbols 70 each comprised of a plurality of time-

domain samples. The modulator 46 modulates each carrier signal with a different QAM symbol 58. As a result of this modulation, carrier signals have phase and amplitude characteristics based on the QAM symbol 58 and therefore based on the input-bit stream 54. In particular, the modulator 46 uses an inverse fast Fourier transform (IFFT) to change the QAM symbols 58 into a transmission signal 38 comprised of a sequence of DMT symbols 70. The modulator 46 changes the QAM symbols 58 into DMT symbols 70 through modulation of the carrier signals. In another embodiment, the modulator 46 uses the inverse discrete Fourier transform (IDFT) to change the QAM symbols 58 into DMT symbols 70. In one embodiment, a pilot tone is included in the transmission signal 38 to provide a reference signal for coherent demodulation of the carrier signals in the remote receiver 34 during reception of the transmission signal 38.

The modulator 46 also includes a phase scrambler 66 that combines a phase shift computed for each QAM-modulated carrier signal with the phase characteristic of that carrier signal. Combining phase shifts with phase characteristics, in accordance with the principles of the invention, substantially scrambles the phase characteristics of the carrier signals in the transmission signal 38. By scrambling the phase characteristics of the carrier signals, the resulting transmission signal 38 has a substantially minimized peak-to-average (PAR) power ratio. The phase scrambler 66 can be part of or external to the modulator 46. Other embodiments of the phase scrambler 66 include, but are not limited to, a software program that is stored in local memory and is executed on the modulator 46, a digital signal processor (DSP) capable of performing mathematical functions and algorithms, and the like. The remote receiver 34 similarly includes a phase scrambler 66' for use when demodulating carrier signals that have had their phase characteristics adjusted by the phase scrambler 66 of the DMT transceiver 10.

To compute a phase shift for each carrier signal, the phase scrambler 66 associates one or more values with that carrier signal. The phase scrambler 66 determines each value for a carrier signal independently of the QAM symbols 58, and, therefore, independently of the bit value(s) modulated onto the carrier signal. The actual value(s) that the phase scrambler 66 associates with each carrier signal can be derived from one or more predefined parameters, such as a pseudo-random number generator (pseudo-RNG), a DMT carrier number, a DMT symbol count, a DMT superframe count, a DMT hyperframe count, and the like, as described in more detail below. Irrespective of the technique used to produce each value, the same technique is used by the DMT transmitter 22 and the remote receiver 34 so that the value associated with a given carrier signal is known at both ends of the communication channel 18.

The phase scrambler 66 then solves a predetermined equation to compute a phase shift for the carrier signal, using the value(s) associated with that carrier signal as input that effects the output of the equation. Any equation suitable for computing phase shifts can be used to compute the phase shifts. When the equation is independent of the bit values of the input serial bit stream 54, the computed phase shifts are also independent of such bit values.

In one embodiment (shown in phantom), the DMT transmitter 22 includes a bit scrambler 74, which receives the input serial bit stream 54 and outputs data bits 76 that are substantially scrambled. The substantially scrambled bits 76 are then passed to the QAM encoder 42. When the bit scrambler 74 is included in the DMT transmitter 22, the operation of the phase scrambler 66 further assures that the transmission signal 38 has a Gaussian probability distribution and, therefore, a substantially minimized PAR.

Fig. 2 shows embodiments of a process used by the DMT transmitter 22 for adjusting the phase characteristic of each carrier signal and combining these carrier signals to produce the transmission signal 38. The DMT transmitter 22 generates (step 100) a value that is associated with a carrier signal. Because the value is being used to alter the phase characteristics of the carrier signal, both the DMT transmitter 22 and the remote receiver 34 must recognize the value as being associated with the carrier signal. Either the DMT transmitter 22 and the remote receiver 34 independently derive the associated value, or one informs the other of the associated value. For example, in one embodiment the DMT transmitter 22 can derive the value from a pseudo-RNG and then transmit the generated value to the remote receiver 34. In another embodiment, the remote receiver 34 similarly derives the value from the same pseudo-RNG and the same seed as used by the transmitter (i.e., the transmitter pseudo-RNG produces the same series of random numbers as the receiver pseudo-RNG).

As another example, the DMT transmitter 22 and the remote receiver 34 can each maintain a symbol counter for counting DMT symbols. The DMT transmitter 22 increments its symbol counter upon transmitting a DMT symbol; the remote receiver 34 upon receipt. Thus, when the DMT transmitter 22 and the remote receiver 34 both use the symbol count as a value for computing phase shifts, both the DMT transmitter 22 and remote receiver 34 "know" that the value is associated with a particular DMT symbol and with each carrier signal of that DMT symbol.

Values can also be derived from other types of predefined parameters. For example, if the predefined parameter is the DMT carrier number, then the value associated with a particular carrier signal is the carrier number of that signal within the DMT symbol. The number of a carrier signal represents the location of the frequency of the carrier signal relative to the frequency of other carrier

signals within a DMT symbol. For example, in one embodiment the DSL communication system 2 provides 256 carrier signals, each separated by a frequency of 4.3125 kHz and spanning the frequency bandwidth from 0 kHz to 1104 kHz. The DMT transmitter 22 numbers the carrier signals from 0 to 255. Therefore, "DMT carrier number 50" represents the 51st DMT carrier signal which is located at the frequency of 215.625 kHz (i.e., 51 x 4.3125 kHz).

Again, the DMT transmitter 22 and the remote receiver 34 can know the value that is associated with the carrier signal because both the DMT transmitter 22 and the remote receiver 34 use the same predefined parameter (here, the DMT carrier number) to make the value-carrier signal association. In other embodiments (as exemplified above with the transmitter pseudo-RNG), the DMT transmitter 22 can transmit the value to the remote receiver 34 (or vice versa) over the communication channel 18.

In other embodiments, other predefined parameters can be used in conjunction with the symbol count. One example of such a predefined parameter is the superframe count that increments by one every 69 DMT symbols. One exemplary implementation that achieves the superframe counter is to perform a modulo 68 operation on the symbol count. As another example, the DMT transmitter 22 can maintain a hyperframe counter for counting hyperframes. An exemplary implementation of the hyperframe count is to perform a modulo 255 operation on the superframe count. Thus, the hyperframe count increments by one each time the superframe count reaches 255.

Accordingly, it is seen that some predefined parameters produce values that vary from carrier signal to carrier signal. For example, when the predefined parameter is the DMT carrier number, values vary based on the frequency of the carrier signal. As another example, the pseudo-RNG generates a new random value for each carrier signal.

Other predefined parameters produce values that vary from DMT symbol 70 to DMT symbol 70. For example, when the predefined parameter is the symbol count, the superframe count, or hyperframe count, values vary based on the numerical position of the DMT symbol 70 within a sequence of symbols, superframes, or hyperframes. Predefined parameters such as the pseudo-RNG, symbol count, superframe count, and superframe can also be understood to be parameters that vary values over time. Any one or combination of the predefined parameters can provide values for input to the equation that computes a phase shift for a given carrier signal.

In one embodiment, the phase scrambling is used to avoid clipping of the transmission signal 38 on a DMT symbol 70 by DMT symbol 70 basis. In this embodiment, the DMT transmitter 22 uses a value based on a predefined parameter that varies over time, such as the symbol count, to compute the phase shift. It is to be understood that other types of predefined parameters that vary the values associated with carrier signals can be used to practice the principles of the invention. As described above, the transceivers 10, 14 may communicate (step 110) the values to synchronize their use in modulating and demodulating the carrier signals.

The DMT transmitter 22 then computes (step 115) the phase shift that is used to adjust the phase characteristic of each carrier signal. The amount of the phase shift combined with the phase characteristic of each QAM-modulated carrier signal depends upon the equation used and the one or more values associated with that carrier signal.

The DMT transmitter 22 then combines (step 120) the phase shift computed for each carrier signal with the phase characteristic of that carrier signal. By scrambling the phase characteristics of the carrier signals, the phase scrambler 66 reduces (with respect to unscrambled phase characteristics) the combined PAR of the plurality of carrier signals and, consequently, the

transmission signal 38. The following three phase shifting examples, PS #1 – PS #3, illustrate methods used by the phase scrambler 66 to combine a computed phase shift to the phase characteristic of each carrier signal.

Phase Shifting Example #1

Phase shifting example #1 (PS #1) corresponds to adjusting the phase characteristic of the QAM-modulated carrier signal associated with a carrier number N by $N \times \frac{\pi}{3}$, modulo (mod) 2π. In this example, a carrier signal having a carrier number N equal to 50 has a phase shift added to the phase characteristic of that carrier signal equal to $50 \times \frac{\pi}{3} (\mathrm{mod}\, 2\pi) = \frac{2}{3}\pi$. The carrier signal with a carrier number N equal to 51 has a phase shift added to the phase characteristic of that carrier signal equal to $51 \times \frac{\pi}{3} (\mathrm{mod}\, 2\pi) = \pi$. The carrier signal with a carrier number N equal to 0 has no phase shift added to the phase characteristic of that carrier signal.

Phase Shifting Example #2

Phase shifting example #2 (PS #2) corresponds to adjusting the phase characteristic of the QAM-modulated carrier signal associated with a carrier number N by $(N + M) \times \frac{\pi}{4}$, mod 2π, where M is the symbol count. In this example, a carrier signal having a carrier number N equal to 50 on DMT symbol count M equal to 8 has a phase shift added to the phase characteristic of that carrier signal equal to $(50 + 8) \times \frac{\pi}{4} (\mathrm{mod}\, 2\pi) = \frac{\pi}{2}$. The carrier signal with the same carrier number N equal to 50 on the next DMT symbol count M equal to 9 has a phase shift added to the phase characteristic of that carrier signal equal to $(50 + 9) \times \frac{\pi}{4} (\mathrm{mod}\, 2\pi) = \frac{3\pi}{4}$.

Phase Shifting Example #3

Phase shifting example #3 (PS #3) corresponds to adjusting the phase characteristic of the QAM-modulated carrier signal associated with a carrier number N by $(X_N)\times\frac{\pi}{6}$, mod 2π, where X_N is an array of N pseudo-random numbers. In this example, a carrier signal having a carrier number N equal to 5 and X_N equal to [3, 8, 1, 4, 9, 5, ...] has a phase shift added to the phase characteristic of the carrier signal that is equal to $(9)\times\frac{\pi}{6}(\text{mod}\,2\pi)=\frac{\pi}{3}$. (Note that 9 is the 5th value in X_N.) The carrier signal with a carrier number N equal to 6 has a phase shift added to the phase characteristic of the carrier signal equal to $(5)\times\frac{\pi}{6}(\text{mod}\,2\pi)=\frac{5\pi}{3}$.

It is to be understood that additional and/or different phase shifting techniques can be used by the phase scrambler 66, and that PS #1, #2, and #3 are merely illustrative examples of the principles of the invention. The DMT transmitter 22 then combines (step 130) the carrier signals to form the transmission signal 38. If the transmission signal is not clipped, as described below, the DMT transmitter 22 consequently transmits (step 160) the transmission signal 38 to the remote receiver 34.

Clipping of Transmission Signals

A transmission signal 38 that has high peak values of voltage (i.e., a high PAR) can induce non-linear distortion in the DMT transmitter 22 and the communication channel 18. One form of this non-linear distortion of the transmission signal 38 that may occur is the limitation of the amplitude of the transmission signal 38 (i.e., clipping). For example, a particular DMT symbol 70 clips in the time domain when one or more time domain samples in that DMT symbol 70 are larger than the maximum allowed digital value for the DMT symbols 70. In multicarrier communication

systems when clipping occurs, the transmission signal 38 does not accurately represent the input serial data bit signal 54.

In one embodiment, the DSL communication system 2 avoids the clipping of the transmission signal 38 on a DMT symbol 70 by DMT symbol 70 basis. The DMT transmitter 22 detects (step 140) the clipping of the transmission signal 38. If a particular DMT symbol 70 clips in the time domain to produce a clipped transmission signal 38, the DMT transmitter 22 substitutes (step 150) a predefined transmission signal 78 for the clipped transmission signal 38.

The predefined transmission signal 78 has the same duration as a DMT symbol 70 (e.g., 250 ms) in order to maintain symbol timing between the DMT transmitter 22 and the remote receiver 34. The predefined transmission signal 78 is not based on (i.e., independent of) the modulated input data bit stream 54; it is a bit value pattern that is recognized by the remote receiver 34 as a substituted signal. In one embodiment, the predefined transmission signal 78 is a known pseudo-random sequence pattern that is easily detected by the remote receiver 34. In another embodiment, the predefined transmission signal 78 is an "all zeros" signal, which is a zero voltage signal produced at the DMT transmitter 22 output (i.e., zero volts modulated on all the carrier signals). In addition to easy detection by the remote receiver 34, the zero voltage signal reduces the power consumption of the DMT transmitter 22 when delivered by the DMT transmitter 22. Further, a pilot tone is included in the predefined transmission signal 78 to provide a reference signal for coherent demodulation of the carrier signals in the remote receiver 34 during reception of the predefined transmission signal 78.

After the remote receiver 34 receives the transmission signal 38, the remote receiver 34 determines if the transmission signal 38 is equivalent to the predefined transmission signal 78. In

one embodiment, when the remote receiver 34 identifies the predefined transmission signal 78, the remote receiver 34 ignores (i.e., discards) the predefined transmission signal 78.

Following the transmission of the predefined transmission signal 78, the phase scrambler 66 shifts (step 120) the phase characteristic of the QAM-modulated carrier signals (based on one of the predefined parameters that varies over time). For example, consider that a set of QAM symbols 58 produces a DMT symbol 70 comprising a plurality of time domain samples, and that one of the time domain samples is larger than the maximum allowed digital value for the DMT symbol 70. Therefore, because the transmission signal 38 would be clipped when sent to the remote receiver 34, the DMT transmitter 22 sends the predefined transmission signal 78 instead.

After transmission of the predefined transmission signal 78, the DMT transmitter 22 again attempts to send the same bit values that produced the clipped transmission signal 38 in a subsequent DMT symbol 70'. Because the generation of phase shifts in this embodiment is based on values that vary over time, the phase shifts computed for the subsequent DMT symbol 70' are different than those that were previously computed for the DMT symbol 70 with the clipped time domain sample. These different phase shifts are combined to the phase characteristics of the modulated carrier signals to produce carrier signals of the subsequent DMT symbol 70' with different phase characteristics than the carrier signals of the DMT symbol 70 with the clipped time domain sample.

DMT communication systems 2 infrequently produce transmission signals 38 that clip (e.g., approximately one clip every 10^7 time domain samples 70). However, if the subsequent DMT symbol 70' includes a time domain sample that clips, then the predefined transmission signal 78 is again transmitted (step 150) to the remote receiver 34 instead of the clipped transmission signal 38. The clipping time domain sample may be on the same or on a different carrier signal than the

previously clipped DMT symbol 70. The DMT transmitter 22 repeats the transmission of the predefined transmission signal 78 until the DMT transmitter 22 produces a subsequent DMT symbol 70' that is not clipped. When the DMT transmitter 22 produces a DMT symbol 70' that is not clipped, the DTM transmitter 22 transmits (step 160) the transmission signal 38 to the remote receiver 34. The probability of a DMT symbol 70 producing a transmission signal 38 that clips in the time domain depends on the PAR of the transmission signal 38.

For example, the following phase shifting example, PST #4, illustrates the method used by the phase scrambler 66 to combine a different phase shift to the phase characteristic of each carrier signal to avoid the clipping of the transmission signal 38.

Phase Shifting Example #4

Phase shifting example #4 (PS #4) corresponds to adjusting the phase characteristic of the carrier signal associated with a carrier number N by $\frac{\pi}{3} \times (M + N)$, mod 2π, where M is the DMT symbol count. In this example, if the DMT symbol 70 clips when the DMT symbol count M equals 5, the predefined transmission signal 78 is transmitted instead of the current clipped transmission signal 38. On the following DMT symbol period, the DMT count M equals 6, thereby causing a different set of time domain samples to be generated for the subsequent DMT symbol 70', although the QAM symbols 58 used to produce both DMT symbols 70, 70' are the same.

If this different set of time domain samples (and consequently the transmission signal 38) is not clipped, the DMT transmitter 22 sends the transmission signal 38. If one of the time domain samples in the different set of time domain samples 70 (and consequently the transmission signal 38) is clipped, then the DMT transmitter 22 sends the predefined transmission signal 78 again. The process continues until a DMT symbol 70 is produced without a time domain sample 70 that is

clipped. In one embodiment, the transmitter 22 stops attempting to produce a non-clipped DMT symbol 70' for the particular set of QAM symbols 58 after generating a predetermined number of clipped DMT symbols 70'. At that moment, the transmitter 22 can transmit the most recently produced clipped DMT symbol 70' or the predetermined transmission signal 78.

The PAR of the DSL communication system 2 is reduced because the predefined transmission signal 78 is sent instead of the transmission signal 38 when the DMT symbol 70 clips. For example, a DMT communication system 2 that normally has a clipping probability of 10^{-7} for the time domain transmission signal 38 can therefore operate with a 10^{-5} probability of clipping and a lower PAR equal to 12.8 dB (as compared to 14.5 dB). When operating at a 10^{-5} probability of clipping, assuming a DMT symbol 70 has 512 time-domain samples 70, the DMT transmitter 22 experiences one clipped DMT symbol 70 out of every $\frac{10^5}{512}$, or 195 DMT symbols 70. This results in the predefined (non-data carrying) transmission signal 78 being transmitted, on average, once every 195 DMT symbols. Although increasing the probability of clipping to 10^{-5} results in approximately a 0.5% (1/195) decrease in throughput, the PAR of the transmission signal 38 is reduced by 1.7 dB, which reduces transmitter complexity in the form of power consumption and component linearity.

While the invention has been shown and described with reference to specific preferred embodiments, it should be understood by those skilled in the art that various changes in form and detail may be made therein without departing from the spirit and scope of the invention as defined by the following claims. For example, although the specification uses DSL to describe the invention, it is to be understood that various form of DSL can be used, e.g., ADSL, VDSL, SDSL, HDSL, HDSL2, or SHDSL. It is also to be understood that the principles of the invention apply to

various types of applications transported over DSL systems (e.g., telecommuting, video conferencing, high speed Internet access, video-on demand).

What is Claimed:

1. In a multicarrier modulation system including a first transceiver in communication with a second transceiver using a transmission signal having a plurality of carrier signals for modulating an input bit stream, each carrier signal having a phase characteristic associated with the input bit stream, a method for scrambling the phase characteristics of the carrier signals comprising:

associating each carrier signal with a value determined independently of any input bit value carried by that carrier signal;

computing a phase shift for each carrier signal based on the value associated with that carrier signal; and

combining the phase shift computed for each carrier signal with the phase characteristic of that carrier signal so as to substantially scramble the phase characteristics of the plurality of carrier signals.

2. The method of claim 1 further comprising modulating bits of the input bit stream onto the carrier signals having the substantially scrambled phase characteristics to produce a transmission signal with a reduced peak-to-average power ratio (PAR).

3. The method of claim 1 further comprising independently deriving the value associated with each carrier signal at each transceiver.

4. The method of claim 1 further comprising transmitting the value associated with each carrier signal from one transceiver to the other transceiver.

5. The method of claim 1 further comprising maintaining synchronization between the transceivers using the value associated with each carrier signal.

6. The method of claim 1 wherein the value varies with each carrier signal.

7. The method of claim 1 wherein the value varies with each DMT symbol.

8. The method of claim 1 wherein the value is derived from a predetermined parameter.

9. The method of claim 8 wherein the predefined parameter is a carrier number.

10. The method of claim 8 wherein the predefined parameter is a symbol count.

11. The method of claim 8 wherein the predefined parameter is a hyperframe count.

12. The method of claim 8 wherein the predefined parameter is a superframe count.

13. The method of claim 1 further comprising scrambling the bits of the input bit stream.

14. The method of claim 1 further comprising transmitting a predetermined transmission signal when the amplitude of the transmission signal exceeds a certain level.

15. The method of claim 14 wherein the predetermined transmission signal comprises a predetermined pattern of bits.

16. The method of claim 14 wherein the predetermined transmission signal comprises a pilot tone.

17. The method of claim 16 wherein the pilot tone is used to maintain timing synchronization between the first transceiver and the second transceiver.

18. The method of claim 15 wherein each bit value in the predetermined pattern of bits is a zero valuc.

19. The method of claim 15 wherein the predetermined pattern of bits is a pseudo-random sequence pattern.

20. In a multicarrier modulation system including a first transceiver in communication with a second transceiver using a transmission signal having a plurality of carrier signals for modulating an input bit stream, each carrier signal having a phase characteristic with the input bit stream, a method for scrambling the phase characteristics of the carrier signals comprising:

associating each carrier signal with a value determined independently of any input bit value carricd by that carrier signal;

computing a phase shift for each carrier signal based on the value associated with that carrier signal; and

demodulating the transmission signal using the phase shift computed for each carrier signal.

Abstract

A system and method that scrambles the phase characteristic of a carrier signal are described. The scrambling of the phase characteristic of each carrier signal includes associating a value with each carrier signal and computing a phase shift for each carrier signal based on the value associated with that carrier signal. The value is determined independently of any input bit value carried by that carrier signal. The phase shift computed for each carrier signal is combined with the phase characteristic of that carrier signal so as to substantially scramble the phase characteristic of the carrier signals. Bits of an input signal are modulated onto the carrier signals having the substantially scrambled phase characteristic to produce a transmission signal with a reduced PAR.

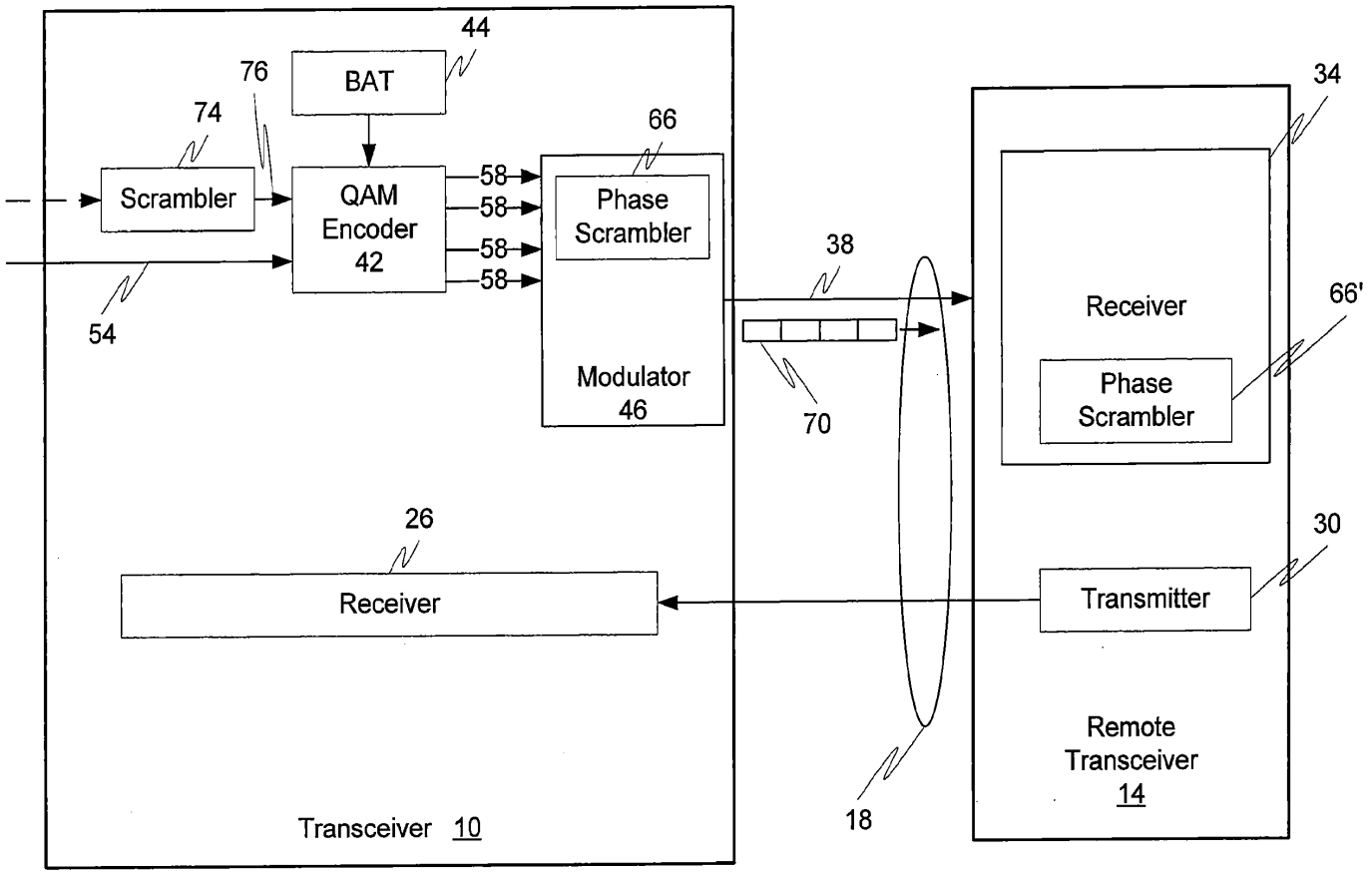
44
BAT
76
74
66
Scrambler
QAM
Encoder
42
58
58
58
58
Phase
Scrambler
38
34
Receiver
66'
Phase
Scrambler
54
Modulator
46
70
26
30
Receiver
Transmitter
Remote
Transceiver
14
18
Transceiver 10

Fig. 1

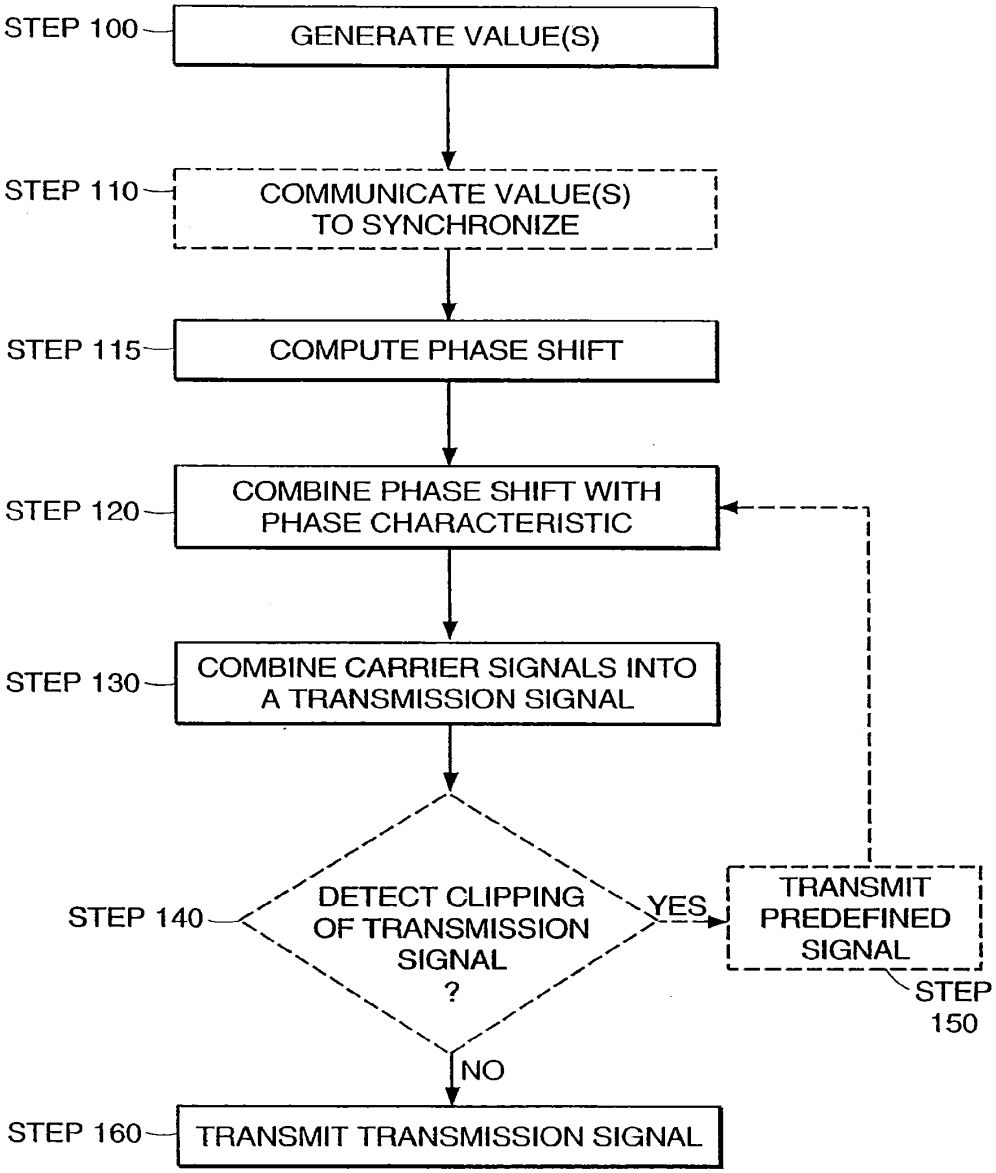
STEP 100
GENERATE VALUE(S)
STEP 110
COMMUNICATE VALUE(S) TO SYNCHRONIZE
STEP 115
COMPUTE PHASE SHIFT
STEP 120
COMBINE PHASE SHIFT WITH PHASE CHARACTERISTIC
STEP 130
COMBINE CARRIER SIGNALS INTO A TRANSMISSION SIGNAL
STEP 140
DETECT CLIPPING OF TRANSMISSION SIGNAL ?
YES
TRANSMIT PREDEFINED SIGNAL
STEP 150
NO
STEP 160
TRANSMIT TRANSMISSION SIGNAL

FIG. 2

~~A~~ System and Method for ~~Scrambling~~Descrambling the Phase of ~~the~~ Carriers in a Multicarrier Communications System

Related Application

This application is a Continuation of U.S. Application No. 13/439,605, filed April 4, 2012, which is a Continuation of U.S. Application No. 13/284,549, filed October 28, 2011, now U.S. Patent No. 8,218,610, which is a continuation of 11/860,080, filed September 24, 2007, now U.S. Patent No. 8,073,041, which is a divisional of U.S. Application No. 11/211,535, filed August 26, 2005, now U.S. Patent No. 7,292,627, which is a continuation of U.S. Application No. 09/710,310, filed on November 9, 2000, now U.S. Patent No. 6,961,369, which~~This application~~ claims the benefit of the filing date of copending U.S. Provisional Application, Serial No. 60/164,134, filed November 9, 1999, entitled "A Method For Randomizing The Phase Of The Carriers In A Multicarrier Communications System To Reduce The Peak To Average Power Ratio Of The Transmitted Signal," each which are~~the entirety of each which provisional application is~~ incorporated by reference herein in their entirety.

Field of the Invention

This invention relates to communications systems using multicarrier modulation. More particularly, the invention relates to multicarrier communications systems that lower the peak-to-average power ratio (PAR) of transmitted signals.

Background of the Invention

In a conventional multicarrier communications system, transmitters communicate over a communication channel using multicarrier modulation or Discrete Multitone Modulation (DMT). Carrier signals (carriers) or sub-channels spaced within a usable frequency band of the communication channel are modulated at a symbol (i.e., block) transmission rate of the system. An input signal, which includes input data bits, is sent to a DMT transmitter, such as a DMT modem. The DMT transmitter typically modulates the phase characteristic, or phase, and amplitude of the carrier signals using an Inverse Fast Fourier Transform (IFFT) to generate a time domain signal, or transmission signal, that

represents the input signal. The DMT transmitter transmits the transmission signal, which is a linear combination of the multiple carriers, to a DMT receiver over the communication channel.

The phase and amplitude of the carrier signals of DMT transmission signal can be considered random because the phase and amplitude result from the modulation of an arbitrary sequence of input data bits comprising the transmitted information. Therefore, under the condition that the modulated data bit stream is random, the DMT transmission signal can be approximated as having a Gaussian probability distribution. A bit scrambler is often used in the DMT transmitter to scramble the input data bits before the bits are modulated to assure that the transmitted data bits are random and, consequently, that the modulation of those bits produces a DMT transmission signal with a Gaussian probability distribution.

With an appropriate allocation of transmit power levels to the carriers or sub-channels, such a system provides a desirable performance. Further, generating a transmission signal with a Gaussian probability distribution is important in order to transmit a transmission signal with a low peak-to-average ratio (PAR), or peak-to-average power ratio. The PAR of a transmission signal is the ratio of the instantaneous peak value (i.e., maximum magnitude) of a signal parameter (e.g., voltage, current, phase, frequency, power) to the time-averaged value of the signal parameter. In DMT systems, the PAR of the transmitted signal is determined by the probability of the random transmission signal reaching a certain peak voltage during the time interval required for a certain number of symbols. An example of the PAR of a transmission signal transmitted from a DMT transmitter is 14.5 dB, which is equivalent to having a 1E-7 probability of clipping. The PAR of a transmission signal transmitted and received in a DMT communication system is an important consideration in the design of the DMT communication system because the PAR of a signal affects the communication system's total power consumption and component linearity requirements of the system.

If the phase of the modulated carriers is not random, then the PAR can increase greatly. Examples of cases where the phases of the modulated carrier signals are not random are when bit scramblers are not used, multiple carrier signals are used to modulate the same

input data bits, and the constellation maps, which are mappings of input data bits to the phase of a carrier signal, used for modulation are not random enough (i.e., a zero value for a data bit corresponds to a 90 degree phase characteristic of the DMT carrier signal and a one value for a data bit corresponds to a -90 degree phase characteristic of the DMT carrier signal). An increased PAR can result in a system with high power consumption and/or with high probability of clipping the transmission signal. Thus, there remains a need for a system and method that can effectively scramble the phase of the modulated carrier signals in order to provide a low PAR for the transmission signal.

Summary of the Invention

The present invention features a system and method that scrambles the phase characteristics of the modulated carrier signals in a transmission signal. In one aspect, a value is associated with each carrier signal. A phase shift is computed for each carrier signal based on the value associated with that carrier signal. The value is determined independently of any input bit value carried by that carrier signal. The phase shift computed for each carrier signal is combined with the phase characteristic of that carrier signal to substantially scramble the phase characteristics of the carrier signals.

In one embodiment, the input bit stream is modulated onto the carrier signals having the substantially scrambled phase characteristic to produce a transmission signal with a reduced peak-to-average power ratio (PAR). The value is derived from a predetermined parameter, such as a random number generator, a carrier number, a DMT symbol count, a superframe count, and a hyperframe count. In another embodiment, a predetermined transmission signal is transmitted when the amplitude of the transmission signal exceeds a certain level.

In another aspect, the invention features a method wherein a value is associated with each carrier signal. The value is determined independently of any input bit value carried by that carrier signal. A phase shift for each carrier signal is computed based on the value associated with that carrier signal. The transmission signal is demodulated using the phase shift computed for each carrier signal.

In another aspect, the invention features a system comprising a phase scrambler that computes a phase shift for each carrier signal based on a value associated with that carrier signal. The phase scrambler also combines the phase shift computed for each carrier signal with the phase characteristic of that carrier signal to substantially scramble the phase characteristic of the carrier signals. In one embodiment, a modulator, in communication with the phase scrambler, modulates bits of an input signal onto the carrier signals having the substantially scrambled phase characteristics to produce a transmission signal with a reduced PAR.

Description of the Drawings

The invention is pointed out with particularity in the appended claims. The advantages of the invention described above, as well as further advantages of the invention, may be better understood by reference to the following description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a block diagram of an embodiment of a digital subscriber line communications system including a DMT (discrete multitone modulation) transceiver, in communication with a remote transceiver, having a phase scrambler for substantially scrambling the phase characteristics of carrier signals; and

FIG. 2 is a flow diagram of an embodiment of a process for scrambling the phase characteristics of the carrier signals in a transmission signal.

Detailed Description

FIG. 1 shows a digital subscriber line (DSL) communication system 2 including a discrete multitone (DMT) transceiver 10 in communication with a remote transceiver 14 over a communication channel 18 using a transmission signal 38 having a plurality of carrier signals. The DMT transceiver 10 includes a DMT transmitter 22 and a DMT receiver 26. The remote transceiver 14 includes a transmitter 30 and a receiver 34. Although described with respect to discrete multitone modulation, the principles of the invention apply also to other types of multicarrier modulation, such as, but not limited to, orthogonally multiplexed quadrature amplitude modulation (OQAM), discrete wavelet multitone (DWMT) modulation, and orthogonal frequency division multiplexing (OFDM).

The communication channel 18 provides a downstream transmission path from the DMT transmitter 22 to the remote receiver 34, and an upstream transmission path from the remote transmitter 30 to the DMT receiver 26. In one embodiment, the communication channel 18 is a pair of twisted wires of a telephone subscriber line. In other embodiments, the communication channel 18 can be a fiber optic wire, a quad cable, consisting of two pairs of twisted wires, or a quad cable that is one of a star quad cable, a Dieselhorst-Martin quad cable, and the like. In a wireless communication system wherein the transceivers 10, 14 are