

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 10,574,497 B1
APPLICATION NO. : 16/027191
DATED : February 25, 2020
INVENTOR(S) : Steve Shattil

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the Specification

Column 1, Line 7, before:

-- Ser. No. 15/489,664 --

Insert the following:

-- Ser. No. 15/642,850, filed on Jul. 6, 2017, now Pat. No. 10,015,034, which is a Continuation of U.S. patent application --

Signed and Sealed this
Twenty-sixth Day of October, 2021



Drew Hirshfeld
*Performing the Functions and Duties of the
Under Secretary of Commerce for Intellectual Property and
Director of the United States Patent and Trademark Office*

**UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION**

Page 1 of 1

PATENT NO. : 10,574,497

APPLICATION NO.: 16/027,191

ISSUE DATE : February 25, 2020

INVENTOR(S) : Steve Shattil

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

col. 1, line 7, before

-- Ser. No. 15/489,664 --

Insert the following

-- Ser. No. 15/642,850, filed on Jul. 6, 2017, now Pat. No. 10,015,034, which is a Continuation of U.S. patent application --

MAILING ADDRESS OF SENDER (Please do not use Customer Number below):

Steven J Shattil
PO Box 17355, Boulder, CO 80308

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. 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 1.0 hour 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: Attention Certificate of Corrections Branch, 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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Number: 16/027,191

Patent Number: 10,574,497

Filing Date: 03-JUL-2018

Inventor: Shattil

Title: "Spreading and Precoding in OFDM"

Atty. Docket No. CBF-000.C7

CERTIFICATE OF CORRECTION

Commissioner for Patents

Office of Data Management Attention: Certificates of Correction Branch

P.O. Box 1450

Alexandria, VA 22313-1450

Dear Sir:

Upon reviewing the above-identified patent, Patentee noted a mistake of a clerical or typographical nature which should be corrected. The mistake occurred in good faith, and its correction does not involve such changes in the patent as would constitute new matter or would require re-examination. The requested correction does not change the Related U.S. Application Data in the above-identified patent.

Transmitted herewith is a proposed Certificate of Correction. Patentee respectfully solicits the granting of the requested Certificate of Correction.

Respectfully submitted,

/Steven J Shattil/

Steven J. Shattil, Reg. No. 40,170

P.O. Box 17355

Boulder, CO 80308-0355

(720) 234-4351

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 10,574,497 B1
APPLICATION NO. : 16/027191
DATED : February 25, 2020
INVENTOR(S) : Steve Shattil

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the Specification

Column 1, Line 16:
--9,042,333--
Should be changed to:
--8,750,264--

Signed and Sealed this
Seventeenth Day of August, 2021



Drew Hirshfeld
*Performing the Functions and Duties of the
Under Secretary of Commerce for Intellectual Property and
Director of the United States Patent and Trademark Office*

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Number: 16/027,191

Patent Number: 10,574,497

Filing Date: 03-JUL-2018

Inventor: Shattil

Title: "Spreading and Precoding in OFDM"

Atty. Docket No. CBF-000.C7

CERTIFICATE OF CORRECTION

Commissioner for Patents

Office of Data Management Attention: Certificates of Correction Branch

P.O. Box 1450

Alexandria, VA 22313-1450

Dear Sir:

Upon reviewing the above-identified patent, Patentee noted a mistake of a clerical or typographical nature which should be corrected. The mistake occurred in good faith, and its correction does not involve such changes in the patent as would constitute new matter or would require re-examination. The requested correction does not change the Related U.S. Application Data in the above-identified patent.

Transmitted herewith is a proposed Certificate of Correction. Patentee respectfully solicits the granting of the requested Certificate of Correction.

Respectfully submitted,

/Steven J Shattil/

Steven J. Shattil, Reg. No. 40,170

P.O. Box 17355

Boulder, CO 80308-0355

(720) 234-4351



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.
16/027,191	02/25/2020	10574497	CBF-000.C7	2427

74284 7590 02/05/2020
Steven J Shattil
P.O. Box 17355
Boulder, CO 80308-0355

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 92 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):

Genghiscomm Holdings, LLC, Boulder, CO;
Steve Shattil, Cheyenne, WY;

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

IR103 (Rev. 10/09)

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (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)

74284 7590 01/02/2020
Steven J Shattil
P.O. Box 17355
Boulder, CO 80308-0355

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 transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

Steven J Shattil	(Typed or printed name)
/Steven J Shattil/	(Signature)
1/8/2020	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/027,191	07/03/2018	Steve Shattil	CBF-000.C7	2427

TITLE OF INVENTION: Spreading and Precoding in OFDM

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$500	\$0.00	\$0.00	\$500	04/02/2020

EXAMINER	ART UNIT	CLASS-SUBCLASS
LO, DIANE LEE	2466	370-329000

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 03-09 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 Steven J Shattil

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 must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

Genghiscomm Holdings, LLC

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Boulder, CO

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

4a. Fees submitted: ☒ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies _____

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

☒ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. Change in Entity Status (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
- ☐ Applicant changing to regular undiscounted fee status.

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.

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.

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 /Steven J Shattil/Date 1/8/2020Typed or printed name Steven J ShattilRegistration No. 40170

Electronic Patent Application Fee Transmittal				
Application Number:		16027191		
Filing Date:		03-Jul-2018		
Title of Invention:		Spreading and Precoding in OFDM		
First Named Inventor/Applicant Name:		Steve Shattil		
Filer:		Steven J Shattil		
Attorney Docket Number:		CBF-000.C7		
Filed as Small 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:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
PUBL. FEE- EARLY, VOLUNTARY, OR NORMAL	1504	1	0	0
UTILITY APPL ISSUE FEE	2501	1	500	500
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				500

Electronic Acknowledgement Receipt	
EFS ID:	38236991
Application Number:	16027191
International Application Number:	
Confirmation Number:	2427
Title of Invention:	Spreading and Precoding in OFDM
First Named Inventor/Applicant Name:	Steve Shattil
Customer Number:	74284
Filer:	Steven J Shattil
Filer Authorized By:	
Attorney Docket Number:	CBF-000.C7
Receipt Date:	08-JAN-2020
Filing Date:	03-JUL-2018
Time Stamp:	13:36:48
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$500
RAM confirmation Number	E202018D38195955
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

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)	CBF_000C7_85B.pdf	81452	no	1
			ed26084e10166ffe60180090417e14c0114346f1		
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	32031	no	2
			ddb6cfd3238ea41f34bf59a4fb4f8bb68f4f64a		
Warnings:					
Information:					
Total Files Size (in bytes):			113483		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					



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

74284 7590 01/02/2020
Steven J Shattil
P.O. Box 17355
Boulder, CO 80308-0355

EXAMINER

LO, DIANE LEE

ART UNIT

PAPER NUMBER

2466

DATE MAILED: 01/02/2020

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/027,191	07/03/2018	Steve Shattil	CBF-000.C7	2427

TITLE OF INVENTION: Spreading and Precoding in OFDM

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$500	\$0.00	\$0.00	\$500	04/02/2020

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: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (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)

74284 7590 01/02/2020
Steven J Shattil
P.O. Box 17355
Boulder, CO 80308-0355

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 transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/027,191	07/03/2018	Steve Shattil	CBF-000.C7	2427

TITLE OF INVENTION: Spreading and Precoding in OFDM

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$500	\$0.00	\$0.00	\$500	04/02/2020

EXAMINER	ART UNIT	CLASS-SUBCLASS
LO, DIANE LEE	2466	370-329000

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 03-09 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, 1 _____
- (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. 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 must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). 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. Fees submitted: ☐ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies _____

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

- ☐ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. Change in Entity Status (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
- ☐ Applicant changing to regular undiscounted fee status.

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.

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.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

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

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/027,191	07/03/2018	Steve Shattil	CBF-000.C7	2427
74284	7590	01/02/2020	EXAMINER	
Steven J Shattil P.O. Box 17355 Boulder, CO 80308-0355			LO, DIANE LEE	
			ART UNIT	PAPER NUMBER
			2466	
DATE MAILED: 01/02/2020				

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 30 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. 16/027,191	Applicant(s) Shattil, Steve	
	Examiner DIANE L LO	Art Unit 2466	AIA (FITF) 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 amendment received 12/13/2019.
☐ 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 27-70. 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 _____.
---	---

/DIANE L LO/ Primary Examiner, Art Unit 2466	
---	--

REASONS FOR ALLOWANCE

The following is an examiner's statement of reasons for allowance:

The terminal disclaimer filed overcomes the double patenting rejection on claims 27-70.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance".

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Steven Shatill on December 27, 2019.

The application has been amended as follows:

28. (Currently Amended) The receiver recited in Claim ~~4~~27, wherein the demodulator is configured to remove a cyclic prefix from the received OFDM signal.

29. (Currently Amended) The receiver recited in Claim ~~4~~27, wherein the demodulator is configured to perform a fast Fourier transform on the received OFDM signal.

30. (Currently Amended) The receiver recited in Claim ~~4~~27, wherein the equalizer is configured to compute channel equalization weights from measurements of received pilot signals.

31. (Currently Amended) The receiver recited in Claim ~~4~~27, wherein the equalizer comprises a spatial filter.

32. (Currently Amended) The receiver recited in Claim ~~4~~27, wherein the despreader comprises a decision processor configured to generate at least one of hard decisions and soft decisions for the estimates of the original data symbols.

33. (Currently Amended) The receiver recited in Claim ~~4~~27, wherein the despreader comprises an inverse fast Fourier transform.

34. (Currently Amended) The receiver recited in Claim ~~4~~27, wherein the DFT-based spreading code set comprises at least one of orthogonal spreading codes and quasi-orthogonal spreading codes.

35. (Currently Amended) The receiver recited in Claim ~~1~~27, wherein the equalizer comprises a decision-feedback equalizer.

36. (Currently Amended) The receiver recited in Claim ~~1~~27, wherein at least one of the demodulator, the equalizer, and the despreader are configured to operate in at least one of a time-division duplexing mode, a frequency-division duplexing mode, and a code-division duplexing mode.

37. (Currently Amended) The receiver recited in Claim ~~1~~27, wherein each of a plurality of sets of OFDM subcarrier frequencies is assigned to one of a plurality of user devices via an orthogonal frequency division multiple access (OFDMA) scheme, the receiver further comprising an OFDMA demultiplexer configured to separate the plurality of complex-valued data symbols into a plurality of groups corresponding to their respective user devices, and wherein each of the plurality of groups is processed by the equalizer and the despreader.

39. (Currently Amended) The apparatus recited in Claim ~~12~~38, wherein the demodulating comprises removing a cyclic prefix from the received OFDM signal.

40. (Currently Amended) The apparatus recited in Claim ~~12~~38, wherein the demodulating comprises performing a fast Fourier transform on the received OFDM signal.

41. (Currently Amended) The apparatus recited in Claim ~~1238~~, wherein the performing channel equalization comprises computing channel equalization weights from measurements of received pilot signals.

42. (Currently Amended) The apparatus recited in Claim ~~1238~~, wherein the performing channel equalization comprises performing spatial filtering.

43. ((Currently Amended) The apparatus recited in Claim ~~1238~~, wherein the despreading comprises generating at least one of hard decisions and soft decisions for the estimates of the original data symbols.

44. (Currently Amended) The apparatus recited in Claim ~~1238~~, wherein the despreading comprises performing an inverse fast Fourier transform.

45. (Currently Amended) The apparatus recited in Claim ~~1238~~, wherein the DFT-based spreading code set comprises at least one of orthogonal spreading codes and quasi-orthogonal spreading codes.

46. (Currently Amended) The apparatus recited in Claim ~~1238~~, wherein the channel equalization comprises decision-feedback equalization.

47. (Currently Amended) The apparatus recited in Claim ~~42~~38, wherein at least one of the demodulating, the performing channel equalization, and the despreading are configured to operate in at least one of a time-division duplexing mode, a frequency-division duplexing mode, and a code-division duplexing mode.

48. (Currently Amended) The apparatus recited in Claim ~~42~~38, wherein each of a plurality of sets of OFDM subcarrier frequencies is assigned to one of a plurality of user devices via an orthogonal frequency division multiple access scheme, and wherein the demodulating comprises separating the plurality of complex-valued data symbols into a plurality of groups corresponding to their respective user devices, and wherein the performing channel equalization and despreading are configured to process each of the plurality of groups.

50. (Currently Amended) The computer program product recited in Claim ~~23~~49, wherein the demodulating comprises removing a cyclic prefix from the received OFDM signal.

51. (Currently Amended) The computer program product recited in Claim ~~23~~49, wherein the demodulating comprises performing a fast Fourier transform on the received OFDM signal.

52. (Currently Amended) The computer program product recited in Claim ~~23~~49, wherein the performing channel equalization comprises computing channel equalization weights from measurements of received pilot signals.

53. (Currently Amended) The computer program product recited in Claim ~~23~~49, wherein the performing channel equalization comprises performing spatial filtering.

54. (Currently Amended) The computer program product recited in Claim ~~23~~49, wherein the despreading comprises generating at least one of hard decisions and soft decisions for the estimates of the original data symbols.

55. (Currently Amended) The computer program product recited in Claim ~~23~~49, wherein the despreading comprises performing an inverse fast Fourier transform.

56. (Currently Amended) The computer program product recited in Claim ~~23~~49, wherein the DFT-based spreading code set comprises at least one of orthogonal spreading codes and quasi-orthogonal spreading codes.

57. (Currently Amended) The computer program product recited in Claim ~~23~~49, wherein the channel equalization comprises decision-feedback equalization.

58. (Currently Amended) The computer program product recited in Claim ~~23~~49, wherein at least one of the demodulating, the performing channel equalization, and the

despreading are configured to operate in at least one of a time-division duplexing mode, a frequency-division duplexing mode, and a code-division duplexing mode.

59. (Currently Amended) The computer program product recited in Claim ~~2349~~, wherein each of a plurality of sets of OFDM subcarrier frequencies is assigned to one of a plurality of user devices via an orthogonal frequency division multiple access scheme, and wherein the demodulating comprises separating the plurality of complex-valued data symbols into a plurality of groups corresponding to their respective user devices, and wherein the performing channel equalization and despreading are configured to process each of the plurality of groups.

61. (Currently Amended) The method recited in Claim ~~3460~~, wherein the demodulating comprises removing a cyclic prefix from the received OFDM signal.

62. (Currently Amended) The method recited in Claim ~~3460~~, wherein the demodulating comprises performing a fast Fourier transform on the received OFDM signal.

63. (Currently Amended) The method recited in Claim ~~3460~~, wherein the performing channel equalization comprises computing channel equalization weights from measurements of received pilot signals.

64. (Currently Amended) The method recited in Claim ~~34~~60, wherein the performing channel equalization comprises performing spatial filtering.

65. (Currently Amended) The method recited in Claim ~~34~~60, wherein the despreading comprises generating at least one of hard decisions and soft decisions for the estimates of the original data symbols.

66. (Currently Amended) The method recited in Claim ~~34~~60, wherein the despreading comprises performing an inverse fast Fourier transform.

67. (Currently Amended) The method recited in Claim ~~34~~60, wherein the DFT-based spreading code set comprises at least one of orthogonal spreading codes and quasi-orthogonal spreading codes.

68. (Currently Amended) The method recited in Claim ~~34~~60, wherein the channel equalization comprises decision-feedback equalization.

69. (Currently Amended) The method recited in Claim ~~34~~60, wherein at least one of the demodulating, the performing channel equalization, and the despreading are configured to operate in at least one of a time-division duplexing mode, a frequency-division duplexing mode, and a code-division duplexing mode.

70. (Currently Amended) The method recited in Claim ~~34~~60, wherein each of a plurality of sets of OFDM subcarrier frequencies is assigned to one of a plurality of user devices via an orthogonal frequency division multiple access scheme, and wherein the demodulating comprises separating the plurality of complex-valued data symbols into a plurality of groups corresponding to their respective user devices, and wherein the performing channel equalization and despreading are configured to process each of the plurality of groups.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DIANE LEE LO whose telephone number is (571)270-1952. The examiner can normally be reached on Monday - Friday 8 am - 5 pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Faruk Hamza can be reached on (571)272-7969. 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 <https://ppair->

[my.uspto.gov/pair/PrivatePair](https://ppair-my.uspto.gov/pair/PrivatePair). 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.

/DIANE L LO/
Primary Examiner, Art Unit 2466

Docket No. CBF-000.C7

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:

Docket No.: CBF-000.C7

Steve Shattil

Confirmation No.: 2427

Application No.: 16/027,191

Group Art Unit: 2466

Filed: 07/03/2018

Examiner: LO, DIANE LEE

For: **SPREADING AND PRECODING IN OFDM**

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

OFFICE ACTION RESPONSE

Sir:

This letter is responsive to the Office Letter mailed on 12/04/2019.

The **Claims** of Record are begin on page 2.

Remarks begin on page 13.

CLAIMS

The following is a complete list of all claims in this application.

Claims 1 – 26 (Cancelled).

27. (Previously Presented) A receiver, comprising:

a demodulator configured to demodulate a received Orthogonal Frequency Division Multiplexing (OFDM) signal into a plurality of complex-valued data symbols, the plurality of complex-valued data symbols comprising a plurality of Discrete Fourier Transform (DFT)- spread data symbols;

an equalizer communicatively coupled to the demodulator and configured to perform channel equalization on the DFT-spread data symbols; and

a despreader communicatively coupled to the equalizer and configured to despread equalized DFT-spread data symbols to generate estimates of original data symbols, wherein the DFT-spread data symbols comprise the original data symbols spread with a DFT-based spreading code set configured to reduce a Peak-to-Average-Power Ratio of a transmitted OFDM signal.

28. (Previously Presented) The receiver recited in Claim 1, wherein the demodulator is configured to remove a cyclic prefix from the received OFDM signal.

29. (Previously Presented) The receiver recited in Claim 1, wherein the demodulator is configured to perform a fast Fourier transform on the received OFDM signal.

30. (Previously Presented) The receiver recited in Claim 1, wherein the equalizer is configured to compute channel equalization weights from measurements of received pilot signals.
31. (Previously Presented) The receiver recited in Claim 1, wherein the equalizer comprises a spatial filter.
32. (Previously Presented) The receiver recited in Claim 1, wherein the despreader comprises a decision processor configured to generate at least one of hard decisions and soft decisions for the estimates of the original data symbols.
33. (Previously Presented) The receiver recited in Claim 1, wherein the despreader comprises an inverse fast Fourier transform.
34. (Previously Presented) The receiver recited in Claim 1, wherein the DFT-based spreading code set comprises at least one of orthogonal spreading codes and quasi-orthogonal spreading codes.
35. (Previously Presented) The receiver recited in Claim 1, wherein the equalizer comprises a decision-feedback equalizer.

36. (Previously Presented) The receiver recited in Claim 1, wherein at least one of the demodulator, the equalizer, and the despreader are configured to operate in at least one of a time-division duplexing mode, a frequency-division duplexing mode, and a code-division duplexing mode.

37. (Previously Presented) The receiver recited in Claim 1, wherein each of a plurality of sets of OFDM subcarrier frequencies is assigned to one of a plurality of user devices via an orthogonal frequency division multiple access (OFDMA) scheme, the receiver further comprising an OFDMA demultiplexer configured to separate the plurality of complex-valued data symbols into a plurality of groups corresponding to their respective user devices, and wherein each of the plurality of groups is processed by the equalizer and the despreader.

38. (Previously Presented) An apparatus, comprising:

a processor; and

a non-transitory computer-readable memory communicatively coupled to the processor, the memory including a set of instructions stored thereon and executable by the processor for:

demodulating a received Orthogonal Frequency Division Multiplexing (OFDM) signal into a plurality of complex-valued data symbols, the plurality of complex-valued data symbols comprising a plurality of Discrete Fourier Transform (DFT)-spread data symbols;

performing channel equalization on the DFT-spread data symbols; and

despreading equalized DFT-spread data symbols to generate estimates of original data symbols, wherein the DFT-spread data symbols comprise the original data symbols spread with a DFT-based spreading code set configured to reduce a Peak-to-Average-Power Ratio of a transmitted OFDM signal.

39. (Previously Presented) The apparatus recited in Claim 12, wherein the demodulating comprises removing a cyclic prefix from the received OFDM signal.

40. (Previously Presented) The apparatus recited in Claim 12, wherein the demodulating comprises performing a fast Fourier transform on the received OFDM signal.

41. (Previously Presented) The apparatus recited in Claim 12, wherein the performing channel equalization comprises computing channel equalization weights from measurements of received pilot signals.

42. (Previously Presented) The apparatus recited in Claim 12, wherein the performing channel equalization comprises performing spatial filtering.

43. (Previously Presented) The apparatus recited in Claim 12, wherein the despreading comprises generating at least one of hard decisions and soft decisions for the estimates of the original data symbols.

44. (Previously Presented) The apparatus recited in Claim 12, wherein the despreading comprises performing an inverse fast Fourier transform.

45. (Previously Presented) The apparatus recited in Claim 12, wherein the DFT-based spreading code set comprises at least one of orthogonal spreading codes and quasi-orthogonal spreading codes.

46. (Previously Presented) The apparatus recited in Claim 12, wherein the channel equalization comprises decision-feedback equalization.

47. (Previously Presented) The apparatus recited in Claim 12, wherein at least one of the demodulating, the performing channel equalization, and the despreading are configured to operate in at least one of a time-division duplexing mode, a frequency-division duplexing mode, and a code-division duplexing mode.

48. (Previously Presented) The apparatus recited in Claim 12, wherein each of a plurality of sets of OFDM subcarrier frequencies is assigned to one of a plurality of user devices via an orthogonal frequency division multiple access scheme, and wherein the demodulating comprises separating the plurality of complex-valued data symbols into a plurality of groups corresponding to their respective user devices, and wherein the performing channel equalization and despreading are configured to process each of the plurality of groups.

49. (Previously Presented) A computer program product, comprising a computer readable hardware storage device having computer readable program code stored therein, said program code containing instructions executable by one or more processors of a computer system to implement a method comprising:

demodulating a received Orthogonal Frequency Division Multiplexing (OFDM) signal into a plurality of complex-valued data symbols, the plurality of complex-valued data symbols comprising a plurality of Discrete Fourier Transform (DFT)-spread data symbols;

performing channel equalization on the DFT-spread data symbols; and

despreading equalized DFT-spread data symbols to generate estimates of original data symbols, wherein the DFT-spread data symbols comprise the original data symbols spread with a DFT-based spreading code set configured to reduce a Peak-to-Average-Power Ratio of a transmitted OFDM signal.

50. (Previously Presented) The computer program product recited in Claim 23, wherein the demodulating comprises removing a cyclic prefix from the received OFDM signal.

51. (Previously Presented) The computer program product recited in Claim 23, wherein the demodulating comprises performing a fast Fourier transform on the received OFDM signal.

52. (Previously Presented) The computer program product recited in Claim 23, wherein the performing channel equalization comprises computing channel equalization weights from measurements of received pilot signals.

53. (Previously Presented) The computer program product recited in Claim 23, wherein the performing channel equalization comprises performing spatial filtering.

54. (Previously Presented) The computer program product recited in Claim 23, wherein the despreading comprises generating at least one of hard decisions and soft decisions for the estimates of the original data symbols.

55. (Previously Presented) The computer program product recited in Claim 23, wherein the despreading comprises performing an inverse fast Fourier transform.

56. (Previously Presented) The computer program product recited in Claim 23, wherein the DFT-based spreading code set comprises at least one of orthogonal spreading codes and quasi-orthogonal spreading codes.

57. (Previously Presented) The computer program product recited in Claim 23, wherein the channel equalization comprises decision-feedback equalization.

58. (Previously Presented) The computer program product recited in Claim 23, wherein at least one of the demodulating, the performing channel equalization, and the

despreading are configured to operate in at least one of a time-division duplexing mode, a frequency-division duplexing mode, and a code-division duplexing mode.

59. (Previously Presented) The computer program product recited in Claim 23, wherein each of a plurality of sets of OFDM subcarrier frequencies is assigned to one of a plurality of user devices via an orthogonal frequency division multiple access scheme, and wherein the demodulating comprises separating the plurality of complex-valued data symbols into a plurality of groups corresponding to their respective user devices, and wherein the performing channel equalization and despreading are configured to process each of the plurality of groups.

60. (Previously Presented) A method comprising:

demodulating a received Orthogonal Frequency Division Multiplexing (OFDM) signal into a plurality of complex-valued data symbols, the plurality of complex-valued data symbols comprising a plurality of Discrete Fourier Transform (DFT)-spread data symbols;

performing channel equalization on the DFT-spread data symbols; and

despreading equalized DFT-spread data symbols to generate estimates of original data symbols, wherein the DFT-spread data symbols comprise the original data symbols spread with a DFT-based spreading code set configured to reduce a Peak-to-Average-Power Ratio of a transmitted OFDM signal.

61. (Previously Presented) The method recited in Claim 34, wherein the demodulating comprises removing a cyclic prefix from the received OFDM signal.

62. (Previously Presented) The method recited in Claim 34, wherein the demodulating comprises performing a fast Fourier transform on the received OFDM signal.

63. (Previously Presented) The method recited in Claim 34, wherein the performing channel equalization comprises computing channel equalization weights from measurements of received pilot signals.

64. (Previously Presented) The method recited in Claim 34, wherein the performing channel equalization comprises performing spatial filtering.

65. (Previously Presented) The method recited in Claim 34, wherein the despreading comprises generating at least one of hard decisions and soft decisions for the estimates of the original data symbols.

66. (Previously Presented) The method recited in Claim 34, wherein the despreading comprises performing an inverse fast Fourier transform.

67. (Previously Presented) The method recited in Claim 34, wherein the DFT-based spreading code set comprises at least one of orthogonal spreading codes and quasi-orthogonal spreading codes.

68. (Previously Presented) The method recited in Claim 34, wherein the channel equalization comprises decision-feedback equalization.

69. (Previously Presented) The method recited in Claim 34, wherein at least one of the demodulating, the performing channel equalization, and the despreading are configured to operate in at least one of a time-division duplexing mode, a frequency-division duplexing mode, and a code-division duplexing mode.

70. (Previously Presented) The method recited in Claim 34, wherein each of a plurality of sets of OFDM subcarrier frequencies is assigned to one of a plurality of user devices via an orthogonal frequency division multiple access scheme, and wherein the demodulating comprises separating the plurality of complex-valued data symbols into a plurality of groups corresponding to their respective user devices, and wherein the performing channel equalization and despreading are configured to process each of the plurality of groups.

REMARKS

Claims 27-70 were rejected on the ground of nonstatutory double patenting in regards to U.S. Pat. No. 10,211,892.

An eTerminal Disclaimer was filed in compliance with 37 CFR 1.321(c) or 1.321(d) to overcome this rejection.

Applicant respectfully contends that no issue of new matter has been added by this amendment.

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Reply is respectfully requested.

Respectfully Submitted,

/Steven J Shattil/

Steven Shattil
Reg. No. 40,170

720-234-4351

Doc Code: DIST.E.FILE Document Description: Electronic Terminal Disclaimer - Filed		PTO/SB/26 U.S. Patent and Trademark Office Department of Commerce	
Electronic Petition Request	TERMINAL DISCLAIMER TO OBIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT		
Application Number	16027191		
Filing Date	03-Jul-2018		
First Named Inventor	Steve Shattil		
Attorney Docket Number	CBF-000.C7		
Title of Invention	Spreading and Precoding in OFDM		
☒ Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.111 to outstanding Office Action ☒ This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.			
Owner		Percent Interest	
Genghiscomm Holdings, LLC		100%	
The owner(s) with percent interest listed above in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent number(s) 10211892 as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns. In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later: - expires for failure to pay a maintenance fee; - is held unenforceable; - is found invalid by a court of competent jurisdiction; - is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321; - has all claims canceled by a reexamination certificate; - is reissued; or - is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer. ☒ Terminal disclaimer fee under 37 CFR 1.20(d) is included with Electronic Terminal Disclaimer request.			

☐ I certify, in accordance with 37 CFR 1.4(d)(4), that the terminal disclaimer fee under 37 CFR 1.20(d) required for this terminal disclaimer has already been paid in the above-identified application.	
Applicant claims the following fee status:	
☒ Small Entity ☐ Micro Entity ☐ Regular Undiscounted	
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.	
THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES I certify, in accordance with 37 CFR 1.4(d)(4) that I am:	
☐ An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application Registration Number _____	
☒ A sole inventor	
☐ A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application	
☐ A joint inventor; all of whom are signing this request	
Signature	/Steve Shattil/
Name	Steve Shattil

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
 Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

Electronic Patent Application Fee Transmittal				
Application Number:		16027191		
Filing Date:		03-Jul-2018		
Title of Invention:		Spreading and Precoding in OFDM		
First Named Inventor/Applicant Name:		Steve Shattil		
Filer:		Steven J Shattil		
Attorney Docket Number:		CBF-000.C7		
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
STATUTORY OR TERMINAL DISCLAIMER	2814	1	160	160
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				160

Doc Code: DISQ.E.FILE

Document Description: Electronic Terminal Disclaimer – Approved

Application No.: 16027191

Filing Date: 03-Jul-2018

Applicant/Patent under Reexamination: Shattil

Electronic Terminal Disclaimer filed on December 13, 2019

☒ APPROVED

This patent is subject to a terminal disclaimer

☐ DISAPPROVED

Approved/Disapproved by: Electronic Terminal Disclaimer automatically approved by EFS-Web

U.S. Patent and Trademark Office

Electronic Acknowledgement Receipt	
EFS ID:	38026612
Application Number:	16027191
International Application Number:	
Confirmation Number:	2427
Title of Invention:	Spreading and Precoding in OFDM
First Named Inventor/Applicant Name:	Steve Shattil
Customer Number:	74284
Filer:	Steven J Shattil
Filer Authorized By:	
Attorney Docket Number:	CBF-000.C7
Receipt Date:	13-DEC-2019
Filing Date:	03-JUL-2018
Time Stamp:	14:57:12
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 160
RAM confirmation Number	E2019BCE57081495
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Terminal Disclaimer-Filed (Electronic)	eTerminal-Disclaimer.pdf	33147	no	2
			27503c71b2c9a4baaa69d81155753f370877c569		
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30441	no	2
			c4d56be7b3e20c2830d32ef54c4e96acc048bcd5c		
Warnings:					
Information:					
Total Files Size (in bytes):			63588		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					



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.
16/027,191	07/03/2018	Steve Shattil	CBF-000.C7	2427
74284	7590	12/04/2019	EXAMINER	
Steven J Shattil P.O. Box 17355 Boulder, CO 80308-0355			LO, DIANE LEE	
			ART UNIT	PAPER NUMBER
			2466	
			MAIL DATE	DELIVERY MODE
			12/04/2019	PAPER

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

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

DETAILED ACTION

This is response to Application 16/027,191 filed on 07/03/2018 in which claims 27-70 are presented for examination.

Double Patenting

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

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the reference application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

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

2. Claim 27 is rejected on the ground of nonstatutory double patenting as being unpatentable over claim 1 and 2 of U.S. Patent No. 10,211,892. Although the claims at issue are not identical, they are not patentably distinct from each other.

Claims 28-37 are rejected because they depend on rejected independent claim 27 above.

3. Claim 38 is rejected on the ground of nonstatutory double patenting as being unpatentable over claim 24 and 25 of U.S. Patent No. 10,211,892. Although the claims at issue are not identical, they are not patentably distinct from each other.

Claims 39-48 are rejected because they depend on rejected independent claim 38 above.

4. Claim 49 is rejected on the ground of nonstatutory double patenting as being unpatentable over claim 24 and 25 of U.S. Patent No. 10,211,892. Although the claims at issue are not identical, they are not patentably distinct from each other.

Claims 50-59 are rejected because they depend on rejected independent claim 49 above.

5. Claim 60 is rejected on the ground of nonstatutory double patenting as being unpatentable over claim 17 of U.S. Patent No. 10,211,892. Although the claims at issue are not identical, they are not patentably distinct from each other.

Claims 61-70 are rejected because they depend on rejected independent claim 60 above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DIANE LEE LO whose telephone number is (571)270-1952. The examiner can normally be reached on Monday - Friday 8 am - 5 pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Faruk Hamza can be reached on (571)272-7969. 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.

/DIANE L LO/
Primary Examiner, Art Unit 2466

<i>Notice of References Cited</i>	Application/Control No. 16/027,191		Applicant(s)/Patent Under Reexamination Shattil, Steve	
	Examiner DIANE L LO		Art Unit 2466	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-10211892-B2	02-2019	Shattil; Steve	H04B7/026	1/1
	B					
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC 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.

U.S. Patent and Trademark Office
PTO-892 (Rev. 01-2001)

Notice of References Cited

Part of Paper No. 20191122