

8416462



THE UNITED STATES OF AMERICA

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UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

September 26, 2023

**THIS IS TO CERTIFY THAT ANNEXED IS A TRUE COPY FROM THE
RECORDS OF THIS OFFICE OF THE FILE WRAPPER AND CONTENTS
OF:**

**APPLICATION NUMBER: 14/948,947
FILING DATE: November 23, 2015
PATENT NUMBER: 9825826
ISSUE DATE: November 21, 2017**



Certified by

Kathi

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		14948947	
	Filing Date		2015-11-23	
	First Named Inventor	Timothy Gallagher		
	Art Unit			
	Examiner Name			
	Attorney Docket Number	24351US04		

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6038435		2000-03-14	Zhang	

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U.S.PATENT APPLICATION PUBLICATIONS						Remove
Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20120163290		2012-06-28	Krafft et al.	

If you wish to add additional U.S. Published Application citation information please click the Add button.

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Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ² i	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1							☐

If you wish to add additional Foreign Patent Document citation information please click the Add button

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NON-PATENT LITERATURE DOCUMENTS		Remove
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.

T⁵

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		14948947
	Filing Date		2015-11-23
	First Named Inventor	Timothy Gallagher	
	Art Unit		
	Examiner Name		
	Attorney Docket Number		24351US04

	1		☐
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If you wish to add additional non-patent literature document citation information please click the Add button **Add**

EXAMINER SIGNATURE

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	14948947
Filing Date	2015-11-23
First Named Inventor	Timothy Gallagher
Art Unit	
Examiner Name	
Attorney Docket Number	24351US04

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the 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 the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Chad M. Gilles/	Date (YYYY-MM-DD)	2015-11-24
Name/Print	Chad M. Gilles	Registration Number	60590

This collection of information is required by 37 CFR 1.97 and 1.98. 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 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: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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.
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 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 Acknowledgement Receipt

EFS ID:	24180547
Application Number:	14948947
International Application Number:	
Confirmation Number:	4520
Title of Invention:	METHOD AND APPARATUS FOR SPECTRUM MONITORING
First Named Inventor/Applicant Name:	Timothy Gallagher
Customer Number:	23446
Filer:	Chad M. Gilles/Laura Foley
Filer Authorized By:	Chad M. Gilles
Attorney Docket Number:	24351US04
Receipt Date:	24-NOV-2015
Filing Date:	
Time Stamp:	15:32:06
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	24351US04_IDS__sb08a_EFS-WEB.pdf	1006753 3ce267b8508017a53b1f309ce302080162af afc9	no	4

Warnings:

Information:

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.

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.

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:



Practitioners associated with Customer Number:

23,446

OR



Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number

Name	Registration Number

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignments documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:



The address associated with Customer Number:

23,446

OR

☐	Firm or Individual Name			
	Address			
	City	State	Zip	
	Country			
	Telephone	Email		

Assignee Name and Address: Maxlinear, Inc.
 5966 La Place Court
 Suite 100
 Carlsbad, CA 92008

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of the practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date	8-18-15
Name	Adam Spice	Telephone	
Title	Chief Financial Officer		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. 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 3 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:				
Filing Date:				
Title of Invention:	METHOD AND APPARATUS FOR SPECTRUM MONITORING			
First Named Inventor/Applicant Name:	Timothy Gallagher			
Filer:	Chad M. Gilles/Laura Foley			
Attorney Docket Number:	24351US04			
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility application filing	1011	1	280	280
Utility Search Fee	1111	1	600	600
Utility Examination Fee	1311	1	720	720
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1600

Electronic Acknowledgement Receipt

EFS ID:	24163590
Application Number:	14948947
International Application Number:	
Confirmation Number:	4520
Title of Invention:	METHOD AND APPARATUS FOR SPECTRUM MONITORING
First Named Inventor/Applicant Name:	Timothy Gallagher
Customer Number:	23446
Filer:	Chad M. Gilles/Laura Foley
Filer Authorized By:	Chad M. Gilles
Attorney Docket Number:	24351US04
Receipt Date:	23-NOV-2015
Filing Date:	
Time Stamp:	15:17:48
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$ 1600
RAM confirmation Number	1868
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	Application Data Sheet	24351US04_ADS_new.pdf	1793037 57b2d0e535d60df0a078dce2f4cfc4912bce78e3	no	9
Warnings:					
Information:					
2		24351US04_Specification.pdf	86163 dccfb09701da0add892843432d6af6236453641f	yes	20
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	15	
	Claims		16	19	
	Abstract		20	20	
Warnings:					
Information:					
3	Drawings-only black and white line drawings	24351US04_Figs_as_filed.pdf	75684 61f44c8adc1681fc979be2c990c5d50d31d99756	no	7
Warnings:					
Information:					
4	Oath or Declaration filed	24351US04_Declaration_Gallagher_executed.pdf	152773 0dc61c476e1e75bb7de9d0451dc8968cbb8c05f4	no	1
Warnings:					
Information:					
5	Oath or Declaration filed	24351US04_Declaration_Huang-signed.pdf	82381 903ae2414844d085d905f9137d849c0dd4238cb2	no	2
Warnings:					
Information:					
6	Oath or Declaration filed	24351US04_Declaration_Tierney_executed.pdf	63807 91797ba4ae069a954ac4c19a66b2f71f03c29bb9	no	2

Warnings:					
Information:					
7	Power of Attorney	Maxlinear_AIA_POA_New_Address.pdf	57159 c411665911520d2fc043d90fdc2ec2c276011499	no	1
Warnings:					
Information:					
8	Fee Worksheet (SB06)	fee-info.pdf	34980 41dd6502f2ed700e6f1fc69a9cfd0864813379b5	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			2345984		
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.					

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	24351US04
		Application Number	
Title of Invention	METHOD AND APPARATUS FOR SPECTRUM MONITORING		
The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.			

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove					
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Timothy		Gallagher		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Encinitas	State/Province	CA	Country of Residence	US
Mailing Address of Inventor:					
Address 1		5966 La Place Court			
Address 2		Ste. 100			
City	Carlsbad	State/Province	CA		
Postal Code	92008	Country i	US		
Inventor 2 Remove					
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Patrick		Tierney		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Solana Beach	State/Province	CA	Country of Residence	US
Mailing Address of Inventor:					
Address 1		5966 La Place Court			
Address 2		Ste. 100			
City	Carlsbad	State/Province	CA		
Postal Code	92008	Country i	US		
Inventor 3 Remove					
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Jun		Huang		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					

Application Data Sheet 37 CFR 1.76		Attorney Docket Number		24351US04	
		Application Number			
Title of Invention		METHOD AND APPARATUS FOR SPECTRUM MONITORING			
City	San Diego	State/Province	CA	Country of Residence	US
Mailing Address of Inventor:					
Address 1		5966 La Place Court			
Address 2		Ste. 100			
City	Carlsbad	State/Province	CA		
Postal Code	92008	Country	US		
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button.					Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).			
☐ An Address is being provided for the correspondence Information of this application.			
Customer Number	23446		
Email Address	mhmpto@mcandrews-ip.com	Add Email	Remove Email

Application Information:

Title of the Invention	METHOD AND APPARATUS FOR SPECTRUM MONITORING		
Attorney Docket Number	24351US04	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	7	Suggested Figure for Publication (if any)	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)
☐ Request Not to Publish. I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application has not and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	24351US04
		Application Number	
Title of Invention	METHOD AND APPARATUS FOR SPECTRUM MONITORING		

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)
Customer Number	23446		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78. When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status		Patented		Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
	Continuation of	14341880	2014-07-28	9203653	2015-12-01
Prior Application Status		Patented		Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
14341880	Continuation of	13607916	2012-09-10	8792008	2014-07-29
Prior Application Status		Expired		Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)		
13607916	Claims benefit of provisional	61532098	2011-09-08		
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.					

Foreign Priority Information:

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	24351US04
		Application Number	
Title of Invention	METHOD AND APPARATUS FOR SPECTRUM MONITORING		

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)ⁱ the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	 Access Code ⁱ (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013. NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	24351US04
		Application Number	
Title of Invention	METHOD AND APPARATUS FOR SPECTRUM MONITORING		

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	24351US04
		Application Number	
Title of Invention	METHOD AND APPARATUS FOR SPECTRUM MONITORING		

Applicant Information:

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Applicant 1			
If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section. Clear			
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Name of the Deceased or Legally Incapacitated Inventor:			
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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	24351US04
		Application Number	
Title of Invention	METHOD AND APPARATUS FOR SPECTRUM MONITORING		

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Signature	/Chad M. Gilles/		Date (YYYY-MM-DD)	2015-11-23
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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	24351US04
		Application Number	
Title of Invention	METHOD AND APPARATUS FOR SPECTRUM MONITORING		

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METHOD AND APPARATUS FOR SPECTRUM MONITORING

PRIORITY CLAIM

[0001] This patent application is a continuation of U.S. Patent Application Serial No. 14/341,880 filed on July 28, 2014 now patented as U.S. Patent No. 9,203,653, which is a continuation of U.S. Patent Application Serial No. 13/607,916 filed on September 10, 2012 now patented as U.S. Patent No. 8,792,008, which also makes reference to, claims priority to and claims benefit from United States Provisional Patent Application Serial No. 61/532,098 filed on September 8, 2011. Each of the above referenced documents is hereby incorporated herein by reference in its entirety.

INCORPORATION BY REFERENCE

[0002] This patent application also makes reference to:

United States Patent Application Serial No. 13/336,451 titled "Method and Apparatus for Broadband Data Conversion," filed on December 23, 2011, and published as U.S. Patent Application Publication No. 2012/0163518;

United States Patent Application Serial No. 13/485,003 titled "Multi-layer Time-Interleaved Analog-to-Digital Converter (ADC)," filed on May 31, 2012 and now patented as U.S. Patent No. 8,611,483; and

United States Patent Application Serial No. 13/588,769 titled "Multi-Standard Coverage Map Generation," filed on August 17, 2012, and now patented as U.S. Patent No. 9,026,118.

[0003] Each of the above referenced documents applications is hereby incorporated herein by reference in its entirety.

FIELD OF THE INVENTION

[0004] Certain embodiments of the invention relate to signal processing. More specifically, certain embodiments of the invention relate to a method and system for spectrum monitoring.

BACKGROUND OF THE INVENTION

[0005] Network-based services can become unacceptable if network parameters fall outside of those for which receivers in the network were designed. For example, in a cable television system there are specifications for the number of channels on the plant, the types of channels, the signal levels of those channels and the impairments that can be on the plant that would affect the performance of the receiver. If some or all of these parameters deviate outside acceptable bounds, the user may experience unacceptable performance. Conventional methods and apparatuses for monitoring network parameters are too costly and impractical for use in customer-premises equipment (CPE).

[0006] Further limitations and disadvantages of conventional and traditional approaches will become apparent to one of skill in the art, through comparison of such systems with some aspects of the present invention as set forth in the remainder of the present application with reference to the drawings.

BRIEF SUMMARY OF THE INVENTION

[0007] A system and/or method is provided for spectrum monitoring, substantially as shown in and/or described in connection with at least one of the figures, as set forth more completely in the claims.

[0008] These and other advantages, aspects and novel features of the present invention, as well as details of an illustrated embodiment thereof, will be more fully understood from the following description and drawings.

BRIEF DESCRIPTION OF SEVERAL VIEWS OF THE DRAWINGS

[0009] FIG. 1A depicts an example cable system in accordance with an example embodiment of the invention.

[0010] FIG. 1B depicts an example receiver operable to perform spectrum monitoring in accordance with an example embodiment of the invention.

[0011] FIG. 1C depicts an example satellite system in accordance with an example embodiment of the invention.

[0012] FIG. 2A depicts an example RF front-end of a receiver operable to perform spectrum monitoring in accordance with an example embodiment of the invention.

[0013] FIG. 2B depicts another example RF front-end of a receiver operable to perform spectrum monitoring in accordance with an example embodiment of the invention.

[0014] FIG. 3 depicts an example channelizer which may be utilized for performing spectrum monitoring in accordance with an example embodiment of the invention.

[0015] FIG. 4 is a flow chart illustrating example steps for spectrum monitoring in accordance with an example embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0016] As utilized herein the terms "circuits" and "circuitry" refer to physical electronic components (i.e. hardware) and any software and/or firmware ("code") which may configure the hardware, be executed by the hardware, and or otherwise be associated with the hardware. As utilized herein, "and/or" means any one or more of the items in the list joined by "and/or". For example, "x and/or y" means any element of the three-element set {(x), (y), (x, y)}. Similarly, "x, y, and/or z" means any element of the seven-element set {(x), (y), (z), (x, y), (x, z), (y, z), (x, y, z)}. As utilized herein, the terms "block" and "module" refer to functions than can be implemented in hardware, software, firmware, or any combination of one or more thereof.

[0017] FIG. 1A depicts an example communication system in accordance with an example embodiment of the invention. Shown in FIG. 1 is a terrestrial television antenna 102, a satellite dish 104, an Internet Protocol (IP) network 106, a headend 108, a wide area network (e.g., hybrid fiber-coaxial (HFC) network) 118, a gateways 120a and 120b, end systems 126a and 126b (e.g., computers), and end systems 128a and 128b. The headend 108 comprises a switch 110, a video modulator 112, a cable modem termination system (CMTS) 114, and a splitter/combiner 116.

[0018] For downstream traffic, the headend 108 may receive television signals via the antenna 102 and the satellite dish 104, and may receive data via the IP network 106. The switch 110 may convey the television signals to the video modulator 112 and the data to the CMTS 114. The video modulator 112 may modulate the received television signals onto a carrier. The CMTS 114 may modulate the received data onto a carrier. The splitter/combiner 116 may combine the outputs of the video modulator 112 and the CMTS 114 resulting in a frequency division multiplexed (FDM) signal comprising one or more television channels and/or one or more DOCSIS channels. The FDM signal may be

onto the wide area network (WAN) 118 for distribution to customer premise equipment (CPE). Each of the gateways 120a and 120b may comprise a receive module 150 operable to process the received FDM signal as described below.

[0019] In an example embodiment, each of the gateways 120a and 120b may be operable to transmit, via a module 152, messages to the CMTS 114. For such upstream data, the gateways 120a and 120b may modulate messages (e.g., network management/maintenance messages) onto one or more carriers for transmission via the WAN 118. The splitter/combiner 116 may then convey the message to the CMTS 114. The CMTS 114 may process the messages and, in an example embodiment, adjust transmission parameters (e.g., modulation parameters, transmit power, frequency offsets, etc.) and/or perform other maintenance/management based on the received messages.

[0020] FIG. 1B depicts an example receiver operable to perform spectrum monitoring in accordance with an example embodiment of the invention. Shown in FIG. 1B is a receiver circuit 100 comprising an RF receive front-end module 158, a channelizer module 102, a monitoring module 154, and a data processing module 156.

[0021] The RF receive front-end 158 may be operable to process a received RF signal S to generate a digital signal D. The signal S may be the result of a plurality of television and/or DOCSIS channels being frequency division multiplexed into a single signal. The signal S may occupy a frequency band from F_{lo} to F_{hi} . The RF front-end 158 may, for example, amplify, down-convert, filter, and/or digitize the received signal S to generate the digital signal D. Example embodiments of the RF front-end are depicted in FIGs. 2A and 2B.

[0022] The channelizer 102 may be operable to select $J+1$ bands (represented as C_1 – C_{J+1}) of the signal S and output each of the selected bands to the monitoring module 154 and/or the data processing module 156, where J is an integer greater than 1. An example

embodiment of the channelizer 102 is depicted in FIG. 3. Each band C_j may, for example, correspond to the frequency band of one or more television channels. For example, each band C_j may be an integer multiple of 6MHz (U.S.) or 8 MHz (EU).

[0023] In an example embodiment, the channelizer 102 may be implemented entirely in the digital domain and the channelization may be achieved via one or more digital filtering algorithms and/or other digital signal processing algorithms.

[0024] The monitoring module 154 may be operable to analyze the band C_{j+1} that it receives from the channelizer 102 to measure/determine characteristics such as, for example, signal power level vs. frequency, delay vs. frequency, phase shift vs. frequency, type and/or amount of modulation, code rate, interference levels, signal to noise ratio, a transfer function of the channel over which the signal was received, an impulse response of the channel over which the signal was received, and/or any other characteristic that may help assess characteristics of the channel over which the signal was received, assess characteristics of the transmitter that sent the signal and/or any otherwise be pertinent to performance of the communication system. The monitoring module may also be operable to generate one or more control signals 160 for configuring the channelizer 102 and/or for configuring the RF front-end 158. Additionally or alternatively, the control signal(s) 160 output by the monitoring module 154 may control the transmission of network management/maintenance messages by the device 150. Such message may comprise, for example, network status updates indicating whether one or more communication parameters of one or more received television or DOCSIS channels are outside acceptable bounds, and/or conveying measured/determined characteristics back to a source of the received signal (e.g., back to a cable headend). In an example embodiment, the monitoring module 174 may be operable to demodulate signals for measuring one or more characteristics such as signal-to-noise ratio, code rate.

[0025] The data processing module 156 may be operable to process the bands C_1 – C_J conveyed to it by the channelizer 102 to recover data present in one or more television channels present in those bands of the signal S. The data processing module 156 may, for example, perform synchronization, equalization, and decoding. The data processing module 156 may output processed data (e.g., MPEG transport stream packets and/or Internet Protocol packets) to end systems 126, perhaps via an interface such as an HDMI interface and/or an Ethernet interface (not shown). The data processing module 156 may also be operable to generate one or more control signals 162 for configuring the channelizer 102 and/or the receive front-end 158.

[0026] The parallel arrangement of the monitoring module 154 and data processing module 156 may enable determination of signal and/or channel characteristics without having to interrupt service to user equipment 126 and 128.

[0027] In an example embodiment, the signal S may be a cable television signal with $F_{lo} \approx 55\text{MHz}$, $F_{hi} \approx 1002\text{ MHz}$. In an example embodiment, the signal S may be a MoCA signal with $F_{lo} \approx 1150\text{ MHz}$ and $F_{hi} \approx 2100\text{ MHz}$. These numbers are purely for illustration and not intended to be limiting.

[0028] In an example embodiment, the signal S may be a satellite television signal such as may be at the input of a LNB, at the output of a LNB, or at the input of an indoor unit (e.g., set top box). In such an embodiment, the front-end 158, channelizer 152, data processing module 154, and/or monitoring module 154 may reside in the indoor unit (e.g., set-top box), outdoor unit (e.g., satellite dish or accompanying components), and/or may be distributed among the indoor unit and outdoor unit of a satellite installation residing at a customer premises. An example of such an embodiment is shown in FIG. 1C.

[0029] In operation of such an example embodiment, the signal S may be amplified, possibly downconverted, and digitized by the RF front-end 158 to generate the signal D. The channelizer 102 may then select J bands of the signal D for output to the data processing module 156. Each of the selected bands C_1 – C_J may, for example, comprise one or more of the cable television channels and/or one or more of the DOCSIS channels that make up the signal S. The data processing module 156 may provide one or more control signals to determine which portion of the signal D is selected for each of the bands C_1 – C_J . The selection may be based, for example, on which television channels are being consumed by end systems 128 and/or whether DOCSIS data is being consumed by end systems 126. The channelizer 102 may also select one band, represented as band C_{J+1} , to be output to the monitoring module 154. Band C_{J+1} may comprise any portion or portions (including the entire bandwidth from F_{lo} to F_{hi}) of the signal D. Which portion of the signal S is selected as band C_{J+1} may, for example, be configured by the monitoring module 154. The data processing module 156 may process one or more of bands C_1 – C_J to recover data on one or more channels (e.g., television and/or DOCSIS channels) present in those bands while the monitoring module 154 may concurrently process band C_{J+1} to measure/determine characteristics of all or a portion of the signal S between f_{lo} and f_{hi} .

[0030] FIG. 1C depicts an example satellite system in accordance with an example embodiment of the invention. Shown in FIG. 1C is a satellite dish assembly 172, and a gateway 196. The subassembly 174 comprises a feed horn 182, an LNB 194, the front-end 158, the channelizer 152, the monitoring module 154, and the data processing module 156. The various modules of the subassembly 174 may reside in one or more housings, on one or more printed circuit boards, and/or one or more integrated circuits (e.g., one or more silicon dice). In another example embodiment, the monitoring module 154 and/or the data processing module 156 may reside in the gateway 196.

[0031] In the example embodiment depicted, the satellite dish assembly 172 comprises a parabolic reflector 176 and a subassembly 174 mounted (e.g., bolted or welded) to a support structure 178 which, in turn, comprises a boom 190 and attaches (e.g., via bolts) to the premises 180 (e.g., to the roof). In another example embodiment, all or a portion of the modules 152, 154, and/or 156 may be mounted to the premises 180 separate from the satellite dish (e.g., connected via wired and/or wireless connections), but may still be part of the “outdoor unit.”

[0032] The gateway 196 may receive data from the satellite dish assembly 172 (via cable(s) 184). The gateway 196 may transmit data onto and receive data from the WAN 192 (via broadband connection 188). The gateway 196 may transmit data to and receive data from user equipment 128 and 126 (via one or more connections 186).

[0033] FIG. 2A depicts an example RF front-end of a receiver operable to perform spectrum monitoring in accordance with an example embodiment of the invention. The RF front-end 158A shown in FIG. 2A comprises a variable gain amplifier 202, and receive chains 204_1 – 204_L , where L is an integer greater than or equal to 1. Each receive chain 204_l may comprise an amplifier module 210_l , a mixer module 212_l , a filter module 214_l , and an analog-to-digital converter (ADC) module 216_l , where l is an integer between 1 and L .

[0034] Each amplifier 210_l may be operable to amplify a band l of the signal S . Each mixer 212_l may be operable to mix a band l of the signal S with a local oscillator signal (not shown) to downconvert the band l to a lower frequency. Each filter module 214_l may be operable to bandpass filter the band l to remove/attenuate frequencies outside band l . Each ADC 216_l may be operable to convert the band l of the analog signal S to a corresponding digital representation. Operation of the RF front-end 158 and/or processing of signals generated by the front-end 158, may, for example, be as described

in United States Patent Application Serial No. 13/336,451 entitled "Method and Apparatus for Broadband Data Conversion" which is incorporated by reference herein, as set forth above.

[0035] In an example embodiment, the front-end 158A may reside in a cable gateway such as the cable gateway 120 described above. In an example embodiment, the front-end 158A may reside in satellite gateway/set-top box and/or in an outdoor unit of a satellite reception assembly (e.g., collocated on-chip or on-PCB with a satellite low-noise block downconverter (LNB)).

[0036] FIG. 2B depicts another example RF front-end of a receiver operable to perform spectrum monitoring in accordance with an example embodiment of the invention. The RF front-end 158B shown in FIG. 2B comprises a variable gain amplifier 252, a filter 254, and an ADC 256. Functions performed by the RF front-end 158B may be referred to as "full-spectrum capture" (or "FSC").

[0037] In the front-end 158B, the entire bandwidth, from F_{lo} to F_{hi} , of signal S may be amplified by the amplifier 252 to generate S' . The amplified signal S' may be then filtered by the filter 254 to remove undesired signals outside of F_{lo} to F_{hi} and generate signal S'' . The signal S'' , from F_{lo} to F_{hi} , may then be digitized by the ADC 256 to generate signal D . In an example embodiment, the ADC may be as described in United States Patent Application Serial No. 13/485,003 entitled "Multi-layer Time-Interleaved Analog-to-Digital Converter (ADC)," which is incorporated by reference herein, as set forth above.

[0038] In an example embodiment, the ADC 256 may be capable of digitizing a signal S wherein F_{lo} to F_{hi} is 1 GHz or higher. Accordingly, for cable television / DOCSIS, the ADC 256 may be operable to digitize the entire cable downstream (e.g., from ~55MHz to ~1002MHz). Similarly, for satellite television, the ADC 256 may be operable to digitize

the received signal at the input of the LNB, and/or the downconverted signal (e.g., from ~1GHz to ~2GHz) at the output by an LNB.

[0039] FIG. 3 depicts an example channelizer which may be utilized for performing spectrum monitoring in accordance with an example embodiment of the invention. Band selection filters 302_1 – 302_J of the channelizer 102 may each process the signal D to recover a corresponding one of the J selected bands of the signal D, and output the band on a corresponding one of the ports 304_1 to 304_J . A band selection filter 302_{J+1} of the channelizer 102 may process the signal D to recover band C_{J+1} from the signal D, and output band C_{J+1} on the port 304_{J+1} . Which band or bands are selected by the filter 302_{J+1} may be configured based on one or more control signals input to the channelizer 102. For example, the value of a parameter k may determine the center frequency of the portion of signal D that is to be selected as C_{J+1} by the filter 302_{J+1} , and the value of Δ may determine the bandwidth of the portion of this signal D that is selected as band C_{J+1} for output on the port 304_{J+1} . In this manner, all of the signal D between F_{lo} and F_{hi} or any portion or portions of the signal D, may be selected for output on the port 304_{J+1} .

[0040] FIG. 4 is a flow chart illustrating example steps for spectrum monitoring in accordance with an example embodiment of the invention. After start step 402, in step 404, the receiver circuit 100 may receive a frequency division multiplexed (FDM) signal comprising one or more channels (e.g., satellite television channels, cable television channels, and/or DOCSIS channels) occupying a frequency band between F_{lo} and F_{hi} . In step 406, the received FDM signal is digitized across the full band from F_{lo} to F_{hi} . In step 408, the digitized signal is channelized into one or more bands. In step 410, a first one or more of the bands are conveyed to a data processing module. In step 412 a second one or more of the bands are output to a monitoring module. In step 414, the data processing module processes one or more of the first one or more bands to recover data on those

bands while the monitoring module concurrently processes the second one or more bands to determine characteristics of all or a portion of the frequency band from F_{lo} to F_{hi} .

[0041] Other embodiments of the invention may provide a non-transitory computer readable medium and/or storage medium, and/or a non-transitory machine readable medium and/or storage medium, having stored thereon, a machine code and/or a computer program having at least one code section executable by a machine and/or a computer, thereby causing the machine and/or computer to perform the steps as described herein for spectrum monitoring

[0042] Accordingly, the present invention may be realized in hardware, software, or a combination of hardware and software. The present invention may be realized in a centralized fashion in at least one computing system, or in a distributed fashion where different elements are spread across several interconnected computing systems. Any kind of computing system or other apparatus adapted for carrying out the methods described herein is suited. A typical combination of hardware and software may be a general-purpose computing system with a program or other code that, when being loaded and executed, controls the computing system such that it carries out the methods described herein. Another typical implementation may comprise an application specific integrated circuit or chip.

[0043] The present invention may also be embedded in a computer program product, which comprises all the features enabling the implementation of the methods described herein, and which when loaded in a computer system is able to carry out these methods. Computer program in the present context means any expression, in any language, code or notation, of a set of instructions intended to cause a system having an information processing capability to perform a particular function either directly or after either or both

of the following: a) conversion to another language, code or notation; b) reproduction in a different material form.

[0044] While the present invention has been described with reference to certain embodiments, it will be understood by those skilled in the art that various changes may be made and equivalents may be substituted without departing from the scope of the present invention. In addition, many modifications may be made to adapt a particular situation or material to the teachings of the present invention without departing from its scope. Therefore, it is intended that the present invention not be limited to the particular embodiment disclosed, but that the present invention will include all embodiments falling within the scope of the appended claims.

CLAIMS

What is claimed is:

1. A method comprising:
performing by one or more circuits of a receiver coupled to a television and data service provider headend via a hybrid fiber coaxial (HFC) network:
receiving, via said HFC network, a signal that carries a plurality of channels, wherein said channels comprise one or both of television channels and data channels;
digitizing said received signal to generate a digitized signal;
selecting a first portion of said digitized signal;
selecting a second portion of said digitized signal;
processing said selected second portion of said digitized signal to recover information carried in said plurality of channels;
analyzing said selected first portion of said digitized signal to measure a characteristic of said received signal; and
controlling the transmission of network management messages back to said headend based on said measured characteristic of said received signal.
2. The method of claim 1, wherein said network management messages indicate whether a parameter is outside of acceptable bounds.
3. The method of claim 2, wherein said parameter is a modulation parameter of said received signal.

4. The method of claim 2, wherein said parameter is a transmit power of said received signal.

5. The method of claim 2, wherein said parameter is a frequency offset of said received signal.

6. The method of claim 1, wherein said characteristic is signal power vs. frequency.

7. The method of claim 1, wherein said characteristics is signal phase vs. frequency.

8. The method of claim 1, wherein said characteristic is one of: signal-to-noise ratio, peak-to-average ratio, noise levels, bit error rate, and symbol error rate.

9. The method of claim 1, configuring, by said one or more circuits, a bandwidth and/or center frequency of said selected first portion of said digitized signal.

10. A system comprising:

a receiver configured to be coupled to a television and data service provider headend via a hybrid fiber coaxial (HFC) network, the receiver comprising: front-end circuitry operable to:

receive a signal that carries a plurality of channels, wherein said channels comprise one or both of television channels and data channels; and
digitize said received signal to generate a digitized signal;

channelizer circuitry operable to:

select a first portion of said digitized signal; and

select a second portion of said digitized signal;

processing circuitry operable to process said selected second portion of said digitized signal to recover information carried in said plurality of channels;

monitoring circuitry operable to:

analyze said selected first portion of said digitized signal to measure a characteristic of said received signal; and

control the transmission of network management messages back to said headend based on said measured characteristic of said received signal.

11. The system of claim 10, wherein said network management messages indicate whether a parameter is outside of acceptable bounds.

12. The system of claim 11, wherein said parameter is a modulation parameter of said received signal.

13. The system of claim 11, wherein said parameter is a transmit power of said received signal.

14. The system of claim 11, wherein said parameter is a frequency offset of said received signal.

15. The method of claim 1, wherein said characteristic is signal power vs. frequency.

16. The method of claim 1, wherein said characteristics is signal phase vs. frequency.

17. The system of claim 10, wherein said characteristic is one of: signal-to-noise ratio, peak-to-average ratio, noise levels, bit error rate, and symbol error rate.

18. The system of claim 10, comprising configuring, by said monitoring circuitry during operation of said one or more circuits, a bandwidth and/or center frequency of said selected first portion of said digitized signal.

ABSTRACT

A receiver is configured to be coupled to a television and data service provider headend via a hybrid fiber coaxial (HFC) network. The receiver comprises front-end circuitry operable to receive a signal that carries a plurality of television and/or data channels, and digitize the received signal to generate a digitized signal. The receiver comprises channelizer circuitry operable to select a first portion of the digitized signal, and select a second portion of the digitized signal. The receiver comprises processing circuitry operable to process the selected second portion of the digitized signal to recover information carried in the plurality of channels. The receiver comprises monitoring circuitry operable to analyze the selected first portion of the digitized signal to measure a characteristic of the received signal; and control the transmission of network management messages back to the headend based on the measured characteristic of the received signal.

1/7

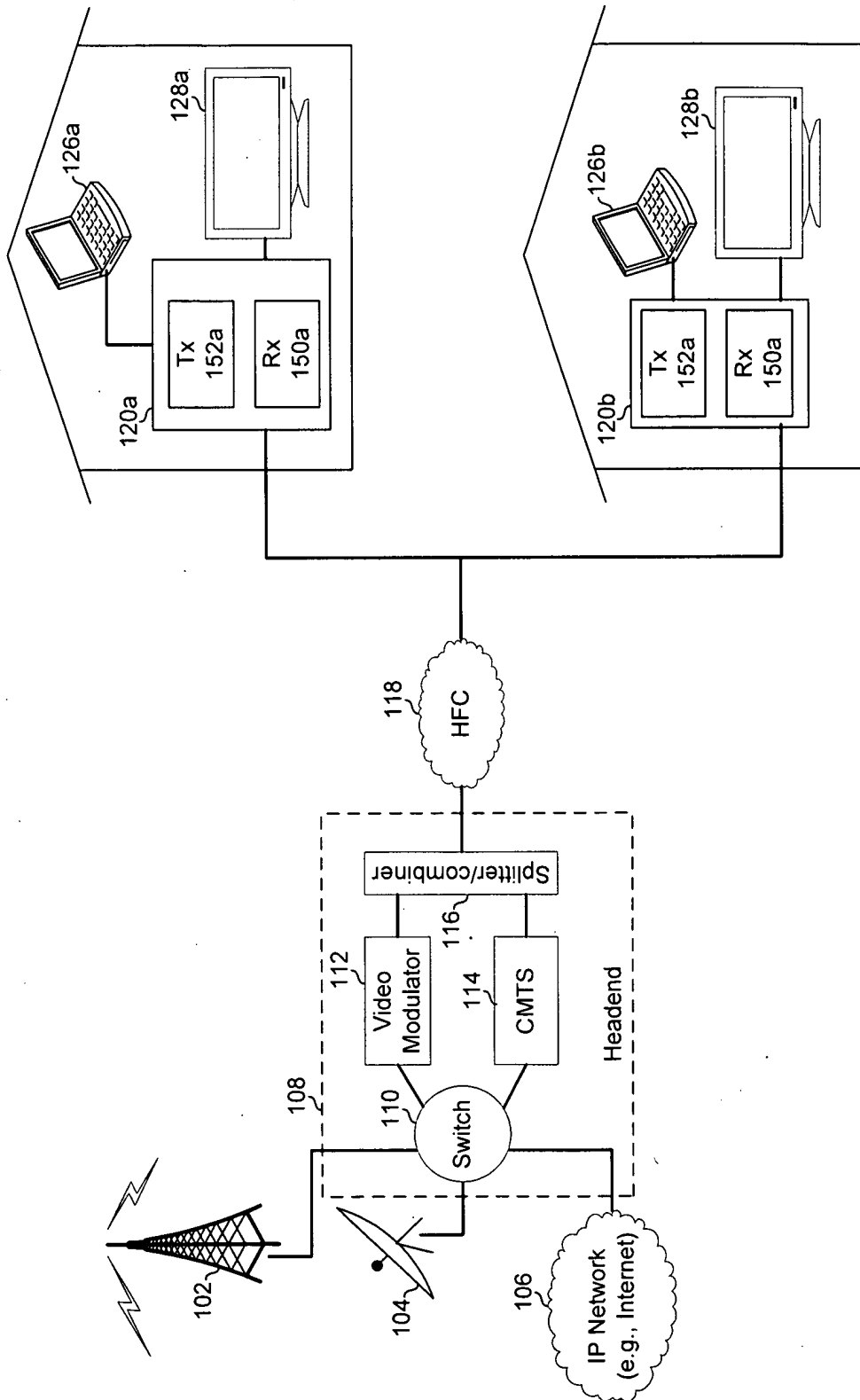


FIG. 1A

2/7

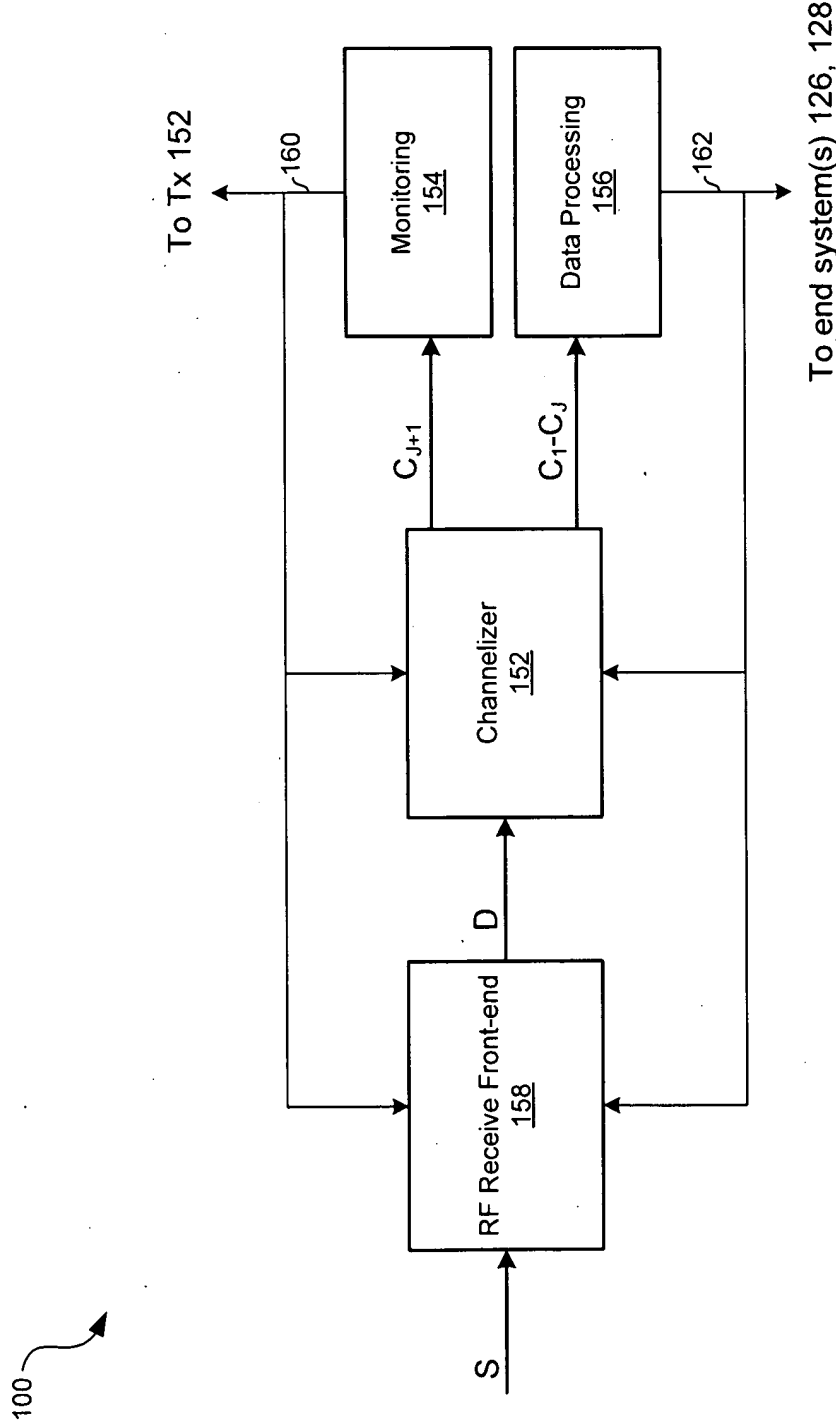


FIG. 1B

3/7

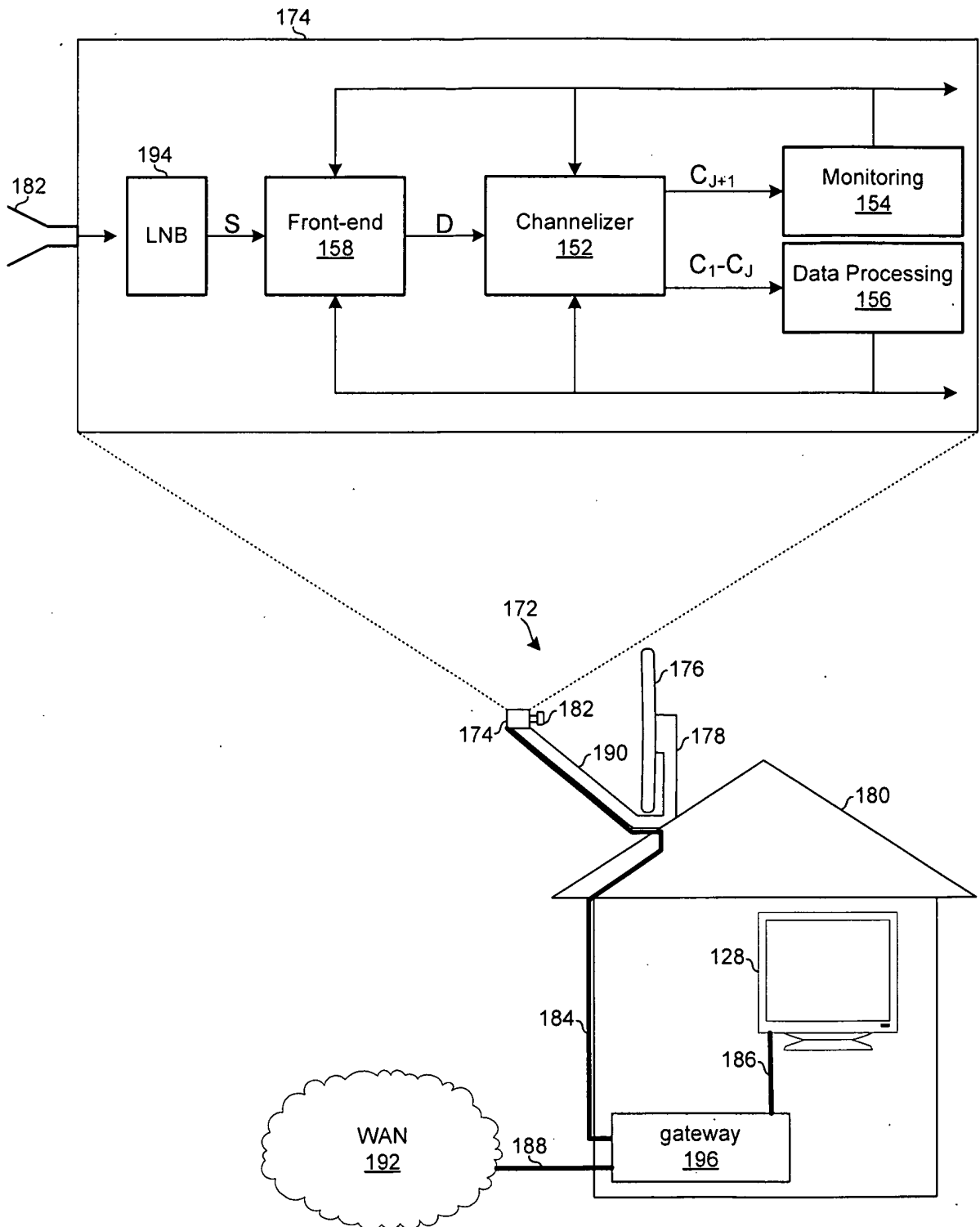


FIG. 1C

4/7

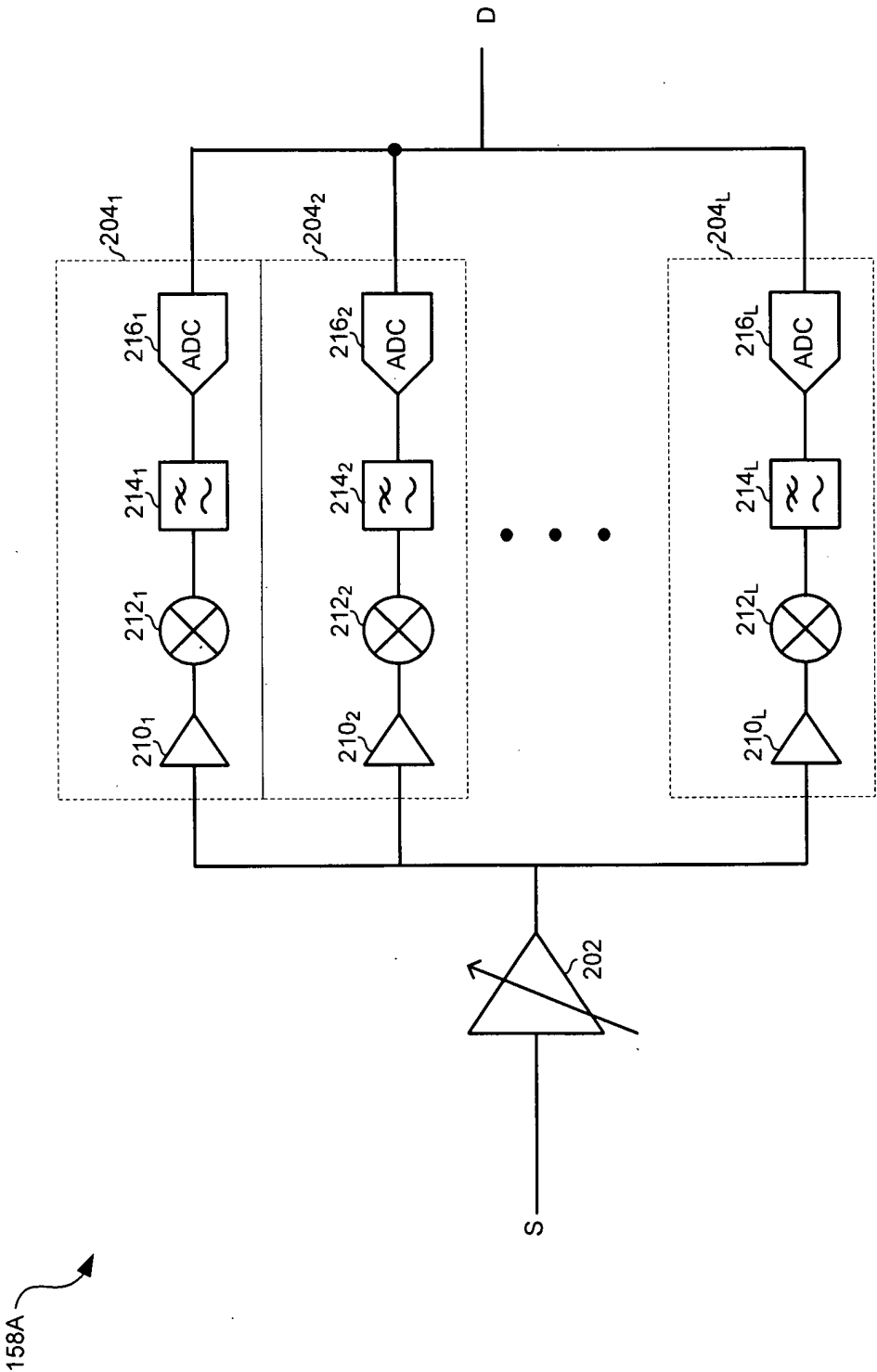


FIG. 2A

5/7

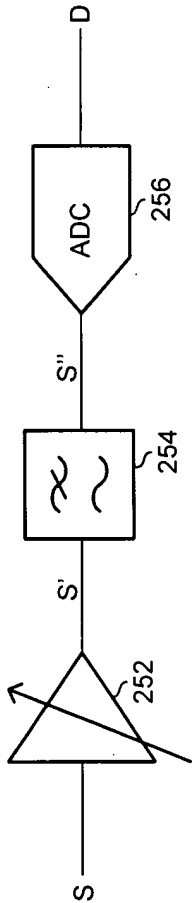


FIG. 2B

158B

6/7

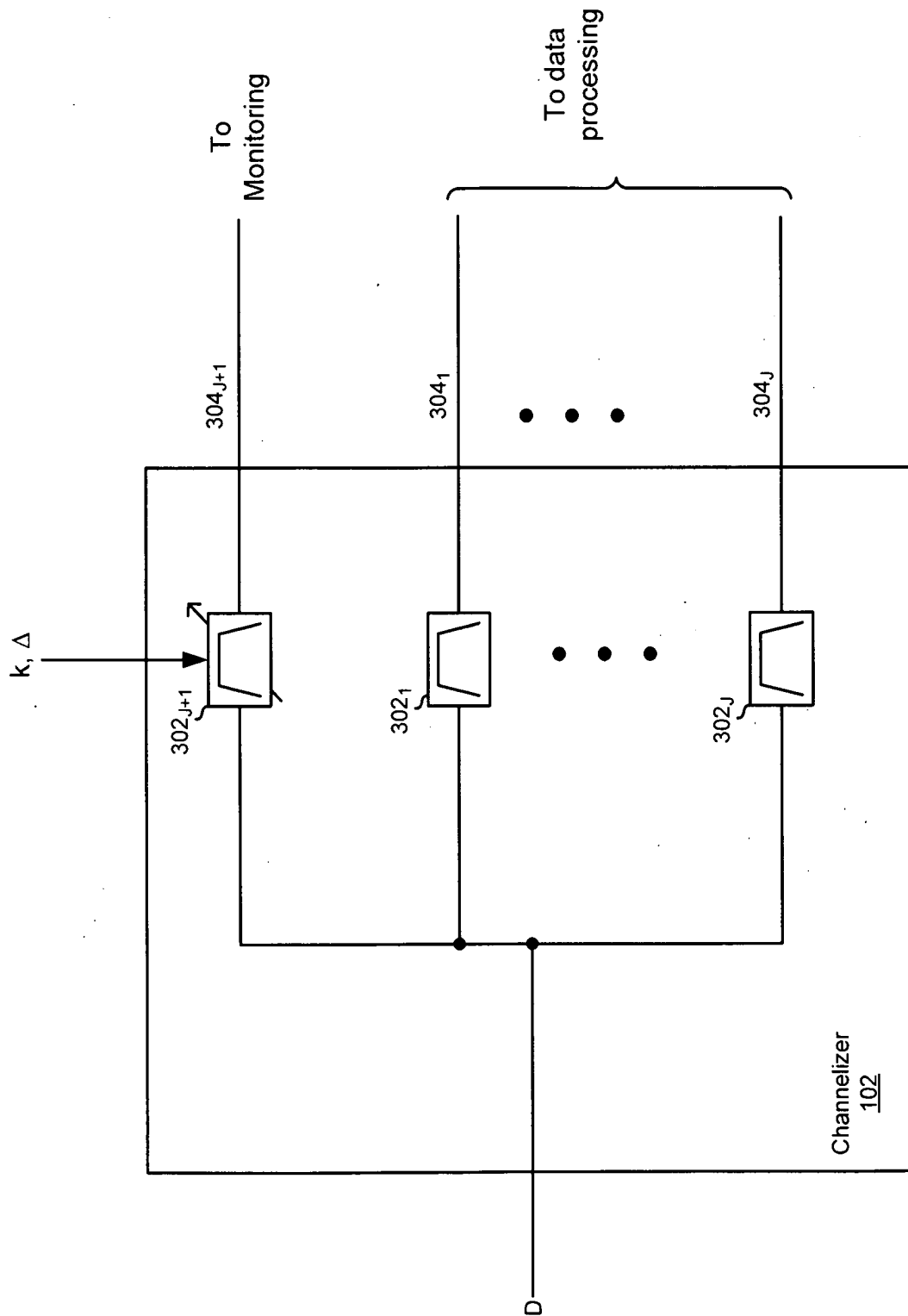


FIG. 3

7/7

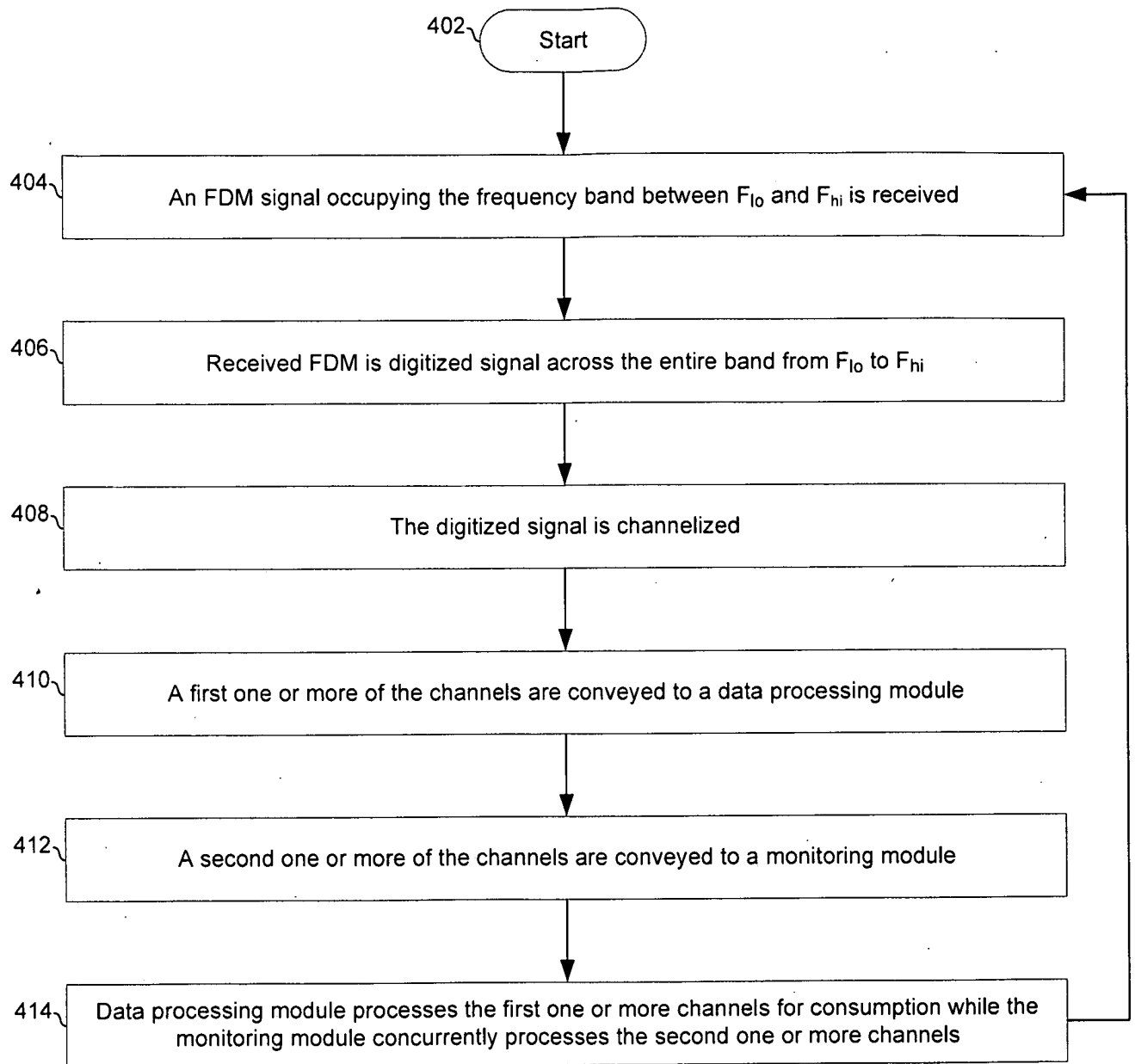


FIG. 4

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**DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN
APPLICATION DATA SHEET (37 CFR 1.76)**

Title of Invention	Title: METHOD AND APPARATUS FOR SPECTRUM MONITORING Docket No. 24351US03
-------------------------------	---

As the below named inventor, I hereby declare that:

This declaration is directed to: ☐ The attached application, or

☒ United States application or PCT international application number 14/341,880

filed on July 28, 2014

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

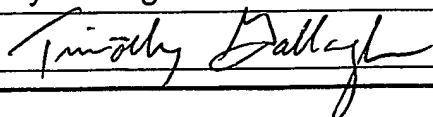
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LEGAL NAME OF INVENTORInventor: Timothy Gallagher

Date (Optional): _____

Signature: 

Note: An application data sheet (PTO/AIA/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional PTO/SB/AIA01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. 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 1 minute 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.

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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of
Invention

Title: METHOD AND APPARATUS FOR SPECTRUM MONITORING
Docket No. 24351US03

As the below named inventor, I hereby declare that:

This declaration
is directed to:

☐

The attached application, or

☒

United States application or PCT international application number 14/341,880

filed on July 28, 2014

The above-identified application was made or authorized to be made by me.

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LEGAL NAME OF INVENTOR

Inventor: Jun Huang

Date (Optional): _____

Signature: /Jun Huang/

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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.

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**DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN
APPLICATION DATA SHEET (37 CFR 1.76)****Title of
Invention****Title: METHOD AND APPARATUS FOR SPECTRUM MONITORING**
Docket No. 24351US03

As the below named inventor, I hereby declare that:

This declaration
is directed to:☐

The attached application, or

☒United States application or PCT international application number 14/341,880
filed on July 28, 2014

The above-identified application was made or authorized to be made by me.

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by fine or imprisonment of not more than five (5) years, or both.**WARNING:**

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LEGAL NAME OF INVENTORInventor: Patrick TierneyDate (Optional): 9/4/15Signature: /Patrick Tierney/

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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).
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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.

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:



Practitioners associated with Customer Number:

23,446

OR



Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number

Name	Registration Number

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignments documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:



The address associated with Customer Number:

23,446

OR

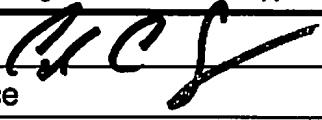
☐	Firm or Individual Name			
	Address			
	City	State	Zip	
	Country			
	Telephone	Email		

Assignee Name and Address: Maxlinear, Inc.
5966 La Place Court
Suite 100
Carlsbad, CA 92008

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SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date	8-18-15
Name	Adam Spice	Telephone	
Title	Chief Financial Officer		

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Electronic Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		METHOD AND APPARATUS FOR SPECTRUM MONITORING		
First Named Inventor/Applicant Name:		Timothy Gallagher		
Filer:		Chad M. Gilles/Laura Foley		
Attorney Docket Number:		24351US04		
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility application filing	1011	1	280	280
Utility Search Fee	1111	1	600	600
Utility Examination Fee	1311	1	720	720
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1600

Electronic Acknowledgement Receipt

EFS ID:	24163590
Application Number:	14948947
International Application Number:	
Confirmation Number:	4520
Title of Invention:	METHOD AND APPARATUS FOR SPECTRUM MONITORING
First Named Inventor/Applicant Name:	Timothy Gallagher
Customer Number:	23446
Filer:	Chad M. Gilles/Laura Foley
Filer Authorized By:	Chad M. Gilles
Attorney Docket Number:	24351US04
Receipt Date:	23-NOV-2015
Filing Date:	
Time Stamp:	15:17:48
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$ 1600
RAM confirmation Number	1868
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	Application Data Sheet	24351US04_ADS_new.pdf	1793037	no	9
			57b2d0e535d60df0a078dcc2f4cfc4912bce78e3		
Warnings:					
Information:					
2		24351US04_Specification.pdf	86163	yes	20
			dcffb09701da0add892843432d6af6236453641f		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	15	
	Claims		16	19	
	Abstract		20	20	
Warnings:					
Information:					
3	Drawings-only black and white line drawings	24351US04_Figs_as_filed.pdf	75684	no	7
			61f44c8adc1681fc979be2c990c5d50d31d99756		
Warnings:					
Information:					
4	Oath or Declaration filed	24351US04_Declaration_Gallagher_executed.pdf	152773	no	1
			0dc61c476e1e75bb7de9d0451dc8968cbb8c05f4		
Warnings:					
Information:					
5	Oath or Declaration filed	24351US04_Declaration_Huang-signed.pdf	82381	no	2
			903ae2414844d085d905f9137d849c0dd4238cb2		
Warnings:					
Information:					
6	Oath or Declaration filed	24351US04_Declaration_Tierney_executed.pdf	63807	no	2
			91797ba4ae069a954ac4c19a66b2f71f03c29bb9		

Warnings:					
Information:					
7	Power of Attorney	Maxlinear_AIA_POA_New_Address.pdf	57159 c411665911520d2fc043d90fdc2ec2c276011499	no	1
Warnings:					
Information:					
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Total Files Size (in bytes):			2345984		
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.					

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	24351US04
		Application Number	
Title of Invention	METHOD AND APPARATUS FOR SPECTRUM MONITORING		
The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.			

Secrecy Order 37 CFR 5.2:

☐	Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
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Inventor Information:

Inventor	1				Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Timothy		Gallagher		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
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Inventor	2				Remove
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	Patrick		Tierney		
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Postal Code	92008	Country	US		

Inventor	3				Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Jun		Huang		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					

Application Data Sheet 37 CFR 1.76		Attorney Docket Number		24351US04	
		Application Number			
Title of Invention		METHOD AND APPARATUS FOR SPECTRUM MONITORING			
City	San Diego	State/Province	CA	Country of Residence	US
Mailing Address of Inventor:					
Address 1		5966 La Place Court			
Address 2		Ste. 100			
City	Carlsbad	State/Province	CA		
Postal Code	92008	Country	US		
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button.					Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).			
☐ An Address is being provided for the correspondence information of this application.			
Customer Number	23446		
Email Address	mhmpto@mcandrews-ip.com	Add Email	Remove Email

Application Information:

Title of the Invention	METHOD AND APPARATUS FOR SPECTRUM MONITORING		
Attorney Docket Number	24351US04	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	7	Suggested Figure for Publication (if any)	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)
☐ Request Not to Publish. I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application has not and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	24351US04
		Application Number	
Title of Invention	METHOD AND APPARATUS FOR SPECTRUM MONITORING		

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)
Customer Number	23446		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status		Patented		Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
	Continuation of	14341880	2014-07-28	9203653	2015-12-01
Prior Application Status		Patented		Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
14341880	Continuation of	13607916	2012-09-10	8792008	2014-07-29
Prior Application Status		Expired		Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)		
13607916	Claims benefit of provisional	61532098	2011-09-08		
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.					Add

Foreign Priority Information:

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	24351US04
		Application Number	
Title of Invention	METHOD AND APPARATUS FOR SPECTRUM MONITORING		

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)ⁱ the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Access Code ⁱ (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013. NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	24351US04
		Application Number	
Title of Invention	METHOD AND APPARATUS FOR SPECTRUM MONITORING		

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	24351US04
		Application Number	
Title of Invention	METHOD AND APPARATUS FOR SPECTRUM MONITORING		

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant	1	Remove
If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section. Clear		
☒ Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.		Person who shows sufficient proprietary interest
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:		
Name of the Deceased or Legally Incapacitated Inventor:		
If the Applicant is an Organization check here. ☒		
Organization Name	MaxLinear, Inc.	
Mailing Address Information For Applicant:		
Address 1	5966 La Place Court	
Address 2	Ste. 100	
City	Carlsbad	State/Province CA
Country	US	Postal Code 92008
Phone Number		Fax Number
Email Address		
Additional Applicant Data may be generated within this form by selecting the Add button. Add		

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	24351US04
		Application Number	
Title of Invention	METHOD AND APPARATUS FOR SPECTRUM MONITORING		

Assignee	1			
Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.				
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NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). However, if this Application Data Sheet is submitted with the **INITIAL** filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Chad M. Gilles/		Date (YYYY-MM-DD)	2015-11-23
First Name	Chad	Last Name	Gilles	Registration Number
				60590
Additional Signature may be generated within this form by selecting the Add button. Add				

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	24351US04
		Application Number	
Title of Invention	METHOD AND APPARATUS FOR SPECTRUM MONITORING		

This collection of information is required by 37 CFR 1.76. 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 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet 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.**

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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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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 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.

METHOD AND APPARATUS FOR SPECTRUM MONITORING

PRIORITY CLAIM

[0001] This patent application is a continuation of U.S. Patent Application Serial No. 14/341,880 filed on July 28, 2014 now patented as U.S. Patent No. 9,203,653, which is a continuation of U.S. Patent Application Serial No. 13/607,916 filed on September 10, 2012 now patented as U.S. Patent No. 8,792,008, which also makes reference to, claims priority to and claims benefit from United States Provisional Patent Application Serial No. 61/532,098 filed on September 8, 2011. Each of the above referenced documents is hereby incorporated herein by reference in its entirety.

INCORPORATION BY REFERENCE

[0002] This patent application also makes reference to:

United States Patent Application Serial No. 13/336,451 titled “Method and Apparatus for Broadband Data Conversion,” filed on December 23, 2011, and published as U.S. Patent Application Publication No. 2012/0163518;

United States Patent Application Serial No. 13/485,003 titled “Multi-layer Time-Interleaved Analog-to-Digital Converter (ADC),” filed on May 31, 2012 and now patented as U.S. Patent No. 8,611,483; and

United States Patent Application Serial No. 13/588,769 titled “Multi-Standard Coverage Map Generation,” filed on August 17, 2012, and now patented as U.S. Patent No. 9,026,118.

[0003] Each of the above referenced documents applications is hereby incorporated herein by reference in its entirety.

FIELD OF THE INVENTION

[0004] Certain embodiments of the invention relate to signal processing. More specifically, certain embodiments of the invention relate to a method and system for spectrum monitoring.

BACKGROUND OF THE INVENTION

[0005] Network-based services can become unacceptable if network parameters fall outside of those for which receivers in the network were designed. For example, in a cable television system there are specifications for the number of channels on the plant, the types of channels, the signal levels of those channels and the impairments that can be on the plant that would affect the performance of the receiver. If some or all of these parameters deviate outside acceptable bounds, the user may experience unacceptable performance. Conventional methods and apparatuses for monitoring network parameters are too costly and impractical for use in customer-premises equipment (CPE).

[0006] Further limitations and disadvantages of conventional and traditional approaches will become apparent to one of skill in the art, through comparison of such systems with some aspects of the present invention as set forth in the remainder of the present application with reference to the drawings.

BRIEF SUMMARY OF THE INVENTION

[0007] A system and/or method is provided for spectrum monitoring, substantially as shown in and/or described in connection with at least one of the figures, as set forth more completely in the claims.

[0008] These and other advantages, aspects and novel features of the present invention, as well as details of an illustrated embodiment thereof, will be more fully understood from the following description and drawings.

BRIEF DESCRIPTION OF SEVERAL VIEWS OF THE DRAWINGS

[0009] FIG. 1A depicts an example cable system in accordance with an example embodiment of the invention.

[0010] FIG. 1B depicts an example receiver operable to perform spectrum monitoring in accordance with an example embodiment of the invention.

[0011] FIG. 1C depicts an example satellite system in accordance with an example embodiment of the invention.

[0012] FIG. 2A depicts an example RF front-end of a receiver operable to perform spectrum monitoring in accordance with an example embodiment of the invention.

[0013] FIG. 2B depicts another example RF front-end of a receiver operable to perform spectrum monitoring in accordance with an example embodiment of the invention.

[0014] FIG. 3 depicts an example channelizer which may be utilized for performing spectrum monitoring in accordance with an example embodiment of the invention.

[0015] FIG. 4 is a flow chart illustrating example steps for spectrum monitoring in accordance with an example embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0016] As utilized herein the terms "circuits" and "circuitry" refer to physical electronic components (i.e. hardware) and any software and/or firmware ("code") which may configure the hardware, be executed by the hardware, and or otherwise be associated with the hardware. As utilized herein, "and/or" means any one or more of the items in the list joined by "and/or". For example, "x and/or y" means any element of the three-element set {(x), (y), (x, y)}. Similarly, "x, y, and/or z" means any element of the seven-element set {(x), (y), (z), (x, y), (x, z), (y, z), (x, y, z)}. As utilized herein, the terms "block" and "module" refer to functions than can be implemented in hardware, software, firmware, or any combination of one or more thereof.

[0017] FIG. 1A depicts an example communication system in accordance with an example embodiment of the invention. Shown in FIG. 1 is a terrestrial television antenna 102, a satellite dish 104, an Internet Protocol (IP) network 106, a headend 108, a wide area network (e.g., hybrid fiber-coaxial (HFC) network) 118, a gateways 120a and 120b, end systems 126a and 126b (e.g., computers), and end systems 128a and 128b. The headend 108 comprises a switch 110, a video modulator 112, a cable modem termination system (CMTS) 114, and a splitter/combiner 116.

[0018] For downstream traffic, the headend 108 may receive television signals via the antenna 102 and the satellite dish 104, and may receive data via the IP network 106. The switch 110 may convey the television signals to the video modulator 112 and the data to the CMTS 114. The video modulator 112 may modulate the received television signals onto a carrier. The CMTS 114 may modulate the received data onto a carrier. The splitter/combiner 116 may combine the outputs of the video modulator 112 and the CMTS 114 resulting in a frequency division multiplexed (FDM) signal comprising one or more television channels and/or one or more DOCSIS channels. The FDM signal may be

onto the wide area network (WAN) 118 for distribution to customer premise equipment (CPE). Each of the gateways 120a and 120b may comprise a receive module 150 operable to process the received FDM signal as described below.

[0019] In an example embodiment, each of the gateways 120a and 120b may be operable to transmit, via a module 152, messages to the CMTS 114. For such upstream data, the gateways 120a and 120b may modulate messages (e.g., network management/maintenance messages) onto one or more carriers for transmission via the WAN 118. The splitter/combiner 116 may then convey the message to the CMTS 114. The CMTS 114 may process the messages and, in an example embodiment, adjust transmission parameters (e.g., modulation parameters, transmit power, frequency offsets, etc.) and/or perform other maintenance/management based on the received messages.

[0020] FIG. 1B depicts an example receiver operable to perform spectrum monitoring in accordance with an example embodiment of the invention. Shown in FIG. 1B is a receiver circuit 100 comprising an RF receive front-end module 158, a channelizer module 102, a monitoring module 154, and a data processing module 156.

[0021] The RF receive front-end 158 may be operable to process a received RF signal S to generate a digital signal D. The signal S may be the result of a plurality of television and/or DOCSIS channels being frequency division multiplexed into a single signal. The signal S may occupy a frequency band from F_{lo} to F_{hi} . The RF front-end 158 may, for example, amplify, down-convert, filter, and/or digitize the received signal S to generate the digital signal D. Example embodiments of the RF front-end are depicted in FIGs. 2A and 2B.

[0022] The channelizer 102 may be operable to select $J+1$ bands (represented as C_1 – C_{J+1}) of the signal S and output each of the selected bands to the monitoring module 154 and/or the data processing module 156, where J is an integer greater than 1. An example

embodiment of the channelizer 102 is depicted in FIG. 3. Each band C_j may, for example, correspond to the frequency band of one or more television channels. For example, each band C_j may be an integer multiple of 6MHz (U.S.) or 8 MHz (EU).

[0023] In an example embodiment, the channelizer 102 may be implemented entirely in the digital domain and the channelization may be achieved via one or more digital filtering algorithms and/or other digital signal processing algorithms.

[0024] The monitoring module 154 may be operable to analyze the band C_{j+1} that it receives from the channelizer 102 to measure/determine characteristics such as, for example, signal power level vs. frequency, delay vs. frequency, phase shift vs. frequency, type and/or amount of modulation, code rate, interference levels, signal to noise ratio, a transfer function of the channel over which the signal was received, an impulse response of the channel over which the signal was received, and/or any other characteristic that may help assess characteristics of the channel over which the signal was received, assess characteristics of the transmitter that sent the signal and/or any otherwise be pertinent to performance of the communication system. The monitoring module may also be operable to generate one or more control signals 160 for configuring the channelizer 102 and/or for configuring the RF front-end 158. Additionally or alternatively, the control signal(s) 160 output by the monitoring module 154 may control the transmission of network management/maintenance messages by the device 150. Such message may comprise, for example, network status updates indicating whether one or more communication parameters of one or more received television or DOCSIS channels are outside acceptable bounds, and/or conveying measured/determined characteristics back to a source of the received signal (e.g., back to a cable headend). In an example embodiment, the monitoring module 174 may be operable to demodulate signals for measuring one or more characteristics such as signal-to-noise ratio, code rate.

[0025] The data processing module 156 may be operable to process the bands C_1 – C_J conveyed to it by the channelizer 102 to recover data present in one or more television channels present in those bands of the signal S. The data processing module 156 may, for example, perform synchronization, equalization, and decoding. The data processing module 156 may output processed data (e.g., MPEG transport stream packets and/or Internet Protocol packets) to end systems 126, perhaps via an interface such as an HDMI interface and/or an Ethernet interface (not shown). The data processing module 156 may also be operable to generate one or more control signals 162 for configuring the channelizer 102 and/or the receive front-end 158.

[0026] The parallel arrangement of the monitoring module 154 and data processing module 156 may enable determination of signal and/or channel characteristics without having to interrupt service to user equipment 126 and 128.

[0027] In an example embodiment, the signal S may be a cable television signal with $F_{lo} \approx 55\text{MHz}$, $F_{hi} \approx 1002\text{ MHz}$. In an example embodiment, the signal S may be a MoCA signal with $F_{lo} \approx 1150\text{ MHz}$ and $F_{hi} \approx 2100\text{ MHz}$. These numbers are purely for illustration and not intended to be limiting.

[0028] In an example embodiment, the signal S may be a satellite television signal such as may be at the input of a LNB, at the output of a LNB, or at the input of a indoor unit (e.g., set top box). In such an embodiment, the front-end 158, channelizer 152, data processing module 154, and/or monitoring module 154 may reside in the indoor unit (e.g., set-top box), outdoor unit (e.g., satellite dish or accompanying components), and/or may be distributed among the indoor unit and outdoor unit of a satellite installation residing at a customer premises. An example of such an embodiment is shown in FIG. 1C.

[0029] In operation of such an example embodiment, the signal S may be amplified, possibly downconverted, and digitized by the RF front-end 158 to generate the signal D. The channelizer 102 may then select J bands of the signal D for output to the data processing module 156. Each of the selected bands C_1 – C_J may, for example, comprise one or more of the cable television channels and/or one or more of the DOCSIS channels that make up the signal S. The data processing module 156 may provide one or more control signals to determine which portion of the signal D is selected for each of the bands C_1 – C_J . The selection may be based, for example, on which television channels are being consumed by end systems 128 and/or whether DOCSIS data is being consumed by end systems 126. The channelizer 102 may also select one band, represented as band C_{J+1} , to be output to the monitoring module 154. Band C_{J+1} may comprise any portion or portions (including the entire bandwidth from F_{lo} to F_{hi}) of the signal D. Which portion of the signal S is selected as band C_{J+1} may, for example, be configured by the monitoring module 154. The data processing module 156 may process one or more of bands C_1 – C_J to recover data on one or more channels (e.g., television and/or DOCSIS channels) present in those bands while the monitoring module 154 may concurrently process band C_{J+1} to measure/determine characteristics of all or a portion of the signal S between f_{lo} and f_{hi} .

[0030] FIG. 1C depicts an example satellite system in accordance with an example embodiment of the invention. Shown in FIG. 1C is a satellite dish assembly 172, and a gateway 196. The subassembly 174 comprises a feed horn 182, an LNB 194, the front-end 158, the channelizer 152, the monitoring module 154, and the data processing module 156. The various modules of the subassembly 174 may reside in one or more housings, on one or more printed circuit boards, and/or one or more integrated circuits (e.g., one or more silicon dice). In another example embodiment, the monitoring module 154 and/or the data processing module 156 may reside in the gateway 196.

[0031] In the example embodiment depicted, the satellite dish assembly 172 comprises a parabolic reflector 176 and a subassembly 174 mounted (e.g., bolted or welded) to a support structure 178 which, in turn, comprises a boom 190 and attaches (e.g., via bolts) to the premises 180 (e.g., to the roof). In another example embodiment, all or a portion of the modules 152, 154, and/or 156 may be mounted to the premises 180 separate from the satellite dish (e.g., connected via wired and/or wireless connections), but may still be part of the “outdoor unit.”

[0032] The gateway 196 may receive data from the satellite dish assembly 172 (via cable(s) 184). The gateway and may transmit data onto and receive data from the WAN 192 (via broadband connection 188). The gateway 196 may transmit data to and receive data from user equipment 128 and 126 (via one or more connections 186).

[0033] FIG. 2A depicts an example RF front-end of a receiver operable to perform spectrum monitoring in accordance with an example embodiment of the invention. The RF front-end 158A shown in FIG. 2A comprises a variable gain amplifier 202, and receive chains 204_1 – 204_L , where L is an integer greater than or equal to 1. Each receive chains 204_l may comprise an amplifier module 210_l , a mixer module 212_l , a filter module 214_l , and an analog-to-digital converter (ADC) module 216_l , where l is an integer between 1 and L .

[0034] Each amplifier 210_l may be operable to amplify a band l of the signal S . Each mixer 212_l may be operable to mix a band l of the signal S with a local oscillator signal (not shown) to downconvert the band l to a lower frequency. Each filter module 214_l may be operable to bandpass filter the band l to remove/attenuate frequencies outside band l . Each ADC 216_l may be operable to convert the band l of the analog signal S to a corresponding digital representation. Operation of the RF front-end 158 and/or processing of signals generated by the front-end 158, may, for example, be as described

in United States Patent Application Serial No. 13/336,451 entitled “Method and Apparatus for Broadband Data Conversion” which is incorporated by reference herein, as set forth above.

[0035] In an example embodiment, the front-end 158A may reside in a cable gateway such as the cable gateway 120 described above. In an example embodiment, the front-end 158A may reside in satellite gateway/set-top box and/or in an outdoor unit of a satellite reception assembly (e.g., collocated on-chip or on-PCB with a satellite low-noise block downconverter (LNB)).

[0036] FIG. 2B depicts another example RF front-end of a receiver operable to perform spectrum monitoring in accordance with an example embodiment of the invention. The RF front-end 158B shown in FIG. 2B comprises a variable gain amplifier 252, a filter 254, and an ADC 256. Functions performed by the RF front-end 158B may be referred to as “full-spectrum capture” (or “FSC”).

[0037] In the front-end 158B, the entire bandwidth, from F_{lo} to F_{hi} , of signal S may be amplified by the amplifier 252 to generate S' . The amplified signal S' may be then filtered by the filter 254 to remove undesired signals outside of F_{lo} to F_{hi} and generate signal S'' . The signal S'' , from F_{lo} to F_{hi} , may then be digitized by the ADC 256 to generate signal D . In an example embodiment, the ADC may be as described in United States Patent Application Serial No. 13/485,003 entitled “Multi-layer Time-Interleaved Analog-to-Digital Converter (ADC),” which is incorporated by reference herein, as set forth above.

[0038] In an example embodiment, the ADC 256 may be capable of digitizing a signal S wherein F_{lo} to F_{hi} is 1 GHz or higher. Accordingly, for cable television / DOCSIS, the ADC 256 may be operable to digitize the entire cable downstream (e.g., from ~55MHz to ~1002MHz). Similarly, for satellite television, the ADC 256 may be operable to digitize

the received signal at the input of the LNB, and/or the downconverted signal (e.g., from ~1GHz to ~2GHz) at the output by an LNB.

[0039] FIG. 3 depicts an example channelizer which may be utilized for performing spectrum monitoring in accordance with an example embodiment of the invention. Band selection filters 302_1 – 302_J of the channelizer 102 may each process the signal D to recover a corresponding one of the J selected bands of the signal D, and output the band on a corresponding one of the ports 304_1 to 304_J . A band selection filter 302_{J+1} of the channelizer 102 may process the signal D to recover band C_{J+1} from the signal D, and output band C_{J+1} on the port 304_{J+1} . Which band or bands are selected by the filter 302_{J+1} may be configured based on one or more control signals input to the channelizer 102. For example, the value of a parameter k may determine the center frequency of the portion of signal D that is to be selected as C_{J+1} by the filter 302_{J+1} , and the value of Δ may determine the bandwidth of the portion of this signal D that is selected as band C_{J+1} for output on the port 304_{J+1} . In this manner, all of the signal D between F_{lo} and F_{hi} or any portion or portions of the signal D, may be selected for output on the port 304_{J+1} .

[0040] FIG. 4 is a flow chart illustrating example steps for spectrum monitoring in accordance with an example embodiment of the invention. After start step 402, in step 404, the receiver circuit 100 may receive a frequency division multiplexed (FDM) signal comprising one or more channels (e.g., satellite television channels, cable television channels, and/or DOCSIS channels) occupying a frequency band between F_{lo} and F_{hi} . In step 406, the received FDM signal is digitized across the full band from F_{lo} to F_{hi} . In step 408, the digitized signal is channelized into one or more bands. In step 410, a first one or more of the bands are conveyed to a data processing module. In step 412 a second one or more of the bands are output to a monitoring module. In step 414, the data processing module processes one or more of the first one or more bands to recover data on those

bands while the monitoring module concurrently processes the second one or more bands to determine characteristics of all or a portion of the frequency band from F_{lo} to F_{hi} .

[0041] Other embodiments of the invention may provide a non-transitory computer readable medium and/or storage medium, and/or a non-transitory machine readable medium and/or storage medium, having stored thereon, a machine code and/or a computer program having at least one code section executable by a machine and/or a computer, thereby causing the machine and/or computer to perform the steps as described herein for spectrum monitoring

[0042] Accordingly, the present invention may be realized in hardware, software, or a combination of hardware and software. The present invention may be realized in a centralized fashion in at least one computing system, or in a distributed fashion where different elements are spread across several interconnected computing systems. Any kind of computing system or other apparatus adapted for carrying out the methods described herein is suited. A typical combination of hardware and software may be a general-purpose computing system with a program or other code that, when being loaded and executed, controls the computing system such that it carries out the methods described herein. Another typical implementation may comprise an application specific integrated circuit or chip.

[0043] The present invention may also be embedded in a computer program product, which comprises all the features enabling the implementation of the methods described herein, and which when loaded in a computer system is able to carry out these methods. Computer program in the present context means any expression, in any language, code or notation, of a set of instructions intended to cause a system having an information processing capability to perform a particular function either directly or after either or both

of the following: a) conversion to another language, code or notation; b) reproduction in a different material form.

[0044] While the present invention has been described with reference to certain embodiments, it will be understood by those skilled in the art that various changes may be made and equivalents may be substituted without departing from the scope of the present invention. In addition, many modifications may be made to adapt a particular situation or material to the teachings of the present invention without departing from its scope. Therefore, it is intended that the present invention not be limited to the particular embodiment disclosed, but that the present invention will include all embodiments falling within the scope of the appended claims.

CLAIMS

What is claimed is:

1. A method comprising:
 - performing by one or more circuits of a receiver coupled to a television and data service provider headend via a hybrid fiber coaxial (HFC) network:
 - receiving, via said HFC network, a signal that carries a plurality of channels, wherein said channels comprise one or both of television channels and data channels;
 - digitizing said received signal to generate a digitized signal;
 - selecting a first portion of said digitized signal;
 - selecting a second portion of said digitized signal;
 - processing said selected second portion of said digitized signal to recover information carried in said plurality of channels;
 - analyzing said selected first portion of said digitized signal to measure a characteristic of said received signal; and
 - controlling the transmission of network management messages back to said headend based on said measured characteristic of said received signal.
2. The method of claim 1, wherein said network management messages indicate whether a parameter is outside of acceptable bounds.
3. The method of claim 2, wherein said parameter is a modulation parameter of said received signal.

4. The method of claim 2, wherein said parameter is a transmit power of said received signal.

5. The method of claim 2, wherein said parameter is a frequency offset of said received signal.

6. The method of claim 1, wherein said characteristic is signal power vs. frequency.

7. The method of claim 1, wherein said characteristics is signal phase vs. frequency.

8. The method of claim 1, wherein said characteristic is one of: signal-to-noise ratio, peak-to-average ratio, noise levels, bit error rate, and symbol error rate.

9. The method of claim 1, configuring, by said one or more circuits, a bandwidth and/or center frequency of said selected first portion of said digitized signal.

10. A system comprising:

a receiver configured to be coupled to a television and data service provider headend via a hybrid fiber coaxial (HFC) network, the receiver comprising: front-end circuitry operable to:

receive a signal that carries a plurality of channels, wherein said channels comprise one or both of television channels and data channels; and
digitize said received signal to generate a digitized signal;

channelizer circuitry operable to:

select a first portion of said digitized signal; and

select a second portion of said digitized signal;

processing circuitry operable to process said selected second portion of said digitized signal to recover information carried in said plurality of channels;

monitoring circuitry operable to:

analyze said selected first portion of said digitized signal to measure a characteristic of said received signal; and

control the transmission of network management messages back to said headend based on said measured characteristic of said received signal.

11. The system of claim 10, wherein said network management messages indicate whether a parameter is outside of acceptable bounds.

12. The system of claim 11, wherein said parameter is a modulation parameter of said received signal.

13. The system of claim 11, wherein said parameter is a transmit power of said received signal.

14. The system of claim 11, wherein said parameter is a frequency offset of said received signal.

15. The method of claim 1, wherein said characteristic is signal power vs. frequency.

16. The method of claim 1, wherein said characteristics is signal phase vs. frequency.

17. The system of claim 10, wherein said characteristic is one of: signal-to-noise ratio, peak-to-average ratio, noise levels, bit error rate, and symbol error rate.

18. The system of claim 10, comprising configuring, by said monitoring circuitry during operation of said one or more circuits, a bandwidth and/or center frequency of said selected first portion of said digitized signal.

ABSTRACT

A receiver is configured to be coupled to a television and data service provider headend via a hybrid fiber coaxial (HFC) network. The receiver comprises front-end circuitry operable to receive a signal that carries a plurality of television and/or data channels, and digitize the received signal to generate a digitized signal. The receiver comprises channelizer circuitry operable to select a first portion of the digitized signal, and select a second portion of the digitized signal. The receiver comprises processing circuitry operable to process the selected second portion of the digitized signal to recover information carried in the plurality of channels. The receiver comprises monitoring circuitry operable to analyze the selected first portion of the digitized signal to measure a characteristic of the received signal; and control the transmission of network management messages back to the headend based on the measured characteristic of the received signal.

1/7

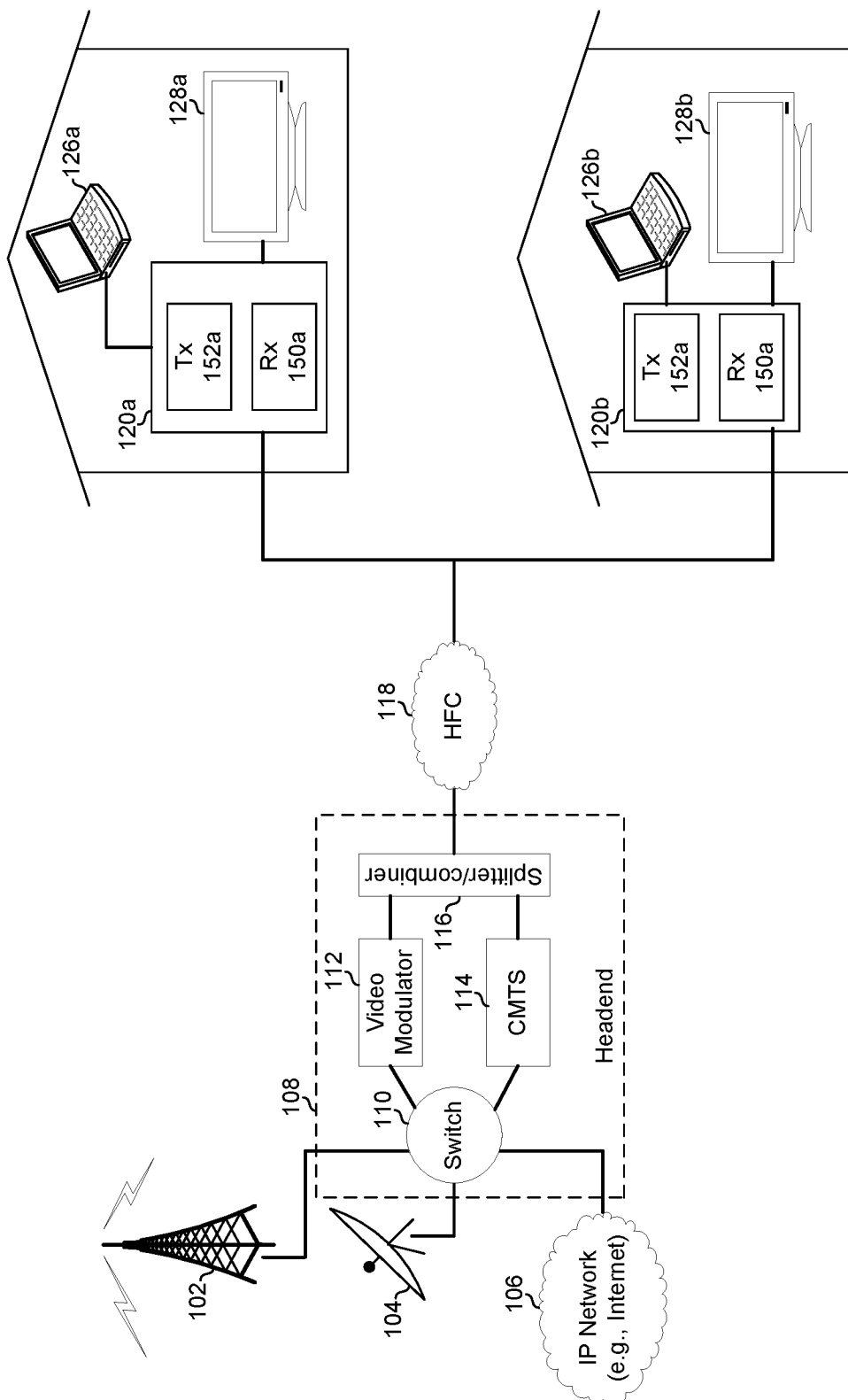


FIG. 1A

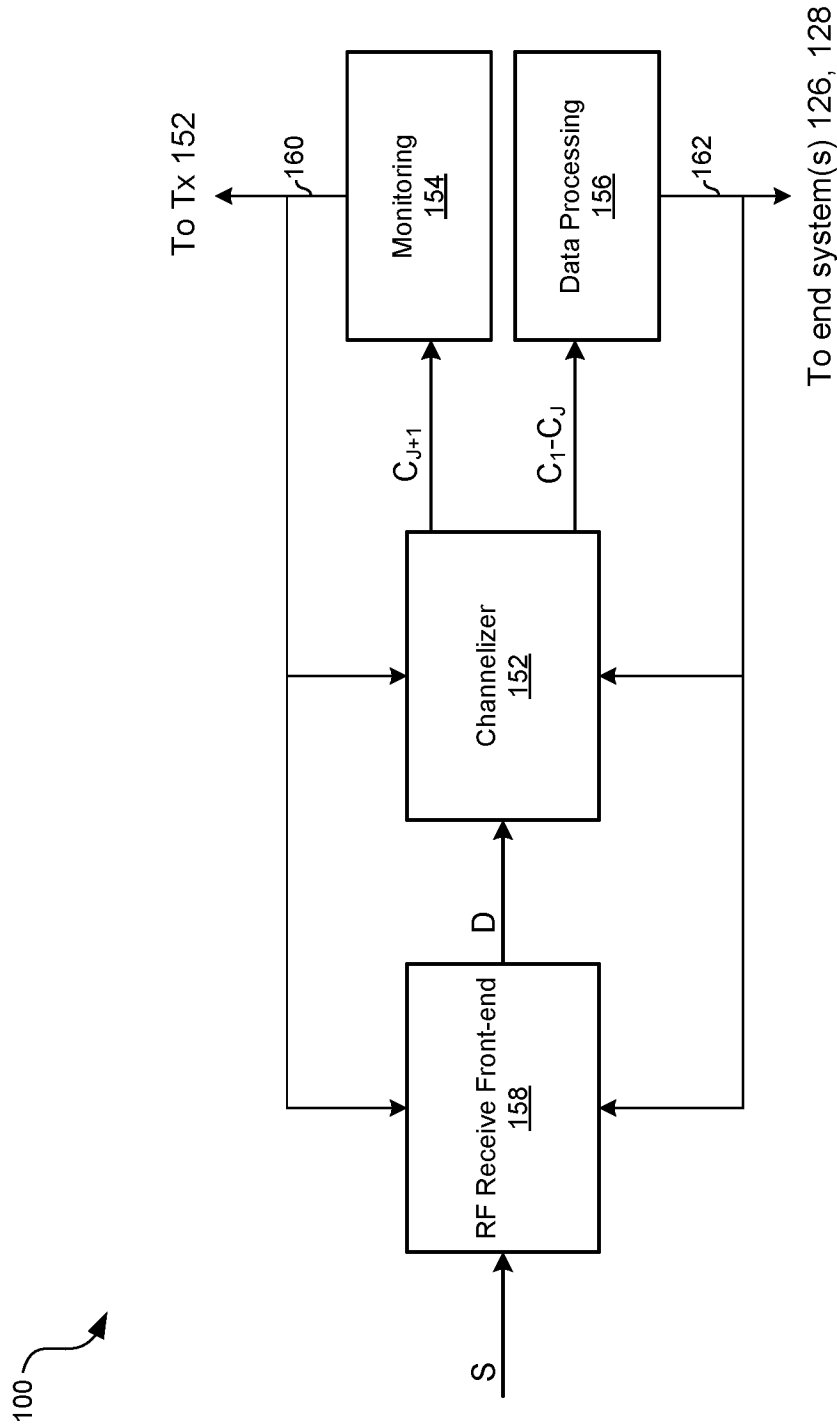


FIG. 1B

3/7

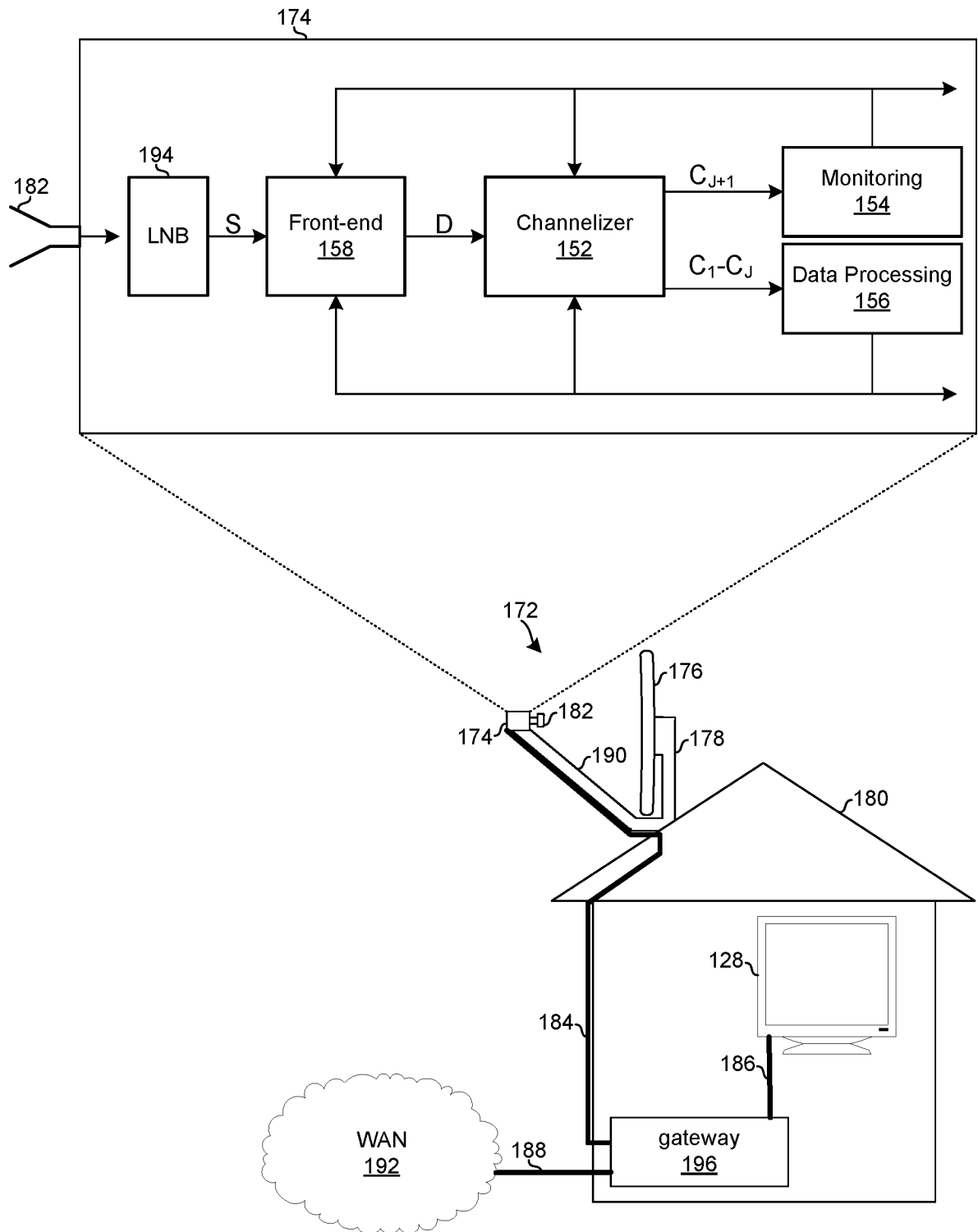


FIG. 1C

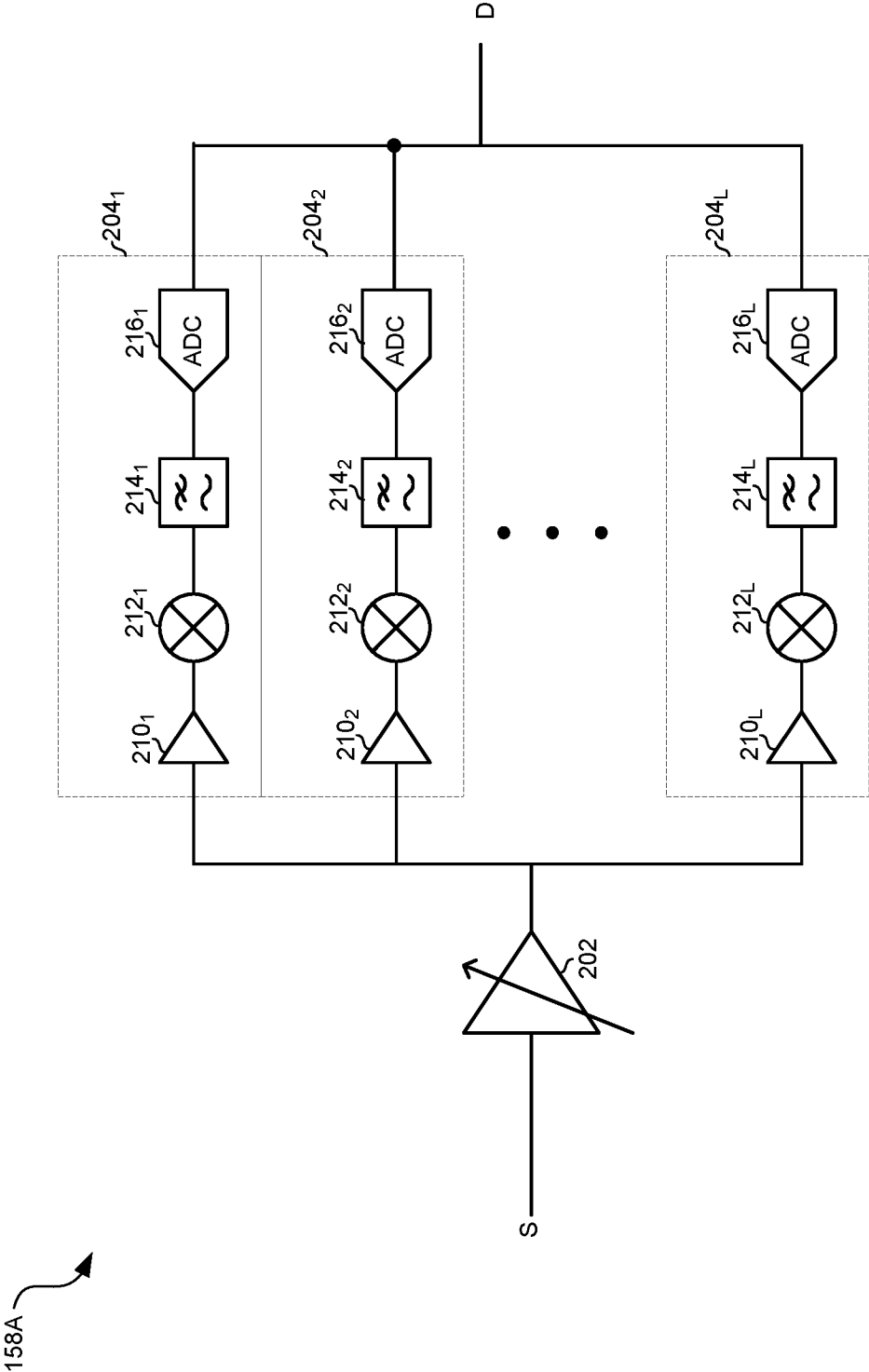


FIG. 2A

5/7

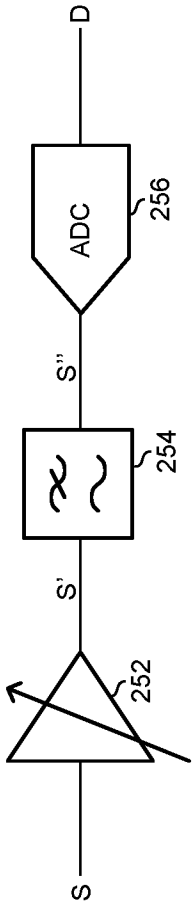


FIG. 2B

158B

6/7

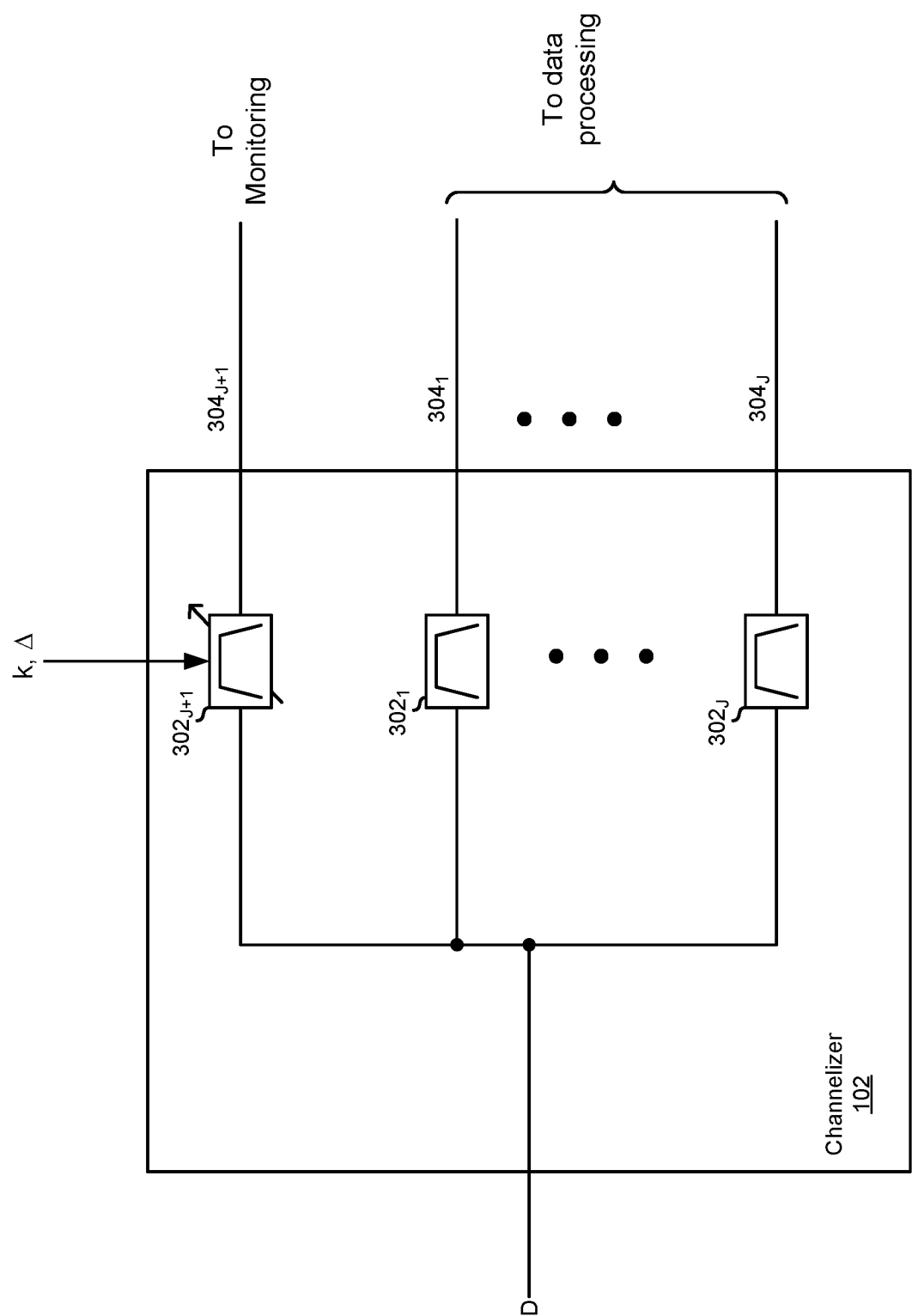


FIG. 3

7/7

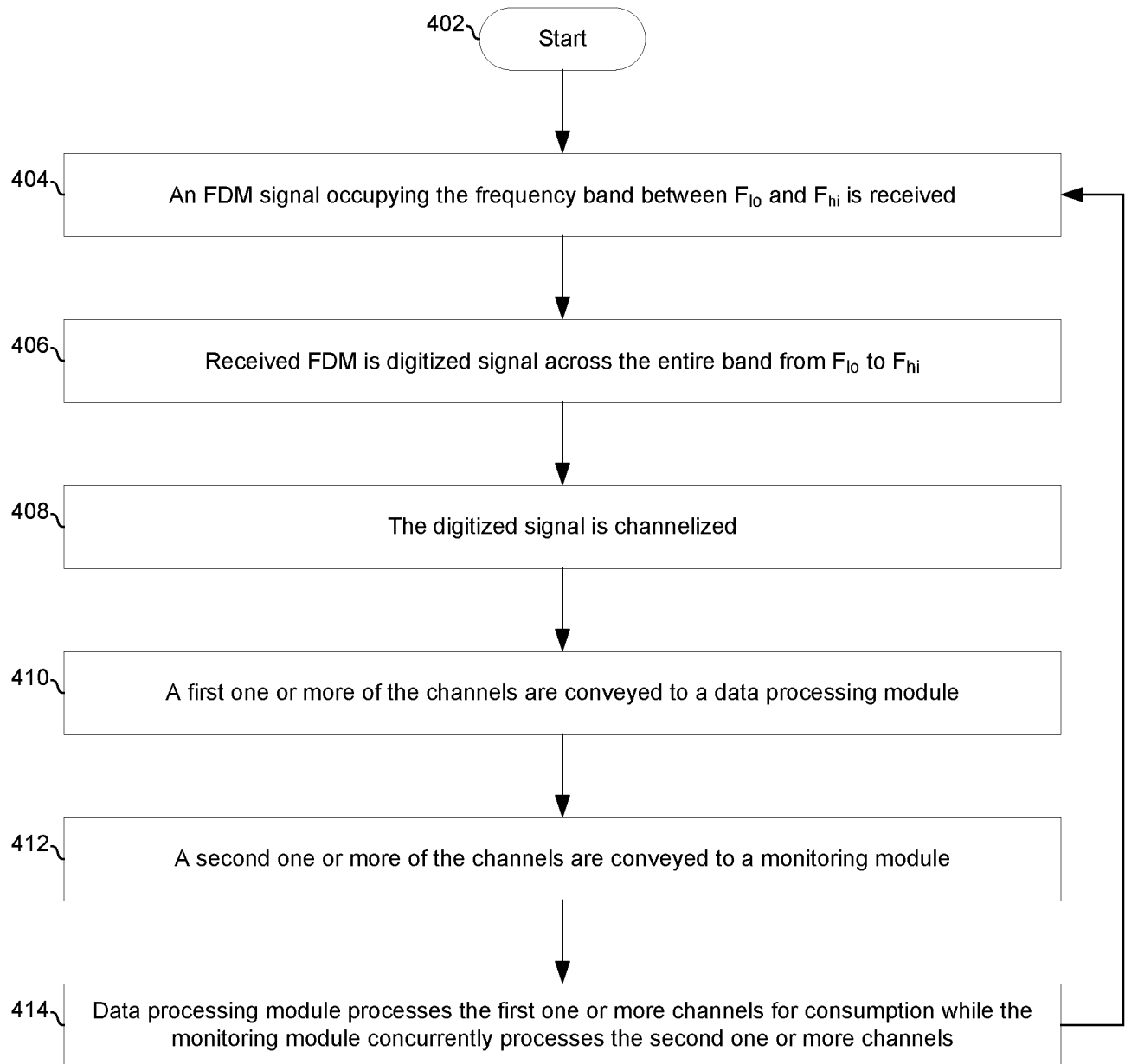


FIG. 4

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of
Invention

Title: METHOD AND APPARATUS FOR SPECTRUM MONITORING
Docket No. 24351US03

As the below named inventor, I hereby declare that:

This declaration
is directed to:

☐

The attached application, or

☒

United States application or PCT international application number 14/341,880
filed on July 28, 2014

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

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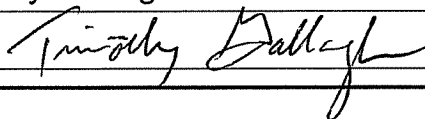
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LEGAL NAME OF INVENTOR

Inventor: Timothy Gallagher

Date (Optional) : _____

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LEGAL NAME OF INVENTORInventor: Jun Huang Date (Optional) : _____Signature: /Jun Huang/

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LEGAL NAME OF INVENTOR

Inventor: Patrick Tierney Date (Optional): 9/4/15

Signature: /Patrick Tierney/

Note: An application data sheet (PTO/AIA/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional PTO/SB/AIA01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. 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 1 minute 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.

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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 14/948,947	
APPLICATION AS FILED - PART I							
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	280
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A	600
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	720
TOTAL CLAIMS (37 CFR 1.16(j))	18	minus 20 = *			OR	x 80 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2	minus 3 = *				x 420 =	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
			TOTAL			TOTAL	1600
* If the difference in column 1 is less than zero, enter "0" in column 2.							
APPLICATION AS AMENDED - PART II							
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)
	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))					OR	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					OR	
			TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)
	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))					OR	
	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.							



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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
14/948,947	11/23/2015		1600	24351US04	18	2

CONFIRMATION NO. 4520

FILING RECEIPT

23446
MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, IL 60661



Date Mailed: 12/16/2015

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)

Timothy Gallagher, Encinitas, CA;
Patrick Tierney, Solana Beach, CA;
Jun Huang, San Diego, CA;

Applicant(s)

MaxLinear, Inc., Carlsbad, CA;

Power of Attorney: The patent practitioners associated with Customer Number 23446

Domestic Priority data as claimed by applicant

This application is a CON of 14/341,880 07/28/2014 PAT 9203653
which is a CON of 13/607,916 09/10/2012 PAT 8792008
which claims benefit of 61/532,098 09/08/2011

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.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 12/14/2015

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/948,947**

Projected Publication Date: 03/24/2016

Non-Publication Request: No

Early Publication Request: No
Title

METHOD AND APPARATUS FOR SPECTRUM MONITORING

Preliminary Class

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).

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Title 37, Code of Federal Regulations, 5.11 & 5.15

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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.

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/948,947	11/23/2015	Timothy Gallagher	24351US04

CONFIRMATION NO. 4520

23446
MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, IL 60661



Date Mailed: 12/16/2015

**NOTICE OF ACCEPTANCE OF AUTHORIZATION
TO PERMIT ACCESS TO SEARCH RESULTS**

This is in response to the applicant's authorization to permit access to the search results from the instant application under 37 CFR 1.14(h)(2) submitted on 11/23/2015.

The authorization to permit access to the search results under 37 CFR 1.14(h)(2) is accepted.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/megga/



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/948,947	11/23/2015	Timothy Gallagher	24351US04

CONFIRMATION NO. 4520

23446
MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, IL 60661



Date Mailed: 12/16/2015

**NOTICE OF ACCEPTANCE OF AUTHORIZATION TO PERMIT
ACCESS TO APPLICATION VIA PRIORITY DOCUMENT EXCHANGE**

This is in response to the applicant's authorization to permit access to the application-as-filed by participating offices under 37 CFR 1.14(h)(1) submitted on 11/23/2015.

The authorization to permit access to the application under 37 CFR 1.14(h)(1) is accepted.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/megga/

To: mhmpato@mcandrews-ip.com,,
From: PAIR_eOfficeAction@uspto.gov
Cc: PAIR_eOfficeAction@uspto.gov
Subject: Private PAIR Correspondence Notification for Customer Number 23446

Dec 16, 2015 05:38:48 AM

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SUITE 3400
CHICAGO, IL 60661
UNITED STATES

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The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

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Application	Document	Mailroom Date	Attorney Docket No.
14948947	APP.FILE.REC	12/16/2015	24351US04
	SREXR.G	12/16/2015	24351US04
	PD.AUTH.G	12/16/2015	24351US04

To view your correspondence online or update your email addresses, please visit us anytime at <https://sportal.uspto.gov/secure/myportal/privatepair>.

If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov with 'e-Office Action' on the subject line or call 1-866-217-9197 during the following hours:

Monday - Friday 6:00 a.m. to 12:00 a.m.

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/948,947	11/23/2015	Timothy Gallagher	24351US04

CONFIRMATION NO. 4520

PUBLICATION NOTICE



OC000000081678586

23446
MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, IL 60661

Title:METHOD AND APPARATUS FOR SPECTRUM MONITORING

Publication No.US-2016-0087865-A1

Publication Date:03/24/2016

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <http://pair.uspto.gov/>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

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Mar 25, 2016 05:27:44 AM

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Application	Document	Mailroom Date	Attorney Docket No.
14948947	NTC.PUB	03/24/2016	24351US04

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/948,947	11/23/2015	Timothy Gallagher	24351US04	4520

23446 7590 09/23/2016
MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, IL 60661

EXAMINER

NATNAEL, PAULO M

ART UNIT	PAPER NUMBER
----------	--------------

2422

NOTIFICATION DATE	DELIVERY MODE
-------------------	---------------

09/23/2016

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):

mhmpto@mcandrews-ip.com

Office Action Summary	Application No. 14/948,947	Applicant(s) GALLAGHER ET AL.	
	Examiner PAULOS M. NATNAEL	Art Unit 2422	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 _____.
☐ 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) 1-18 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) 1-18 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 10/23/15 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) | 3) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)
Paper No(s)/Mail Date _____ | 4) ☐ Other: _____ |

DETAILED ACTION

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

Examiner's Note

2. The examiner below cites particular figures, paragraphs, columns, and line numbers in the reference(s), as applied to the claims. Although the particular citations are representative teachings and are applied to specific limitations within the claims, other passages, internally cited references, and figures may also apply. In preparing a response, it is requested that the applicant fully consider the references in their entirety as potentially disclosing or teaching all or part of the claimed invention and fully consider the context of the passage as taught by the reference(s).

Double Patenting

3. 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 conflicting claims 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); *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 nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP §§ 706.02(l)(1) - 706.02(l)(3) for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) 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 www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

4. Claims **1-18** are rejected on the ground of nonstatutory double patenting as being unpatentable over claims **1, 3, 4,6,8,10,12 and 14 of U.S. Patent No. 9,203,653**.

Although the claims at issue are not identical, they are not patentably distinct from each other because the claimed subject matter in claims **1-18** is fully disclosed or is transparently found in claims **1, 3, 4,6,8,10,12 and 14** of Patent '**653** *with obvious wording variations* and allowing the invention defined by claims of the instant application would result in an unwarranted timewise extension of the monopoly defined by the invention of claims of patent '**653**.

While the patented claims do not recite "controlling the transmission of network management messages back to said headend based on said measured characteristic of said received signal," the patent claims recite outputting selected first portion to the signal analyzer for measurement of one or more characteristics of the received signal." The latter notwithstanding, however, it is well known in the art of television/video/audio broadcast to transmit, send, or transfer characteristics of a signal being received and processed back to the controller, which may be a server computer/controller, or the headend for the purpose of generating further adjustment and/or instructions based on such feedback. It would have been therefore obvious to those with ordinary skill in the art at the time the invention was made to modify the system/reference accordingly.

Claim Rejections - 35 USC § 103

5. 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, 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 negated by the manner in which the invention was made.

6. Claims **1-11** are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over **Krafft et al., US 2012/0163290 A1**.

Claim **1** is a method claim of claim **10** and, therefore, claim **1** is rejected for the same reasons shown in claim **10** (see below).

Regarding claims **2 and 11**, wherein said network management messages indicate whether a parameter is outside of acceptable bounds, see rejection of claim 10.

Regarding claims **3, 12**, the claimed wherein said parameter is a modulation parameter of said received signal, see “data modulation stage” in the transmitter ¶[0009 and 0011], which obviously generates a modulation parameter, value, characteristic, or property.

Regarding claims **4 and 13**, wherein said parameter is a transmit power of said received signal (**power amplifier amplifies the signal before transmission**, ¶[0009 and 0011],

Art Unit: 2422

which obviously such amplification generates a parameter, value, characteristic, or property, a transmit/transmission power, showing the power needed or used).

As to claims **5-8 and 14-17**, Krafft teaches multiple standards and various methods including data modulation scheme comprising frequency shift keying, etc. (**¶ 0011**).

Krafft also discloses low noise system, represented by low noise block down converter (LNB), **Fig.8; claim 3**.

As to claims **9 and 18**, configuring, by said one or more circuits, a bandwidth and/or center frequency of said selected first portion of said digitized signal, and comprising configuring, by said monitoring circuitry during operation of said one or more circuits, a bandwidth and/or center frequency of said selected first portion of said digitized signal (claim 18), Krafft discloses low noise system, represented by low noise block down converter (LNB), Fig.8; claim 3. Furthermore, the signal conditioning module 302 which is operable to produce multiple path signals 303 having a split input signal which in turn includes two or more bands each having a reduce bandwidth of the plurality of IF signals (**¶¶ [0085]-[0089]; claim 17**).

Regarding claim **10**, Krafft discloses the claimed system comprising:

a) a receiver configured to be coupled to a television and data service provider headend via a hybrid fiber coaxial (HFC) network (**¶¶ 0042 and 0100**), the receiver comprising:

Art Unit: 2422

front-end circuitry operable to: **(satellite receiver 120, Fig.6, receiving satellite signal 122 through antenna 125; Fig.14, step 402).**

b) receive a signal that carries a plurality of channels, wherein said channels comprise one or both of television channels and data channels **(satellite receiver 120, Fig.6, receiving satellite signal 122 through antenna 125; (See also Fig.14, step 402.)**

c) digitize said received signal **(ADC 352-1...352-N, Fig.11; (See, digitized input signal 332-1, Fig.11)** to generate a digitized signal channelizer circuitry operable to:

d) select a first portion of said digitized signal; and select a second portion of said digitized signal **(channelizer 348, Figs. 9-11; Fig.14, steps 412-414).**

e) processing circuitry operable to process said selected second portion of said digitized signal to recover information carried in said plurality of channels **(Packet network adapter module 140, Fig.6-7. Fig.14, step 404-408).**

f) monitoring circuitry operable to: analyze said selected first portion of said digitized signal to measure a characteristic of said received signal **(Packet network adapter module 140, Fig.6-7. See also Fig.14, step 404-408).**

As to the claimed “control the transmission of network management messages back to said headend based on said measured characteristic of said received signal,”

Art Unit: 2422

Krafft does not expressly teach “control the transmission of network management messages back to said headend based on said measured characteristic of said received signal. However, it would be obvious to the skilled in art of television, video, or audio broadcast to transmit, send, or transfer characteristics of a signal that has been received and/or processed back to the controller which may be a server computer or the headend controller, for the purpose of generating further adjustments and/or instructions based on such a feedback. In that regard, **Sasaki (US 20050152557 A1)** discloses multi-speaker audio system and automatic control method, comprising a server apparatus 100, speaker 200. Specifically, on [0216] Sasaki teaches that the server apparatus 100 calculates the transfer characteristic of the audio signal received from the speaker device 200, thereby determining the propagation delay time for each speaker device 200. The propagation delay time determined for each speaker device 200 is a delay from the timing of the trigger signal, and the propagation delay time of the speaker device 200 that has generated the trigger signal is zero. And “the server apparatus 100 can calculate the transfer characteristic from the audio signal from one or both of the two microphones 202a and 202b” ¶[0518]; **emphasis added**. It would have been therefore obvious to those with ordinary skill in the art at the time the invention was made to modify the system/reference in order to generate further adjustments or for the purpose of receiving further instructions in the operation of the device, i.e. the television/video/audio receiver using the feedback.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Reidhead et al. (US 7,162,731) discloses RF characterization of cable plant and corresponding calibration of communication equipment.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAULO M. NATNAEL whose telephone number is (571)272-7354. The examiner can normally be reached on 8AM-4:30PM Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jefferey Harold can be reached on (571) 272-7519. 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.

/PAULOS M NATNAEL/
Primary Examiner, Art Unit 2422

PMN
September 14, 2016

Application/Control Number: 14/948,947
Art Unit: 2422

Page 10

Notice of References Cited	Application/Control No. 14/948,947		Applicant(s)/Patent Under Reexamination GALLAGHER ET AL.	
	Examiner PAULOS M. NATNAEL		Art Unit 2422	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-2005/0152557 A1	07-2005	Sasaki, Toru	H04S7/302	381/58
*	B	US-7,162,731 B2	01-2007	Reidhead; Lance R.	H04L1/24	348/180
*	C	US-7,418,240 B2	08-2008	Hsu; Hanna S	H04L1/0003	370/252
*	D	US-2010/0171659 A1	07-2010	Waters; Deric Wayne	H04B17/24	342/357.74
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*	F	US-8,161,388 B2	04-2012	Rodriguez; Arturo A.	G06F3/14	348/125
*	G	US-8,611,483 B2	12-2013	Zhu; Jianyu	H04L7/0334	341/122
*	H	US-8,792,008 B2	07-2014	Gallagher; Timothy	H04L43/08	348/192
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		14948947	
	Filing Date		2015-11-23	
	First Named Inventor	Timothy Gallagher		
	Art Unit			
	Examiner Name			
	Attorney Docket Number		24351US04	

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Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6038435		2000-03-14	Zhang	

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	1	20120163290		2012-06-28	Krafft et al.	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		14948947	14948947 - GAU: 2422
	Filing Date		2015-11-23	
	First Named Inventor	Timothy Gallagher		
	Art Unit			
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	Attorney Docket Number		24351US04	

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Examiner Signature	/Paulos Natnael/	Date Considered	09/14/2016
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¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	14948947	14948947 - GAU: 2422
Filing Date	2015-11-23	
First Named Inventor	Timothy Gallagher	
Art Unit		
Examiner Name		
Attorney Docket Number	24351US04	

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

- ☐ That each item of information contained in the 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 the information disclosure statement. See 37 CFR 1.97(e)(1).

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- ☐ See attached certification statement.
- ☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.
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SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Chad M. Gilles/	Date (YYYY-MM-DD)	2015-11-24
Name/Print	Chad M. Gilles	Registration Number	60590

This collection of information is required by 37 CFR 1.97 and 1.98. 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 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: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	46007	frequency adj offset\$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/09/15 08:07
L3	28	(send\$3 transfer\$4 transmi\$4) near (signal near2 characteristic) near5 (headend server)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/09/15 08:09
L4	13	L3 and @ay<"2011"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/09/15 08:09
S1	0	("20120163290" "6038435").PN.).PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/14 07:38
S2	6	("20120163290" "6038435").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/09/14 07:39
S3	6	("2012/0163290").URPN.	USPAT	OR	ON	2016/09/14 08:09
S4	17	((("9203653") or ("20150022673")).PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/14 08:12
S5	15	"9203653".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	2016/09/14 08:13

			IBM_TDB			
S6	7	((("8611483") or ("9026118"))).PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/14 08:17
S7	12	("20090138966" "20090168843" "20100171659" "20110235758" "20120163290" "5375146" "6038435" "6263195" "6813320" "6904273" "7197685" "7912158").PN. OR ("9203653").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/09/14 08:22
S8	41	"9203653"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/09/14 09:49
S9	0	"9203653.pn"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/09/14 09:49
S10	15	"9203653".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/09/14 09:49
S11	3	"9203653"	USPAT	OR	ON	2016/09/14 09:50
S12	5	"8792008"	USPAT	OR	ON	2016/09/14 09:51
S13	7953	("hybrid fiber coaxial" HFC) and television and network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/09/14 10:10
S14	2320	S13 and (television TV broadcast\$3) adj channel	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/09/14 10:10
S15	785	S14 and (data information) adj channel	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/09/14 10:11

S16	327	S15 and (ADC digitiz\$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/09/14 10:12
S19	3	S16 and (analyz\$3 measur\$4 calculat\$3 comput\$5 determin\$5) near9 (signal near characteristic)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/09/14 10:14
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S21	1694	S20 and (data information) near2 channel	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/09/14 10:42
S22	698	S21 and (ADC digitiz\$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/09/14 10:42
S23	9	S22 and (analyz\$3 measur\$4 calculat\$3 comput\$5 determin\$5) near9 (signal near2 characteristic)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/09/14 10:43
S24	9	S23 not S18	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/09/14 10:43
S25	6	S23 not S19	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/09/14 10:43
S26	9	S23 AND ((G06F3/14 OR G09G2340/14 OR G09G2360/02 OR H04N2005/4412 OR H04N21/4122 OR H04N21/4147 OR H04N21/42204 OR H04N21/4402 OR H04N21/440263 OR H04N21/4758 OR	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	ON	2016/09/14 10:55

		H04N21/4854 OR H04N5/4401 OR H04N5/46 OR H04N7/0122 OR H04N21/42676 OR H04N21/615 OR H04N21/64723 OR H04N7/17309 OR H04N17/00 OR H04N21/23614 OR H04N21/4104 OR H04N21/4307 OR H04N21/4345 OR H04N21/4348 OR H04N21/4363 OR H04N21/6332 OR H04N21/654 OR H04N21/8133 OR H03G3/3036 OR H04L1/24 OR H04L25/022 OR H04L25/0224 OR H04L25/0226 OR H04L27/0002 OR H04L27/34 OR H04L12/66 OR H04L1/0003 OR H04L1/0009 OR H04L1/20 OR H04L43/08 OR G09B5/065 OR H04B17/309).CPC.)	DERWENT; IBM_TDB			
S27	2067	348/180,192-193.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/09/14 10:58
S28	192	S27 and (television TV broadcast\$3) adj2 channel	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/09/14 10:58
S29	85	S28 and (data information) near2 channel	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/09/14 10:58
S30	4	S29 and (analyz\$3 measur\$4 calculat\$3 comput\$5 determin\$5) near9 (signal near2 characteristic)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/09/14 10:58
S31	368	transmi\$4 near9 (signal near2 characteristic) same (headend server) (remote adj (microcontroller microcomputer))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/09/14 11:32
S32	169	(send\$3 transfer\$4 transmi\$4) near (signal near2 characteristic) near9 (headend server) (remote adj (microcontroller microcomputer))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/09/14 11:33
S33	46	(send\$3 transfer\$4 transmi\$4) near (signal near2 characteristic) near9 (headend server)	US-PGPUB; USPAT; USOCR; FPRS;	OR	ON	2016/09/14 11:33

			EPO; JPO; DERWENT; IBM_TDB			
S34	2	(send\$3 transfer\$4 transmi\$4) near (signal near2 characteristic) near (headend server)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/09/14 11:37
S35	27	(send\$3 transfer\$4 transmi\$4) near (signal near2 characteristic) near5 (headend server)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/09/14 11:40
S36	13	S35 and @ay< "2011"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/09/14 11:41

9/ 15/ 2016 8:50:29 AM
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BIB DATA SHEET

CONFIRMATION NO. 4520

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.	
14/948,947	11/23/2015	348	2422	24351US04	
RULE					
APPLICANTS MaxLinear, Inc., Carlsbad, CA; INVENTORS Timothy Gallagher, Encinitas, CA; Patrick Tierney, Solana Beach, CA; Jun Huang, San Diego, CA; ** CONTINUING DATA ***** This application is a CON of 14/341,880 07/28/2014 PAT 9203653 which is a CON of 13/607,916 09/10/2012 PAT 8792008 which claims benefit of 61/532,098 09/08/2011 ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 12/14/2015					
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☐ Yes ☒ No Verified and /PAULOS M NATNAEL/ Acknowledged Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY CA	SHEETS DRAWINGS 7	TOTAL CLAIMS 18	INDEPENDENT CLAIMS 2
ADDRESS MCANDREWS HELD & MALLOY, LTD 500 WEST MADISON STREET SUITE 3400 CHICAGO, IL 60661 UNITED STATES					
TITLE METHOD AND APPARATUS FOR SPECTRUM MONITORING					
FILING FEE RECEIVED 1600	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		

Search Notes 	Application/Control No. 14948947	Applicant(s)/Patent Under Reexamination GALLAGHER ET AL.
	Examiner PAULOS M NATNAEL	Art Unit 2422

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
348	192,193,180	9/14/16	pmn
	(key-word search)		

SEARCH NOTES		
Search Notes	Date	Examiner
EAST, Inventor search on PALM, eDAN	9/14/16	pmn
G06F3/14 OR G09G2340/14 OR G09G2360/02 OR H04N2005/4412 OR H04N21/4122 OR H04N21/4147 OR H04N21/42204 OR H04N21/4402 OR H04N21/440263 OR H04N21/4758 OR H04N21/4854 OR H04N5/4401 OR H04N5/46 OR H04N7/0122 OR H04N21/42676 OR H04N21/615 OR H04N21/64723 OR H04N7/17309 OR H04N17/00 OR H04N21/23614 OR H04N21/4104 OR H04N21/4307 OR H04N21/4345 OR H04N21/4348 OR H04N21/4363 OR H04N21/6332 OR H04N21/654 OR H04N21/8133 OR H03G3/3036 OR H04L1/24 OR H04L25/022 OR H04L25/0224 OR H04L25/0226 OR H04L27/0002 OR	9/14/16	pmn

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

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From: PAIR_eOfficeAction@uspto.gov
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Sep 23, 2016 05:54:39 AM

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Application	Document	Mailroom Date	Attorney Docket No.
14948947	CTNF	09/23/2016	24351US04
	892	09/23/2016	24351US04
	1449	09/23/2016	24351US04

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PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Attorney Docket No. 24351US04

Patent Application of: Timothy Gallagher Application No. 14/948,947 Filed: November 23, 2015 Title: METHOD AND APPARATUS FOR SPECTRUM MONITORING Examiner: Paulos M. Natnaei Group Art Unit: 2422 Confirmation No.: 4520	EFS ELECTRONIC FILING December 19, 2016
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Amendment

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

Dear Sir:

This paper responds to the Non-Final Office Action of September 23, 2016. This response is timely filed. The Applicant respectfully requests reconsideration in view of the following remarks.

Amendments to the Claims begin on page 2.

Remarks begin on page 6.

LISTING OF CLAIMS

1. (original) A method comprising:
performing by one or more circuits of a receiver coupled to a television and data service provider headend via a hybrid fiber coaxial (HFC) network:
receiving, via said HFC network, a signal that carries a plurality of channels, wherein said channels comprise one or both of television channels and data channels;
digitizing said received signal to generate a digitized signal;
selecting a first portion of said digitized signal;
selecting a second portion of said digitized signal;
processing said selected second portion of said digitized signal to recover information carried in said plurality of channels;
analyzing said selected first portion of said digitized signal to measure a characteristic of said received signal; and
controlling the transmission of network management messages back to said headend based on said measured characteristic of said received signal.
2. (original) The method of claim 1, wherein said network management messages indicate whether a parameter is outside of acceptable bounds.
3. (original) The method of claim 2, wherein said parameter is a modulation parameter of said received signal.
4. (original) The method of claim 2, wherein said parameter is a transmit power of said received signal.
5. (original) The method of claim 2, wherein said parameter is a frequency offset of said received signal.

6. (original) The method of claim 1, wherein said characteristic is signal power vs. frequency.

7. (original) The method of claim 1, wherein said characteristics is signal phase vs. frequency.

8. (original) The method of claim 1, wherein said characteristic is one of: signal-to-noise ratio, peak-to-average ratio, noise levels, bit error rate, and symbol error rate.

9. (original) The method of claim 1, configuring, by said one or more circuits, a bandwidth and/or center frequency of said selected first portion of said digitized signal.

10. (original) A system comprising:

a receiver configured to be coupled to a television and data service provider headend via a hybrid fiber coaxial (HFC) network, the receiver comprising: front-end circuitry operable to:

receive a signal that carries a plurality of channels, wherein said channels comprise one or both of television channels and data channels; and

digitize said received signal to generate a digitized signal;

channelizer circuitry operable to:

select a first portion of said digitized signal; and

select a second portion of said digitized signal;

processing circuitry operable to process said selected second portion of said digitized signal to recover information carried in said plurality of channels;

monitoring circuitry operable to:

analyze said selected first portion of said digitized signal to measure a characteristic of said received signal; and control the transmission of network management messages back to said headend based on said measured characteristic of said received signal.

11. (original) The system of claim 10, wherein said network management messages indicate whether a parameter is outside of acceptable bounds.

12. (original) The system of claim 11, wherein said parameter is a modulation parameter of said received signal.

13. (original) The system of claim 11, wherein said parameter is a transmit power of said received signal.

14. (original) The system of claim 11, wherein said parameter is a frequency offset of said received signal.

15. (original) The method of claim 1, wherein said characteristic is signal power vs. frequency.

16. (original) The method of claim 1, wherein said characteristics is signal phase vs. frequency.

17. (original) The system of claim 10, wherein said characteristic is one of: signal-to-noise ratio, peak-to-average ratio, noise levels, bit error rate, and symbol error rate.

18. (original) The system of claim 10, comprising configuring, by said monitoring circuitry during operation of said one or more circuits, a bandwidth and/or center frequency of said selected first portion of said digitized signal.

REMARKS

The present application includes pending claims 1-18. Claims 1-18 have been rejected. The Office Action of September 23, 2016, has been carefully considered.

The Applicant respectfully traverses the above rejections at least for the reasons previously set forth during prosecution and at least based on the following remarks. Examination and reconsideration of the claims in view of the following remarks are respectfully requested.

Double Patenting – 9,203,653

Claims 1-18 are rejected on the ground of nonstatutory double patenting as being allegedly unpatentable over U.S. Patent No. 9,203,653.

The Applicant traverses these rejections, but in order to advance prosecution has filed a terminal disclaimer. Accordingly, this rejection should be withdrawn.

As per rejections under 35 U.S.C. §103

Claims 1-18 are rejected under pre-AIA 35 U.S.C. 103(a) as being allegedly unpatentable over Krafft (US 2012/0163290) in view of Sasaki (US 20050152557 A1)

Claim 1

Claim 1 recites “controlling the **transmission** of network management messages back to said headend based on said measured characteristic of said received signal.”

The Office Action admits that Krafft does not teach “control the transmission of network management messages back to said headend based on said measured characteristic of said received signal.” Without conceding the sufficiency of Krafft for what it is asserted to allegedly teach, the Applicant agrees that Krafft is deficient.

The Office Action alleges that Sasaki overcomes the deficiencies of Krafft. However, instead of citing how Sasaki suggests or teaches “the **transmission** of network management messages,” the Office Action manipulates the limitation to mean something completely different. The Office Action states:

However, it would be obvious to the skilled in art of television, video, or audio broadcast to transmit, send, or **transfer characteristics** of a signal that has been received and/or processed back to the controller which may be a server computer or the headend controller, for the purpose of generating further adjustments and/or instructions based on such a feedback. In that regard, Sasaki (US 20050152557 A1) discloses multi-speaker audio system and automatic control method, comprising a server apparatus 100, speaker 200. Specifically, on [0216] Sasaki teaches that the server apparatus 100 calculates the **transfer characteristic** of the audio signal received from the speaker device 200, thereby determining the propagation delay time for each speaker device 200. The propagation delay time determined for each speaker device 200 is a delay from the timing of the trigger signal, and the propagation delay time of the speaker device 200 that has generated the trigger signal is zero. And "the server apparatus 100 can calculate the **transfer characteristic** from the audio signal from one or both of the two microphones 202a and 202b" ¶[0518]; emphasis added. It would have been therefore obvious to those with ordinary skill in the art at the time the invention was made to modify the system/reference in order to generate further adjustments or for the purpose of receiving further instructions in the operation of the device, i.e. the television/video/audio receiver using the feedback.

(OA at 8, emphasis added.) The Office Action begins by arguing without support that it would be obvious to have "characteristics of a signal" transmitted, sent, or transferred... back to ... the headend. Then, the Office Action combines the word "transfer" (*e.g.*, transmit or send) and "characteristics" into a term of art – "transfer characteristics." The calculation of a "transfer characteristic" is not equivalent to "the **transmission** of network management messages." For example, Sasaki's "transfer characteristic" is a measure of the propagation/transfer delay experienced by an audio signal as it is propagated/transferred from a microphone to a speaker. The Office Action fails to show that Sasaki's "transfer characteristic" is necessarily transmitted, sent, or transferred after it is calculated.

For the above reasons, claim 1 has not been shown to be obvious.

Claim 10

Claim 10 recites “monitoring circuitry operable to ... control the **transmission** of network management messages **back to** said headend based on said measured characteristic of said received signal.”

For the aforementioned reasons regarding claim 1, claim 10 has also not been shown to be obvious.

For at least the aforementioned reasons, claims 1-18 are allowable.

Final Matters

The Office Action makes various statements, including without limitation statements regarding the claims, 35 U.S.C. §103, the cited references, one of ordinary skill in the art, etc., that are now moot in view of the previously presented amendments and/or arguments. Thus, the Applicant will not address all of such statements at the present time. However, the Applicant expressly reserves the right to challenge such statements in the future should the need arise (*e.g.*, if such statements should become relevant by reappearing in a rejection of any current or future claim or be relied upon in any proceeding involving this application or a corresponding patent). The Applicant also respectfully reserves the right to argue additional reasons that support the allowability of all claims, whether or not argued in this Response or previous responses, should that need arise in the future.

Conclusion

The Applicant submits that the pending claims are in condition for allowance and courteously solicits an expeditious Notice of Allowability with respect to all pending claims. If the Examiner has any questions or the Applicant can be of any assistance, the Examiner is invited to contact the undersigned attorney.

The Commissioner is authorized to charge any necessary fees, or credit any overpayment to the Deposit Account of McAndrews, Held & Malloy, Account No. 13-0017.

Respectfully submitted,

Dated: December 19, 2016

/Wayne H. Bradley/
Wayne H. Bradley
Reg. No. 39,916

McAndrews, Held & Malloy, Ltd.
500 W. Madison Street
34th Floor
Chicago, IL 60661
Phone (312) 775-8000
Fax (312) 775-8100

**TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING
REJECTION OVER A "PRIOR" PATENT**

Docket Number (Optional)

24351US04

In re Application of: Timothy Gallagher

Application No.: 14/948,947

Filed: November 23, 2015

For: METHOD AND APPARATUS FOR SPECTRUM MONITORING

The applicant, MAXILNEAR, INC., owner of 100 percent interest 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** No. 9,203,653 as the term of said **prior patent** is presently shortened by any terminal disclaimer. The applicant 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 applicant 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.

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I hereby acknowledge that any willful false statements made are punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

2. ☒ The undersigned is an attorney or agent of record. Reg. No. 39916

/Wayne H. Bradley/

Signature

December 19, 2016

Date

Wayne H. Bradley

Typed or printed name

Attorney of Record

Title

312-775-8000

Telephone Number

- ☒ Terminal disclaimer fee under 37 CFR 1.20(d) included.

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Electronic Patent Application Fee Transmittal				
Application Number:		14948947		
Filing Date:		23-Nov-2015		
Title of Invention:		METHOD AND APPARATUS FOR SPECTRUM MONITORING		
First Named Inventor/Applicant Name:		Timothy Gallagher		
Filer:		Wayne Bradley/Roberta Kieltyka		
Attorney Docket Number:		24351US04		
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:				
STATUTORY OR TERMINAL DISCLAIMER	1814	1	160	160
Total in USD (\$)				160

Electronic Acknowledgement Receipt

EFS ID:	27833339
Application Number:	14948947
International Application Number:	
Confirmation Number:	4520
Title of Invention:	METHOD AND APPARATUS FOR SPECTRUM MONITORING
First Named Inventor/Applicant Name:	Timothy Gallagher
Customer Number:	23446
Filer:	Wayne Bradley/Roberta Kieltyka
Filer Authorized By:	Wayne Bradley
Attorney Docket Number:	24351US04
Receipt Date:	19-DEC-2016
Filing Date:	23-NOV-2015
Time Stamp:	15:51:21
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	122016INTEFSW15525300
Deposit Account	130017
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 37 CFR 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		24351US04_Response_w_TD.pdf	47508	yes	9
			89ae03c819ccff3186274394277c4a5cba7c20b8		
	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	9	
Warnings:					
Information:					
2	Terminal Disclaimer Filed	24351US01_Terminal_Disclaimer_AIA0026.pdf	160403	no	2
			970ecded955147dc96563aa5df50178ae3fbd0a9		
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30703	no	2
			2b64ec98f743cb124fdb6f1118cbc4e7c1afc83		
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New International Application Filed with the USPTO as a Receiving Office

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/948,947	Filing Date 11/23/2015	☐ To be Mailed
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ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

(Column 1)

(Column 2)

FOR	NUMBER FILED	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), (l), 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

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	12/19/2016	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	* 18	Minus	** 20	= 0	X \$80 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 0	X \$420 =	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	

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	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
DIANA BATES

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.

Application Number 	Application/Control No. 14/948,947	Applicant(s)/Patent under Reexamination GALLAGHER ET AL.	
Document Code - DISQ		Internal Document – DO NOT MAIL	

TERMINAL DISCLAIMER	☒ APPROVED	☐ DISAPPROVED
Date Filed : 19 December, 2016	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:
<u>PAMELA YOUNG</u> Technology Center: <u>PLRC</u> Telephone: _____



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/948,947	11/23/2015	Timothy Gallagher	24351US04	4520

23446 7590 02/23/2017
MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, IL 60661

EXAMINER

NATNAEL, PAULO M

ART UNIT	PAPER NUMBER
----------	--------------

2422

NOTIFICATION DATE	DELIVERY MODE
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02/23/2017

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):

mhmpto@mcandrews-ip.com

Office Action Summary	Application No. 14/948,947	Applicant(s) GALLAGHER ET AL.	
	Examiner PAULOS M. NATNAEL	Art Unit 2422	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 12/19/16.
☐ 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) 1-18 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) 1-18 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) | 3) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)
Paper No(s)/Mail Date ____. | 4) ☐ Other: ____. |

DETAILED ACTION

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

Examiner's Note

2. The examiner below cites particular figures, paragraphs, columns, and line numbers in the reference(s), as applied to the claims. Although the particular citations are representative teachings and are applied to specific limitations within the claims, other passages, internally cited references, and figures may also apply. In preparing a response, it is requested that the applicant fully consider the references in their entirety as potentially disclosing or teaching all or part of the claimed invention and fully consider the context of the passage as taught by the reference(s).

Double Patenting

3. The Terminal Disclaimer filed on **12/19/16** has been approved.

Response to Arguments

4. Applicant's arguments filed **12/19/16** have been fully considered but they are not persuasive. Applicant argues that Sasaki does not teaches "control the transmission of network management messages back to said headend based on said measured characteristic of said received signal." Furthermore, the applicant argues:

The Office Action begins by arguing without support that it would be obvious to have "characteristics of a signal" transmitted, sent, or transferred... back to ... the headend. Then, the Office Action combines the word "transfer" (e.g., transmit or send) and "characteristics" into a term of art - "transfer characteristics." The calculation of a "transfer characteristic" is not equivalent to "the **transmission** of network management messages." For example, Sasaki's "transfer characteristic" is a measure of the propagation/transfer delay experienced by an audio signal as it is propagated/transferred from a microphone to a speaker. The Office Action fails to show that Sasaki's "transfer characteristic" is necessarily transmitted, sent, or transferred after it is calculated.

The examiner disagrees. Note, first of all, that "the transmission of network management messages" may be maintenance messages from device 150 (§ 0024) or network management/maintenance messages (§ 0019). These messages may be modulated onto carriers for transmission. Furthermore, **on column 3, lines 51-57**, Gallagher (**US 9,203,653**) explains a similar process. Gallagher teaches, "Such message may comprise, for example, network status updates indicating whether one or more communication parameters of one or more received television or DOCSIS channels are outside acceptable bounds, and/or conveying measured/determined characteristics back to a source of the received signal (e.g., back to a cable headend)." (Emphasis added).

Further, contrary to applicant's assertion, the Office Action provided ample support. The Office Action first showed that Sasaki disclosed the server apparatus 100 calculates the transfer characteristic of the audio signal received from the speaker device 200, thereby determining the propagation delay time for each speaker device 200. The propagation delay time determined for each speaker device 200 is a delay from the timing of the trigger signal, and the propagation delay time of the speaker device 200 that has generated the trigger signal is zero. And "the server apparatus 100

can calculate the transfer characteristic from the audio signal from one or both of the two microphones 202a and 202b” ¶ [0518].

As the disclosure shows, Sasaki is capable of sending or transmitting signal characteristics of the audio signals (in this case microphones 202a and 202b) back to the server. The disclosure by Sasaki that “sending/transmitting signal characteristics of the audio signals (in this case microphones 202a and 202b) back to the server,” clearly corresponds to the disclosure on col. 3 lines 51-57 of Gallagher as quoted above.

Therefore, the argument that Sasaki does not disclose “the transmission of network management messages” because they are different from what Sasaki which disclose just transfer characteristic from the audio signal, is not persuasive. Because the claimed limitation, “the transmission of network management messages” may be just conveying measured/determined characteristics back to a source of the received signal, which is clearly met by Sasaki as shown above.

5. In the previous Office Action, the Sasaki reference information was inadvertently left out from the heading of the 35 U.S.C. 103(a) rejection. It has been corrected below.

6. Claims **1-11** are again rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over **Krafft et al., US 2012/0163290 A1** in view of **Sasaki, US 20050152557 A1**.

Art Unit: 2422

Claim **1** is a method claim of claim **10** and, therefore, claim **1** is rejected for the same reasons shown in claim **10** (see below).

Regarding claims **2 and 11**, wherein said network management messages indicate whether a parameter is outside of acceptable bounds, **see rejection of claim 10**.

Regarding claims **3, 12**, the claimed wherein said parameter is a modulation parameter of said received signal, **see “data modulation stage” in the transmitter” ¶[0009 and 0011], which obviously generates a modulation parameter, value, characteristic, or property.**

Regarding claims **4 and 13**, wherein said parameter is a transmit power of said received signal (**power amplifier amplifies the signal before transmission, ¶[0009 and 0011], which obviously such amplification generates a parameter, value, characteristic, or property, a transmit/transmission power, showing the power needed or used).**

As to claims **5-8 and 14-17**, Krafft teaches multiple standards and various methods including data modulation scheme comprising frequency shift keying, etc. (**¶ 0011**).

Krafft also discloses low noise system, represented by low noise block down converter (LNB), **Fig.8; claim 3**.

Art Unit: 2422

As to claims **9 and 18**, configuring, by said one or more circuits, a bandwidth and/or center frequency of said selected first portion of said digitized signal, and comprising configuring, by said monitoring circuitry during operation of said one or more circuits, a bandwidth and/or center frequency of said selected first portion of said digitized signal (claim 18), Krafft discloses low noise system, represented by low noise block down converter (LNB), Fig.8; claim 3. Furthermore, the signal conditioning module 302 which is operable to produce multiple path signals 303 having a split input signal which in turn includes two or more bands each having a reduce bandwidth of the plurality of IF signals (§§ [0085]-[0089]; claim 17).

Regarding claim **10**, Krafft discloses the claimed system comprising:

a) a receiver configured to be coupled to a television and data service provider headend via a hybrid fiber coaxial (HFC) network (§§ **0042 and 0100**), the receiver comprising: front-end circuitry operable to: **(satellite receiver 120, Fig.6, receiving satellite signal 122 through antenna 125; Fig.14, step 402).**

b) receive a signal that carries a plurality of channels, wherein said channels comprise one or both of television channels and data channels **(satellite receiver 120, Fig.6, receiving satellite signal 122 through antenna 125; (See also Fig.14, step 402.)**

c) digitize said received signal **(ADC 352-1...352-N, Fig.11; (See, digitized input signal 332-1, Fig.11)** to generate a digitized signal channelizer circuitry operable to:

d) select a first portion of said digitized signal; and select a second portion of said digitized signal (**channelizer 348, Figs. 9-11; Fig.14, steps 412-414**).

e) processing circuitry operable to process said selected second portion of said digitized signal to recover information carried in said plurality of channels (**Packet network adapter module 140, Fig.6-7. Fig.14, step 404-408**).

f) monitoring circuitry operable to: analyze said selected first portion of said digitized signal to measure a characteristic of said received signal (**Packet network adapter module 140, Fig.6-7. See also Fig.14, step 404-408**).

As to the claimed “control the transmission of network management messages back to said headend based on said measured characteristic of said received signal,” Krafft does not expressly teach “control the transmission of network management messages back to said headend based on said measured characteristic of said received signal. However, it would be obvious to the skilled in art of television, video, or audio broadcast to transmit, send, or transfer characteristics of a signal that has been received and/or processed back to the controller which may be a server computer or the headend controller, for the purpose of generating further adjustments and/or instructions based on such a feedback. In that regard, **Sasaki (US 20050152557 A1)** discloses multi-speaker audio system and automatic control method, comprising a server apparatus 100, speaker 200. Specifically, on [0216] Sasaki teaches that the server

apparatus 100 calculates the transfer characteristic of the audio signal received from the speaker device 200, thereby determining the propagation delay time for each speaker device 200. The propagation delay time determined for each speaker device 200 is a delay from the timing of the trigger signal, and the propagation delay time of the speaker device 200 that has generated the trigger signal is zero. And “the server apparatus 100 can calculate the transfer characteristic from the audio signal from one or both of the two microphones 202a and 202b” ¶[0518]; **emphasis added**. It would have been therefore obvious to those with ordinary skill in the art at the time the invention was made to modify the system/reference in order to generate further adjustments or for the purpose of receiving further instructions in the operation of the device, i.e. the television/video/audio receiver using the feedback.

Conclusion

7. **THIS ACTION IS MADE FINAL.** 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

Art Unit: 2422

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAULO M. NATNAEL whose telephone number is (571)272-7354. The examiner can normally be reached on 8AM-4:30PM Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jefferey Harold can be reached on (571) 272-7519. 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.

/PAULOS M NATNAEL/
Primary Examiner, Art Unit 2422

PMN
February 13, 2017

Search Notes 	Application/Control No. 14948947	Applicant(s)/Patent Under Reexamination GALLAGHER ET AL.
	Examiner PAULOS M NATNAEL	Art Unit 2422

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
348	192,193,180	9/14/16	pmn
	(key-word search)		
Updated search	" "	2/13/17	pmn

SEARCH NOTES		
Search Notes	Date	Examiner
EAST, Inventor search on PALM, eDAN	9/14/16	pmn
G06F3/14 OR G09G2340/14 OR G09G2360/02 OR H04N2005/4412 OR H04N21/4122 OR H04N21/4147 OR H04N21/42204 OR H04N21/4402 OR H04N21/440263 OR H04N21/4758 OR H04N21/4854 OR H04N5/4401 OR H04N5/46 OR H04N7/0122 OR H04N21/42676 OR H04N21/615 OR H04N21/64723 OR H04N7/17309 OR H04N17/00 OR H04N21/23614 OR H04N21/4104 OR H04N21/4307 OR H04N21/4345 OR H04N21/4348 OR H04N21/4363 OR H04N21/6332 OR H04N21/654 OR H04N21/8133 OR H03G3/3036 OR H04L1/24 OR H04L25/022 OR H04L25/0224 OR H04L25/0226 OR H04L27/0002 OR	9/14/16	pmn
(key-word search)		
Updated search	2/13/17	pmn

INTERFERENCE SEARCH

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

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S40	34	(send\$3 transfer\$4 transmi\$4) near (signal near2 characteristic) near5 (headend server)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/02/13 15:22
S41	13	S40 and @ay<"2011"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/02/13 15:22
S42	2075	348/180,192-193.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/02/13 15:22
S43	192	S42 and (television TV broadcast\$3) adj2 channel	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/02/13 15:22
S44	85	S43 and (data information) near2 channel	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/02/13 15:22
S45	4	S44 and (analyz\$3 measur\$4 calculat\$3 comput\$5 determin\$5) near9 (signal near2 characteristic)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/02/13 15:22
S46	34	(send\$3 transfer\$4 transmi\$4) near (signal near2 characteristic) near5 (headend server)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/02/13 15:22
S47	13	S46 and @ay<"2011"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/02/13 15:22
S48	8299	("hybrid fiber coaxial" HFC) and television and network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/02/13 15:23
S49	2412	S48 and (television TV broadcast\$3) adj channel	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/02/13 15:23
S50	815	S49 and (data information) adj channel	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/02/13 15:23
S51	340	S50 and (ADC digitiz\$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/02/13 15:23

S52	3	S51 and (analyz\$3 measur\$4 calculat\$3 comput\$5 determin\$5) near9 (signal near characteristic)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/02/13 15:23
S53	2629	S48 and (television TV broadcast\$3) adj2 channel	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/02/13 15:23
S54	1768	S53 and (data information) near2 channel	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/02/13 15:23
S55	723	S54 and (ADC digitiz\$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/02/13 15:23
S56	9	S55 and (analyz\$3 measur\$4 calculat\$3 comput\$5 determin\$5) near9 (signal near2 characteristic)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/02/13 15:23
S57	6	S56 not S52	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/02/13 15:23

2/ 14/ 2017 10:14:34 AM
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Application	Document	Mailroom Date	Attorney Docket No.
14948947	CTFR	02/23/2017	24351US04

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UNITED STATES PATENT AND TRADEMARK OFFICE
PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Attorney Docket No. 24351US04

Patent Application of: Timothy Gallagher Application No. 14/948,947 Filed: November 23, 2015 Title: METHOD AND APPARATUS FOR SPECTRUM MONITORING Examiner: Paulos M. Natnael Group Art Unit: 2422 Confirmation No.: 4520	EFS ELECTRONIC FILING May 17, 2017
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Amendment

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

Dear Sir:

This paper responds to the Final Office Action (“FOA”) of February 23, 2017. This response is timely filed. The Applicant respectfully requests reconsideration in view of the following remarks.

Amendments to the Claims begin on page 2.

Remarks begin on page 6.

LISTING OF CLAIMS

1. (original) A method comprising:
performing by one or more circuits of a receiver coupled to a television and data service provider headend via a hybrid fiber coaxial (HFC) network:
receiving, via said HFC network, a signal that carries a plurality of
channels, wherein said channels comprise one or both of television
channels and data channels;
digitizing said received signal to generate a digitized signal;
selecting a first portion of said digitized signal;
selecting a second portion of said digitized signal;
processing said selected second portion of said digitized signal to recover
information carried in said plurality of channels;
analyzing said selected first portion of said digitized signal to measure a
characteristic of said received signal; and
controlling the transmission of network management messages back to said
headend based on said measured characteristic of said received
signal.
2. (original) The method of claim 1, wherein said network management messages indicate whether a parameter is outside of acceptable bounds.
3. (original) The method of claim 2, wherein said parameter is a modulation parameter of said received signal.
4. (original) The method of claim 2, wherein said parameter is a transmit power of said received signal.
5. (original) The method of claim 2, wherein said parameter is a frequency offset of said received signal.

6. (original) The method of claim 1, wherein said characteristic is signal power vs. frequency.

7. (original) The method of claim 1, wherein said characteristics is signal phase vs. frequency.

8. (original) The method of claim 1, wherein said characteristic is one of: signal-to-noise ratio, peak-to-average ratio, noise levels, bit error rate, and symbol error rate.

9. (original) The method of claim 1, configuring, by said one or more circuits, a bandwidth and/or center frequency of said selected first portion of said digitized signal.

10. (original) A system comprising:

a receiver configured to be coupled to a television and data service provider

headend via a hybrid fiber coaxial (HFC) network, the receiver comprising:
front-end circuitry operable to:

receive a signal that carries a plurality of channels, wherein said
channels comprise one or both of television channels and data
channels; and

digitize said received signal to generate a digitized signal;

channelizer circuitry operable to:

select a first portion of said digitized signal; and

select a second portion of said digitized signal;

processing circuitry operable to process said selected second portion of said
digitized signal to recover information carried in said plurality of
channels;

monitoring circuitry operable to:

analyze said selected first portion of said digitized signal to measure a characteristic of said received signal; and control the transmission of network management messages back to said headend based on said measured characteristic of said received signal.

11. (original) The system of claim 10, wherein said network management messages indicate whether a parameter is outside of acceptable bounds.

12. (original) The system of claim 11, wherein said parameter is a modulation parameter of said received signal.

13. (original) The system of claim 11, wherein said parameter is a transmit power of said received signal.

14. (original) The system of claim 11, wherein said parameter is a frequency offset of said received signal.

15. (original) The method of claim 1, wherein said characteristic is signal power vs. frequency.

16. (original) The method of claim 1, wherein said characteristics is signal phase vs. frequency.

17. (original) The system of claim 10, wherein said characteristic is one of: signal-to-noise ratio, peak-to-average ratio, noise levels, bit error rate, and symbol error rate.

18. (original) The system of claim 10, comprising configuring, by said monitoring circuitry during operation of said one or more circuits, a bandwidth and/or center frequency of said selected first portion of said digitized signal.

REMARKS

The present application includes pending claims 1-18. Claims 1-18 have been rejected. The FOA of February 23, 2017 has been carefully considered.

The Applicant respectfully traverses the above rejections at least for the reasons previously set forth during prosecution and at least based on the following remarks. Examination and reconsideration of the claims in view of the following remarks are respectfully requested.

Rejections under 35 U.S.C. §103

Claims 1-18 are rejected under 35 U.S.C. 103 as being allegedly unpatentable over Krafft (U.S. Patent Application Publication No. 2012/0163290) in view of Sasaki (U.S. Patent Application Publication No. 2005/0152557).

Claim 10

Claim 10 recites “*monitoring circuitry operable to... control the transmission of network management messages back to said headend based on said measured characteristic of said received signal.*”

The FOA (p. 7) admits that Krafft does not teach “*control the transmission of network management messages back to said headend based on said measured characteristic of said received signal.*” Without conceding the sufficiency of Krafft for what it is asserted to allegedly teach, the Applicant agrees that Krafft is deficient.

The Office Action alleges that Sasaki overcomes the deficiencies of Krafft. However, instead of citing how Sasaki suggests or teaches “*control the transmission ... based on said measured characteristic*” the FOA states:

However, it would be obvious to the skilled in art of television, video, or audio broadcast to transmit, send, or transfer characteristics of a signal that has been received and/or processed back to the controller which may be a server computer or the headend controller, for the purpose of generating

further adjustments and/or instructions based on such a feedback. In that regard, Sasaki (US 20050152557 A1) discloses multi-speaker audio system and automatic control method, comprising a server apparatus 100, speaker 200. Specifically, on [0216] Sasaki teaches that the server apparatus 100 calculates the transfer characteristic of the audio signal received from the speaker device 200, thereby determining the propagation delay time for each speaker device 200. The propagation delay time determined for each speaker device 200 is a delay from the timing of the trigger signal, and the propagation delay time of the speaker device 200 that has generated the trigger signal is zero. And "the server apparatus 100 can calculate the transfer characteristic from the audio signal from one or both of the two microphones 202a and 202b" ¶[0518]; emphasis added. It would have been therefore obvious to those with ordinary skill in the art at the time the invention was made to modify the system/reference in order to generate further adjustments or for the purpose of receiving further instructions in the operation of the device, i.e. the television/video/audio receiver using the feedback.

FOA pp 7-8.

Apparently, the FOA has identified Sasaki's alleged "transfer characteristic of the audio signal" as the alleged "*characteristic of said received signal.*" However, the FOA fails to identify how Sasaki teaches "*monitoring circuitry operable to... control the transmission... based on*" Sasaki's alleged "transfer characteristic of the audio signal."

For the above reasons, claim 10 has not been shown to be obvious.

Claim 1

Claim 1 recites "*controlling the transmission of network management messages back to said headend based on said measured characteristic of said received signal.*"

The FOA (p. 7) states that "[c]laim 1 is a method claim of claim 10 and, therefore, claim 1 is rejected for the same reasons shown in claim 10." For the aforementioned reasons regarding claim 10, claim 1 has also not been shown to be obvious.

For at least the aforementioned reasons, claims 1-18 are allowable.

Final Matters

The Office Action makes various statements, including without limitation statements regarding the claims, 35 U.S.C. §103, the cited references, one of ordinary skill in the art, etc., that are now moot in view of the previously presented amendments and/or arguments. Thus, the Applicant will not address all of such statements at the present time. However, the Applicant expressly reserves the right to challenge such statements in the future should the need arise (*e.g.*, if such statements should become relevant by reappearing in a rejection of any current or future claim or be relied upon in any proceeding involving this application or a corresponding patent). The Applicant also respectfully reserves the right to argue additional reasons that support the allowability of all claims, whether or not argued in this Response or previous responses, should that need arise in the future.

Conclusion

The Applicant submits that the pending claims are in condition for allowance and courteously solicits an expeditious Notice of Allowability with respect to all pending claims. If the Examiner has any questions or the Applicant can be of any assistance, the Examiner is invited to contact the undersigned attorney.

The Commissioner is authorized to charge any necessary fees, or credit any overpayment to the Deposit Account of McAndrews, Held & Malloy, Account No. 13-0017.

Respectfully submitted,

Dated: May 17, 2017

/Wayne H. Bradley/
Wayne H. Bradley
Reg. No. 39,916

McAndrews, Held & Malloy, Ltd.
500 W. Madison Street
34th Floor
Chicago, IL 60661
Phone (312) 775-8000
Fax (312) 775-8100

Electronic Acknowledgement Receipt

EFS ID:	29238218
Application Number:	14948947
International Application Number:	
Confirmation Number:	4520
Title of Invention:	METHOD AND APPARATUS FOR SPECTRUM MONITORING
First Named Inventor/Applicant Name:	Timothy Gallagher
Customer Number:	23446
Filer:	Wayne Bradley/Laura Foley
Filer Authorized By:	Wayne Bradley
Attorney Docket Number:	24351US04
Receipt Date:	17-MAY-2017
Filing Date:	23-NOV-2015
Time Stamp:	15:52:52
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		24351US04_FINAL_Response.pdf	46266	yes	9
			6520e222d22df3ffdc06c5152b05d7b03681cf8d		

Multipart Description/PDF files in .zip description			
Document Description	Start	End	
Response After Final Action	1	1	
Claims	2	5	
Applicant Arguments/Remarks Made in an Amendment	6	9	

Warnings:

Information:

Total Files Size (in bytes):	46266
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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.

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/948,947	Filing Date 11/23/2015	☐ To be Mailed
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ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO**APPLICATION AS FILED – PART I**

(Column 1)

(Column 2)

FOR	NUMBER FILED	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

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	05/17/2017	CLAIMS REMAINING AFTER AMENDMENT	Minus	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	* 18	Minus	** 20	= 0	X \$80 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X \$420 =	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	

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT	Minus	HIGHEST NUMBER PREVIOUSLY PAID FOR	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
EVELYN NIMMONS

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.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/948,947	11/23/2015	Timothy Gallagher	24351US04	4520

23446 7590 06/01/2017
MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, IL 60661

EXAMINER

NATNAEL, PAULO M

ART UNIT	PAPER NUMBER
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2422

NOTIFICATION DATE	DELIVERY MODE
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06/01/2017

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):

mhmpto@mcandrews-ip.com

Advisory Action Before the Filing of an Appeal Brief	Application No. 14/948,947	Applicant(s) GALLAGHER ET AL.	
	Examiner PAULO M. NATNAEL	Art Unit 2422	AIA (First Inventor to File) Status No

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

THE REPLY FILED 17 May 2017 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

NO NOTICE OF APPEAL FILED

1. ☒ The reply was filed after a final rejection. No Notice of Appeal has been filed. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance;
 (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114 if this is a utility or plant application. Note that RCEs are not permitted in design applications. The reply must be filed within one of the following time periods:

a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.

b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action; or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

c) ☐ A prior Advisory Action was mailed more than 3 months after the mailing date of the final rejection in response to a first after-final reply filed within 2 months of the mailing date of the final rejection. The current period for reply expires _____ months from the mailing date of the prior Advisory Action or SIX MONTHS from the mailing date of the final rejection, whichever is earlier.

Examiner Note: If box 1 is checked, check either box (a), (b) or (c). ONLY CHECK BOX (b) WHEN THIS ADVISORY ACTION IS THE FIRST RESPONSE TO APPLICANT'S FIRST AFTER-FINAL REPLY WHICH WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. ONLY CHECK BOX (c) IN THE LIMITED SITUATION SET FORTH UNDER BOX (c). See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) or (c) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☐ The proposed amendments filed after a final rejection, but prior to the date of filing a brief, will not be entered because

a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);

b) ☐ They raise the issue of new matter (see NOTE below);

c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or

d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: _____. (See 37 CFR 1.116 and 41.33(a)).

4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).

5. ☐ Applicant's reply has overcome the following rejection(s): _____.

6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).

7. ☐ For purposes of appeal, the proposed amendment(s): (a) ☐ will not be entered, or (b) ☐ will be entered, and an explanation of how the new or amended claims would be rejected is provided below or appended.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

9. ☐ The affidavit or other evidence filed after final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).

10. ☐ The affidavit or other evidence filed after the date of filing the Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).

11. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

12. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because:
See Continuation Sheet.

13. ☐ Note the attached Information *Disclosure Statement(s)*. (PTO/SB/08) Paper No(s). _____

14. ☐ Other: _____.

STATUS OF CLAIMS

15. The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: _____.

Claim(s) objected to: _____.

Claim(s) rejected: _____.

Claim(s) withdrawn from consideration: _____.

	/PAULOS M NATNAEL/ Primary Examiner, Art Unit 2422
--	---

Continuation of 12. does NOT place the application in condition for allowance because:

Apparently, the FOA has identified Sasaki's alleged "transfer characteristic of the audio signal" as the alleged "characteristic of said received signal." However, the FOA fails to identify how Sasaki teaches "monitoring circuitry operable to... control the transmission... based on" Sasaki's alleged "transfer characteristic of the audio signal."

For the above reasons, claim 10 has not been shown to be obvious.

The examiner disagrees.

As was indicated in the previous office action, Krafft does not expressly teach "control the transmission of network management messages back to said headend based on said measured characteristic of said received signal."

However, it would be obvious to those with ordinary skill in art of television, video, or audio broadcast, to transmit, send, or transfer characteristics of a signal that has been received and/or processed back to the controller/server/headend computer or controller, for the purpose of generating further adjustments and/or instructions based on such a feedback.

Sasaki teaches a multi-speaker audio system and an automatic control method, comprising a server apparatus 100, speaker 200. Specifically, on [0216] Sasaki discloses that the server apparatus 100 calculates the transfer characteristic of the audio signal received from the speaker device 200 thereby determining the propagation delay time for each speaker device 200. The propagation delay time determined for each speaker device 200 is a delay from the timing of the trigger signal, and the propagation delay time of the speaker device 200 that has generated the trigger signal is zero. And "the server apparatus 100 can calculate the transfer characteristic from the audio signal from one or both of the two microphones 202a and 202b" paragraphs 0216 and 0518. As a result, the server calculates the layout configuration of the plurality of speakers [or the distance between the speakers] (Abstract) for the enjoyment of the listener. This automatic control method (title) by the feedback (the transfer characteristic of the audio signals output by the speakers) is the same as (or at least is similar to) the claimed network management messages sent back to the receiver device as a result of the claimed "measured characteristic of said received signal."

It would have been therefore obvious to those with ordinary skill in the art at the time of the invention to modify the system of Krafft by providing the method of control/feedback taught by Sasaki in order to generate the desired control adjustments by receiving instructions during the operation of the receiving device, i.e. the television/video/audio receiver, using the feedback sent to the server/headend. Doing so would enhance the utilization efficiency of the Krafft reference because both video and audio signals, as well known in the art, may be transmitted together for synchronization purposes, and control the transmission of control messages from the headend/server to the receiving device.

The argument, therefore, is unpersuasive.

To: mhmpto@mcandrews-ip.com,,
From: PAIR_eOfficeAction@uspto.gov
Cc: PAIR_eOfficeAction@uspto.gov
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Jun 01, 2017 04:17:02 AM

Dear PAIR Customer:

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Application	Document	Mailroom Date	Attorney Docket No.
14948947	CTAV	06/01/2017	24351US04

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Thank you for prompt attention to this notice,

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PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

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

Application Number	14948947	Filing Date	2015-11-23	Docket Number (if applicable)	24351US04	Art Unit	2422
First Named Inventor	Timothy Gallagher			Examiner Name	Paulos M. Natnael		

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, to any international application that does not comply with the requirements of 35 U.S.C. 371, 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 130017

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

Applicant Signature

Signature of Registered U.S. Patent Practitioner			
Signature	Wayne H. Bradley/	Date (YYYY-MM-DD)	2017-06-14
Name	Wayne H. Bradley	Registration Number	39916

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.

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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.
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 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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Attorney Docket No. 24351US04

Patent Application of: Timothy Gallagher Application No. 14/948,947 Filed: November 23, 2015 Title: METHOD AND APPARATUS FOR SPECTRUM MONITORING Examiner: Paulos M. Natnael Group Art Unit: 2422 Confirmation No.: 4520	EFS ELECTRONIC FILING June 14, 2017
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Amendment

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

Dear Sir:

This paper responds to the Advisory Action of June 1, 2017. This response is timely filed with a one-month extension. The Applicant respectfully requests reconsideration in view of the following remarks.

Amendments to the Claims begin on page 2.

Remarks begin on page 6.

LISTING OF CLAIMS

1. (currently amended) A method comprising:
performing by one or more circuits of a receiver coupled to a television and data service provider headend via a hybrid fiber coaxial (HFC) network:
receiving, via said HFC network, a signal that carries a plurality of
channels, wherein said channels comprise one or both of television
channels and data channels;
digitizing said received signal to generate a digitized signal;
selecting a first portion of said digitized signal;
selecting a second portion of said digitized signal;
processing said selected second portion of said digitized signal to recover
information carried in said plurality of channels;
analyzing said selected first portion of said digitized signal to measure a
characteristic of said received signal; and
controlling the transmission of network management messages back to said
headend based on said measured characteristic of said received
signal, wherein said measured characteristic is different than said
network management messages.
2. (original) The method of claim 1, wherein said network management messages
indicate whether a parameter is outside of acceptable bounds.
3. (original) The method of claim 2, wherein said parameter is a modulation
parameter of said received signal.
4. (original) The method of claim 2, wherein said parameter is a transmit power of
said received signal.

5. (original) The method of claim 2, wherein said parameter is a frequency offset of said received signal.

6. (original) The method of claim 1, wherein said characteristic is signal power vs. frequency.

7. (original) The method of claim 1, wherein said characteristics is signal phase vs. frequency.

8. (original) The method of claim 1, wherein said characteristic is one of: signal-to-noise ratio, peak-to-average ratio, noise levels, bit error rate, and symbol error rate.

9. (original) The method of claim 1, configuring, by said one or more circuits, a bandwidth and/or center frequency of said selected first portion of said digitized signal.

10. (currently amended) A system comprising:

a receiver configured to be coupled to a television and data service provider

headend via a hybrid fiber coaxial (HFC) network, the receiver comprising:
front-end circuitry operable to:

receive a signal that carries a plurality of channels, wherein said
channels comprise one or both of television channels and data
channels; and

digitize said received signal to generate a digitized signal;

channelizer circuitry operable to:

select a first portion of said digitized signal; and

select a second portion of said digitized signal;

processing circuitry operable to process said selected second portion of said
digitized signal to recover information carried in said plurality of
channels;

monitoring circuitry operable to:

analyze said selected first portion of said digitized signal to measure
a characteristic of said received signal; and
control the transmission of network management messages back to
said headend based on said measured characteristic of said
received signal, wherein said measured characteristic is
different than said network management messages.

11. (original) The system of claim 10, wherein said network management messages indicate whether a parameter is outside of acceptable bounds.

12. (original) The system of claim 11, wherein said parameter is a modulation parameter of said received signal.

13. (original) The system of claim 11, wherein said parameter is a transmit power of said received signal.

14. (original) The system of claim 11, wherein said parameter is a frequency offset of said received signal.

15. (original) The method of claim 1, wherein said characteristic is signal power vs. frequency.

16. (original) The method of claim 1, wherein said characteristics is signal phase vs. frequency.

17. (original) The system of claim 10, wherein said characteristic is one of: signal-to-noise ratio, peak-to-average ratio, noise levels, bit error rate, and symbol error rate.

18. (original) The system of claim 10, comprising configuring, by said monitoring circuitry during operation of said one or more circuits, a bandwidth and/or center frequency of said selected first portion of said digitized signal.

REMARKS

The present application includes pending claims 1-18. Claims 1-18 have been rejected. The Advisory Action of June 23, 2017 has been carefully considered.

Reconsideration in view of the following remarks is respectfully requested. Though the Applicant generally disagrees with such rejections, to expedite allowance of various pending claims, claims 1 and 10 have been amended.

Note that such amendments are in no way to be construed as the Applicant agreeing with any rejections not specifically discussed below. The Applicant respectfully traverses the above rejections at least for the reasons previously set forth during prosecution and at least based on the following remarks. Examination and reconsideration of the claims in view of the following remarks are respectfully requested.

Rejections under 35 U.S.C. §103

Claims 1-18 are rejected under 35 U.S.C. 103 as being allegedly unpatentable over Krafft (U.S. Patent Application Publication No. 2012/0163290) in view of Sasaki (U.S. Patent Application Publication No. 2005/0152557).

The Applicant traverses these rejections, but in order to advance prosecution has amended claims 1 and 10. Claims 1 and 10 as amended render moot and therefore overcome the rejection under 35 U.S.C. 103.

For at least the aforementioned reasons, claims 1-18 as amended are allowable.

Final Matters

The Office Action makes various statements, including without limitation statements regarding the claims, 35 U.S.C. §103, the cited references, one of ordinary skill in the art, etc., that are now moot in view of the previously presented amendments

and/or arguments. Thus, the Applicant will not address all of such statements at the present time. However, the Applicant expressly reserves the right to challenge such statements in the future should the need arise (*e.g.*, if such statements should become relevant by reappearing in a rejection of any current or future claim or be relied upon in any proceeding involving this application or a corresponding patent). The Applicant also respectfully reserves the right to argue additional reasons that support the allowability of all claims, whether or not argued in this Response or previous responses, should that need arise in the future.

Conclusion

The Applicant submits that the pending claims are in condition for allowance and courteously solicits an expeditious Notice of Allowability with respect to all pending claims. If the Examiner has any questions or the Applicant can be of any assistance, the Examiner is invited to contact the undersigned attorney.

The Commissioner is authorized to charge any necessary fees, or credit any overpayment to the Deposit Account of McAndrews, Held & Malloy, Account No. 13-0017.

Respectfully submitted,

Dated: June 14, 2017

/Wayne H. Bradley/
Wayne H. Bradley
Reg. No. 39,916

McAndrews, Held & Malloy, Ltd.
500 W. Madison Street
34th Floor
Chicago, IL 60661
Phone (312) 775-8000
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Electronic Patent Application Fee Transmittal				
Application Number:		14948947		
Filing Date:		23-Nov-2015		
Title of Invention:		METHOD AND APPARATUS FOR SPECTRUM MONITORING		
First Named Inventor/Applicant Name:		Timothy Gallagher		
Filer:		Wayne Bradley/Stephanie Holmes		
Attorney Docket Number:		24351US04		
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(\$)
Extension - 1 month with \$0 paid	1251	1	200	200
Miscellaneous:				
RCE- 1st Request	1801	1	1200	1200
Total in USD (\$)				1400

Electronic Acknowledgement Receipt

EFS ID:	29498222
Application Number:	14948947
International Application Number:	
Confirmation Number:	4520
Title of Invention:	METHOD AND APPARATUS FOR SPECTRUM MONITORING
First Named Inventor/Applicant Name:	Timothy Gallagher
Customer Number:	23446
Filer:	Wayne Bradley/Stephanie Holmes
Filer Authorized By:	Wayne Bradley
Attorney Docket Number:	24351US04
Receipt Date:	14-JUN-2017
Filing Date:	23-NOV-2015
Time Stamp:	15:59:42
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 1400
RAM confirmation Number	061517INTEFSW16005000
Deposit Account	130017
Authorized User	Wayne Bradley

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)
37 CFR 1.20 (Post Issuance fees)
37 CFR 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	Request for Continued Examination (RCE)	24351US04_RCE_Transmittal.pdf	1350111	no	3
			b9a5740d2084db3d6787f50db3ee49df62533506		
Warnings:					
Information:					
2		24351US04_Response.pdf	36732	yes	7
			b981d0daeba3102ea3d6d61db42a9ebb9515af6c		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Response After Final Action		1	1	
	Claims		2	5	
	Applicant Arguments/Remarks Made in an Amendment		6	7	
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	32452	no	2
			52ff9cf2ee6e17b04d3ef51ac5905130ce695ff6		
Warnings:					
Information:					
Total Files Size (in bytes):			1419295		

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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/948,947	Filing Date 11/23/2015	☐ To be Mailed
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ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

(Column 1)

(Column 2)

FOR	NUMBER FILED	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), (l), 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

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	06/14/2017	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	* 18	Minus	** 20	= 0	X \$80 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 0	X \$420 =	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	

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	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
/DORIS KING/

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.



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

23446 7590 07/19/2017
MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, IL 60661

EXAMINER

NATNAEL, PAULOS M

ART UNIT

PAPER NUMBER

2422

DATE MAILED: 07/19/2017

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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14/948,947

11/23/2015

Timothy Gallagher

24351US04

4520

TITLE OF INVENTION: METHOD AND APPARATUS FOR SPECTRUM MONITORING

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$960	\$0	\$0	\$960	10/19/2017

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)

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.

23446 7590 07/19/2017
MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, IL 60661

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.
14/948,947	11/23/2015	Timothy Gallagher	24351US04	4520

TITLE OF INVENTION: METHOD AND APPARATUS FOR SPECTRUM MONITORING

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$960	\$0	\$0	\$960	10/19/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
NATNAEL, PAULO M	2422	348-192000

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, 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 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
- ☐ 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
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/948,947	11/23/2015	Timothy Gallagher	24351US04	4520

23446 7590 07/19/2017
MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, IL 60661

EXAMINER

NATNAEL, PAULOS M

ART UNIT	PAPER NUMBER
----------	--------------

2422

DATE MAILED: 07/19/2017

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. 14/948,947	Applicant(s) GALLAGHER ET AL.	
	Examiner PAULOS M. NATNAEL	Art Unit 2422	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 claim amendments and arguments received 6/14/17.
☐ 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 1-18. 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) | 5. ☐ Examiner's Amendment/Comment |
| 2. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 6. ☐ Examiner's Statement of Reasons for Allowance |
| 3. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 7. ☐ Other _____. |
| 4. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____. | |

/PAULOS M NATNAEL/
Primary Examiner, Art Unit 2422

Issue Classification 	Application/Control No. 14948947	Applicant(s)/Patent Under Reexamination GALLAGHER ET AL.	
	Examiner PAULO M NATNAEL	Art Unit 2422	

CPC						
Symbol					Type	Version
H04L		43		08	F	2013-01-01
H04N		17		00	I	2013-01-01
H04L		12		66	I	2013-01-01
H04B		17		309	I	2015-01-15

CPC Combination Sets				
Symbol	Type	Set	Ranking	Version

NONE		Total Claims Allowed:	
		18	
(Assistant Examiner)	(Date)		
/PAULOS M NATNAEL/ Primary Examiner.Art Unit 2422	6/29/17	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1b

Issue Classification 	Application/Control No. 14948947	Applicant(s)/Patent Under Reexamination GALLAGHER ET AL.
	Examiner PAULOS M NATNAEL	Art Unit 2422

☒ 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
	1		17												
	2		18												
	3														
	4														
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	10														
	11														
	12														
	13														
	14														
	15														
	16														

NONE	Total Claims Allowed: 18	
(Assistant Examiner)	(Date)	
/PAULOS M NATNAEL/ Primary Examiner.Art Unit 2422	6/29/17	O.G. Print Claim(s) 1
(Primary Examiner)	(Date)	O.G. Print Figure 1b

Search Notes 	Application/Control No. 14948947	Applicant(s)/Patent Under Reexamination GALLAGHER ET AL.
	Examiner PAULOS M NATNAEL	Art Unit 2422

CPC- SEARCHED		
Symbol	Date	Examiner
H04N 17/00	9/14/16	pmn

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner
G06F3/14	6/29/17	pmn

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
348	192,193,180	9/14/16	pmn
	(key-word search)		
Updated search	" "	2/13/17	pmn
" "	" "	6/28-6/29/17	pmn

SEARCH NOTES		
Search Notes	Date	Examiner
EAST, Inventor search on PALM, eDAN	9/14/16	pmn
G06F3/14 OR G09G2340/14 OR G09G2360/02 OR H04N2005/4412 OR H04N21/4122 OR H04N21/4147 OR H04N21/42204 OR H04N21/4402 OR H04N21/440263 OR H04N21/4758 OR H04N21/4854 OR H04N5/4401 OR H04N5/46 OR H04N7/0122 OR H04N21/42676 OR H04N21/615 OR H04N21/64723 OR H04N7/17309 OR H04N17/00 OR H04N21/23614 OR H04N21/4104 OR H04N21/4307 OR H04N21/4345 OR H04N21/4348 OR H04N21/4363 OR H04N21/6332 OR H04N21/654 OR H04N21/8133 H03G3/3036; H04L1/24;H04L25/022; H04L25/0224; (key-word search)	9/14/16	pmn
Updated search	2/13/17	pmn
" "	6/28-6/29/17	pmn
See search history printout included with this form to determine scope of search		

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INTERFERENCE SEARCH

US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
348	192	6/29/17	pmn
H04N	17/00	6/29/17	pmn

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EAST Search History**EAST Search History (Prior Art)**

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	38407	receiv\$3 near9 (plural\$3 multi\$3) adj channel	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/06/29 09:40
L3	4053	2 and (television TV broadcast\$3) adj channel	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/06/29 09:42
L4	1806	3 and (data information) adj channel	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/06/29 09:42
L5	353	4 and digitiz\$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/06/29 09:42
L6	4	5 and (select\$3 choos\$3 multiplex\$3) near9 digitiz\$5 adj signal	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/06/29 09:43
L7	236	5 and (recover\$3 extract\$3) near9 (data information)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/06/29 09:44
L8	3	7 and (determin\$5 measur\$5 comput\$5 calculat\$3) near9 characteristic near9 signal	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/06/29 09:45
L9	33	7 and (determin\$5 measur\$5 comput\$5 calculat\$3) near9 characteristic	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/06/29 09:45
L10	0	9 and (transmi\$5 transfer\$4) near9 (message feedback) near9 ("head end" server)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/06/29 09:47
L11	0	9 and (send\$3 transmi\$5 transfer\$4) near9 (message feedback) near9 ("head end" server)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/06/29 09:48
L12	7	9 and (send\$3 transmi\$5 transfer\$4) near9 (request\$3 message feedback) near9 ("head end" server)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/06/29 09:48
L13	1	12 AND ((H04H20/78 OR H04H60/97 OR H04N21/2385 OR H04N7/17309).CPC.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/06/29 11:35

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L14	1473	348/19\$.ccls.	US-PGPUB; USPAT	OR	ON	2017/06/29 13:57
L15	18	14 and receiv\$3 near9 (plural\$3 multi\$3) adj channel	US-PGPUB; USPAT	OR	ON	2017/06/29 13:58
L17	10	15 and (television TV broadcast\$3) adj channel	US-PGPUB; USPAT	OR	ON	2017/06/29 13:58
L18	1	17 and (select\$3 choos\$3 multiplex\$3) near9 digitiz\$5 adj signal	US-PGPUB; USPAT	OR	ON	2017/06/29 13:59
L19	1582	348/180,191,192.ccls.	US-PGPUB; USPAT	OR	ON	2017/06/29 14:08
L20	1465	348/180,192.ccls.	US-PGPUB; USPAT	OR	ON	2017/06/29 14:09
L23	300	20 and (recover\$3 extract\$3) near9 (data information)	US-PGPUB; USPAT	OR	ON	2017/06/29 14:10
L24	43	23 and (television TV broadcast\$3) adj channel	US-PGPUB; USPAT	OR	ON	2017/06/29 14:11

6/ 29/ 2017 2:20:58 PM
C:\ Users\ pnatnael\ Documents\ EAST\ Workspaces\ 14948947.wsp

<i>Index of Claims</i> 	Application/Control No. 14948947	Applicant(s)/Patent Under Reexamination GALLAGHER ET AL.
	Examiner PAULOS M NATNAEL	Art Unit 2422

✓	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	06/29/2017								
	1	=								
	2	=								
	3	=								
	4	=								
	5	=								
	6	=								
	7	=								
	8	=								
	9	=								
	10	=								
	11	=								
	12	=								
	13	=								
	14	=								
	15	=								
	16	=								
	17	=								
	18	=								

To: mhmpto@mcandrews-ip.com,,
From: PAIR_eOfficeAction@uspto.gov
Cc: PAIR_eOfficeAction@uspto.gov
Subject: Private PAIR Correspondence Notification for Customer Number 23446

Jul 19, 2017 03:52:50 AM

Dear PAIR Customer:

MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, IL 60661
UNITED STATES

The following USPTO patent application(s) associated with your Customer Number, 23446 , have new outgoing correspondence. This correspondence is now available for viewing in Private PAIR.

The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

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Application	Document	Mailroom Date	Attorney Docket No.
14948947	NOA	07/19/2017	24351US04

To view your correspondence online or update your email addresses, please visit us anytime at <https://portal.uspto.gov/secure/myportal/privatepair>.

If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov with 'e-Office Action' on the subject line or call 1-866-217-9197 during the following hours:

Monday - Friday 6:00 a.m. to 12:00 a.m.

Thank you for prompt attention to this notice,

UNITED STATES PATENT AND TRADEMARK OFFICE
PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

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)

23446 7590 07/19/2017
MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, IL 60661

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 via EFS

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.

Wayne H. Bradley	(Depositor's name)
/Wayne H. Bradley/	(Signature)
October 18, 2017	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/948,947	11/23/2015	Timothy Gallagher	24351US04	4520

TITLE OF INVENTION: METHOD AND APPARATUS FOR SPECTRUM MONITORING

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$960	\$0	\$0	\$960	10/19/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
NATNAEL, PAULO M	2422	348-192000

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, **McAndrews, Held & Malloy, Ltd.**
 (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 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

Maxlinear, Inc.

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

Carlsbad, CA

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 **13-0017** (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
☐ 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 /Wayne H. Bradley/

Date October 18, 2017

Typed or printed name Wayne H. Bradley

Registration No. 39,916

Electronic Patent Application Fee Transmittal				
Application Number:		14948947		
Filing Date:		23-Nov-2015		
Title of Invention:		METHOD AND APPARATUS FOR SPECTRUM MONITORING		
First Named Inventor/Applicant Name:		Timothy Gallagher		
Filer:		Wayne Bradley/Laura Foley		
Attorney Docket Number:		24351US04		
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:	30686124
Application Number:	14948947
International Application Number:	
Confirmation Number:	4520
Title of Invention:	METHOD AND APPARATUS FOR SPECTRUM MONITORING
First Named Inventor/Applicant Name:	Timothy Gallagher
Customer Number:	23446
Filer:	Wayne Bradley/Laura Foley
Filer Authorized By:	Wayne Bradley
Attorney Docket Number:	24351US04
Receipt Date:	18-OCT-2017
Filing Date:	23-NOV-2015
Time Stamp:	08:53:37
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$960
RAM confirmation Number	101817INTEFSW08543800
Deposit Account	130017
Authorized User	Wayne Bradley

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)
 37 CFR 1.20 (Post Issuance fees)
 37 CFR 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)	24351US04_issue_fee_transmittal.pdf	962658	no	1
			7dccefd20c6c38692b38d3fc47658d5e28143e8a		

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	30685	no	2
			63c608bb05b4e67cb054ff57e5c29d369d60a89a		

Warnings:

Information:

Total Files Size (in bytes):			993343
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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.



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United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/948,947	11/21/2017	9825826	24351US04	4520

23446 7590 11/01/2017
MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, IL 60661

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):

MaxLinear, Inc., Carlsbad, CA;
Timothy Gallagher, Encinitas, CA;
Patrick Tierney, Solana Beach, CA;
Jun Huang, San Diego, CA;

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To: mhmppto@mcandrews-ip.com,,
From: PAIR_eOfficeAction@uspto.gov
Cc: PAIR_eOfficeAction@uspto.gov
Subject: Private PAIR Correspondence Notification for Customer Number 23446

Nov 03, 2017 04:37:45 AM

Dear PAIR Customer:

MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, IL 60661
UNITED STATES

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Application	Document	Mailroom Date	Attorney Docket No.
14948947	ISSUE.NTF	11/01/2017	24351US04

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If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov with 'e-Office Action' on the subject line or call 1-866-217-9197 during the following hours:

Monday - Friday 6:00 a.m. to 12:00 a.m.

Thank you for prompt attention to this notice,

UNITED STATES PATENT AND TRADEMARK OFFICE
PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:

☒

Practitioners associated with Customer Number:

23,446

OR

☐

Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number

Name	Registration Number

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:

☒

The address associated with Customer Number:

23,446

OR

☐

Firm or individual name

Address

City

State

Zip

Country

Telephone

Email

Assignee name and address: ENTROPIC COMMUNICATIONS, LLC
1345 AVENUE OF THE AMERICAS, 46TH FLOOR
NEW YORK, NY 10105

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of the practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee.

Signature /Andrea L. Gothing/

Date 2021-05-04

Name Andrea L. Gothing

Telephone 415-830-0613

Title Licensing Officer and Authorized Signatory, Entropic Communications, LLC

This collection of information is required by 37 CFR 1.31, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public, which is to update (and by the USPTO to process) the file of a patent or reexamination proceeding. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 18 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.

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.

Electronic Acknowledgement Receipt

EFS ID:	43005743
Application Number:	14948947
International Application Number:	
Confirmation Number:	4520
Title of Invention:	METHOD AND APPARATUS FOR SPECTRUM MONITORING
First Named Inventor/Applicant Name:	Timothy Gallagher
Customer Number:	23446
Filer:	Ronald H. Spuhler/Deborah Wilson
Filer Authorized By:	Ronald H. Spuhler
Attorney Docket Number:	24351US04
Receipt Date:	16-JUN-2021
Filing Date:	23-NOV-2015
Time Stamp:	15:44:24
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Assignee showing of ownership per 37 CFR 3.73	24351US04_373c_Statement_A IA-96.pdf	120186 b873465804e0a783b77da6a6e73be23aba 522565	no	3

Warnings:

Information:					
2	Power of Attorney	Entropic- POA_General_Assignee_Entrop icCommunications_ALG.pdf	487892 51444e06ae84b241bfc127dc47c5d6c6469 44dd7	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			608078		
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.					

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.

STATEMENT UNDER 37 CFR 3.73(c)Applicant/Patent Owner: ENTROPIC COMMUNICATIONS, LLCApplication No./Patent No.: 14/948,947 Filed/Issue Date: 2015-11-23Titled: METHOD AND APPARATUS FOR SPECTRUM MONITORINGENTROPIC COMMUNICATIONS, LLC, a limited liability company

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☒ The assignee of the entire right, title, and interest.
2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):
- ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.
- ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (e.g., bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

- A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.
- B. ☒ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: Timothy Gallagher, Patrick Tierney, Jun Huang To: MAXLINEAR, INC.The document was recorded in the United States Patent and Trademark Office at
Reel 037133, Frame 0385, or for which a copy thereof is attached.2. From: MAXLINEAR, INC. To: ENTROPIC COMMUNICATIONS, LLCThe document was recorded in the United States Patent and Trademark Office at
Reel 055898, Frame 0230, or for which a copy thereof is attached.

[Page 1 of 2]

This collection of information is required by 37 CFR 3.73(b). 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. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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STATEMENT UNDER 37 CFR 3.73(c)

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
 Reel _____, Frame _____, or for which a copy thereof is attached.

4. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
 Reel _____, Frame _____, or for which a copy thereof is attached.

5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
 Reel _____, Frame _____, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
 Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).



As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Ronald H. Spuhler/

2021-06-16

Signature

Date

Ronald H. Spuhler

52245

Printed or Typed Name

Title or Registration 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.

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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).
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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)).
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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.



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	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/948,947	11/23/2015	Timothy Gallagher	24351US04

23446
MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, IL 60661

CONFIRMATION NO. 4520
POA ACCEPTANCE LETTER



Date Mailed: 06/22/2021

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 06/16/2021.

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.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/zretta/

To: mhmpto@mcandrews-ip.com,,
From: PAIR_eOfficeAction@uspto.gov
Cc: PAIR_eOfficeAction@uspto.gov
Subject: Private PAIR Correspondence Notification for Customer Number 23446

Jun 22, 2021 04:25:17 AM

Dear PAIR Customer:

MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, IL 60661
UNITED STATES

The following USPTO patent application(s) associated with your Customer Number, 23446 , have new outgoing correspondence. This correspondence is now available for viewing in Private PAIR.

The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

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Application	Document	Mailroom Date	Attorney Docket No.
14948947	N570	06/22/2021	24351US04

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Thank you for prompt attention to this notice,

UNITED STATES PATENT AND TRADEMARK OFFICE
PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

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 Eastern District of Texas on the following

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

DOCKET NO. 2:22-cv-125	DATE FILED 4/27/2022	U.S. DISTRICT COURT Eastern District of Texas
PLAINTIFF ENTROPIC COMMUNICATIONS, LLC		DEFENDANT CHARTER COMMUNICATIONS, INC., ET AL
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 8,223,775	7/17/2012	Entropic Communications, LLC
2 8,284,690	10/9/2012	Entropic Communications, LLC
3 8,792,008	7/29/2014	Entropic Communications, LLC
4 9,210,362	12/8/2015	Entropic Communications, LLC
5 9,825,826	11/21/2017	Entropic Communications, LLC

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
1		
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

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 Eastern District of Texas on the following

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

DOCKET NO. 2:22-cv-125	DATE FILED 4/27/2022	U.S. DISTRICT COURT Eastern District of Texas
PLAINTIFF ENTROPIC COMMUNICATIONS, LLC		DEFENDANT CHARTER COMMUNICATIONS, INC., ET AL
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 10,135,682	11/20/2018	Entropic Communications, LLC
2		
3		
4		
5		

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
1		
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