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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	24351US02
	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.
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Applicant 1 Remove

Applicant Authority	◉ Inventor	○ Legal Representative under 35 U.S.C. 117	○ Party of Interest under 35 U.S.C. 118

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☐ **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	24351US02	**Small Entity Status Claimed**	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		**Sub Class (if any)**	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	7	**Suggested Figure for Publication (if any)**	1B

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☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S. C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in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.

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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, or 365(c) or indicate National Stage entry from a PCT application. Providing this 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(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	non provisional of	61532098	2011-09-08

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

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This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. 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(a).

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Application Number	Country [i]	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	24351US02
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Title of Invention	Method and Apparatus for Spectrum Monitoring	

Signature	/Chad M. Gilles/			Date (YYYY-MM-DD)	2012-09-10
First Name	Chad	Last Name	Gilles	Registration Number	60590

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Filed electronically on
Sept. 10, 2012 - CMG

METHOD AND APPARATUS FOR SPECTRUM MONITORING

PRIORITY CLAIM

[0001] This patent application makes reference to, claims priority to and claims benefit from United States Provisional Patent Application Serial No. 61/532,098 entitled "Method and Apparatus for Spectrum Monitoring" and filed on September 8, 2011.

[0002] The above application is hereby incorporated herein by reference in its entirety.

INCORPORATION BY REFERENCE

[0003] This patent application also makes reference to:

United States Patent Application Serial No. 13/336,451 entitled "Method and Apparatus for Broadband Data Conversion" and filed on December 23, 2011; and

United States Patent Application Serial No. 13/485,003 entitled "Multi-layer Time-Interleaved Analog-to-Digital Converter (ADC)" and filed on May 31, 2012; and

United States Patent Application Serial No. 13/588,769 entitled "Multi-Standard Coverage Map Generation" and filed on August 17, 2012.

[0004] Each of the above stated applications is hereby incorporated herein by reference in its entirety.

FIELD OF THE INVENTION

[0005] 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

[0006] 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).

[0007] 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

[0008] 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.

[0009] 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

[0010] FIG. 1A depicts an example cable system in accordance with an example embodiment of the invention.

[0011] FIG. 1B depicts an example receiver operable to perform spectrum monitoring in accordance with an example embodiment of the invention.

[0012] FIG. 1C depicts an example satellite system in accordance with an example embodiment of the invention.

[0013] 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.

[0014] 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.

[0015] FIG. 3 depicts an example channelizer which may be utilized for performing spectrum monitoring in accordance with an example embodiment of the invention.

[0016] 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

[0017] 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.

[0018] 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.

[0019] 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.

[0020] 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.

[0021] 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.

[0022] 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.

[0023] 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).

[0024] 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.

[0025] 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 of 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.

[0026] The data processing module 156 may be operable to process the bands C_I–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.

[0027] 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.

[0028] In an example embodiment, the signal S may be a cable television signal with $F_{lo} \approx 55$MHz, $F_{hi} \approx 1002$ MHz. In an example embodiment, the signal S may be a MoCA signal with with $F_{lo} \approx 1150$ MHz and $F_{hi} \approx 2100$ MHz. These numbers are purely for illustration and not intended to be limiting.

[0029] 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.

[0030] 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}.

[0031] 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.

[0032] 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."

[0033] 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).

[0034] 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.

[0035] 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 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.

[0036] 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)).

[0037] 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").

[0038] 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.

[0039] 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.

[0040] 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}.

[0041] 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}.

[0042] 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

[0043] 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.

[0044] 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.

[0045] 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 system comprising:

an analog-to-digital converter operable to digitize a signal spanning an entire television spectrum comprising a plurality of television channels;

a signal monitor operable to analyze a signal to determine a characteristic of said signal;

a data processor operable to process a television channel to recover content carried on the television channel; and

a channelizer operable to:

select a first portion of said signal;

select a second portion of said signal; and

concurrently output said first portion of said signal to said signal monitor and said second portion of said signal to said data processor.

2. The system of claim 1, wherein said first portion of said signal spans said entire television spectrum.

3. A method comprising:

performing by one or more circuits:

receiving a signal having a bandwidth that spans from a first frequency, F_{lo}, to a second frequency, F_{hi}, wherein said signal carries a plurality of channels;

digitizing said received signal from F_{lo} to F_{hi} to generate a digitized signal;

selecting a first portion of said digitized signal;

selecting a second portion of said digitized signal; and

concurrently outputting said selected first portion and said selected second portion, wherein:

said selected first portion is output to a signal analyzer for determination of one or more characteristics of the received signal; and

said selected second portion is output to a data processor for recovery of data carried on one or more of said plurality of channels.

4. The method of claim 3, wherein said first portion comprises all of said received signal from F_{lo} to F_{hi}.

5. The method of claim 3, comprising:

analyzing said selected first portion to determine a characteristic of said received signal; and

reporting said determined characteristic to a source of said received signal.

6. The method of claim 5, wherein said characteristic is one of: signal power vs. frequency, phase vs. frequency, signal-to-noise ratio, peak-to-average ratio, noise levels, bit error rate, and symbol error rate.

7. The method of claim 3, wherein:

said received signal is a cable television signal; and

said plurality of channels comprises a plurality of television channels.

8. The method of claim 3, wherein:

said received signal is a satellite television signal output by a low noise block downconverter; and

said plurality of channels comprises a plurality of television channels.

9. The method of claim 8, wherein said one or more circuits reside in a customer premises satellite reception assembly.

10. The method of claim 3, wherein said one or more circuits reside in a customer premises gateway.

11. The method of claim 3, wherein a bandwidth and/or center frequency of said selected first portion is configurable during operation of said one or more circuits.

12. A system comprising:

one or more circuits that are operable to:

receive a signal having a bandwidth that spans from a first frequency, F_{lo}, to a second frequency, F_{hi}, wherein said signal carries a plurality of channels;

digitize said received signal from F_{lo} to F_{hi} to generate a digitized signal;

select a first portion of said digitized signal;

select a second portion of said digitized signal; and

concurrently output said selected first portion and said selected second portion, wherein:

said selected first portion is output to a signal analyzer for determination of one or more characteristics of the received signal; and

said selected second portion is output to a data processor for recovery of data carried on one or more of said plurality of channels.

13. The system of claim 12, wherein said first portion comprises all of said received signal from F_{lo} to F_{hi}.

14. The system of claim 12, wherein said one or more circuits are operable to:

analyze said first portion to determine a characteristic of said first portion; and

report said determined characteristic to a source of said received signal.

15. The system of claim 14, wherein said characteristic is one of: signal power vs. frequency, phase vs. frequency, signal-to-noise ratio, peak-to-average ratio, noise levels, bit error rate, and symbol error rate.

16. The system of claim 12, wherein:

said received signal is a cable television signal; and

said plurality of channels comprises a plurality of television channels.

17. The system of claim 12, wherein:

said received signal is a satellite television signal output by a low noise block downconverter; and

said plurality of channels comprises a plurality of television channels.

18. The system of claim 17, wherein said one or more circuits reside in a customer premises satellite reception assembly.

19. The system of claim 12, wherein said one or more circuits reside in a customer premises gateway.

20. The system of claim 12, wherein a bandwidth and/or center frequency of said selected first portion is configurable during operation of said one or more circuits.

ABSTRACT

A system, such as a satellite reception assembly or customer premises gateway, may comprise an analog-to-digital converter operable to digitize a signal spanning an entire television spectrum (e.g., cable television spectrum or satellite television spectrum) comprising a plurality of television channels. The system may comprise a signal monitor operable to analyze a signal to determine a characteristic of the signal. The system may comprise a data processor operable to process a television channel to recover content carried on the television channel. The system may comprise a channelizer operable to select first and second portions of the signal, and concurrently output the first portion to the signal monitor and the second portion to the data processor.

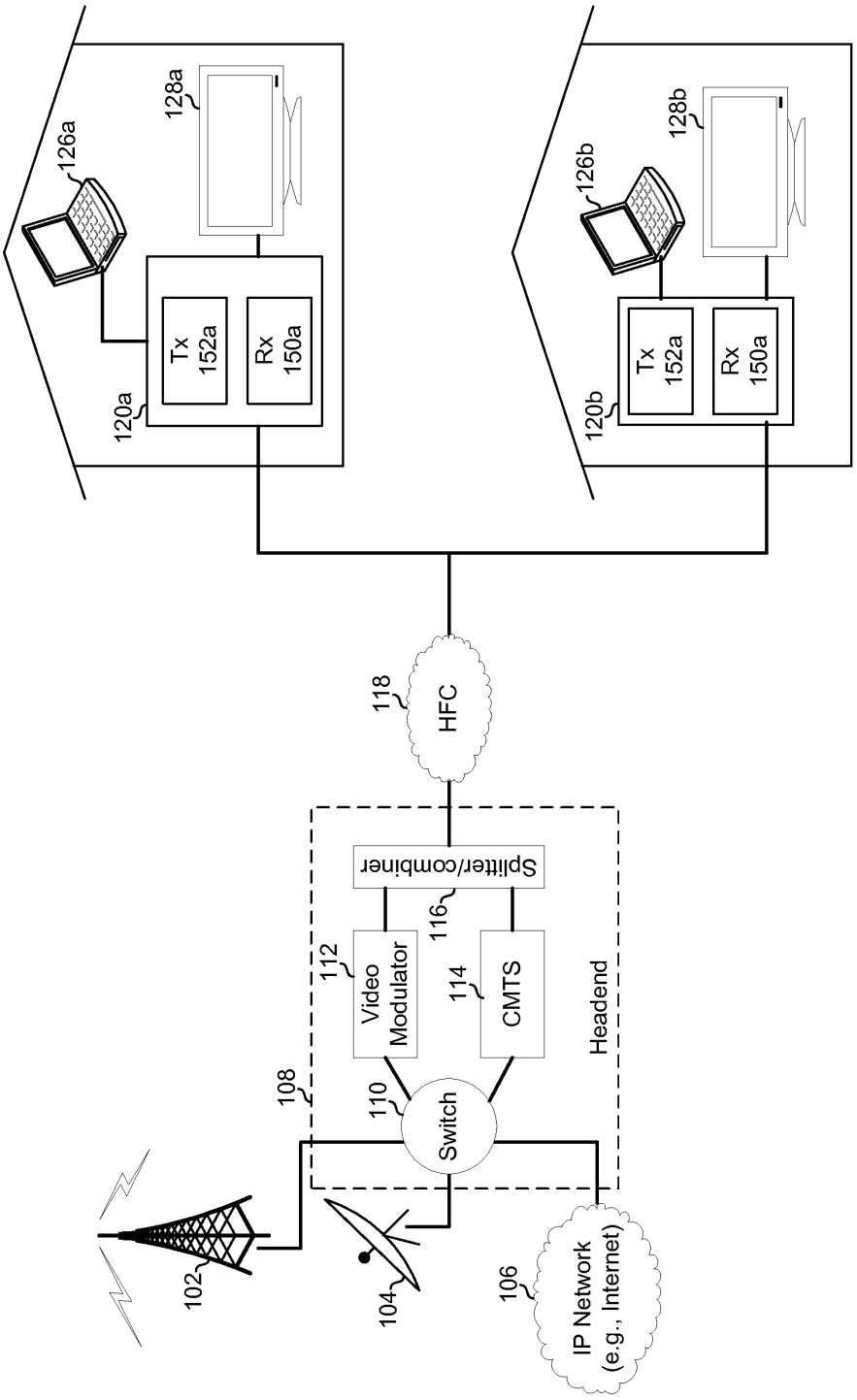

126a
128a
Tx 152a
Rx 150a
120a
126b
128b
Tx 152a
Rx 150a
120b
118
HFC
Splitter/combiner
116
112
Video Modulator
114
CMTS
Headend
108
110
Switch
102
104
106
IP Network (e.g., Internet)

FIG. 1A

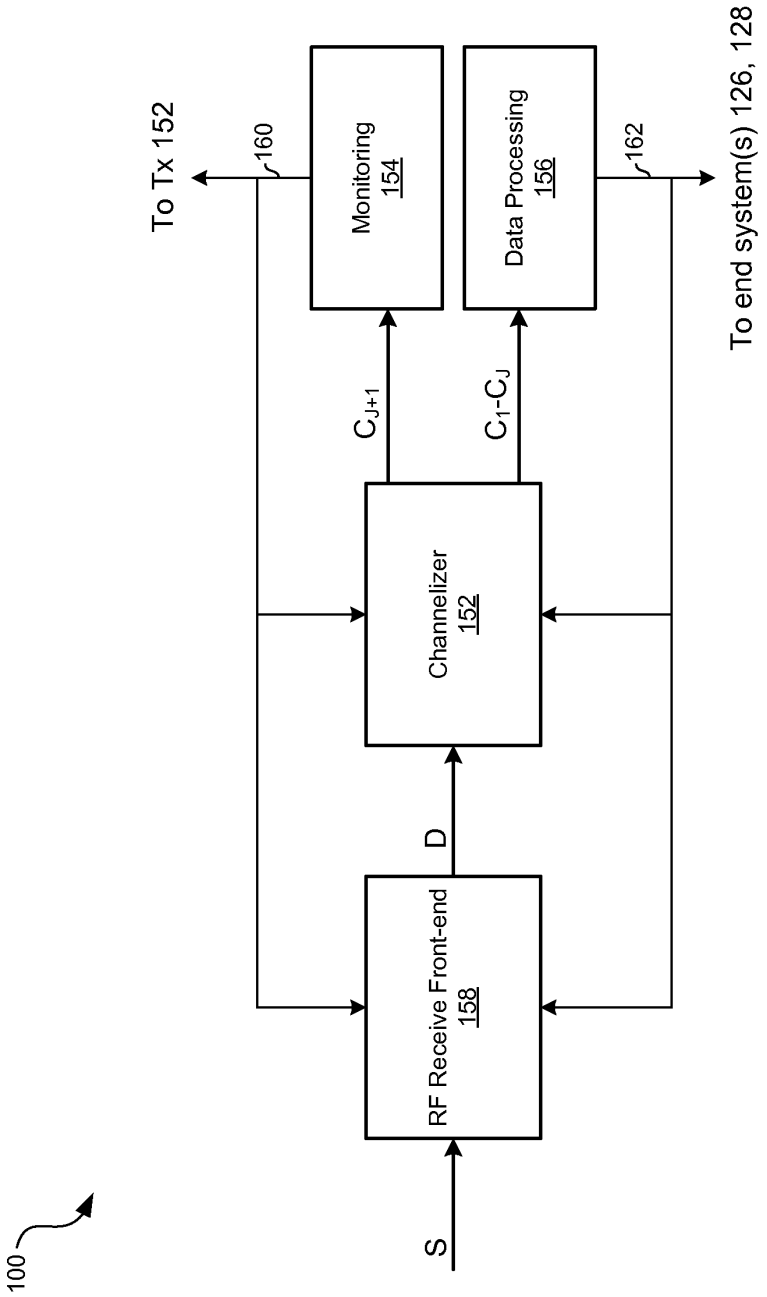

100
S
RF Receive Front-end
158
D
Channelizer
152
C_{J+1}
C_1-C_J
Monitoring
154
Data Processing
156
160
162
To Tx 152
To end system(s) 126, 128

FIG. 1B

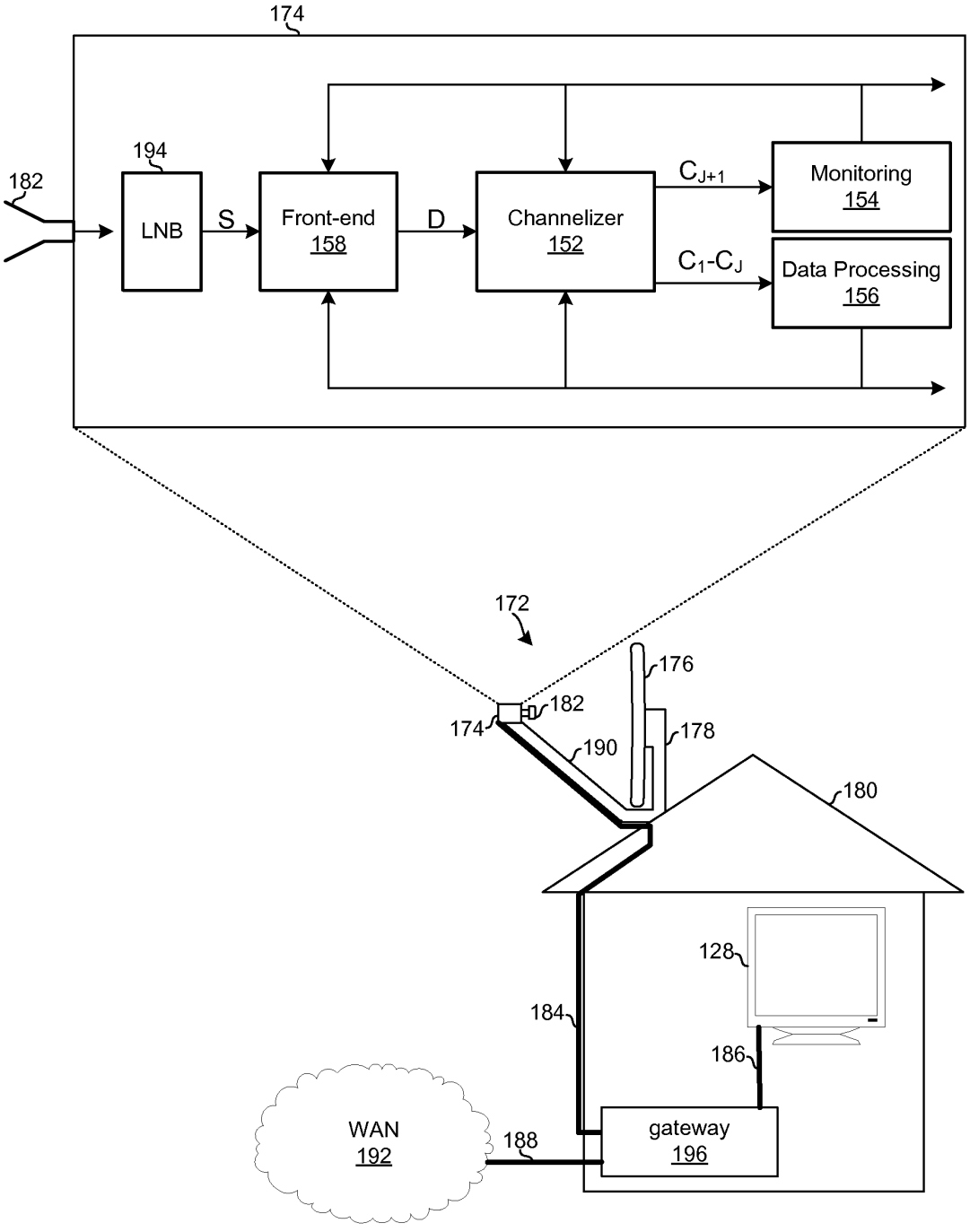

174
194
182
LNB
S
Front-end
158
D
Channelizer
152
C_{J+1}
Monitoring
154
C_1-C_J
Data Processing
156
172
176
182
174
178
190
180
128
184
186
WAN
192
188
gateway
196

FIG. 1C

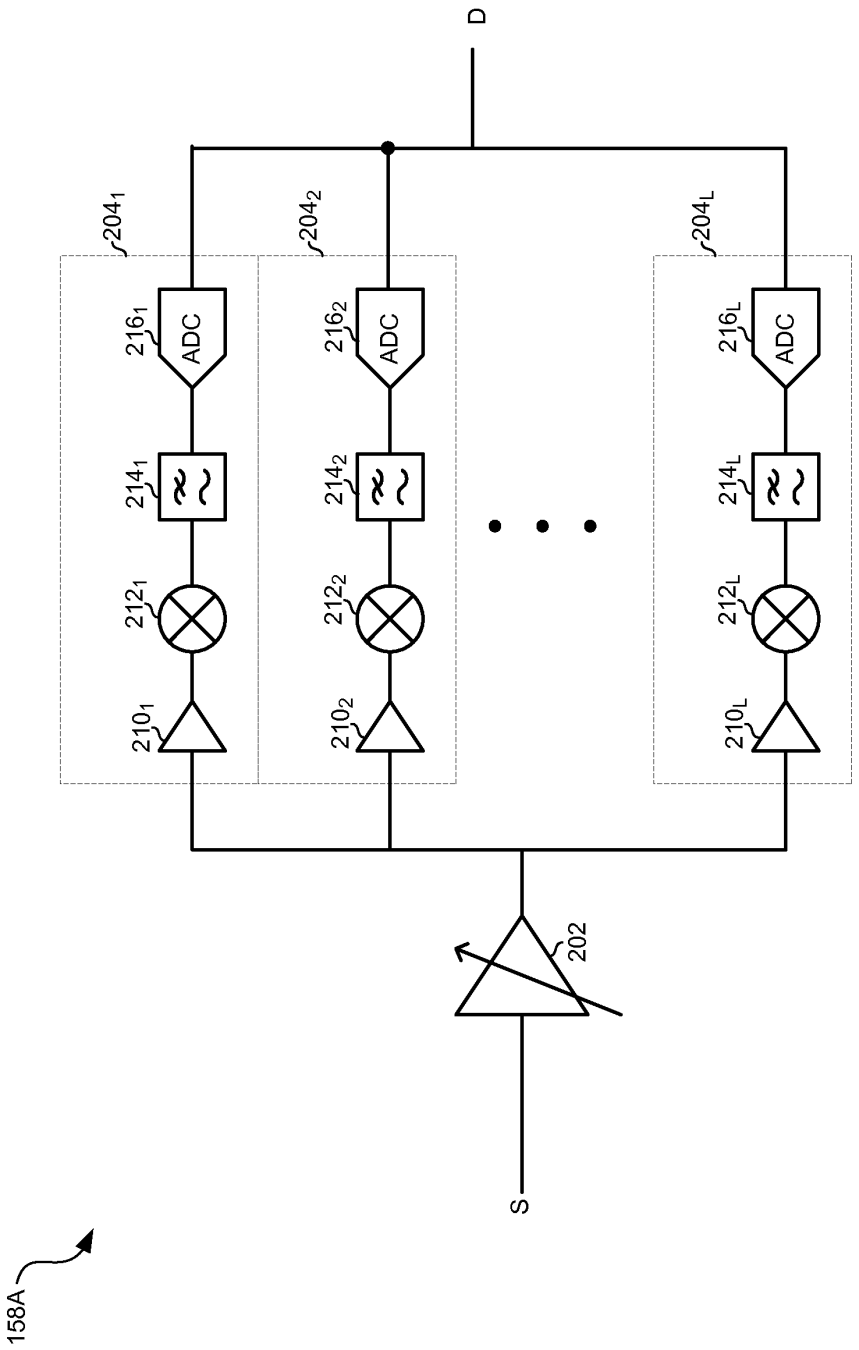

D
204_1
204_2
204_L
216_1
ADC
216_2
ADC
216_L
ADC
214_1
214_2
214_L
212_1
212_2
212_L
210_1
210_2
210_L
202
S
158A

FIG. 2A

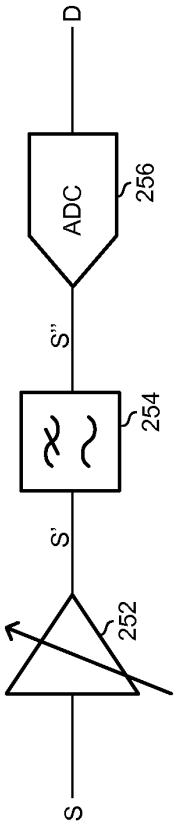


FIG. 2B

158B

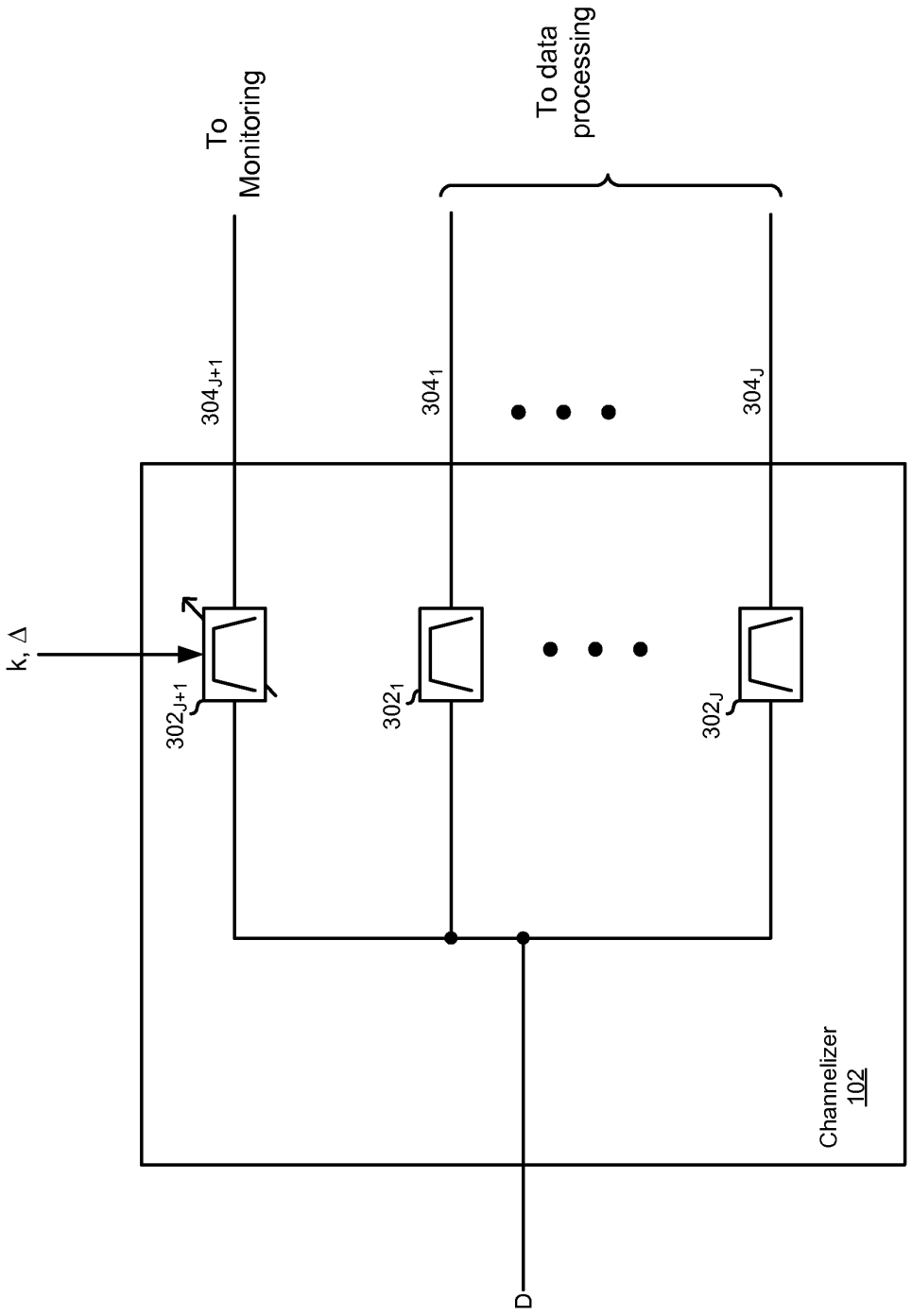

To Monitoring
To data processing
304_{J+1}
304_1
304_J
k, Δ
302_{J+1}
302_1
302_J
Channelizer 102
D

FIG. 3

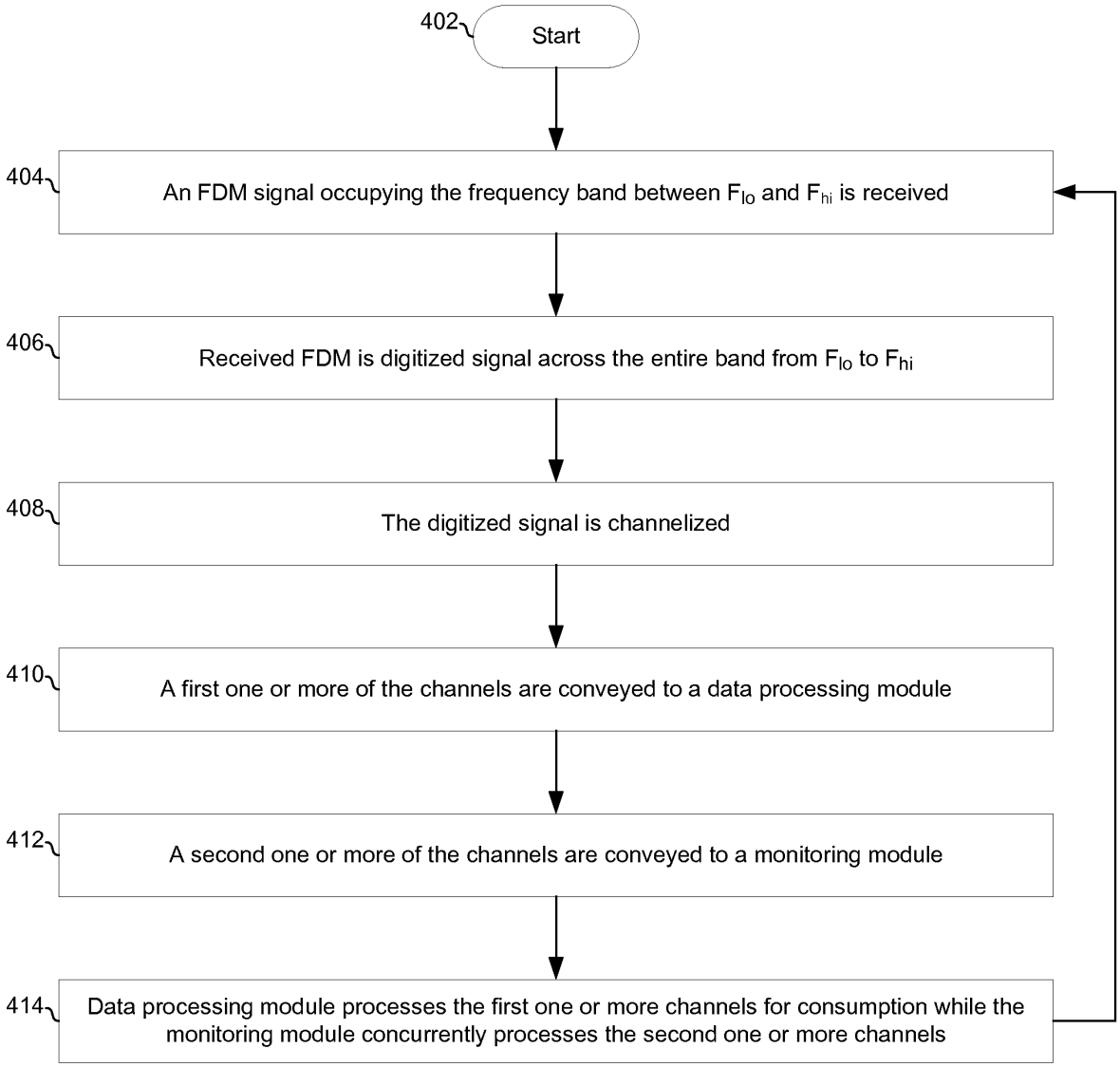

402
Start
404
An FDM signal occupying the frequency band between F_{lo} and F_{hi} is received
406
Received FDM is digitized signal across the entire band from F_{lo} to F_{hi}
408
The digitized signal is channelized
410
A first one or more of the channels are conveyed to a data processing module
412
A second one or more of the channels are conveyed to a monitoring module
414
Data processing module processes the first one or more channels for consumption while the monitoring module concurrently processes the second one or more channels

FIG. 4

Declaration for patent application entitled:
"Method and Apparatus for Spectrum Monitoring"

Docket No:	24351US02	Serial No:	
Inventors:	Timothy Gallagher, Patrick Tierney, Jun Huang	Filed on:	

As a below-named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am an original, first, and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled "Method and Apparatus for Spectrum Monitoring," the specification of which

(check one) [X] is attached hereto.

[] was filed on _____, 20___ as Application Serial No. _____, was amended on _____, and issued on _____ as U.S. Patent No.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information that is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119(a)-(d) of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

(Application No.)	(Country)	(Date Filed)

I hereby claim the benefit under Title 35, United States Code, §119(e) of any United States provisional application(s) listed below:

61/532,098	September 8, 2011
(Application No.)	(Filing Date)

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application or any international application designating the United States under Title 35, United States Code, §365 listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56, regarding events which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application No.)	(Filing Date)

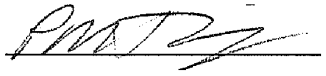
Docket No. 24351US02

Declaration for patent application entitled:
"Method and Apparatus for Spectrum Monitoring"

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Named inventor:

Full name Patrick Tierney

Inventor's Signature  Date September 7 , 2012

Residence 877 Stevens Ave. #4200, Solana Beach, CA 92975 Citizenship USA

Post Office Address N/A

Declaration for patent application entitled:
"Method and Apparatus for Spectrum Monitoring"

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Named inventor:

Full name Jun Huang

Inventor's Signature Jun Huang Date September 6 , 2012

Residence SAN DIEGO, CA, U.S. Citizenship CHINA

Post Office Address 10563 BLUE GRANITE DR, SAN DIEGO, CA 92127

Docket No: 24351US02 Serial No:
Inventors: Timothy Gallagher,Patrick Tierney, Jun Huang Filed on:

As a below-named inventor, I hereby declare that:
My residence, post office address and citizenship are as stated below next to my name.
I believe I am an original, first, and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled "Method and Apparatus for Spectrum Monitoring," the specification of which (check one)?

[X] is attached hereto.
[] was filed on _____, 20 as Application Serial No. _____, was amended on , and issued on as U.S. Patent No.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.
I acknowledge the duty to disclose information that is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, §1.56.
I hereby claim foreign priority benefits under Title 35, United States Code, §119(a)-(d) of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

_____	_____	_____
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_____	_____
(Application No.)	(Filing Date)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Named inventor:
Full name: Timothy Gallagher
Inventor's Signature: /Timothy Gallagher/
Date: Sept 7, 2012
Residence (City, State, Country): Encinitas, Ca, USA
Citizenship: USA
Mailing Address: 840 Val Sereno Dr

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:	24351US02
Filed as Small Entity	

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	95	95
Utility Search Fee	2111	1	310	310
Utility Examination Fee	2311	1	125	125
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**530**

Electronic Acknowledgement Receipt	
EFS ID:	13694889
Application Number:	13607916
International Application Number:	
Confirmation Number:	4054
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:	24351US02
Receipt Date:	10-SEP-2012
Filing Date:	
Time Stamp:	11:13:01
Application Type:	Utility under 35 USC 111(a)

Payment information:

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Payment Type	Deposit Account
Payment was successfully received in RAM	$530
RAM confirmation Number	10756
Deposit Account	130017
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File Listing:					
Document Number	**Document Description**	**File Name**	**File Size(Bytes)/ Message Digest**	**Multi Part /.zip**	**Pages (if appl.)**
1	Application Data Sheet	24351US02_ADS.pdf	1031603 171a9f6f8be66db394a46ea7ee66ca66c46ca26c	no	5
Warnings:					
Information:					
2		24351US02_Specification_as_filed.pdf	117527 2acef95cc31a3ef3359a1ab8e3940d4cc74f1492	yes	21
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Specification		1	15	
	Claims		16	20	
	Abstract		21	21	
Warnings:					
Information:					
3	Drawings-only black and white line drawings	24351US02_Figs_as_filed.pdf	87276 b0875da4bfc128e52c2c6a5b63e1df4593a60d66	no	7
Warnings:					
Information:					
4	Oath or Declaration filed	24351US02_Declaration_executed.pdf	667867 ccfd386d743e3e4baa1569506a50c5e74c734326	no	4
Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	32613 b8461f201b6769f44ad7a43cb69ab21eaa7ff333	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1936886		

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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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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/607,916	09/10/2012	2618	530	24351US02	20	3

CONFIRMATION NO. 4054

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

FILING RECEIPT

OC000000056618980

Date Mailed: 09/21/2012

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)

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

Applicant(s)

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

Power of Attorney: None

Domestic Priority data as claimed by applicant

This appln claims benefit of 61/532,098 09/08/2011

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If Required, Foreign Filing License Granted: 09/18/2012

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/607,916**

Projected Publication Date: 03/14/2013

Non-Publication Request: No

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

Title

Method and Apparatus for Spectrum Monitoring

Preliminary Class

455

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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.

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The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as

set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

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

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

NOT GRANTED

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

SelectUSA

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

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 13/607,916

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	95		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	310		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	125		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	20 minus 20 =	*	x 30 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	x 125 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	530		TOTAL	

APPLICATION AS AMENDED - PART II

AMENDMENT A

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
Application Size Fee (37 CFR 1.16(s))									
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

AMENDMENT B

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)	OR	RATE($)	ADDITIONAL FEE($)
Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
Application Size Fee (37 CFR 1.16(s))									
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

PTO/SB/80 (11-08)
Approved for use through 11/30/2011. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

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(b).

I hereby appoint:

☑ Practitioners associated with the 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(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) 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.
2051 Palomar Airport Road, Suite 100
Carlsbad, CA 92011

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, 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	6/30/2011
Name	Curtis Ling, Ph.D.	Telephone	760.692.0711
Title	Chief Technology 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 Acknowledgement Receipt

EFS ID:	13851271
Application Number:	13607916
International Application Number:	
Confirmation Number:	4054
Title of Invention:	Method and Apparatus for Spectrum Monitoring
First Named Inventor/Applicant Name:	Patrick Tierney
Customer Number:	23446
Filer:	Chad M. Gilles/Laura Foley
Filer Authorized By:	Chad M. Gilles
Attorney Docket Number:	24351US02
Receipt Date:	27-SEP-2012
Filing Date:	10-SEP-2012
Time Stamp:	12:03:14
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		24351US02_Statement_373b_with_assignment.pdf	709474 82c59b3fdac044370f5f4e7e5d01f5e33c6fc9b8	yes	7

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Assignee showing of ownership per 37 CFR 3.73.	1	6
	Power of Attorney	7	7
Warnings:			
Information:			
	Total Files Size (in bytes):	709474	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/96 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Timothy Gallagher, Patrick Tierney, Jun Huang

Application No./Patent No.: 13/607,916 Filed/Issue Date: September 10, 2012

Titled:
METHOD AND APPARATUS FOR SPECTRUM MONITORING

MaxLinear, Inc. , a corporation
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.

states that it is:

1. [X] the assignee of the entire right, title, and interest in;

2. [ ] an assignee of less than the entire right, title, and interest in
(The extent (by percentage) of its ownership interest is _____ %); or

3. [ ] the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

A. [X] 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 therefore is attached.

OR

B. [ ] A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. 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.

2. 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.

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.

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

[X] As required by 37 CFR 3.73(b)(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.

/Chad M. Gilles/ September 27, 2012
Signature Date

Chad M. Gilles Attorney
Printed or Typed Name Title

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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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.

Docket No. 24351US02

Assignment of rights for patent application entitled:
"Method and Apparatus for Spectrum Monitoring"

Docket No:	24351US01	Serial No:	13/607,916
Inventors:	Timothy Gallagher, Patrick Tierney, Jun Huang	Filed on:	September 10, 2012

In consideration of One Dollar ($1.00) and other good and valuable considerations in hand paid, the receipt and sufficiency whereof are hereby acknowledged, each of the undersigned hereby assigns to MaxLinear, Inc. incorporated under the laws of the state of Delaware, its successors and assigns, the entire right, title and interest in the invention or improvements of the undersigned disclosed in an application for Letters Patent of the United States, entitled: "Method and Apparatus for Spectrum Monitoring" and identified as File No. 24351US02, in the offices of McAndrews, Held & Malloy, Ltd., in United States Provisional Patent Application Serial No. 61/532,098 filed on September 8, 2011, and in said application and any and all other applications, both United States and foreign, which the undersigned may file, either solely or jointly with others, on said invention or improvements, and in any and all Letters Patent of the United States and foreign countries, which may be obtained on any of said applications, and in any continuation, continuation-in-part, divisional, re-examination, reissue or extension of such patents, and further assigns to said assignee the priority right provided by the International Convention.

Each of the undersigned hereby authorizes and requests the Commissioner of Patents and Trademarks to issue said Letters Patent to said assignee.

Each of the undersigned hereby authorizes and requests the attorneys of record in said application to insert in this assignment the filing date and serial number of said application when officially known.

Each of the undersigned warrants himself/herself to be the owner of the entire right, title and interest in said invention or improvements and to have the right to make this assignment, and further warrants that there are no outstanding prior assignments, licenses, or other encumbrances on the interest herein assigned.

For said considerations, each of the undersigned hereby agrees, upon the request and at the expense of said assignee, its successors and assigns, to execute any and all continuation, continuation-in-part, divisional, re-examination, extension, and substitute applications for said invention or improvements, and any necessary oath, affidavit or declaration relating thereto, and any application for the reissue, re-examination, or extension of any Letters Patent that may be granted upon said application, and any and all applications and other document for Letters Patent in foreign countries on said invention or improvements, that said assignee, its successors or assigns may deem necessary or expedient, and for the said considerations each of the undersigned authorizes said assignee to apply for patents for said invention or improvements in its own name in such countries where such procedure is proper and further agrees, upon the request of said assignee, its successors and assigns, to cooperate to the best of the ability of the undersigned with said assignee, its successors and assigns, in any proceedings or transactions involving such applications or patents, including the preparation and execution of preliminary statements, giving and producing evidence and performing any and all other acts necessary to obtain said Letters Patent, both United States and foreign, and vest all rights therein hereby conveyed in the assignee, its successors and assigns, whereby said Letters Patent will be held and enjoyed by the said assignee, its successors and assigns, to the full end of the term for which said Letters Patent will be granted, as fully and entirely as the same would have been held and enjoyed by the undersigned if this assignment had not been made.

Docket No. 24351US02

Assignment of rights for patent application entitled:
"Method and Apparatus for Spectrum Monitoring"

WITNESS my hand this 11th day of September, 2012.

Timothy Gallagher

Timothy Gallagher

Docket No. 24351US02

Assignment of rights for patent application entitled:
"Method and Apparatus for Spectrum Monitoring"

WITNESS my hand this 6th day of September, 2012.

Jun Huang

Docket No. 24351US02

Assignment of rights for patent application entitled:
"Method and Apparatus for Spectrum Monitoring"

WITNESS my hand this 7 day of September, 2012.

Patrick Tierney

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
13/607,916	09/10/2012	Patrick Tierney	24351US02

CONFIRMATION NO. 4054

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

POA ACCEPTANCE LETTER

OC000000056868067

Date Mailed: 10/03/2012

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 09/27/2012.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/zabraha/

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

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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
13/607,916	09/10/2012	Patrick Tierney	24351US02

CONFIRMATION NO. 4054

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

PUBLICATION NOTICE

OC000000059852795

Title: Method and Apparatus for Spectrum Monitoring

Publication No.US-2013-0063608-A1
Publication Date:03/14/2013

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 Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/607,916	09/10/2012	Patrick Tierney	24351US02	4054

23446 7590 01/16/2014

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

EXAMINER	
NATNAEL, PAULOS M	

ART UNIT	PAPER NUMBER
2422	

NOTIFICATION DATE	DELIVERY MODE
01/16/2014	ELECTRONIC

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

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

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

mhmpto@mcandrews-ip.com

Office Action Summary	Application No. 13/607,916	Applicant(s) TIERNEY 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) *1-20* 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) *1-4,7-13 and 16-20* is/are rejected.

8)☒ Claim(s) *5,6,14 and 15* 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 *9/10/12* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

DETAILED ACTION

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

Claim Rejections - 35 USC § 112

2. The following is a quotation of 35 U.S.C. 112(b):
(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims **1-11** are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

In claim **1**, line 4, it is unclear if the claimed “said signal” is referring to "a signal" analyzed by the signal monitor or the digitized signal (converted by the analog-to-digital converter), rendering the claim vague and indefinite.

Likewise, in lines 9-11, the claimed "said signal" reference is not clear to which signal it is referring to, which, again, renders the claim indefinite.

4. For the purpose of this rejection, the claimed **said signal** is assumed to be referring to the **digitized signal**.

Claim Rejections - 35 USC § 102

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

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

6. Claims **12-13,16-20** are rejected under pre-AIA 35 U.S.C. 102b as being anticipated by **Zhang, US 6,038,435.**

Considering claim **12,** Zhang discloses all claimed subject matter, note;

a) receive a signal having a bandwidth that spans from a first frequency, Flo, to a second frequency, Fhi, wherein said signal carries a plurality of channels, **is met by** RF Analog receiver and down converter 2, Fig.1;

b) digitize said received signal from Flo to Fhi to generate a digitized signal, **is met by ADC 5, Fig.1.**

c) select a first portion of said digitized signal; select a second portion of said digitized signal, **is met by** Channelizers 9-11, Fig.1. (See, e.g., col. 2, line 62 to col. 3, line 5).

d) concurrently output said selected first portion and said selected second portion, wherein: said selected first portion is output to a signal analyzer for determination of one or more characteristics of the received signal; and said selected second portion is

output to a data processor for recovery of data carried on one or more of said plurality of channels, **is met by** channelizer banks 9,10 and 11, Fig.1 which output to the Baseband DSP 12,13,14.

As to claim **13**, see rejection of claim 12;

Regarding claim **16**, see rejection of claim 12;

Considering claim **17**, Zhang discloses down converter 3 and 4;

Regarding claims **18 and 19**, see rejection of claim 1 and 3.

As to claim **20,** see the disclosure on *col. 3, lines 17-22*

Claim Rejections - 35 USC § 103

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

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

8. Claims **1-4 and 7-11** are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over **Zhang, US 6,038,435.**

Considering claim **1**, Zhang discloses the following claimed subject matter, note;

a) an analog-to-digital converter operable to digitize a signal…**is met by** ADC 5, Fig.1;

b) a signal monitor operable to analyze a signal to determine a characteristic of said signal, **is met by** Baseband DSP 12,13,14, Fig.1.

c) a data processor operable to process…, **is met by** Baseband DSP 12,13,14, Fig.1.

d) a channelizer operable to: select a first portion of said signal; select a second portion of said signal; and concurrently output said first portion of said signal to said signal monitor and said second portion of said signal to said data processor, **is met by** channelizer banks 9,10 and 11, Fig.1;

Except for;

e) the claimed spanning an entire television spectrum comprising a plurality of television channels…a television channel to recover content carried on the television channel;

Regarding e) the ADC 5 in Zhang is utilized to digitize a signal used in the telephone system. However, as is well known in the art, the same analog-to-digital converter can be used in digitizing any type of signals including RF signals received through an antenna such as television signal. Therefore, it would have been obvious to

the skilled in the art at the time the invention was made to modify the system of Zhang by incorporating/utilizing the same ADC 5 to digitize the received RF television signals. Doing so would save the cost of acquiring or building another or separate ADC for different signal.

Regarding claim **2**, see rejection of claim 1.

Claim **3** is a method claim of claim 1 and therefore claim 3 is rejected for the same reasons as in claim 1.

Regarding claim **4**, see rejection of claim 1.

Regarding claim **7**, see rejection of claim 1 and 3.

Regarding claim **8**, Zhang discloses down converter 3 and 4, Fig.1;

Regarding claim **9 and 10**, see rejection of claim 1 and 3.

As to claim **11,** see the disclosure on col. 3, lines 17-22.

Allowable Subject Matter

9. Claims **5-6** and **14-15** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

McHenry, US 20100105332 A1 discloses method and system for dynamic spectrum access using detection periods.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAULOS 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
January 12, 2014

Notice of References Cited	Application/Control No. 13/607,916	Applicant(s)/Patent Under Reexamination TIERNEY 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	Classification
*	A	US-6,813,320 B1	11-2004	Claxton et al.	375/316
*	B	US-7,197,685 B2	03-2007	Limberg, Allen LeRoy	714/756
*	C	US-2010/0105332 A1	04-2010	McHenry et al.	455/62
*	D	US-2012/0163518 A1	06-2012	Reddy et al.	375/350
*	E	US-8,588,339 B2	11-2013	Birru et al.	375/316
*	F	US-8,611,483 B2	12-2013	Zhu et al.	375/349
*	G	US-6,038,435	03-2000	Zhang, Jin-Yun	455/234.1
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	135209	(analog-to-digital near convert$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/12/17 08:32
S2	1963	S1 and (television TV) adj2 channel	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/12/17 08:34
S3	139	S2 and signal near analyz$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/12/17 08:34
S4	4	S3 and (channeliz$3 select$3 switch$3) near5 ((second another additional) near (portion part region))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/12/17 08:36
S5	139	S3 and (channeliz$3 select$3 switch$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/12/17 08:37
S6	10	S5 and ((second another additional) near (portion part))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/12/17 08:38
S7	8	S6 and (first near (portion part))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/12/17 08:39
S8	4	S7 not S4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2013/12/17 08:39
S9	2	"20120163518"	US-PGPUB; USPAT; USOCR;	OR	ON	2013/12/17 09:33

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
S10	1	(("8611483") or ("20120309337")).PN.	USPAT; USOCR	OR	OFF	2013/12/17 09:34
S11	2	(("8611483") or ("20120309337")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/12/17 09:34
S12	109396	spectrum near5 (check$3 monitor$3 detect$3 determin$5)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/11 15:31
S13	7899	S12 and channel near5 (select$3 choos$3 multiplex$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/11 15:32
S14	1175	S12 same channel near5 (select$3 choos$3 multiplex$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/11 15:33
S15	131	S14 and "analog-to-digital" near2 conver$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/11 15:34
S16	172	S14 and (("analog-to-digital" near2 conver$4) ADC)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/11 15:34
S17	30	S16 and (first second) near2 (portion region area part)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/11 15:35
S18	7	S17 and (tv television) near channel	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/11 15:35
S19	13	S17 and (tv television) near2 channel	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/11 15:35
S20	15	S17 and (tv television broadcast$3) near2 channel	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	ON	2014/01/11 15:35

			DERWENT; IBM_TDB			
S21	981339	data adj process$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/11 16:07
S22	66646	data adj process$3 and recovery	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/11 16:07
S23	13057	data adj processor and recovery	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/11 16:08
S24	88	S23 and signal adj2 analyzer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/11 16:08
S25	32	S24 and (("analog-to-digital" near2 conver$4) ADC digitiz$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/11 16:09
S26	8	S25 and (plural$3 multi$3) near2 channel	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/11 16:10
S27	6	S25 and (plural$3 multi$3) adj2 channel	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/11 16:10
S28	192	channelizer same digitiz$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/12 11:40
S29	2	S28 and signal adj monitor$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/12 11:40
S30	55	S28 and monitor$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	ON	2014/01/12 11:41

			DERWENT; IBM_TDB			
S31	2	S30 and (first second) adj2 (portion part)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/12 11:41
S32	3	S30 and recover$3 near2 content	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/12 11:42
S33	3	S30 and recover$3 near5 content	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/12 11:43
S34	4	S30 and recover$3 with content	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/12 11:43
S35	40	("5029162" | "5128958" | "5134631" | "5276685" | "5301364" | "5465406" | "5469115" | "5566201" | "5662688" | "5745531").PN. OR ("6038435").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2014/01/12 11:46
S36	3	S35 and channeliz$3	US-PGPUB; USPAT; USOCR	OR	ON	2014/01/12 11:59

1/ 12/ 2014 2:17:23 PM
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BIB DATA SHEET

CONFIRMATION NO. 4054

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
13/607,916	09/10/2012 **RULE**	348	2422	24351US02

APPLICANTS

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

** **CONTINUING DATA** *************************
This appln claims benefit of 61/532,098 09/08/2011

** **FOREIGN APPLICATIONS** *************************

** **IF REQUIRED, FOREIGN FILING LICENSE GRANTED** ** ** SMALL ENTITY **
09/18/2012

		STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☑ No Verified and Acknowledged /PAULOS M NATNAEL/ Examiner's Signature	☐ Met after Allowance Initials	CA	7	20	3

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		
530	FEES: Authority has been given in Paper No.____________ to charge/credit DEPOSIT ACCOUNT No.____________ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other ________________ ☐ Credit

BIB (Rev. 05/07).

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13607916	TIERNEY ET AL.
	Examiner	Art Unit
	PAULOS M NATNAEL	2422

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
348	192,725,572,731,729,	1/12/14	pmn
455	234.1,136,138,234.2,	1/12/14	pmn
375	349,350,316,	1/12/14	pmn
	(key-word search)		

SEARCH NOTES		
Search Notes	Date	Examiner
EAST, Inventor search on PALM, eDAN	1/12/14	pmn

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

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
(Attorney Docket No. 24351US02)

In the Application of:	
	Patrick Tierney et al.
Serial No.:	13/607,916
Filed:	September 10, 2012
Entitled:	METHOD AND APPARATUS FOR SPECTRUM MONITORING
Examiner:	NATNAEL, Paulos M.
Art Unit:	2422
Confirmation No.:	4054
Customer No.:	23446

RESPONSE UNDER 37 C.F.R. § 1.111

This paper responds to the non-final office action mailed January 16, 2014 ("Office Action") in the above-identified application ("Instant Application"). The Applicant respectfully requests entry of the following amendments and consideration of the following remarks.

I. CONTENTS OF THIS CORRESPONDENCE

The listing of claims begins on page 2 of this paper.

Remarks/Arguments begin on page 6 of this paper.

II. LISTING OF CLAIMS

1. (Currently Amended) A system comprising:

an analog-to-digital converter operable to digitize a signal spanning an entire television spectrum comprising a plurality of television channels, said digitization resulting in a digitized signal;

a signal monitor operable to:

analyze said digitized signal to determine a characteristic of said digitized signal; and

report said determined characteristic to a source of said received signal;

a data processor operable to process a television channel to recover content carried on the television channel; and

a channelizer operable to:

select a first portion of said digitized signal;

select a second portion of said digitized signal; and

concurrently output said first portion of said digitized signal to said signal monitor and said second portion of said digitized signal to said data processor.

2. (Original) The system of claim 1, wherein said first portion of said signal spans said entire television spectrum.

3. (Currently Amended) A method comprising:

performing by one or more circuits:

receiving a signal having a bandwidth that spans from a first frequency, F_{lo}, to a second frequency, F_{hi}, wherein said signal carries a plurality of channels;

digitizing said received signal from F_{lo} to F_{hi} to generate a digitized signal;

selecting a first portion of said digitized signal;

selecting a second portion of said digitized signal; and

concurrently outputting said selected first portion and said selected second portion, wherein:

said selected first portion is output to a signal analyzer ~~for~~which analyzes said selected first portion to determin~~ation of~~ one or more characteristics of the received signal, and which reports said determined one or more characteristics to a source of said received signal; and

said selected second portion is output to a data processor for recovery of data carried on one or more of said plurality of channels.

4. (Original) The method of claim 3, wherein said first portion comprises all of said received signal from F_{lo} to F_{hi}.

5. (Cancelled)

6. (Currently Amended) The method of claim 3[[5]], wherein said one or more characteristics is one of: signal power vs. frequency, phase vs. frequency, signal-to-noise ratio, peak-to-average ratio, noise levels, bit error rate, and symbol error rate.

7. (Original) The method of claim 3, wherein:

said received signal is a cable television signal; and

said plurality of channels comprises a plurality of television channels.

8. (Original) The method of claim 3, wherein:

said received signal is a satellite television signal output by a low noise block downconverter; and

said plurality of channels comprises a plurality of television channels.

9. (Original) The method of claim 8, wherein said one or more circuits reside in a customer premises satellite reception assembly.

10. (Original) The method of claim 3, wherein said one or more circuits reside in a customer premises gateway.

11. (Original) The method of claim 3, wherein a bandwidth and/or center frequency of said selected first portion is configurable during operation of said one or more circuits.

12. (Currently Amended) A system comprising:

one or more circuits that are operable to:

receive a signal having a bandwidth that spans from a first frequency, F_{lo}, to a second frequency, F_{hi}, wherein said signal carries a plurality of channels;

digitize said received signal from F_{lo} to F_{hi} to generate a digitized signal;

select a first portion of said digitized signal;

select a second portion of said digitized signal; and

concurrently output said selected first portion and said selected second portion, wherein:

said selected first portion is output to a signal analyzer that is operable to~~for~~ analyze said first portion to determine~~ation of~~ one or more characteristics of ~~the received signal~~said first portion, and that is operable to report said determined one or more characteristics to a source of said received signal; and

said selected second portion is output to a data processor for recovery of data carried on one or more of said plurality of channels.

13. (Original) The system of claim 12, wherein said first portion comprises all of said received signal from F_{lo} to F_{hi}.

14. (Cancelled)

15. (Currently Amended) The system of claim 12[[14]], wherein said one or more characteristics is one of: signal power vs. frequency, phase vs. frequency, signal-to-noise ratio, peak-to-average ratio, noise levels, bit error rate, and symbol error rate.

16. (Original) The system of claim 12, wherein:

said received signal is a cable television signal; and

said plurality of channels comprises a plurality of television channels.

17. (Original) The system of claim 12, wherein:

said received signal is a satellite television signal output by a low noise block downconverter; and

said plurality of channels comprises a plurality of television channels.

18. (Original) The system of claim 17, wherein said one or more circuits reside in a customer premises satellite reception assembly.

19. (Original) The system of claim 12, wherein said one or more circuits reside in a customer premises gateway.

20. (Original) The system of claim 12, wherein a bandwidth and/or center frequency of said selected first portion is configurable during operation of said one or more circuits.

III. REMARKS / ARGUMENTS

Claims 1–3 stand rejected under 35 U.S.C. § 112(b).

Claims 12–13, 16–20 stand rejected under 35 U.S.C. § 102(b) based on US6038435 (Zhang).

Claims 1–4 and 7–11 stand rejected under 35 U.S.C. § 103(a) based on Zhang.

Claims 5–6 and 14–15 stand allowable but objected to as being dependent on a rejected base claim.

Applicant respectfully traverses the rejections. Nevertheless, to expedite disposition of the Instant Application, independent claims 1, 3, and 12 are amended to recite limitations substantially similar to limitations previously presented in allowable claims 5 and 14. Accordingly, claims 1, 3, and 12 are in condition for allowance. Claims 2, 4, 6–11, 13, 15–20 are also in condition for allowance at least because each depends from one of claims 1, 3, and 12.

IV. CONCLUSION

In addition to the statements addressed above, the Office Action makes various statements regarding the claims and the cited references that are now moot in light of the above. Thus, the Applicant will not address 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 statement should become relevant by appearing in a rejection of any current or future claim or be relied upon in any proceeding involving this application or a corresponding patent).

Based on at least the foregoing, the Applicant respectfully submits that claims 1–4, 6–13, and 15–20 are in condition for allowance. If the Examiner disagrees, but believes a telephonic interview could help expedite disposition of the Instant Application, the Examiner is encouraged to telephone the undersigned at (312) 775-8033.

The Commissioner is hereby authorized to charge any additional fees or credit any overpayment to the deposit account of McAndrews, Held & Malloy, Ltd., Account No. 13-0017.

A Notice of Allowance is courteously solicited.

Respectfully submitted,

Date: April 10, 2014

/Chad M. Gilles/
Chad M. Gilles
Registration No. 60,590
Representative for Applicant

McAndrews, Held & Malloy, Ltd.
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Electronic Acknowledgement Receipt	
EFS ID:	18726576
Application Number:	13607916
International Application Number:	
Confirmation Number:	4054
Title of Invention:	Method and Apparatus for Spectrum Monitoring
First Named Inventor/Applicant Name:	Patrick Tierney
Customer Number:	23446
Filer:	Chad M. Gilles/Laura Foley
Filer Authorized By:	Chad M. Gilles
Attorney Docket Number:	24351US02
Receipt Date:	10-APR-2014
Filing Date:	10-SEP-2012
Time Stamp:	13:32:59
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		24351US02_OA_16JAN2014_Response.pdf	37098 3f9b6b1931f8a1a77bf3d7473793f8a2ad11319c	yes	7

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	5
	Applicant Arguments/Remarks Made in an Amendment	6	7
Warnings:			
Information:			
	Total Files Size (in bytes):	37098	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

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

NOTICE OF ALLOWANCE AND FEE(S) DUE

23446 7590 05/14/2014

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

EXAMINER	
NATNAEL, PAULOS M	
ART UNIT	PAPER NUMBER
2422	

DATE MAILED: 05/14/2014

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/607,916	09/10/2012	Patrick Tierney	24351US02	4054

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	SMALL	$480	$0	$0	$480	08/14/2014

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)

23446 7590 05/14/2014
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
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/607,916	09/10/2012	Patrick Tierney	24351US02	4054

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	SMALL	$480	$0	$0	$480	08/14/2014

EXAMINER	ART UNIT	CLASS-SUBCLASS
NATNAEL, PAULOS 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,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

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

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

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

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

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

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/607,916	09/10/2012	Patrick Tierney	24351US02	4054

23446 7590 05/14/2014

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CHICAGO, IL 60661

EXAMINER	
NATNAEL, PAULOS M	
ART UNIT	PAPER NUMBER
2422	

DATE MAILED: 05/14/2014

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/607,916	Applicant(s) TIERNEY 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 *4/10/14*.
   ☐ 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 *1-4,6-13,15-20, renumbered as 1-18, respectively*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/PAULOS M NATNAEL/
Primary Examiner, Art Unit 2422

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	2549	spectrum near monitor$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/05/04 13:14
L2	461	1 and (tv television broadcast$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/05/04 13:14
L3	21	2 and channeliz$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/05/04 13:15
L5	9	3 and (report$3 (send$3 adj back))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/05/04 13:28
L6	12	3 not 5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/05/04 13:32

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L7	1158	348/19$.ccls.	USPAT; UPAD	OR	ON	2014/05/04 13:38
L8	0	7 and channeliz$3	USPAT; UPAD	OR	ON	2014/05/04 13:38
L9	4	7 and spectrum near monitor$3	USPAT; UPAD	OR	ON	2014/05/04 13:39
L10	1	7 and digitiz$5 with (first second) adj2 (portion part)	USPAT; UPAD	OR	ON	2014/05/04 13:40

5/4/2014 1:56:21 PM
C:\Users\pnatnael\Documents\EAST\Workspaces\13607916.wsp

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13607916	TIERNEY ET AL.
	Examiner	**Art Unit**
	PAULOS M NATNAEL	2422

CPC						
Symbol					**Type**	**Version**
H04L		43	/	08	A	2013-01-01
H04N		17	/	00	I	2013-01-01
H04L		12	/	66	F	2013-01-01
H04B		17	/	0042	A	2013-01-01
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CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	18	
/PAULOS M NATNAEL/ Primary Examiner.Art Unit 2422	5/4/14	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13607916	TIERNEY ET AL.
	Examiner	**Art Unit**
	PAULOS M NATNAEL	2422

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION										
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED					
348	192	H	0	4	N	17 / 00 (2006.01.01)						
CROSS REFERENCE(S)												
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)											

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	18	
/PAULOS M NATNAEL/ Primary Examiner.Art Unit 2422	5/4/14	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2

U.S. Patent and Trademark Office — Part of Paper No. 20140504

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13607916	TIERNEY ET AL.
	Examiner	**Art Unit**
	PAULOS M NATNAEL	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	1	15	17												
2	2	16	18												
3	3	17	19												
4	4	18	20												
	5														
5	6														
6	7														
7	8														
8	9														
9	10														
10	11														
11	12														
12	13														
	14														
13	15														
14	16														

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 18	
/PAULOS M NATNAEL/ Primary Examiner.Art Unit 2422 (Primary Examiner)	5/4/14 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2

U.S. Patent and Trademark Office Part of Paper No. 20140504

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13607916	TIERNEY ET AL.
	Examiner	**Art Unit**
	PAULOS M NATNAEL	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	05/04/2014								
1	1	=								
2	2	=								
3	3	=								
4	4	=								
	5	-								
5	6	=								
6	7	=								
7	8	=								
8	9	=								
9	10	=								
10	11	=								
11	12	=								
12	13	=								
	14	-								
13	15	=								
14	16	=								
15	17	=								
16	18	=								
17	19	=								
18	20	=								

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13607916	TIERNEY ET AL.
	Examiner	Art Unit
	PAULOS M NATNAEL	2422

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
348	192,725,572,731,729,	1/12/14	pmn
455	234.1,136,138,234.2,	1/12/14	pmn
375	349,350,316,	1/12/14	pmn
	(key-word search)		
Updated Search	" "	5/4/14	pmn

SEARCH NOTES		
Search Notes	Date	Examiner
EAST, Inventor search on PALM, eDAN	1/12/14	pmn
" "	5/4/14	pmn

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
348	192	5/4/14	pmn

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

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23446 7590 05/14/2014
MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, IL 60661

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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.

Chad M. Gilles	(Depositor's name)
/Chad M. Gilles/	(Signature)
June 16, 2014	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/607,916	09/10/2012	Patrick Tierney	24351US02	4054

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	SMALL	$480	$0	$0	$480	08/14/2014

EXAMINER	ART UNIT	CLASS-SUBCLASS
NATNAEL, PAULOS 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,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
2 McAndrews, Held & Malloy, Ltd.
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 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ☐ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ☐ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

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

Authorized Signature /Chad M. Gilles/ Date June 16, 2014

Typed or printed name Chad M. Gilles Registration No. 60,590

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

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
(Attorney Docket No. 24351US02)

In the Application of:

Patrick Tierney et al.

Serial No. 13/607,916

Filed: Sept. 10, 2012

For: METHOD AND APPARATUS FOR SPECTRUM MONITORING

Examiner: NATNAEL, Paulos M.

Group Art Unit: 2422

Confirmation No. 4054

AMENDMENT AFTER ALLOWANCE PURSUANT TO 37 CFR § 1.312

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

Dear Sir:

This paper is submitted concurrently with the issue fee and responds to the Notice of Allowance mailed May 14, 2014 in the above-identified application. Applicant respectfully requests entry of the following remarks in the record and entry of the following claim amendments pursuant to 37 C.F.R. § 1.312.

AMENDMENTS TO THE CLAIMS

Listing of claims:

1. (Currently Amended) A system comprising:

an analog-to-digital converter operable to digitize a received signal spanning an entire television spectrum comprising a plurality of television channels, said digitization resulting in a digitized signal;

a signal monitor operable to:

analyze said digitized signal to determine a characteristic of said digitized signal; and

report said determined characteristic to a source of said received signal;

a data processor operable to process a television channel to recover content carried on the television channel; and

a channelizer operable to:

select a first portion of said digitized signal;

select a second portion of said digitized signal; and

concurrently output said first portion of said digitized signal to said signal monitor and said second portion of said digitized signal to said data processor.

2. (Currently Amended) The system of claim 1, wherein said first portion of said digitized signal spans said entire television spectrum.

3. (Previously Presented) A method comprising:

performing by one or more circuits:

receiving a signal having a bandwidth that spans from a first frequency, F_{lo}, to a second frequency, F_{hi}, wherein said signal carries a plurality of channels;

digitizing said received signal from F_{lo} to F_{hi} to generate a digitized signal;

selecting a first portion of said digitized signal;

selecting a second portion of said digitized signal; and

concurrently outputting said selected first portion and said selected second portion, wherein:

said selected first portion is output to a signal analyzer which analyzes said selected first portion to determine one or more characteristics of the received signal, and which reports said determined one or more characteristics to a source of said received signal; and

said selected second portion is output to a data processor for recovery of data carried on one or more of said plurality of channels.

4. (Original) The method of claim 3, wherein said first portion comprises all of said received signal from F_{lo} to F_{hi}.

5. (Cancelled)

6. (Previously Presented) The method of claim 3, wherein said one or more characteristics is one of: signal power vs. frequency, phase vs. frequency, signal-to-noise ratio, peak-to-average ratio, noise levels, bit error rate, and symbol error rate.

7. (Original) The method of claim 3, wherein:

said received signal is a cable television signal; and

said plurality of channels comprises a plurality of television channels.

8. (Original) The method of claim 3, wherein:

said received signal is a satellite television signal output by a low noise block downconverter; and

said plurality of channels comprises a plurality of television channels.

9. (Original) The method of claim 8, wherein said one or more circuits reside in a customer premises satellite reception assembly.

10. (Original) The method of claim 3, wherein said one or more circuits reside in a customer premises gateway.

11. (Original) The method of claim 3, wherein a bandwidth and/or center frequency of said selected first portion is configurable during operation of said one or more circuits.

12. (Previously Presented) A system comprising:

one or more circuits that are operable to:

receive a signal having a bandwidth that spans from a first frequency, F_{lo}, to a second frequency, F_{hi}, wherein said signal carries a plurality of channels;

digitize said received signal from F_{lo} to F_{hi} to generate a digitized signal;

select a first portion of said digitized signal;

select a second portion of said digitized signal; and

concurrently output said selected first portion and said selected second portion, wherein:

said selected first portion is output to a signal analyzer that is operable to analyze said first portion to determine one or more characteristics of said first portion, and that is operable to report said

determined one or more characteristics to a source of said received signal; and

said selected second portion is output to a data processor for recovery of data carried on one or more of said plurality of channels.

13. (Original) The system of claim 12, wherein said first portion comprises all of said received signal from F_{lo} to F_{hi}.

14. (Cancelled)

15. (Previously Presented) The system of claim 12, wherein said one or more characteristics is one of: signal power vs. frequency, phase vs. frequency, signal-to-noise ratio, peak-to-average ratio, noise levels, bit error rate, and symbol error rate.

16. (Original) The system of claim 12, wherein:

said received signal is a cable television signal; and

said plurality of channels comprises a plurality of television channels.

17. (Original) The system of claim 12, wherein:

said received signal is a satellite television signal output by a low noise block downconverter; and

said plurality of channels comprises a plurality of television channels.

18. (Original) The system of claim 17, wherein said one or more circuits reside in a customer premises satellite reception assembly.

19. (Original) The system of claim 12, wherein said one or more circuits reside in a customer premises gateway.

20. (Original) The system of claim 12, wherein a bandwidth and/or center frequency of said selected first portion is configurable during operation of said one or more circuits.

REMARKS

In the Notice of Allowance mailed on May 14, 2014, claims 1-4, 6-13 and 15-20 were allowed. The Applicant thanks the Examiner for positive consideration of the claims. The Applicant does not believe the above claim amendments should have any impact on the allowability of the claims as the amendments merely clarify antecedents.

Respectfully submitted,

Dated: June 16, 2014

By: /Chad M. Gilles/
Chad M. Gilles
Reg. No. 60,590

McAndrews, Held & Malloy, Ltd.
500 West Madison Street - Ste. 3400
Chicago, Illinois 60661
(312) 775-8000

Electronic Patent Application Fee Transmittal

Application Number:	13607916
Filing Date:	10-Sep-2012
Title of Invention:	METHOD AND APPARATUS FOR SPECTRUM MONITORING
First Named Inventor/Applicant Name:	Patrick Tierney
Filer:	Chad M. Gilles/Laura Foley
Attorney Docket Number:	24351US02

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl Issue Fee	2501	1	480	480
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
		Total in USD ($)		**480**

Electronic Acknowledgement Receipt	
EFS ID:	19309211
Application Number:	13607916
International Application Number:	
Confirmation Number:	4054
Title of Invention:	METHOD AND APPARATUS FOR SPECTRUM MONITORING
First Named Inventor/Applicant Name:	Patrick Tierney
Customer Number:	23446
Filer:	Chad M. Gilles/Laura Foley
Filer Authorized By:	Chad M. Gilles
Attorney Docket Number:	24351US02
Receipt Date:	16-JUN-2014
Filing Date:	10-SEP-2012
Time Stamp:	10:17:00
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$480
RAM confirmation Number	8364
Deposit Account	130017
Authorized User	GILLES, CHAD
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees) Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	24351US02_issue_fee_transmittal.pdf	174874 af1317a764a20134cfd0c57d418f7cfb397d779e	no	1
Warnings:					
Information:					
2		24351US02_312_Amendment_with_claims.pdf	34639 de40beaeb491f7f4f177faa980d58176a0263e1f	yes	7

Multipart Description/PDF files in .zip description

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

Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30170 62ac99863ea4d2d219184993e0ac49fbfa552d54	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	239683		

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/607,916	09/10/2012	Patrick Tierney	24351US02	4054

23446 7590 06/30/2014

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

EXAMINER	
NATNAEL, PAULOS M	

ART UNIT	PAPER NUMBER
2422	

NOTIFICATION DATE	DELIVERY MODE
06/30/2014	ELECTRONIC

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

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

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

mhmpto@mcandrews-ip.com

Response to Rule 312 Communication	Application No.	Applicant(s)
	13/607,916	TIERNEY ET AL.
	Examiner	Art Unit
	PAULOS M. NATNAEL	2422

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

1. ☒ The amendment filed on *16 June 2014* under 37 CFR 1.312 has been considered, and has been:

a) ☒ entered.

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

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

d) ☐ disapproved. See explanation below.

e) ☐ entered in part. See explanation below.

/PAULOS M NATNAEL/
Primary Examiner, Art Unit 2422

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
(Attorney Docket No. 24351US02)

In the Application of:

Patrick Tierney et al.

Serial No. 13/607,916

Filed: Sept. 10, 2012

For: METHOD AND APPARATUS FOR SPECTRUM MONITORING

Examiner: NATNAEL, Paulos M.

Group Art Unit: 2422

Confirmation No. 4054

AMENDMENT AFTER ALLOWANCE PURSUANT TO 37 CFR § 1.312

Please Enter!
/P.N./
06/25/2014

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

Dear Sir:

This paper is submitted concurrently with the issue fee and responds to the Notice of Allowance mailed May 14, 2014 in the above-identified application. Applicant respectfully requests entry of the following remarks in the record and entry of the following claim amendments pursuant to 37 C.F.R. § 1.312.

DISH 1003

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/607,916	07/29/2014	8792008	24351US02	4054

23446 7590 07/09/2014

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 52 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):

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

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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY.DOCKET NO./TITLE	REQUEST ID
13/607,916	09/10/2012	Patrick Tierney	24351US02	50658

Acknowledgement of Loss of Entitlement to Entity Status Discount

The entity status change request below filed through Private PAIR on 11/02/2017 has been accepted.

CERTIFICATIONS:

Change of Entity Status:

X Applicant changing to regular undiscounted fee status.

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

This portion must be completed by the signatory or signatories making the entity status change in accordance with 37 CFR 1.4(d)(4).

Signature:	/Christopher C. Winslade/
Name:	Christopher C. Winslade
Registration Number:	36308

PTO/AIA/80 (07-17)
Approved for use through 03/31/2021. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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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:

[X] 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:

[X] 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.**

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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 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:	43005681
Application Number:	13607916
International Application Number:	
Confirmation Number:	4054
Title of Invention:	METHOD AND APPARATUS FOR SPECTRUM MONITORING
First Named Inventor/Applicant Name:	Patrick Tierney
Customer Number:	23446
Filer:	Ronald H. Spuhler/Deborah Wilson
Filer Authorized By:	Ronald H. Spuhler
Attorney Docket Number:	24351US02
Receipt Date:	16-JUN-2021
Filing Date:	10-SEP-2012
Time Stamp:	15:41:39
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Assignee showing of ownership per 37 CFR 3.73	24351US02_373c_Statement_AIA-96.pdf	120179 51f941950754f24991086a8816a14c2df6ac4b9e	no	3
Warnings:					

Information:					
2	Power of Attorney	Entropic-POA_General_Assignee_EntropicCommunications_ALG.pdf	487892 51444e06ae84b241bfc127dc47c5d6c646944dd7	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	608071	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/AIA/96 (08-12)
Approved for use through 01/31/2013. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: ENTROPIC COMMUNICATIONS, LLC

Application No./Patent No.: 13/607,916 Filed/Issue Date: 2012-09-10

Titled: METHOD AND APPARATUS FOR SPECTRUM MONITORING

ENTROPIC 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 029034, Frame 0905, or for which a copy thereof is attached.

2. From: MAXLINEAR, INC. To: ENTROPIC COMMUNICATIONS, LLC

   The document was recorded in the United States Patent and Trademark Office at
   Reel 055898, Frame 0230, or for which a copy thereof is attached.

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**.

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

PTO/AIA/96 (08-12)
Approved for use through 01/31/2013. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

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.

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.

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
13/607,916	09/10/2012	Patrick Tierney	24351US02

CONFIRMATION NO. 4054

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

POA ACCEPTANCE LETTER

OC000000126433481

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**.

/zabraha/

AO 120 (Rev. 08/10)

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

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

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

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
2:22-cv-75	3/9/2022	Eastern District of Texas

PLAINTIFF	DEFENDANT
ENTROPIC COMMUNICATIONS, LLC	DIRECTV, LLC, AT&T, INC., AT&T SERVICES, INC., and AT&T COMMUNICATIONS, LLC.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	7,130,576	10/31/2006	Entropic Communications, LLC
2	7,542,715	6/2/2009	Entropic Communications, LLC
3	8,792,008	7/29/2014	Entropic Communications, LLC
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
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

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

AO 120 (Rev. 08/10)

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

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

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

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
2:22-cv-76	3/9/2022	Eastern District of Texas

PLAINTIFF	DEFENDANT
ENTROPIC COMMUNICATIONS, LLC	DISH NETWORK CORP.; DISH NETWORK LLC; AND DISH NETWORK SERVICE LLC

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	7,130,576	10/31/2006	Entropic Communications, LLC
2	7,542,715	6/2/2009	Entropic Communications, LLC
3	8,792,008	7/29/2014	Entropic Communications, LLC
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
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

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

AO 120 (Rev. 08/10)

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

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

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

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
2:22-cv-125	4/27/2022	Eastern District of Texas

PLAINTIFF	DEFENDANT
ENTROPIC COMMUNICATIONS, LLC	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
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

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Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

AO 120 (Rev. 08/10)

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

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

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

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
2:22-cv-125	4/27/2022	Eastern District of Texas

PLAINTIFF	DEFENDANT
ENTROPIC COMMUNICATIONS, LLC	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			
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In the above—entitled case, the following patent(s)/ trademark(s) have been included:

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

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

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Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy