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September 26, 2023

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OF:**

**APPLICATION NUMBER: 10/322,834
FILING DATE: December 18, 2002
PATENT NUMBER: 7295518
ISSUE DATE: November 13, 2007**



Certified by

Kathi

Performing the Functions and Duties of the
Under Secretary of Commerce
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12/18/02

1062 U.S. PTO

12-20102

10/322834

12/18/02

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Approved for use through 10/31/2002. OMB 0651-0032

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No. 9228

First Inventor Anton Monk

Title Broadband Network for Coaxial Cable Using Multi-carrier Modulation

Express Mail Label No. EU828750385US

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. ☒ Fee Transmittal Form (e.g., PTO/SB/17)
(Submit an original and a duplicate for fee processing)
2. ☒ Applicant claims small entity status.
See 37 CFR 1.27.
3. ☒ Specification [Total Pages 21]
(preferred arrangement set forth below)
 - Descriptive title of the invention
 - Cross Reference to Related Applications
 - Statement Regarding Fed sponsored R & D
 - Reference to sequence listing, a table, or a computer program listing appendix
 - Background of the Invention
 - Brief Summary of the Invention
 - Brief Description of the Drawings (if filed)
 - Detailed Description
 - Claim(s)
 - Abstract of the Disclosure
4. ☒ Drawing(s) (35 U.S.C. 113) [Total Sheets 10]
5. Oath or Declaration [Total Pages 3]
 - a. ☒ Newly executed (original or copy)
Copy from a prior application (37 CFR 1.63 (d))
 - b. ☐ (for continuation/divisional with Box 18 completed)
 - i. ☐ DELETION OF INVENTOR(S)
Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).
6. ☐ Application Data Sheet. See 37 CFR 1.76

ADDRESS TO: Assistant Commissioner for Patents
Box Patent Application
Washington, DC 20231

7. ☐ CD-ROM or CD-R in duplicate, large table or Computer Program (Appendix)
8. Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary)
 - a. ☐ Computer Readable Form (CRF)
 - b. Specification Sequence Listing on:
 - i. ☐ CD-ROM or CD-R (2 copies); or
 - ii. ☐ paper
 - c. ☐ Statements verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

9. ☒ Assignment Papers (cover sheet & document(s))
10. ☒ 37 CFR 3.73(b) Statement (when there is an assignee) ☒ Power of Attorney
11. ☐ English Translation Document (if applicable)
12. ☐ Information Disclosure Statement (IDS)/PTO-1449 ☐ Copies of IDS Citations
13. ☐ Preliminary Amendment
14. ☒ Return Receipt Postcard (MPEP 503) (Should be specifically itemized)
15. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed)
16. ☒ Nonpublication Request under 35 U.S.C. 122 (b)(2)(B)(i). Applicant must attach form PTO/SB/35 or its equivalent.
17. ☐ Other:

18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment, or in an Application Data Sheet under 37 CFR 1.76:

☒ Continuation ☐ Divisional ☐ Continuation-in-part (CIP)

of prior application No. 10/230,687

Prior application information:

Examiner

Group Art Unit: 2661

For CONTINUATION OR DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 5b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

19. CORRESPONDENCE ADDRESS

☒ Customer Number or Bar Code Label 24244 (Insert Customer No. or Attach barcode label here) or ☐ Correspondence address below

Name

Address 24244

City PATENT TRADEMARK OFFICE State Zip Code

Country Telephone 858-229-6801 Fax 858-509-0184

Name (Print/Type) Michael W. Landry Registration No. (Attorney/Agent) 38,216

Signature [Signature] Date 12/18/02

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FEE TRANSMITTAL

for FY 2002

Patent fees are subject to annual revision.

☒ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT	(\$) 452
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Complete if Known

Application Number	
Filing Date	
First Named Inventor	Anton Monk
Examiner Name	
Group Art Unit	
Attorney Docket No.	9228

METHOD OF PAYMENT (check all that apply)

☒ Check ☐ Credit card ☐ Money Order ☐ Other ☐ None

☒ Deposit Account:

Deposit Account	502165
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Michael W. Landry

The Commissioner is authorized to: *(check all that apply)*

☐ Charge fee(s) indicated below ☒ Credit any overpayments

☐ Charge any additional fee(s) during the pendency of this application.

☐ Charge fee(s) indicated below, **except for the filing fee** to the above-identified deposit account.

FEE CALCULATION

1. BASIC FILING FEE

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee	Fee Code	Fee		
101	740	201	370	Utility filing fee	370
106	330	206	165	Design filing fee	
107	510	207	255	Plant filing fee	
108	740	208	370	Reissue filing fee	
114	160	214	80	Provisional filing fee	

SUBTOTAL (1) (\$)**370**

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

		Extra Claims		Fee from below	Fee Paid
Total Claims	10	- 20** =	0	X	
Independent Claims	4	- 3** =	1	X	42
Multiple Dependent					

<u>Large Entity</u>		<u>Small Entity</u>		<u>Fee Description</u>
<u>Fee Code</u>	<u>Fee (\$)</u>	<u>Fee Code</u>	<u>Fee (\$)</u>	
103	18	203	9	Claims in excess of 20
102	84	202	42	Independent claims in excess of 3
104	280	204	140	Multiple dependent claim, if not paid
109	84	209	42	** Reissue independent claims over original patent
110	18	210	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2)	(\$) 42
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****or number previously paid, if greater; For Reissues, see above**

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity/Small Entity		Fee Description		Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)	
105	130	205	65	Surcharge - late filing fee or oath
127	50	227	25	Surcharge - late provisional filing fee or cover sheet
139	130	139	130	Non-English specification
147	2,520	147	2,520	For filing a request for <i>ex parte</i> reexamination
112	920*	112	920*	Requesting publication of SIR prior to Examiner action
113	1,840*	113	1,840*	Requesting publication of SIR after Examiner action
115	110	215	55	Extension for reply within first month
116	400	216	200	Extension for reply within second month
117	920	217	460	Extension for reply within third month
118	1,440	218	720	Extension for reply within fourth month
128	1,960	228	980	Extension for reply within fifth month
119	320	219	160	Notice of Appeal
120	320	220	160	Filing a brief in support of an appeal
121	280	221	140	Request for oral hearing
138	1,510	138	1,510	Petition to institute a public use proceeding
140	110	240	55	Petition to revive - unavoidable
141	1,280	241	640	Petition to revive - unintentional
142	1,280	242	640	Utility issue fee (or reissue)
143	460	243	230	Design issue fee
144	620	244	310	Plant issue fee
122	130	122	130	Petitions to the Commissioner
123	50	123	50	Processing fee under 37 CFR 1.17(q)
126	180	126	180	Submission of Information Disclosure Stmt
581	40	581	40	Recording each patent assignment per property (times number of properties)
146	740	246	370	Filing a submission after final rejection (37 CFR § 1.129(a))
149	740	249	370	For each additional invention to be examined (37 CFR § 1.129(b))
179	740	279	370	Request for Continued Examination (RCE)
169	900	169	900	Request for expedited examination of a design application

Other fee (specify) _____

*Reduced by Basic Filing Fee Paid **SUBTOTAL (3)** (\$) 40

SUBMITTED BY

Name (Print/Type)	Michael W. Landry
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Registration No. (Attorney/Agent)	38,216
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Complete (if applicable)

Telephone	858-229-6801
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Signature	M. W. Landry
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Date	12/18/02
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STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Monk, et al.

Application No./Patent No.: _____ Filed/Issue Date: 12/18/2002

Entitled: Broadband Network for Coaxial Cable Using Multi-carrier Modulation

Entropic Communications, Inc. a Corporation

(Name of Assignee)

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

states that it is:

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

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

- 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.

OR

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

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

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

- [X] Copies of assignments or other documents in the chain of title are attached.
[NOTE: A separate copy (i.e., the original assignment document or a true copy of the original document) must be submitted to Assignment Division in accordance with 37 CFR Part 3, if the assignment is to be recorded 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.

12/16/02 Date

Itzhak Gurantz

Typed or printed name



Signature

CEO, Entropic Communications Inc.

Title

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NONPUBLICATION REQUEST UNDER 35 U.S.C. 122(b)(2)(B)(i)	First Named Inventor		Monk
	Title	Broadband Network for Coaxial Cable Using Multi-carrier Modulation	
	Atty Docket Number	9228	

I hereby 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 agreement, that requires publication at eighteen months after filing.

I hereby request that the attached application not be published under 35 U.S.C. 122(b).

12/18/02
Date

Michael W. Landry
Signature

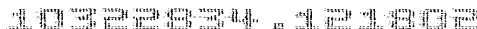
Michael W. Landry
Typed or printed name

This request must be signed in compliance with 37 CFR 1.33(b) and submitted with the application **upon filing**.

Applicant may rescind this nonpublication request at any time. If applicant rescinds a request that an application not be published under 35 U.S.C. 122(b), the application will be scheduled for publication at eighteen months from the earliest claimed filing date for which a benefit is claimed.

If applicant subsequently files an application directed to the invention disclosed in the attached application in another country, or under a multilateral international agreement, that requires publication of applications eighteen months after filing, the applicant **must** notify the United States Patent and Trademark Office of such filing within forty-five (45) days after the date of the filing of such foreign or international application. **Failure to do so will result in abandonment of this application (35 U.S.C. 122(b)(2)(B)(iii)).**

Burden Hour Statement: This collection of information is required by 37 CFR 1.213(a). The information is used by the public to request that an application not be published under 35 U.S.C. 122(b) (and the PTO to process that request). Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This form is estimated to take 6 minutes to complete. This time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.



PTO/SB/24 (10-01)

Approved for use through 10/31/2002. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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EXPRESS ABANDONMENT UNDER 37 CFR 1.138		Docket Number (Optional) 9223	
To: Assistant Commissioner for Patents Washington, DC 20231	In re Application of Monk, et al.		
	Application Number 10/230,687		Filed 8/29/2002
	For Broadband Network for Coaxial Cable Using Multi-carrier Modulation		
	Art Unit 2661	Examiner	
Please check only one of boxes 1-3 below: (If no box is checked, this paper will be treated as a request for express abandonment as of the filing date of this paper.) 1. ☐ Express Abandonment I request that the above-identified application be expressly abandoned as of the filing date of this paper. 2. ☒ Express Abandonment in Favor of a Continuing Application I request that the above-identified application be expressly abandoned as of the filing date accorded the continuing application filed herewith. 3. ☐ Petition for Express Abandonment to Avoid Publication under 37 CFR 1.138(c) I hereby petition to expressly abandon the above-identified application to avoid publication. NOTE: The application will be published in regular course unless the petition is recognized by the Pre-Grant Publication Division in sufficient time to avoid publication (e.g., more than four (4) weeks prior to the projected publication date). Petition Fee – must be filed with petition to avoid delays in recognizing the petition. a. ☐ The Commissioner is hereby authorized to charge the petition fee under 37 CFR 1.17(h) to Deposit Account No. _____ b. ☐ Check in the amount of \$ _____ is enclosed. c. ☐ Payment by credit card (Form PTO-2038 is enclosed). Fax the petition directly to the Pre-Grant Publication Division at (703) 305-8568 or Mail the petition to the above address directed to Box PGPub-ABD. NOTE: A paper requesting express abandonment of an application is not effective unless and until an appropriate USPTO official recognizes the paper. See MPEP 711.01. In addition, the paper will not stop publication of the application unless a petition under 37 CFR 1.138(c) is recognized by the Pre-Grant Publication Division in sufficient time to avoid publication. I am the: ☐ applicant. ☐ assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96) ☐ attorney or agent of record. ☒ attorney or agent acting under 37 CFR 1.34(a) (may act only if box 2 above, stating that the application is expressly abandoned in favor of a continuing application, is checked). Attorney or agent registration number if acting under 37 CFR 1.34(a). <u>38,216</u> (Attorney or agent registration number) <u>Michael W. Landry</u> <u>12/18/02</u> Signature Date Michael W. Landry Typed or printed name * Note: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*. * ☐ Total of _____ forms are submitted.			

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[illegible]

5 Docket: 9223

5 Docket: 9223

5 Docket: 9223

2002 entitled "Broadband Network for Coaxial Cable Using Multi-carrier Modulation" now abandoned, which claims priority to U.S. provisional patent application No. 60/316,820, filed August 30, 2001 entitled "Broadband Local Area Network Using Coaxial Cable"; U.S. provisional patent application No. 60/363,420 filed March 12, 2002 entitled "Method of bit and energy loading to reduce interference effects in devices sharing a communication medium"; and U.S. provisional patent application No. 60/385,361, filed June 3, 2002 entitled "Power loading to reduce interference effects in devices sharing a communication medium", each of which is incorporated herein by reference.

20

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30 cable TV (CATV) service the signals must be separated to avoid interference. The LAN signal can use one band of frequencies and the cable TV service can use a different band. A typical cable TV

configuration for a home is shown in Fig. 1. Signal splitters are used to distribute downstream signals from the point of entry (POE) to the various terminals in the home, which can include cable converter boxes, televisions, and cable modems, generally referred to as customer premise equipment (CPE).

Each terminal device may have the ability to transmit as well as receive. The upstream signals

transmitted by the terminal device flows through the signal splitters back to the POE and into the cable plant and are received by the head end. The signal splitters are functioning as signal combiners for upstream signals. Devices communicating with the head end generally do not communicate with each other.

Signal splitters are commonly used in home and other building type coaxial cable wiring. They have an input port and multiple output ports. The input port can also be considered a common port. The output ports can also be considered tap ports. Splitters are generally passive devices and can be constructed using lumped element circuits with discrete transformers, inductors, capacitors, and resistors. Splitters can also be constructed using strip line or microstrip circuits. A typical two-way splitter splits the power equally between the two output ports if each port is terminated equally. Thus each output would have a power level 3 dB lower than the input. Ideally, a splitter transfers all power from the input port to the output ports. In a practical implementation there is a modest power loss in the splitter due to impedance mismatches, non-zero resistances, dissipative losses in circuit elements, and other non-ideal properties. These losses amount to approximately 0.5 dB, thus a practical two-way splitter provides -3.5 dB power level to each output.

Splitters are generally bi-directional; they can also function as signal combiners, which sum the power from multiple ports into a single output. The ports used as outputs in a splitter configuration become inputs ports for the combining configuration. The common port becomes the output port.

A splitter may have 3 or more tap ports. There is typically an N-way splitter at the point of entry of a building that distributes the incoming CATV signal to each room of the building. The N-way splitter also combines the signals from each room, providing a return path for devices such as cable modems to transmit back to the cable head-end.

Splitters can be designed with power dividing ratios that are not equal. Instead of a 3 dB loss to each port, one port can have, for example 1.15 dB loss, and the other 6 dB. This corresponds to 75%/25% coupling. This type of splitter could be used to balance signal power at all terminal devices when there are multiple levels of signal splitters. A branch that terminates directly to a terminal device would be connected to a higher loss tap port. A branch that contains additional splitters would be connected to a lower loss tap port, which provides extra power to compensate for the loss of additional splitters.

Another characteristic of interest in signal splitters is the isolation between output ports. The isolation is typically between 10 dB and 40 dB. This isolation attenuates signals communicating between tap ports.

The signal splitter/combiner is therefore directional, power flows to and from the common port to the tap ports, but power is attenuated between tap ports.

In a conventional cable TV or cable modem use, this isolation is desirable because terminal devices do not communicate with each other, they only communicate through the POE with the cable head-end. In a LAN system, terminal devices must communicate directly with each other, therefore attenuation between tap ports in the signal splitters results in an undesirable signal loss. Presenting a further problem to terminal to terminal communications is the variation in attenuation in different branches of the building wiring. All terminal devices are not connected directly to the main splitter, but may be connected at a secondary splitter, for example in a room. The level of attenuation between different pairs of terminal devices needing to communicate may vary by 10 to 40 dB or more.

Several buildings may be connected to one splitter at the street. Although the isolation of this splitter is high, some coupling between taps occurs, allowing transmission from one building to another. This is a source of interference between LANs in neighboring buildings.

Another approach to overcoming the splitter inter-port isolation is to replace the main splitter at the building POE with a symmetric power splitter/combiner. In a symmetric splitter, power entering any port is divided among the other ports. A symmetric splitter/combiner is not directional. This type of splitter has 3 dB or more additional loss compared to a directional signal splitter. The additional loss is greater depending on the number of tap ports. A power amplifier may be required to boost the signal to compensate for this loss. A bi-directional device, such as a cable modem, requires a reverse path so the

amplifier needs to be bi-directional. Another disadvantage to this approach is that installation is required; each coax connected to the existing N-way directional splitter must be disconnected and moved to the new splitter. Another disadvantage of this approach is that power must be available for the amplifier, which is not generally present in the area a typical main splitter is located.

Imperfect terminations at connections create micro reflections within the cable wiring. The dominant main signal and reflected signal combine in the channel. A reflection anywhere in the wiring produces a multipath signal in some or all wiring branches that creates inter-symbol interference (ISI). The multipath signal has a delay and amplitude difference relative to the main signal. In the frequency domain, a reflection produces ripples in the response of the channel, creating amplitude variations across the pass band. In the time domain, ISI is seen as an impairment to the shape of the digital signal pulses. ISI will degrade the bit error rate (BER) performance of the communication channel. To overcome the effects of reflections, an adaptive equalizer is commonly used in the terminal device receiver. This creates a filter response that restores a flat frequency response impaired by the multipath signal.

The signals transmitted by LAN devices can create interference with televisions and set top boxes even though the LAN signals are out of band of these receivers, due to down conversion and signal mixing in the receivers.

Broadband networks are described in U.S. patent 5,889,765 “Bi-directional communications Network” issued to Gibbs, U.S. patents 5,940,387 and 6,005,861 “Home Multimedia Network Architecture” issued to Humpleman, U.S. patent 5,870,513 “Bi-directional Cable Network with a Mixing Tap or Suppressing Undesirable Noise in Signals From a Remote End of the Network” issued to Williams, U.S. patent 5,805,591 Subscriber Network Interface issued to Naboulsi, U.S. patent 6,008,368 “Ethernet Transport Facility Over Digital Subscriber Lines issued to Rubinstain”, U.S. patent 6,137,793 “Reverse Path Multiplexer for Use in High Speed Data Transmissions” issued to Gorman, and U.S. patent 6,091,932 “Bidirectional Point to Multipoint Network Using Multicarrier Modulation” issued to Langlais, each of which is incorporated herein by reference.

Gibbs discloses a broadband network overlaid with the cable service frequencies using dynamically allocated TDMA protocols. Humpleman patents disclose a home network using an active network

impairs the ability to achieve high data rates in a communication network. The signal reflections and tap port isolation of splitters existing in a typical cable TV wiring configuration presents a problem to shared usage of the cable for a LAN system. The prior art references address communicating between a cable head end and in-home units but do not address the impairments present in the home wiring that
5 restricts high bandwidth communication between devices within the home.

SUMMARY OF THE INVENTION

10 The present invention uses a form of multi-carrier modulation, orthogonal frequency division multiplex (OFDM), to transmit digital data signals through the coaxial cable wiring installed in homes. Communication is achieved through splitters and signal impairments caused by reflections and attenuation are overcome. Bit loading, along with power loading, adaptive power control, and frequency coordination can be used individually or in combination to implement a network that overcomes the
15 problem of multipath and high attenuation in building cable wiring that would restrict the ability of terminal devices to communicate with each other.

Channel probing messages formed using a predetermined bit sequence and length are transmitted between network devices to estimate the channel characteristics, including the multipath characteristics
20 and a profile of the signal to noise ratio over the frequency band of interest. The probe messages are transmitted using robust modulation, for example QPSK, to insure the message can be received. The probe messages are transmitted without bit loading, that is all carriers have the same robust modulation and all carriers have the same power. The receiving device processes the probe messages as received and determines the impairment present at each carrier frequency. Based on the estimate of the channel,
25 bit loading is applied to increase the modulation order at carriers with high signal to noise ratio and lower the modulation order at carriers with low signal to noise ratio.

Power loading of the individual carriers forming the OFDM signal allows the data network signal to minimize interference to the other services using the cable. Selective avoidance of specific carrier
30 frequencies avoids interference from the other services to the network signal.

cable". Additional networks can be connected to taps in the cable plant. The networks can reside in the same or different building.

LAN devices 280 and 282 can be used for digital video services or data services. LAN device 282, for example, can extract digital video data from a transport stream, such as an MPEG stream, transmitted over the network and decode the transport stream to produce an analog video signal suitable for connection to a standard TV set.

Existing devices, such as TV 240 and cable modem 250 connected to PC 260, use frequency bands distinct from the frequency band used by the LAN and therefore operate in a normal manner.

The frequencies used by the LAN can be located above the standard cable use frequencies, which extend to 550 MHz, 750 MHz, or 850 MHz. Other frequency plans can be used, for example where a block of frequencies is available in the middle of the cable band. The filter cut-off frequencies are selected according to the frequencies bands used. Satellite systems generally use frequencies above 950 MHz to communicate the received signal from the out door unit (ODU) to the integrated receiver decoder (IRD) set top box. A LAN would use frequencies below 950 MHz in this case.

Referring to Fig 3, more than one network can occupy the frequency band used for network services.

The amount of spectrum used by a particular network depends on the data bandwidth needed for the service provided. Fig. 4 shows the spectrum used by cable upstream and downstream signals with a network signal using the spectrum above the cable band.

The present invention can use a time division duplex (TDD) protocol for communications. In a TDD system, receive and transmit data are communicated during different time intervals, generally using the same frequency. The advantage of using TDD is that the transceiver design is simplified. Different users share a common frequency channel through the use of time division multiple access (TDMA). In a TDMA system each user transmits during a different time interval. Users are assigned one or more slots of predetermined length in a framing structure that contains multiple slots. All users are synchronized by a beacon message broadcast on the network. The beacon message provides a common time reference to the users and can include other network management information.

produces some harmonic content that is removed by low-pass filters and allows demodulation and decoding of the message.

The originating terminal device transmits the channel probing message at a predetermined power level.

- 5 Alternatively, the message can embed a data field that indicates the transmitted power of the message. Using either source of information, the responding terminal device can adapt its transmitted power during the response to provide a desired power level at the originating device. By evaluating the received power measurement data in the response message, the originating device has a direct evaluation of the signal loss due to the channel. The power level of subsequent transmissions by the originating
- 10 device to a responding device is set according to the channel loss measurement. An acknowledgement message is sent from the originating device to the responding device to conclude the communication establishment sequence.

- In one embodiment, the power measurement can be made by observing the AGC control level, which
- 15 represents the received power level.

OFDM Waveform Modulator and Demodulator

- Multi-tone modulation uses a set of modulating carriers that are integer multiples of a common
- 20 frequency and the symbol period is the inverse of the common frequency. Multi-tone modulation is also called discrete multi-tone (DMT) and orthogonal frequency division multiplexing (OFDM). OFDM utilizes quadrature phase shift keying (QPSK) and multi-level quadrature amplitude modulation (QAM) wherein each OFDM carrier can be modulated by an amplitude/phase-varying signal. QPSK is composed a sine and a cosine wave of identical frequency with phase modulation applied to each carrier
- 25 independently. QAM is composed of sine and cosine waves with phase modulation and amplitude modulation. QPSK is an m-ary QAM signal with $m=2$. These signals can be represented using complex numbers. To modulate, data bits are encoded into a number of m-ary QAM constellations, which then modulate the respective carriers. The carriers are summed together for transmission over the channel. Each carrier is independent and can be independently decoded in the receiver. All carriers are related in
- 30 frequency, being an integer multiple of a base frequency.

Micro reflections tend to have a time displacement relative to the main signal ranging from several nanoseconds to a few microseconds. If the time displacement is longer than an information symbol period ISI is created when the reflected signal from a prior symbol arrives during a later symbol. In OFDM, the user data bits generated at a high rate are distributed over many carriers, each with a lower data rate and therefore longer symbol period. At a symbol period longer than the multipath delay, the main and reflected signals arrive at a receiver during the same symbol reducing the effects of ISI. For example, if a data rate of 100 mbps is modulated using QPSK, which provides 2 bits per symbol; the symbol period is 20 nS. Using OFDM with 100 carriers, the data rate of each carrier is 1 mbps. With QPSK modulation the symbol period for each carrier is 2 uS.

OFDM processes all carriers as a block using a time to frequency transform. Furthermore, a cyclic prefix is added to the beginning of each OFDM symbol and transmitted to simulate periodicity. The cyclic prefix is created by replicating data from the end of the block at the beginning of the block. The length of the cyclic prefix is a function of the multipath time displacement. By adding a cyclic prefix to the transmitted data the OFDM signal is robust in a multipath environment by providing a guard interval between symbols. Hence, OFDM provides a mechanism to overcome the frequency selective channel impairments present in coaxial building wiring.

The OFDM waveform is generated by applying an inverse discrete Fourier transform (IDFT) to a complex vector that results in a real valued time domain sequence. The time domain sequence is applied to an up converter to place the waveform at the proper RF frequency.

Bit loading is a method of allocating a higher order signal constellation to carriers that have higher signal to noise ratio and a lower order constellation to carriers that have lower signal to noise ratio.

Higher SNR channels can support higher data capacity. Frequency bins occupying parts of the channel where the SNR is high can be used to transmit more bits. Each carrier may be modulated with a different order constellation, where higher SNR frequencies can bear a higher order constellation, and the resulting closer spacing of the constellation points. Frequencies with the lower SNR use lower order constellations such as QPSK. U.S. patent 6,438,174 "Multi-carrier transmission systems" incorporated herein by reference, discloses discrete multi-tone modulation and a technique for bit loading applied to point-to-point twisted pair wiring. U.S. patent 6,259,746 "Method for allocating data and power in a

that avoid interference with other devices. Inverse Fast Fourier Transform (IFFT) 540 performs a frequency domain to time domain transformation that converts the complex series of frequency amplitude values into a time sequence. The IFFT output array is converted to a serial data stream by a parallel to serial converter 542 as part of IFFT 540. The digital time sequence is converted to an analog representation by digital to analog (DAC) 550. The analog signal is translated to a suitable carrier frequency by up converter 560. The time sequence can be either real valued or complex valued samples. In the case of complex values, DAC 550 would be a dual DAC and up converter 560 would be a quadrature modulator. An amplifier provides the appropriate overall power for the signal to be inserted into the communications medium.

Power adjustment table 530 may also be used to influence the order of modulation generated by QAM encoder 520 for each of the carriers. Higher power level carriers can support higher order of modulation and lower power levels require lower order modulation. The selection of QAM modulation order is bit loading, the selection of carrier power is power loading. The power profile used to avoid interference can alter both the power in each carrier and the number of bits transmitted in each symbol of each carrier.

Fig. 6 is a block diagram of a representative demodulator for use with the present invention. The inverse of the modulator operations are performed to reproduce digital data. Not shown are operations of carrier and symbol timing recovery, which can be performed using techniques well known in the art.

Multi-carrier system architecture is covered in ADSL/VDSL Principles by DR. Dennis J. Rauchmayer, Macmillan Technical Publishing, 1999 and DSL Simulation Techniques and Standards Development for Digital Subscriber Line Systems by Dr. Walter Y. Chen, Macmillan Technology Publishing, 1998, incorporated herein by reference.

Channel Probing Message

Channel probing messages are transmitted between network devices to estimate the channel characteristics. The channel probe uses a predetermined bit sequence which is known by the receiving

device. By passing a known data sequence through the channel, the response of the channel can be determined, including multipath and SNR profile.

Probe packets are sent by devices upon command from a cycle master. This request for transmission of a probe message may be periodic or as part of scheduled activity. A probe packet is analyzed by the receiving node, a bit loading profile is computed, and the bit loading information is transmitted back to the sending node. The sending node then uses the requested bit loading until a new bit loading is requested by the receiving node.

In a symmetric channel the receiving device can determine bit loading for transmitted its own messages based on channel characteristics measured from a received probe message. The bit loading is valid for sending messages to the device that transmitted the probe message. In a non-symmetric channel, the receiving device must communicate the results of the analysis, either as raw data or as a bit loading profile, back to the sending device for the sending device to modify the transmission parameters.

Fig. 7 shows an example of a bit loading probe message 700, comprised of a preamble 710, channel estimation training sequence 720, and a bit loading training sequence 730. The preamble portion 710 of the message 700 is used to compute an estimate of the carrier frequency offset and sample timing offset. The preamble 710 is 2 OFDM symbols in length transmitted in time domain as 512 bits. The channel estimation training sequence 720 is 8 OFDM symbols transmitted in the frequency domain with 256 carriers using QPSK modulation and is used to compute the transfer function of the channel. From the transfer function, equalizer coefficients are computed and loaded the taps of an equalizer. The remaining portion of the probe message is processed with the benefit of equalization on the signal.

The bit loading training sequence 730 is 80 symbols transmitted in the frequency domain using BPSK modulation and is used to compute the actual bit loading needed for data traffic. The bit loading training sequence provides for averaging over a large number of symbols. The SNR in each frequency bin is calculated and the bit loading profile is generated. Determination of a channel response, multipath, and SNR profile from a known signal is well known in the art. The data pattern chosen for the preamble and training sequences can be a pseudo-random data sequence of the specified length. A preferred pattern for the preamble uses a selected pattern for the first half of the preamble and a bit inversion of the

selected pattern for the second half of the preamble. This pattern provides desirable auto-correlation properties.

Schmidl, et al. "Robust Frequency and Timing Synchronization for OFDM", IEEE Transactions on Communications, vol. 45, No. 12, pp. 1613-1621 (1997) and Minn, et al. "On Timing Offset Estimation for OFDM Systems", IEEE Communications Letters, Vol. 4, No. 7, pp. 242-244, incorporated herein by reference, describe techniques for forming and processing sequences to synchronize receivers to data transmissions over frequency-selective channels.

The signal processing and computations performed on signal samples needed for modulating, demodulating, channel estimation, and other operations can be performed by dedicated hardware resources or by a programmed signal processor. A typical system will utilize both hardware and software techniques to perform the needed signal processing. Signal processing circuitry can be integrated into a single system on a chip (SOC), partitioned into several chips, or programmed into a field programmable gate array (FPGA).

Fig. 8 shows a schematic representation of a splitter 810 with a signal burst 820 of power P entering splitter port A. The signal burst will couple to port B with attenuation of, for example, 20 dB producing signal P_1 . The signal burst will also couple to port C with a loss of 3.5 dB and pass up the wiring branch to a point that produces some reflection with a particular attenuation. The reflected signal will pass down the wiring branch to splitter port C and couple to port B with a power level of P_2 . The resulting signal 830 present at port B will be a signal burst of power P_1 followed by the echo of power P_2 . Depending on the level of the reflection and the isolation from port A to port B, the first signal burst arriving at port B can be higher or lower in power than the second signal burst arriving. The time displacement of the two arrivals is dependant upon the cable length of the wiring branch connected to port C.

Fig. 9 shows a time domain plot of two signal bursts, one arriving at time 0 and the other arriving at time $t_{sub.e}$. The corresponding frequency domain plot shows nulls in the spectrum with a separation of $1/t_{sub.e}$. This diagram shows the effect of two time displaced signals arriving at a single point and the effect on the frequency response of the signal.

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frequency band used will be logged as unusable. The network or device ID can be transmitted in a base coding modulation, such as QPSK. This allows the scanning terminal to synchronize to and decode enough information to identify the activity without knowing the specific modulation used in the terminal specific and payload portions of the frame.

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Once a clear area of the available frequency band is determined, the network controller node can begin transmitting network access information to allow other devices to gain access to the network within the home.

- 10 An alternative to frequency coordination between networks is to insert a blocking filter at the POE of the home. This prevents egress of signals from the home and ingress of signals from other homes. The filter is a low pass or band pass filter that allows CATV signals to pass unaffected and blocks the frequencies used by the network. An additional benefit is to insure privacy of the network data. The communication activity scan would then detect any cable or satellite services and use other frequency
- 15 bands for the network.

What is claimed is:

1. A data communication network comprising:

at least two network devices, each network device comprising a multi-carrier modulator for modulating data, an up converter for translating the modulated data to an RF carrier frequency, a down converter for translating an RF signal, and a multi-carrier demodulator for demodulating the translated RF signal to produce data; and

cable wiring comprising a splitter with a common port and a plurality of tap ports, and a plurality of segments of coaxial cable connecting between the splitter tap ports and the network devices;

whereby network devices communicate with each other through the cable wiring using multi-carrier signaling.

2. The data communication network of claim 1 wherein network devices transmit probe messages through the cable wiring and analyze received probe message signals to determine channel characteristics and bit loading is selected based on the determined channel characteristics.

3. The data communication network of claim 2 wherein a network device comprises a means for determining signal activity and selects a frequency band for operation that is not used by other services.

4. The data communication network of claim 2 wherein the network shares the cable wiring with a cable television service and the network device up converter translates the modulated data to an RF carrier frequency above the frequency used by the cable television service.

5. A method of communicating digital data between a plurality of terminal devices connected to coaxial wiring installed in a building comprising a splitter and segments of coaxial cable, the method comprising the steps of:

in a first terminal device, modulating the digital data using bit loaded orthogonal frequency division multiplex (OFDM) to create a modulated signal;

9. The method of claim 8 wherein the preamble is a predetermined sequence of QPSK encoded data bits; the channel estimation training sequence is a predetermined sequence of QPSK encoded OFDM symbols; and the bit loading training sequence is a predetermined sequence of BPSK encoded OFDM symbols.

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10. A network device for communicating data to other network devices over a coaxial wiring system comprising a splitter and a plurality of cable segments connected between the splitter and the network devices, the network device comprising:

a data modulator to produce a multicarrier modulated signal;

10 a demodulator for multicarrier modulated signal to produce data;

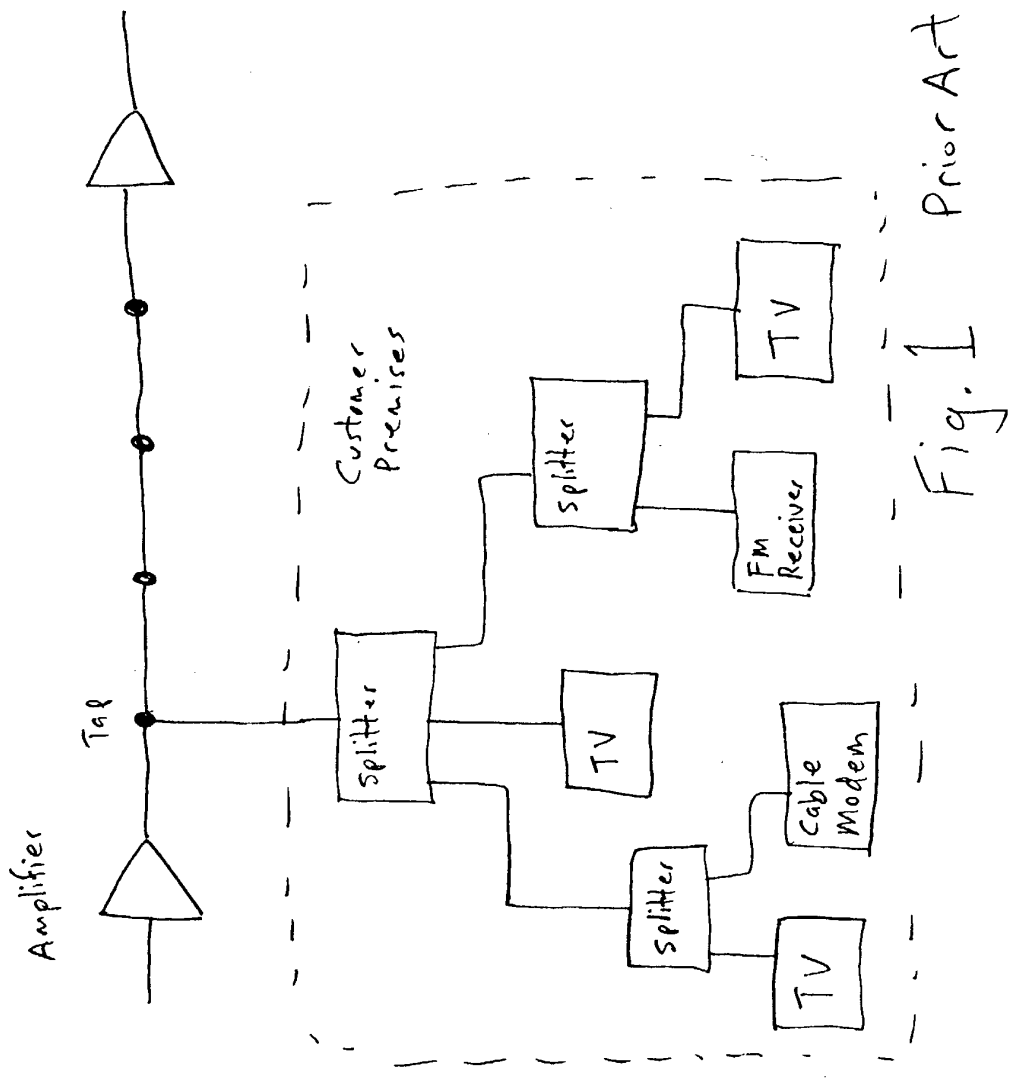
means for producing and transmitting a probe message; and

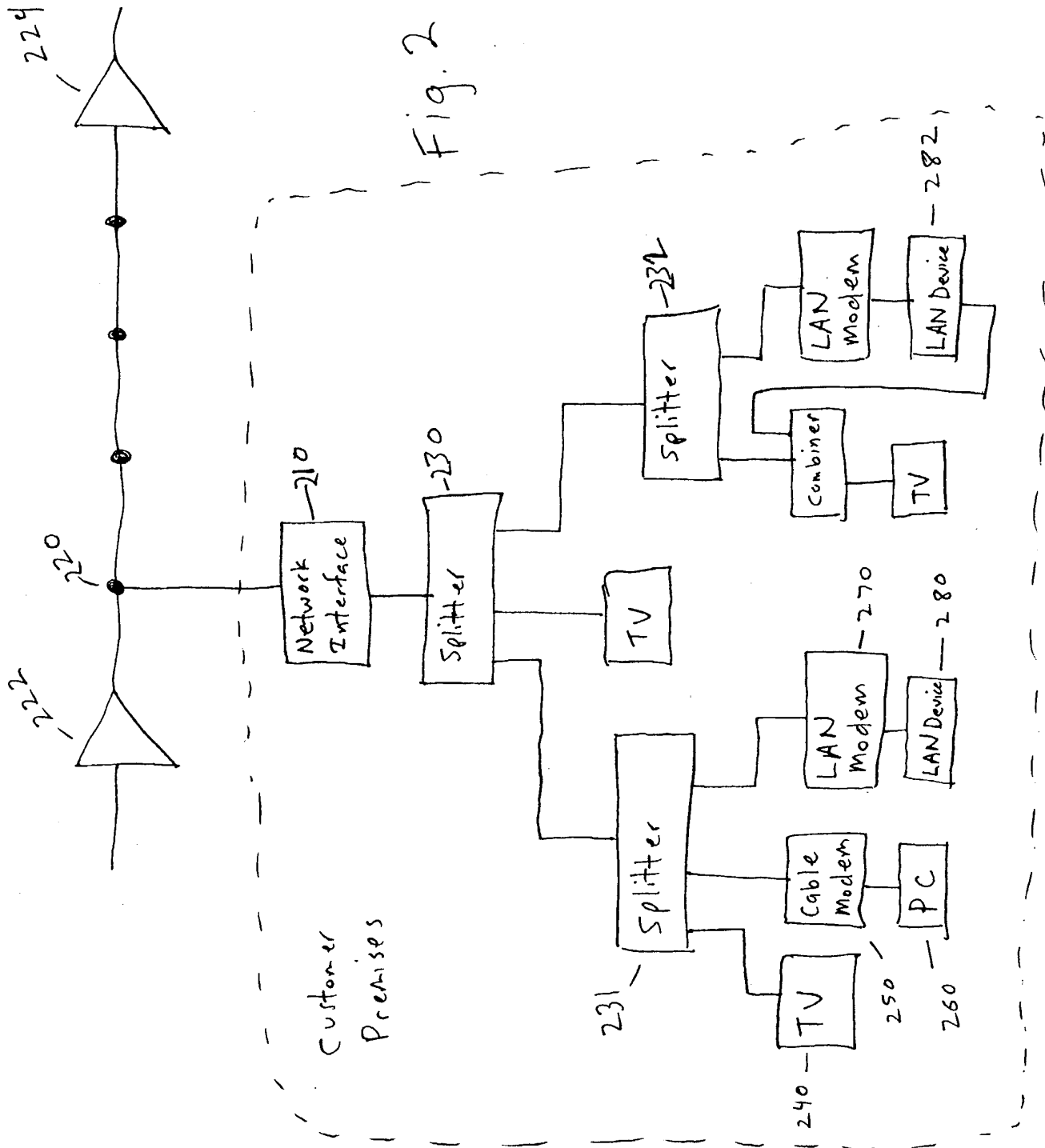
means for receiving and analyzing a probe message to determine a bit loading profile used to transmit data.

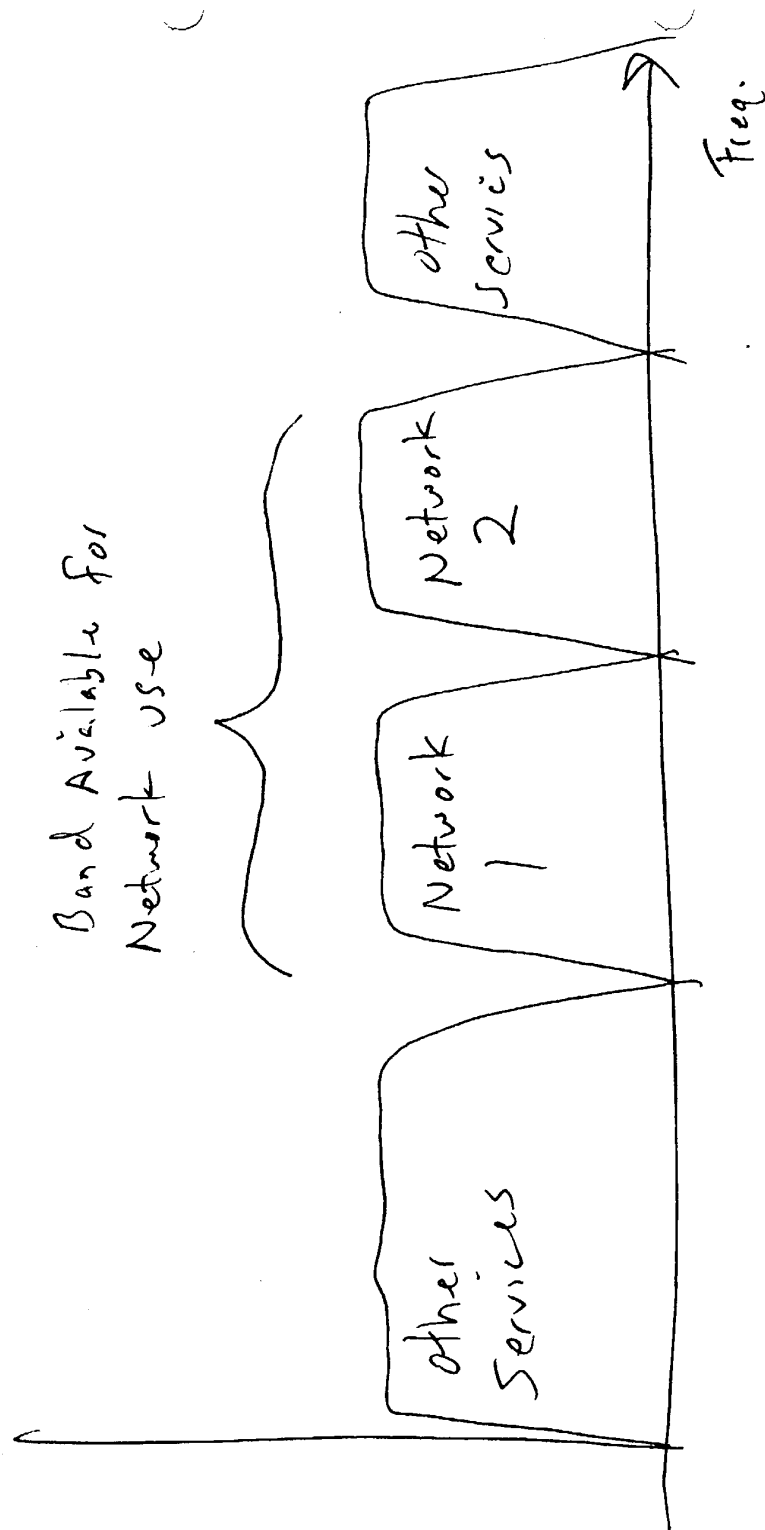
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ABSTRACT

A broadband local area data network uses coaxial cable wiring for interconnection of terminal devices. Orthogonal frequency division multiplexing (OFDM) with bit loading is used to overcome channel
5 impairments and provide a path for terminal devices to transmit to and receive from other terminal devices. Probe messages are sent between devices to characterize the communication channel and determine optimum bit loading. The data network shares the cable spectrum with other services and uses frequency bands not used by other services. Adaptive power control can be used to maintain signal
10 to noise ratio in a communication between terminal devices. Frequency coordination can be used to avoid interference between the LAN communications and other services transmitted on the cable.







Frequency Usage on a Coax System

Fig 3

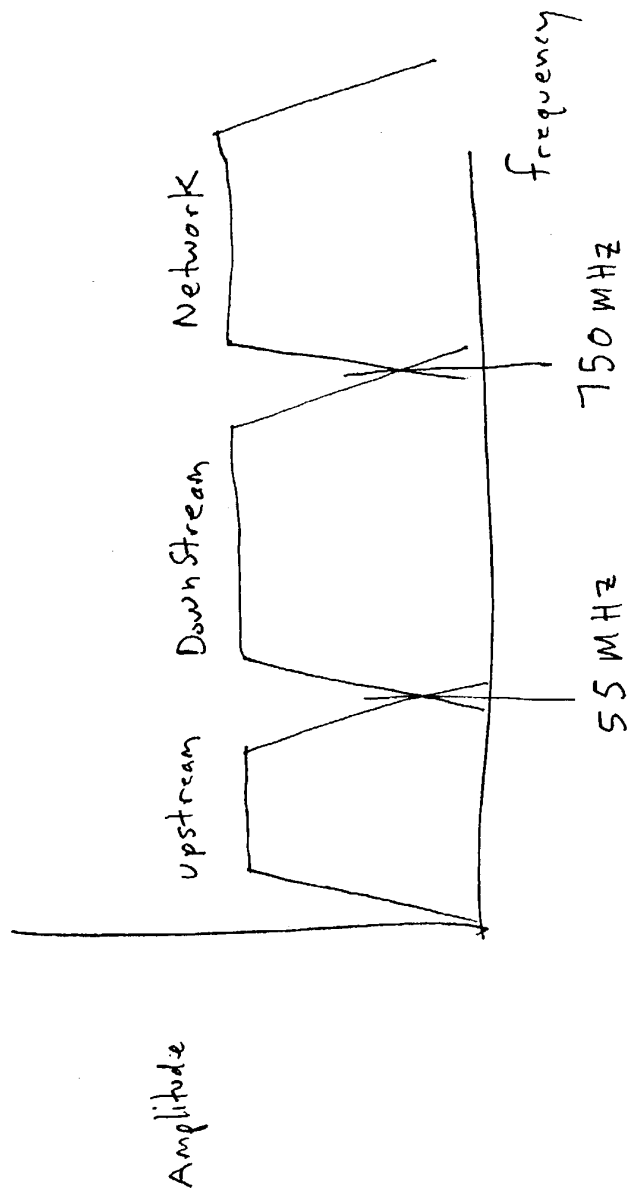


Fig 4

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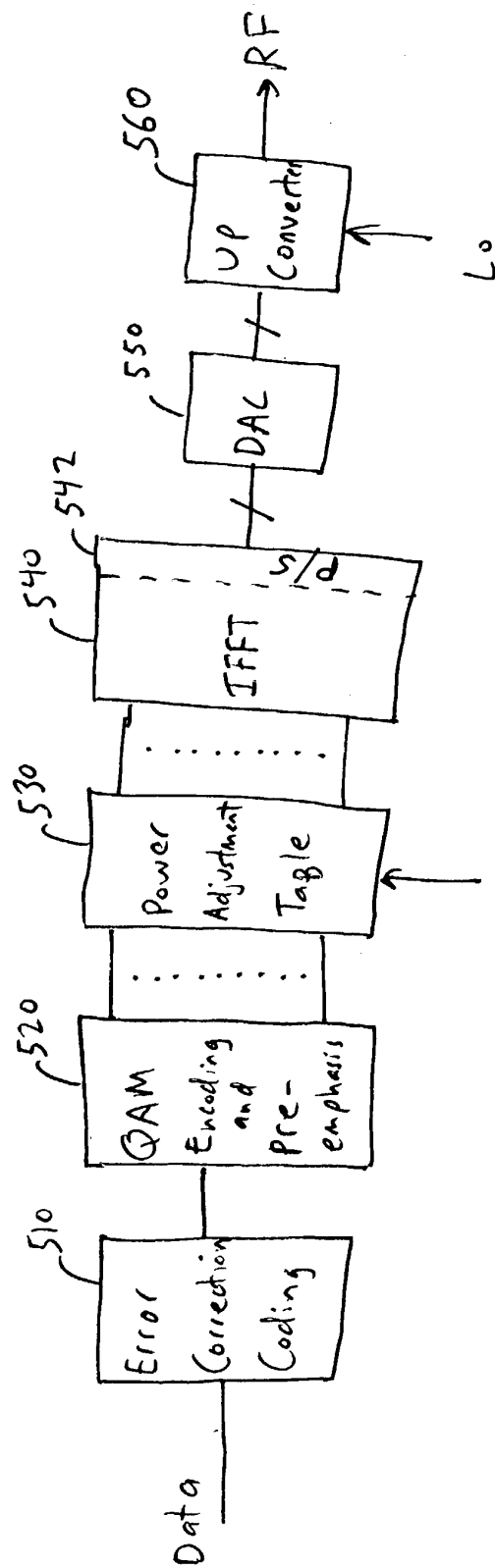


Fig 5

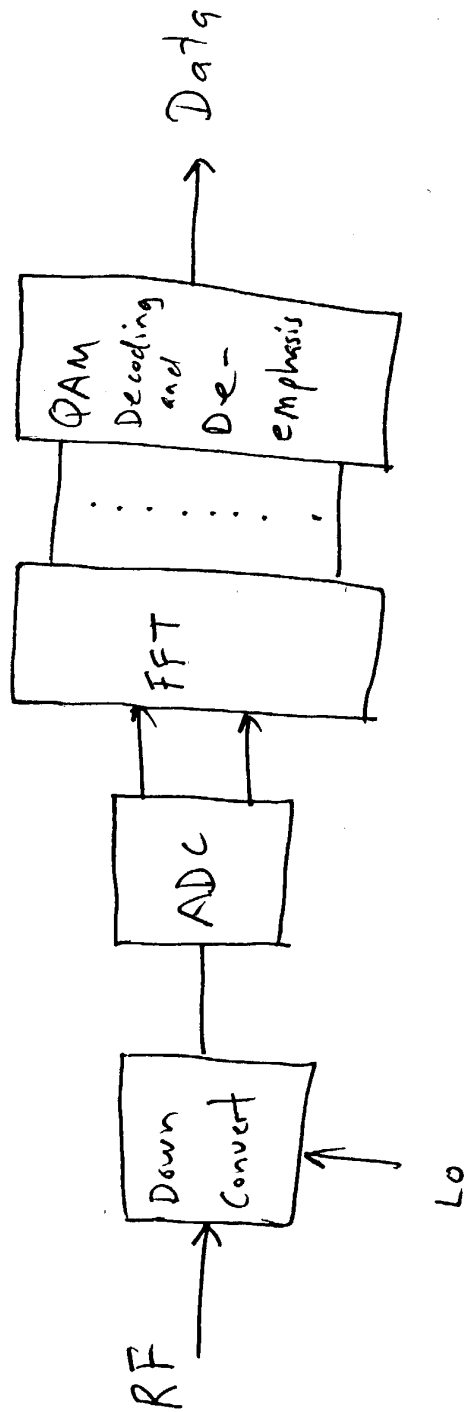


Fig 6

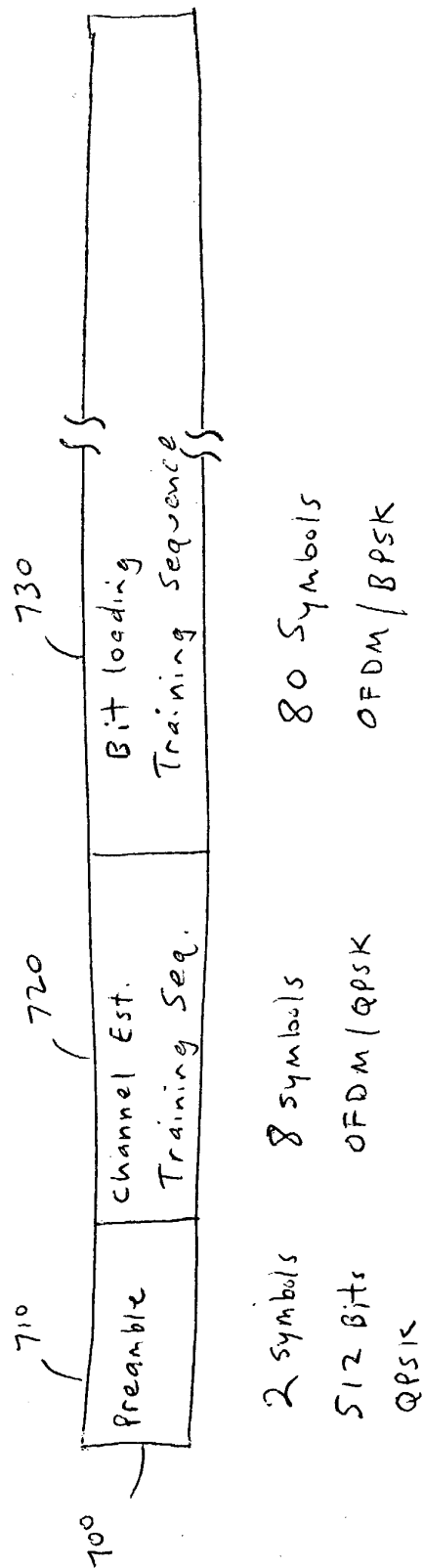


Fig 7

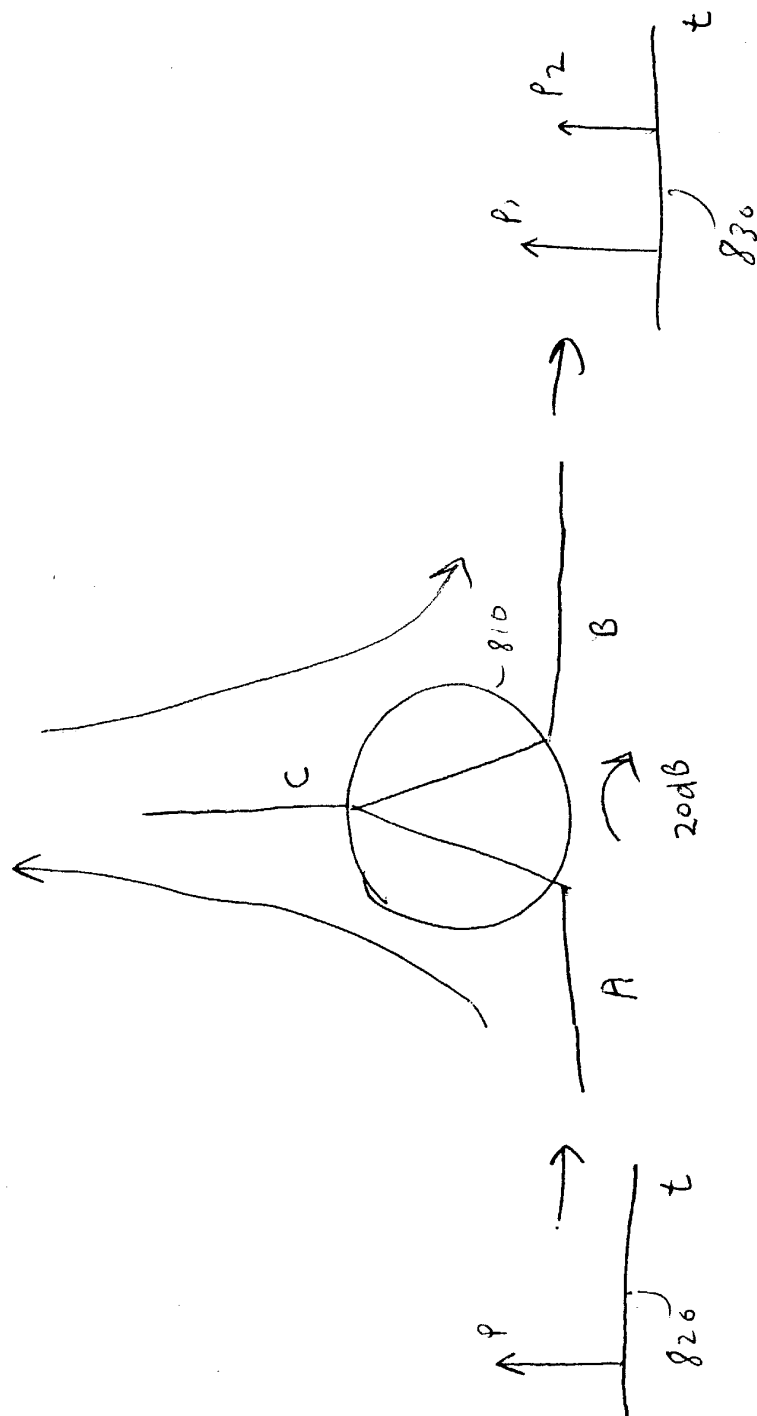


Fig 8

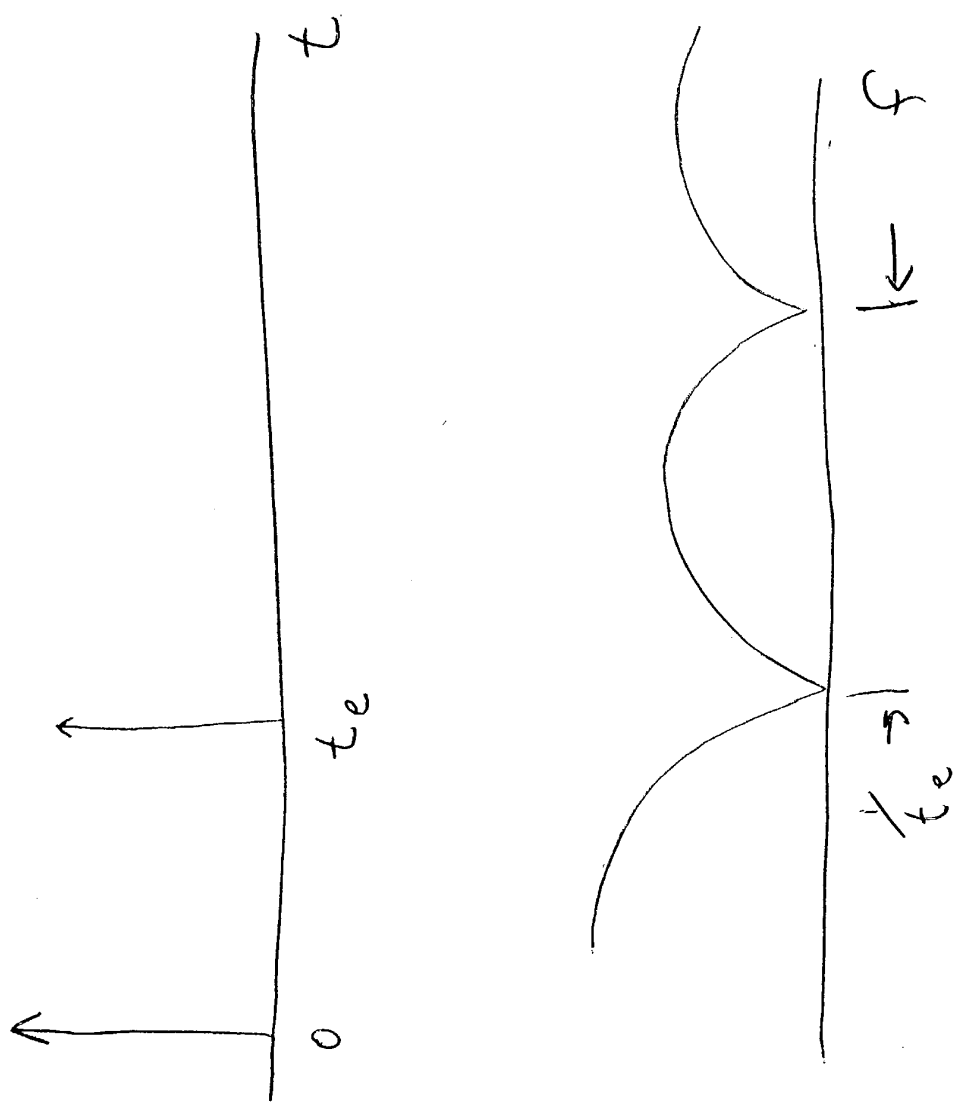


Fig 9

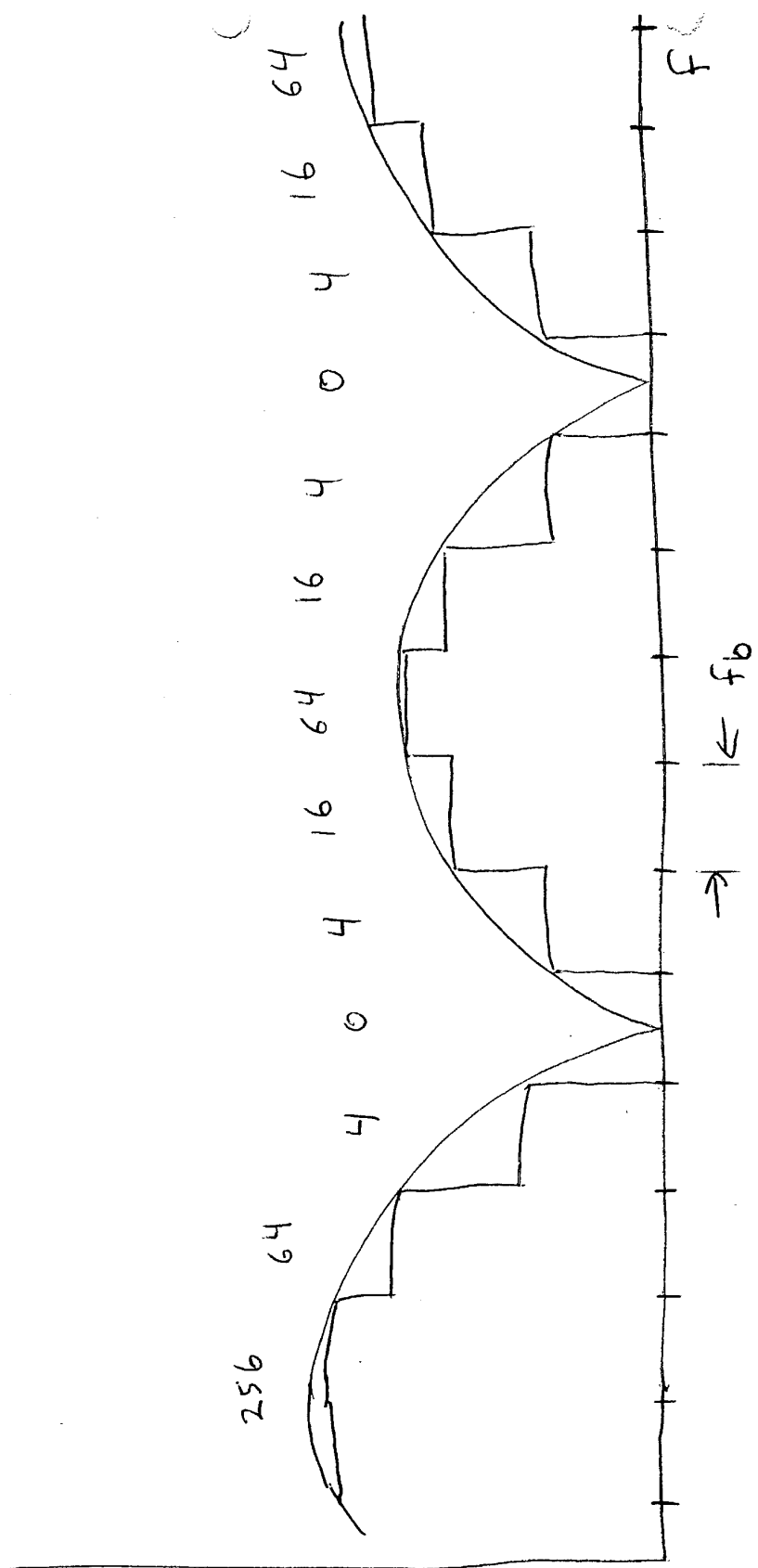


Fig 10

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	First Named Inventor Monk		
	COMPLETE IF KNOWN		
	Application Number		
	Filing Date	12/18/02	
		Art Unit	
		Examiner Name	

As the below named inventor, I hereby declare that:

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

I believe I am the original and first inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Broadband Network for Coaxial Cable Using Multi-carrier Modulation

(Title of the Invention)

the specification of which

☒ is attached hereto

OR

☐ was filed on (MM/DD/YYYY)	as United States Application Number or PCT International
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Application Number	and was amended on (MM/DD/YYYY)	(if applicable).
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I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

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[Page 1 of 2]

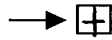
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Inventor's Signature <i>A. Monk</i>								Date <i>12/16/02</i>	
San Diego Residence: City			CA State		USA Country		USA Citizenship		
10618 Ambergldes Ln									
Mailing Address									
San Diego City			CA State		92130 ZIP		USA Country		
NAME OF SECOND INVENTOR:					☐ A petition has been filed for this unsigned inventor				
Given Name (first and middle [if any])					Family Name or Surname				
Brett					Bernath				
Inventor's Signature <i>B. Bernath</i>								Date <i>12/16/02</i>	
San Diego Residence: City			CA State		USA Country		USA Citizenship		
4167 Calle Mar De Ballenas									
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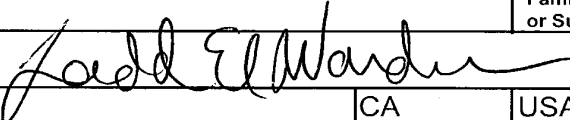
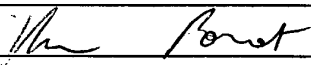
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Given Name Itzhak		Family Name or Surname Gurantz	
Inventor's Signature 		Date 12/16/02	
San Diego Residence: City	CA State	USA Country	USA Citizenship
5584 Shannon Ridge Lane Mailing Address			
Mailing Address			
City San Diego	CA State	92130 ZIP	USA Country
Name of Additional Joint Inventor, if any:		☐ A petition has been filed for this unsigned inventor	
Given Name Ladd		Family Name or Surname El Wardani	
Inventor's Signature 		Date 12/16/02	
La Jolla Residence: City	CA State	USA Country	USA Citizenship
6416 La Jolla Scenic Dr. South Mailing Address			
Mailing Address			
City La Jolla	CA State	92037 ZIP	USA Country
Name of Additional Joint Inventor, if any:		☐ A petition has been filed for this unsigned inventor	
Given Name Ron		Family Name or Surname Porat	
Inventor's Signature 		Date 12/16/02	
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Filing Date	12/18/02
First Named Inventor	Monk
Title	Broadband Network for Coaxial ...
Group Art Unit	
Examiner Name	
Attorney Docket Number	9228

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Michael W. Landry

Address

5098 Seachase St.

Address

City

San Diego

State

CA

Zip

92130

Country

Telephone

858-229-6801

Fax

858-509-0184

I am the:

☐ Applicant/Inventor.

☒ Assignee of record of the entire interest. See 37 CFR 3.71.

Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

SIGNATURE of Applicant or Assignee of Record

Name

Itzhak Gurantz, CEO Entropic Communications Inc.

Signature

Date

12/16/02

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APPLICATION NUMBER	FILING/RECEIPT DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
10/322,834	12/18/2002	Anton Monk	9228

CONFIRMATION NO. 6744

FORMALITIES LETTER



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SAN DIEGO, CA 92130

Date Mailed: 01/28/2003

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	First Named Inventor	Monk	
	Art Unit	2661	
	Examiner Name		
Total Number of Pages in This Submission	12	Attorney Docket Number	9228

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Typed or printed	Michael W. Landry	
Signature	<i>Michael W. Landry</i>	Date 3/11/2003

This collection of information is required by 37 CFR 1.5. 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, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Washington, DC 20231.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

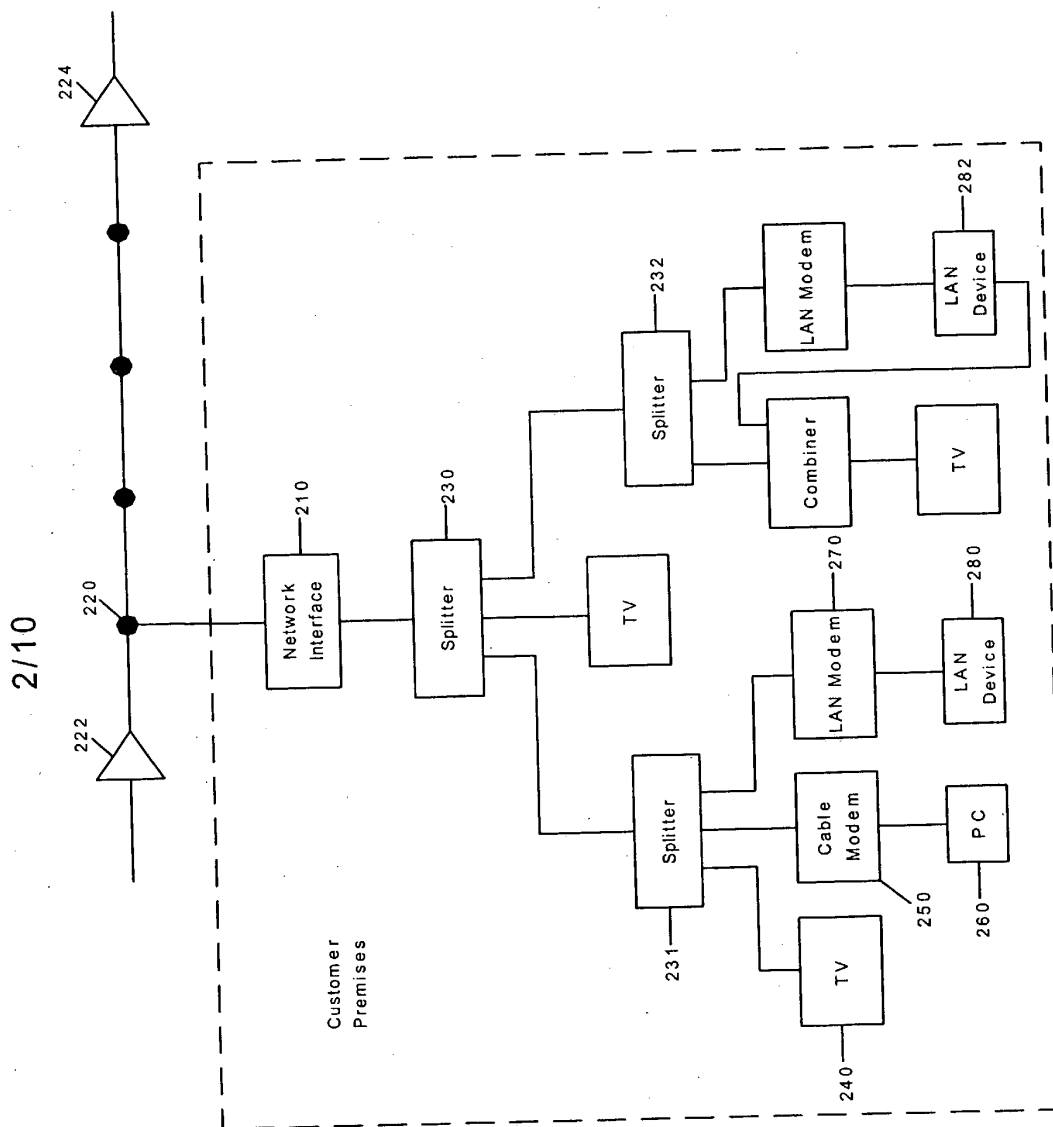


Fig. 2



3/10

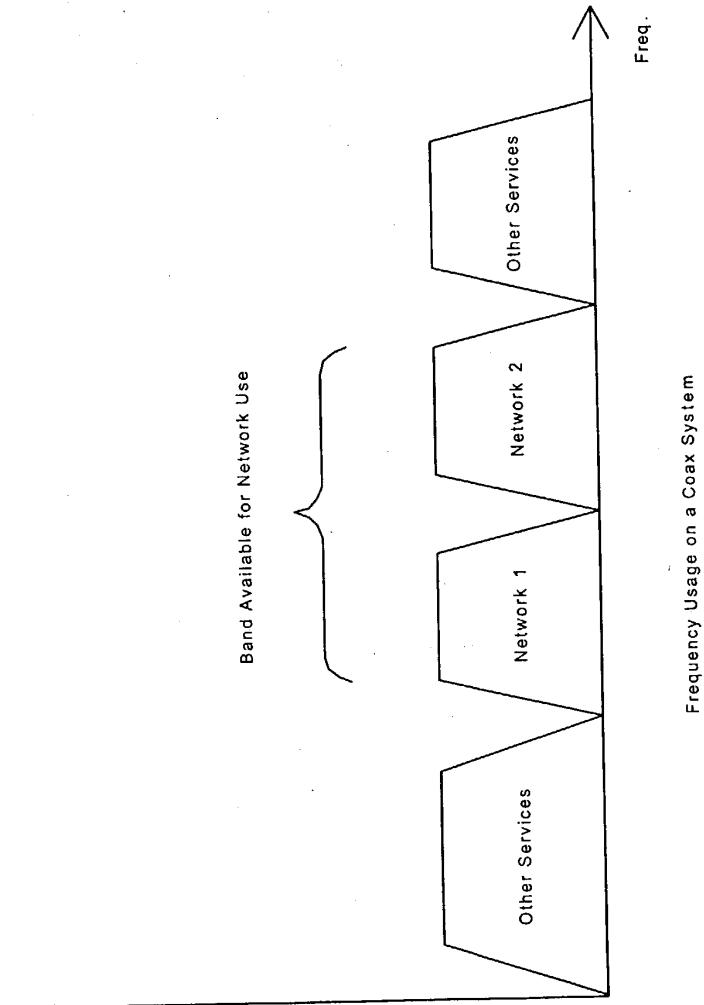


Fig. 3



4/10

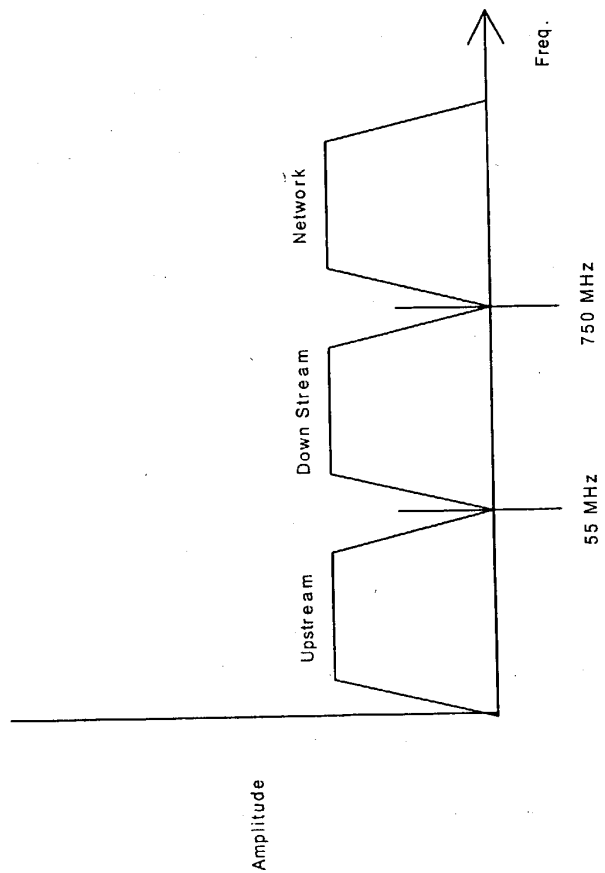


Fig. 4



5/10

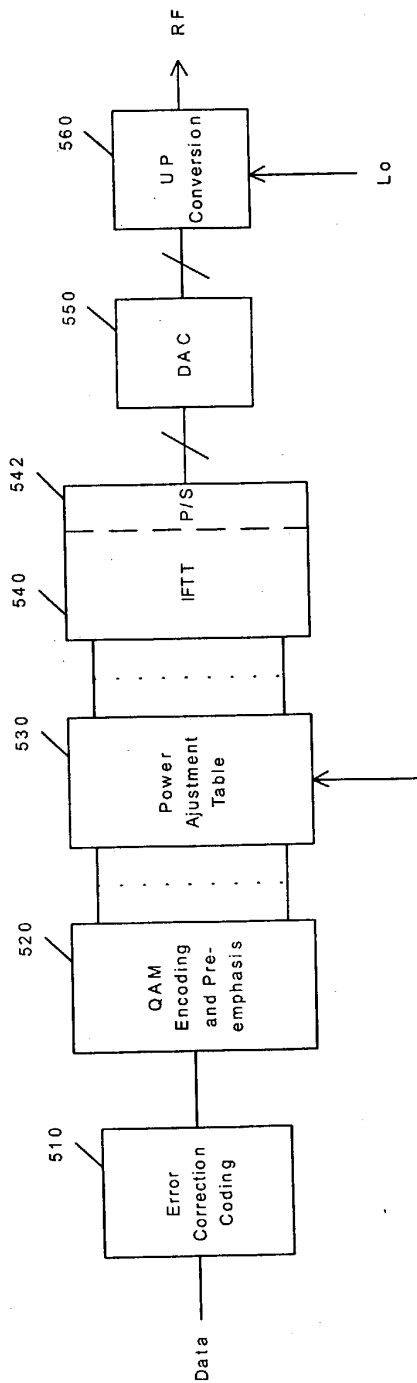


Fig. 5



6/10

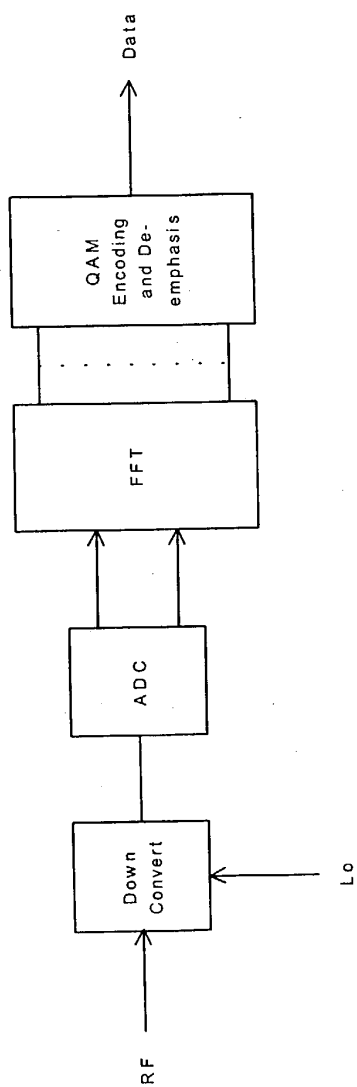


Fig. 6



7/10

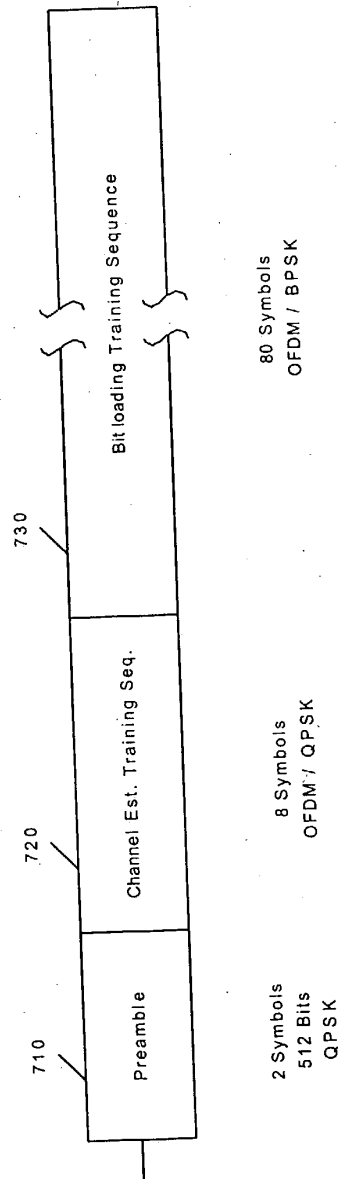


Fig. 7

8/10

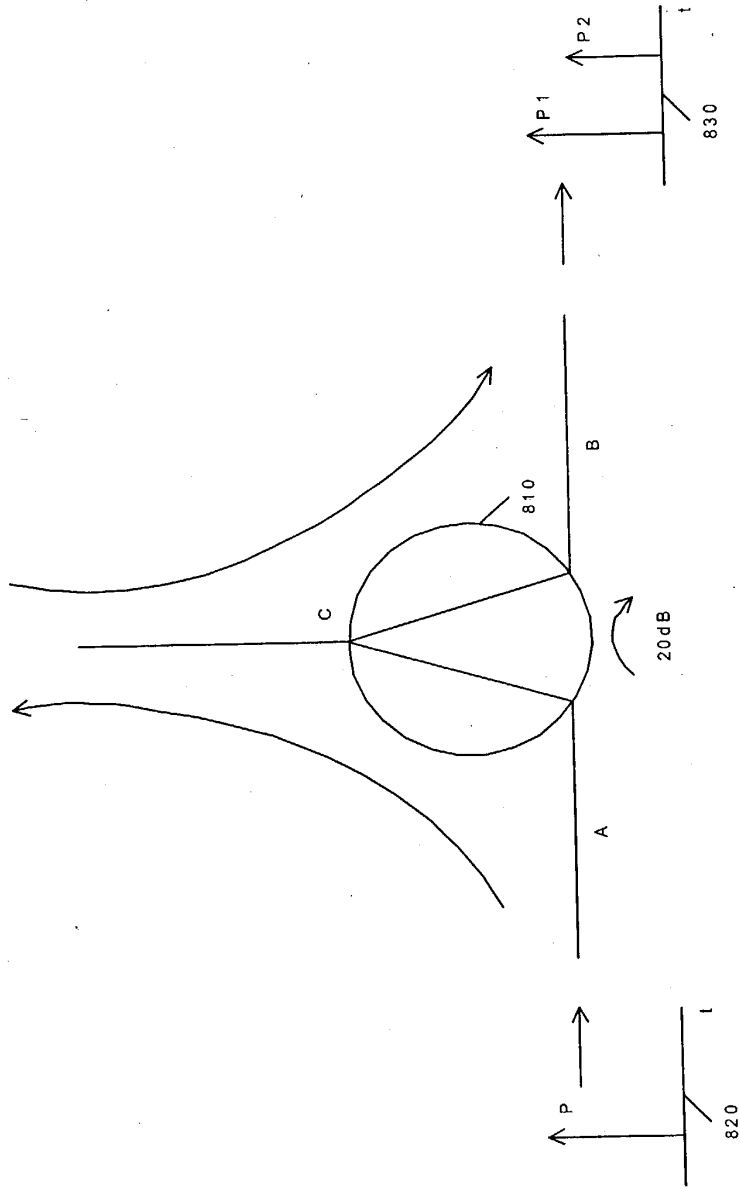


Fig. 8



9/10

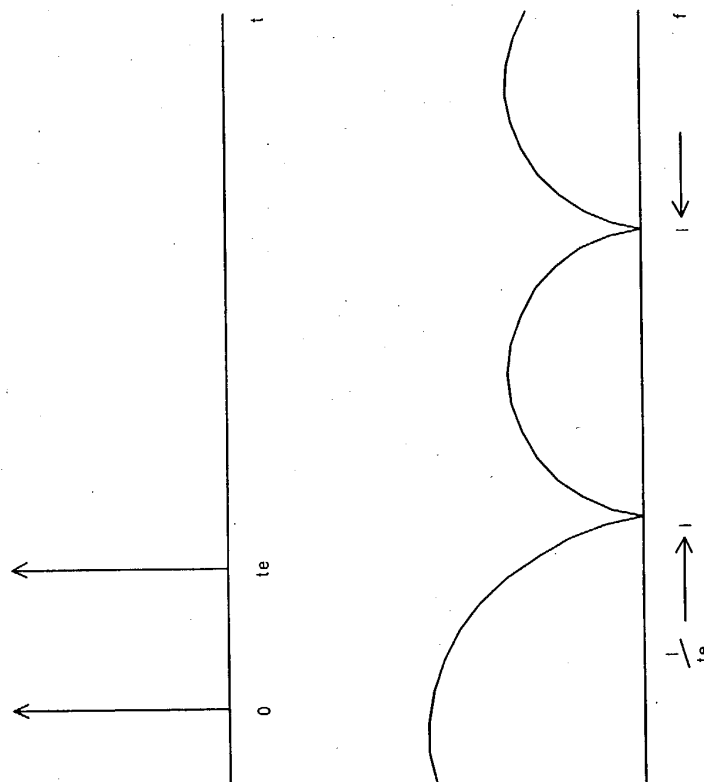


Fig. 9

A circular stamp from the Office of the Inspector General. The text "OIG" is at the top, "OFFICE OF THE INSPECTOR GENERAL" is around the bottom, and "MAR 17 2003" is in the center. The number "1054" is written to the right of the date.

10/10

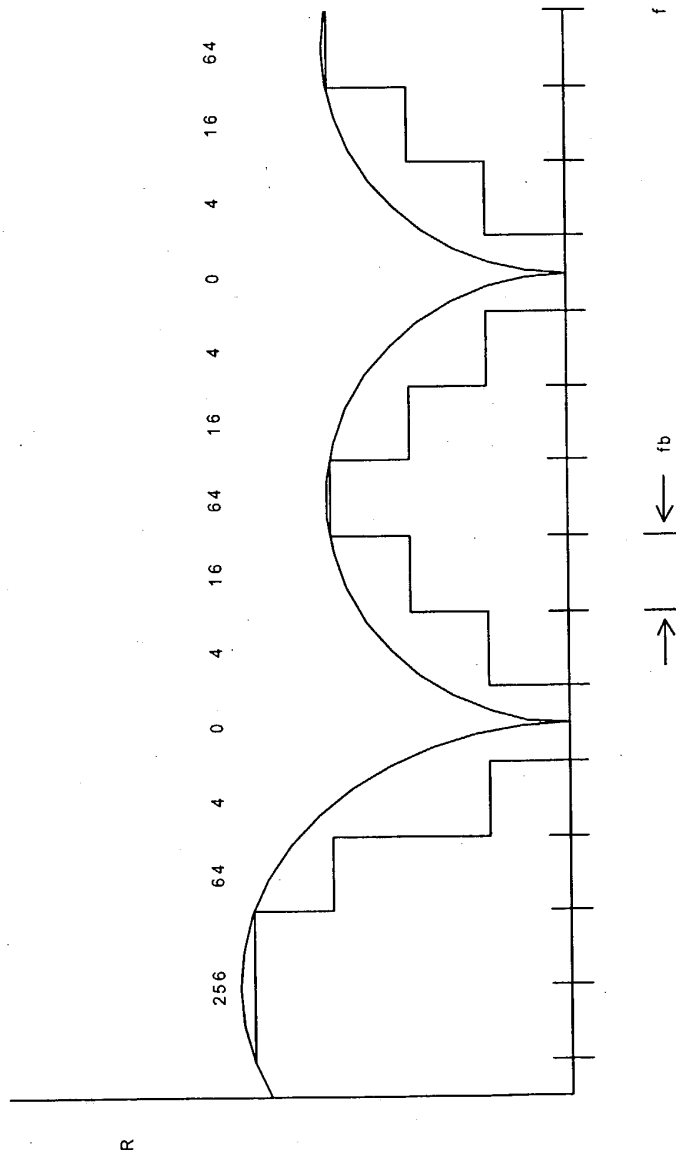


Fig. 10

Special Instructions for Evidence Copy Box Identification

Documents in this patent application scanned prior to the scan date of this document may not have a box number present in the database. The documents are in the same box as this paper. If the patent application documents that do not have a box number are stored in more than one box, a copy of this form is placed in each box. Check the database box number for each copy of this form to identify all of the evidence copy box numbers for documents that do not have a box number.

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The documents stored in this box are original application papers scanned and endorsed by PACR and imported into IFW.

☐

The documents stored in this box were scanned into the IFW prototype for GAU 1634, 2827, or 2834.

Indexer, place an X in only one box above to indicate the documents placed in this box that were previously scanned in PACR or IFW and will not be scanned again.

PATENT APPLICATION SERIAL NO. _____

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

12/23/2002 HBELETE1 00000036 10322834

01 FC:2001	370.00 OP
02 FC:2201	42.00 OP

PTO-1556
(5/87)

PATENT APPLICATION FEE DETERMINATION RECORD
Effective October 1, 2001

Application or Docket Number

9228

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS	10	
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	10 minus 20=	*
INDEPENDENT CLAIMS	4 minus 3 =	* 1
MULTIPLE DEPENDENT CLAIM PRESENT ☐		

SMALL ENTITY TYPE ☐ OR

OTHER THAN SMALL ENTITY

RATE	FEE
BASIC FEE	370.00
X\$ 9=	
X42=	42.5
+140=	
TOTAL	412.5

RATE	FEE
BASIC FEE	740.00
X\$18=	
X84=	
+280=	
TOTAL	

* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total	*	Minus **
	Independent	*	Minus ***
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐		

SMALL ENTITY OR

OTHER THAN SMALL ENTITY

RATE	ADDITIONAL FEE
X\$ 9=	
X42=	
+140=	
TOTAL	

RATE	ADDITIONAL FEE
X\$18=	
X84=	
+280=	
TOTAL	

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total	*	Minus **
	Independent	*	Minus ***
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐		

RATE	ADDITIONAL FEE
X\$ 9=	
X42=	
+140=	
TOTAL	

RATE	ADDITIONAL FEE
X\$18=	
X84=	
+280=	
TOTAL	

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total	*	Minus **
	Independent	*	Minus ***
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐		

RATE	ADDITIONAL FEE
X\$ 9=	
X42=	
+140=	
TOTAL	

RATE	ADDITIONAL FEE
X\$18=	
X84=	
+280=	
TOTAL	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."

***If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

MULTIPLE DEPENDENT CLAIM FEE CALCULATION SHEET (FOR USE WITH FORM PTO-875)							SERIAL NO.	FILING DATE					
							APPLICANT(S)						
CLAIMS													
	AS FILED		AFTER 1st AMENDMENT		AFTER 2nd AMENDMENT			•		•		•	
	IND.	DEP.	IND.	DEP.	IND.	DEP.		IND.	DEP.	IND.	DEP.	IND.	DEP.
1	/						51						
2		/					52						
3							53						
4							54						
5	/						55						
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48							98						
49							99						
50							100						
TOTAL IND.	4						TOTAL IND.						
TOTAL DEP.	6						TOTAL DEP.						
TOTAL CLAIMS	10						TOTAL CLAIMS						

PTO-1360 (3-78)

*MAY BE USED FOR ADDITIONAL CLAIMS OR AMENDMENTS

U.S. DEPARTMENT OF COMMERCE
Patent and Trademark Office



Commissioner for Patents
Washington, DC 20231
www.uspto.gov

APPLICATION NUMBER	FILING/RECEIPT DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
10/322,834	12/18/2002	Anton Monk	9228

CONFIRMATION NO. 6744

24244

MICHAEL W LANDRY
5098 SEACHASE STREET
SAN DIEGO, CA 92130

FORMALITIES LETTER



OC000000009437855

Date Mailed: 01/28/2003

NOTICE TO FILE CORRECTED APPLICATION PAPERS

Filing Date Granted

An application number and filing date have been accorded to this application. The application is informal since it does not comply with the regulations for the reason(s) indicated below. Applicant is given TWO MONTHS from the date of this Notice within which to correct the informalities indicated below. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

The required item(s) identified below must be timely submitted to avoid abandonment:

- Replacement drawings in compliance with 37 CFR 1.84 and 37 CFR 1.121 are required. The drawings submitted are not acceptable because:
 - The drawing sheets do not have the appropriate margin(s) (see 37 CFR 1.84(g)). Each sheet must include a top margin of at least 2.5 cm. (1 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 1.5 cm. (5/8 inch), and a bottom margin of at least 1.0 cm. (3/8 inch). See Figures(s) 3,10.

*A copy of this notice **MUST** be returned with the reply.*

Customer Service Center
Initial Patent Examination Division (703) 308-1202

PART 3 - OFFICE COPY

CLAIMS ONLY							Application Number 10322834		Filing Date			
							Applicant(s)					
							* May be used for additional claims or amendments					
CLAIMS	AS FILED		AFTER FIRST AMENDMENT		AFTER SECOND AMENDMENT		*		*		*	
	Indep	Depend	Indep	Depend	Indep	Depend	Indep	Depend	Indep	Depend	Indep	Depend
1							51					
2							52					
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6							56					
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45							95					
46							96					
47							97					
48							98					
49							99					
50							100					
Total Indep	4						Total Indep					
Total Depend	6						Total Depend					
Total Claims	10						Total Claims					

PATENT APPLICATION FEE DETERMINATION RECORD
Effective October 1, 2001

Application or Docket Number

10302834

CLAIMS AS FILED - PART I

(Column 1) (Column 2)

TOTAL CLAIMS	10	
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	10 minus 20 = *	
INDEPENDENT CLAIMS	4 minus 3 = *	1
MULTIPLE DEPENDENT CLAIM PRESENT ☐		

* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

(Column 1) (Column 2) (Column 3)

AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total	*	Minus	**	=
	Independent	*	Minus	***	=
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐				

SMALL ENTITY TYPE ☐ OR

OTHER THAN SMALL ENTITY

RATE	FEE
BASIC FEE	370.00
X\$ 9=	
X42=	42.5
+140=	
TOTAL	412.5

RATE	FEE
BASIC FEE	740.00
X\$18=	
X84=	
+280=	
TOTAL	

SMALL ENTITY OR

OTHER THAN SMALL ENTITY

RATE	ADDITIONAL FEE
X\$ 9=	
X42=	
+140=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$18=	
X84=	
+280=	
TOTAL ADDIT. FEE	

(Column 1) (Column 2) (Column 3)

AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total	*	Minus	**	=
	Independent	*	Minus	***	=
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐				

RATE	ADDITIONAL FEE
X\$ 9=	
X42=	
+140=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$18=	
X84=	
+280=	
TOTAL ADDIT. FEE	

(Column 1) (Column 2) (Column 3)

AMENDMENT C		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total	*	Minus	**	=
	Independent	*	Minus	***	=
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐				

RATE	ADDITIONAL FEE
X\$ 9=	
X42=	
+140=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$18=	
X84=	
+280=	
TOTAL ADDIT. FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."

***If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

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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.
10/322,834	12/18/2002	Anton Monk	9228	6744
24244	7590	03/19/2007		
MICHAEL W LANDRY 5098 SEACHASE STREET SAN DIEGO, CA 92130			EXAMINER QURESHI, AFSAR M	
			ART UNIT 2616	PAPER NUMBER

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
31 DAYS	03/19/2007	PAPER

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

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/322,834	Applicant(s) MONK ET AL.
	Examiner Afsar M. Qureshi	Art Unit 2616

-- 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 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ 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

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☐ Claim(s) ____ is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☒ Claim(s) 1-10 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

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).
- a) ☐ All b) ☐ Some * c) ☐ None of:
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) | 4) ☐ Interview Summary (PTO-413) |
| 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) ☐ Information Disclosure Statement(s) (PTO/SB/08) | 5) ☐ Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____. | 6) ☒ Other: <u>Election/Restriction only</u> . |

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-4, 10, drawn to network component and two way spectrum, classified in class 725, subclass 127.
- II. Claims 5--9, drawn to orthogonal functions, classified in class 370, subclass 208.

1. The inventions are distinct, each from the other because of the following reasons:

(i) Inventions Group I and Group II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed. The subcombination has separate utility of channel estimation, modulating using OFDM, channel estimation training sequence, QPSK encoded OFDM, bit loading etc. The examiner has required restriction between combination and subcombination inventions. Where applicant elects a subcombination, and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a

continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

(ii) Inventions Group I and Group II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, subcombination Group II has separate utility such as channel estimation, modulating using OFDM, channel estimation training sequence, QPSK encoded OFDM. See MPEP § 806.05(d).

The examiner has required restriction between subcombinations usable together. Where applicant elects a subcombination and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

2. Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required

because the inventions have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper.

3. Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions require a different field of search (see MPEP § 808.02), restriction for examination purposes as indicated is proper.

4. Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48 (b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48 (b) and by a fee required under 37 CFR 1.17 (i).

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Afsar M. Qureshi whose telephone number is (571) 272 3178.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Field Lynn can be reached on (571) 272 2092. 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.


AFSAR QURESHI
PRIMARY EXAMINER

3/7/2007



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



Bib Data Sheet

CONFIRMATION NO. 6744

SERIAL NUMBER 10/322,834	FILING OR 371(c) DATE 12/18/2002 RULE	CLASS 370	GROUP ART UNIT 2616	ATTORNEY DOCKET NO. 9228
------------------------------------	---	---------------------	-------------------------------	------------------------------------

APPLICANTS
Anton Monk, San Diego, CA;
Brett Bernath, San Diego, CA;
Itzhak Gurantz, San Diego, CA;
Ladd El Wardani, La Jolla, CA;
Ron Porat, La Jolla, CA;

**** CONTINUING DATA ******* *Yes Ad?*
This application is a CON of 10/230,687 08/29/2002 ABN which claims benefit of 60/316,820 08/30/2001 and claims benefit of 60/363,420 03/12/2002 and claims benefit of 60/385,361 06/03/2002

**** FOREIGN APPLICATIONS ******* *None Ad*

IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 01/27/2003 **** SMALL ENTITY ****

Foreign Priority claimed ☐ yes ☒ no	STATE OR COUNTRY CA	SHEETS DRAWING 10	TOTAL CLAIMS 10	INDEPENDENT CLAIMS 4
35 USC 119 (a-d) conditions met ☐ yes ☒ no ☐ Met after Allowance				
Verified and Acknowledged <i>Ad</i> Examiner's Signature _____ Initials _____				

ADDRESS
24244

TITLE
Broadband network for coaxial cable using multi-carrier modulation

FILING FEE RECEIVED 412	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
-----------------------------------	---	---

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No: 10/322,834 Confirmation No. 6744

Attorney Docket: 9228

5 Filed: 12/18/2002

Applicant: Monk, et. al

Title: Broadband Network for Coaxial Cable Using Multi-carrier Modulation

Examiner/GAU: Afsar M Qureshi / 2616

10 Date: 4/3/2007

Amendment / Election

15 Mail Stop Amendment (filed online)
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

20 Dear Sir:

In response to the Office Action mailed 3/19/2007, please accept the following election and amendments:

Claims starting on page 2.

25 Remarks on page 4.

Claim amendments:

1. (Original) A data communication network comprising:

- 5 at least two network devices, each network device comprising a multi-carrier modulator for modulating data, an up converter for translating the modulated data to an RF carrier frequency, a down converter for translating an RF signal, and a multi-carrier demodulator for demodulating the translated RF signal to produce data; and
- 10 cable wiring comprising a splitter with a common port and a plurality of tap ports, and a plurality of segments of coaxial cable connecting between the splitter tap ports and the network devices;

whereby network devices communicate with each other through the cable wiring using multi-carrier signaling.

15

2. (Original) The data communication network of claim 1 wherein network devices transmit probe messages through the cable wiring and analyze received probe message signals to determine channel characteristics and bit loading is selected based on the determined channel characteristics.

- 20 3. (Original) The data communication network of claim 2 wherein a network device comprises a means for determining signal activity and selects a frequency band for operation that is not used by other services.

4. (Original) The data communication network of claim 2 wherein the network shares the cable wiring
- 25 with a cable television service and the network device up converter translates the modulated data to an RF carrier frequency above the frequency used by the cable television service.

5-9 (Canceled)

10. (Original) A network device for communicating data to other network devices over a coaxial wiring system comprising a splitter and a plurality of cable segments connected between the splitter and the network devices, the network device comprising:

a data modulator to produce a multicarrier modulated signal;

5 a demodulator for multicarrier modulated signal to produce data;

means for producing and transmitting a probe message; and

means for receiving and analyzing a probe message to determine a bit loading profile used to transmit data.

10

Remarks

Claims - Election

Claims were restricted in the office action.

5

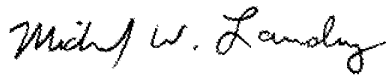
In a phone message left with the Examiner on 3/21/07, election was made to have Group I examined, claims 1-4 and 10. A phone message from the Examiner on 3/22/07 confirmed the election. The reply provides written verification of the election.

10 Claims 1-4 and 10 remain.

Claims in the non-elected Group II, claims 5-9, have been canceled.

If it is felt that direct communication would serve to advance prosecution of this case, the examiner is
15 invited to call the attorney at the below listed telephone number.

Respectfully submitted,



20

Michael W. Landry
Attorney for Applicants
Reg. No. 38,216
5098 Seachase St.
San Diego CA 92130
858-229-6801
mlandry@iprsolutions.com

25

Electronic Acknowledgement Receipt

EFS ID:	1651366
Application Number:	10322834
International Application Number:	
Confirmation Number:	6744
Title of Invention:	Broadband network for coaxial cable using multi-carrier modulation
First Named Inventor/Applicant Name:	Anton Monk
Customer Number:	24244
Filer:	Michael William Landry
Filer Authorized By:	
Attorney Docket Number:	9228
Receipt Date:	03-APR-2007
Filing Date:	18-DEC-2002
Time Stamp:	20:16:23
Application Type:	Utility

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)	Multi Part /.zip	Pages (if appl.)
1	Response to Election / Restriction Filed	9228-Election-Response.pdf	79792	no	4

Warnings:

Information:	
Total Files Size (in bytes):	79792
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.	

PATENT APPLICATION FEE DETERMINATION RECORD
Effective October 1, 2001

Application or Docket Number
10302834

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS	10	
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	10 minus 20=	
INDEPENDENT CLAIMS	4 minus 3 =	1
MULTIPLE DEPENDENT CLAIM PRESENT ☐		

* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	5	Minus 20	=
Independent	2	Minus 4	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐			

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	*	Minus	=
Independent	*	Minus	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐			

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	*	Minus	=
Independent	*	Minus	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐			

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

SMALL ENTITY TYPE ☐ OR

OTHER THAN SMALL ENTITY

RATE	FEE		RATE	FEE
BASIC FEE	370.00	OR	BASIC FEE	740.00
X\$ 9=		OR	X\$18=	
X42=	42.5	OR	X84=	
+140=		OR	+280=	
TOTAL	412.5	OR	TOTAL	

SMALL ENTITY OR

OTHER THAN SMALL ENTITY

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X\$ 9=		OR	X\$18=	
X42=		OR	X84=	
+140=		OR	+280=	
TOTAL		OR	TOTAL	
ADDIT. FEE		OR	ADDIT. FEE	

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X\$ 9=		OR	X\$18=	
X42=		OR	X84=	
+140=		OR	+280=	
TOTAL		OR	TOTAL	
ADDIT. FEE		OR	ADDIT. FEE	

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X\$ 9=		OR	X\$18=	
X42=		OR	X84=	
+140=		OR	+280=	
TOTAL		OR	TOTAL	
ADDIT. FEE		OR	ADDIT. FEE	

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NOTICE OF ALLOWANCE AND FEE(S) DUE

24244 7590 09/06/2007

MICHAEL W LANDRY
5098 SEACHASE STREET
SAN DIEGO, CA 92130

EXAMINER

QURESHI, AFSAR M

ART UNIT

PAPER NUMBER

2616

DATE MAILED: 09/06/2007

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/322,834	12/18/2002	Anton Monk	9228	6744

TITLE OF INVENTION: BROADBAND NETWORK FOR COAXIAL CABLE USING MULTI-CARRIER MODULATION

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$700	\$0	\$0	\$700	12/06/2007

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 SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

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)

24244 7590 09/06/2007

MICHAEL W LANDRY
5098 SEACHASE STREET
SAN DIEGO, CA 92130

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.
10/322,834	12/18/2002	Anton Monk	9228	6744

TITLE OF INVENTION: BROADBAND NETWORK FOR COAXIAL CABLE USING MULTI-CARRIER MODULATION

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$700	\$0	\$0	\$700	12/06/2007

EXAMINER	ART UNIT	CLASS-SUBCLASS
QURESHI, AFSAR M	2616	370-235000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list
 (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
 (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
 3 _____

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

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

(A) NAME OF ASSIGNEE

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

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

4a. The following fee(s) are submitted:

- ☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

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

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

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

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information 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.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/322,834	12/18/2002	Anton Monk	9228	6744
24244	7590	09/06/2007		
MICHAEL W LANDRY 5098 SEACHASE STREET SAN DIEGO, CA 92130				
			EXAMINER QURESHI, AFSAR M	
			ART UNIT 2616	PAPER NUMBER
DATE MAILED: 09/06/2007				

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

The Patent Term Adjustment to date is 1159 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 1159 day(s).

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 Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

28

Notice of Allowability	Application No.	Applicant(s)	
	10/322,834	MONK ET AL.	
	Examiner	Art Unit	
	Afsar M. Qureshi	2616	

-- 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 amendmen, dtd 4/03/2007 and Telephonic Interview dated 4/10/2007t.
2. ☒ The allowed claim(s) is/are 1,3,4,10 (now renumbered as 1-4).
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - 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.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☒ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date 4/11/2007.

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)

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. ☐ Notice of References Cited (PTO-892) 2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ 4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material | <ol style="list-style-type: none"> 5. ☐ Notice of Informal Patent Application 6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date _____ 7. ☒ Examiner's Amendment/Comment 8. ☒ Examiner's Statement of Reasons for Allowance 9. ☐ Other _____ |
|---|--|


AFSAR QURESHI
PRIMARY EXAMINER
4/11/07

EXAMINER'S AMENDMENT ✓

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

Authorization for this examiner's amendment was given in a telephone interview with Michael W. Landry on 4/10/2007.

The application has been amended as follows:

1. IN THE CLAIMS:

Claim 1, line 8, after "signaling" added -- ; wherein network devices transmit probe messages through the cable wiring and analyze received probe message signals to determine channel characteristics and bit loading is selected based on the determined channel characteristics --

Claim 2, Cancelled.

Claim 3, line 1, deleted "claim 2" ; replaced with -- claim 1 --

Claim 4, line 1, deleted "claim 2" , replaced with -- claim 1 --

2. Applicant, in response to Election/Restriction, cancelled claims 5-9, without traverse (see Interview Summary).

Drawings

3. The following changes to the drawings have been approved by the examiner and agreed upon by applicant: Figure 1, submitted on, 3/17/2003, should be labeled as "PRIOR ART" (see drawings submitted on 12/18/2002. In order to avoid abandonment of the application, applicant must make these above agreed upon drawing changes.

REASONS FOR ALLOWANCE

4. Claims 1, 3, 4 and 10 are allowed over prior art of record.

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

The prior art of record, Dodds et al. (US 6,886,181) and an article "*Multicarrier Modulation for Data Transmission; An Idea Whose Time has Come*", by John A.C. Bingham, IEEE, alone or in combination, fails to disclose a network device for communicating data to other network devices by utilizing unique method step of determining channel characteristics and a bit loading profile used to transmit data by analyzing received probe message signals (claims 1 and 10).

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

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Afsar M. Qureshi whose telephone number is (571) 272 3178. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Field Lynn can be reached on (571) 272 2092. 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.


AFSAR QURESHI
PRIMARY EXAMINER
4/11/2007

Interview Summary	Application No.	Applicant(s)	
	10/322,834	MONK ET AL.	
	Examiner	Art Unit	
	Afsar M. Qureshi	2616	

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

(1) Afsar M. Qureshi. (3)_____

(2) Michael Landry. (4)_____

Date of Interview: 10 April 2007.

Type: a) ☒ Telephonic b) ☐ Video Conference
c) ☐ Personal [copy given to: 1) ☐ applicant 2) ☐ applicant's representative]

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

Claim(s) discussed: 1-4 and 10.

Identification of prior art discussed: _____

Agreement with respect to the claims f) ☒ was reached. g) ☐ was not reached. h) ☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: In order to expedite the allowance, Applicant's attorney agreed to amend claim 1 per Examiner's suggestion and cancel claim 2, also, amend claims 3 and 4 to correct the dependency.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN A NON-EXTENDABLE PERIOD OF THE LONGER OF ONE MONTH OR THIRTY DAYS FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.



Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.

AFSAR QURESHI
Examiner Signature Required 4/10/07

Notice of References Cited	Application/Control No. 10/322,834	Applicant(s)/Patent Under Reexamination MONK ET AL.	
	Examiner Afsar M. Qureshi	Art Unit 2616	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,886,181	04-2005	Dodds et al.	725/119
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
*	U	John A.C. Bingham, "Multicarrier Modulation for Data Transmission; An idea whose time has come", IEEE Communication Magazine, Vol. 28, No.5, PP 5-14, May 1990.
	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.



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Bib Data Sheet

CONFIRMATION NO. 6744

SERIAL NUMBER 10/322,834	FILING OR 371(c) DATE 12/18/2002 RULE	CLASS 370	GROUP ART UNIT 2616	ATTORNEY DOCKET NO. 9228
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APPLICANTS
 Anton Monk, San Diego, CA;
 Brett Bernath, San Diego, CA;
 Itzhak Gurantz, San Diego, CA;
 Ladd El Wardani, La Jolla, CA;
 Ron Porat, La Jolla, CA;

**** CONTINUING DATA **** *Yes* *ad*
 This application is a CON of 10/230,687 08/29/2002 ABN which claims benefit of 60/316,820 08/30/2001 and claims benefit of 60/363,420 03/12/2002 and claims benefit of 60/385,361 06/03/2002

**** FOREIGN APPLICATIONS **** *None* *98*

IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 01/27/2003 **** SMALL ENTITY ****

Foreign Priority claimed ☐ yes ☒ no	STATE OR COUNTRY CA	SHEETS DRAWING 10	TOTAL CLAIMS 10	INDEPENDENT CLAIMS 4
35 USC 119 (a-d) conditions met ☐ yes ☒ no ☐ Met after Allowance				
Verified and Acknowledged <i>ad</i> Examiner's Signature _____ Initials _____				

ADDRESS
24244

TITLE
Broadband network for coaxial cable using multi-carrier modulation

FILING FEE RECEIVED 412	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
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Search Notes 	Application/Control No.		Applicant(s)/Patent under Reexamination	
	10/322,834		MONK ET AL.	
	Examiner		Art Unit	
	Afsar M. Qureshi		2616	

SEARCHED			
Class	Subclass	Date	Examiner
370	204-208	4/11/2007	AQ
	230,230.1		
	235-238		
725	126,127		
	133		
375	260,261		
	267,320		
	332,471		

INTERFERENCE SEARCHED			
Class	Subclass	Date	Examiner
Interference Search included		4/11/2007	AQ

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	DATE	EXMR
EAST, WEST, PgPub, Derwent, FAST, EPO, JPOText, IEEE	4/10/2007	AQ

☐ Claims renumbered in the same order as presented by applicant			☐ CPA			☐ T.D.			☐ R.1.47				
Final	Original		Final	Original		Final	Original		Final	Original			
1	1			31			61			121			181
-	2			32			62			122			182
2	3			33			63			123			183
3	4			34			64			124			184
-	5			35			65			125			185
-	6			36			66			126			186
-	7			37			67			127			187
-	8			38			68			128			188
-	9			39			69			129			189
4	10			40			70			130			190
	11			41			71			131			191
	12			42			72			132			192
	13			43			73			133			193
	14			44			74			134			194
	15			45			75			135			195
	16			46			76			136			196
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	18			48			78			138			198
	19			49			79			139			199
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	21			51			81			141			201
	22			52			82			142			202
	23			53			83			143			203
	24			54			84			144			204
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	26			56			86			146			206
	27			57			87			147			207
	28			58			88			148			208
	29			59			89			149			209
	30			60			90			150			210

Index of Claims



Application/Control No.

10/322,834

Examiner

Afsar M. Qureshi

Applicant(s)/Patent under Reexamination

MONK ET AL.

Art Unit

2616

√	Rejected
=	Allowed

—	(Through numeral) Cancelled
+	Restricted

N	Non-Elected
I	Interference

A	Appeal
O	Objected

Claim		Date											
Final	Original	4/1/07											
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10/322, 834

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	1295	"multi-carrier modulation"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/11 12:17
L2	0	1 and "725".ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/11 12:17
L3	25	1 and "725"/\$.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/11 12:17
L4	2	3 and 725/127.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/11 12:36
L5	25	3 and modulat\$3	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/11 12:37
L6	0	5 and upconverter and downconverter	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/11 12:37
L7	0	5 and (up adj converter)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/11 12:38
L8	8	5 and broadband	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/11 12:38

EAST Search History

L9	4	8 and (channel same characteristic)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/11 12:40
L10	184	1 and (channel same characteristic)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/11 12:41
L11	158	10 and (bit load\$3)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/11 12:41
L12	1	1 and ((channel same characteristic)same ("bit loading"))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/11 12:41

10/322,834

1/2

Interference EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	365	((multi?carrier) or ("multi-carrier")) same modulat\$3).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/11 12:50
L2	1	1 and ((down adj converter) same (demodulator)).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/11 12:47
L3	0	2 and (cable same splitter).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/11 12:48
L4	0	1 and (cable same splitter).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/11 12:48
L5	9	1 and (bit adj load\$3).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/11 12:48
L6	0	5 and (cable same splitter).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/11 12:48
L7	0	5 and (coaxial same connection).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/11 12:49
L8	0	("370"/\$.ccls. and modulat\$3).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/11 12:49

10/322834

2/L

Interference

EAST Search History

L9	1	("375"/\$.ccls. and modulat\$3).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/11 12:50
L11	0	("725"/\$.ccls. and modulat\$3).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/11 12:50
L12	0	9 and (((multi?carrier) or ("multi-carrier"))) same modulat\$3). clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/11 12:50

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** Mail Stop ISSUE FEE
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CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

24244 7590 09/06/2007

MICHAEL W LANDRY
5098 SEACHASE STREET
SAN DIEGO, CA 92130

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.

Michael W. Landry	(Depositor's name)
<i>Michael W. Landry</i>	(Signature)
9/24/07	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/322,834 12/18/2002 Anton Monk 9228 6744

TITLE OF INVENTION: BROADBAND NETWORK FOR COAXIAL CABLE USING MULTI-CARRIER MODULATION

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
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nonprovisional YES \$700 \$0 \$0 \$700 12/06/2007

EXAMINER	ART UNIT	CLASS-SUBCLASS
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QURESHI, AFSAR M 2616 370-235000

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 Michael W. Landry
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)

Entropic Communications Inc. San Diego 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. Payment online
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number (enclose an extra copy of this form).

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

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☒ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature *Michael W. Landry*
Typed or printed name Michael W. Landry

Date 9/24/07
Registration No. 38,216

This collection of information 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.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No: 10/322,834 Confirmation No. 6744

Attorney Docket: 9228

5 Filed: 12/18/2002

Applicant: Monk, et. al

Title: Broadband Network for Coaxial Cable Using Multi-carrier Modulation

Examiner/GAU: Afsar M Qureshi / 2616

10 Date: 9/24/2007

Issue Fee payment, Replacement drawings sheets

Mail Stop Issue Fee (filed online)

15 Commissioner for Patents

P.O. Box 1450

Alexandria VA 22313-1450

Dear Sir:

20

In response to the Notice of Allowance and Issue Fee payment due mailed 9/6/2007, please accept the following:

Remarks on page 2, explanation of changes in replacement drawing sheets.

25 Replacement drawing sheets.

Remarks

Drawing Amendments

5 In response to the Examiner's request and to correct typographical errors, replacement drawings are submitted. Prior drawings for Fig. 1 through Fig. 10 are replaced with new drawings. Specific objections have been corrected:

Fig. 1 is designated as Prior Art.

10

Other typographical errors observed by applicant have been corrected.

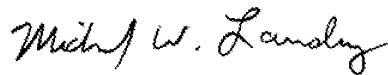
No new matter has been added.

15 **Conclusion**

If it is felt that direct communication would serve to advance prosecution of this case, the examiner is invited to call the attorney at the below listed telephone number.

20

Respectfully submitted,



25

Michael W. Landry
Attorney for Applicants
Reg. No. 38,216
5098 Seachase St.
San Diego CA 92130
858-229-6801
mlandry@iprsolutions.com

Electronic Patent Application Fee Transmittal				
Application Number:		10322834		
Filing Date:		18-Dec-2002		
Title of Invention:		BROADBAND NETWORK FOR COAXIAL CABLE USING MULTI-CARRIER MODULATION		
First Named Inventor/Applicant Name:		Anton Monk		
Filer:		Michael William Landry		
Attorney Docket Number:		9228		
Filed as Large Entity				
Utility 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	1501	1	1400	1400
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Total in USD (\$)				1400

Electronic Acknowledgement Receipt

EFS ID:	2230005
Application Number:	10322834
International Application Number:	
Confirmation Number:	6744
Title of Invention:	BROADBAND NETWORK FOR COAXIAL CABLE USING MULTI-CARRIER MODULATION
First Named Inventor/Applicant Name:	Anton Monk
Customer Number:	24244
Filer:	Michael William Landry
Filer Authorized By:	
Attorney Docket Number:	9228
Receipt Date:	24-SEP-2007
Filing Date:	18-DEC-2002
Time Stamp:	02:48:19
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment was successfully received in RAM	\$ 1400
RAM confirmation Number	4730
Deposit Account	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)
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Information:					
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Information:					
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Warnings:					
Information:					
Total Files Size (in bytes):			254885		
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CONFIRMATION NO. 6744

SERIAL NUMBER	FILING OR 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
10/322,834	12/18/2002	370	2616	9228
RULE				
APPLICANTS Anton Monk, San Diego, CA; Brett Bernath, San Diego, CA; Itzhak Gurantz, San Diego, CA; Ladd El Wardani, La Jolla, CA; Ron Porat, La Jolla, CA;				
** CONTINUING DATA ***** This application is a CON of 10/230,687 08/29/2002 ABN which claims benefit of 60/316,820 08/30/2001 and claims benefit of 60/363,420 03/12/2002 and claims benefit of 60/385,361 06/03/2002				
** FOREIGN APPLICATIONS *****				
IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 01/27/2003				
Foreign Priority claimed ☐ yes ☐ no 35 USC 119 (a-d) conditions ☐ yes ☐ no ☐ Met after met Allowance Verified and Acknowledged _____ Examiner's Signature _____ Initials _____		STATE OR COUNTRY CA	SHEETS DRAWING 10	TOTAL CLAIMS 10
INDEPENDENT CLAIMS 4				
ADDRESS 24244				
TITLE BROADBAND NETWORK FOR COAXIAL CABLE USING MULTI-CARRIER MODULATION				
FILING FEE RECEIVED 412	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	

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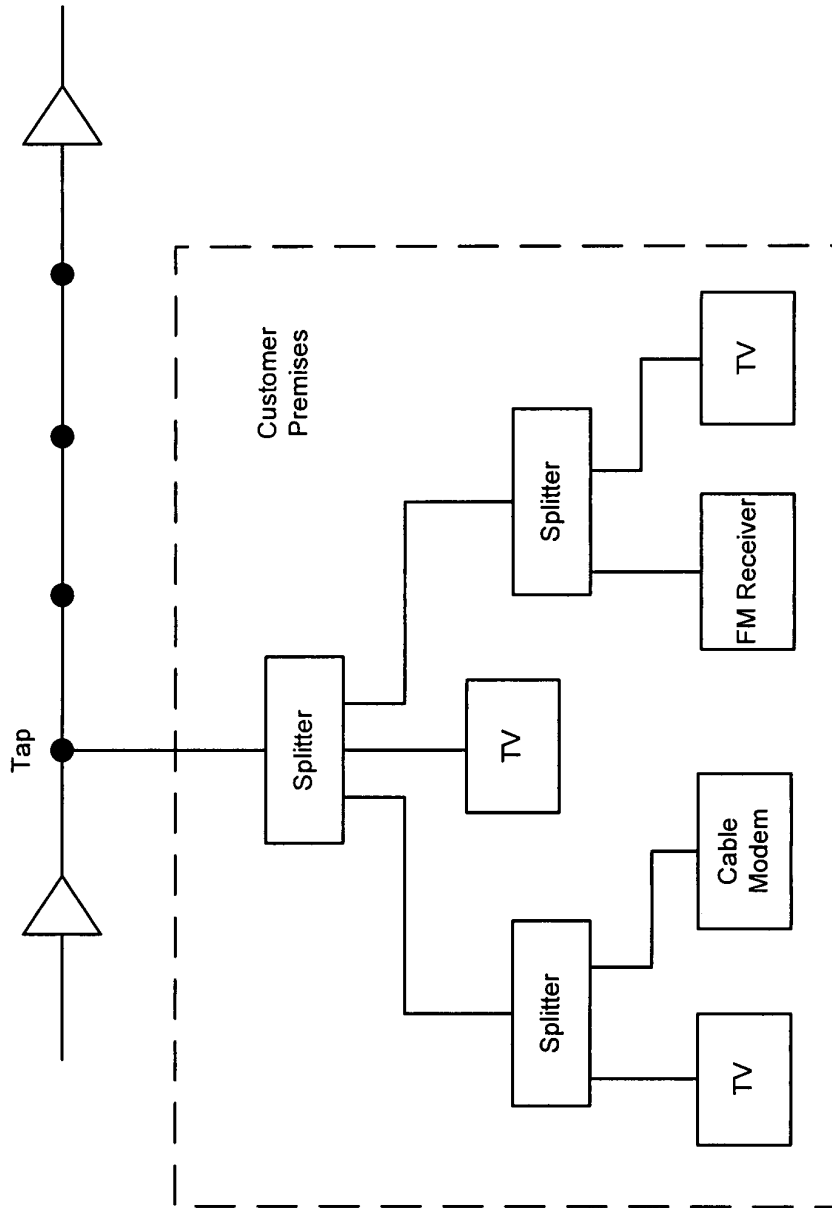


Fig. 1
Prior Art

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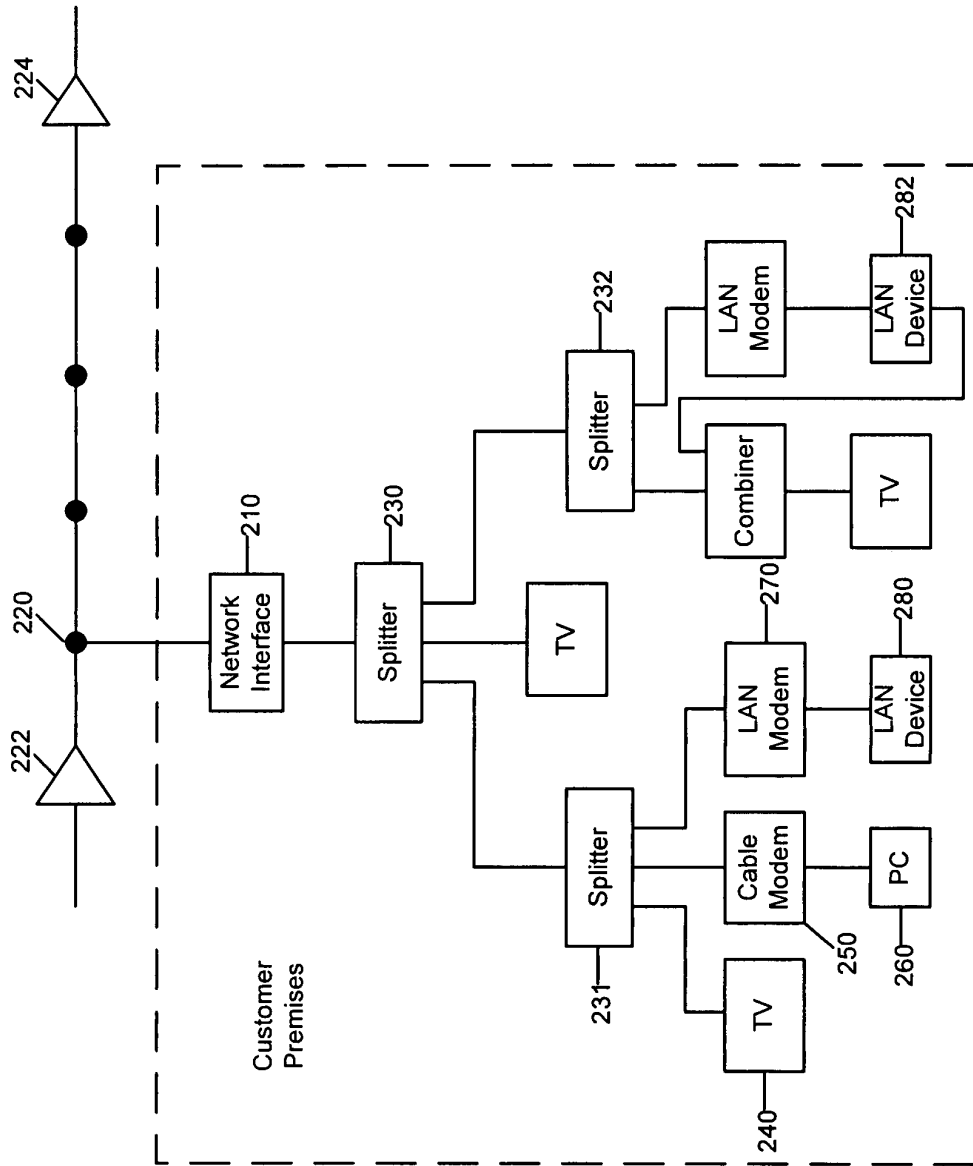


Fig. 2

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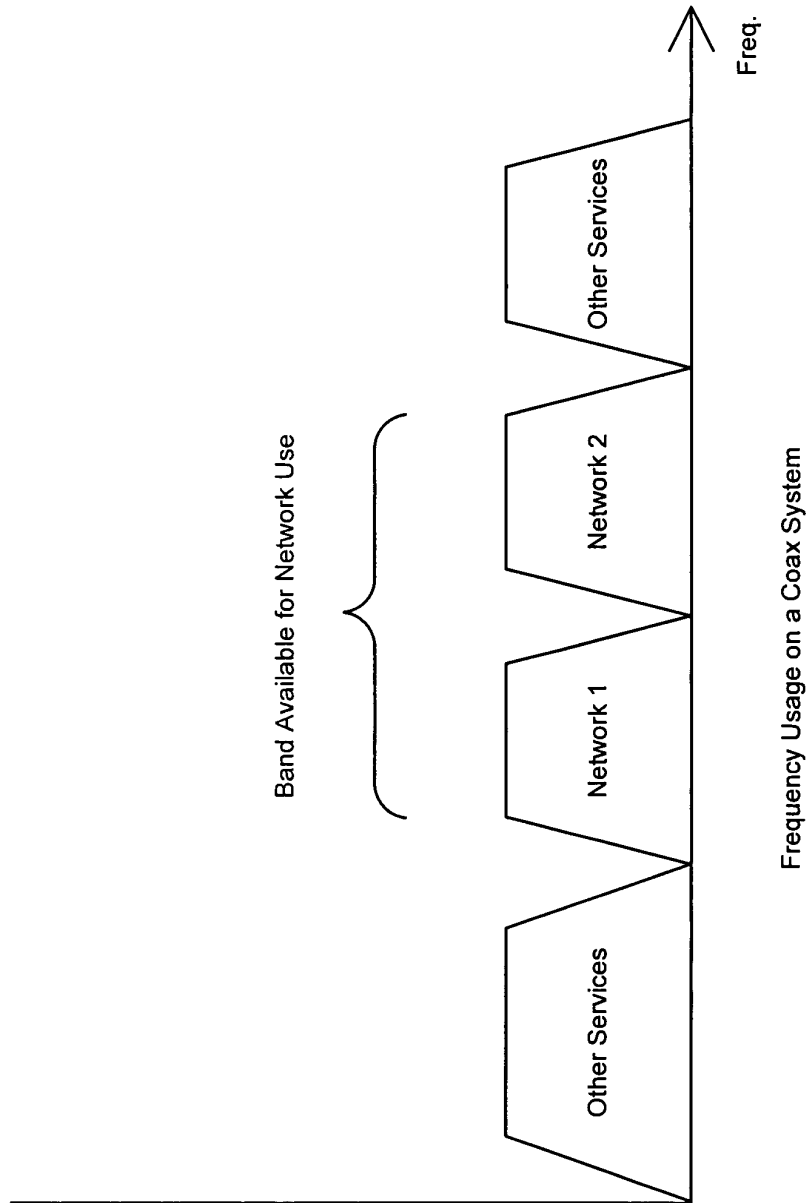


Fig. 3

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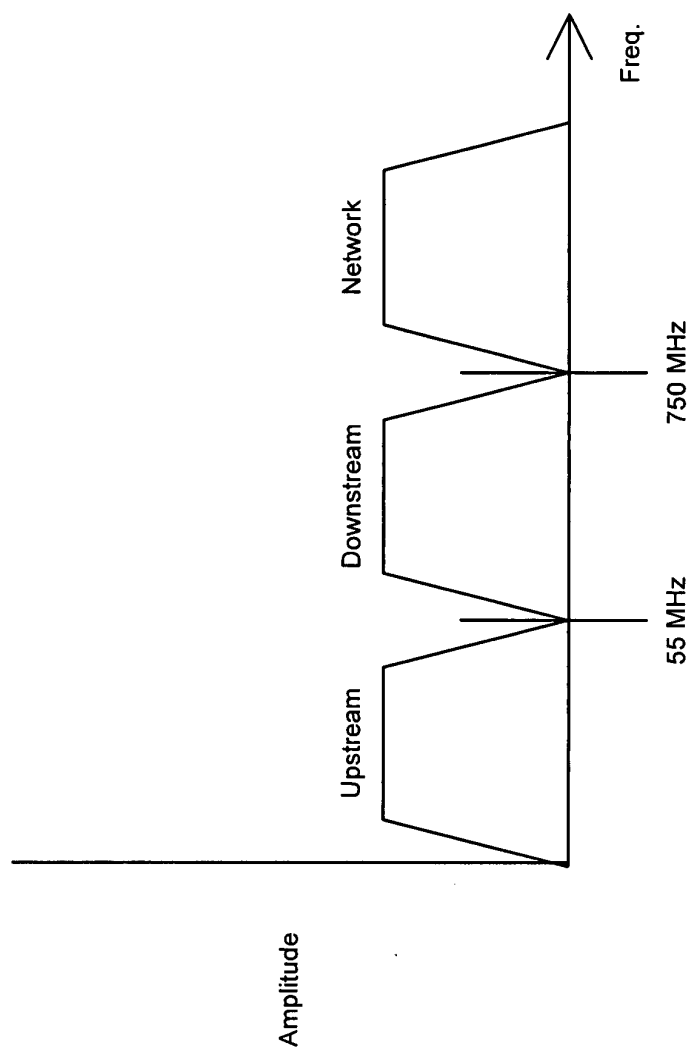


Fig. 4

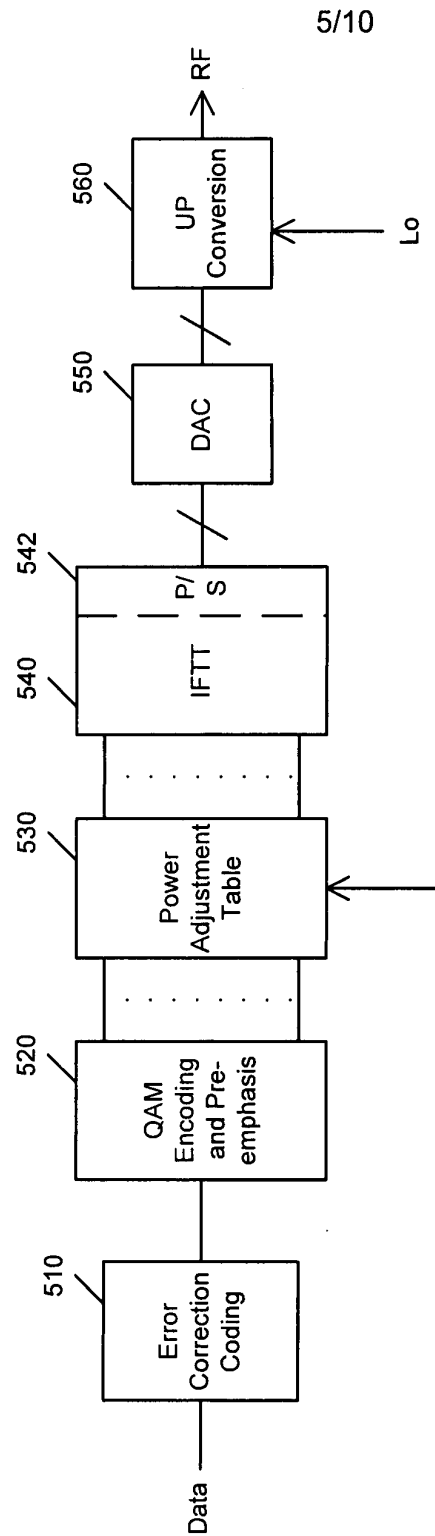


Fig. 5

6/10

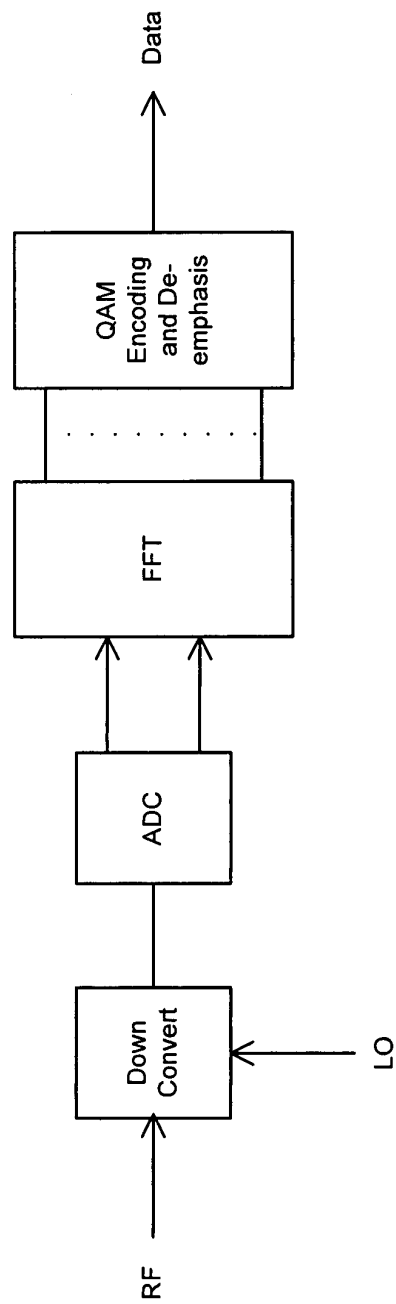


Fig. 6

7/10

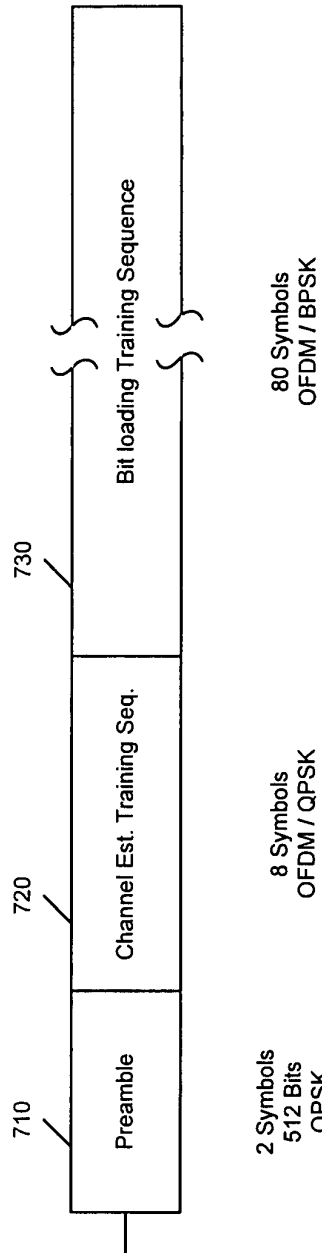


Fig. 7

8/10

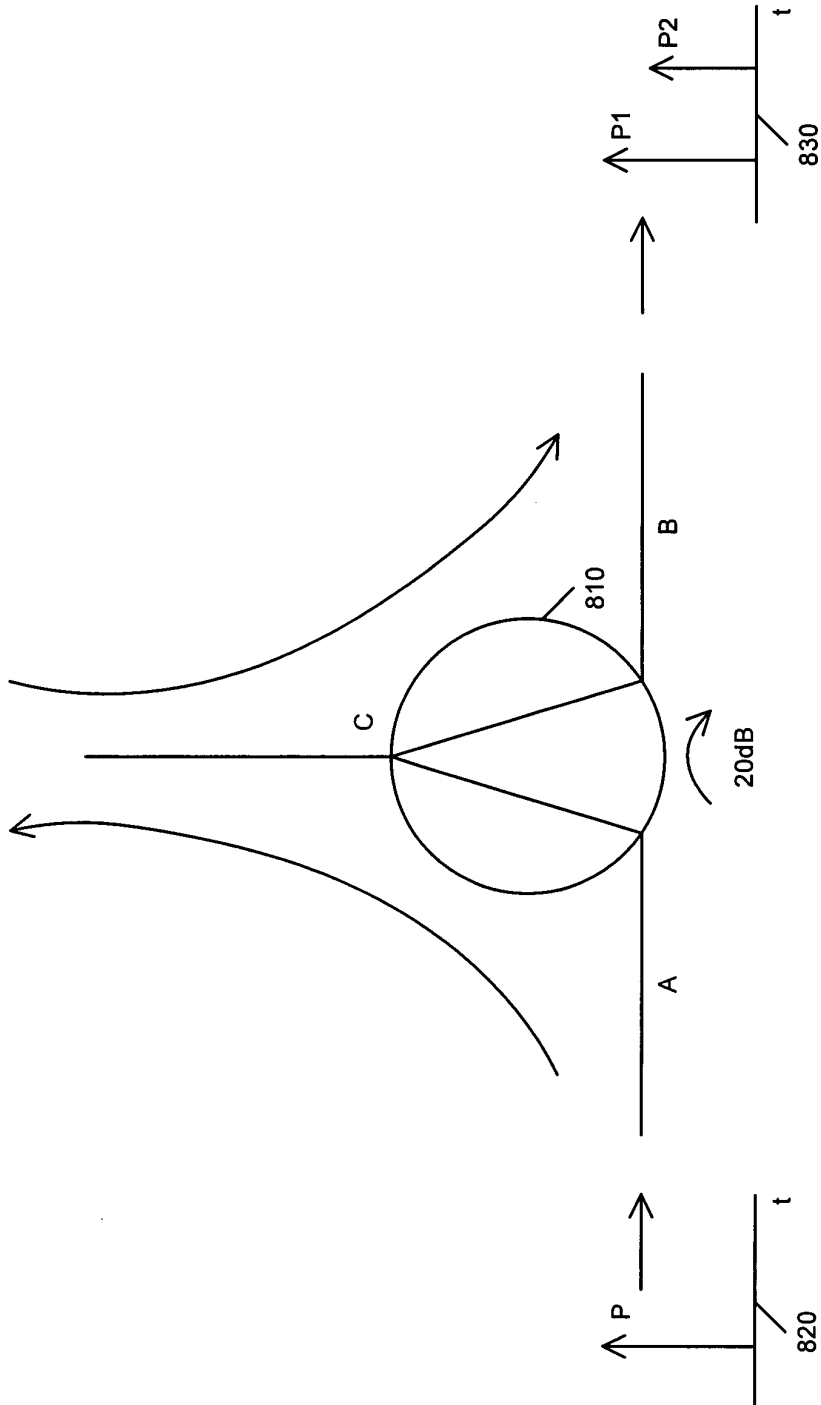


Fig. 8

9/10

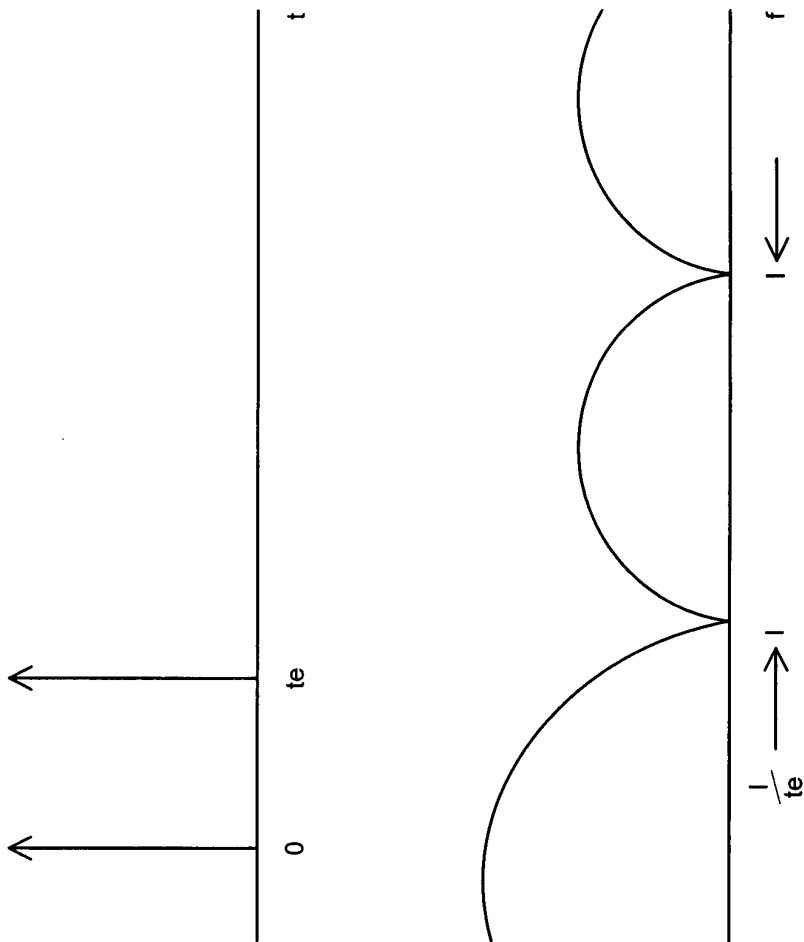


Fig. 9

10/10

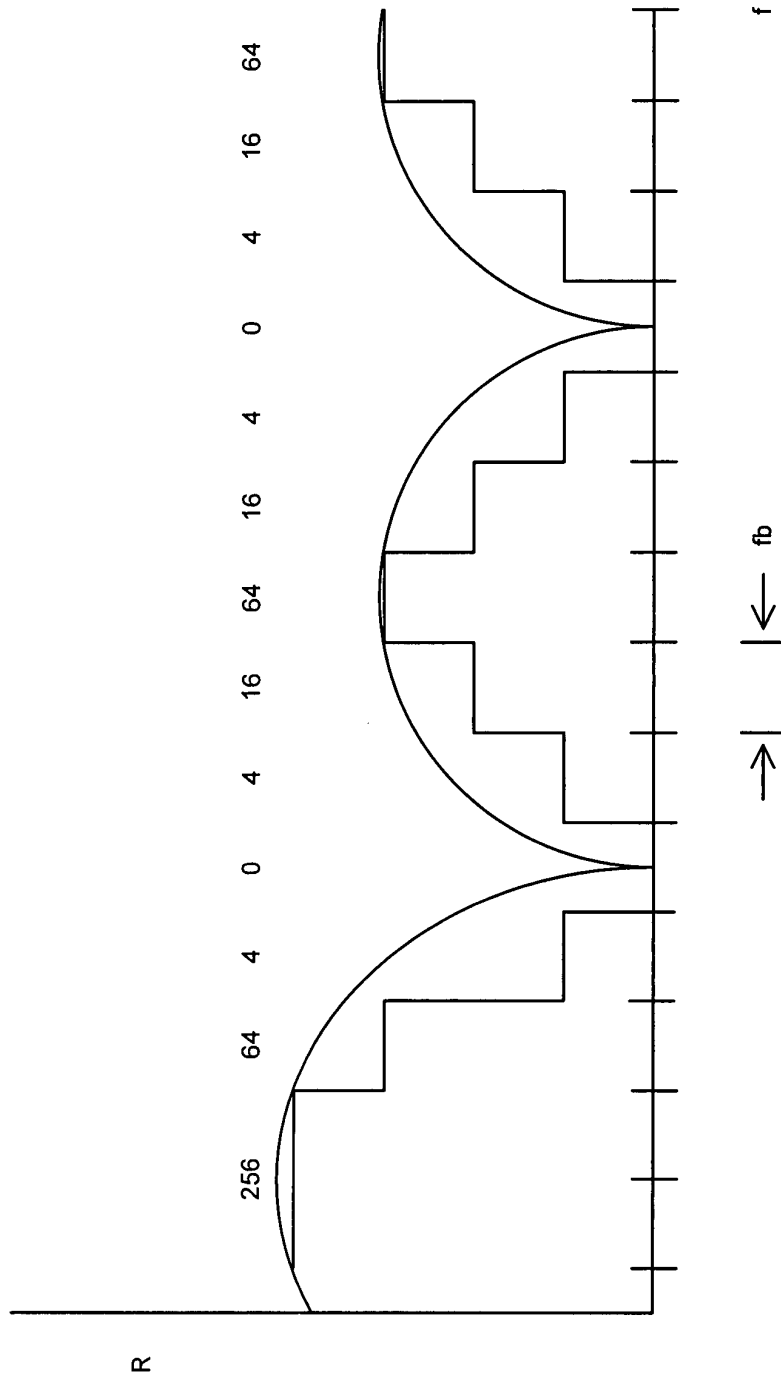


Fig. 10



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/322,834	11/13/2007	7295518	9228	6744
24244	7590	10/24/2007		
MICHAEL W LANDRY 5098 SEACHASE STREET SAN DIEGO, CA 92130				

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 1108 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 Customer Service Center of the Office of Patent Publication at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

Anton Monk, San Diego, CA;
Brett Bernath, San Diego, CA;
Itzhak Gurantz, San Diego, CA;
Ladd El Wardani, La Jolla, CA;
Ron Porat, La Jolla, CA;



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	PATENT NUMBER	GROUP ART UNIT	FILE WRAPPER LOCATION
10/322,834	7295518	2616	9200

Correspondence Address / Fee Address Change

The following fields have been set to Customer Number 77676 on 03/06/2008

- Correspondence Address
- Maintenance Fee Address

The address of record for Customer Number 77676 is:

Michael W. Landry
5098 Seachase Street
San Diego, CA 92130

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.: 10/322,834

Confirmation No.: 6744

In re application of: Anton Monk et al.

U.S. Patent No.: 7,295,518

Filed: 12/18/2002

Issued: 11/13/2007

Art Unit: 2616

Examiner: Afsar M. Qureshi

Docket No.: E010003USC1

Title: **BROADBAND NETWORK FOR
COAXIAL CABLE USING MULTI-CARRIER
MODULATION**

Certificate of Transmission Under 37 C.F.R. 1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450 on the date shown below.

DATE: AUGUST 16, 2012

RUTH DER

Mail Stop M Correspondence
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**NOTIFICATION OF CHANGE IN
SMALL ENTITY STATUS TO LARGE ENTITY STATUS**

Applicant hereby asserts the loss of entitlement to small entity status in the referenced application herein.

The Commissioner is also authorized to charge any fees required by this paper or to credit any excess payment to Deposit Account **04-1679**.

Respectfully submitted,

Dated: August 16, 2012

/James Y.C. Sze/

James Y.C. Sze, Reg. No.: 43,943
Attorney For Applicant

Duane Morris LLP
750 B Street, Suite 2900
San Diego, CA 92101-4681
Phone: 619.744.2200
Fax: 619.744.2201

Electronic Acknowledgement Receipt	
EFS ID:	13515434
Application Number:	10322834
International Application Number:	
Confirmation Number:	6744
Title of Invention:	BROADBAND NETWORK FOR COAXIAL CABLE USING MULTI-CARRIER MODULATION
First Named Inventor/Applicant Name:	Anton Monk
Customer Number:	77676
Filer:	James Y.C. Sze/Ruth Der
Filer Authorized By:	James Y.C. Sze
Attorney Docket Number:	E010003USC1
Receipt Date:	16-AUG-2012
Filing Date:	18-DEC-2002
Time Stamp:	16:06:26
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	Miscellaneous Incoming Letter	7295518largeentity.pdf	70938 148e39712a27e829d1eb4c35823751e596b5f75e	no	1

Warnings:

Information:

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

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

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

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

DOCKET NO.	DATE FILED	US District Court Southern District of California
3:13-cv-01102-WQH-BGS	5/8/13	San Diego, CA
PLAINTIFF		DEFENDANT
Entropic Communications, Inc.		ViXS Systems, Inc., et al.
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1. 7,295,518	6.	11.
2. 7,889,759	7.	12.
3.	8.	13.
4.	9.	14.
5.	10.	15.

In the above-entitled case, the following patents(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY	
	Amendment ___ Answer ___ Cross Bill ___ Other Pleading ___	
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1.	6.	11.
2.	7.	12.
3.	8.	13.
4.	9.	14.
5.	10.	15.

In the above-entitled case, the following decision has been rendered or judgment issued:

DECISION/JUDGMENT		
CLERK	(BY) DEPUTY CLERK	DATE
W. Samuel Hamrick, Jr.		

COVINGTON & BURLING LLP

BEIJING BRUSSELS LONDON NEW YORK
SAN DIEGO SAN FRANCISCO SEOUL
SHANGHAI SILICON VALLEY WASHINGTON

ERIC A. CALIGIURI
9191 TOWNE CENTRE DRIVE
6TH FLOOR
SAN DIEGO, CA 92122-1225
T 858.678.1808
ecaligiuri@cov.com

June 16, 2014

VIA FIRST CLASS MAIL

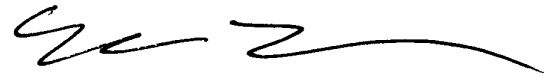
Director of the U.S. Patent and Trademark Office
U.S. Patent and Trademark Office
P.O. Box 1450
Alexandria, VA

Re: United States District Court for the Southern District of California
Case No. 3:13-cv-1102-CAB-BGS

Dear Director:

It recently came to our attention that the enclosed "Report on the Filing or Determination of an Action Regarding a Patent or Trademark" from case no. 3:13-cv-1102-CAB-BGS in the United States District Court for the Southern District of California does not appear in the image file wrapper on the Public Pair website. To ensure that the PTO's records are complete, we enclose that report with this letter. The Report relates to U.S. Patents nos. 7,295,518 and 7,889,759.

Sincerely,



Eric A. Caligiuri

EAC

Enclosure

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:

23446

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:

23446

OR

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

Assignee Name and Address:

Entropic Communications, LLC.
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	6/5/15
Name	Adam Spice	Telephone	
Title	Chief Financial Officer		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

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.

STATEMENT UNDER 37 CFR 3.73(b)Applicant/Patent Owner: Anton Monk, Brett Bernath, Itzhak Gurantz, Ladd El Wardani, Ron PoratApplication No./Patent No.: 7,295,518 Filed/Issue Date: 11/13/2007Titled: BROADBAND NETWORK FOR COAXIAL CABLE USING MULTI-CARRIER MODULATIONEntropic Communications, LLC, a corporation

(Name of Assignee)

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

states that it is:

1. ☒ 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. ☐ 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: Anton Monk, Brett Bernath, Itzhak Gurantz, Ladd El Wardani, Ron Porat To: ENTROPIC COMMUNICATIONS, INC.

The document was recorded in the United States Patent and Trademark Office at

Reel 013596, Frame 0590, or for which a copy thereof is attached.

2. From: ENTROPIC COMMUNICATIONS INC. and ENTROPIC COMMUNICATIONS, INC. To: ENTROPIC COMMUNICATIONS, INC.

The document was recorded in the United States Patent and Trademark Office at

Reel 035706, Frame 0267, or for which a copy thereof is attached.

3. From: ENTROPIC COMMUNICATIONS, INC. and ENTROPIC COMMUNICATIONS, LLC To: ENTROPIC COMMUNICATIONS, LLC

The document was recorded in the United States Patent and Trademark Office at

Reel 035717, Frame 0628, 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(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.

/Christopher C. Winslade/

07/23/2015

Signature

Date

Christopher C. Winslade, Reg. No. 36308

Attorney for Applicant

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.**

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

Privacy Act Statement

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

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

Electronic Acknowledgement Receipt

EFS ID:	23001218
Application Number:	10322834
International Application Number:	
Confirmation Number:	6744
Title of Invention:	BROADBAND NETWORK FOR COAXIAL CABLE USING MULTI-CARRIER MODULATION
First Named Inventor/Applicant Name:	Anton Monk
Customer Number:	77676
Filer:	Christopher C. Winslade/Deb Wilson
Filer Authorized By:	Christopher C. Winslade
Attorney Docket Number:	E010003USC1
Receipt Date:	23-JUL-2015
Filing Date:	18-DEC-2002
Time Stamp:	12:35:18
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	Power of Attorney	Entropic_POA_PreAIA.pdf	340881 8107f4c6d5473b527f97e45769199b81a37aad1b	no	2

Warnings:

Information:

2	Assignee showing of ownership per 37 CFR 3.73	29398US01_373b_Statement_s b96.pdf	431617 04ec2cafcae031f2985cb5180c1223a1198 ce96	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			772498		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
10/322,834	12/18/2002	Anton Monk	E010003USC1

CONFIRMATION NO. 6744

POA ACCEPTANCE LETTER

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



Date Mailed: 08/04/2015

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 07/23/2015.

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.

/dtdinh/



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
10/322,834	12/18/2002	Anton Monk	E010003USC1

CONFIRMATION NO. 6744

POWER OF ATTORNEY NOTICE



OC000000076611359*

Date Mailed: 08/04/2015

77676
Michael W. Landry
5098 Seachase Street
San Diego, CA 92130

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 07/23/2015.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(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.

/dtdinh/

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

Aug 04, 2015 05:32:01 AM

Dear PAIR Customer:

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

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

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Application	Document	Mailroom Date	Attorney Docket No.
10322834	N570	08/04/2015	E010003USC1
	N570	08/04/2015	E010003USC1

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

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

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

Thank you for prompt attention to this notice,

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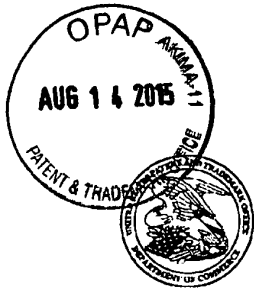
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5213033334 401450



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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
10/322,834	12/18/2002	Anton Monk	E010003USC1

CONFIRMATION NO. 6744
POWER OF ATTORNEY NOTICE

77676
Michael W. Landry
5098 Seachase Street
San Diego, CA 92130



Date Mailed: 08/04/2015

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 07/23/2015.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(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.

/dtdinh/

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

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

I hereby appoint:

☒

Practitioners associated with Customer Number: 23,446

OR

☐

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

Name	Registration Number

Name	Registration Number

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

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

☒

The address associated with Customer Number: 23,446

OR

☐

Firm or individual name

Address

City

State

Zip

Country

Telephone

Email

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

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

SIGNATURE of Assignee of Record

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

Signature/Andrea L. Gothing/

Date 2021-05-04

Name Andrea L. Gothing

Telephone 415-830-0613

Title Licensing Officer and Authorized Signatory, Entropic Communications, LLC

This collection of information is required by 37 CFR 1.31, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public, which is to update (and by the USPTO to process) the file of a patent or reexamination proceeding. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 18 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

Privacy Act Statement

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

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

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

Electronic Acknowledgement Receipt

EFS ID:	43327997
Application Number:	10322834
International Application Number:	
Confirmation Number:	6744
Title of Invention:	BROADBAND NETWORK FOR COAXIAL CABLE USING MULTI-CARRIER MODULATION
First Named Inventor/Applicant Name:	Anton Monk
Customer Number:	23446
Filer:	Ronald H. Spuhler/Deborah Wilson
Filer Authorized By:	Ronald H. Spuhler
Attorney Docket Number:	29398US01
Receipt Date:	23-JUL-2021
Filing Date:	18-DEC-2002
Time Stamp:	11:37:12
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	29398US01_373c_Statement_A IA-96.pdf	124865 34c27d76b412f661d17be5505e0d577e70867123	no	3

Warnings:

Information:					
2	Power of Attorney	Entropic- POA_General_Assignee_Entrop icCommunications_ALG.pdf	487892	no	2
			51444e06ae84b241bfc127dc47c5d6c6469 44dd7		
Warnings:					
Information:					
Total Files Size (in bytes):			612757		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					

STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: ENTROPIC COMMUNICATIONS, LLC

Application No./Patent No.: 10/322,834 Filed/Issue Date: 2002-12-18

Titled: BROADBAND NETWORK FOR COAXIAL CABLE USING MULTI-CARRIER MODULATION

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: Anton Monk, Brett Bernath, Itzhak Gurantz, Ladd El Wardani, Ron Porat To: ENTROPIC COMMUNICATIONS, INC.

The document was recorded in the United States Patent and Trademark Office at
Reel 013596, Frame 0590, or for which a copy thereof is attached.

2. From: EXCALIBUR ACQUISITION CORPORATION, ENTROPIC COMMUNICATIONS, INC. To: ENTROPIC COMMUNICATIONS, INC.

The document was recorded in the United States Patent and Trademark Office at
Reel 035706, Frame 0267, or for which a copy thereof is attached.

[Page 1 of 2]

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

STATEMENT UNDER 37 CFR 3.73(c)

3. From: ENTROPIC COMMUNICATIONS, INC., EXCALIBUR SUBSIDIARY, LLC To: ENTROPIC COMMUNICATIONS, LLC

The document was recorded in the United States Patent and Trademark Office at
Reel 035717, Frame 0628, or for which a copy thereof is attached.

4. From: ENTROPIC COMMUNICATIONS, LLC To: MAXLINEAR COMMUNICATIONS LLC

The document was recorded in the United States Patent and Trademark Office at
Reel 055776, Frame 0482, or for which a copy thereof is attached.

5. From: MAXLINEAR COMMUNICATIONS LLC To: ENTROPIC COMMUNICATIONS, LLC

The document was recorded in the United States Patent and Trademark Office at
Reel 055899, Frame 0291, 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/

2021-07-23

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.
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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.



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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
10/322,834	12/18/2002	Anton Monk	29398US01

CONFIRMATION NO. 6744

POA ACCEPTANCE LETTER



OC000000127383691*

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

Date Mailed: 08/02/2021

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 07/23/2021.

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.

/nrhayden/

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

Aug 02, 2021 03:51:29 AM

Dear PAIR Customer:

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

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

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Application	Document	Mailroom Date	Attorney Docket No.
10322834	N570	08/02/2021	29398US01

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

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

Thank you for prompt attention to this notice,

UNITED STATES PATENT AND TRADEMARK OFFICE
PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM