

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
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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 Northern District of Texas on the following

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

DOCKET NO. 3:16-cv-00477-B	DATE FILED 2/19/2016	U.S. DISTRICT COURT Northern District of Texas
PLAINTIFF CommScope Technologies LLC		DEFENDANT Dali Wireless Inc
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 8,326,218	12/4/2012	CommScope Technologies LLC
2 7,639,982	12/29/2009	CommScope Technologies LLC
3 8,577,286	11/5/2013	CommScope Technologies LLC
4 7,848,747	12/7/2010	CommScope Technologies LLC
5		

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

DATE INCLUDED	INCLUDED BY <input type="checkbox"/> Amendment <input checked="" type="checkbox"/> Answer <input type="checkbox"/> Cross Bill <input type="checkbox"/> Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 9,332,402	5/3/2016	CommScope Technologies LLC,
2 9,031,521	5/12/2015	Dali
3 9,531,473	12/27/2016	Dali
4		
5		

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

DECISION/JUDGEMENT

CLERK Karen Mitchell	(BY) DEPUTY CLERK s/Yolanda Pace	DATE 9/13/2017
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Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
 Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

AO 120 (Rev. 08/10)

TO: Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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In the above—entitled case, the following patent(s)/ trademark(s) have been included:

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PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

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

DECISION/JUDGEMENT

CLERK Karen Mitchell	(BY) DEPUTY CLERK S/Thomas Drew	DATE 2/19/2016
-------------------------	------------------------------------	-------------------

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



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/617,215	12/04/2012	8326218	100.019US03	4148

34206 7590 11/14/2012
FOGG & POWERS LLC
5810 W 78TH STREET
SUITE 100
MINNEAPOLIS, MN 55439

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 477 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

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

Philip M. Wala, Waseca, MN;

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

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax **(571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

34206 7590 08/02/2012
FOGG & POWERS LLC
5810 W 78TH STREET
SUITE 100
MINNEAPOLIS, MN 55439

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.
-----------------	-------------	----------------------	---------------------	------------------

12/617,215 11/12/2009 Philip M. Wala 100.019US03 4148

TITLE OF INVENTION: POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1740	\$300	\$0	\$2040	11/02/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS
NGUYEN, DUC M	2618	455-016000

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 Fogg & Powers LLC

(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)

ADC Telecommunications, Inc.

Eden Prairie, MN

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. ~~XXXXXX XXXX XXXX~~
☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number 502432 (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 /Jon M. Powers/

Date 2012-10-29

Typed or printed name Jon M. Powers

Registration No. 43868

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.

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

SOLiD Ex. 1016

Electronic Patent Application Fee Transmittal

Application Number:	12617215			
Filing Date:	12-Nov-2009			
Title of Invention:	POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT			
First Named Inventor/Applicant Name:	Philip M. Wala			
Filer:	Jon M. Powers/Lisa Gentry			
Attorney Docket Number:	100.019US03			
Filed as Large Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl issue fee	1501	1	1770	1770
Publ. Fee- early, voluntary, or normal	1504	1	300	300

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				2070

Electronic Acknowledgement Receipt

EFS ID:	14097082
Application Number:	12617215
International Application Number:	
Confirmation Number:	4148
Title of Invention:	POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT
First Named Inventor/Applicant Name:	Philip M. Wala
Customer Number:	34206
Filer:	Jon M. Powers/Lisa Gentry
Filer Authorized By:	Jon M. Powers
Attorney Docket Number:	100.019US03
Receipt Date:	29-OCT-2012
Filing Date:	12-NOV-2009
Time Stamp:	15:41:33
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$ 2070
RAM confirmation Number	1538
Deposit Account	502432
Authorized User	FOGG, DAVID N.

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

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	00314704.PDF	119123 82fef99b2ebc7c8bf9e34a166b1763846409118c	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	32053 74efaf6d29a5cd2393a54fd34c90930772e2f18f	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			151176		
<p>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.</p> <p><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.</p> <p><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.</p> <p><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.</p>					



UNITED STATES PATENT AND TRADEMARK OFFICE

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

NOTICE OF ALLOWANCE AND FEE(S) DUE

34206 7590 08/02/2012
FOGG & POWERS LLC
5810 W 78TH STREET
SUITE 100
MINNEAPOLIS, MN 55439

EXAMINER

NGUYEN, DUC M

ART UNIT

PAPER NUMBER

2618

DATE MAILED: 08/02/2012

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

12/617,215

11/12/2009

Philip M. Wala

100.019US03

4148

TITLE OF INVENTION: POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1740	\$300	\$0	\$2040	11/02/2012

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)

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.

34206 7590 08/02/2012
FOGG & POWERS LLC
5810 W 78TH STREET
SUITE 100
MINNEAPOLIS, MN 55439

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.
-----------------	-------------	----------------------	---------------------	------------------

12/617,215 11/12/2009 Philip M. Wala 100.019US03 4148

TITLE OF INVENTION: POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1740	\$300	\$0	\$2040	11/02/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS
NGUYEN, DUC M	2618	455-016000

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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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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P.O. Box 1450
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/617,215	11/12/2009	Philip M. Wala	100.019US03	4148

34206 7590 08/02/2012
FOGG & POWERS LLC
5810 W 78TH STREET
SUITE 100
MINNEAPOLIS, MN 55439

EXAMINER

NGUYEN, DUC M

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

2618

DATE MAILED: 08/02/2012

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 455 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 455 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.

Privacy Act Statement

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

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

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

Notice of Allowability	Application No.	Applicant(s)	
	12/617,215	WALA, PHILIP M.	
	Examiner	Art Unit	
	DUC M. NGUYEN	2618	

-- 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 7/11/12.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are 1-28.
4. ☐ 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.

5. ☐ 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.
 6. ☐ 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 ____.
- 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).**
7. ☐ 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. <input type="checkbox"/> Notice of References Cited (PTO-892) 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date <u>7/11/12</u> 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | <ol style="list-style-type: none"> 5. <input type="checkbox"/> Notice of Informal Patent Application 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date ____. 7. <input type="checkbox"/> Examiner's Amendment/Comment 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance 9. <input type="checkbox"/> Other ____. |
|---|--|

/DUC M NGUYEN/
Primary Examiner, Art Unit 2618

7/27/12

Art Unit: 2618

REASON FOR ALLOWANCE

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

As to claims 1, 12, 21, 25, the cited prior art of record fail to disclose or make it obvious an apparatus or method for a host unit with an interface that digitally sums corresponding upstream digital RF samples received from a plurality of remote units to produce summed upstream digital RF samples and then converting the summed upstream digital RF samples to a replicated upstream analog wireless RF signal, which comprises components and connections as specified in the claims.

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."

2. **Any response to this action should be mailed to:**

Commissioner of Patents

P.O. Box 1450

Alexandria, VA 22313-1450

or faxed to:

(571) 273-8300 (for **formal** communications intended for entry)

(571)-273-7893 (for informal or **draft** communications).

Art Unit: 2618

Hand-delivered responses should be brought to Customer Service Window,
Randolph Building, 401 Dulany Street, Alexandria, VA 22314.


Any inquiry concerning this communication or communications from the examiner should be directed to Duc M. Nguyen whose telephone number is (571) 272-7893, Monday-Thursday (9:00 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nay Maung can be reached on 571-272-7882. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

/Duc M. Nguyen/

Primary Examiner, Art Unit 2618

July 27, 2012

<i>Issue Classification</i> 	Application/Control No. 12617215	Applicant(s)/Patent Under Reexamination WALA, PHILIP M.
	Examiner DUC M NGUYEN	Art Unit 2618

[illegible][illegible]

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	28	
/DUC M NGUYEN/ Primary Examiner.Art Unit 2618	7/27/12	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	6

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		12617215	
	Filing Date		2009-11-12	
	First Named Inventor	Wala		
	Art Unit	2618		
	Examiner Name	Duc M. Nguyen		
	Attorney Docket Number	100.019US03		

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

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FOREIGN PATENT DOCUMENTS							Remove	
Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1	1127056	CN		1996-07-17	Russell et al.		<input type="checkbox"/>

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

Add

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

T⁵

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

Application Number	12617215
Filing Date	2009-11-12
First Named Inventor	Wala
Art Unit	2618
Examiner Name	Duc M. Nguyen
Attorney Docket Number	100.019US03

1	CHINESE PATENT OFFICE, "Office Action", 04/06/2012, Published in: CN	<input type="checkbox"/>
2	CHINESE PATENT OFFICE, "Office Action", 06/21/2012, Published in: CN	<input type="checkbox"/>

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

EXAMINER SIGNATURE

Examiner Signature	/Duc Nguyen/	Date Considered	07/18/2012
--------------------	--------------	-----------------	------------

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

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

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

Application Number	12617215
Filing Date	2009-11-12
First Named Inventor	Wala
Art Unit	2618
Examiner Name	Duc M. Nguyen
Attorney Docket Number	100.019US03

CERTIFICATION STATEMENT

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

- ☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

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

- ☐ See attached certification statement.
- ☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.
- ☒ A certification statement is not submitted herewith.

SIGNATURE

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

Signature	/Jon M. Powers/	Date (YYYY-MM-DD)	2012-07-11
Name/Print	Powers, Jon M.	Registration Number	43868

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

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

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

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

EAST Search History

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	9738	455/7 455/16 455/20 455/561	US-PGPUB; USPAT; UPAD	OR	ON	2012/07/27 16:47
L3	12209	455/7 455/16 455/20 455/561 455/560	US-PGPUB; USPAT; UPAD	OR	ON	2012/07/27 16:47
L4	18	3 and (digital\$5 near5 summing).clm.	US-PGPUB; USPAT; UPAD	OR	ON	2012/07/27 16:48
L5	51	3 and (digital\$5 near5 add\$4).clm.	US-PGPUB; USPAT; UPAD	OR	ON	2012/07/27 16:54
L6	27	3 and (digital\$5 near5 add\$3).clm.	US-PGPUB; USPAT; UPAD	OR	ON	2012/07/27 16:54

7/ 27/ 2012 4:57:24 PM
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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	2	"7639982".pn.	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/07/18 09:04
L2	53	("20030143947" "4183054" "4611323" "4628501" "4654843" "4667319" "4691292" "4760573" "4999831" "5193109" "5243598" "5321736" "5321849" "5339184" "5499047" "5603080" "5621786" "5627879" "5642405" "5644622" "5657374" "5708961" "5724385" "5765097" "5765099" "5774789" "5802173" "5809431" "5852651" "5878325" "5946622" "5969837" "5978650" "6005884" "6112086" "6147786" "6181687" "6192216" "6198558" "6262981" "6275990" "6317884" "6337754" "6362908" "6374124" "6466572" "6480551" "6486907" "6697603" "6771933" "6785558" "6801767" "7035671").PN.	US- PGPUB; USPAT; USOCR	OR	ON	2012/07/18 09:04
L3	9	("3835393" "4959862" "5390337" "5408259" "5499047" "5528582" "5534912" "5561404" "5606725").PN.	US- PGPUB; USPAT; USOCR	OR	ON	2012/07/18 09:08
L4	7	(head near end) and (QAM near demodulator) and (digital near microcell near PCN)	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/07/18 09:12
L5	64	("3931473" "4101834" "4112488" "4144409" "4144411" "4231116" "4244046" "4354167" "4402076" "4451699" "4456793" "4475010" "4485486" "4525861" "4531239" "4556760" "4596051" "4613990" "4669107" "4701909" "4704733" "4718004" "4754451" "4759051" "4760573" "4790000" "4797947" "4816825" "4831662" "4849963" "4916460" "4920533" "4932049" "4959829" "4977593" "5067147" "5067173" "5084869" "5136410" "5138440" "5159479" "5175867" "5193109" "5243598" "5251053" "5267261" "5272700" "5278690" "5280472" "5285469" "5297193" "5299198" "5301056" "5303287"	US- PGPUB; USPAT; USOCR	OR	ON	2012/07/18 09:20


		"5305308" "5309474" "5313461" "5339184" "5381459" "5392453" "5442700" "5586121" "5587734" "5802173").PN.				
L6	50	("5852651").URPN.	USPAT	OR	ON	2012/07/18 09:21
L7	53	("20030143947" "4183054" "4611323" "4628501" "4654843" "4667319" "4691292" "4760573" "4999831" "5193109" "5243598" "5321736" "5321849" "5339184" "5499047" "5603080" "5621786" "5627879" "5642405" "5644622" "5657374" "5708961" "5724385" "5765097" "5765099" "5774789" "5802173" "5809431" "5852651" "5878325" "5946622" "5969837" "5978650" "6005884" "6112086" "6147786" "6181687" "6192216" "6198558" "6262981" "6275990" "6317884" "6337754" "6362908" "6374124" "6466572" "6480551" "6486907" "6697603" "6771933" "6785558" "6801767" "7035671").PN.	US- PGPUB; USPAT; USOCR	OR	ON	2012/07/18 09:21

7/ 18/ 2012 10:14:39 AM
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<i>Index of Claims</i> 	Application/Control No. 12617215	Applicant(s)/Patent Under Reexamination WALA, PHILIP M.
	Examiner DUC M NGUYEN	Art Unit 2618

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

<input checked="" type="checkbox"/> Claims renumbered in the same order as presented by applicant				<input type="checkbox"/> CPA				<input checked="" type="checkbox"/> T.D.				<input type="checkbox"/> R.1.47			
CLAIM		DATE													
Final	Original	04/05/2012	07/27/2012												
	1	✓	=												
	2	✓	=												
	3	✓	=												
	4	✓	=												
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	25	✓	=												
	26	✓	=												
	27	✓	=												
	28	✓	=												


Search Notes 	Application/Control No. 12617215	Applicant(s)/Patent Under Reexamination WALA, PHILIP M.
	Examiner DUC M NGUYEN	Art Unit 2618

SEARCHED			
Class	Subclass	Date	Examiner
455	7, 16, 20, 560, 561	3/29/12	DN
370	906, 907, 501, 535-537	3/29/12	DN
398	173	3/29/12	DN
Updated	same as aboves	7/27/12	DN

SEARCH NOTES			
Search Notes		Date	Examiner
see EAST search history		3/29/12	DN
		7/18/12	DN

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner
455	7, 16, 20, 560, 561	7/27/12	DN

	/DUC M NGUYEN/ Primary Examiner.Art Unit 2618
--	--

Application Number 	Application/Control No. 12/617,215	Applicant(s)/Patent under Reexamination WALA, PHILIP M.	
Document Code - DISQ		Internal Document – DO NOT MAIL	

TERMINAL DISCLAIMER	<input checked="" type="checkbox"/> APPROVED	<input type="checkbox"/> DISAPPROVED
Date Filed : July 11, 2012	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:

Henry D. Jefferson
2 td's are approved

Applicant(s)	Wala	AMENDMENT AND RESPONSE UNDER 37 C.F.R. § 1.111
Serial No.	12/617,215	
Filing Date	11/12/2009	
Confirmation No.	4148	
Examiner Name	NGUYEN, DUC M	
Group Art Unit	2618	
Attorney Docket No.	100.019US03	
Title: POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT		

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

The Office Action mailed on April 11, 2012, has been reviewed. Applicant respectfully requests reconsideration of the outstanding rejections based on the following.

Remarks begin on page 2 of this paper.

Serial No.: 12/617,215

Filing Date: 11/12/2009

Attorney Docket No. 100.019US03

Title: POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT

REMARKS

The Office Action mailed on April 11, 2012, has been reviewed. Claims 1-28 are pending in this application.

Double Patenting Rejections

Claims 1-28 were rejected under a non-statutory obviousness-type double patenting rejection, specifically U.S. Patent No. 6,704,545. A Terminal Disclaimer in compliance with 37 CFR 1.321(b)(iv) has been submitted herewith to over come these rejections.

Claims 1-28 were rejected under a non-statutory obviousness-type double patenting rejection, specifically U.S. Patent No. 7,639,982. A Terminal Disclaimer in compliance with 37 CFR 1.321(b)(iv) has been submitted herewith to over come these rejections.

Accordingly, Applicant respectfully requests that these rejections be withdrawn.

Serial No.: 12/617,215

Filing Date: 11/12/2009

Attorney Docket No. 100.019US03

Title: POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT

CONCLUSION

Applicant respectfully submits that claims **1-28** are in condition for allowance and notification to that effect is earnestly requested. If necessary, please charge any additional fees or credit overpayments to Deposit Account No. 502432.

If the Examiner has any questions or concerns regarding this application, please contact the undersigned at the telephone number listed below.

Respectfully submitted,

Date: 2012-07-11

/Jon M. Powers/

Jon M. Powers

Reg. No. 43868

Attorneys for Applicant
Fogg & Powers LLC
5810 W. 78th Street, Ste. 100
Minneapolis, MN 55439
T – (952) 465-0770
F – (952) 465-0771

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		12617215	
	Filing Date		2009-11-12	
	First Named Inventor	Wala		
	Art Unit	2618		
	Examiner Name	Duc M. Nguyen		
	Attorney Docket Number	100.019US03		

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

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

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FOREIGN PATENT DOCUMENTS							Remove	
Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ² i	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1	1127056	CN		1996-07-17	Russell et al.		<input type="checkbox"/>

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

Add

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

T⁵

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

Application Number	12617215
Filing Date	2009-11-12
First Named Inventor	Wala
Art Unit	2618
Examiner Name	Duc M. Nguyen
Attorney Docket Number	100.019US03

1	CHINESE PATENT OFFICE, "Office Action", 04/06/2012, Published in: CN	<input type="checkbox"/>
2	CHINESE PATENT OFFICE, "Office Action", 06/21/2012, Published in: CN	<input type="checkbox"/>

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

EXAMINER SIGNATURE

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

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

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

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

Application Number	12617215
Filing Date	2009-11-12
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Art Unit	2618
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Attorney Docket Number	100.019US03

CERTIFICATION STATEMENT

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

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

OR

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

☐ See attached certification statement.

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

☒ A certification statement is not submitted herewith.

SIGNATURE

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

Signature	/Jon M. Powers/	Date (YYYY-MM-DD)	2012-07-11
Name/Print	Powers, Jon M.	Registration Number	43868

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

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

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

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

Electronic Patent Application Fee Transmittal

Application Number:	12617215			
Filing Date:	12-Nov-2009			
Title of Invention:	POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT			
First Named Inventor/Applicant Name:	Philip M. Wala			
Filer:	Jon M. Powers/Lisa Gentry			
Attorney Docket Number:	100.019US03			
Filed as Large Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
Statutory or terminal disclaimer	1814	2	160	320
Total in USD (\$)				500

Electronic Acknowledgement Receipt

EFS ID:	13221418
Application Number:	12617215
International Application Number:	
Confirmation Number:	4148
Title of Invention:	POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT
First Named Inventor/Applicant Name:	Philip M. Wala
Customer Number:	34206
Filer:	Jon M. Powers/Lisa Gentry
Filer Authorized By:	Jon M. Powers
Attorney Docket Number:	100.019US03
Receipt Date:	11-JUL-2012
Filing Date:	12-NOV-2009
Time Stamp:	11:13:53
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$ 500
RAM confirmation Number	9416
Deposit Account	502432
Authorized User	FOGG,DAVID N.

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

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		00311061.PDF	122541	yes	3
			99637510b084b380e6251ca1548fa74f4b443d9d		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
	Applicant Arguments/Remarks Made in an Amendment		2	3	
Warnings:					
Information:					
2	Terminal Disclaimer Filed	00311064.PDF	79629	no	2
			a434ca79996fde2ac46886382e07dabc17b7216f		
Warnings:					
Information:					
3	Terminal Disclaimer Filed	00311062.PDF	79632	no	2
			6ebe70acfe3272b345fca932fab05f95c9332069		
Warnings:					
Information:					
4	Non Patent Literature	00308996.PDF	598594	no	12
			a94e5733e9133b349fdc26eecf0ad97d8df3cfe		
Warnings:					
Information:					
5	Non Patent Literature	00311073.PDF	253534	no	11
			889e2a5180cf52cdfbac0f1bf30babb64887680e		
Warnings:					
Information:					
6	Information Disclosure Statement (IDS) Form (SB08)	00309000.PDF	766125	no	4
			10b984da488fb50f9b19bd005d9c6b2a8f4837a1		
Warnings:					
Information:					
A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.					

7	Fee Worksheet (SB06)	fee-info.pdf	32138 ecff3aa434fcd2b66463c3bcd7582fb15aae462	no	2
Warnings:					
Information:					
Total Files Size (in bytes):				1932193	
<p>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.</p> <p><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.</p> <p><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.</p> <p><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.</p>					

Applicant(s)	Wala	<u>TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A PRIOR PATENT</u>
Serial No.	12/617,215	
Filing Date	11/12/2009	
Group Art Unit	2618	
Examiner Name	Duc M. Nguyen	
Confirmation No.	4148	
Attorney Docket No.	100.019US03	
Title: POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT		

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

The Owner, ADC Telecommunications, Inc., with a business address of 1187 Park Place, Shakopee, MN, 55379, of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application, which would extend beyond the expiration date of the full statutory term defined in 35 U.S.C. §§ 154 and 173, as presently shortened by any terminal disclaimer, of U.S. Patent No. 6,704,545 (the '545 Patent). The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the '545 Patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors, or assigns.

In making the above disclaimer, the Owner does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term as defined in 35 U.S.C. §§ 154 and 173 of the '545 Patent, as presently shortened by any terminal disclaimer, in the event that it later: expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR § 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

TERMINAL DISCLAIMER

PAGE 2

Serial No.: 12/617,215

Filing Date: 11/12/2009

Attorney Docket No. 100.019US03

Title: POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT

Payment of the Terminal Disclaimer fee of \$160.00 pursuant to 37 C.F.R. § 1.20(d) is being made by credit card. Please charge any further fees deemed necessary or credit any overpayment to Deposit Account No. 502432.

The undersigned attorney is an attorney of record.

The Examiner is invited to contact the below-signed attorney if any further assistance is required.

Respectfully submitted,

Date: 2012-07-11

/Jon M. Powers/

Jon M. Powers
Reg. No. 43868

Attorneys for Applicant

Fogg & Powers LLC

5810 W. 78th St, Suite 100 | Minneapolis, MN 55439

T – (952) 465-0770 | F – (952) 465-0771

Applicant(s)	Wala	<u>TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A PRIOR PATENT</u>
Serial No.	12/617,215	
Filing Date	11/12/2009	
Group Art Unit	2618	
Examiner Name	Duc M. Nguyen	
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Attorney Docket No.	100.019US03	
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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

The Owner, ADC Telecommunications, Inc., with a business address of 1187 Park Place, Shakopee, MN, 55379, of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application, which would extend beyond the expiration date of the full statutory term defined in 35 U.S.C. §§ 154 and 173, as presently shortened by any terminal disclaimer, of U.S. Patent No. 7,639,982 (the '982 Patent). The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the '982 Patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors, or assigns.

In making the above disclaimer, the Owner does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term as defined in 35 U.S.C. §§ 154 and 173 of the '982 Patent, as presently shortened by any terminal disclaimer, in the event that it later: expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR § 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

TERMINAL DISCLAIMER

PAGE 2

Serial No.: 12/617,215

Filing Date: 11/12/2009

Attorney Docket No. 100.019US03

Title: POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT

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The undersigned attorney is an attorney of record.

The Examiner is invited to contact the below-signed attorney if any further assistance is required.

Respectfully submitted,

Date: 2012-07-11

/Jon M. Powers/

Jon M. Powers
Reg. No. 43868

Attorneys for Applicant

Fogg & Powers LLC

5810 W. 78th St, Suite 100 | Minneapolis, MN 55439

T – (952) 465-0770 | F – (952) 465-0771



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/617,215	11/12/2009	Philip M. Wala	100.019US03	4148
34206	7590	04/11/2012	EXAMINER	
FOGG & POWERS LLC 5810 W 78TH STREET SUITE 100 MINNEAPOLIS, MN 55439			NGUYEN, DUC M	
			ART UNIT	PAPER NUMBER
			2618	
			NOTIFICATION DATE	DELIVERY MODE
			04/11/2012	ELECTRONIC

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

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

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

DAVID@FOGGLAW.COM
docketing@fogglaw.com

Office Action Summary	Application No. 12/617,215	Applicant(s) WALA, PHILIP M.	
	Examiner DUC M. NGUYEN	Art Unit 2618	

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

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

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) ☒ Claim(s) 1-28 is/are pending in the application.
 5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 1-28 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ 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

- 13) ☐ 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) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>11/12/09</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Information Disclosure Statement

1. The references listed in the information disclosure statements submitted on 11/12/09 have been considered by the examiner (see attached PTO-1449).

Double Patenting

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

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to

Art Unit: 2618

be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims **1-28** are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-79 of U.S. Patent No. **6,704,545**.

Although the conflicting claims are not identical, they are not patentably distinct from each other because they both claim a host unit with an interface that digitally sums corresponding upstream digital RF samples received from a plurality of remote units to produce summed upstream digital RF samples and then converting the summed upstream digital RF samples to a replicated upstream analog wireless RF signal.

4. Claims **1-28** are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-81 of U.S. Patent No. **7,639,982**.

Although the conflicting claims are not identical, they are not patentably distinct from each other because they both claim a host unit with an interface that digitally sums corresponding upstream digital RF samples received from a plurality of remote units to produce summed upstream digital RF samples and then converting the summed upstream digital RF samples to a replicated upstream analog wireless RF signal.

Conclusion

Art Unit: 2618

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

See the attached PTO-892.

6. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(571) 273-8300 (for **formal** communications intended for entry)

(571)-273-7893 (for informal or **draft** communications).

Hand-delivered responses should be brought to Customer Service Window,
Randolph Building, 401 Dulany Street, Alexandria, VA 22314.

Any inquiry concerning this communication or communications from the examiner should be directed to Duc M. Nguyen whose telephone number is (571) 272-7893, Monday-Thursday (9:00 AM - 5:00 PM).

Or to Nay Maung (Supervisor) whose telephone number is (571) 272-7882.

/Duc M. Nguyen/

Primary Examiner, Art Unit 2618

Apr 4, 2012

Notice of References Cited	Application/Control No. 12/617,215		Applicant(s)/Patent Under Reexamination WALA, PHILIP M.	
	Examiner DUC M. NGUYEN		Art Unit 2618	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,356,374	03-2002	Farhan, Forrest M.	398/191
*	B	US-6,373,611	04-2002	Farhan et al.	398/182
*	C	US-6,449,071	09-2002	Farhan et al.	398/79
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

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

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

Notice of References Cited	Application/Control No. 12/617,215	Applicant(s)/Patent Under Reexamination WALA, PHILIP M.	
	Examiner DUC M. NGUYEN	Art Unit 2618	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,356,374	03-2002	Farhan, Forrest M.	398/191
*	B	US-6,373,611	04-2002	Farhan et al.	398/182
*	C	US-6,449,071	09-2002	Farhan et al.	398/79
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
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Search Notes 	Application/Control No. 12617215	Applicant(s)/Patent Under Reexamination WALA, PHILIP M.
	Examiner DUC M NGUYEN	Art Unit 2618

SEARCHED			
Class	Subclass	Date	Examiner
455	7, 16, 20, 560, 561	3/29/12	DN
370	906, 907, 501, 535-537	3/29/12	DN
398	173	3/29/12	DN

SEARCH NOTES		
Search Notes	Date	Examiner
see EAST search history	3/29/12	DN

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

	/DUC M NGUYEN/ Primary Examiner.Art Unit 2618
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		12617215
	Filing Date		11/12/2009
	First Named Inventor	Wala	====
	Art Unit		2618
	Examiner Name	D. Nguyen	
	Attorney Docket Number		100.019US03

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Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	4183054		1980-01-08	Patisaul et al.	
	2	4611323		1986-09-09	Hessenmiiller	
	3	4628501		1986-12-09	Loscoe	
	4	4654843		1987-03-31	Roza et al.	
	5	4667319		1987-05-19	CHUM	
	6	4691292		1987-09-01	Rothweiler	
	7	4760573		1988-07-26	Calvignac et al.	
	8	4999831		1991-03-12	Grace	

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Application Number		12/617215
Filing Date		11/12/2009
First Named Inventor	Wala	2618
Art Unit		D. Nguyen
Examiner Name		
Attorney Docket Number		100.019US03

9	5193109		1993-03-09	Chien-Yeh Lee	
10	5243598		1993-09-07	Lee	
11	5321849		1994-06-14	Lemson	
12	5339184		1994-08-16	Tang	
13	5499047		1996-03-12	Terry et al.	
14	5603080		1997-02-11	Kallander et al.	
15	5621786		1997-04-15	Fischer et al.	
16	5627879		1997-05-06	Russell et al.	
17	5642405		1997-06-24	Fischer et al.	
18	5644622		1997-07-01	Russell et al.	
19	5657374		1997-08-12	Russell et al.	

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Examiner Name	D. Nguyen	
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20	5724385		1998-03-03	Levin et al.	
21	5765097		1998-06-09	Dail	
22	5765099		1998-06-09	Georges et al.	
23	5774789		1998-06-30	Van der Kaay et al.	
24	5809431		1998-09-15	Bustamante et al.	
25	5852651		1998-12-22	Fischer et al.	
26	5878325		1999-03-02	Dail	
27	5946622		1999-08-31	Bojeryd	
28	5969837		1999-10-19	Farber et al.	
29	5978650		1999-11-02	Fischer et al.	
30	6112086		2000-08-29	Wala	

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Art Unit		2618
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Attorney Docket Number		100.019US03

31	6147786		2000-11-14	Pan	
32	6198558		2001-03-06	Graves et al.	
33	6362908		2002-03-26	Kimbrough et al.	
34	6486907		2002-11-26	Farber et al.	

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	1	3707244	DE	A	1988-09-15	Schalamon		<input type="checkbox"/>
	2	0391597	EP		1990-10-10	CHU		<input type="checkbox"/>

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Application Number	12/617215	
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Art Unit	2618	
Examiner Name	D. Nguyen	
Attorney Docket Number	100.019US03	

3	0664621	EP		1995-07-26	Zarem et al.		<input type="checkbox"/>
4	9115927	WO		1991-10-17	Cook et al.		<input type="checkbox"/>

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	1	AKOS ET AL., "DIRECT BANDPASS SAMPLING OF MULTIPLE DISTINCT RF SIGNALS", 7/1/1999, Page(s) 983-988, Volume 47, Publisher: IEEE Transactions on Communications	<input type="checkbox"/>
	2	FOXCOW WIRELESS PROPRIETARY INFORMATION, "LITENNA IN-BUILDING RF DISTRIBUTION SYSTEM", 1998, Page(s) 1-8	<input type="checkbox"/>
	3	FOXCOW WIRELESS PROPRIETARY INFORMATION, "APPLICATION NOTE RFIBER-RF FIBEROPTIC LINKS FOR WIRELESS APPLICATIONS", , Page(s) 3-11 1998	<input type="checkbox"/>
	4	GRACE, MARTIN K., "Synchronous Quantized Subcarrier Multiplexing for Transport of Video, Voice and Data", "IEEE Journal on Selected Areas in Communications", Sept. 1990, Page(s) 1351-1358, Volume 8, Number 7, Publisher: IEEE	<input type="checkbox"/>
	5	HARVEY ET AL., "Cordless Communications Utilising Radio Over Fibre Techniques for the Local Loop", "IEEE International Conference on Communications", June 1991, Page(s) 1171-1175, Publisher: IEEE	<input type="checkbox"/>
	6	NAKATSUGAWA ET AL., "SOFTWARE RADIO BASE AND PERSONAL STATIONS FOR CELLULAR/PCS SYSTEMS", 2000, Page(s) 617-621, Publisher: IEEE	<input type="checkbox"/>
	7	WALA, "A New Microcell Architecture Using Digital Optical Transport ", "Freedom Through Wireless Technology", 5/18/93, Page(s) 585-588, Publisher: Proceedings of the Vehicular Technology Conference, New York, IEEE, Published in: US	<input type="checkbox"/>

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Application Number		12/617215
Filing Date		11/12/2009
First Named Inventor	Wala	2618
Art Unit		D. Nguyen
Examiner Name		
Attorney Docket Number		100.019US03

EXAMINER SIGNATURE

Examiner Signature	/Duc Nguyen/	Date Considered	03/29/2012
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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.N./

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	11	"4667319".pn. "6262981".pn. "6005884".pn. "5644622".pn. "6198558".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/03/29 13:50
L2	120	("4144409" "4144411" "4231116" "4451699" "4456793" "4475010" "4485486" "4525861" "4556760" "4613990" "4669107" "4759051" "4790000" "4797947" "4831662" "4916460" "4932049" "5067147" "5067173" "5084869" "5159479" "5175867" "5193109" "5243598" "5251053" "5267261" "5278690" "5280472" "5285469" "5297193" "5301056" "5303287" "5305308" "5309474" "5339184" "5381459" "5392453").PN. OR ("5644622").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2012/03/29 14:02
L3	51	2 and (summing adding)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/03/29 14:04
L4	18	2 and ((summing adding) same (digital\$3 digitiz\$4))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/03/29 14:05
L5	22	("3995120" "4709418" "4759018" "4763317" "5018142" "5420583" "5426527" "5544161" "5559624" "5563815" "5644622" "5694232" "5790523" "5790533" "5878325" "5896216" "5966636" "6041056" "6161011" "6323793" "6373611" "6978091").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2012/03/29 14:07
L6	16	("3995120" "4739521" "4759018" "5003624" "5018412" "5060310" "5339184" "5420583" "5426527" "5526164" "5563815" "5598288" "5615034" "5644622" "5657143" "5896216").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2012/03/29 14:29
L7	18	("3995120" "4759018" "4763317" "4994909" "5018142" "5420583" "5426527" "5544161" "5563815" "5644622" "5694232" "5790523" "5790533" "5878325" "5966636" "6041056" "6161011" "6323793").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2012/03/29 14:52

L8	9	("3995120" "4759018" "5018142" "5420583" "5426527" "5563815" "5644622" "5786919" "5953668").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2012/03/29 15:02
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L10	32	5 6 7	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/03/29 15:17
L11	6	10 and ((summing adding) same (digital\$3 digitiz\$4))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/03/29 15:17
L12	1	10 and (add\$3 near (digital\$3 digitiz\$4))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/03/29 15:19
L13	11	2 and (add\$3 near (digital\$3 digitiz\$4))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/03/29 15:20
L14	36	("0612086" "20030143947" "20030162516" "4144411" "4451699" "4475010" "4485486" "4556760" "4849963" "4916460" "5067173" "5278690" "5621786" "5627879" "5642405" "5644622" "5657374" "5765099" "5774789" "5802173" "5809395" "5852651" "5878325" "5969837" "6122529" "6150993" "6223021" "6259910" "6298246" "6336042" "6349200" "6374124" "6480702" "6801767" "6807374").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2012/03/29 15:22
L15	0	14 and (add\$3 near (digital\$3 digitiz\$4))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/03/29 15:23
L16	0	14 and (add\$3 near2 (digital\$3 digitiz\$4))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/03/29 15:23
L17	2	14 and (sum\$3 near2 (digital\$3 digitiz\$4))	US-PGPUB; USPAT;	OR	ON	2012/03/29 15:23

			USOCR; EPO; JPO; DERWENT			
L18	1	10/029261	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/03/29 15:25
L19	237	(ADC near2 telecommunicat\$4) and ((sum\$3 add\$3) near5 (digital\$3 digitiz\$4))	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/03/29 15:30
L20	40	(ADC near2 telecommunicat\$4) and ((sum\$3 add\$3) near2 (digital\$3 digitiz\$4))	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/03/29 15:31
L21	19	2 and ((sum\$3 add\$3) near2 (digital\$3 digitiz\$4))	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/03/29 15:35
L22	13	("3995120" "4759018" "5018142" "5420583" "5426527" "5459607" "5544161" "5553064" "5563815" "5610911" "5631757" "5644622" "5694232").PN.	US- PGPUB; USPAT; USOCR	OR	ON	2012/03/29 15:44
L23	2	22 and ((sum\$3 add\$3) near2 (digital\$3 digitiz\$4))	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/03/29 15:46
L24	83	("5644622").URPN.	USPAT	OR	ON	2012/03/29 16:07
L25	2	"6356374".pn. and interleav\$5	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/03/29 16:16
L26	0	"7639982".pn. and interleav\$5	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/03/29 16:42
L27	1	"7639982".pn. and sum\$4	US- PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/03/29 16:43




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CONFIRMATION NO. 4148

SERIAL NUMBER 12/617,215	FILING or 371(c) DATE 11/12/2009 RULE	CLASS 455	GROUP ART UNIT 2618	ATTORNEY DOCKET NO. 100.019US03		
APPLICANTS Philip M. Wala, Waseca, MN; ** CONTINUING DATA ***** This application is a CON of 10/740,944 12/19/2003 PAT 7,639,982 which is a CON of 09/619,431 07/19/2000 PAT 6,704,545 Yes DN ** FOREIGN APPLICATIONS ***** No DN ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 11/20/2009						
Foreign Priority claimed <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 35 USC 119(a-d) conditions met <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Verified and Acknowledged <u>/DUC M NGUYEN/</u> Examiner's Signature		<input type="checkbox"/> Met after Allowance Initials	STATE OR COUNTRY MN	SHEETS DRAWINGS 8	TOTAL CLAIMS 28	INDEPENDENT CLAIMS 4
ADDRESS FOGG & POWERS LLC 5810 W 78TH STREET SUITE 100 MINNEAPOLIS, MN 55439 UNITED STATES						
TITLE POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT						
FILING FEE RECEIVED 1726	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		<input type="checkbox"/> All Fees			
			<input type="checkbox"/> 1.16 Fees (Filing)			
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			<input type="checkbox"/> Other _____			
			<input type="checkbox"/> Credit			

<i>Index of Claims</i> 	Application/Control No. 12617215	Applicant(s)/Patent Under Reexamination WALA, PHILIP M.
	Examiner DUC M NGUYEN	Art Unit 2618

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

<input type="checkbox"/> Claims renumbered in the same order as presented by applicant		<input type="checkbox"/> CPA		<input type="checkbox"/> T.D.		<input type="checkbox"/> R.1.47			
CLAIM		DATE							
Final	Original	04/05/2012							
	1	✓							
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	3	✓							
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/617,215	11/12/2009	Philip M. Wala	100.019US03

CONFIRMATION NO. 4148

PUBLICATION NOTICE



OC000000040544536

34206
FOGG & POWERS LLC
5810 W 78TH STREET
SUITE 100
MINNEAPOLIS, MN 55439

Title:POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT

Publication No.US-2010-0061291-A1

Publication Date:03/11/2010

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12/617,215	11/12/2009	2617	1726	100.019US03	28	4

CONFIRMATION NO. 4148

34206
FOGG & POWERS LLC
5810 W 78TH STREET
SUITE 100
MINNEAPOLIS, MN 55439

FILING RECEIPT



OC000000038897250

Date Mailed: 12/01/2009

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Applicant(s)

Philip M. Wala, Waseca, MN;

Assignment For Published Patent Application

ADC Telecommunications, Inc., Eden Prairie, MN

Power of Attorney: The patent practitioners associated with Customer Number 34206

Domestic Priority data as claimed by applicant

This application is a CON of 10/740,944 12/19/2003
which is a CON of 09/619,431 07/19/2000 PAT 6,704,545

Foreign Applications

If Required, Foreign Filing License Granted: 11/20/2009

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/617,215**

Projected Publication Date: 03/11/2010

Non-Publication Request: No

Early Publication Request: No

Title

POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT

Preliminary Class

455

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

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

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

NOT GRANTED

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



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/617,215	11/12/2009	Philip M. Wala	100.019US03

34206
FOGG & POWERS LLC
5810 W 78TH STREET
SUITE 100
MINNEAPOLIS, MN 55439

CONFIRMATION NO. 4148
POA ACCEPTANCE LETTER



Date Mailed: 11/25/2009

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 11/13/2009.

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.

/atesfai/

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



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/617,215	11/12/2009	Philip M. Wala	100.019US03

34206
FOGG & POWERS LLC
5810 W 78TH STREET
SUITE 100
MINNEAPOLIS, MN 55439

CONFIRMATION NO. 4148
POWER OF ATTORNEY NOTICE



Date Mailed: 11/25/2009

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 11/13/2009.

- 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).

/atesfai/

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

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

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

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

I hereby appoint:



Practitioners associated with the Customer Number:

34206

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:

34206

OR

<input type="checkbox"/> Firm or Individual Name			
Address			
City	State	Zip	
Country			
Telephone	Email		

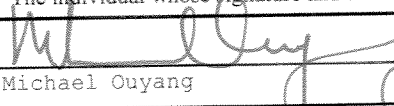
Assignee Name and Address:

ADC Telecommunications, Inc.
13625 Technology Drive
Eden Prairie, MN 55344-2252

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	April 13, 2009
Name	Michael Ouyang	Telephone	952-917-0571
Title	Chief Intellectual Property Counsel		

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.

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Wala

Application No./Patent No.: 12/617,215 Filed/Issue Date: 11/12/2009

Titled: POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT

ADC Telecommunications, Inc., a _____,
(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 011011, Frame 0120, 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 follows:

1. From: _____ To: _____

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

2. From: _____ To: _____

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

3. From: _____ To: _____

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

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

- ☒ 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.

/David N. Fogg/
Signature

November 13, 2009
Date

David N. Fogg (USPTO Reg. 35138)
Printed or Typed Name

Title Attorney of Record

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.

Electronic Acknowledgement Receipt

EFS ID:	6443348
Application Number:	12617215
International Application Number:	
Confirmation Number:	4148
Title of Invention:	POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT
First Named Inventor/Applicant Name:	Philip M. Wala
Customer Number:	34206
Filer:	Jon M. Powers/Lisa Gentry
Filer Authorized By:	Jon M. Powers
Attorney Docket Number:	100.019US03
Receipt Date:	13-NOV-2009
Filing Date:	
Time Stamp:	14:16:36
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	00185329.PDF	197615 <small>7c0a88d1314b049b729f074b36ca7773749455d2</small>	no	1

Warnings:

Information:

SOLiD Ex. 1016

Page 71

2	Assignee showing of ownership per 37 CFR 3.73(b).	00185494.PDF	83355 d3733b1e9fde7281c1bf83b6271e6e37f6a3fc4	no	1
Warnings:					
Information:					
Total Files Size (in bytes):				280970	
<p>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.</p> <p><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.</p> <p><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.</p> <p><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.</p>					

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		
	First Named Inventor	Wala	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	100.019US03	

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	4183054		1980-01-08	Patisaul et al.	
	2	4611323		1986-09-09	Hessenmiiller	
	3	4628501		1986-12-09	Loscoe	
	4	4654843		1987-03-31	Roza et al.	
	5	4667319		1987-05-19	CHUM	
	6	4691292		1987-09-01	Rothweiler	
	7	4760573		1988-07-26	Calvignac et al.	
	8	4999831		1991-03-12	Grace	

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

Application Number		
Filing Date		
First Named Inventor	Wala	
Art Unit		
Examiner Name		
Attorney Docket Number	100.019US03	

	9	5193109		1993-03-09	Chien-Yeh Lee	
	10	5243598		1993-09-07	Lee	
	11	5321849		1994-06-14	Lemson	
	12	5339184		1994-08-16	Tang	
	13	5499047		1996-03-12	Terry et al.	
	14	5603080		1997-02-11	Kallander et al.	
	15	5621786		1997-04-15	Fischer et al.	
	16	5627879		1997-05-06	Russell et al.	
	17	5642405		1997-06-24	Fischer et al.	
	18	5644622		1997-07-01	Russell et al.	
	19	5657374		1997-08-12	Russell et al.	

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

Application Number		
Filing Date		
First Named Inventor	Wala	
Art Unit		
Examiner Name		
Attorney Docket Number	100.019US03	

	20	5724385		1998-03-03	Levin et al.	
	21	5765097		1998-06-09	Dail	
	22	5765099		1998-06-09	Georges et al.	
	23	5774789		1998-06-30	Van der Kaay et al.	
	24	5809431		1998-09-15	Bustamante et al.	
	25	5852651		1998-12-22	Fischer et al.	
	26	5878325		1999-03-02	Dail	
	27	5946622		1999-08-31	Bojeryd	
	28	5969837		1999-10-19	Farber et al.	
	29	5978650		1999-11-02	Fischer et al.	
	30	6112086		2000-08-29	Wala	

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

Application Number		
Filing Date		
First Named Inventor	Wala	
Art Unit		
Examiner Name		
Attorney Docket Number	100.019US03	

	31	6147786		2000-11-14	Pan	
	32	6198558		2001-03-06	Graves et al.	
	33	6362908		2002-03-26	Kimbrough et al.	
	34	6486907		2002-11-26	Farber et al.	

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Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ² j	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1	3707244	DE	A	1988-09-15	Schalamon		<input type="checkbox"/>
	2	0391597	EP		1990-10-10	CHU		<input type="checkbox"/>

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

Application Number		
Filing Date		
First Named Inventor	Wala	
Art Unit		
Examiner Name		
Attorney Docket Number	100.019US03	

3	0664621	EP		1995-07-26	Zarem et al.		<input type="checkbox"/>
4	9115927	WO		1991-10-17	Cook et al.		<input type="checkbox"/>

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NON-PATENT LITERATURE DOCUMENTS

Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
	1	AKOS ET AL., "DIRECT BANDPASS SAMPLING OF MULTIPLE DISTINCT RF SIGNALS", 7/1/1999, Page(s) 983-988, Volume 47, Publisher: IEEE Transactions on Communications	<input type="checkbox"/>
	2	FOXCOW WIRELESS PROPRIETARY INFORMATION, "LITENNA IN-BUILDING RF DISTRIBUTION SYSTEM", 1998, Page(s) 1-8	<input type="checkbox"/>
	3	FOXCOW WIRELESS PROPRIETARY INFORMATION, "APPLICATION NOTE RFIBER-RF FIBEROPTIC LINKS FOR WIRELESS APPLICATIONS", , Page(s) 3-11	<input type="checkbox"/>
	4	GRACE, MARTIN K., "Synchronous Quantized Subcarrier Multiplexing for Transport of Video, Voice and Data", "IEEE Journal on Selected Areas in Communications", Sept. 1990, Page(s) 1351-1358, Volume 8, Number 7, Publisher: IEEE	<input type="checkbox"/>
	5	HARVEY ET AL., "Cordless Communications Utilising Radio Over Fibre Techniques for the Local Loop", "IEEE International Conference on Communications", June 1991, Page(s) 1171-1175, Publisher: IEEE	<input type="checkbox"/>
	6	NAKATSUGAWA ET AL., "SOFTWARE RADIO BASE AND PERSONAL STATIONS FOR CELLULAR/PCS SYSTEMS", 2000, Page(s) 617-621, Publisher: IEEE	<input type="checkbox"/>
	7	WALA, "A New Microcell Architecture Using Digital Optical Transport ", "Freedom Through Wireless Technology", 5/18/93, Page(s) 585-588, Publisher: Proceedings of the Vehicular Technology Conference, New York, IEEE, Published in: US	<input type="checkbox"/>

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

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

Application Number		
Filing Date		
First Named Inventor	Wala	
Art Unit		
Examiner Name		
Attorney Docket Number	100.019US03	

EXAMINER SIGNATURE

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

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

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

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

Application Number	
Filing Date	
First Named Inventor	Wala
Art Unit	
Examiner Name	
Attorney Docket Number	100.019US03

CERTIFICATION STATEMENT

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

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

OR

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

☐ See attached certification statement.

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

☒ None

SIGNATURE

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

Signature	/Jon M. Powers/	Date (YYYY-MM-DD)	2009-11-12
Name/Print	Powers, Jon M.	Registration Number	43868

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

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

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

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

Electronic Patent Application Fee Transmittal

Application Number:				
Filing Date:				
Title of Invention:	POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT			
First Named Inventor/Applicant Name:	Philip M. Wala			
Filer:	Jon M. Powers/Lisa Gentry			
Attorney Docket Number:	100.019US03			
Filed as Large Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility application filing	1011	1	330	330
Utility Search Fee	1111	1	540	540
Utility Examination Fee	1311	1	220	220
Pages:				
Claims:				
Claims in excess of 20	1202	8	52	416
Independent claims in excess of 3	1201	1	220	220
Miscellaneous-Filing:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1726

Electronic Acknowledgement Receipt

EFS ID:	6441468
Application Number:	12617215
International Application Number:	
Confirmation Number:	4148
Title of Invention:	POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT
First Named Inventor/Applicant Name:	Philip M. Wala
Customer Number:	34206
Filer:	Jon M. Powers/Lisa Gentry
Filer Authorized By:	Jon M. Powers
Attorney Docket Number:	100.019US03
Receipt Date:	12-NOV-2009
Filing Date:	
Time Stamp:	15:47:00
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$ 1726
RAM confirmation Number	2277
Deposit Account	502432
Authorized User	POWERS,JON M.

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File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		00185391.PDF	126988	yes	28
			72f3ed1ff8deb63ad7dc39f816e293f1afc58a1		
	Multipart Description/PDF files in .zip description				
	Document Description		Start		End
	Specification		1		18
	Claims		19		27
	Abstract		28		28
Warnings:					
Information:					
2	Drawings-only black and white line drawings	00185301.PDF	201396	no	8
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Warnings:					
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3	Application Data Sheet	00185393.PDF	957589	no	4
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Warnings:					
Information:					
4	Oath or Declaration filed	00185303.PDF	103199	no	2
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Warnings:					
Information:					
5	Transmittal Letter	00185394.PDF	63682	no	1
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6	Information Disclosure Statement (IDS) Filed (SB/08)	00185395.PDF	1185503	no	8
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7	Fee Worksheet (PTO-875)	fee-info.pdf	38170	no	2
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Electronic Acknowledgement Receipt

EFS ID:	6441468
Application Number:	12617215
International Application Number:	
Confirmation Number:	4148
Title of Invention:	POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT
First Named Inventor/Applicant Name:	Philip M. Wala
Customer Number:	34206
Filer:	Jon M. Powers/Lisa Gentry
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Information:					
3	Application Data Sheet	00185393.PDF	957589	no	4
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4	Oath or Declaration filed	00185303.PDF	103199	no	2
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5	Transmittal Letter	00185394.PDF	63682	no	1
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Information:					
6	Information Disclosure Statement (IDS) Filed (SB/08)	00185395.PDF	1185503	no	8
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Information:					
7	Fee Worksheet (PTO-875)	fee-info.pdf	38170	no	2
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POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT

Cross Reference to Related Applications

[0001] This application is a continuation of U.S. Application Serial No. 10/740,944, filed on December 19, 2003 entitled "POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT", which, in turn, is a continuation of U.S. Application Serial No. 09/619,431, filed on July 19, 2000, entitled "POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT". Both U.S. Application Serial No. 10/740,944 and U.S. Application Serial No. 09/619,431 are incorporated herein by reference.

Technical Field

[0002] The present invention is related to high capacity mobile communications systems, and more particularly to a point-to-multipoint digital micro-cellular communication system.

Background Information

[0003] With the widespread use of wireless technologies additional signal coverage is needed in urban as well as suburban areas. One obstacle to providing full coverage in these areas is steel frame buildings. Inside these tall shiny buildings (TSBs), signals transmitted from wireless base stations attenuate dramatically and thus significantly impact the ability to communicate with wireless telephones located in the buildings. In some buildings, very low power ceiling mounted transmitters are mounted in hallways and conference rooms within the building to distribute signals throughout the building. Signals are typically fed from a single point and then split in order to feed the signals to different points in the building.

[0004] In order to provide coverage a single radio frequency (RF) source needs to simultaneously feeds multiple antenna units, each providing coverage to a different part of a building for example. Simultaneous bi-directional RF distribution often involves

splitting signals in the forward path (toward the antennas) and combining signals in the reverse path (from the antennas). Currently this can be performed directly at RF frequencies using passive splitters and combiners to feed a coaxial cable distribution network. In passive RF distribution systems, signal splitting in the forward path is significantly limited due to inherent insertion loss associated with the passive devices. Each split reduces the level of the signal distributed in the building thereby making reception, e.g. by cell phones, more difficult. In addition, the high insertion loss of coaxial cable at RF frequencies severely limits the maximum distance over which RF signals can be distributed. Further, the system lacks any means to compensate for variations of insertion loss in each path.

[0005] Another solution to distributing RF signals in TSBs is taking the RF signal from a booster or base station, down converting it to a lower frequency, and distributing it via Cat 5 (LAN) or coaxial cable wiring to remote antenna units. At the remote antenna units, the signal is up converted and transmitted. While down-conversion reduces insertion loss, the signals are still susceptible to noise and limited dynamic range. Also, each path in the distribution network requires individual gain adjustment to compensate for the insertion loss in that path.

[0006] In another approach, fiber optic cables are used to distribute signals to antennas inside of a building. In this approach, RF signals are received from a bi-directional amplifier or base station. The RF signals directly modulate an optical signal, which is transported throughout the building as analog modulated light signals over fiber optic cable. Unfortunately, conventional systems using analog optical modulation transmission over optical fibers require highly sophisticated linear lasers to achieve adequate performance. Also, analog optical systems are limited in the distance signals can be transmitted in the building. Typically, this limitation is made worse due to the use of multimode fiber that is conventionally available in buildings. Multimode fiber is wider than single mode fiber and supports a number of different reflection modes so that signals tend to exhibit dispersion at the terminating end of the fiber. In addition, analog installation typically includes significant balancing when setting up the system. Further, RF levels in the system need to be balanced with the optical levels. If there is

optical attenuation, the RF levels need to be readjusted. In addition, if the connectors are not well cleaned or properly secured, the RF levels can change.

[0007] Digitization of the RF spectrum prior to transport solves many of these problems. The level and dynamic range of digitally transported RF remains unaffected over a wide range of path loss. This allows for much greater distances to be covered, and eliminates the path loss compensation problem. However, this has been strictly a point-to-point architecture. One drawback with digitally transported RF in a point-to-point architecture is the equipment and cost requirement. A host RF to digital interface device is needed for each remote antenna unit. In particular, for use within a building or building complex the number of RF to digital interface devices and the fiber to connect these devices is burdensome. For example, in a building having 20 floors, the requirement may include 20 host RF to digital interface devices for 20 remote antenna units, 1 per floor. In some applications more than one remote antenna unit per floor may be required. As a result, there is a need in the art for improved techniques for distributing RF signals in TSBs, which would incorporate the benefits of digital RF transport into a point-to-multipoint architecture.

Summary

[0008] The above-mentioned problems with distributing RF signals within a building and other problems are addressed by the present invention and will be understood by reading and studying the following specification.

[0009] In one embodiment, a digital radio frequency transport system is provided. The transport system includes a digital host unit and at least two digital remote units coupled to the digital host unit. The digital host unit includes shared circuitry that performs bi-directional simultaneous digital radio frequency distribution between the digital host unit and the at least two digital remote units.

[0010] In another embodiment, a digital radio frequency transport system is provided. The transport system includes a digital host unit and at least one digital expansion unit coupled to the digital host unit. The transport system further includes at least two digital remote units, each coupled to one of the digital host unit and the digital expansion unit. The digital host unit includes shared circuitry that performs bi-

directional simultaneous digital radio frequency distribution between the digital host unit and the at least two digital remote units.

[0011] In an alternate embodiment, a method of performing point-to-multipoint radio frequency transport is provided. The method includes receiving radio frequency signals at a digital host unit and converting the radio frequency signals to a digitized radio frequency spectrum. The method also includes optically transmitting the digitized radio frequency spectrum to a plurality of digital remote units. The method further includes receiving the digitized radio frequency spectrum at the plurality of digital remote units, converting the digitized radio frequency spectrum to analog radio frequency signals and transmitting the analog radio frequency signals via a main radio frequency antenna at each of the plurality of digital remote units.

Brief Description of the Drawings

[0012] Figure 1 is an illustration of one embodiment of a point-to-multipoint communication system according to the teachings of the present invention.

[0013] Figure 2 is a block diagram of one embodiment of a communication system according to the teachings of the present invention.

[0014] Figure 3 is a block diagram of another embodiment of a communication system according to the teachings of the present invention.

[0015] Figure 4 is a block diagram of one embodiment of a digital host unit according to the teachings of the present invention.

[0016] Figure 5 is a block diagram of one embodiment of a digital remote unit according to the teachings of the present invention.

[0017] Figure 6 is a block diagram of one embodiment of a digital expansion unit according to the teachings of the present invention.

[0018] Figure 7 is a block diagram of one embodiment of a microcell base station according to the teachings of the present invention.

[0019] Figure 8 is an illustration of one embodiment of an overflow algorithm for a channel summer according to the teachings of the present invention.

Detailed Description

[0020] In the following detailed description of the preferred embodiments, reference is made to the accompanying drawings that form a part hereof, and in which is shown by way of illustration specific embodiments in which the invention may be practiced. It is to be understood that other embodiments may be utilized and structural changes may be made without departing from the scope of the present invention.

[0021] Figure 1 is an illustration of one exemplary embodiment of a point-to-multipoint digital transport system shown generally at 100 and constructed according to the teachings of the present invention. The point-to-multipoint digital transport system 100 is shown distributed within a complex of tall shiny buildings (TSBs) 2. Although system 100 is shown in a complex of TSBs 2, it is understood that system 100 is not limited to this embodiment. Rather, system 100 in other embodiments is used to distribute signals in a single building, or other appropriate structure or indoor or outdoor location that exhibits high attenuation to RF signals. Advantageously, system 100 uses digital summing of digitized RF signals from multiple antennas to improve signal coverage in structures, such as TSBs.

[0022] Point-to-multipoint digital transport of RF signals is accomplished through a network of remote antenna units or digital remote units 40 and 40' and a digital host unit 20, which interfaces with a wireless network 5 which is coupled to the public switched telephone network (PSTN), or a mobile telecommunications switching office (MTSO) or other switching office/network. System 100 operates by transporting RF signals digitally over fiber optic cables. Signals received at DHU 20 are distributed to multiple DRUs 40 and 40' to provide coverage throughout a building complex. In addition, signals received at each of the DRUs 40 and 40' are summed together at the DHU 20 for interface to a wireless network.

[0023] In one embodiment, digital expansion unit DEU 30 is situated between the DHU 20 and one or more DRUs. In the forward path, DEU 30 expands the coverage area by splitting signals received from DHU 20 to a plurality of DRUs 40'. In the reverse path, DEU 30 receives signals from a plurality of DRUs 40', digitally sums the signals

together and transports them to a DHU 20 or another DEU such as 30. This system allows for successive branching of signals using DEUs 30 and expanded coverage to multiple DRUs 40 and 40'. This system provides an efficient way of providing signal coverage for wireless communication without added attenuation loss and distance constraint found with analog systems. By using DEUs 30, antennas can be placed further from DHU 20 without adversely affecting signal strength since shorter fiber optic cables can be used.

[0024] Digital transport system 100 includes a wireless interface device (WID) 10 that provides an interface to a wireless network. In one embodiment, the WID 10 includes either conventional transmitters and receivers or all digital transmitter and receiver equipment, and interface circuitry to a mobile telecommunications switching office (MTSO). In one embodiment, the wireless interface device 10 is coupled to an MTSO via a T1 line and receives and transmits signals between the MTSO and the DHU 20. In another embodiment, the wireless interface device 10 is coupled to the public switched telephone network (PSTN). In one embodiment, WID 10 comprises a base station and connects directly to DHU 20 via coaxial cables. In another embodiment, WID 10 comprises a base station and wirelessly connects to DHU 20 via a bi-directional amplifier that is connected to an antenna. In one embodiment, the antenna is an outdoor antenna.

[0025] WID 10 communicates signals between wireless units and the wireless network via digital remote units DRUs 40 and 40'. WID 10 is coupled to DHU 20. The DHU 20 is coupled to at least one digital expansion unit DEU 30 and a plurality of DRUs 40. In addition, DEU 30 is coupled to a plurality of DRUs 40'. The DHU 20 receives RF signals from WID 10 and converts the RF signals to digital RF signals. DHU 20 further optically transmits the digital RF signals to multiple DRUs 40 either directly or via one or more DEUs 30.

[0026] Each DRU 40 and 40' is connected through a fiber optic cable (or optionally another high bandwidth carrier) to transport digital RF signals to one of DHU 20 or DEU 30. In one embodiment, the fiber optic cable comprises multimode fiber pairs coupled between the DRUs 40 and the DHU 20, between the DRUs 40 and 40' and the DEUs 30 and between the DEUs 30 and the DHU 20. In one embodiment, the DEU 30

is coupled to the DHU 20 via single mode fiber and the DEU 30 is coupled to the DRUs 40' via multimode fiber pairs. Although, transport system 100 has been described with fiber optic cable other carriers may be used, e.g., coaxial cable.

[0027] In another embodiment, the DHU 20 is coupled to the DRUs 40 by a direct current power cable in order to provide power to each DRU 40. In one embodiment, the direct current power cable delivers 48 VDC to each DRU 40 connected to the DHU 20. In another embodiment, the DEU 30 is coupled to DRUs 40' by a direct current power cable to provide power to each DRU 40'. In one embodiment, the direct current power cable delivers 48 VDC to each DRU 40' connected to the DEU 30. In an alternate embodiment, DRUs 40 and 40' are connected directly to a power supply. In one embodiment, the power supply provides DC power to the DRUs 40 and 40'. In an alternate embodiment, the power supply provides AC power to the DRUs 40 and 40'. In one embodiment, DRUs 40 and 40' each include an AC/DC power converter.

[0028] Both DHU 20 and DEU 30 split signals in the forward path and sum signals in the reverse path. In order to accurately sum the digital signals together at DHU 20 or DEU 30 the data needs to come in to the DHU 20 or DEU 30 at exactly the same rate. As a result all of the DRUs 40 and 40' need to be synchronized so that their digital sample rates are all locked together. Synchronizing the signals in time is accomplished by locking everything to the bit rate over the fiber. In one embodiment, the DHU 20 sends out a digital bit stream and the optical receiver at the DEU 30 or DRU 40 detects that bit stream and locks its clock to that bit stream. In one embodiment, this is being accomplished with a multiplexer chip set and local oscillators, as will be described below. Splitting and combining the signals in a digital state avoids the combining and splitting losses experienced with an analog system. In addition, transporting the digital signals over multimode fiber results in a low cost transport system that is not subject to much degradation.

[0029] The down-conversion and up-conversion of RF signals are implemented by mixing the signal with a local oscillator (LO) at both the DRUs and the DHU. In order for the original frequency of the RF signal to be restored, the signal must be up-converted with an LO that has exactly the same frequency as the LO that was used for

down conversion. Any difference in LO frequencies will translate to an equivalent end-to-end frequency offset. In the embodiments described, the down conversion and up conversion LOs are at locations remote from one another. Therefore, in one preferred embodiment, frequency coherence between the local and remote LO's is established as follows: at the DHU end, there is a 142 MHz reference oscillator which establishes the bit rate of 1.42 GHz over the fiber. This reference oscillator also generates a 17.75 MHz reference clock which serves as a reference to which LO's at the DHU are locked.

[0030] At each of the DRUs, there is another 17.75 MHz clock, which is recovered from the optical bit stream with the help of the clock and bit recovery circuits. Because this clock is recovered from the bit stream generated at the host, it is frequency coherent with the reference oscillator at the host. A reference 17.75 MHz clock is then generated to serve as a reference for the remote local oscillators. Because the remote recovered bit clock is frequency coherent with the host master clock, the host and remote reference clocks, and any LO's locked to them, are also frequency coherent, thus ensuring that DHU and DRU LO's are locked in frequency. It is understood that in other embodiments the bit rate over the fiber may vary and the frequency of the clocks will also vary.

[0031] Figure 2 is a block diagram of one embodiment of a communication system, shown generally at 200 and constructed according to the teachings of the present invention. In this embodiment, a digital host unit (DHU) 220 is coupled to a bi-directional amplifier (BDA) 211. The BDA 211 receives communication signals from a wireless interface device (WID) and transports the communication signals as RF signals to the DHU 220 and receives RF signals from DHU 220 and transmits the RF signals to the WID. The DHU 220 receives RF signals from the BDA 211 and digitizes the RF signals and optically transmits the digital RF signals to multiple DRUs via transmission lines 214-1 to 214-N. DHU 220 also receives digitized RF signals over transmission lines 216-1 to 216-N from a plurality of DRUs either directly or indirectly via DEUs, reconstructs the corresponding analog RF signals, and applies them to BDA 211. In one embodiment, DHU 220 receives signals directly from a plurality N of DRUs. The signals are digitally summed and then converted to analog signals and transmitted to BDA 211. In another embodiment, DHU 220 receives signals from one or more DEUs

and one or more DRUs directly. Again, the signals are all digitally summed and then converted to analog signals and transmitted to BDA 211. The signals received via transmission lines 216-1 to 216-N may be received directly from a DRU or signals that are received by a DEU and summed together and then transported via 216-1 to 216-N to DHU 220 for additional summing and conversion for transport to BDA 211. DEUs provide a way to expand the coverage area and digitally sum signals received from DRUs or other DEUs for transmission in the reverse path to other DEUs or DHU 220. In one embodiment, transmission lines 214-1 to 214-N and 216-1 to 216-N comprise multimode fiber pairs. In an alternate embodiment, each fiber pair is replaced by a single fiber, carrying bi-directional optical signals through the use of wavelength division multiplexing (WDM). In an alternate embodiment, transmission lines 214-1 to 214-N and 216-1 to 216-N comprise single mode fibers. In one embodiment, N is equal to six. In an alternate embodiment, the number of transmission lines in the forward path direction 214-1 to 214-N is not equal to the number of transmission lines in the reverse path direction 216-1 to 216-N.

[0032] Figure 3 is a block diagram of an alternate embodiment of a communication system shown generally at 300 and constructed according to the teachings of the present invention. Communication system 300 includes a base station 310 coupled to a DHU 320. Base station 310 includes conventional transmitters and receivers 323 and 328, respectively, and conventional radio controller or interface circuitry 322 to an MTSO or telephone switched network. DHU 320 is coupled to base station 310. DHU 320 is also coupled to transmission lines 314-1 to 314-M, which transmit in the forward path direction and transmission lines 316-1 to 316-M, which transmit in the reverse path direction.

[0033] DHU 320 essentially converts the RF spectrum to digital in the forward path and from digital to analog in the reverse path. In the forward path, DHU 320 receives the combined RF signal from transmitters 323, digitizes the combined signal and transmits it in digital format over fibers 314-1 to 314-M, which are connected directly to a plurality of DRUs or indirectly to one or more DRUs via one or more DEUs.

[0034] In one embodiment, DHU 320 receives signals directly from a plurality M of DRUs. The signals are digitally summed and then converted to analog signals and

transmitted to base station 310. In another embodiment, DHU 320 receives signals from one or more DEUs and one or more DRUs directly. Again, the signals are all digitally summed and then converted to analog signals and transmitted to base station 310. The signals received via transmission lines 316-1 to 316-M may be received directly from a DRU or signals that are received by a DEU and summed together and then transported via 316-1 to 316-M to DHU 320 for additional summing and conversion for transport to base station 210. DEUs provide a way to expand the coverage area by splitting signals in the forward path and digitally summing signals received from DRUs or other DEUs in the reverse path for transmission upstream to other DEUs or a DHU. In the reverse path, DHU 320 also receives digitized RF signals over fibers 316-1 to 316-M from a plurality of DRUs, either directly or indirectly via DEUs, reconstructs the corresponding analog RF signal, and applies it to receivers 328.

[0035] In one embodiment, transmission lines 314-1 to 314-M and 316-1 to 316-M comprise multimode fiber pairs. In an alternate embodiment, each fiber pair is replaced by a single fiber, carrying bi-directional optical signals through the use of wavelength division multiplexing (WDM). In an alternate embodiment, transmission lines 314-1 to 314-M and 316-1 to 316-M comprise single mode fibers. In one embodiment, M is equal to six. In an alternate embodiment, the number of transmission lines in the forward path direction 314-1 to 314-M is not equal to the number of transmission lines in the reverse path direction 316-1 to 316-M.

[0036] Referring now to FIG. 4, there is shown one embodiment of a DHU 420 constructed according to the teachings of the present invention. DHU 420 includes an RF to digital converter 491 receiving the combined RF signals from a wireless interface device such as a base station, BDA or the like. RF to digital converter 491 provides a digitized traffic stream that is transmitted to multiplexer 466. Multiplexer 466 converts the parallel output of the A/D converter into a framed serial bit stream. At the output of the multiplexer is a 1 to P fan out buffer 407, which splits the digital signal P ways. There are P optical transmitters 431-1 to 431-P one feeding each of the P optical transmission lines 414-1 to 414-P. The digitized signals are applied to fibers 414-1 to

414-P for transmission to corresponding DRUs either directly or via DEUs. In one embodiment, P is equal to 6.

[0037] In one embodiment, DHU 420 includes an amplifier 450 that receives the combined RF signal from a wireless interface device such as a base station or BDA. The combined RF signal is amplified and then mixed by mixer 452 with a signal received from local oscillator 468. Local oscillator 468 is coupled to reference oscillator 415. In one embodiment the local oscillator is coupled to a frequency divider circuit 470, which is in turn coupled to reference oscillator 415. The local oscillator is locked to the reference oscillator 415 as a master clock so that the down conversion of the RF signals is the same as the up conversion. The result is end to end, from DHU to DRU, or DHU to one or more DEUs to DRU, no frequency shift in the signals received and transmitted. The local oscillator 463 is also coupled to a synthesizer circuit 476.

[0038] The output signal of mixer 452 is provided to amplifier 454 amplified and then filtered via intermediate frequency (IF) filter 456. The resultant signal is the combined RF signal converted down to an IF signal. The IF signal is mixed with another signal originating from the reference oscillator 415 via mixer 460. The output of mixer 460 is summed together at 462 with a signal produced by field programmable gate array (FPGA) 467. The output is then converted from an analog signal to a digital signal via analog/digital (A/D) converter 464 once converted the digital RF signal is applied to multiplexer 466. In one embodiment, the A/D converter 464 is a 14-bit converter handling a 14-bit signal. In other embodiments, the A/D converter 464 may be of any size to accommodate an appropriate signal. In one embodiment, the input signal from FPGA 467 is a dither signal from dither circuit 462 that adds limited out of band noise to improve the dynamic range of the RF signal.

[0039] In one embodiment, DHU 420 includes an alternating current to digital current power distribution circuit 6 that provides direct current power to each of the DRUs coupled to DHU 420.

[0040] DHU 420 further includes a plurality of digital optical receivers 418-1 to 418-P in the reverse path. Receivers 418-1 to 418-P each output an electronic digital signal, which is applied to clock and bit recovery circuits 445-1 to 445-P, respectively, for clock and bit recovery of the electronic signals. The signals are then applied to

demultiplexers 441-1 to 441-P, respectively, which extract the digitized signals generated at the DRUs, as will be explained in detail below. Demultiplexers 441-1 to 441-P further extract alarm (monitoring) and voice information framed with the digitized signals. The digitized signals output at each demultiplexer 441-1 to 441-P are then applied to FPGA 467 where the signals are summed together and then applied to digital to RF converter 495. Converter 495 operates on the sum of the digitized signals extracted by demultiplexers 441-1 to 441-P, reconstructing baseband replicas of the RF signals received at all the digital remote units. The baseband replicas are then up-converted to their original radio frequency by mixing with a local oscillator 482 and filtering to remove image frequencies. Local oscillator 482 is coupled to synthesizer 476 and reference oscillator as discussed with respect to local oscillator 468 above.

[0041] In one embodiment, digital to RF converter 495 includes digital to analog (D/A) converter 484 coupled to an output of FPGA 467 the digitized RF signals are converted to analog RF signals and then mixed with a signal from reference oscillator 415 by mixer 492. The signal is then filtered by IF filter 490 and amplified by amplifier 488. The resultant signal is then mixed with a signal from local oscillator 482 and then applied to RF filter 484, amplifier 480 and RF filter 478 for transmission by a wireless interface device such as a BDA or base station.

[0042] In one embodiment, FPGA 467 includes an alarm/control circuit 474, which extracts overhead bits from DRUs to monitor error and alarm information. In one embodiment, the FPGA 467 includes a summer 498, which mathematically sums together the digital RF signals received from fibers 416-1 to 416-P. In another embodiment FPGA includes an overflow algorithm circuit 486 coupled to the output of summer 486. The algorithm circuit 496 allows the summed digital RF signals to saturate and keep the summed signal within a defined number of bits. In one embodiment, the algorithm circuit includes a limiter. In one embodiment, the RF signals are 14-bit signals and when summed and limited by summer 498 and overflow algorithm 496 result in a 14-bit output signal.

[0043] For example, in one embodiment each of the digital RF signals received from fibers 416-1 to 416-P, where P is equal to 6, comprise 14 bit inputs. All of those 6 different 14 bit inputs then go into summer 498. In order to allow for overflow, at least

17 bits of resolution is needed in the summer 498 to handle a worst-case scenario when all 6 of the 14 bit inputs are at full scale at the same time. In this embodiment, a 17-bit wide summer 498 is employed to handle that dynamic range. Coming out of summer 498 is needed a 14-bit signal going in the reverse path. In one embodiment, an algorithm circuit 496 for managing the overflow is implemented. In one embodiment, the summer and 498 and overflow algorithm 496 are included in FPGA 467. In one embodiment, overflow algorithm 496 acts like a limiter and allows the sum to saturate and keeps the summed signal within 14 bits. In an alternate embodiment, overflow algorithm circuit 496 controls the gain and scales the signal dynamically to handle overflow conditions.

[0044] Figure 8 illustrates one embodiment of an algorithm 863 for a channel summer 865 in order to limit the sum of input signals 0 to 5 to 14 bits. In this embodiment, input signals 0 to 5 comprise 6 signals that are summed together by summer 865. The sum of input signals 0 to 5 is reduced to a signal having 14 bits or less by the algorithm 863. It is understood that the algorithm 865 is by example and is not meant to restrict the type of algorithm used to limit the sum of signals 0 to 5 to 14 bits or less.

[0045] For example, when the sum of the 6 input signals 0 to 5 is greater than or equal to 13FFBh then the sum is divided by 6 for a signal that is 14 bits or less. When the sum of the 6 input signals 0 to 5 is greater than 13FFBh but less than or equal to FFFCh then the sum is divided by 5 for a signal that is 14 bits or less. When the sum of the 6 input signals 0 to 5 is greater than FFFCh but less than BFFDh then the sum is divided by 4 for a signal that is 14 bits or less. When the sum of the 6 input signals 0 to 5 is greater BFFDh but less than 7FFEh then the sum is divided by 3 for a signal that is 14 bits or less. Finally, when the sum of the 6 input signals 0 to 5 is greater than 7FFEh but less than or equal to 3FFFh then the sum is divided by 2 for a signal that is 14 bits or less.

[0046] Figure 5 is a block diagram of one embodiment of a digital remote unit (DRU) 540 constructed according to the teachings of the present invention. A digital optical receiver 501 receives the optical digital data stream transmitted from a DHU directly or via a DEU. Receiver 501 converts the optical data stream to a corresponding series of electrical pulses. The electrical pulses are applied to clock and bit recovery circuit 503.

The series of electrical pulses are then applied to demultiplexer 505. Demultiplexer 505 extracts the digitized traffic signals and converts the signals from serial to parallel.. The output parallel signal is then applied to digital to RF converter 595 for conversion to RF and transmission to duplexer 547. RF converter 595 is connected to the main antenna 599 through a duplexer 547. Accordingly, radio frequency signals originating from a wireless interface device are transmitted from main antenna 547.

[0047] In one embodiment, digital to RF converter 595 includes a digital-to-analog (D/A) converter 509, which reconstructs the analog RF signal and applies it to IF 504 and amplifier 506. The analog signal is mixed with an output signal of reference oscillator 515 by mixer 502. The output of amplifier 506 is mixed with a signal from local oscillator 519 that locks the RF signal with the return digital signal via reference oscillator 515 that is coupled to local oscillator 519. In one embodiment, the reference oscillator is coupled to frequency divider 517 that in turn is coupled to local oscillators 519 and 529. The local oscillators 519 and 529 are also coupled to synthesizer 521 that is coupled to programmable logic device 525.

[0048] RF signals received at main antenna 599 are passed through duplexer 547 to RF to digital converter 593. The RF signals are converted to digital signals and then applied to multiplexer 536 converted from parallel-to-serial and optically transmitted via optical transmitter 532 to a DEU or DHU.

[0049] In one embodiment, RF to digital converter 593 includes a first amplifier 543 that receives RF signals from duplexer 547, amplifies the signals and transmits them to digital attenuator 539. In one embodiment, amplifier 543 is a low noise amplifier. Digital attenuator 539 receives the amplified signals and digitally attenuates the signal to control the levels in case of an overload situation. RF to digital converter 593 further includes a second amplifier 537, which receives the attenuated signals, amplifies the signals and applies the amplified signals to mixer 535. Mixer 535 mixes the amplified signals with a signal received from local oscillator 529. The resultant signals are applied to a third amplifier 533 an IF filter 548 and a fourth amplifier 546 in series to down convert to an IF signal. The IF signal is then mixed with a signal from reference oscillator 515 and the mixed signal is summed with a signal from dither circuit 527. The resultant signal is applied to analog-to-digital converter 538 and converted to a

digital signal. The output digital signal is then applied to a multiplexer 536. In one embodiment, the multiplexer 536 multiplexes the signal together with a couple of extra bits to do framing and control information. In one embodiment, multiplexer 536, clock and bit recovery circuit and demultiplexer 505 comprise a multiplexer chip set.

[0050] Programmable logic circuit 525 programs synthesizer 521 for the reference oscillator and for the up and down conversion of local oscillators 519 and 529. The programmable logic circuit 525 looks for error conditions, for out of lock conditions on the oscillators and reports error modes and looks for overflow condition in the A/D converter 538. If an overflow condition occurs the programmable logic circuit 525 indicates that you are saturating and adds some extra attenuation at digital attenuator 539 in order to reduce the RF signal levels coming in from RF antenna 599 and protect the system from overload.

[0051] In one embodiment, DRU 540 includes an internal direct current power distribution system 5. In one embodiment, the distribution system receives 48 VDC and internally distributes 3 outputs of +3.8V, +5.5V and +8V.

[0052] Figure 6 is a block diagram of one embodiment of a digital expansion unit (DEU) 630 constructed according to the teachings of the present invention. DEU 630 is designed to receive optical signals and transmit optical signals. An optical receiver 651 receives digitized RF signals and transmits them to clock and bit recovery circuit 653 that performs clock and bit recovery to lock the local clock and clean up the signal. The signals are then split into X RF digital signals by 1 to X fan out buffer 607. The signals are then transmitted via optical transmitters 655-1 to 655-X to X receiving units such as DEUs or DRUs. The X receiving units may be any combination of DEUs or DRUs. In one embodiment, X is equal to six.

[0053] DEU 630 also includes optical receivers 669-1 to 669-X, which receive digitized RF signals directly from DRUs or indirectly via DEUs. In operation the signals are received, applied to clock and bit recovery circuits 673-1 to 673-X respectively to lock the local clock and clean up the signals and then applied to demultiplexers 671-1 to 671-X. Demultiplexers 671-1 to 671-X each extract the digitized traffic and apply the samples to field programmable gate array 661. The signals are summed together digitally and transmitted to multiplexer 657, which multiplexes the signal together with

a couple of extra bits to do framing and control information. In addition, the multiplexer 657 converts the signals parallel to serial. The signals are then applied to optical transmitter 659 for further transmission. In one embodiment, the signals are directly transmitted to a DHU or indirectly via one or more additional DEUs.

[0054] In one embodiment, the FPGA 661 includes summer 665, which mathematically sums together the digital RF signals received from demultiplexers 671-1 to 671-X. In another embodiment, FPGA 661 includes an overflow algorithm circuit 663 coupled to the output of summer 665. The algorithm circuit 663 allows the summed digital RF signals to saturate and keep the summed signal within a defined number of bits. In one embodiment, the algorithm circuit includes a limiter. In one embodiment, the RF signals are 14-bit signals and when summed and limited by summer 665 and overflow algorithm 663 result in a 14-bit output signal.

[0055] In one embodiment, DEU 630 includes an alternating current to digital current power distribution circuit 7 that provides direct current power to each of the DRUs coupled to DEU 630.

[0056] In an alternate embodiment, the digital host unit (DHU) and wireless interface device (WID) are located some distance from the building being served. The DHU in the building is replaced by a DEU, and the link between that DEU and the remotely located DHU is via single mode fiber. Figure 7 is a block diagram of this embodiment.

A microcell base station shown generally at 700 includes conventional transmitters and receivers 723 and 728, respectively, and conventional radio controller or interface circuitry 722. In the forward path, a DHU 767 receives the combined RF signal from transmitters 723, digitizes the combined signal and transmits it in digital format over single mode fiber to a DEU. In the reverse path, DHU 767 receives digitized RF signal from a DEU, reconstructs the corresponding analog RF signal, and applies it to receivers 728.

[0057] In another alternate embodiment, the wireless interface device (WID) is a software defined base station, and the interface between the DHU and WID takes place digitally, eliminating the need for the RF to digital conversion circuitry in the DHU.

Conclusion

[0058] A digital radio frequency transport system has been described. The transport system includes a digital host unit and at least two digital remote units coupled to the digital host unit. The digital host unit includes shared circuitry that performs bi-directional simultaneous digital radio frequency distribution between the digital host unit and the at least two digital remote units.

[0059] In addition, a digital radio frequency transport system has been described. The transport system includes a digital host unit and at least one digital expansion unit coupled to the digital host unit. The transport system further includes at least two digital remote units, each coupled to one of the digital host unit and the digital expansion unit. The digital host unit includes shared circuitry that performs bi-directional simultaneous digital radio frequency distribution between the digital host unit and that at least two digital remote units.

[0060] Further, a method of performing point-to-multipoint radio frequency transport has been described. The method includes receiving analog radio frequency signals at a digital host unit and converting the analog radio frequency signals to digitized radio frequency signals. The method also includes splitting the digitized radio frequency signals into a plurality of a digital radio frequency signals and optically transmitting the digital radio frequency signals to a plurality of digital remote units. The method further includes receiving the digital radio frequency signals at a plurality of digital remote units, converting the digital radio frequency signals to analog radio frequency signals and transmitting the signals via a main radio frequency antenna at each of the plurality of digital remote units.

[0061] Although specific embodiments have been illustrated and described herein, it will be appreciated by those of ordinary skill in the art that any arrangement which is calculated to achieve the same purpose may be substituted for the specific embodiments shown. For example, a digital remote unit is not limited to the receipt and summing and splitting and transmitting of digitized radio frequency signals. In other embodiments, the digital host unit is capable of receiving and summing analog radio frequency signals in addition to or instead of digitized radio frequency signals. As well, the digital host

unit is capable of splitting and transmitting analog radio frequency signals in addition to or instead of digitized radio frequency signals. This application is intended to cover any adaptations or variations of the present invention. Therefore, it is intended that this invention be limited only by the claims and the equivalents thereof.

What is claimed is:

1. A system for wireless radio frequency signal distribution within a coverage area in which one or more wireless units wirelessly transmit in an upstream wireless radio frequency spectrum, the system comprising:

a host unit; and

a plurality of remote units communicatively coupled to the host unit using at least one communication medium, wherein each of the plurality of remote units is associated with a portion of the coverage area;

wherein each of the plurality of remote units receives a respective original upstream analog wireless signal comprising the upstream radio frequency spectrum and any upstream transmissions from any of the wireless units that are within the portion of the coverage area associated with that remote unit;

wherein each of the plurality of remote units generates respective upstream digital RF samples indicative of the respective original upstream analog wireless signal received at that remote unit;

wherein each of the plurality of remote units communicates the respective upstream digital RF samples generated by that remote unit to the host unit using the at least one communication medium;

wherein the host unit digitally sums corresponding upstream digital RF samples received from the plurality of remote units to produce summed upstream digital RF samples; and

wherein the host unit converts the summed upstream digital RF samples to a replicated upstream analog wireless radio frequency signal.

2. The system of claim 1, wherein the host unit receives an original downstream analog wireless signal comprising a downstream radio frequency spectrum and any downstream transmissions for the wireless units;

wherein the host unit generates downstream digital RF samples indicative of the original downstream analog wireless signal;

wherein the host unit communicates the downstream digital RF samples to at least some of the plurality of remote units using the at least one communication medium; and

wherein each of the at least some of the plurality of remote units to which the host unit communicates the downstream digital RF samples converts the downstream digital RF samples to a replicated downstream analog wireless radio frequency signal.

3. The system of claim 2, wherein the host unit comprises:

an analog-to-digital converter to digitize the original downstream analog wireless radio frequency signal in order to produce the downstream digital RF samples; and

a multiplexer to frame the downstream digital RF samples for communication to at least some of the plurality of remote units as a downstream framed signal; and

wherein each of the plurality of remote units comprises:

a respective demultiplexer to extract the downstream digital RF samples from the downstream framed signal received from the host unit; and

a respective digital-to-analog converter to convert the downstream digital RF samples to the respective replicated downstream analog wireless radio frequency signal.

4. The system of claim 2, wherein the respective replicated downstream analog wireless radio frequency signal generated at each of the at least some of the plurality of remote units is radiated from at least one antenna associated with that remote unit.

5. The system of claim 1, wherein each of the plurality of remote units comprises:

a respective analog-to-digital converter to digitize the original upstream analog wireless radio frequency signal received at that remote unit in order to produce the respective upstream digital RF samples; and

a respective multiplexer to frame the respective upstream digital RF samples for communication to the host unit as a respective upstream framed signal; and

wherein the host unit comprises:

at least one demultiplexer to extract the respective upstream digital RF samples from the respective upstream framed signals received from the plurality of remote units; and

a digital-to-analog converter to convert the summed upstream digital RF samples to the replicated upstream analog wireless radio frequency signal.

6. The system of claim 1, wherein the replicated upstream analog wireless radio frequency signal is communicated from the host unit to at least one base station.

7. The system of claim 6, wherein the replicated upstream analog wireless radio frequency signal is communicated from the host unit to the at least one base station using at least one bi-directional amplifier.

8. The system of claim 1, wherein the host unit digitally sums the corresponding upstream digital RF samples received from the plurality of remote units in order to produce the summed upstream digital RF samples at a resolution greater than a resolution of the upstream digital RF samples being summed.

9. The system of claim 1, wherein the upstream radio frequency spectrum comprises a cellular radio frequency spectrum.

10. The system of claim 1 wherein the at least one communication medium comprises at least one of: a single mode optical fiber, a multi-mode optical fiber, and a coaxial cable.

11. The system of claim 1 further comprising:
a digital expansion unit that is communicatively coupled to the host unit; and
a second plurality of remote units that are communicatively coupled to the digital expansion unit;

wherein each of the second plurality of remote units receives a respective original upstream analog wireless signal comprising the upstream radio frequency spectrum and any transmissions from any of the wireless units that are within the portion of the coverage area associated with that remote unit;

wherein each of the second plurality of remote units generates respective upstream digital RF samples indicative of the respective original upstream analog wireless signal received at that remote unit;

wherein each of the second plurality of remote units communicates the respective upstream digital RF samples generated by that remote unit to the digital expansion unit;

wherein the digital expansion unit digitally sums corresponding upstream digital RF samples received from the second plurality of remote units to produce summed upstream digital RF samples;

wherein the digital expansion unit communicates the summed upstream digital RF samples to the host unit; and

wherein the host unit digitally sums the upstream digital RF samples received from the digital expansion unit with corresponding digital RF samples received from the plurality of remote units.

12. A host unit for wireless radio frequency signal distribution within a coverage area in which one or more wireless units transmit in an upstream wireless radio frequency spectrum, the host unit comprising:

an interface to communicatively couple the host unit to a plurality of remote units using at least one communication medium, wherein each of the plurality of remote units is associated with a portion of the coverage area and each of the plurality of remote units receives a respective original upstream analog wireless signal comprising the upstream radio frequency spectrum and any upstream transmissions from any of the wireless units that are within the portion of the coverage area associated with that remote unit and wherein each of the plurality of remote units generates respective upstream digital RF samples indicative of the respective original upstream analog

wireless signal received at that remote unit, wherein the interface is used to receive the upstream digital RF samples from the plurality of remote units;

a digital summer to digitally sum corresponding upstream digital RF samples received from the plurality of remote units to produce summed upstream digital RF samples; and

a digital-to-analog converter to convert the summed upstream digital RF samples to a replicated upstream analog wireless radio frequency signal.

13. The host unit of claim 12, wherein the interface is used to receive, at the host unit, an original downstream analog wireless signal comprising a downstream radio frequency spectrum and any downstream transmissions for the wireless units; and

wherein the host unit further comprises an analog-to-digital converter to digitize the original downstream analog wireless radio frequency signal in order to generate downstream digital RF samples indicative of the original downstream analog wireless signal;

wherein the interface is used to communicate the downstream digital RF samples to at least some of the plurality of remote units using the at least one communication medium; and

wherein each of the at least some of the plurality of remote units to which the host unit communicates the digital RF samples converts the downstream digital RF samples to a replicated downstream analog wireless radio frequency signal.

14. The host unit of claim 13, wherein the host unit comprises a multiplexer to frame the downstream digital RF samples for communication to at least some of the plurality of remote units as a downstream framed signal.

15. The host unit of claim 12, wherein each of the plurality of remote units frames the respective upstream digital RF samples for communication to the host unit as a respective upstream framed signal; and

wherein the host unit comprises at least one demultiplexer to extract the respective upstream digital RF samples from the respective upstream framed signals received from the plurality of remote units.

16. The host unit of claim 12, wherein the host unit communicates the replicated upstream analog wireless radio frequency signal to at least one base station.

17. The host unit of claim 16, wherein the replicated upstream analog wireless radio frequency signal is communicated from the host unit to the at least one base station using at least one bi-directional amplifier.

18. The host unit of claim 12, wherein the digital summer digitally sums the corresponding upstream digital RF samples received from the plurality of remote units at a resolution greater than a resolution of the upstream digital RF samples being summed.

19. The host unit of claim 12, wherein the upstream radio frequency spectrum comprises a cellular radio frequency spectrum.

20. The host unit of claim 12 wherein the at least one communication medium comprises at least one of: single mode optical fiber, multi-mode optical fiber, and coaxial cable.

21. A digital expansion unit for wireless radio frequency signal distribution within a coverage area in which one or more wireless units transmit in an upstream wireless radio frequency spectrum, the digital expansion unit comprising:

a host unit interface to communicatively couple the digital expansion unit to a host unit;

a remote unit interface to communicatively couple the digital expansion unit to a plurality of remote units, wherein each of the plurality of remote units is associated with a portion of the coverage area and each of the plurality of remote units receives a

respective original upstream analog wireless signal comprising the upstream radio frequency spectrum and any upstream transmissions from any of the wireless units that are within the portion of the coverage area associated with that remote unit and wherein each of the plurality of remote units generates respective upstream digital RF samples indicative of the respective original upstream analog wireless signal received at that remote unit, wherein the remote unit interface is used to receive the upstream digital RF samples from the plurality of remote units; and

a digital summer to digitally sum corresponding upstream digital RF samples received from the plurality of remote units to produce summed upstream digital RF samples; and

wherein the digital expansion unit communicates at least a portion of the summed upstream digital RF samples to the host unit.

22. The digital expansion unit of claim 21, wherein each of the plurality of remote units frames the respective upstream digital RF samples for communication to the digital expansion unit as a respective upstream framed signal;

wherein the digital expansion unit comprises at least one demultiplexer to extract the respective upstream digital RF samples from the respective upstream framed signals received from the plurality of remote units; and

wherein the digital expansion unit comprises a multiplexer to frame the summed upstream digital RF samples for communication to the host unit.

23. The digital expansion unit of claim 21, wherein the digital summer digitally sums the corresponding upstream digital RF samples at a resolution greater than a resolution of the upstream digital RF samples being summed.

24. The digital expansion unit of claim 21, wherein the upstream radio frequency spectrum comprises a cellular radio frequency spectrum.

25. A method of distributing wireless radio frequency signals within a coverage area in which one or more wireless units transmit in an upstream wireless radio frequency

spectrum, the method using a host unit and a plurality of remote units, each of the plurality of remote units being associated with a portion of the coverage area, the method comprising:

at each of the plurality of remote units:

receiving a respective original upstream analog wireless signal comprising the upstream radio frequency spectrum and any upstream transmissions from any of the wireless units that are within the portion of the coverage area associated with that remote unit;

generating respective upstream digital RF samples indicative of the respective original upstream analog wireless signal received at that remote unit; and

communicating the respective upstream digital RF samples generated by that remote unit to the host unit using at least one communication medium; and

at the host unit:

digitally summing corresponding upstream digital RF samples received from the plurality of remote units to produce summed upstream digital RF samples; and

converting the summed upstream digital RF samples to a replicated upstream analog wireless radio frequency signal.

26. The method of claim 25, wherein each of the plurality of remote units frames the respective upstream digital RF samples for communication to the digital expansion unit as a respective upstream framed signal;

wherein the method further comprises, at the host unit, for each of the plurality of remote units, extracting the respective upstream digital RF samples from the respective upstream framed signal received from that remote unit; and

wherein the method further comprises, at the host unit, framing the summed upstream digital RF samples for communication to the host unit.

27. The method of claim 25, wherein the corresponding upstream digital RF samples are digitally summed at a resolution greater than a resolution of the upstream digital RF samples being summed.

28. The method of claim 25, wherein the upstream radio frequency spectrum comprises a cellular radio frequency spectrum.

Abstract of the Disclosure

A digital radio frequency transport system that performs bi-directional simultaneous digital radio frequency distribution is provided. The transport system includes a digital host unit and at least two digital remote units coupled to the digital host unit. The bi-directional simultaneous digital radio frequency distribution is performed between the digital host unit and the at least two digital remote units.

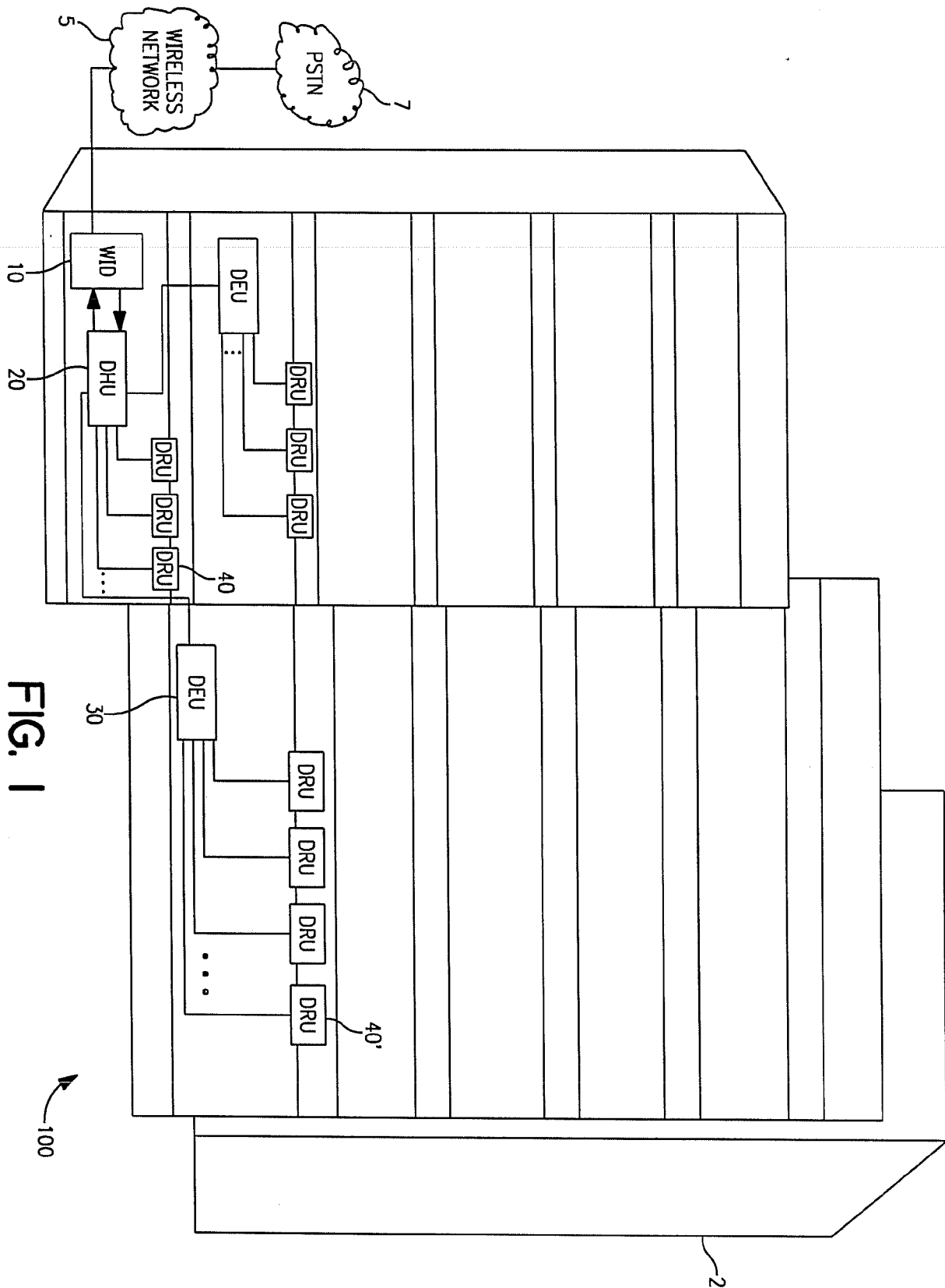


FIG. 1

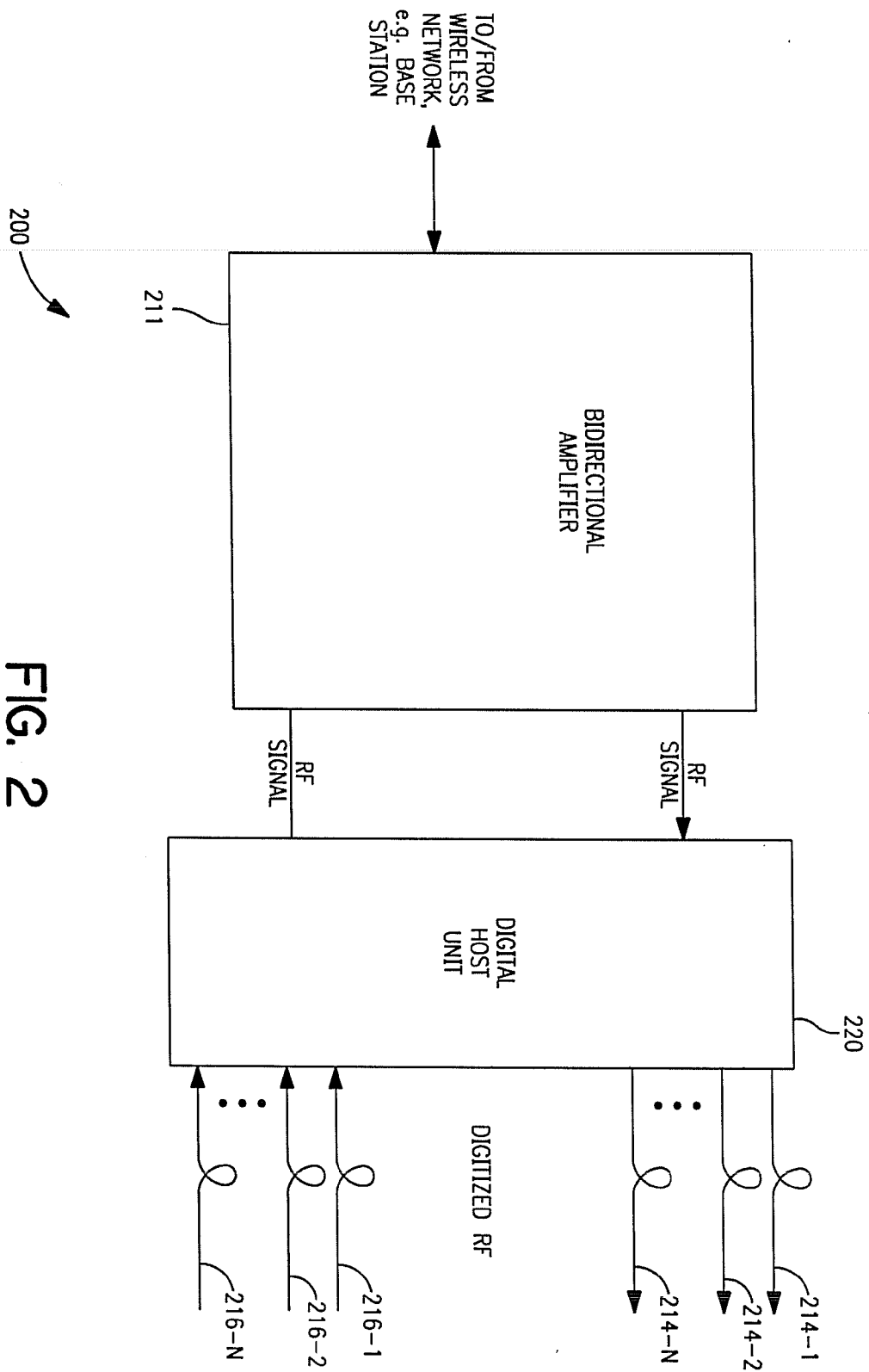


FIG. 2

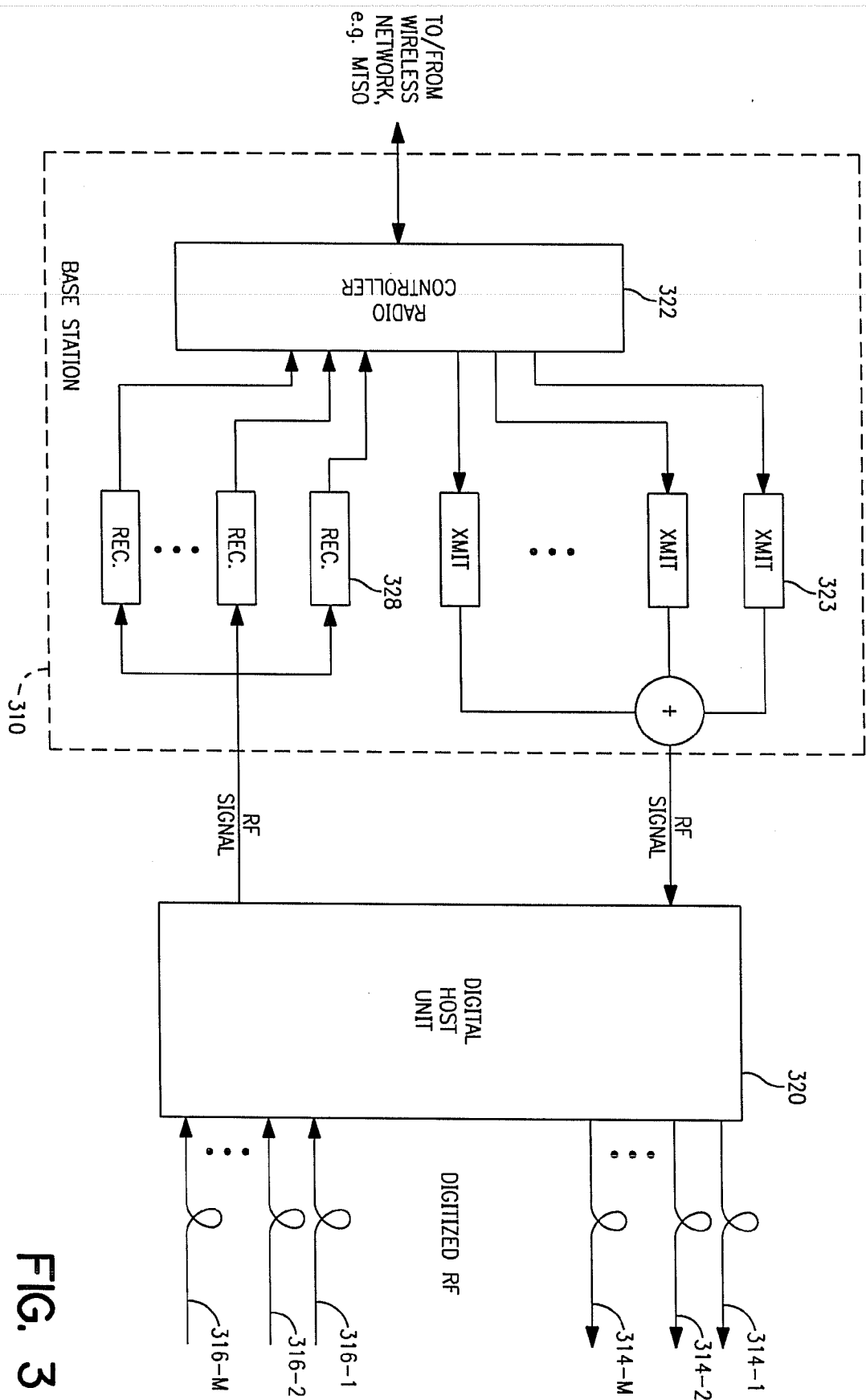


FIG. 3

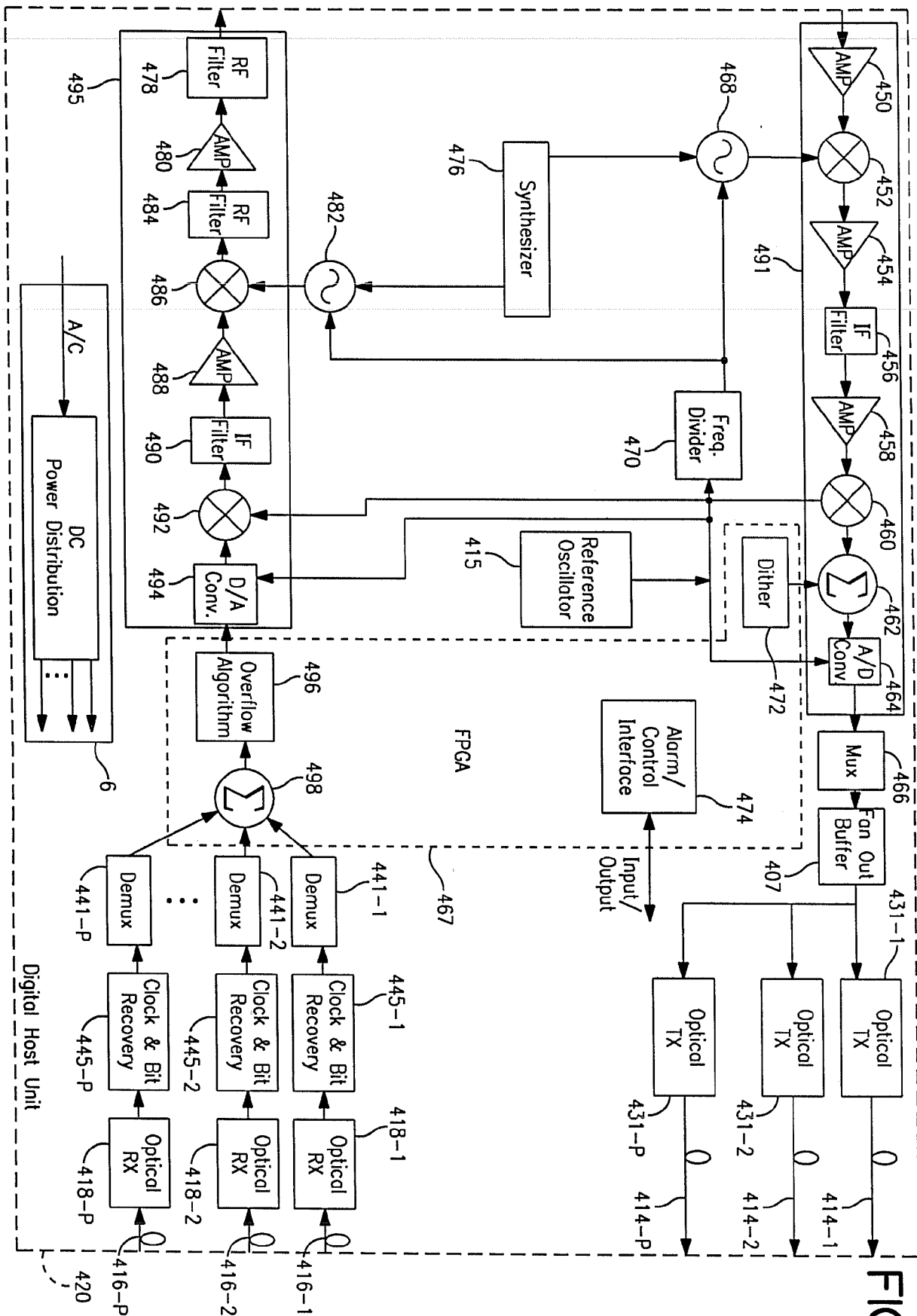


FIG. 4

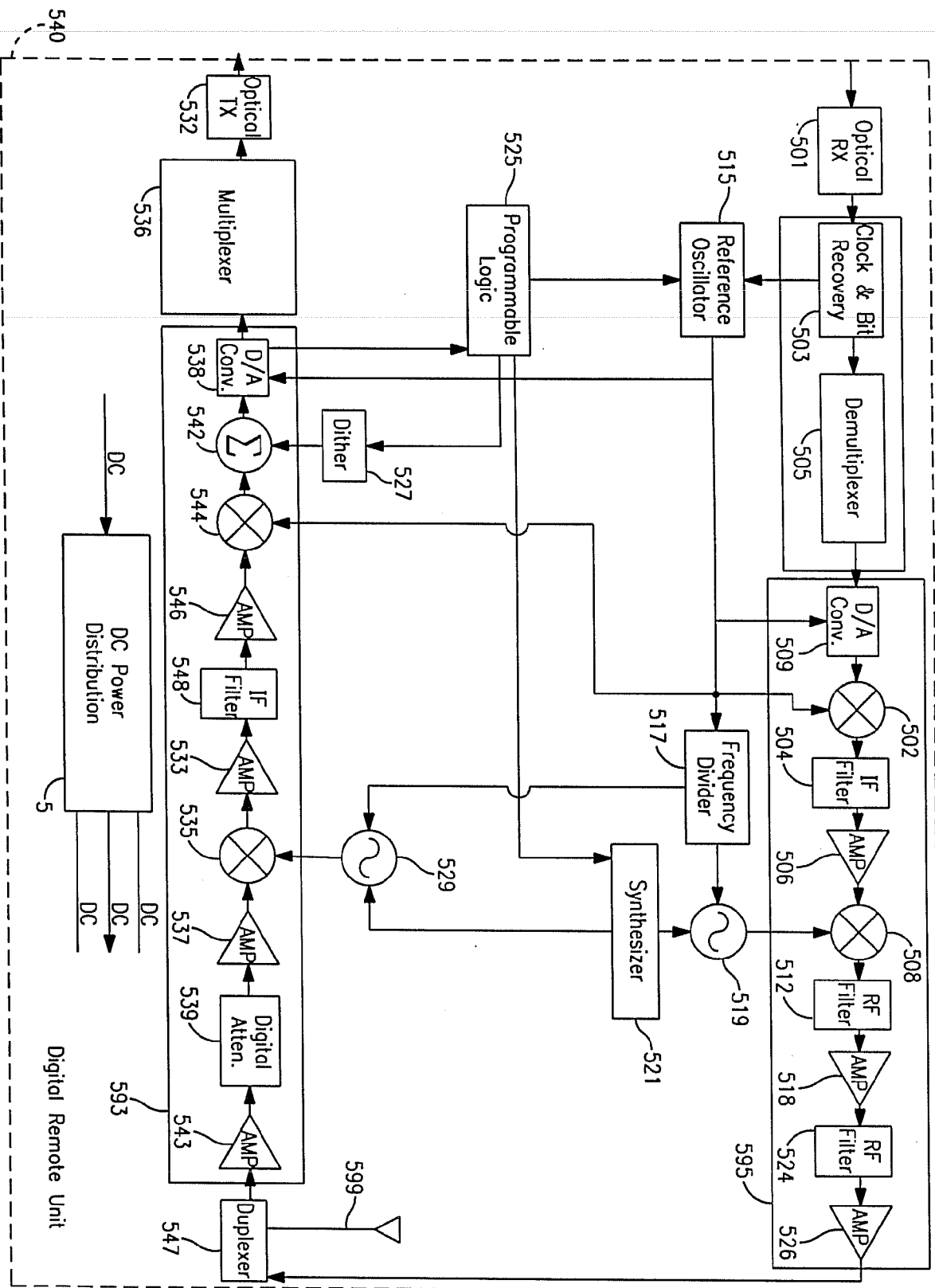


FIG. 5

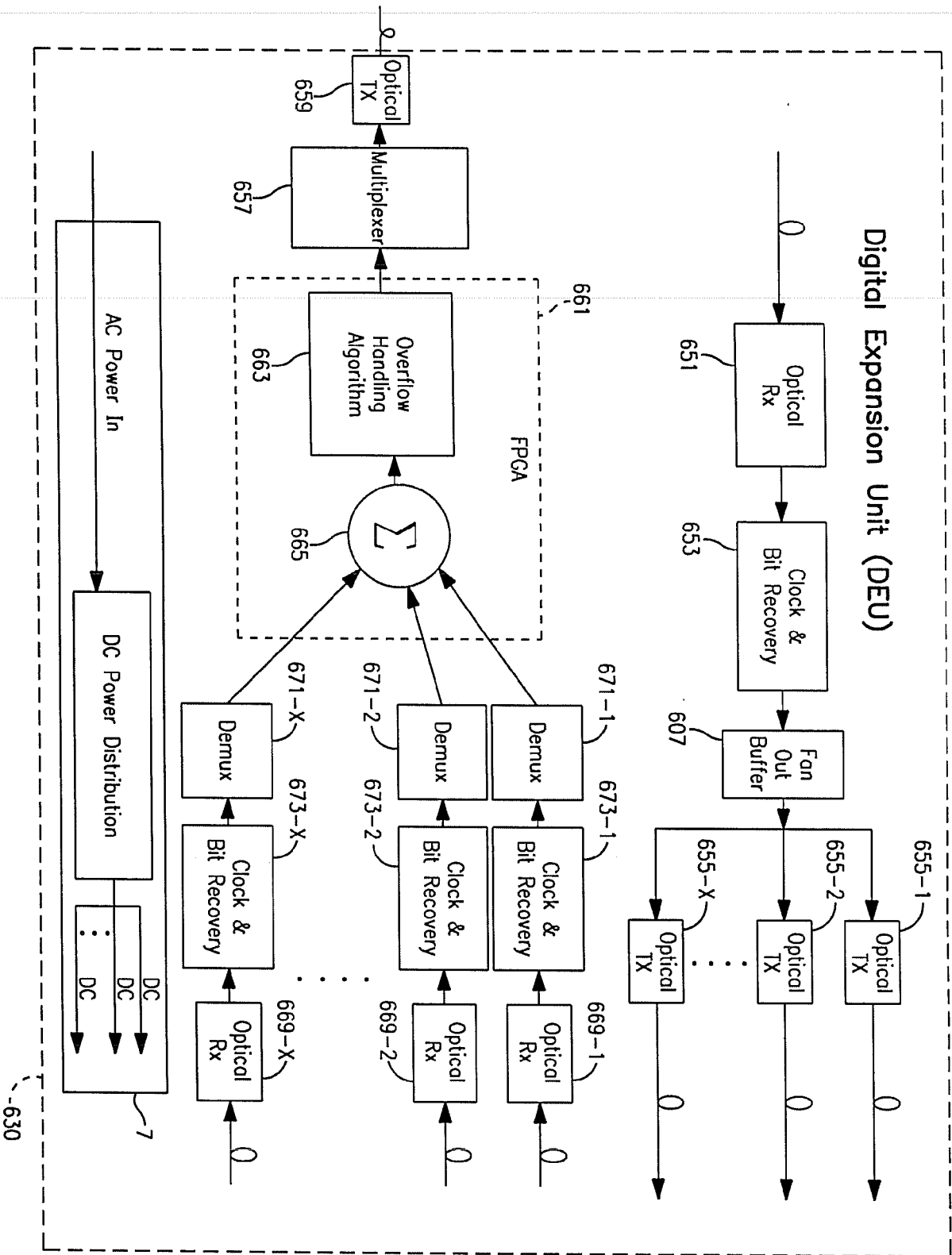


FIG. 6

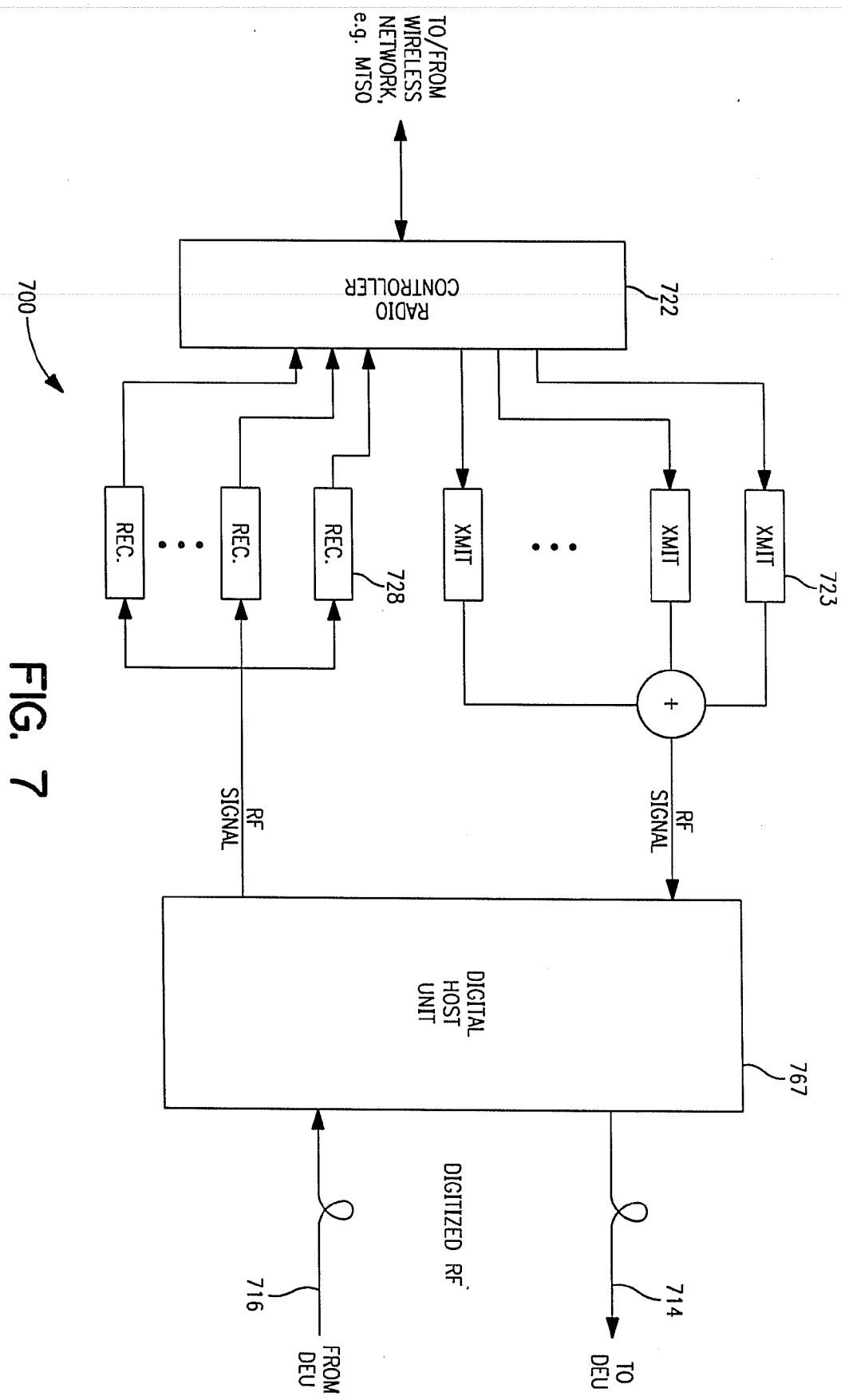


FIG. 7

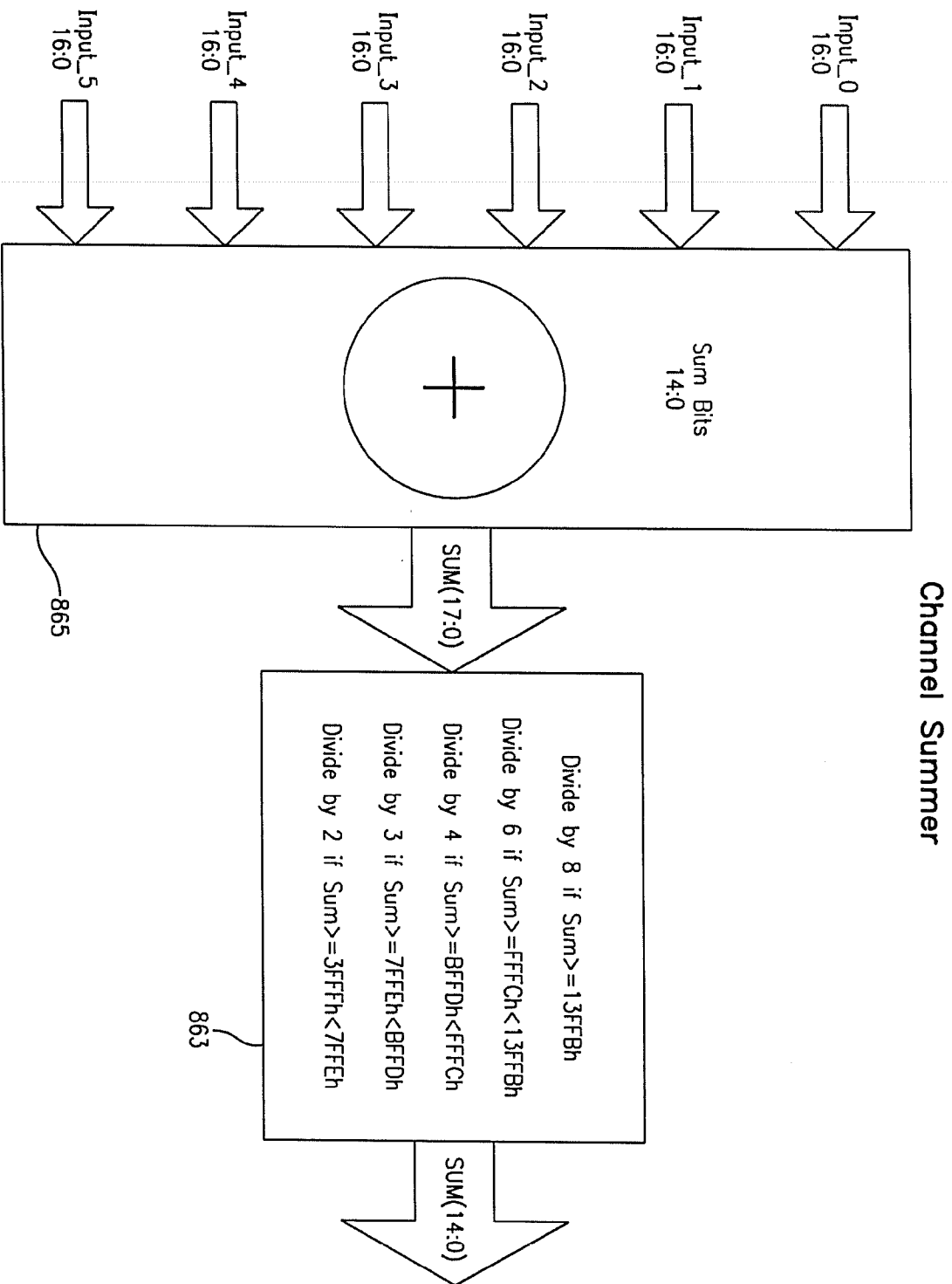


FIG. 8

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	100.019US03
		Application Number	
Title of Invention	POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

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Attorney Docket Number	100.019US03	Small Entity Status Claimed <input type="checkbox"/>	
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		Sub Class (if any)	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	8	Suggested Figure for Publication (if any)	

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	100.019US03
		Application Number	
Title of Invention	POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT		

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Prior Application Status		Remove			
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)		
	Continuation of	10/740944	2003-12-19		
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Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	100.019US03
		Application Number	
Title of Invention	POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT		

Assignee Information:

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

Assignee 1

[Remove](#)

If the Assignee is an Organization check here. ☒

Organization Name ADC Telecommunications, Inc.

Mailing Address Information:

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State/Province

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Phone Number

Fax Number

Email Address

Additional Assignee Data may be generated within this form by selecting the Add button.

[Add](#)

Signature:

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.

Signature	/Jon M. Powers/		Date (YYYY-MM-DD)	2009-11-12
First Name	Jon	Last Name	Powers	Registration Number
				43868

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

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

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

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

United States Patent Application

COMBINED DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I declare that:

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

I believe I am the original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled: POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT; the specification of which is attached hereto.

I have reviewed and understand the contents of the above-identified specification, including the claims.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. § 1.56.

I claim foreign priority benefits under 35 U.S.C. § 119/365 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on the basis of which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached
NONE				

I claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below.

Application Number(s)	Filing Date (MM/DD/YYYY)
NONE	

I claim the benefit under 35 U.S.C. § 120/365 of any United States and PCT international application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose material information as defined in Title 37 C.F.R. § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. or PCT Application Number	Filing Date (MM/DD/YYYY)	Patent No.
NONE		

As a named inventor, I appoint the following registered practitioners to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith, with full right of substitution:

Name	Registration Number	Name	Registration Number
Fogg, David N.	Reg. No. 35,138	Polglaze, Daniel J.	Reg. No. 39,801
Leffert, Thomas W.	Reg. No. 40,697	Slifer, Russell D.	Reg. No. 39,838

Please direct all correspondence in this case to:

Fogg, Slifer & Polglaze, P.A.
P.O. Box 581009, Minneapolis, MN 55458-1009
Telephone No. (612) 252-0014
Fax (612) 252-0019

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

Inventor

Given Name (First and Middle [if any])

Philip M.

Family Name or Surname

WALA

Inventor's
Signature*Philip M. Wala*

Date

7/19/00

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Applicant(s)	Wala	<p style="text-align: center;">INFORMATION DISCLOSURE STATEMENT</p>
Serial No.	Unassigned	
Filing Date	Even Date Herewith	
Group Art Unit	Unassigned	
Examiner	Unassigned	
Attorney Docket No.	100.019US03	
Title: POINT-TO-MULTIPOINT DIGITAL RADIO FREQUENCY TRANSPORT		

Mail Stop Patent Application
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313

In compliance with 37 C.F.R. §§ 1.56 and 1.97, *et seq.*, the enclosed materials are brought to the attention of the Examiner for consideration in connection with the above-identified Application. Applicant respectfully requests that this Information Disclosure Statement be entered and the references listed on the attached Form 1449 be considered by the Examiner and made of record. Pursuant to MPEP §609, Applicant further requests that the Examiner initial next to each reference on the Form 1449 to indicate that the listed references have been considered. Applicant further requests that a copy of the initialed Form 1449 be returned with the next official communication.

Further pursuant to MPEP §609, because all of the references listed on the attached Form 1449 have been previously submitted and made of record in the parent applications, U.S. Patent Application Serial Nos. 10/740,944, filed on December 19, 2003 and 09/619,431, filed July 19, 2000, copies are not submitted herewith.

The Examiner is invited to contact the Applicant's Representative at the below-listed telephone number if there are any questions regarding this communication.

Respectfully submitted,

Date: 2009-11-12

/Jon M. Powers/
Jon M. Powers
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Filing Date: 11/12/09

Approved for use through 7/31/2006. OMB 0651-0032

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

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PATENT APPLICATION FEE DETERMINATION RECORD					Application or Docket Number	
Substitute for Form PTO-875					12/617,215	
APPLICATION AS FILED – PART I						
(Column 1)		(Column 2)		SMALL ENTITY		OR
OTHER THAN SMALL ENTITY						
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	RATE (\$)	FEE (\$)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A		N/A	330
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A		N/A	540
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A		N/A	220
TOTAL CLAIMS (37 CFR 1.16(i))	28	.minus 20 = 8	x\$26		x\$52	416
INDEPENDENT CLAIMS (37 CFR 1.16(h))	4	minus 3 = 1	x\$110		x\$220	220
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$270 (\$135 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR					
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))			195		390	
			TOTAL		TOTAL	1726
* If the difference in column 1 is less than zero, enter "0" in column 2.						
APPLICATION AS AMENDED – PART II						
(Column 1)		(Column 2)		(Column 3)		
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	SMALL ENTITY		OR
	Total (37 CFR 1.16(i))	Minus **	=	RATE (\$)	ADDITIONAL FEE (\$)	RATE (\$)
	Independent (37 CFR 1.16(h))	Minus ***	=	X =		X =
	Application Size Fee (37 CFR 1.16(s))			X =		X =
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))			N/A		N/A
			TOTAL		TOTAL	
			ADD'T FEE		ADD'T FEE	
(Column 1)		(Column 2)		(Column 3)		
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	SMALL ENTITY		OR
	Total (37 CFR 1.16(i))	Minus **	=	RATE (\$)	ADDITIONAL FEE (\$)	RATE (\$)
	Independent (37 CFR 1.16(h))	Minus ***	=	X =		X =
	Application Size Fee (37 CFR 1.16(s))			X =		X =
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))			N/A		N/A
			TOTAL		TOTAL	
			ADD'T FEE		ADD'T 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.						

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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