

CERTIFICATION AND REQUEST FOR PRIORITIZED EXAMINATION UNDER 37 CFR 1.102(e) (Page 1 of 1)			
First Named Inventor:	Paul LEMSON	Nonprovisional Application Number (if known):	
Title of Invention:	REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS		
APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS PRIORITIZED EXAMINATION FOR THE ABOVE-IDENTIFIED APPLICATION.			
1. The processing fee set forth in 37 CFR 1.17(i)(1) and the prioritized examination fee set forth in 37 CFR 1.17(c) have been filed with the request. The publication fee requirement is met because that fee, set forth in 37 CFR 1.18(d), is currently \$0. The basic filing fee, search fee, and examination fee are filed with the request or have been already been paid. I understand that any required excess claims fees or application size fee must be paid for the application. 2. I understand that the application may not contain, or be amended to contain, more than four independent claims, more than thirty total claims, or any multiple dependent claims, and that any request for an extension of time will cause an outstanding Track I request to be dismissed. 3. The applicable box is checked below: I. ☒ Original Application (Track One) - Prioritized Examination under § 1.102(e)(1) i. (a) The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a). This certification and request is being filed with the utility application via EFS-Web. ---OR--- (b) The application is an original nonprovisional plant application filed under 35 U.S.C. 111(a). This certification and request is being filed with the plant application in paper. ii. An executed inventor's oath or declaration under 37 CFR 1.63 or 37 CFR 1.64 for each inventor, <u>or</u> the application data sheet meeting the conditions specified in 37 CFR 1.53(f)(3)(i) is filed with the application. II. ☐ Request for Continued Examination - Prioritized Examination under § 1.102(e)(2) i. A request for continued examination has been filed with, or prior to, this form. ii. If the application is a utility application, this certification and request is being filed via EFS-Web. iii. The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a), or is a national stage entry under 35 U.S.C. 371. iv. This certification and request is being filed prior to the mailing of a first Office action responsive to the request for continued examination. v. No prior request for continued examination has been granted prioritized examination status under 37 CFR 1.102(e)(2).			
Signature <u>/Sarah Mirza/</u>		Date <u>2020-07-30</u>	
Name (Print/Typed) <u>Sarah Mirza</u>		Practitioner Registration Number <u>74866</u>	
Note: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required.*			
☒ *Total of <u>1</u> forms are submitted.			

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REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS

CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] This application is a continuation of U.S. Patent Application No. 16/868,748, filed May 7, 2020, which is a continuation of U.S. Patent Application No. 16/737,419, filed January 8, 2020, which is a continuation of U.S. Patent Application No. 16/175,520, filed October 30, 2018, now U.S. Patent No. 10,701,695, which is a continuation of U.S. Patent Application No. 15/391,408, filed December 27, 2016, now U.S. Patent 10,159,074, which is a continuation of U.S. Patent Application No. 14/949,405, filed November 23, 2015, now U.S. Patent 9,531,473; which is a continuation of U.S. Patent Application No. 14/169,719, filed January 31, 2014, now U.S. Patent 9,419,714; which is a continuation of U.S. Patent Application No. 13/211,243, filed August 16, 2011, now U.S. Patent 8,682,338; which claims the benefit of U.S. Patent Application No. 61/382,836, filed September 14, 2010; the disclosures of which are hereby incorporated by reference for all purposes

FIELD OF THE INVENTION

[0002] The present invention generally relates to wireless communication systems employing Distributed Antenna Systems (DAS) as part of a distributed wireless network. More specifically, the present invention relates to a DAS utilizing software defined radio (SDR).

BACKGROUND OF THE INVENTION

[0003] Wireless and mobile network operators face the continuing challenge of building networks that effectively manage high data-traffic growth rates. Mobility and an increased level of multimedia content for end users requires end-to-end network adaptations that support both new services and the increased demand for broadband and flat-rate Internet access. One of the most difficult challenges faced by network operators is caused by the physical movements of subscribers from one location to another, and particularly when wireless subscribers congregate in large numbers at one location. A notable example is a business

enterprise facility during lunchtime, when a large number of wireless subscribers visit a cafeteria location in the building. At that time, a large number of subscribers have moved away from their offices and usual work areas. It's likely that during lunchtime there are many locations throughout the facility where there are very few subscribers. If the indoor wireless network resources were properly sized during the design process for subscriber loading as it is during normal working hours when subscribers are in their normal work areas, it is very likely that the lunchtime scenario will present some unexpected challenges with regard to available wireless capacity and data throughput.

[0004] To accommodate this variation in subscriber loading, there are several candidate prior art approaches.

[0005] One approach is to deploy many low-power high-capacity base stations throughout the facility. The quantity of base stations is determined based on the coverage of each base station and the total space to be covered. Each of these base stations is provisioned with enough radio resources, i.e., capacity and broadband data throughput to accommodate the maximum subscriber loading which occurs during the course of the workday and work week. Although this approach typically yields a high quality of service, the notable disadvantage of this approach is that during a major part of the time many of the base stations' capacity is being wasted. Since a typical indoor wireless network deployment involves capital and operational costs which are assessed on a per-subscriber basis for each base station, the typically high total life cycle cost for a given enterprise facility is far from optimal.

[0006] A second candidate approach involves deployment of a DAS along with a centralized group of base stations dedicated to the DAS. A conventional DAS deployment falls into one of two categories. The first type of DAS is "fixed", where the system configuration doesn't change based on time of day or other information about usage. The remote units associated with the DAS are set up during the design process so that a particular block of base station radio resources is thought to be enough to serve each small group of DAS remote units. A notable disadvantage of this approach is that most enterprises seem to undergo frequent rearrangements and re-organizations of various groups within the enterprise. Therefore, it's highly likely that the initial setup will need to be changed from time to time, requiring

deployment of additional staff and contract resources with appropriate levels of expertise regarding wireless networks.

[0007] The second type of DAS is equipped with a type of network switch which allows the location and quantity of DAS remote units associated with any particular centralized base station to be changed manually. Although this approach would seem to allow dynamic reconfiguration based on the needs of the enterprise or based on time of day, it frequently requires deployment of additional staff resources for real-time management of the network. Another issue is that it's not always correct or best to make the same DAS remote unit configuration changes back and forth on each day of the week at the same times of day. Frequently it is difficult or impractical for an enterprise IT manager to monitor the subscriber loading on each base station. And it is almost certain that the enterprise IT manager has no practical way to determine the loading at a given time of day for each DAS remote unit; they can only guess.

[0008] Another major limitation of prior art DAS deployments is related to their installation, commissioning and optimization process. Some challenging issues which must be overcome include selecting remote unit antenna locations to ensure proper coverage while minimizing downlink interference from outdoor macro cell sites, minimizing uplink interference to outdoor macro cell sites, and ensuring proper intra-system handovers while indoors and while moving from outdoors to indoors (and vice-versa). The process of performing such deployment optimization is frequently characterized as trial-and-error and as such, the results may not be consistent with a high quality of service.

[0009] A major limitation of prior art DAS equipment employing digital transmission links such as optical fiber or wired Ethernet is the fact that the prior-art RF-to-digital conversion techniques utilize an approach whereby the system converts a single broad RF bandwidth of e.g., 10 to 25 MHz to digital. Therefore all the signals, whether weak or strong, desired or undesired, contained within that broad bandwidth are converted to digital, whether those signals are desired or not. This approach frequently leads to inefficiencies within the DAS which limit the DAS network capacity. It would be preferable to employ an alternative

approach yielding greater efficiencies and improved flexibility, particularly for neutral host applications.

[0010] In 2008 the FCC further clarified its E-911 requirements with regard to Phase 2 accuracy for mobile wireless networks. The information required in Phase 2 is the mobile phone number and the physical location, within a few dozen yards, from which the call was made. The Canadian government is reportedly considering enacting similar requirements. Also the FCC is eager to see US mobile network operators provide positioning services with enhanced accuracy for E-911 for indoor subscribers. There is a reported effort within the FCC to try to mandate Phase 2 accuracy indoors, within the next 2 years.

[0011] Many wireless networks employ mobile and fixed broadband wireless terminals which employ GPS-based E-911 location services. It has been demonstrated that GPS signals from satellites outdoors don't propagate well into the indoor space. Therefore an alternative, more robust E-911 location determination approach is required for indoors, particularly if the FCC requirements are changed to be more stringent.

[0012] Several US operators have expressed concern about how they can practically and cost-effectively obtain these enhanced location accuracy capabilities. Operators are very eager to identify a cost-effective approach which can be deployed indoors for enhanced location accuracy.

[0013] One proposed approach toward indoor location accuracy enhancement for CDMA networks would employ a separate unit known as a CDMA Pilot Beacon. A notable disadvantage of this approach for an indoor OAS application is that since the CDMA Pilot Beacon unit is a separate and dedicated device and not integrated within the OAS, it would likely be costly to deploy. The Pilot Beacon approach for CDMA networks employs a Pilot Beacon with a unique PN code (in that area) which effectively divides a particular CDMA network coverage area (e.g., indoors) into multiple small zones (which each correspond to the coverage area of a low-power Pilot Beacon). Each Pilot Beacon's location, PN code and RF Power level are known by the network. Each Pilot Beacon must be synchronized to the CDMA network, via GPS or local base station connection. A variable delay setting permits each Pilot Beacon to have the appropriate system timing to permit triangulation and/or Cell ID position

determination. One optional but potentially costly enhancement to this approach would employ a Wireless Modem for each Pilot Beacon to provide remote Alarms, Control and Monitoring of each CDMA Pilot Beacon. No known solution for indoor location accuracy enhancement has been publicly proposed for WCDMA networks.

[0014] One candidate technically-proven approach toward indoor location accuracy enhancement for GSM networks would employ a separate unit known as a Location Measurement Unit or LMU. A notable disadvantage of this approach for an indoor DAS application is that, since the LMU is a separate and dedicated device and not integrated within the DAS, it is costly to deploy. Each LMU requires a backhaul facility to a central server which analyzes the LMU measurements. The LMU backhaul cost adds to the total cost of deploying the enhanced accuracy E-911 solution for GSM networks. Despite the availability of the already technically-proven LMU approach, it has not been widely deployed in conjunction with indoor DAS.

[0015] Based on the prior art approaches described herein, it is apparent that a highly efficient, easily deployed and dynamically reconfigurable wireless network is not achievable with prior art systems and capabilities.

BRIEF SUMMARY OF THE INVENTION

[0016] The present invention substantially overcomes the limitations of the prior art discussed above. The advanced system architecture of the present invention provides a high degree of flexibility to manage, control, enhance and facilitate radio resource efficiency, usage and overall performance of the distributed wireless network. This advanced system architecture enables specialized applications and enhancements including flexible simulcast, automatic traffic load-balancing, network and radio resource optimization, network calibration, autonomous/assisted commissioning, carrier pooling, automatic frequency selection, radio frequency carrier placement, traffic monitoring, traffic tagging, and indoor location determination using pilot beacons. The present invention can also serve multiple operators, multi-mode radios (modulation-independent) and multi-frequency bands per operator to increase the efficiency and traffic capacity of the operators' wireless networks.

[0017] Accordingly, it is an object of the present invention to provide a capability for Flexible Simulcast. With Flexible Simulcast, the amount of radio resources (such as RF carriers, CDMA codes or TDMA time slots) assigned to a particular RRU or group of RRUs by each RRU Access Module can be set via software control as described hereinafter to meet desired capacity and throughput objectives or wireless subscriber needs. To achieve these and other objects, an aspect of the present invention employs software-programmable frequency selective Digital Up-Converters (DUCs) and Digital Down-Converters (DDCs). A software-defined Remote Radio Head architecture is used for cost-effective optimization of the radio performance. Frequency selective DDCs and DUCs at the Remote Radio Head enable a high signal to noise ratio (SNR) which maximize the throughput data rate. An embodiment shown in Figure 1 depicts a basic structure and provides an example of a Flexible Simulcast downlink transport scenario. Figure 2 depicts an embodiment of a basic structure of a Flexible Simulcast uplink transport scenario.

[0018] It is a further object of the present invention to facilitate conversion and transport of several discrete relatively narrow RF bandwidths. In another aspect of the invention, an embodiment converts only that plurality of specific, relatively narrow bandwidths that carry useful information. Thus, this aspect of the present invention allows more efficient use of the available optical fiber transport bandwidth for neutral host applications, and facilitates transport of more operators' band segments over the optical fiber. To achieve the above result, the present invention utilizes frequency-selective filtering at the Remote Radio Head which enhances the system performance. In some embodiments of this aspect of the invention, noise reduction via frequency-selective filtering at the Remote Radio Head is utilized for maximizing the SNR and consequently maximizing the data throughput. It is a further object of the present invention to provide CDMA and WCDMA indoor location accuracy enhancement. In an aspect of the present invention, an embodiment provides enhanced location accuracy performance by employing pilot beacons. Figure 3 depicts a typical indoor system employing multiple Remote Radio Head Units (RRUs) and a central Digital Access Unit (DAU). The Remote Radio Heads have a unique beacon that is distinct and identifies that particular indoor cell. The mobile user will use the beacon information to assist in the localization to a particular cell.

[0019] It is a further object of the present invention to enhance GSM and LTE indoor location accuracy. In another aspect, an embodiment of the present invention provides localization of a user based on the radio signature of the mobile device. Figure 4 depicts a typical indoor system employing multiple Remote Radio Head Units (RRUs) and a central Digital Access Unit (DAU). In accordance with the invention, each Remote Radio Head provides unique header information on data received by that Remote Radio Head. The system of the invention uses this header information in conjunction with the mobile user's radio signature to localize the user to a particular cell. It is a further object of the present invention to re-route local traffic to Internet VOIP, Wi-Fi or WiMAX. In this aspect of the invention, an embodiment determines the radio signatures of the individual users within a DAU or Island of DAUs and uses this information to identify if the users are located within the coverage area associated with a specific DAU or Island of DAUs. The DAUs track the radio signatures of all the active users within its network and record a running data base containing information pertaining to them. One embodiment of the present invention is for the Network Operations Center (NOC) to inform the DAU that, e.g., two specific users are collocated within the same DAU or Island of DAUs, as depicted in Figure 6. The DAUs then reroute the users to Internet VOIP, Wi-Fi or WiMAX as appropriate. Another embodiment of the present invention is to determine the Internet Protocol (IP) addresses of the individual users' Wi-Fi connections. If the individual users' IP addresses are within the same DAU or Island of DAUs, the data call for these users is rerouted over the internal network.

[0020] Applications of the present invention are suitable to be employed with distributed base stations, distributed antenna systems, distributed repeaters, mobile equipment and wireless terminals, portable wireless devices, and other wireless communication systems such as microwave and satellite communications. The present invention is also field upgradable through a link such as an Ethernet connection to a remote computing center.

[0021] Appendix I is a glossary of terms used herein, including acronyms.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022] Further objects and advantages of the present invention can be more fully understood from the following detailed description taken in conjunction with the accompanying drawings in which:

[0023] FIG. 1 is a block diagram according to one embodiment of the invention showing the basic structure and an example of a Flexible Simulcast downlink transport scenario based on having 2 DAU and 4 DRU.

[0024] FIG. 2 is a block diagram in accordance with an embodiment of the invention showing the basic structure and an example of a Flexible Simulcast uplink transport scenario based on having 2 DAU and 4 DRU.

[0025] FIG. 3 shows an embodiment of an indoor system employing multiple Remote Radio Head Units (RRUs) and a central Digital Access Unit (DAU).

[0026] FIG. 4 shows an embodiment of an indoor system in accordance with the invention which employs multiple Remote Radio Head Units (RRUs) and a central Digital Access Unit (DAU).

[0027] FIG. 5 illustrates an embodiment of a cellular network system employing multiple Remote Radio Heads according to the present invention.

[0028] FIG. 6 is a depiction of local connectivity according to one embodiment of the present invention.

[0029] FIG. 7 illustrates an embodiment of the basic structure of the embedded software control modules which manage key functions of the DAU and RRU, in accordance with the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0030] The present invention is a novel Reconfigurable Distributed Antenna System that provides a high degree of flexibility to manage, control, re-configure, enhance and facilitate the radio resource efficiency, usage and overall performance of the distributed wireless network. An embodiment of the Reconfigurable Distributed Antenna System in accordance with the

present invention is shown in Figure 1. The Flexible Simulcast System 100 can be used to explain the operation of Flexible Simulcast with regard to downlink signals. The system employs a Digital Access Unit functionality (hereinafter "DAU"). The DAU serves as an interface to the base station (BTS). The DAU is (at one end) connected to the BTS, and on the other side connected to multiple RRUs. For the downlink (DL) path, RF signals received from the BTS are separately down-converted, digitized, and converted to baseband (using a Digital Down-Converter). Data streams are then I/Q mapped and framed. Specific parallel data streams are then independently serialized and translated to optical signals using pluggable SFP modules, and delivered to different RRUs over optical fiber cable. For the uplink (UL) path optical signals received from RRUs are deserialized, deframed, and up-converted digitally using a Digital Up-Converter. Data streams are then independently converted to the analog domain and up-converted to the appropriate RF frequency band. The RF signal is then delivered to the BTS. An embodiment of the system is mainly comprised of DAU1 indicated at 101, RRU1 indicated at 103, RRU2 indicated at 104, DAU2 indicated at 102, RRU3 indicated at 105, and RRU4 indicated at 106. A composite downlink input signal 107 from, e.g., a base station belonging to one wireless operator enters DAU1 at the DAU1 RF input port. Composite signal 107 is comprised of Carriers 1-4. A second composite downlink input signal from e.g., a second base station belonging to the same wireless operator enters DAU2 at the DAU2 RF input port. Composite signal 108 is comprised of Carriers 5-8. The functionality of DAU1, DAU2, RRU1, RRU2, RRU3 and RRU4 are explained in detail by U.S. Provisional Application S.N. 61/374593, entitled "Neutral Host Architecture for a Distributed Antenna System," filed August 17, 2010 and attached hereto as an appendix. One optical output of DAU1 is fed to RRU1. A second optical output of DAU1 is fed via bidirectional optical cable 113 to DAU2. This connection facilitates networking of DAU1 and DAU2, which means that all of Carriers 1-8 are available within DAU1 and DAU2 to transport to RRU1, RRU2, RRU3 and RRU4 depending on software settings within the networked DAU system comprised of DAU1 and DAU2. The software settings within RRU1 are configured either manually or automatically such that Carriers 1-8 are present in the downlink output signal 109 at the antenna port of RRU1. The presence of all 8 carriers means that RRU1 is potentially able to access the full capacity of both base stations feeding DAU1 and DAU2. A possible application

for RRU1 is in a wireless distribution system is e.g., a cafeteria in an enterprise building during the lunch hour where a large number of wireless subscribers are gathered. RRU2 is fed by a second optical port of RRU1 via bidirectional optical cable 114 to RRU2. Optical cable 114 performs the function of daisy chaining RRU2 with RRU1. The software settings within RRU2 are configured either manually or automatically such that Carriers 1, 3, 4 and 6 are present in downlink output signal 110 at the antenna port of RRU2. The capacity of RRU2 is set to a much lower value than RRU1 by virtue of its specific Digital Up Converter settings. The individual Remote Radio Units have integrated frequency selective DUCs and DDCs with gain control for each carrier. The DAUs can remotely turn on and off the individual carriers via the gain control parameters.

[0031] In a similar manner as described previously for RRU1, the software settings within RRU3 are configured either manually or automatically such that Carriers 2 and 6 are present in downlink output signal 111 at the antenna port of RRU3. Compared to the downlink signal 110 at the antenna port of RRU2, the capacity of RRU3 which is configured via the software settings of RRU3 is much less than the capacity of RRU2. RRU4 is fed by a second optical port of RRU3 via bidirectional optical cable 115 to RRU4. Optical cable 115 performs the function of daisy chaining RRU4 with RRU3. The software settings within RRU4 are configured either manually or automatically such that Carriers 1, 4, 5 and 8 are present in downlink output signal 112 at the antenna port of RRU4. The capacity of RRU4 is set to a much lower value than RRU1. The relative capacity settings of RRU1, RRU2, RRU3 and RRU4 and can be adjusted dynamically as discussed in connection with Figure 7 to meet the capacity needs within the coverage zones determined by the physical positions of antennas connected to RRU1, RRU2, RRU3 and RRU4 respectively.

[0032] The present invention facilitates conversion and transport of several discrete relatively narrow RF bandwidths. This approach allows conversion of only those multiple specific relatively narrow bandwidths which carry useful or specific information. This approach also allows more efficient use of the available optical fiber transport bandwidth for neutral host applications, and allows transport of more individual operators' band segments over the optical fiber. As disclosed in U.S. Provisional Application S.N. 61/374593, entitled "Neutral Host Architecture for a Distributed Antenna System," filed August 17, 2010 and also referring to

Figure 1 of the instant patent application, Digital Up Converters located within the RRU which are dynamically software-programmable as discussed hereinafter can be re-configured to transport from the DAU input to any specific RRU output any specific narrow frequency band or bands, RF carriers or RF channels which are available at the respective RF input port of either DAU. This capability is illustrated in Figure 1 where only specific frequency bands or RF carriers appear at the output of a given RRU.

[0033] A related capability of the present invention is that not only can the Digital Up Converters located within each RRU be configured to transport any specific narrow frequency band from the DAU input to any specific RRU output, but also the Digital Up Converters within each RRU can be configured to transport any specific time slot or time slots of each carrier from the DAU input to any specific RRU output. The DAU detects which carriers and corresponding time slots are active. This information is relayed to the individual RRUs via the management control and monitoring protocol software discussed hereinafter. This information is then used, as appropriate, by the RRUs for turning off and on individual carriers and their corresponding time slots.

[0034] Referring to Figure 1 of the instant patent application, an alternative embodiment of the present invention may be described as follows. In a previous description of Figure 1, a previous embodiment involved having downlink signals from two separate base stations belonging to the same wireless operator enter DAU1 and DAU2 input ports respectively. In an alternative embodiment, a second composite downlink input signal from e.g., a second base station belonging to a different wireless operator enters DAU2 at the DAU2 RF input port. In this embodiment, signals belonging to both the first operator and the second operator are converted and transported to RRU1, RRU2, RRU3 and RRU4 respectively. This embodiment provides an example of a neutral host wireless system, where multiple wireless operators share a common infrastructure comprised of DAU1, DAU2, RRU1, RRU2, RRU3 and RRU4. All the previously mentioned features and advantages accrue to each of the two wireless operators.

[0035] As disclosed in U.S. Provisional Application S.N. 61/374593, entitled "Neutral Host Architecture for a Distributed Antenna System," filed August 17, 2010 and also referring to Figure 1 of the instant patent application, the Digital Up Converters present in the RRU can be

programmed to process various signal formats and modulation types including FDMA, CDMA, TDMA, OFDMA and others. Also, the Digital Up Converters present in the respective RRUs can be programmed to operate with signals to be transmitted within various frequency bands subject to the capabilities and limitations of the system architecture disclosed in U.S. Provisional Application S.N. 61/374593, entitled "Neutral Host Architecture for a Distributed Antenna System," filed August 17, 2010. In one embodiment of the present invention where a wideband CDMA signal is present within e.g., the bandwidth corresponding to carrier 1 at the input port to DAU1, the transmitted signal at the antenna ports of RRU1, RRU2 and RRU4 will be a wideband CDMA signal which is virtually identical to the signal present within the bandwidth corresponding to carrier 1 at the input port to DAU1.

[0036] As disclosed in U.S. Provisional Application S.N. 61/374593, entitled "Neutral Host Architecture for a Distributed Antenna System," filed August 17, 2010 and also referring to Figure 1 of the instant patent application, it is understood that the Digital Up Converters present in the respective RRUs can be programmed to transmit any desired composite signal format to each of the respective RRU antenna ports. As an example, the Digital Up Converters present in RRU1 and RRU2 can be dynamically software-reconfigured as described previously so that the signal present at the antenna port of RRU1 would correspond to the spectral profile shown in Figure 1 as 110, and also that the signal present at the antenna port of RRU2 would correspond to the spectral profile shown in Figure 1 as 109. The application for such a dynamic rearrangement of RRU capacity would be e.g., if a company meeting were suddenly convened in the area of the enterprise corresponding to the coverage area of RRU2. Although the description of some embodiments in the instant application refers to base station signals 107 and 108 as being on different frequencies, the system and method of the present invention readily supports configurations where one or more of the carriers which are part of base station signals 107 and 108 and are identical frequencies, since the base station signals are digitized, packetized, routed and switched to the desired RRU.

[0037] Another embodiment of the Distributed Antenna System in accordance with the present invention is shown in Figure 2. As disclosed in U.S. Provisional Application S.N. 61/374593, entitled "Neutral Host Architecture for a Distributed Antenna System," filed August 17, 2010 and also as shown in Figure 2 the Flexible Simulcast System 200 can be used to

explain the operation of Flexible Simulcast with regard to uplink signals. As discussed previously with regard to downlink signals and by referring to Figure 1, the uplink system shown in Figure 2 is mainly comprised of DAU1 indicated at 201, RRU1 indicated at 203, RRU2 indicated at 204, DAU2 indicated at 202, RRU3 indicated at 205, and RRU4 indicated at 206. In a manner similar to the downlink operation explained by referring to Figure 1, the operation of the uplink system shown in Figure 2 can be understood as follows.

[0038] The Digital Down Converters present in each of RRU1, RRU2, RRU3 and RRU4 are dynamically software-configured as described previously so that uplink signals of the appropriate desired signal format(s) present at the receive antenna ports of the respective RRU1, RRU2, RRU3 and RRU4 are selected based on the desired uplink band(s) to be processed and filtered, converted and transported to the appropriate uplink output port of either DAU1 or DAU2. The DAUs and RRUs frame the individual data packets corresponding to their respective radio signature using the Common Public Interface Standard (CPRI). Other Interface standards are applicable provided they uniquely identify data packets with respective RRUs. Header information is transmitted along with the data packet which identifies the RRU and DAU that corresponds to the individual data packet.

[0039] In one example for the embodiment shown in Figure 2, RRU1 and RRU3 are configured to receive uplink signals within the Carrier 2 bandwidth, whereas RRU2 and RRU4 are both configured to reject uplink signals within the Carrier 2 bandwidth. When RRU3 receives a strong enough signal at its receive antenna port within the Carrier 2 bandwidth to be properly filtered and processed, the Digital Down Converters within RRU3 facilitate processing and conversion. Similarly, when RRU1 receives a strong enough signal at its receive antenna port within the Carrier 2 bandwidth to be properly filtered and processed, the Digital Down Converters within RRU1 facilitate processing and conversion. The signals from RRU1 and RRU3 are combined based on the active signal combining algorithm, and are fed to the base station connected to the uplink output port of DAU1. The term simulcast is frequently used to describe the operation of RRU1 and RRU3 with regard to uplink and downlink signals within Carrier 2 bandwidth. The term Flexible Simulcast refers to the fact that the present invention supports dynamic and/or manual rearrangement of which specific RRU are involved in the signal combining process for each Carrier bandwidth.

[0040] Referring to Figure 2, the Digital Down Converters present in RRU1 are configured to receive and process signals within Carrier 1-8 bandwidths. The Digital Down Converters present in RRU2 are configured to receive and process signals within Carrier 1, 3, 4 and 6 bandwidths. The Digital Down Converters present in RRU3 are configured to receive and process signals within Carrier 2 and 6 bandwidths. The Digital Down Converters present in RRU4 are configured to receive and process signals within Carrier 1, 4, 5 and 8 bandwidths. The respective high-speed digital signals resulting from processing performed within each of the four RRU are routed to the two DAUs. As described previously, the uplink signals from the four RRUs are combined within the respective DAU corresponding to each base station.

[0041] An aspect of the present invention includes an integrated Pilot Beacon function within the each RRU. In an embodiment, each RRU comprises a unique software programmable Pilot Beacon as discussed hereinafter. This approach is intended for use in CDMA and/or WCDMA indoor DAS networks. A very similar approach can be effective for indoor location accuracy enhancement for other types of networks such as LTE and WiMAX. Because each RRU is already controlled and monitored via the DAUs which comprise the network, there is no need for costly deployment of additional dedicated wireless modems for remote monitoring and control of pilot beacons.

[0042] An RRU-integrated Pilot Beacon approach is employed for both CDMA and WCDMA networks. Each operational pilot beacon function within an RRU employs a unique PN code (in that area) which effectively divides the WCDMA or CDMA indoor network coverage area into multiple small "zones" (which each correspond to the coverage area of a low-power Pilot Beacon). Each Pilot Beacon's location, PN code and RF Power level are known by the network. Each Pilot Beacon is synchronized to the WCDMA or CDMA network, via its connection to the DAU.

[0043] Unlike the transmit signal from a base station which is "dynamic", the Pilot Beacon transmit signal will be effectively "static" and its downlink messages will not change over time based on network conditions.

[0044] For a WCDMA network, in Idle mode each mobile subscriber terminal is able to perform Pilot Signal measurements of downlink signals transmitted by base stations and Pilot

Beacons. When the WCDMA mobile subscriber terminal transitions to Active mode, it reports to the serving cell all its Pilot Signal measurements for base stations and for Pilot Beacons. For CDMA networks, the operation is very similar. For some RRU deployed in an indoor network, the RRU can be provisioned as either a Pilot Beacon or to serve mobile subscribers in a particular operator bandwidth, but not both.

[0045] For a WCDMA network, existing inherent capabilities of the globally- standardized networks are employed. The WCDMA mobile subscriber terminal is able to measure the strongest CPICH RSCP (Pilot Signal Code Power) in either Idle mode or any of several active modes. Also, measurements of CPICH Ec/No by the mobile subscriber terminal in either Idle mode or any of several active modes are possible. As a result, the mobile subscriber terminal reports all available RSCP and Ec/No measurements via the serving base station (whether indoor or outdoor) to the network. Based on that information, the most likely mobile subscriber terminal location is calculated and/or determined. For CDMA networks, the operation is very similar to the process described herein.

[0046] A previously described embodiment of the present invention referring to Figure 1 involved having a wideband CDMA signal present within e.g., the bandwidth corresponding to carrier 1 at the input port to DAU1. In the previously described embodiment, the transmitted signal at the antenna ports of RRU1, RRU2 and RRU4 is a wideband CDMA signal which is virtually identical to the signal present within the bandwidth corresponding to carrier 1 at the input port to DAU1. An alternative embodiment of the present invention is one where a wideband CDMA signal is present within e.g., the bandwidth corresponding to carrier 1 at the input port to DAU1. However, in the alternative embodiment the transmitted signal at the antenna port of RRU1 differs slightly from the previous embodiment. In the alternative embodiment, a wideband CDMA signal is present within e.g., the bandwidth corresponding to carrier 1 at the input port to DAU1. The transmitted signal from RRU1 is a combination of the wideband CDMA signal which was present at the input port to DAU1, along with a specialized WCDMA pilot beacon signal. The WCDMA pilot beacon signal is intentionally set well below the level of the base station pilot signal.

[0047] A further alternative embodiment can be explained referring to Figure 1 which applies in the case where CDMA signals are generated by the base station connected to the input port of DAU1. In this further alternative embodiment of the present invention, the transmitted signal at the antenna port of RRU1 is a combination of the CDMA signal which was present at the input port to DAU1, along with a specialized CDMA pilot beacon signal. The CDMA pilot beacon signal is intentionally set well below the level of the base station pilot signal.

[0048] An embodiment of the present invention provides enhanced accuracy for determining location of indoor wireless subscribers. Figure 4 depicts a typical indoor system employing multiple Remote Radio Head Units (RRUs) and a central Digital Access Unit (DAU). Each Remote Radio Head provides a unique header information on data received by that Remote Radio Head. This header information in conjunction with the mobile user's radio signature are used to localize the user to a particular cell. The DAU signal processing can identify the individual carriers and their corresponding time slots. A header is included with each data packet that uniquely identifies the corresponding RRU. The DAU can detect the carrier frequency and the corresponding time slot associated with the individual RRUs. The DAU has a running data base that identifies each carrier frequency and time slot with a respective RRU. The carrier frequency and time slot is the radio signature that uniquely identifies the GSM user.

[0049] The DAU communicates with a Network Operation Center (NOC) via a Ethernet connection or an external modem, as depicted in Figure 5. Once a E911 call is initiated the Mobile Switching Center (MSC) in conjunction with the NOC can identify the corresponding BaseTransceiver Station (BTS) where the user has placed the call. The user can be localized within a BTS cell. The NOC then makes a request to the individual DAUs to determine if the E911 radio signature is active in their indoor cell. The DAU checks its data base for the active carrier frequency and time slot. If that radio signature is active in the DAU, then that DAU will provide the NOC with the location information of the corresponding RRU.

[0050] A further embodiment of the present invention includes LTE to provide enhanced accuracy for determining the location of indoor wireless subscribers. GSM uses individual carriers and time slots to distinguish users whereas LTE uses multiple carriers and time slot information to distinguish users. The DAU can simultaneously detect multiple carriers and

their corresponding time slots to uniquely identify the LTE user. The DAU has a running data base that identifies the carrier frequencies and time slot radio signature for the respective RRU. This information can be retrieved from the NOC once a request is made to the DAU.

[0051] Referring next to Figure 7, the DAU embedded software control module and RRU embedded software control module can be better understood in connection with the operation of key functions of the DAU and RRU. One such key function is determining and/or setting the appropriate amount of radio resources (such as RF carriers, CDMA codes or TDMA time slots) assigned to a particular RRU or group of RRUs to meet desired capacity and throughput objectives. The DAU embedded software control module comprises a DAU Monitoring module that detects which carriers and corresponding time slots are active for each RRU. The DAU embedded software control module also comprises a DAU Management Control module which communicates with the RRU over a fiber optic link control channel via a control protocol with the RRU Management Control module. In turn, the RRU Management Control module sets the individual parameters of all the RRU Digital Up-Converters to enable or disable specific radio resources from being transmitted by a particular RRU or group of RRUs, and also sets the individual parameters of all the RRU Digital Down-Converters to enable or disable specific uplink radio resources from being processed by a particular RRU or group of RRUs.

[0052] In an embodiment, an algorithm operating within the DAU Monitoring module, that detects which carriers and corresponding time slots for each carrier are active for each RRU, provides information to the DAU Management Control module to help identify when, e.g., a particular downlink carrier is loaded by a percentage greater than a predetermined threshold whose value is communicated to the DAU Management Control module by the DAU's Remote Monitoring and Control function. If that occurs, the DAU Management Control module adaptively modifies the system configuration to slowly begin to deploy additional radio resources (such as RF carriers, CDMA codes or TDMA time slots) for use by a particular RRU which need those radio resources within its coverage area. At the same time, in at least some embodiments the DAU Management Control module adaptively modifies the system configuration to slowly begin to remove certain radio resources (such as RF carriers, CDMA codes or TDMA time slots) for use by a particular RRU which no longer needs those radio

resources within its coverage area. Another such key function of the DAU embedded software control module and RRU embedded software control module is determining and/or setting and/or analyzing the appropriate transmission parameters and monitoring parameters for the integrated Pilot Beacon function contained within each RRU. These Pilot Beacon transmission and monitoring parameters include Beacon Enable/Disable, Beacon Carrier Frequencies, Beacon Transmit Power, Beacon PN Code, Beacon Downlink BCH Message Content, Beacon Alarm, Beacon Delay Setting and Beacon Delay Adjustment Resolution. The RRU Pilot Beacon Control module communicates with the pilot beacon generator function in the RRU to set and monitor the pilot beacon parameters as listed herein.

[0053] In summary, the Reconfigurable Distributed Antenna System of the present invention described herein efficiently conserves resources and reduces costs. The reconfigurable system is adaptive or manually field-programmable, since the algorithms can be adjusted like software in the digital processor at any time.

[0054] Although the present invention has been described with reference to the preferred embodiments, it will be understood that the invention is not limited to the details described thereof. Various substitutions and modifications have been suggested in the foregoing description, and others will occur to those of ordinary skill in the art. Therefore, all such substitutions and modifications are intended to be embraced within the scope of the invention as defined in the appended claims.

APPENDIX I

Glossary of Terms

ACLR	Adjacent Channel Leakage Ratio
ACPR	Adjacent Channel Power Ratio
ADC	Analog to Digital Converter
AQDM	Analog Quadrature Demodulator
AQM	Analog Quadrature Modulator
AQDMC	Analog Quadrature Demodulator Corrector
AQMC	Analogy Quadrature Modulator Corrector
BPF	Bandpass Filter
BTS	Base Transceiver System or Base Station
CDMA	Code Division Multiple Access
CFR	Crest Factor Reduction
DAC	Digital to Analog Converter
DAU	Digital Access Unit
DET	Detector
DHMPA	Digital Hybrid mode Power Amplifier
DDC	Digital Down Converter
DNC	Down Converter
DPA	Doherty Power Amplifier
DQDM	Digital Quadrature Demodulator
DQM	Digital Quadrature Modulator
DSP	Digital Signal Processing
DUC	Digital Up Converter
EER	Envelope Elimination and Restoration
EF	Envelope Following
ET	Envelope Tracking
EVM	Error Vector Magnitude
FFLPA	Feedforward Linear Power Amplifier

FIR	Finite Impulse Response
FPGA	Field-Programmable Gate Array
GSM	Global System for Mobile Communications
I-Q	In-phase / Quadrature
IF	Intermediate Frequency
LINC	Linear Amplification Using Nonlinear Components
LO	Local Oscillator
LPF	Low Pass Filter
MCPA	Multi-Carrier Power Amplifier
MDS	Multi-Directional Search
OFDM	Orthogonal Frequency Division Multiplexing
PA	Power Amplifier
PARR	Peak-to-Average Power Ratio
PD	Digital Baseband Predistortion
PLL	Phase Locked Loop
PN	Pseudo-Noise
QAM	Quadrature Amplitude Modulation
QPSK	Quadrature Phase Shift Keying
RF	Radio Frequency
RRH	Remote Radio Head
RRU	Remote Radio head Unit
SAW	Surface Acoustic Wave Filter
UMTS	Universal Mobile Telecommunications System
UPC	Up Converter
WCDMA	Wideband Code Division Multiple Access
WLAN	Wireless Local Area Network

WHAT IS CLAIMED IS:

1. A wireless system comprising:
one or more central nodes that receive a number of a plurality of radio resources from
an operator hub that enables wireless communications and that provides the
plurality of radio resources to a radio access network using the Common Public
Radio Interface (CPRI) protocol; and
a plurality of wireless access points that is coupled to the one or more central nodes and
distributes one or more wireless signals to one or more wireless subscribers, the
plurality of wireless access points including at least a first access point and a
second access point,
wherein one or more central nodes assigns a first subset of the number of the plurality
of radio resources to the first access point and a second subset of the number of
the plurality of radio resources to the second access point, the first subset
including more radio resources than the second subset, and
wherein, in response to a change in need of a number of wireless subscribers coupled to
the second access point, the one or more central nodes assign additional radio
resources of the plurality of radio resources to the second access point.
2. The wireless system of claim 1, wherein the change in need is determined based on a
change in capacity needed by the number of wireless subscribers coupled to the second access
point or a change in throughput needed by the number of wireless subscribers coupled to the
second access point.
3. The wireless system of claim 1, wherein the additional resources are included in the
first subset prior to being assigned to the second access point, and wherein the one or more
central nodes assign the additional radio resources of the plurality of radio resources to the
second access point comprises removing the additional resources from the first subset assigned
to the first access point.

4. The wireless system of claim 1, wherein the one or more central nodes analyze one or more transmission parameters associated with the second access point to determine the change in need.
5. The wireless system of claim 1, wherein the one or more central nodes determines the change in need by determining that at least one transmission parameter associated with the second access point is greater than a threshold.
6. The wireless system of claim 1, wherein the first access point belongs to a first sector and the second access point belongs to a second sector.
7. The wireless system of claim 1, wherein the first access point belongs to a first building and the second access point belongs to a second building.
8. The wireless system of claim 1, wherein at least one of the plurality of wireless access points enables communication between an IP device and the one or more central nodes.
9. The wireless system of claim 1, wherein at least two of the plurality of wireless access points are connected in a daisy chain manner to relay communications between at least a subset of the plurality of wireless access points.
10. The wireless system of claim 1, wherein a transmission power provided by at least one of the plurality of wireless access points is configurable via software.
11. The wireless system of claim 1, wherein the one or more one or more central nodes are coupled to a plurality of operator networks via the operator hub.
12. A method comprising:
receiving a plurality of radio resources from an operator hub that operates using a
Common Public Radio Interface (CPRI) protocol;

assigning a first subset of the plurality of radio resources to a first access point included in a plurality of wireless access points and a second subset of the plurality of radio resources to a second access point included in the plurality of wireless access points, the first subset including more radio resources than the second subset; and
in response to a change in need of a number of wireless subscribers coupled to the second access point, assigning one or more additional radio resources of the plurality of radio resources to the second access point.

13. The method of claim 12, wherein the change in need is determined based on a change in capacity needed by the number of wireless subscribers coupled to the second access point or a change in throughput needed by the number of wireless subscribers coupled to the second access point.

14. The method of claim 12, wherein the one or more additional resources are included in the first subset prior to being assigned to the second access point, and wherein assigning the one or more additional radio resources comprises removing the one or more additional resources from the first subset assigned to the first access point.

15. The method of claim 12, further comprising analyzing one or more transmission parameters associated with the second access point to determine the change in need.

16. The method of claim 12, where the first access point belongs to a first sector and the second access point belongs to a second sector.

17. The method of claim 12, where the first access point belongs to a first building and the second access point belongs to a second building.

18. The method of claim 12, wherein at least one of the plurality of wireless access points enables communication between an IP device and one or more central nodes.

19. The method of claim 12, wherein at least two of the plurality of wireless access points are connected in a daisy chain manner to relay communications between at least a subset of the plurality of wireless access points.

20. One or more non-transitory computer readable storage media storing instructions that, when executed by one or more processors, cause the one or more processors to perform the steps of:

receiving a plurality of radio resources from an operator hub that operates using a
Common Public Radio Interface (CPRI) protocol;

assigning a first subset of the plurality of radio resources to a first access point included
in a plurality of wireless access points and a second subset of the plurality of
radio resources to a second access point included in the plurality of wireless
access points, the first subset including more radio resources than the second
subset; and

in response to a change in need by a number of wireless subscribers coupled to the
second access point, assigning one or more additional radio resources of the
plurality of radio resources to the second access point.

ABSTRACT

The present disclosure is a novel utility of a software defined radio (SDR) based Distributed Antenna System (DAS) that is field reconfigurable and support multi-modulation schemes (modulation-independent), multi-carriers, multi-frequency bands and multi-channels. The present disclosure enables a high degree of flexibility to manage, control, enhance, facilitate the usage and performance of a distributed wireless network such as flexible simulcast, automatic traffic load-balancing, network and radio resource optimization, network calibration, autonomous/assisted commissioning, carrier pooling, automatic frequency selection, frequency carrier placement, traffic monitoring, traffic tagging, pilot beacon, etc.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number DALI0002US1C1
		Application Number
Title of Invention	REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS	
The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.		

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☐	Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	DALI0002US1C1
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Title of Invention	REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS		

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Title of the Invention	REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS		
Attorney Docket Number	DALI0002US1C1	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	7	Suggested Figure for Publication (if any)	

Filing By Reference:

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

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

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

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	DALI0002US1C1
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Prior Application Status		Pending		Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)		
	Continuation of	16868748	2020-05-07		
Prior Application Status		Pending		Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)		
16868748	Continuation of	16737419	2020-01-08		
Prior Application Status		Pending		Remove	
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16737419	Continuation of	16175520	2018-10-30		
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16175520	Continuation of	15391408	2016-12-27	10159074	2018-12-18
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15391408	Continuation of	14949405	2015-11-23	9531473	2016-12-27
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14949405	Continuation of	14169719	2014-01-31	9419714	2016-08-16
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14169719	Continuation of	13211243	2011-08-16	8682338	2014-03-25
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13211243	Claims benefit of provisional	61382836	2010-09-14		
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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	DALI0002US1C1
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Title of Invention	REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS		

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

This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

☐ NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	DALI0002US1C1
	Application Number	
Title of Invention	REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS	

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

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

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

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

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

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

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

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

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

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

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

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	DALI0002US1C1
	Application Number	
Title of Invention	REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.			
Applicant	1	Remove	
If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.			
Clear			
☒ Assignee	Legal Representative under 35 U.S.C. 117		Joint Inventor
Person to whom the inventor is obligated to assign.		Person who shows sufficient proprietary interest	
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:			
Name of the Deceased or Legally Incapacitated Inventor:			
If the Applicant is an Organization check here. ☒			
Organization Name	DALI WIRELESS, INC.		
Mailing Address Information For Applicant:			
Address 1	535 Middlefield Road		
Address 2	Suite 280		
City	Menlo Park	State/Province	CA
Country	US	Postal Code	94025
Phone Number		Fax Number	
Email Address			
Additional Applicant Data may be generated within this form by selecting the Add button. Add			

Assignee Information including Non-Applicant Assignee Information:

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

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	DALI0002US1C1
	Application Number	
Title of Invention		
REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS		

Assignee 1				
Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.				
Remove				
If the Assignee or Non-Applicant Assignee is an Organization check here. ☐				
Prefix	Given Name	Middle Name	Family Name	Suffix
Mailing Address Information For Assignee including Non-Applicant Assignee:				
Address 1				
Address 2				
City		State/Province		
Country i		Postal Code		
Phone Number		Fax Number		
Email Address				
Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add 				

Signature: Remove 				
NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).				
This Application Data Sheet must be signed by a patent practitioner if one or more of the applicants is a juristic entity (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, all joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of all joint inventor-applicants.				
See 37 CFR 1.4(d) for the manner of making signatures and certifications.				
Signature	/Sarah Mirza/		Date (YYYY-MM-DD)	2020-07-30
First Name	Sarah	Last Name	Mirza	Registration Number
				74866
Additional Signature may be generated within this form by selecting the Add button. Add 				

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	DALI0002US1C1
		Application Number	
Title of Invention	REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS		

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.

EFS Web 2.2.13

Electronic Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS		
First Named Inventor/Applicant Name:		Paul LEMSON		
Filer:		Sarah W. Mirza/Kari Cruz		
Attorney Docket Number:		DALI0002USC1		
Filed as Small Entity				
Filing Fees for Track I Prioritized Examination - Nonprovisional Application under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
UTILITY FILING FEE (ELECTRONIC FILING)	4011	1	75	75
UTILITY SEARCH FEE	2111	1	330	330
UTILITY EXAMINATION FEE	2311	1	380	380
REQUEST FOR PRIORITIZED EXAMINATION	2817	1	2000	2000
Pages:				
Claims:				
Miscellaneous-Filing:				
PROCESSING FEE, EXCEPT PROV. APPLS.	2830	1	70	70

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 (\$)				2855

Electronic Acknowledgement Receipt	
EFS ID:	40153623
Application Number:	16944028
International Application Number:	
Confirmation Number:	7090
Title of Invention:	REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS
First Named Inventor/Applicant Name:	Paul LEMSON
Customer Number:	107456
Filer:	Sarah W. Mirza/Kari Cruz
Filer Authorized By:	Sarah W. Mirza
Attorney Docket Number:	DALI0002USC1
Receipt Date:	30-JUL-2020
Filing Date:	
Time Stamp:	20:08:39
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$2855
RAM confirmation Number	E20207TK09392838
Deposit Account	506640
Authorized User	Kari Cruz
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.17 (Patent application and reexamination processing fees) 37 CFR 1.19 (Document supply fees)	

37 CFR 1.21 (Miscellaneous fees and charges)					
File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Drawings-only black and white line drawings	DALI_Figures.pdf	3036550	no	7
			da4d3b739a9a9c28c856cd5f307a99682ad6cfc		
Warnings:					
Information:					
2	Oath or Declaration filed	DALI0002USC1_Dec.pdf	3195999	no	4
			abecfc385a57c511c492293d4e14aeb2bf1e310d		
Warnings:					
Information:					
3	TrackOne Request	DALI0002USC1_Track1.pdf	113890	no	2
			9631464c1905b73703f05885a8a78e4c93600af8		
Warnings:					
Information:					
4		DALI0002USC1_Application1.pdf	140942	yes	25
			ad0e09ee7f3efb54e0521a7fce2b6224c0d8e7f5		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	20	
	Claims		21	24	
	Abstract		25	25	
Warnings:					
Information:					
5	Application Data Sheet	DALI0002USC1_ADS.pdf	1823293	no	10
			fb95202ac7eab5dfeae61b07da4678d56ae0851		

Warnings:					
Information:					
6	Fee Worksheet (SB06)	fee-info.pdf	38316	no	2
			02b0d915dc77c4a0954b747b3301ebf4dd3b17b		
Warnings:					
Information:					
Total Files Size (in bytes):			8348990		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					

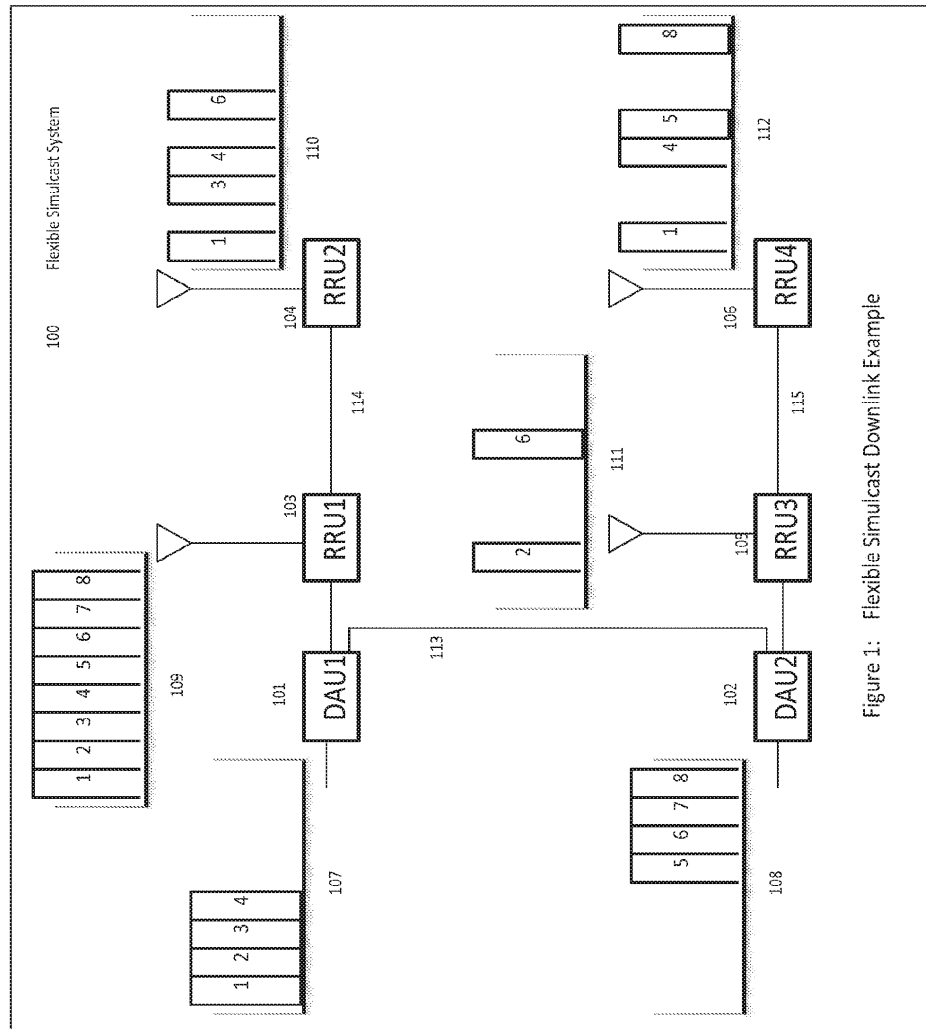


Figure 1: Flexible Simulcast Downlink Example

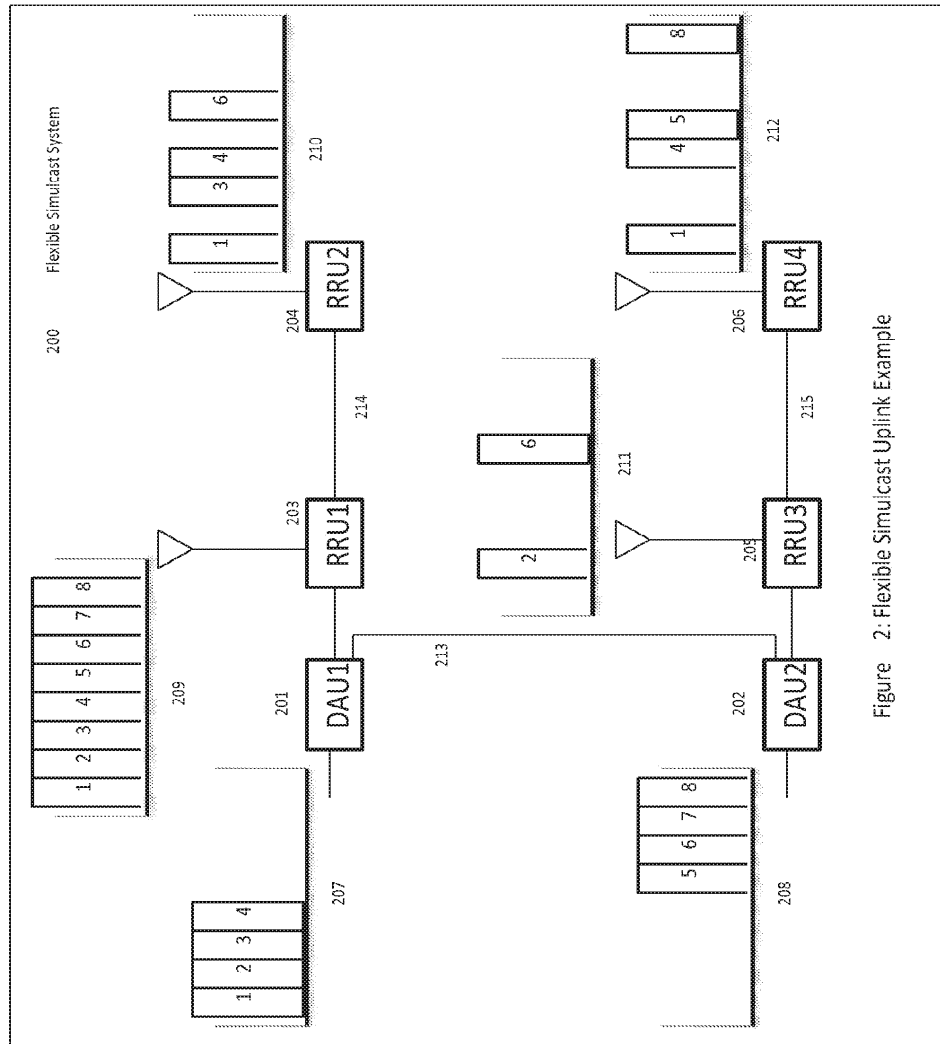


Figure 2: Flexible Simulcast Uplink Example

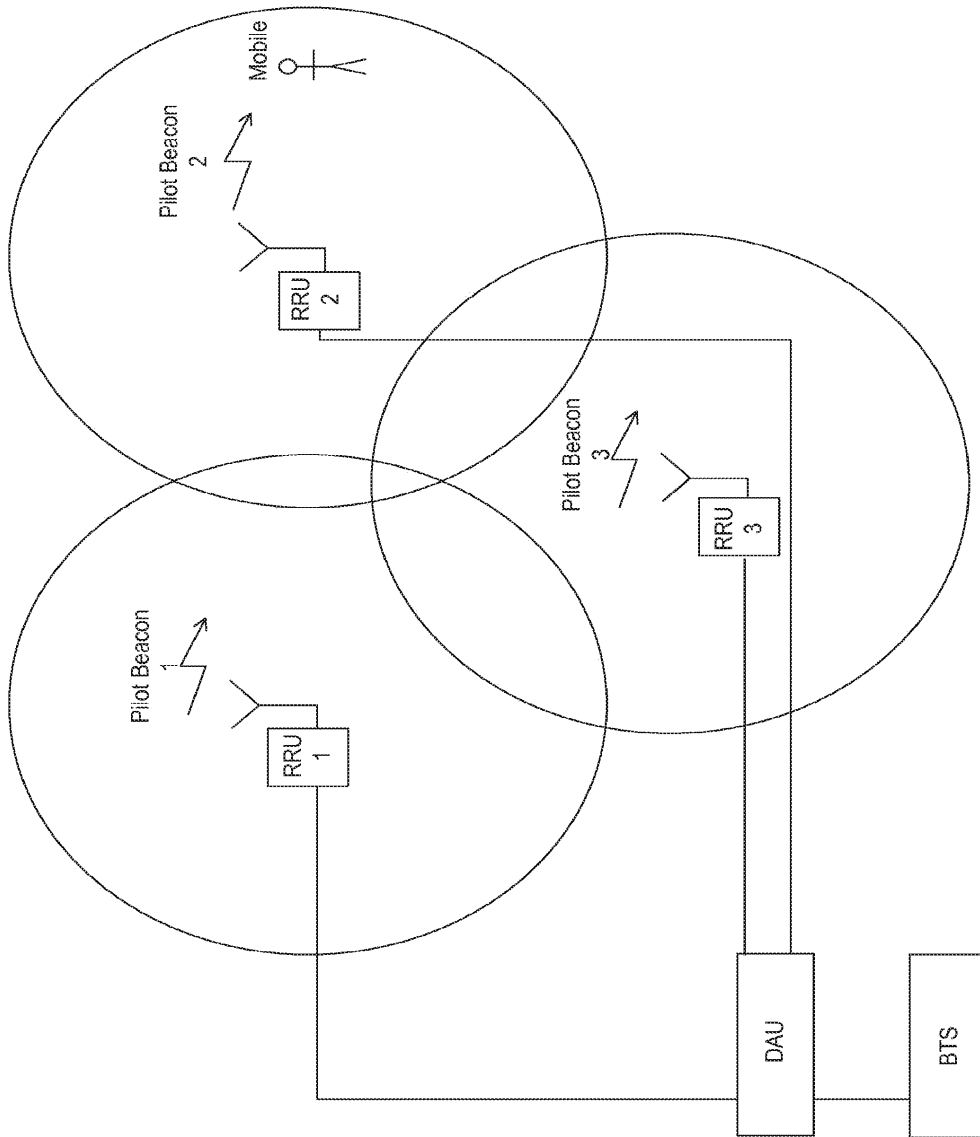


Figure 3 Pilot Beacon Indoor Localization System for CDMA and WCDMA

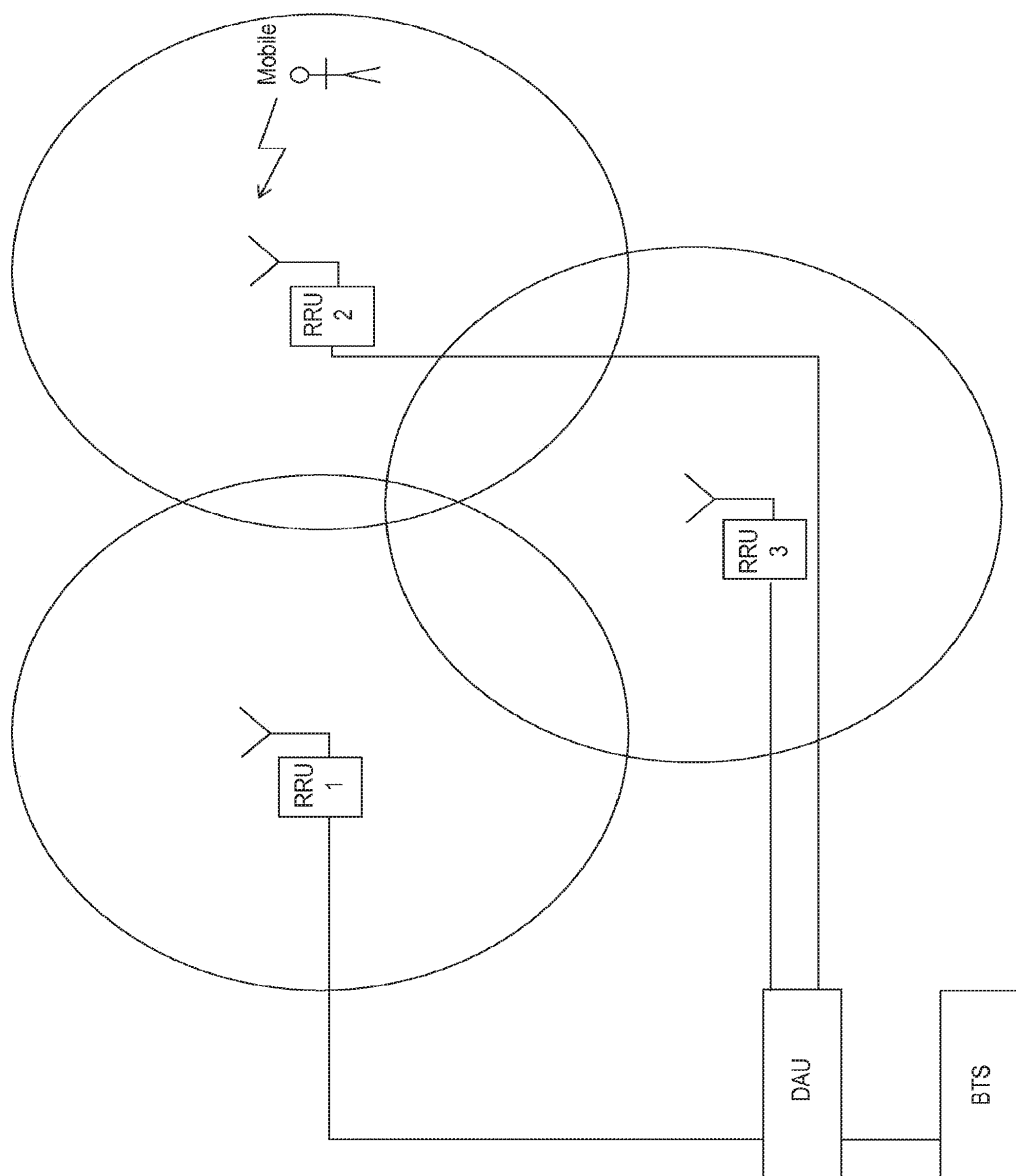


Figure 4 Indoor Localization System of GSM and LTE

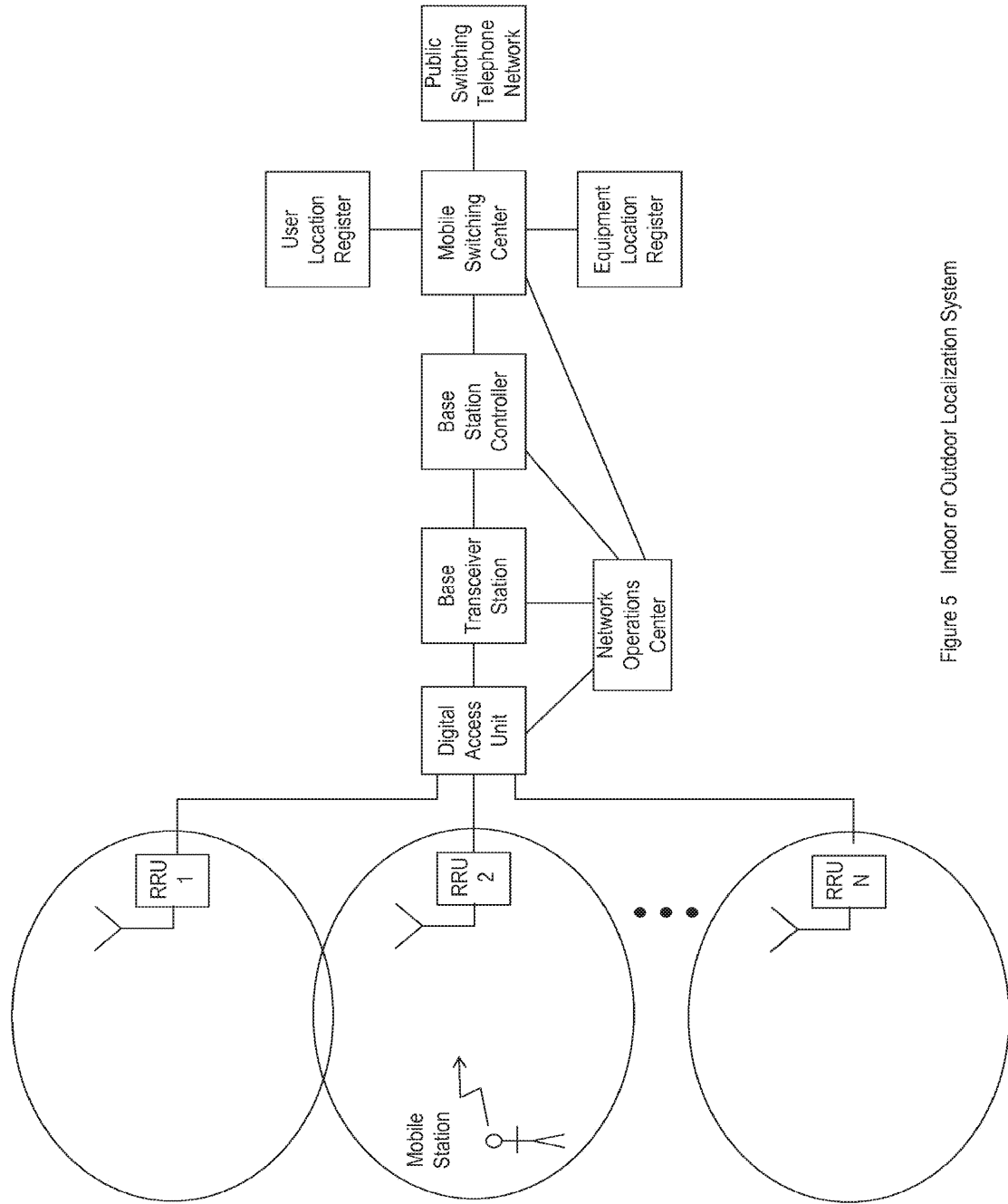


Figure 5 Indoor or Outdoor Localization System

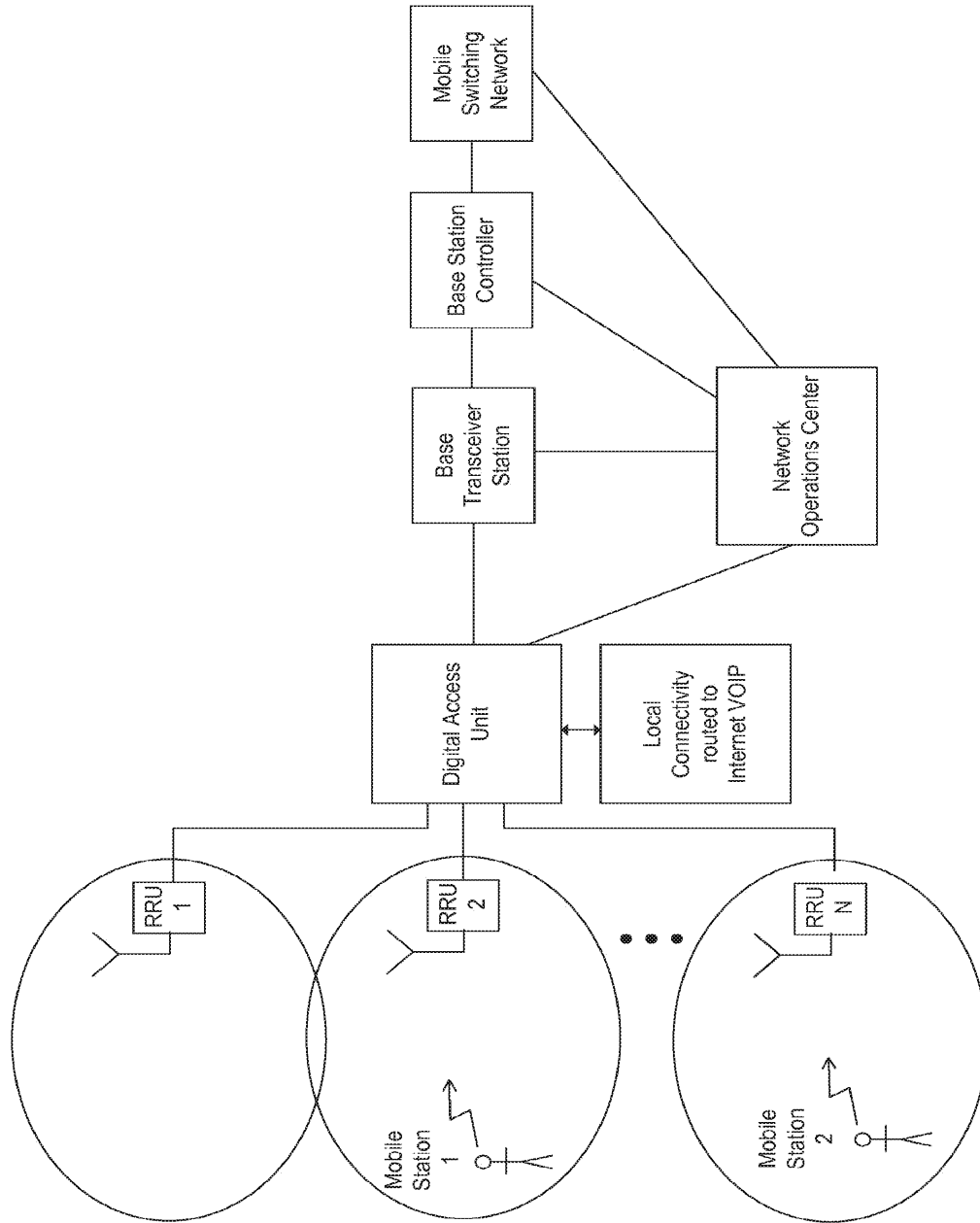


Figure 6 Local Connectivity

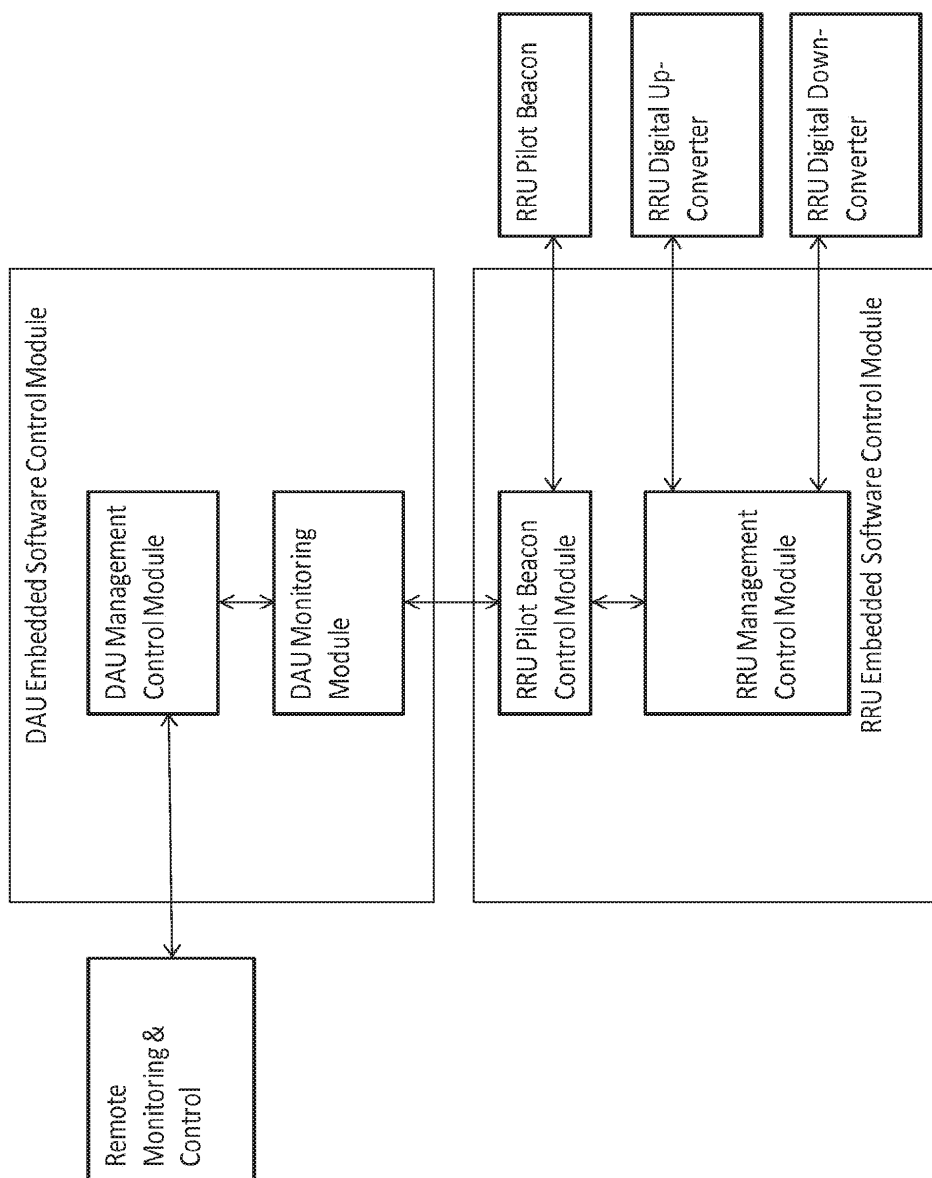
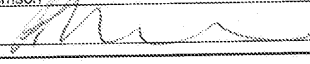


Figure 7: Embedded Software Control Modules

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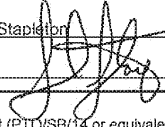
**DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN
 APPLICATION DATA SHEET (37 CFR 1.76)**

Title of Invention	REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS
As the below named inventor, I hereby declare that: This declaration is directed to: ☐ The attached application, or ☒ United States application or PCT international application number 14/949,405 filed on November 23, 2015 The above-identified application was made or authorized to be made by me. I believe that I am the original inventor or an original joint inventor of a claimed invention in the application. I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both. WARNING: Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available. LEGAL NAME OF INVENTOR Inventor: <u>Paul Lemson</u> Date (Optional): _____ Signature:  Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional PTO/AIA/01 form for each additional inventor.	

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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

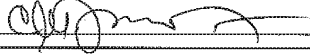
Title of Invention	REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS
As the below named inventor, I hereby declare that: This declaration is directed to: ☐ The attached application, or ☒ United States application or PCT international application number 14/949,405 filed on November 23, 2015 The above-identified application was made or authorized to be made by me. I believe that I am the original inventor or an original joint inventor of a claimed invention in the application. I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both. WARNING: Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.	
LEGAL NAME OF INVENTOR	
Inventor: <u>Shawn Patrick Stapleton</u> Date (Optional): _____ Signature: 	
Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional PTO/AIA/01 form for each additional inventor.	

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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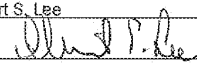
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U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

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

APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS
As the below named inventor, I hereby declare that: This declaration is directed to: ☐ The attached application, or ☒ United States application or PCT international application number 14/949,405 filed on November 23, 2015 The above-identified application was made or authorized to be made by me. I believe that I am the original inventor or an original joint inventor of a claimed invention in the application. I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both. WARNING: Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available. LEGAL NAME OF INVENTOR Inventor: <u>Albert S. Lee</u> Date (Optional) : _____ Signature: <u></u> Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional PTO/AIA/01 form for each additional inventor.	

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
16/944,028	07/30/2020	2414	785	DALI0002US1C1	20	3

CONFIRMATION NO. 7090

FILING RECEIPT



0000000119041773

107456
Artegis Law Group, LLP
John Carey
7710 Cherry Park Drive Suite T #104
Houston, TX 77095

Date Mailed: 08/07/2020

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

Inventor(s)

Paul LEMSON, Woodinville, WA;
Shawn Patrick STAPLETON, Vancouver, CANADA;
Sasa TRAJKOVIC, Burnaby, CANADA;
Albert S. LEE, Vancouver, CANADA;

Applicant(s)

DALI WIRELESS, INC., Menlo Park, CA;

Power of Attorney: None**Domestic Priority data as claimed by applicant**

This application is a CON of 16/868,748 05/07/2020 PAT 10743317
which is a CON of 16/737,419 01/08/2020
which is a CON of 16/175,520 10/30/2018 PAT 10701695
which is a CON of 15/391,408 12/27/2016 PAT 10159074
which is a CON of 14/949,405 11/23/2015 PAT 9531473
which is a CON of 14/169,719 01/31/2014 PAT 9419714
which is a CON of 13/211,243 08/16/2011 PAT 8682338
which claims benefit of 61/382,836 09/14/2010

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

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Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

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

If Required, Foreign Filing License Granted: 08/06/2020

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/944,028**

Projected Publication Date: 11/12/2020

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS

Preliminary Class

370

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

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For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

**LICENSE FOR FOREIGN FILING UNDER
Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15**

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

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

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

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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 U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor

page 3 of 4

community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 16/944,028			
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	75		N/A			
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	330		N/A			
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	380		N/A			
TOTAL CLAIMS (37 CFR 1.16(i))	20	minus 20 = *	x 50 =	0.00	OR				
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3	minus 3 = *	x 230 =	0.00					
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00					
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00					
			TOTAL	785		TOTAL			
* If the difference in column 1 is less than zero, enter "0" in column 2.									
APPLICATION AS AMENDED - PART II									
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY	
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)	
	Total (37 CFR 1.16(i))	*	Minus **	=	x	=	OR	x	=
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x	=	OR	x	=
	Application Size Fee (37 CFR 1.16(s))					OR			
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					OR			
			TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE			
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY	
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)	
	Total (37 CFR 1.16(i))	*	Minus **	=	x	=	OR	x	=
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x	=	OR	x	=
	Application Size Fee (37 CFR 1.16(s))					OR			
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					OR			
			TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE			
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.									



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/944,028	07/30/2020	Paul LEMSON	DALI0002US1C1	7090
107456	7590	08/10/2020		
Artegis Law Group, LLP John Carey 7710 Cherry Park Drive Suite T #104 Houston, TX 77095			EXAMINER REGO, DOMINIC E	
			ART UNIT	PAPER NUMBER
			2648	
			NOTIFICATION DATE	DELIVERY MODE
			08/10/2020	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):

jmatthews@artegislaw.com
kcruz@artegislaw.com
sjohnson@artegislaw.com

<i>Decision Granting Request for Prioritized Examination (Track I)</i>	Application No. 16/944,028	Applicant(s) LEMSON et al.	
	Examiner BRIAN W BROWN	Art Unit OPET	AIA (FITF) Status No
1. THE REQUEST FILED <u>30 July 2020</u> IS GRANTED . The above-identified application has met the requirements for prioritized examination A. ☒ for an original nonprovisional application (Track I). B. ☐ for an application undergoing continued examination (RCE). 2. The above-identified application will undergo prioritized examination. The application will be accorded special status throughout its entire course of prosecution until one of the following occurs: A. filing a <u>petition for extension of time</u> to extend the time period for filing a reply; B. filing an <u>amendment to amend the application to contain more than four independent claims, more than thirty total claims</u>, or a multiple dependent claim; C. filing a <u>request for continued examination</u> ; D. filing a notice of appeal; E. filing a request for suspension of action; F. mailing of a notice of allowance; G. mailing of a final Office action; H. completion of examination as defined in 37 CFR 41.102; or I. abandonment of the application. Telephone inquiries with regard to this decision should be directed to BRIAN BROWN at (571)272-5338. In his/her absence, calls may be directed to Petition Help Desk at (571) 272-3282.			
/BRIAN W BROWN/ Petitions Examiner, OPET			

U.S. Patent and Trademark Office
PTO-2298 (Rev. 02-2012)



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NOTICE OF ALLOWANCE AND FEE(S) DUE

107456 7590 09/09/2020
Artegis Law Group, LLP
John Carey
7710 Cherry Park Drive Suite T #104
Houston, TX 77095

EXAMINER	
REGO, DOMINIC E	
ART UNIT	PAPER NUMBER
2648	

DATE MAILED: 09/09/2020

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/944,028	07/30/2020	Paul LEMSON	DALI0003USC6C1	7090

TITLE OF INVENTION: REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$500	\$0.00	\$0.00	\$500	12/09/2020

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

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

Page 1 of 3

PTOL-85 (Rev. 02/11)

PART B - FEE(S) TRANSMITTAL

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

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

By fax, send to: (571)-273-2885

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

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

107456 7590 09/09/2020
Artegis Law Group, LLP
John Carey
7710 Cherry Park Drive Suite T #104
Houston, TX 77095

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

Certificate of Mailing or Transmission

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

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/944,028	07/30/2020	Paul LEMSON	DALI0003USC6C1	7090

TITLE OF INVENTION: REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$500	\$0.00	\$0.00	\$500	12/09/2020

EXAMINER	ART UNIT	CLASS-SUBCLASS
REGO, DOMINIC E	2648	370-329000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

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

1 _____

2 _____

3 _____

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

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

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

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

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

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

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

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

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

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

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

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

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/944,028	07/30/2020	Paul LEMSON	DALI0003USC6C1	7090
107456 7590 09/09/2020 Artegis Law Group, LLP John Carey 7710 Cherry Park Drive Suite T #104 Houston, TX 77095			EXAMINER REGO, DOMINIC E	
			ART UNIT	PAPER NUMBER
			2648	

DATE MAILED: 09/09/2020

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

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

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

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

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

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

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

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

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

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

Notice of Allowability	Application No. 16/944,028	Applicant(s) LEMSON et al.	
	Examiner DOMINIC E REGO	Art Unit 2648	AIA (FITF) Status No

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

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 07/30/2020.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 1-20. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

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

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

* Certified copies not received: _____.

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

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

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

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

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

Allowable Subject Matter

2. Claims 1-20 are allowed.
3. The following is an examiner's statement of reasons for allowance:

Regarding claim 1, the prior art of record, specifically Hunter, JR. et al. (US Patent Application Publication #2011/0241425) teaches a wireless system comprising:
one or more central nodes (See Fig. 1, master unit 12) that receive a number of a plurality of radio resources from an operator hub (base station 14) (Paragraphs 0032-0035);

a plurality of wireless access points (remote unit 16) that is coupled to the one or more central nodes and distributes one or more wireless signals to one or more wireless subscribers 20, the plurality of wireless access points including at least a first access point and a second access point (Paragraphs 0032-0035).

Akman et al. (US 2010/0075678) teaches Central nodes that enables wireless communications and that provides the plurality of radio resources to a radio access network using the Common Public Radio Interface (CPRI) protocol (Paragraphs 0004 and 0022).

However, as a whole, none of the prior art cited alone or in combination provides the motivation to teach wherein one or more central nodes assigns a first subset of the number of the plurality of radio resources to the first access point and a second subset

of the number of the plurality of radio resources to the second access point, the first subset including more radio resources than the second subset, and wherein, in response to a change in need of a number of wireless subscribers coupled to the second access point, the one or more central nodes assign additional radio resources of the plurality of radio resources to the second access point.

Regarding claims 12 and 20, the prior art of record, specifically Hunter, JR. et al. (US Patent Application Publication #2011/0241425) teaches a method comprising:
receiving a plurality of radio resources from an operator hub (base station 14)
(Paragraphs 0032-0035).

Akman et al. (US 2010/0075678) teaches receiving a plurality of radio resources from an operator hub that operates using a Common Public Radio Interface (CPRI) protocol (Paragraphs 0004 and 0022).

However, as a whole, none of the prior art cited alone or in combination provides the motivation to teach assigning a first subset of the plurality of radio resources to a first access point included in a plurality of wireless access points and a second subset of the plurality of radio resources to a second access point included in the plurality of wireless access points, the first subset including more radio resources than the second subset; and in response to a change in need of a number of wireless subscribers coupled to the second access point, assigning one or more additional radio resources of the plurality of radio resources to the second access point.

Dependent claims 2-11 and 13-19 are allowed for the same reason.

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".

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Abdelmonem et al. (US 2010/0118921), Balkwill (US 2012/0150521), and Osterling et al. (US 2010/0136932).

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DOMINIC E REGO whose telephone number is (571)272-8132. The examiner can normally be reached on Monday-Friday, 8:00am-4:30pm.

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

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wesley Kim can be reached on 571-272-7867. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <https://ppair-my.uspto.gov/pair/PrivatePair>. Should you have questions on access to the Private

Application/Control Number: 16/944,028
Art Unit: 2648

Page 5

PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DOMINIC E REGO/
Primary Examiner, Art Unit 2648
Tel 571-272-8132

Notice of References Cited	Application/Control No. 16/944,028		Applicant(s)/Patent Under Reexamination LEMSON et al.	
	Examiner DOMINIC E REGO		Art Unit 2648	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20100118921-A1	05-2010	Abdelmonem; Amr	H04W88/10	375/148
*	B	US-20120150521-A1	06-2012	Balkwill; Matthew John	H04W16/22	703/13
*	C	US-20100075678-A1	03-2010	Akman; Arda	H04W24/06	455/436
*	D	US-20100136932-A1	06-2010	Osterling; Jacob	H01Q21/28	455/115.1
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

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

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

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

Notice of References Cited

Part of Paper No. 20200903

Issue Classification 	Application/Control No. 16/944,028	Applicant(s)/Patent Under Reexamination LEMSON et al.
	Examiner DOMINIC E REGO	Art Unit 2648

CPC						
Symbol				Type	Version	
H04W	/	72	/	0453	F	2013-01-01
H04B	/	10	/	25753	I	2013-01-01
H04W	/	88	/	085	I	2013-01-01
H04L	/	47	/	125	I	2013-01-01
H03F	/	1	/	3247	I	2013-01-01
H04Q	/	11	/	0067	I	2013-01-01
H04L	/	5	/	0048	I	2013-01-01
H04L	/	25	/	02	I	2013-01-01
H03F	/	3	/	24	I	2013-01-01
H04L	/	45	/	56	I	2013-01-01
H04W	/	72	/	0486	I	2013-01-01
H04W	/	40	/	02	I	2013-01-01
H04L	/	5	/	0032	I	2013-01-01
H04W	/	24	/	02	I	2013-01-01
H04B	/	10	/	2575	I	2013-01-01
H03F	/	2201	/	3233	A	2013-01-01
H04Q	/	2213	/	1301	A	2013-01-01
H03F	/	2200	/	204	A	2013-01-01
H04Q	/	2011	/	0081	A	2013-01-01
H03F	/	2201	/	3224	A	2013-01-01

CPC Combination Sets					
Symbol	Type	Set	Ranking	Version	

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	20	
/DOMINIC E REGO/ Primary Examiner, Art Unit 2648	03 September 2020	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	4

U.S. Patent and Trademark Office

Part of Paper No.: 20200903

Issue Classification 	Application/Control No. 16/944,028	Applicant(s)/Patent Under Reexamination LEMSON et al.
	Examiner DOMINIC E REGO	Art Unit 2648

INTERNATIONAL CLASSIFICATION			
CLAIMED			
H04W		72	04
H04W		88	08
H04W		40	02
H04L		12	803
H04L		5	00
H04B		10	2575
NON-CLAIMED			

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS

CROSS REFERENCES(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	20	
/DOMINIC E REGO/ Primary Examiner, Art Unit 2648	03 September 2020	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	4

U.S. Patent and Trademark Office

Part of Paper No.: 20200903

Search Notes 	Application/Control No. 16/944,028	Applicant(s)/Patent Under Reexamination LEMSON et al.
	Examiner DOMINIC E REGO	Art Unit 2648

CPC - Searched*		
Symbol	Date	Examiner
H04W72/0453 H04W24/02 H04W40/02 H04W72/0486 H04W88/085	09/03/2020	DR
H04L5/0032 H04L5/0048 H04L25/02 H04L45/56 H04L47/125	09/03/2020	DR
H03F1/3247 H03F3/24 H03F2200/204 H03F2201/3224 H03F2201/3233	09/03/2020	DR
H04Q2213/1301	09/03/2020	DR

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
H04W72/0453 H04W24/02 H04W40/02 H04W72/0486 H04W88/085	09/03/2020	DR
H04L5/0032 H04L5/0048 H04L25/02 H04L45/56 H04L47/125	09/03/2020	DR
H03F1/3247 H03F3/24 H03F2200/204 H03F2201/3224 H03F2201/3233	09/03/2020	DR
H04Q2213/1301	09/03/2020	DR
EAST, Inventor, and Assignee search	09/03/2020	DR
IPR16/944,028 Reviewed Inter Partes Review of U.S. Patent No. 8,682,338 on 09/03/2020	09/03/2020	DR

/DOMINIC E REGO/ Primary Examiner, Art Unit 2648	
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<i>Search Notes</i> 	Application/Control No. 16/944,028	Applicant(s)/Patent Under Reexamination LEMSON et al.
	Examiner DOMINIC E REGO	Art Unit 2648

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
	PGPUB Text Search-See interference search history	09/03/2020	DR

/DOMINIC E REGO/ Primary Examiner, Art Unit 2648	
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Bibliographic Data

Application No: 16/944,028

Foreign Priority claimed: ☐ Yes ☒ No

35 USC 119 (a-d) conditions met: ☐ Yes ☒ No ☐ Met After Allowance

Verified and Acknowledged: /DOMINIC E REGO/

Examiner's Signature

Initials

Title:

REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA
SYSTEM AND METHODS

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
07/30/2020	370	2648	DALI0003USC6C1
RULE			

APPLICANTS

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Sasa TRAJKOVIC, Burnaby, CANADA

Albert S. LEE, Vancouver, CANADA

CONTINUING DATA

This application is a CON of 16868748 05/07/2020 PAT 10743317

16868748 is a CON of 16737419 01/08/2020

16737419 is a CON of 16175520 10/30/2018 PAT 10701695

16175520 is a CON of 15391408 12/27/2016 PAT 10159074

15391408 is a CON of 14949405 11/23/2015 PAT 9531473

14949405 is a CON of 14169719 01/31/2014 PAT 9419714

14169719 is a CON of 13211243 08/16/2011 PAT 8682338

13211243 has PRO of 61382836 09/14/2010

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

08/06/2020

** SMALL ENTITY **

STATE OR COUNTRY

UNITED STATES

ADDRESS

Artegis Law Group, LLP
John Carey
7710 Cherry Park Drive Suite T #104
Houston, TX 77095
UNITED STATES

FILING FEE RECEIVED

\$2,855

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L4	1,025	(common adj2 public adj2 radio adj2 interface cpri) near2 protocol	US-PGPUB; USPAT; DERWENT	OR	ON	2020/09/03 17:21
L5	22	4 same hub	US-PGPUB; USPAT; DERWENT	OR	ON	2020/09/03 17:21
L6	0	5 and (@ad <= "20100914" @rlad <= "20100914" @pd <= "20100914")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/09/03 17:22
L7	598	4 same (base adj2 station\$1 bts\$1 bs\$1 base\$station node-b access near2 (point terminal node) base near2 site bss eNB\$1 e\$node\$b network near2 node\$1 (earth ground) near2 station gateway hub)	US-PGPUB; USPAT; DERWENT	OR	ON	2020/09/03 17:25
L8	4,706	(common adj2 public adj2 radio adj2 interface cpri)	US-PGPUB; USPAT; DERWENT	OR	ON	2020/09/03 17:25
L9	88	7 and (@ad <= "20100914" @rlad <= "20100914" @pd <= "20100914")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/09/03 17:26
L10	111	8 same radio near3 resource\$1	US-PGPUB; USPAT; DERWENT	OR	ON	2020/09/03 17:27
L11	66	10 same (base adj2 station\$1 bts\$1 bs\$1 base\$station node-b access near2 (point terminal node) base near2 site bss eNB\$1 e\$node\$b network near2 node\$1 (earth ground) near2 station gateway hub)	US-PGPUB; USPAT; DERWENT	OR	ON	2020/09/03 17:27
L12	11	11 and (@ad <= "20100914" @rlad <= "20100914" @pd <= "20100914")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/09/03 17:28
L13	54	assign\$3 with resource\$1 with (first primary) near2 (router access adj2 (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g") same assign\$3 near8 resource\$1 near8 second\$3 near2 (router	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/09/03 17:48

		access adj2 (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g")				
L14	117	(first primary) near2 sub\$set with radio near2 resource\$1 with second\$3 near2 sub\$set	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/09/03 17:49
L15	30	L14 same assign\$3 with resource\$1	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/09/03 17:49
L16	26	L14 same (additional extra more) with resource\$1	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/09/03 17:49
L17	78,308	(H04W72/0453 H04W24/02 H04W40/02 H04W72/0486 H04W88/085 H04L5/0032 H04L5/0048 H04L25/02 H04L45/56 H04L47/125 H03F1/3247 H03F3/24 H03F2200/204 H03F2201/3224 H03F2201/3233 H04Q2011/0081 H04Q2213/1301).cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/09/03 17:50
L18	16,468	assign\$3 near8 (additional extra more) near8 resource\$1	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/09/03 17:50
L19	95	L18 same (different various multi\$3 many several numerous variety plurality alternat\$3 another other second primary secondary two) near2 (router access adj2 (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/09/03 17:50
L20	28	L17 and L19	US-PGPUB; USPAT; DERWENT	OR	ON	2020/09/03 17:50
L21	2	L20 and (@ad <= "20100914" @riad <= "20100914" @pd <= "20100914")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/09/03 17:50
S323	116	(first primary) near2 sub\$set with radio near2 resource\$1 with second\$3 near2 sub\$set	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/08/26 16:54
S324	0	S323 same assign\$3 with additional near7 resource\$1	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/08/26 16:55

S325	1	S323 same assign\$3 with (additional extra more) with resource\$1	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/08/26 16:57
S326	1	S323 same ((first primary) same second\$3) near2 (router access adj2 (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/08/26 17:02
S327	1	assign\$3 near8 (first primary) near2 sub\$set near6 radio near2 resource\$1 with (first primary) near2 (router access adj2 (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g") same second\$3 near2 (router access adj2 (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/08/27 10:40
S328	0	assign\$3 with (different various multi\$3 many several numerous variety plurality alternat\$3 another other second primary secondary two) near2 sub\$set with radio near2 resource\$1 with (different various multi\$3 many several numerous variety plurality alternat\$3 another other second primary secondary two) near2 (router access adj2 (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/08/27 10:44
S329	8	(different various multi\$3 many several numerous variety plurality alternat\$3 another other second primary secondary two) near2 sub\$set with radio near2 resource\$1 near9 (different various multi\$3 many several numerous variety plurality alternat\$3 another other second primary secondary two) near2 (router access adj2 (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/08/27 10:48
S330	2	S329 and (@ad <= "20100914" @rlad <= "20100914" @pd <= "20100914")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/08/27 10:50
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		H03F2201/3233 H04Q2011/0081 H04Q2213/1301).cpc.				
S332	2	gate\$way with assign\$3 with (different various multi\$3 many several numerous variety plurality alternat\$3 another other second primary secondary two) with radio near2 resource\$1 with (different various multi\$3 many several numerous variety plurality alternat\$3 another other second primary secondary two) near3 (router access adj2 (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/08/27 11:23
S333	16,432	assign\$3 near8 (additional extra more) near8 resource\$1	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/08/27 11:33
S334	95	S333 same (different various multi\$3 many several numerous variety plurality alternat\$3 another other second primary secondary two) near2 (router access adj2 (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/08/27 11:34
S335	28	S331 and S334	US-PGPUB; USPAT; DERWENT	OR	ON	2020/08/27 11:36
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S337	8	assign\$3 near5 (additional extra more) near4 resource\$1 near8 (first primary) near2 (router access adj2 (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/08/27 11:44
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S339	0	adjust\$3 near6 radio near2 resource\$1 near8 (first primary) near2 (base adj2 station\$1 bts\$1 bs\$1 base\$station node- b access near2 (point terminal node) base near2 site bss eNB\$1 e\$node\$b network near2 node\$1 (earth ground) near2 station gateway hub router access adj2 (port point device terminal station	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/08/27 11:50

		equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g") same congestion				
S340	2	adjust\$3 near6 radio near2 resource\$1 near8 (different various multi\$3 many several numerous variety plurality alternat\$3 another other second primary secondary two) near2 (base adj2 station\$1 bts\$1 bs\$1 base\$station node-b access near2 (point terminal node) base near2 site bss eNB\$1 e\$node\$b network near2 node\$1 (earth ground) near2 station gateway hub router access adj2 (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g") same congestion	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/08/27 11:52
S341	20	(alter\$3 chang\$6 vary\$3 modif\$4 adjust\$3 adjustable adjustment correct\$3) near8 resource\$1 with (different various multi\$3 many several numerous variety plurality alternat\$3 another other second primary secondary two) near2 (base adj2 station\$1 bts\$1 bs\$1 base\$station node-b access near2 (point terminal node) base near2 site bss eNB\$1 e\$node\$b network near2 node\$1 (earth ground) near2 station gateway hub router access adj2 (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g") same congestion	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/08/27 12:02
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S343	53	assign\$3 near8 resource\$1 with (first primary) near2 (router access adj2 (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g") same assign\$3 near8 resource\$1 near8 second\$3 near2 (router access adj2 (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/09/03 10:42
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S345	3	resource\$1 near2 allocat\$3 with (first primary) near2 (router access adj2 (port point device terminal station equipment	US-PGPUB; USPAT;	OR	ON	2020/09/03 10:49

		node\$1 unit) ap "802.11a" "802.11b" "802.11g") same assign\$3 near8 resource\$1 near8 second\$3 near2 (router access adj2 (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g")	USOCR; EPO; JPO			
S346	95	assign\$5 with resource\$1 with (first primary) adj2 (router access adj2 (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g") same second\$3 adj2 (router access adj2 (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/09/03 11:19
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S348	46,642	(H04W72/0453 H04W24/02 H04W40/02 H04W88/085 H04L45/56 H04L47/125).cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/09/03 11:21
S349	4	S347 and S348	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/09/03 11:21

9/3/2020 5:57:47 PM
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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S312	28	(dali near2 wireless).as.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/08/26 10:52
S313	886	(paul near lemson).in. (shawn near patrick near stapleton).in. (sasa near trajkovic).in. (albert near2 lee).in.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/08/26 10:52
S314	1	((central near2 node (digital access) near2 (node device station terminal unit module equipment apparatus mean\$1) dau master near2 (node device station terminal unit module equipment apparatus mean\$1) mu (emulated near2 cell micro\$cell micro near2 cell femto femto\$cell femto near2 cell pico pico\$cell pico near2 cell indoor near cell home near3 (cell node) henb\$1) near2 gateway) same ((radio antenna) near3 (node device station terminal unit module equipment apparatus mean\$1) rru) same first near2 sub\$set with resource\$1 same second\$3 near4 sub\$set with resource\$1).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/08/26 10:57
S315	39	((central near2 node (digital access) near2 (node device station terminal unit module equipment apparatus mean\$1) dau master near2 (node device station terminal unit module equipment apparatus mean\$1) mu (emulated near2 cell micro\$cell micro near2 cell femto femto\$cell femto near2 cell pico pico\$cell pico near2 cell indoor near cell home near3 (cell node) henb\$1) near2 gateway) same ((radio antenna) near3 (node device station terminal unit module equipment apparatus mean\$1) rru) same sub\$set with resource\$1).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/08/26 11:12
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S317	886	(paul near lemson).in. (shawn near patrick near stapleton).in. (sasa near trajkovic).in. (albert near2 lee).in.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/08/26 11:18

S318	0	S315 and S316	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/08/26 11:18
S319	0	S315 and S317	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/08/26 11:18
S320	723	(common near2 public near radio near interface cpri).clm.	US-PGPUB; USPAT; DERWENT	OR	ON	2020/08/26 11:20
S321	8	S316 and S320	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/08/26 11:20
S322	15	S317 and S320	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/08/26 11:20

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		16944028
	Filing Date		2020-07-30
	First Named Inventor	Paul Lemson	
	Art Unit	2648	
	Examiner Name	Dominic E Rego	
	Attorney Docket Number	DALI0003USC6C1PX	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		16944028
	Filing Date		2020-07-30
	First Named Inventor	Paul Lemson	
	Art Unit	2648	
	Examiner Name	Dominic E Rego	
Attorney Docket Number		DALI0003USC6C1PX	

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Description

[0001] The present invention relates to indoor communications systems, and particularly to wireless cellular communications systems in buildings and tunnels.

[0002] Wireless communications systems are becoming an increasingly widespread phenomenon of modern communications. Since many users place an increasing number of cellular calls or data transmissions within buildings or other confined structures, there is a need to achieve high quality indoor coverage at appropriate capacity.

[0003] A conventional configuration to extend a wireless communications service e.g. GSM or UMTS, from an outdoor environment to an indoor area is shown in Figure 1 and is characterized by the utilization of a repeater R that is typically located within a building B to retransmit within the building a wireless signal Ws received at an external antenna A1 or retransmit outside the building the wireless signals Ws of mobile stations Ms, e.g. mobile phones, handheld computers and the like, located inside the building B. In the downlink, that is when the wireless signals Ws from the external environment are transmitted to the mobile stations Ms inside the building B, said outdoor wireless signals are passed along a first connection Co1 to the repeater R which forwards the signal along a second connection Co2 to a plurality of inter-connected amplifiers Am, the amplifiers amplify the signals which are then transmitted over the in-building antennas A2 to A4. In the uplink direction, that is, when the wireless signals Ws from the mobile stations Ms are transmitted to a wireless infrastructure outside the building B, the repeater R receives said signals along connection Co2 and transmits them along connection Co1 to the external antenna A1.

[0004] It is also possible that the repeater R of the indoor communications structure is replaced by a base station connected to a communications core network along connection Co1. Typically, the information is distributed via analogue signals inside the buildings and confined areas.

[0005] Another known indoor communications system providing wireless cellular service is shown in figure 2. A core network CN is connected to a base station Bs. The radio frequency (RF) signals from the base station or an off-air repeater OAR are digitized into base band signals in a base station interface BSI (and vice versa in uplink transmission) and distributed in the form of data packets using data cables, e.g. category 5 (CAT5) or optical fiber, to at least one Ethernet switch ES. The Ethernet switch ES then distributes the information to the corresponding remote radio heads RH1 to RH4 serving a particular cell area C1 and C2. An example of such system is disclosed in Patent Application US 2005/0157675 A1. An advantage of such systems is that they provide a cost-effective solution due to the use or re-use of low cost distribution cabling which is usually already present, totally or partly, in buildings and used for other types of digital communi-

cations e.g. local area network LAN structures using Ethernet protocol.

[0006] Using standard Ethernet switches, cell configurations can be achieved due to the sectorization of data flow. Normally, an Ethernet hub is needed in each Ethernet sector for data distribution in downlink and data packaging in uplink. The hub function is placed in at least one of the associated remote radio heads. In complex systems, series of Ethernet switches are necessary and bottlenecks of data flow are evident due to the 1 to n distribution characteristic of the Ethernet switch resulting in limiting the capacity of the network.

[0007] The object of the present invention is to provide a method and a system for wireless cellular indoor communications with improved cell and load balancing management.

[0008] The object is achieved by a and a wireless cellular indoor communications system according to claim 1 and a method for wireless cellular indoor communications according to claim 6.

[0009] The system for wireless cellular indoor communications of the invention uses a cell management unit with complex matrix function, instead of distributed standard Ethernet switches, for flexible cell management of multi-service and multi-operator functions.

[0010] The cell management unit is the interface between a number of base stations and the Ethernet connection. It provides multi-functions for a broad scope of complex scenarios of operation, with multi-carrier, multi-service and multi-operator functions, and efficient data management. In this way, the remote radio heads can be used in parallel for different services and at different functions, such as for frequency division duplex (FDD) and time division duplex (TDD). The remote radio heads are serviced by RF-Hubs similar to the original Ethernet hub functionality. Due to a compact arrangement of the cell management unit, data concentrations can be avoided and high data transfer can be achieved in complex networks.

[0011] The cell management unit provides data management in terms of packaging and addressing to the radio heads in downlink and un-packaging and addressing to the base stations in uplink. Since the cell management unit performs the frequency allocation of the remote radio heads, cell management for different services and operators can be achieved. Cell management can be performed manually, by software control or even automatically adaptive to current cell scenarios.

[0012] Due to a traffic activity control, un-used carriers in remote radio heads can be deactivated at locations of low traffic and can be shifted and activated in remote radio heads at locations of high traffic. The load-balancing in base stations can be performed independently of the cell management function. In this way, capacity can follow moving users in complex buildings, such as airports, stations, etc., with dynamic distribution of hot-spots.

[0013] Cost optimization can be achieved when cell

architectures must no longer be designed for peak traffic with moving users all over the whole building. Further cost optimization is achieved using base stations with digital interface and remote radio heads at dedicated locations, where capacity and coverage is needed. Additionally, since information is distributed in digital baseband, cost-effective transport can be used or eventually re-used, such as CAT5 cabling and optical fiber. Due to the LAN characteristic of the digital distribution infrastructure, the remote radio heads can advantageously be easily relocated.

[0014] Radio heads can be designed using low-cost technology of mobile stations avoiding high RF transmission levels.

[0015] An embodiment example of the invention is now explained with the aid of Figures 1 to 6.

Figure 1 shows a first typical indoor communications system structure, for analogue systems, according to the prior art.

Figure 2 shows a wireless cellular indoor communications system, with digital distribution of signals over Ethernet, according to the prior art.

Figure 3 shows a first example of a wireless cellular indoor communications system, with separated cell configuration, according to the invention.

Figure 4 shows a second example of a wireless cellular indoor communications system, with overlapping cell configuration, according to the invention.

Figure 5 shows an example of carrier distribution according to the wireless cellular indoor communications method of the invention.

Figure 6 shows an example block schematic of a wireless cellular indoor communications system according to the invention.

[0016] A first example of a wireless cellular indoor communications system structure according to the invention is shown in Figure 3, comprising a core network CN, a base station Bs, a cell management unit CMU, an off-air repeater (OAR), digital interfaces i1 to i3, RF hubs RFH1 and RFH2, and remote radio heads RH1 to RH5.

[0017] In the downlink direction, communications core network signals intended for the mobile station inside the indoor environment, e.g. a building or a tunnel, are received by the base station Bs. Said signals are then passed in digital form through a first connection interface i1, e.g. an electrical or optical connection using Ethernet protocol or of other standards (e.g. OBSAI or CPRI), to the cell management unit CMU. The cell management unit CMU performs data packaging in downlink and forwards said digital packets through a second digital connection interface i2, e.g. an electrical or optical connection

using Ethernet protocol, to the RF Hubs RFH1 and RFH2, which in turn pass the packets through a third connection interface i3, e.g. an electrical or optical connection using Ethernet protocol, to the remote radio heads RH1 to RH5.

[0018] Similarly, in the uplink direction, radio signals Vs transmitted by the mobile stations located in the indoor environment are received by the remote radio heads RH1 to RH5 and sent to the core network CN with data packaging in the RF Hubs.

[0019] The base station is a conventional base station without radio equipment. The cell management unit CMU provides transparent operation of the radio heads RH1 to RH5 from the base station and comprises standard digital interfaces to the base station Bs and to the off-air repeater OAR, at least one Ethernet interface to connect the RF Hubs RFH1 and RFH2, an intelligent switching unit for data distribution and cell organization configurable in size and functionality according to system dimensions, a complex matrix function to combine different base stations with a number of RF hubs, multi-service and multi-operator functionality for full transparency, flexible cell management for static cell configurations, automatic cell management for adaptive cell configurations.

[0020] The CMU preferably comprises the following functionality (in a form independent of the used air interface standard):

- means for supporting efficient load balancing at and between base stations through adaptive cell reconfiguration, especially through the shifting of un-used carriers from radio heads inside areas of low traffic load to radio heads inside areas of high traffic load, e.g. means for individual load identification for each carrier on each of the radio heads by air interface activity detection and interference sensing. Air interface activity detection thereby is realized on the basis of the individually supported air interface protocols; means for de-activation of un-used carriers per radio head on an individual basis; means for shifting carriers from radio heads, where these carriers are not used for radio heads with high load on their active carriers, means for activation of the shifted carriers at locations (radio heads) of high loading. The cell management unit mechanism of adaptive cell reconfiguration thereby will neither require any changes to the load balancing mechanisms at or between the access nodes (e.g. BTS, Node-B, WiMAX base station) nor any dedicated messaging between access nodes and CMU for supporting load balancing.
- mapping means from carriers or time, frequency or time-frequency allocations to individual radio heads, as identified e.g. through their MAC addresses or the connectors of the respective digital lines to which the radio heads are connected,
- delay management means for alignment of the indi-

vidual delays accumulated on the digital connections between the cell management unit and each of the radio heads,

- means for synchronization of the signals between the cell management unit and the individual radio heads,
- failure detection means for the individual digital links between the cell management unit and the radio heads.

[0021] The RF hubs provide data distribution to the remote radio heads in downlink and data packaging in uplink

[0022] The remote radio heads RH1 to RH5 are RF air interfaces to users providing a digital interface to the network. They are part of the BTS according to standards, such as OBSAI or CPRI. The remote radio heads are equipped to transmit four carriers over the full RF bandwidth of each service but channel-selective at least in uplink. In this way, a remote radio head can operate individually for dedicated operators only. Since frequency allocation of each carrier can be tuned remotely by the cell management unit CMU, the remote radio heads RH1 to RH5 can represent an individual cell and/or can be part of a greater cell. Thus, in both cases, extension of capacity and/or coverage, can be achieved. Different types of remote radio heads can be planned either for FDD or for TDD operation.

[0023] In Figure 3, the wireless cellular indoor communications system, according to the invention, is illustrated with separated cell configuration, that is, a first RF Hub RFH1 is connected to two remote radio heads RH1 and RH2 which provide service in a first cell area C1 inside a certain first indoor location area A1, and a second RF Hub RFH2 is connected to three remote radio heads RH3 to RH5 which provide service in a second cell area C2 inside a certain second indoor location area A2, and the first and second indoor location areas A1 and A2 being isolated or separated. On the other hand, Figure 4 illustrates a wireless cellular indoor communications system, according to the invention, which presents overlapping cell configuration, that is, now the first RF Hub RFH1 is connected to two remote radio heads RH1 and RH2, RH1 providing service in cell C1, and RH2 providing service in cell C2, and cells C1 and C2 overlapping in the same indoor location area A1, and the second RF Hub RFH2 is connected to three remote radio heads RH3, RH4 and RH5 which also provide service in different overlapping cells C1, C2 at the same indoor location area A2.

[0024] For the sake of generalization, other cell configurations, as the ones illustrated in the examples of Figures 3 and 4, are possible according to the invention. Each remote radio head can service a different cell area, or two, or more, remote radio heads can belong to the same cell area, said cell areas overlapping inside a certain indoor location area or being in different location areas.

The RF hubs can be connected to remote radio heads which serve the same cell or serve different cells.

[0025] Figure 5 shows an example of carrier distribution according to the wireless cellular indoor communications method of the invention considering four carriers per remote radio head RH-1 to RH-N. The base station Bs provides the M carriers Ca1 to CaM to the cell management unit CMU which in turn distributes it between the at least one RF Hub RFH 1 to X of the next stage. The one or more RF Hubs distribute carriers 1 to 4 to a first remote radio head RH-1 according to medium access control (MAC) addresses MA1 to MA4 in the Ethernet packets, carriers 5 to 8 to a second remote radio head RH-2 according to MAC addresses 5 to 8, and carriers M-3 to M to an N remote radio head RH-N according to MAC addresses M-3 to M, where $M = N \times 4$.

[0026] Figure 6 shows an example block schematic of a wireless cellular indoor communications system according to the invention. In the example of the figure the cell management unit CMU operates on eight base stations BS1 to BS8 and on eight RF Hubs RFH1 to RFH8 (but, of course, more or less base stations Bs and RF Hubs could also be connected to the CMU). Each base station can provide four carriers at individual services. The eight BS can cover different services of different operators. The network between interfaces I1 and I3 is fully transparent, while the remote radio heads RH1 to RH32 are dedicated for individual services.

Claims

1. A wireless cellular indoor communications system comprising at least one base station (Bs) connected to a cell management unit (CMU) through a first digital connection interface (i1), the cell management unit connected to at least one RF hub (RFH1, RFH2) through a second digital connection interface (i2), and the at least one RF hub connected to at least one remote radio head (RH1 to RH5) through a third digital connection interface (i3), the at least one remote radio head providing service in a certain cell area (C1, C2) inside a confined environment, the cell management unit (CMU) comprising

- means for providing efficient load balancing at and between base stations through adaptive cell reconfiguration,
- means for mapping carriers, time, frequency or time-frequency allocations to individual radio heads,
- means for alignment of individual delays accumulated on the digital connections between the cell management unit and each of the radio heads,
- means for synchronization of the signals between the cell management unit and the individual remote radio heads,

- means for failure detection of the individual digital links between the cell management unit and the remote radio heads.
- 2. The wireless cellular indoor communications system of claim 1 wherein the means for supporting efficient load balancing comprise means for shifting un-used carriers from remote radio heads inside areas of low traffic load to remote radio heads inside areas of high traffic load. 5 10
- 3. The wireless cellular indoor communications system of claim 2 wherein the means for shifting un-used carriers from remote radio heads inside areas of low traffic load to remote radio heads inside areas of high traffic load comprise 15

- means for individual load identification for each carrier on each of the radio heads by air interface activity detection and interference sensing, 20
- means for de-activation of un-used carriers per remote radio head on an individual basis;
- means for shifting carriers from radio heads, where these carriers are not used for radio heads with high load on their active carriers, 25
- means for activation of the shifted carriers at locations where the remote radio heads are loaded over a predetermined value.

- 4. The wireless cellular indoor communications system of claim 1, wherein the carriers, time, frequency or time-frequency allocations are identified through their MAC addresses or the connectors of the respective digital lines to which the radio heads are connected. 30 35
- 5. The wireless cellular indoor communications system of claim 1, wherein the first, second and third digital interface is an electrical or optical connection using Ethernet protocol. 40
- 6. A method for wireless cellular indoor communications, the method comprising a base station (Bs) transmitting or receiving call or data information to/from a cell management unit (CMU) through a first digital connection interface (i1), the cell management unit transmitting or receiving call or data information to/from at least one RF hub (RFH1, RFH2) through a second digital connection interface (i2), and the at least one RF hub transmitting or receiving call or data information to/from at least one remote radio head (RH1 to RH5) through a third digital connection interface (i3), the at least one remote radio head providing service in a certain cell area (C1, C2) inside a confined environment, 55 and the cell management unit (CMU)

- providing efficient load balancing at and between base stations through adaptive cell reconfiguration,
- mapping carriers, time, frequency or time-frequency allocations to individual radio heads,
- aligning individual delays accumulated on the digital connections between the cell management unit and each of the radio heads,
- synchronizing signals between the cell management unit and the individual remote radio heads,
- detecting failure of the individual digital links between the cell management unit and the remote radio heads.

Amended claims in accordance with Rule 137(2) EPC.

1. A wireless cellular indoor communications system comprising at least one base station (Bs) connected to a cell management unit (CMU) through a first digital connection interface (i1), the cell management unit connected to at least one RF hub (RFH1, RFH2) through a second digital connection interface (i2), and the at least one RF hub connected to at least one remote radio head (RH1 to RH5) through a third digital connection interface (i3), the at least one remote radio head providing service in a certain cell area (C1, C2) inside a confined environment, the cell management unit (CMU) comprising

- means for providing efficient load balancing at and between base stations through adaptive cell reconfiguration,
- means for shifting un-used carriers from remote radio heads inside areas of low traffic load to remote radio heads inside areas of high traffic load,
- means for mapping carriers, time, frequency or time-frequency allocations to individual radio heads,
- means for alignment of individual delays accumulated on the digital connections between the cell management unit and each of the radio heads,
- means for synchronization of the signals between the cell management unit and the individual remote radio heads,
- means for failure detection of the individual digital links between the cell management unit and the remote radio heads.

2. The wireless cellular indoor communications system of claim 1 wherein the means for shifting un-used carriers from remote radio heads inside areas of low traffic load to remote radio heads inside areas of high traffic load comprise

- means for individual load identification for each carrier on each of the radio heads by air interface activity detection and interference sensing,
- means for de-activation of un-used carriers per remote radio head on an individual basis;
- means for shifting carriers from radio heads, where these carriers are not used for radio heads with high load on their active carriers,
- means for activation of the shifted carriers at locations where the remote radio heads are loaded over a predetermined value.

3. The wireless cellular indoor communications system of claim 1, wherein the carriers, time, frequency or time-frequency allocations are identified through their MAC addresses or the connectors of the respective digital lines to which the radio heads are connected.

4. The wireless cellular indoor communications system of claim 1, wherein the first, second and third digital interface is an electrical or optical connection using Ethernet protocol.

5. A method for wireless cellular indoor communications, the method comprising a base station (Bs) transmitting or receiving call or data information to/from a cell management unit (CMU) through a first digital connection interface (i1), the cell management unit transmitting or receiving call or data information to/from at least one RF hub (RFH1, RFH2) through a second digital connection interface (i2), and the at least one RF hub transmitting or receiving call or data information to/from at least one remote radio head (RH1 to RH5) through a third digital connection interface (i3), the at least one remote radio head providing service in a certain cell area (C1, C2) inside a confined environment, and the cell management unit (CMU)

- providing efficient load balancing at and between base stations through adaptive cell reconfiguration,
- shifting un-used carriers from remote radio heads inside areas of low traffic load to remote radio heads inside areas of high traffic load,
- mapping carriers, time, frequency or time-frequency allocations to individual radio heads,
- aligning individual delays accumulated on the digital connections between the cell management unit and each of the radio heads,
- synchronizing signals between the cell management unit and the individual remote radio heads,
- detecting failure of the individual digital links between the cell management unit and the re-

ote radio heads.

6. A cell management unit (CMU) comprising:

- means for providing efficient load balancing at and between base stations through adaptive cell reconfiguration, the base stations connected to the cell management unit
- means for shifting un-used carriers from remote radio heads inside areas of low traffic load to remote radio heads inside areas of high traffic load, the remote radio heads connected to at least one RF Hub, the RF Hub connected to the cell management unit,
- means for mapping carriers, time, frequency or time-frequency allocations to individual radio heads,
- means for alignment of individual delays accumulated on the digital connections between the cell management unit and each of the radio heads,
- means for synchronization of the signals between the cell management unit and the individual remote radio heads,
- means for failure detection of the individual digital links between the cell management unit and the remote radio heads.

7. The management unit (CMU) according to claim 6, wherein the means for shifting un-used carriers from remote radio heads inside areas of low traffic load to remote radio heads inside areas of high traffic load comprise

- means for individual load identification for each carrier on each of the radio heads by air interface activity detection and interference sensing,
- means for de-activation of un-used carriers per remote radio head on an individual basis;
- means for shifting carriers from radio heads, where these carriers are not used for radio heads with high load on their active carriers,
- means for activation of the shifted carriers at locations where the remote radio heads are loaded over a predetermined value.

Figure 1

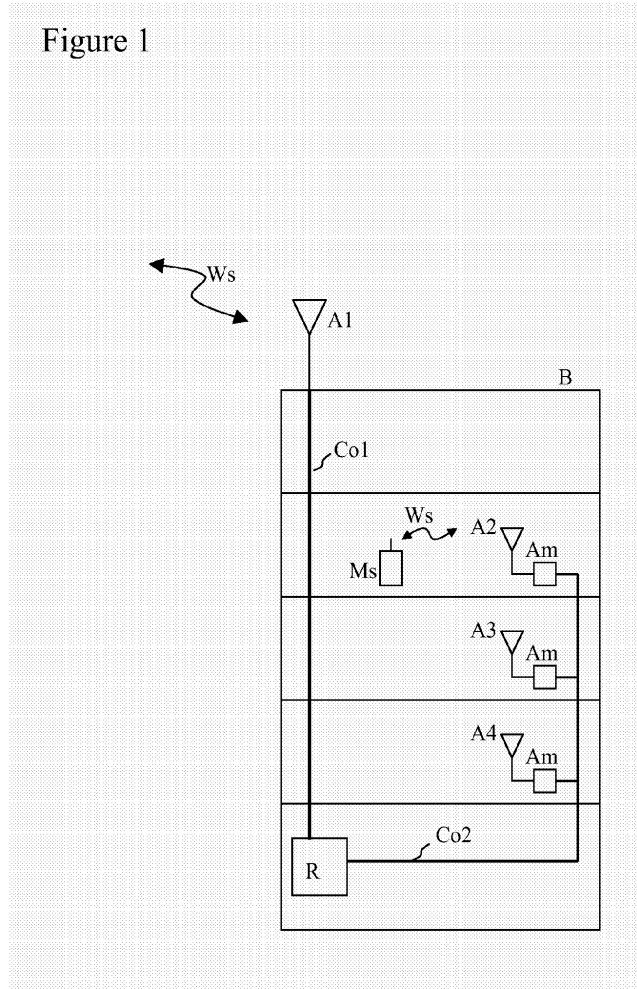


Figure 2

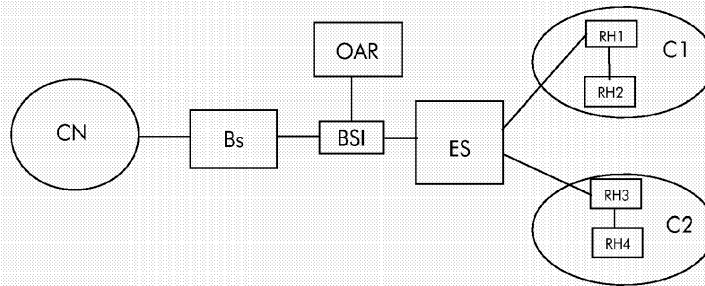


Figure 3

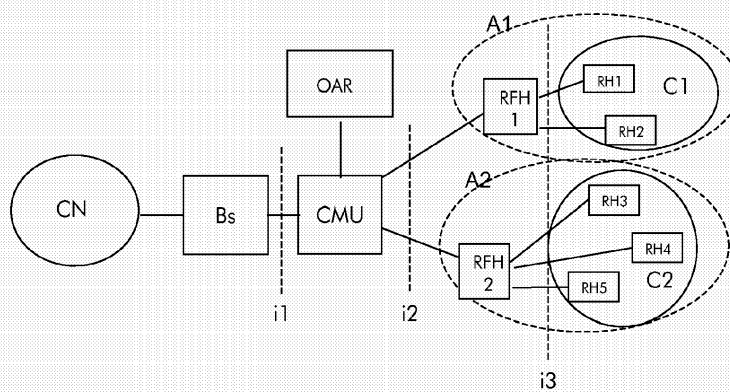


Figure 4

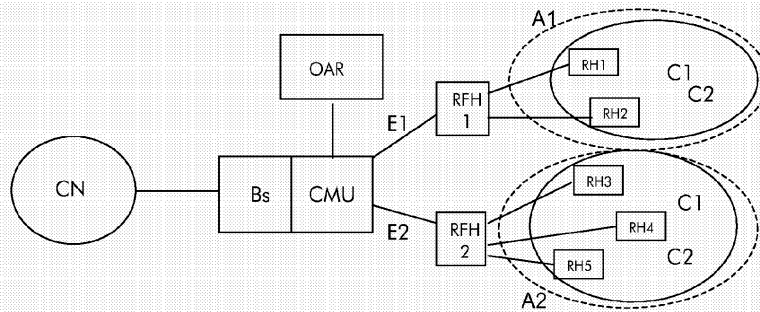


Figure 5

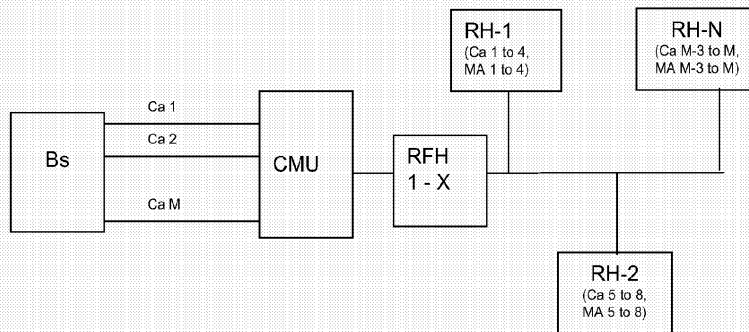
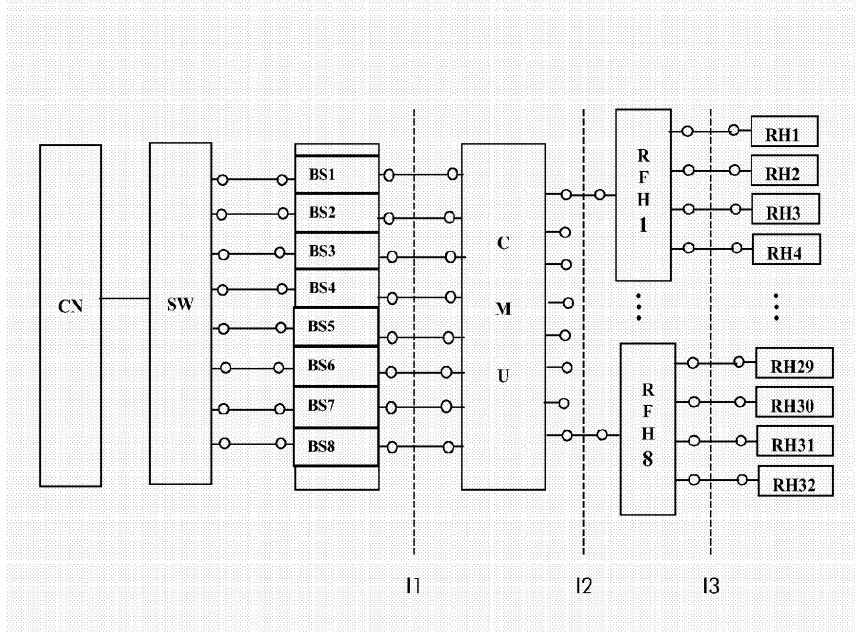


Figure 6



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EUROPEAN SEARCH REPORT

Application Number
EP 06 30 1157

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 4 May 2007	Examiner Rosenauer, Hubert
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document	

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EUROPEAN SEARCH REPORT

Application Number
EP 06 30 1157

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 1 617 598 A (SAMSUNG ELECTRONICS CO LTD [KR]) 18 January 2006 (2006-01-18) * paragraph [0003] - paragraph [0005] * * paragraph [0015] * * paragraph [0030] - paragraph [0033] * * paragraph [0037] - paragraph [0044] * * figures 2,6-8 *	1,6	
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			TECHNICAL FIELDS SEARCHED (IPC)
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 4 May 2007	Examiner Rosenauer, Hubert
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

1
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Electronic Patent Application Fee Transmittal				
Application Number:		16944028		
Filing Date:		30-Jul-2020		
Title of Invention:		REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS		
First Named Inventor/Applicant Name:		Paul LEMSON		
Filer:		Sarah W. Mirza/Steve Johnson		
Attorney Docket Number:		DALI0003USC6C1PX		
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	1806	1	240	240
Total in USD (\$)				240

Electronic Acknowledgement Receipt	
EFS ID:	40576792
Application Number:	16944028
International Application Number:	
Confirmation Number:	7090
Title of Invention:	REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS
First Named Inventor/Applicant Name:	Paul LEMSON
Customer Number:	107456
Filer:	Sarah W. Mirza/Steve Johnson
Filer Authorized By:	Sarah W. Mirza
Attorney Docket Number:	DALI0003USC6C1PX
Receipt Date:	16-SEP-2020
Filing Date:	30-JUL-2020
Time Stamp:	15:32:39
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$240
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	DALI0003USC6C1PX_IDS.pdf	1006596	no	4
			ce7e42cbfd764a0cd65bc83e594e597452e e27f5		
Warnings:					
Information:					
2	Foreign Reference	FR1_EP1924109A1.pdf	1245220	no	14
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Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30614	no	2
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Application Number	16/944,028
Filing Date	2020-07-30
First Named Inventor	Paul LEMSON
Title	REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS
Art Unit	2648
Examiner Name	REGO, DOMINIC E
Attorney Docket Number	DALI0003USC6C1

SIGNATURE of Applicant or Patent Practitioner

Signature	/Sarah Mirza/	Date (Optional)	September 17, 2020
Name	Sarah Mirza	Registration Number	74,866
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Applicant Name (if Applicant is a juristic entity)			
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- ☐ Inventor or Joint Inventor (title not required below)
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3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt	
EFS ID:	40589629
Application Number:	16944028
International Application Number:	
Confirmation Number:	7090
Title of Invention:	REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS
First Named Inventor/Applicant Name:	Paul LEMSON
Customer Number:	107456
Filer:	Sarah W. Mirza/Steve Johnson
Filer Authorized By:	Sarah W. Mirza
Attorney Docket Number:	DALI0003USC6C1PX
Receipt Date:	17-SEP-2020
Filing Date:	30-JUL-2020
Time Stamp:	15:42:02
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	DALI0003USC6C1_POA.pdf	228320	no	3
			ea6fed99a75951e336013def0655eb3322a706673d		

Warnings:

Information:	
Total Files Size (in bytes):	228320
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.	



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/944,028	07/30/2020	Paul LEMSON	DALI0003USC6C1

CONFIRMATION NO. 7090

POA ACCEPTANCE LETTER



0C000000120019946

107456
Artegis Law Group, LLP
John Carey
7710 Cherry Park Drive Suite T #104
Houston, TX 77095

Date Mailed: 09/21/2020

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 09/17/2020.

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

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

/ldvan/



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/944,028	07/30/2020	Paul LEMSON	DALI0003USC6C1

CONFIRMATION NO. 7090

PUBLICATION NOTICE



107456
Artegis Law Group, LLP
John Carey
7710 Cherry Park Drive Suite T #104
Houston, TX 77095

Title:REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS

Publication No.US-2020-0359383-A1

Publication Date:11/12/2020

NOTICE OF PUBLICATION OF APPLICATION

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

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

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Public Records Division. The Public Records Division can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Public Records Division, Alexandria, VA 22313-1450 or via the Internet.

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

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

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



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United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/944,028	07/30/2020	Paul LEMSON	DALI0003USC6C1	7090
107456	7590	11/20/2020	EXAMINER	
Artegis Law Group, LLP			REGO, DOMINIC E	
John Carey				
7710 Cherry Park Drive Suite T #104				
Houston, TX 77095				
			ART UNIT	PAPER NUMBER
			2648	
			NOTIFICATION DATE	DELIVERY MODE
			11/20/2020	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):

jmatthews@artegislaw.com
kcruz@artegislaw.com
sjohnson@artegislaw.com

PTOL-90A (Rev. 04/07)

Supplemental Notice of Allowability	Application No. 16/944,028	Applicant(s) LEMSON et al.	
	Examiner DOMINIC E REGO	Art Unit 2648	AIA (FITF) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--
All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 09/16/2020.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 1-20 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

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

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

* Certified copies not received: _____.

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

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

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

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

/DOMINIC E REGO/
Primary Examiner, Art Unit 2648

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

EXAMINER'S AMENDMENT

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

Authorization for this examiner's amendment was given in a telephone interview with Sara Mirza on 11/14/2020.

Please replace the original claims 1, 12, and 20 with the following amended claims.

1. (Currently Amended) A wireless system comprising:

one or more central nodes that receive a number of a plurality of radio resources from an operator hub that enables wireless communications and that provides the plurality of radio resources to a radio access network using the Common Public Radio Interface (CPRI) protocol; and

a plurality of wireless access points that is coupled to the one or more central nodes and distributes one or more wireless signals to one or more wireless subscribers, the plurality of wireless access points including at least a first access point and a second access point, wherein one or more central nodes assigns a first subset of the

number of the plurality of radio resources to the first access point and a second subset of the number of the plurality of radio resources to the second access point, the first subset including more radio resources than the second subset, and

wherein, in response to a change in need of a number of wireless subscribers coupled to the second access point and which of the second subset is loaded beyond a threshold, the one or more central nodes assign additional radio resources of the plurality of radio resources to the second access point.

12. (Currently Amended) A method comprising: receiving a plurality of radio resources from an operator hub that operates using a Common Public Radio Interface (CPRI) protocol;

assigning a first subset of the plurality of radio resources to a first access point included in a plurality of wireless access points and a second subset of the plurality of radio resources to a second access point included in the plurality of wireless access points, the first subset including more radio resources than the second subset; and

in response to a change in need of a number of wireless subscribers coupled to the second access point and which of the second subset is loaded beyond a threshold, assigning one or more additional radio resources of the plurality of radio resources to the second access point.

20. (Currently Amended) One or more non-transitory computer readable storage media storing instructions that, when executed by one or more processors, cause the one or

more processors to perform the steps of: receiving a plurality of radio resources from an operator hub that operates using a Common Public Radio Interface (CPRI) protocol;

assigning a first subset of the plurality of radio resources to a first access point included in a plurality of wireless access points and a second subset of the plurality of radio resources to a second access point included in the plurality of wireless access points, the first subset including more radio resources than the second subset; and

in response to a change in need by a number of wireless subscribers coupled to the second access point and which of the second subset is loaded beyond a threshold, assigning one or more additional radio resources of the plurality of radio resources to the second access point.

(End of Amendment).

Allowable Subject Matter

3. Claims 1-20 are allowed.

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

Regarding claim 1, the prior art of record, specifically Hunter, JR. et al. (US Patent Application Publication #2011/0241425) teaches a wireless system comprising:

one or more central nodes (See Fig. 1, master unit 12) that receive a number of a plurality of radio resources from an operator hub (base station 14) (Paragraphs 0032-0035);

a plurality of wireless access points (remote unit 16) that is coupled to the one or more central nodes and distributes one or more wireless signals to one or more wireless subscribers 20, the plurality of wireless access points including at least a first access point and a second access point (Paragraphs 0032-0035).

Akman et al. (US 2010/0075678) teaches Central nodes that enables wireless communications and that provides the plurality of radio resources to a radio access network using the Common Public Radio Interface (CPRI) protocol (Paragraphs 0004 and 0022).

Heinz-Dieter (EP 1924109) teaches wherein one or more central nodes assigns a first subset of the number of the plurality of radio resources to the first access point and a second subset of the number of the plurality of radio resources to the second access point, the first subset including more radio resources than the second subset (See abstract; Paragraphs [0016-0020, especially Paragraphs [0020]]).

However, as a whole, none of the prior art cited alone or in combination provides the motivation to teach wherein, in response to a change in need of a number of wireless subscribers coupled to the second access point and which of the second subset is loaded beyond a threshold, the one or more central nodes assign additional radio resources of the plurality of radio resources to the second access point.

Regarding claims 12 and 20, the prior art of record, specifically Hunter, JR. et al. (US Patent Application Publication #2011/0241425) teaches a method comprising:
receiving a plurality of radio resources from an operator hub (base station 14)
(Paragraphs 0032-0035).

Akman et al. (US 2010/0075678) teaches receiving a plurality of radio resources from an operator hub that operates using a Common Public Radio Interface (CPRI) protocol (Paragraphs 0004 and 0022).

Heinz-Dieter (EP 1924109) teaches assigning a first subset of the plurality of radio resources to a first access point included in a plurality of wireless access points

and a second subset of the plurality of radio resources to a second access point included in the plurality of wireless access points, the first subset including more radio resources than the second subset (See abstract; Paragraphs [0016-0020, especially Paragraphs [0020]).

However, as a whole, none of the prior art cited alone or in combination provides the motivation to teach in response to a change in need by a number of wireless subscribers coupled to the second access point and which of the second subset is loaded beyond a threshold, assigning one or more additional radio resources of the plurality of radio resources to the second access point.

Dependent claims 2-11 and 13-19 are allowed for the same reason.

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".

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DOMINIC E REGO whose telephone number is (571)272-8132. The examiner can normally be reached on Monday-Friday, 8:00am-4:30pm.

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

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wesley Kim can be reached on 571-272-7867. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <https://ppair-my.uspto.gov/pair/PrivatePair>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DOMINIC E REGO/
Primary Examiner, Art Unit 2648
Tel 571-272-8132

Examiner-Initiated Interview Summary	Application No. 16/944,028	Applicant(s) LEMSON et al.		
	Examiner DOMINIC E REGO	Art Unit 2648	AIA (First Inventor to File) Status No	Page 1 of 1

All Participants (applicant, applicants representative, PTO personnel)	Title	Type
DOMINIC E REGO	Primary Examiner	Telephonic
Sarah Mirza	Attorney	

Date of Interview: 05 November 2020

Issues Discussed:

Other

Claims 1-20 were allowed on 09/09/2020. Applicant's representative filed IDS on 09/16/2020 and in that IDS, cited reference, EP1,924,109, is a potential reference that teaches all of the allowable subject matter of claims 1, 12, and 20. In the interview, Examiner thoroughly discussed the prior art in view of claims 1, 12, and 20, and Applicant's representative agreed to amend claims 1, 12, and 20 in such a way in order to overcome the prior art.

/DOMINIC E REGO/ Primary Examiner, Art Unit 2648	
Applicant is reminded that a complete written statement as to the substance of the interview must be made of record in the application file. It is the applicants responsibility to provide the written statement, unless the interview was initiated by the Examiner and the Examiner has indicated that a written summary will be provided. See MPEP 713.04 Please further see: MPEP 713.04 Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews, paragraph (b) 37 CFR § 1.2 Business to be transacted in writing	

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

Doc code: IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/ISB/08a (02-18)

Approved for use through 11/30/2020. OMB 0851-0031

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	16944028
	Filing Date	2020-07-30
	First Named Inventor	Paul Lemson
	Art Unit	2648
	Examiner Name	Dominic E Rego
	Attorney Docket Number	DALI0003USC6C1PX

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	1	20100177760	A1	2010-07-15	Cannon et al.			
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	1	1 924 109	EP	A1	2008-05-21	Alcatel Lucent		
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EFS Web 2.1.18

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.E.R/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		16944028
	Filing Date		2020-07-30
	First Named Inventor	Paul Lemson	
	Art Unit	2648	
	Examiner Name	Dominic E Rego	
Attorney Docket Number		DALI0003USC6C1PX	

1			
If you wish to add additional non-patent literature document citation information please click the Add button Add			
EXAMINER SIGNATURE			
Examiner Signature	/DOMINIC E REGO/		Date Considered 11/16/2020
*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	16944028
	Filing Date	2020-07-30
	First Named Inventor	Paul Lemson
	Art Unit	2648
	Examiner Name	Dominic E Rego
	Attorney Docket Number	DALI0003USC6C1PX

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	/Sarah Mirza/	Date (YYYY-MM-DD)	2020-09-16
Name/Print	Sarah Mirza	Registration Number	74866

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 record s.
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.

EFS Web 2.1.18

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.E.R/

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S383	29	(dali near2 wireless).as.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/11/15 17:20
S384	362	((combin\$3 combination synthesiz\$3 affiliat\$3 aggregat\$3 add\$3 addition composit\$3 integrat\$3 mix\$3 cumulative\$1 jointly summation) same first near4 path same second near4 path same single near4 path).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/11/15 17:20
S385	0	S383 and S384	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/11/15 17:20
S386	896	(paul near lemson).in. (shawn near patrick near stapleton).in. (sasa near trajkovic).in. (albert near2 lee).in.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/11/15 17:20
S387	0	S386 and S384	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/11/15 17:20
S388	80,201	(H04W72/0453 H04W24/02 H04W40/02 H04W72/0486 H04W88/085 H04L5/0032 H04L5/0048 H04L25/02 H04L45/56 H04L47/125 H03F1/3247 H03F3/24 H03F2200/204 H03F2201/3224 H03F2201/3233 H04Q2011/0081 H04Q2213/1301).cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/11/15 17:20
S389	16,979	assign\$3 near8 (additional extra more) near8 resource\$1	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/11/15 17:20
S390	96	S389 same (different various multi\$3 many several numerous variety plurality alternat\$3 another other second primary secondary two) near2 (router access adj2 (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/11/15 17:20

S391	29	S388 and S390	US-PGPUB; USPAT; DERWENT	OR	ON	2020/11/15 17:20
S392	3	S391 and (@ad <= "20100914" @rlad <= "20100914" @pd <= "20100914")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/11/15 17:20
S393	127	(first primary) near2 sub\$set with radio near2 resource\$1 with second\$3 near2 sub\$set	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/11/15 17:20
S394	27	S393 same (additional extra more) with resource\$1	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/11/15 17:20

11/16/2020 12:25:57 PM

C:\Users\drego\Documents\EAST\Workspaces\16944028.wsp

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL (Submitted Only via EFS-Web)							
Application Number	16/944,028	Filing Date	2020-07-30	Docket Number (if applicable)	DALI0003USC6C1	Art Unit	2648
First Named Inventor	Paul Lemson			Examiner Name	Dominic E. Rego		
This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application. Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV							
SUBMISSION REQUIRED UNDER 37 CFR 1.114							
Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).							
☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.							
☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____							
☐ Other _____							
☒ Enclosed							
☐ Amendment/Reply							
☒ Information Disclosure Statement (IDS)							
☐ Affidavit(s)/ Declaration(s)							
☐ Other _____							
MISCELLANEOUS							
☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____ (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)							
☐ Other _____							
FEES							
☒ The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed. The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No <u>506640</u>							
SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED							
☒ Patent Practitioner Signature ☐ Applicant Signature							

Doc code: RCEX

Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (02-18)

Approved for use through 11/30/2020. OMB 0851-0031

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

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

Signature of Registered U.S. Patent Practitioner			
Signature	Sarah Mirza/	Date (YYYY-MM-DD)	2020-12-09
Name	Sarah Mirza	Registration Number	74866

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

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

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The 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.
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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

EFS - Web 2.1.16

Doc code: IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (02-18)

Approved for use through 11/30/2020. OMB 0651-0031

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

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		16944028
	Filing Date		2020-07-30
	First Named Inventor	Paul Lemson	
	Art Unit	2648	
	Examiner Name	Dominic E. Rego	
	Attorney Docket Number	DALI0003USC6C1	

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	6785558	B1	2004-08-31	Stratford et al.		
	2	8958789	B2	2015-02-17	Bauman et al.		
	3	8346091	B2	2013-01-01	Kummetz et al.		
	4	6801767	B1	2004-10-05	Schwartz et al.		
	5	7286507	B1	2007-10-23	Oh et al.		
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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	20090180426	A1	2009-07-16	Sabat et al.		

EFS Web 2.1.18

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		16944028
	Filing Date		2020-07-30
	First Named Inventor	Paul Lemson	
	Art Unit	2648	
	Examiner Name	Dominic E. Rego	
Attorney Docket Number		DALI0003USC6C1	

2	20100128676	A1	2010-05-27	Wu et al.
3	20050157675	A1	2005-07-21	Feder et al.

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	1							

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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	CPRI Specification V 4.0 (2008-06-30) "Common Public Radio Interface (CPRI); Interface Specification"	
	2	Standard Reference Books" to include three books, and provides front and back matter and selected pages: Charles E. Spurgeon, Ethernet The Definitive Guide 99, 101-201 (O'Reilly & Associates, Inc., 2000) (Ex. 1028); Ray Horak, Telecommunications and Data Communications Handbook 353-366, 375-385, 394-397 (John Wiley & Sons, Inc. 2007) (Ex. 1027); and Network Design Basics for Cabling Professionals 41-67, 69-117, 119-134, 315-327	
	3	Open Base Station Architecture Initiative, BTS System Reference Document Version 2.0 2006	
	4	Open Base Station Architecture Initiative, Reference Point 3 Specification Version 3.1, 2006	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		16944028
	Filing Date		2020-07-30
	First Named Inventor	Paul Lemson	
	Art Unit	2648	
	Examiner Name	Dominic E. Rego	
Attorney Docket Number		DALI0003USC6C1	

5	CPRI, Common Public Radio Interface, Specification, Feb 21, 2009		
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		16944028
	Filing Date		2020-07-30
	First Named Inventor	Paul Lemson	
	Art Unit		2648
	Examiner Name	Dominic E. Rego	
Attorney Docket Number		DALI0003USC6C1	

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	/Sarah Mirza/	Date (YYYY-MM-DD)	2020-12-09
Name/Print	Sarah Mirza	Registration Number	74866
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

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

Electronic Patent Application Fee Transmittal				
Application Number:		16944028		
Filing Date:		30-Jul-2020		
Title of Invention:		REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS		
First Named Inventor/Applicant Name:		Paul LEMSON		
Filer:		Sarah W. Mirza/Brandon Kistler		
Attorney Docket Number:		DALI0003USC6C1		
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
RCE- 1ST REQUEST	1801	1	1360	1360
Total in USD (\$)				1360

Electronic Acknowledgement Receipt	
EFS ID:	41338977
Application Number:	16944028
International Application Number:	
Confirmation Number:	7090
Title of Invention:	REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS
First Named Inventor/Applicant Name:	Paul LEMSON
Customer Number:	107456
Filer:	Sarah W. Mirza/Brandon Kistler
Filer Authorized By:	Sarah W. Mirza
Attorney Docket Number:	DALI0003USC6C1
Receipt Date:	09-DEC-2020
Filing Date:	30-JUL-2020
Time Stamp:	15:59:39
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$1360
RAM confirmation Number	E2020B9G00057875
Deposit Account	506640
Authorized User	Brandon Kistler
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.21 (Miscellaneous fees and charges) 37 CFR 1.19 (Document supply fees)	

37 CFR 1.17 (Patent application and reexamination processing fees)					
File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Continued Examination (RCE)	DALI0003USC6C1-RCE.pdf	1349925	no	3
			be4a3c6c7b4a5011ee91e807d3da3600a4513203		
Warnings:					
Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	DALI0003USC6C1-IDS.pdf	1035161	no	5
			edba95f497d09223a71284635ad4ac9a0029d4d8		
Warnings:					
Information:					
3	Non Patent Literature	NPL1-CPRI-Specification-Common-Public-Radio-Interface.pdf	1460545	no	96
			dbbf76194ebea73e889fd360199c6c05c02c1a5f		
Warnings:					
Information:					
4	Non Patent Literature	NPL2-Standard-Reference-Bookss.pdf	13662387	no	116
			69f2b228e2092e6b1ac6463a4b2102dd7c52d7e0		
Warnings:					
Information:					
5	Non Patent Literature	NPL3-Open-Base-Station-Architecture.pdf	1613166	no	151
			934150e10164cae4c0416eaceda2a14a46e1eb2e		
Warnings:					
Information:					
6	Non Patent Literature	NPL4-Open-Base-Station-Reference-Point-3.pdf	751175	no	116
			d8a2b915a7f08c5ac32ac591477c69e84538fc7		
Warnings:					
Information:					

7	Non Patent Literature	NPL5-Common-Public-Radio-Interface-Specification.pdf	214653	no	3				
			6235807a90a90305c595cc460cc85307dd8ae426						
Warnings:									
Information:									
8	Fee Worksheet (SB06)	fee-info.pdf	30571	no	2				
			6a5845426670781d94ffa5e82c9869a287a2c1ec						
Warnings:									
Information:									
Total Files Size (in bytes):			20117583						
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.									



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NOTICE OF ALLOWANCE AND FEE(S) DUE

107456 7590 12/23/2020
Artegis Law Group, LLP
John Carey
7710 Cherry Park Drive Suite T #104
Houston, TX 77095

EXAMINER	
REGO, DOMINIC E	
ART UNIT	PAPER NUMBER
2648	

DATE MAILED: 12/23/2020

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/944,028	07/30/2020	Paul LEMSON	DALI0003USC6C1	7090

TITLE OF INVENTION: REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$600	\$0.00	\$0.00	\$600	03/23/2021

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

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

Page 1 of 3

PTOL-85 (Rev. 02/11)

PART B - FEE(S) TRANSMITTAL

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

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

By fax, send to: (571)-273-2885

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

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

107456 7590 12/23/2020
Artegis Law Group, LLP
John Carey
7710 Cherry Park Drive Suite T #104
Houston, TX 77095

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

Certificate of Mailing or Transmission

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

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/944,028	07/30/2020	Paul LEMSON	DALI0003USC6C1	7090

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nonprovisional	SMALL	\$600	\$0.00	\$0.00	\$600	03/23/2021

EXAMINER	ART UNIT	CLASS-SUBCLASS
REGO, DOMINIC E	2648	370-329000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

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

1 _____

2 _____

3 _____

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

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

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

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

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

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

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

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

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

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

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

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

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/944,028	07/30/2020	Paul LEMSON	DALI0003USC6C1	7090
107456 7590 12/23/2020 Artegis Law Group, LLP John Carey 7710 Cherry Park Drive Suite T #104 Houston, TX 77095			EXAMINER REGO, DOMINIC E	
			ART UNIT	PAPER NUMBER
			2648	

DATE MAILED: 12/23/2020

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

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

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

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

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

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

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

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

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

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

Notice of Allowability	Application No. 16/944,028	Applicant(s) LEMSON et al.	
	Examiner DOMINIC E REGO	Art Unit 2648	AIA (FITF) Status No

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

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 12/09/2020.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 1-20 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

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

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

* Certified copies not received: _____.

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

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

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

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

/DOMINIC E REGO/
Primary Examiner, Art Unit 2648

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

Allowable Subject Matter

2. Claims 1-20 are allowed for the same reasons presented in the previous office action mailed on 11/20/2020.
3. 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."

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DOMINIC E REGO whose telephone number is (571)272-8132. The examiner can normally be reached on Monday-Friday, 8:00am-4:30pm.

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

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wesley Kim can be reached on 571-272-7867. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <https://ppair-my.uspto.gov/pair/PrivatePair>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DOMINIC E REGO/
Primary Examiner, Art Unit 2648
Tel 571-272-8132

<i>Search Notes</i> 	Application/Control No. 16/944,028	Applicant(s)/Patent Under Reexamination LEMSON et al.
	Examiner DOMINIC E REGO	Art Unit 2648

CPC - Searched*		
Symbol	Date	Examiner
H04W72/0453 H04W24/02 H04W40/02 H04W72/0486 H04W88/085	09/03/2020	DR
H04L5/0032 H04L5/0048 H04L25/02 H04L45/56 H04L47/125	09/03/2020	DR
H03F1/3247 H03F3/24 H03F2200/204 H03F2201/3224 H03F2201/3233	09/03/2020	DR
H04Q2213/1301	09/03/2020	DR

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

/DOMINIC E REGO/ Primary Examiner, Art Unit 2648	
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<i>Search Notes</i> 	Application/Control No. 16/944,028	Applicant(s)/Patent Under Reexamination LEMSON et al.
	Examiner DOMINIC E REGO	Art Unit 2648

Search Notes		
Search Notes	Date	Examiner
H04W72/0453 H04W24/02 H04W40/02 H04W72/0486 H04W88/085	09/03/2020	DR
H04L5/0032 H04L5/0048 H04L25/02 H04L45/56 H04L47/125	09/03/2020	DR
H03F1/3247 H03F3/24 H03F2200/204 H03F2201/3224 H03F2201/3233	09/03/2020	DR
H04Q2213/1301	09/03/2020	DR
EAST, Inventor, and Assignee search	09/03/2020	DR
IPR16/944,028 Reviewed Inter Partes Review of U.S. Patent No. 8,682,338 on 09/03/2020	09/03/2020	DR
Updated above search	12/16/2020	DR
NPL search using ip.com, google patent, and google scholar	12/16/2020	DR

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
	PGPUB Text Search-See interference search history	09/03/2020	DR
	Updated above search	12/16/2020	DR

/DOMINIC E REGO/ Primary Examiner, Art Unit 2648	
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Issue Classification 	Application/Control No. 16/944,028	Applicant(s)/Patent Under Reexamination LEMSON et al.
	Examiner DOMINIC E REGO	Art Unit 2648

CPC						
Symbol				Type	Version	
H04W	/	72	/	0453	F	2013-01-01
H03F	/	1	/	3247	I	2013-01-01
H03F	/	3	/	24	I	2013-01-01
H04L	/	5	/	0048	I	2013-01-01
H04L	/	25	/	02	I	2013-01-01
H04W	/	24	/	02	I	2013-01-01
H04B	/	10	/	2575	I	2013-01-01
H04W	/	88	/	085	I	2013-01-01
H04B	/	10	/	25753	I	2013-01-01
H04L	/	5	/	0032	I	2013-01-01
H04Q	/	11	/	0067	I	2013-01-01
H04W	/	72	/	0486	I	2013-01-01
H04L	/	45	/	56	I	2013-01-01
H04L	/	47	/	125	I	2013-01-01
H04W	/	40	/	02	I	2013-01-01
H03F	/	2200	/	204	A	2013-01-01
H03F	/	2201	/	3224	A	2013-01-01
H03F	/	2201	/	3233	A	2013-01-01
H04Q	/	2213	/	1301	A	2013-01-01
H04Q	/	2011	/	0081	A	2013-01-01

CPC Combination Sets				
Symbol	Type	Set	Ranking	Version

NONE	Total Claims Allowed:	
(Assistant Examiner)	(Date)	20
/DOMINIC E REGO/	16 December 2020	O.G. Print Claim(s)
Primary Examiner, Art Unit 2648	(Date)	O.G. Print Figure
(Primary Examiner)		1
		4

U.S. Patent and Trademark Office

Part of Paper No.: 20201216

Issue Classification 	Application/Control No. 16/944,028	Applicant(s)/Patent Under Reexamination LEMSON et al.
	Examiner DOMINIC E REGO	Art Unit 2648

INTERNATIONAL CLASSIFICATION			
CLAIMED			
H04W		72	04
H04W		88	08
H04W		40	02
H04L		12	803
H04L		5	00
H04B		10	2575
NON-CLAIMED			

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS

CROSS REFERENCES(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	20	
/DOMINIC E REGO/ Primary Examiner, Art Unit 2648	16 December 2020	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	4

U.S. Patent and Trademark Office

Part of Paper No.: 20201216

Web Search History

date, time	web site	search string
12/16/2020 8:51:46 PM	Google Patents (old)	(assign) (additional OR extra OR more) (resource)
12/16/2020 8:53:50 PM	Google Patents	Keyword Group 1 [(assign) (additional OR extra OR more) (resource)]
12/16/2020 8:54:43 PM	Google Patents	Keyword Group 1 [(assign) (additional OR extra OR more) (resource)] Before Priority Date: priority:20100914
12/16/2020 8:56:05 PM	Google Patents	Keyword Group 1 [(assign) (additional OR extra OR more) (resource) (first OR primary) (subset) (radio) (resource)] Before Priority Date: priority:20100914
12/16/2020 8:56:52 PM	Google Patents	Keyword Group 1 [(assign) (additional OR extra OR more) (resource) (first OR primary) (subset) (radio) (resource) (baseband) (controller)] Before Priority Date: priority:20100914
12/16/2020 8:59:17 PM	Google Patents	Keyword Group 1 [(assign) (additional OR extra OR more) (resource) (first OR primary) (subset) (radio) (resource) (baseband) (controller) (common) (public) (radio) (interface) (cpri)] Before Priority Date: priority:20100914
12/16/2020 8:59:36 PM	Google Scholar	google scholar
12/16/2020 8:59:56 PM	Google Scholar	(assign) (additional OR extra OR more) (resource) (first OR primary) (subset) (radio) (resource) (baseband) (controller)
12/16/2020 9:00:04 PM	Google Scholar	(assign) (additional OR extra OR more) (resource) (first OR primary) (subset) (radio) (resource) (baseband) (controller) [before:2010]
12/16/2020 9:00:29 PM	Google Scholar	[before:2010] (assign) (additional OR extra OR more) (resource) (first OR primary) (subset) (radio) (resource) (baseband) (controller) (cpri)

Main Concept Text Patent search using ip.com

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one or more central nodes that receive a number of a plurality of radio resources from an operator hub that enables wireless communications and that provides the plurality of radio resources to a radio access network using the Common Public Radio Interface (CPRI) protocol; and a plurality of wireless access points that is coupled to the one or more central nodes and distributes one or more wireless signals to one or more wireless subscribers, the plurality of wireless access points including at least a first access point and a second access point, wherein one or more central nodes assigns a first subset of the number of the plurality of radio resources to the first access point and a second subset of the number of the plurality of radio resources to the second access point, the first subset including more radio resources than the second subset, and wherein, in response to a change in need of a number of wireless subscribers coupled to the second access point, the one or more central nodes assign additional radio resources of the plurality of radio resources to the second access point.

(No Concept Modifiers)

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Filters (1)

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Publication Date: From 2000-07-25 To 2010-09-14

Options

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De-dup: Simple Family Numbers

Cut-off: None

Sort: Relevance

Content: Patent Publications (164)

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US Patents

US Designs

US Applications

EPO Patents

EPO Applications

China Patents

China Applications

Japan Patents

Japan Applications

Korea Patents

Korea Applications

WIPO Applications
 Argentina Patents
 Argentina Applications
 Brazil Patents
 Brazil Applications
 Canada Patents
 Canada Applications
 Chile Patents
 Chile Applications
 Colombia Applications
 Costa Rica Applications
 Cuba Patents
 Cuba Applications
 Dominican Republic Applications
 Ecuador Patents
 Ecuador Applications
 El Salvador Applications
 Guatemala Applications
 Honduras Applications
 Mexico Patents
 Mexico Applications
 Nicaragua Patents
 Panama Applications
 Peru Applications
 Trinidad & Tobago Patents
 Uruguay Applications
 Austria Patents
 Austria Applications
 Belarus Patents
 Belgium Patents
 Belgium Applications
 Bosnia & Herzegovina Patents
 Bosnia & Herzegovina Applications
 Bulgaria Patents
 Bulgaria Applications
 Croatia Patents
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Main Concept Text

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one or more central nodes that receive a number of a plurality of radio resources from an operator hub that enables wireless communications and that provides the plurality of radio resources to a radio access network using the Common Public Radio Interface (CPRI) protocol; and a plurality of wireless access points that is coupled to the one or more central nodes and distributes one or more wireless signals to one or more wireless subscribers, the plurality of wireless access points including at least a first access point and a second access point, wherein one or more central nodes assigns a first subset of the number of the plurality of radio resources to the first access point and a second subset of the number of the plurality of radio resources to the second access point, the first subset including more radio resources than the second subset, and wherein, in response to a change in need of a number of wireless subscribers coupled to the second access point, the one or more central nodes assign additional radio resources of the plurality of radio resources to the second access point.

(No Concept Modifiers)

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Filters (1)

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Publication Date: From 1987-06-01 To 2010-04-14

Options

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De-dup: None

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Sort: Relevance

Content: Non-Patent Literature (25)

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	30	(dali near2 wireless).as.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:21
L2	232	((radio near3 (node device station terminal unit module equipment apparatus mean\$1) rru router access adj (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g" wireless-B wireless-G wireless near2 lan local near2 node wan wlan wireless near local near area near network wifi hot\$spot perononal near2 area near2 network\$3 pan) same (wcd wireless near communication near2 (mean\$1 terminal device unit apparatus station user subscriber phone cellular radio cell adj phone mobile equipment) cellular cell adj phone (wireless communication) near2 (mean\$1 terminal device unit apparatus station user subscriber phone cellular cell adj phone mobile equipment) phone telephone cordless hand\$free hand adj free hand\$held hand adj held subscriber electronic near2 (node device station terminal unit module equipment component apparatus mean\$1)) same control\$4 with switch\$3 same resource\$1).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:21
L3	0	L1 and L2	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:21
L4	902	(paul near lemson).in. (shawn near patrick near stapleton).in. (sasa near trajkovic).in. (albert near2 lee).in.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:21
L5	0	L4 and L2	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:21

12/16/2020 9:07:31 PM
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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L6	320,518	(different various multi\$3 many several numerous variety plurality alternat\$3 another other second primary secondary two) near2 (radio near3 (node device station terminal unit module equipment apparatus mean\$1) rru router access adj (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g" wireless-B wireless-G wireless near2 lan local near2 node wan wlan wireless near local near area near network wifi hot\$spot perononal near2 area near2 network\$3 pan)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:22
L7	37,168	L6 with (different various multi\$3 many several numerous variety plurality alternat\$3 another other second primary secondary two) near2 (wcd wireless near communication near2 (mean\$1 terminal device unit apparatus station user subscriber phone cellular radio cell adj phone mobile equipment) cellular cell adj phone (wireless communication) near2 (mean\$1 terminal device unit apparatus station user subscriber phone cellular cell adj phone mobile equipment) phone telephone cordless hand\$free hand adj free hand\$held hand adj held subscriber electronic near2 (node device station terminal unit module equipment component apparatus mean\$1))	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:22
L8	22	L7 same base\$band near2 control\$4	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:22
L9	81,136	(H04W72/0453 H04W24/02 H04W40/02 H04W72/0486 H04W88/085 H04L5/0032 H04L5/0048 H04L25/02 H04L45/56 H04L47/125 H03F1/3247 H03F3/24 H03F2200/204 H03F2201/3224 H03F2201/3233 H04Q2011/0081 H04Q2213/1301).cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:22
L10	11	L8 and (@ad <= "20100914" @rlad <= "20100914" @pd <= "20100914")	US-PGPUB; USPAT;	OR	ON	2020/12/16 20:22

			USOCR; EPO; JPO			
L11	0	L9 and L10	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:22
L12	552,781	(distribut\$3 near2 antenna near2 system das (array adaptive distribut\$3) near5 antenna\$1)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:23
L13	221,031	(different various multi\$3 many several numerous variety plurality alternat\$3 another other second primary secondary two) adj2 (radio near3 (node device station terminal unit module equipment apparatus mean\$1) rru router access adj (port point device terminal station equipment nodes\$1 unit) ap "802.11a" "802.11b" "802.11g" wireless-B wireless- G wireless near2 lan local near2 node wan wlan wireless near local near area near network wifi hot\$spot peronol near2 area near2 network\$3 pan)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:23
L14	15,934	L13 with (different various multi\$3 many several numerous variety plurality alternat\$3 another other second primary secondary two) adj2 (wcd wireless near communication near2 (mean\$1 terminal device unit apparatus station user subscriber phone cellular radio cell adj phone mobile equipment) cellular cell adj phone (wireless communication) near2 (mean\$1 terminal device unit apparatus station user subscriber phone cellular cell adj phone mobile equipment) phone telephone cordless hand\$free hand adj free hand\$held hand adj held subscriber electronic near2 (node device station terminal unit module equipment component apparatus mean\$1))	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:23
L15	117	L12 same L14	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:23
L16	0	L15 same assign\$4 near6 radio near2 resourc\$1	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:23

L17	30	(base\$band base near2 band) with control\$4 with assign\$4 near6 radio near2 resourc\$1	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:23
L18	16	L17 and (@ad <= "20100914" @rlad <= "20100914" @pd <= "20100914")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:23
L19	4	L17 with (different various multi\$3 many several numerous variety plurality alternat\$3 another other second primary secondary two) adj2 (radio near3 (node device station terminal unit module equipment apparatus mean\$1) rru router access adj (port point device terminal station equipment nodes\$1 unit) ap "802.11a" "802.11b" "802.11g" wireless-B wireless-G wireless near2 lan local near2 node wan wlan wireless near local near area near network wifi hot\$spot pernonal near2 area near2 network\$3 pan)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:23
L20	22	L17 with (radio near3 (node device station terminal unit module equipment apparatus mean\$1) rru router access adj (port point device terminal station equipment nodes\$1 unit) ap "802.11a" "802.11b" "802.11g" wireless-B wireless-G wireless near2 lan local near2 node wan wlan wireless near local near area near network wifi hot\$spot pernonal near2 area near2 network\$3 pan)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:23
L21	17	L9 and L20	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:23
L22	11	L21 and (@ad <= "20100914" @rlad <= "20100914" @pd <= "20100914")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:23
L23	3	base\$band near2 (control\$4 control near2 (node device station terminal unit module equipment component apparatus mean\$1)) near8 assign\$3 near6 resource\$1	US-PGPUB; USPAT; DERWENT	OR	ON	2020/12/16 20:24
L24	0	L23 and (@ad <= "20100914" @rlad <= "20100914" @pd <= "20100914")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:24

L25	81,136	(H04W72/0453 H04W24/02 H04W40/02 H04W72/0486 H04W88/085 H04L5/0032 H04L5/0048 H04L25/02 H04L45/56 H04L47/125 H03F1/3247 H03F3/24 H03F2200/204 H03F2201/3224 H03F2201/3233 H04Q2011/0081 H04Q2213/1301).cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:37
L26	39	base\$band with (control\$4 control near2 (node device station terminal unit module equipment component apparatus mean\$1)) with assign\$3 near6 resource\$1	US-PGPUB; USPAT; DERWENT	OR	ON	2020/12/16 20:37
L27	8	L25 and L26	US-PGPUB; USPAT; DERWENT	OR	ON	2020/12/16 20:37
L28	0	L27 and (@ad <= "20100914" @rlad <= "20100914" @pd <= "20100914")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:37
L29	1	L26 and (@ad <= "20100914" @rlad <= "20100914" @pd <= "20100914")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:37
L30	2,331	(control\$4 control near2 (node device station terminal unit module equipment component apparatus mean\$1)) near8 assign\$3 near6 radio near3 resource\$1	US-PGPUB; USPAT; DERWENT	OR	ON	2020/12/16 20:38
L31	42	L30 with (different various multi\$3 many several numerous variety plurality alternat\$3 another other second primary secondary two) adj2 (wcd wireless near communication near2 (mean\$1 terminal device unit apparatus station user subscriber phone cellular radio cell adj phone mobile equipment) cellular cell adj phone (wireless communication) near2 (mean\$1 terminal device unit apparatus station user subscriber phone cellular cell adj phone mobile equipment) phone telephone cordless hand\$free hand adj free hand\$held hand adj held subscriber electronic near2 (node device station terminal unit module equipment component apparatus mean\$1))	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:38
L32	21	L31 and (@ad <= "20100914" @rlad <= "20100914" @pd <= "20100914")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:38

L33	7	L25 and L32	US-PGPUB; USPAT; DERWENT	OR	ON	2020/12/16 20:38
L34	81,136	(H04W72/0453 H04W24/02 H04W40/02 H04W72/0486 H04W88/085 H04L5/0032 H04L5/0048 H04L25/02 H04L45/56 H04L47/125 H03F1/3247 H03F3/24 H03F2200/204 H03F2201/3224 H03F2201/3233 H04Q2011/0081 H04Q2213/1301).cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:38
L35	17,193	assign\$3 near8 (additional extra more) near8 resource\$1	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:38
L36	97	L35 same (different various multi\$3 many several numerous variety plurality alternat\$3 another other second primary secondary two) near2 (router access adj2 (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:38
L37	29	L34 and L36	US-PGPUB; USPAT; DERWENT	OR	ON	2020/12/16 20:38
L38	3	L37 and (@ad <= "20100914" @rlad <= "20100914" @pd <= "20100914")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:38
L39	128	(first primary) near2 sub\$set with radio near2 resource\$1 with second\$3 near2 sub\$set	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:39
L40	28	L39 same (additional extra more) with resource\$1	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2020/12/16 20:39
L41	2	16/944028	US-PGPUB; USPAT; DERWENT	OR	ON	2020/12/16 20:43
L42	19	"6785558".pn. "8958789".pn. "8346091".pn. "6801767".pn. "7286507".pn. "20090180426" "20100128676" "20050157675"	US-PGPUB; USPAT; DERWENT	OR	ON	2020/12/16 21:06

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	Filing Date		2020-07-30
	First Named Inventor	Paul Lemson	
	Art Unit	2648	
	Examiner Name	Dominic E. Rego	
	Attorney Docket Number	DALI0003USC6C1	

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	2	8958789	B2	2015-02-17	Bauman et al.		
	3	8346091	B2	2013-01-01	Kummetz et al.		
	4	6801767	B1	2004-10-05	Schwartz et al.		
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	First Named Inventor	Paul Lemson	
	Art Unit	2648	
	Examiner Name	Dominic E. Rego	
Attorney Docket Number		DALI0003USC6C1	

2	20100128676	A1	2010-05-27	Wu et al.
3	20050157675	A1	2005-07-21	Feder et al.

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	1	CPRI Specification V 4.0 (2008-06-30) "Common Public Radio Interface (CPRI); Interface Specification"	
	2	Standard Reference Books" to include three books, and provides front and back matter and selected pages: Charles E. Spurgeon, Ethernet The Definitive Guide 99, 101-201 (O'Reilly & Associates, Inc., 2000) (Ex. 1028); Ray Horak, Telecommunications and Data Communications Handbook 353-366, 375-385, 394-397 (John Wiley & Sons, Inc. 2007) (Ex. 1027); and Network Design Basics for Cabling Professionals 41-67, 69-117, 119-134, 315-327	
	3	Open Base Station Architecture Initiative, BTS System Reference Document Version 2.0 2006	
	4	Open Base Station Architecture Initiative, Reference Point 3 Specification Version 3.1, 2006	

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	First Named Inventor	Paul Lemson	
	Art Unit	2648	
	Examiner Name	Dominic E. Rego	
Attorney Docket Number		DALI0003USC6C1	

5	CPRI, Common Public Radio Interface, Specification, Feb 21, 2009		
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	Filing Date	2020-07-30
	First Named Inventor	Paul Lemson
	Art Unit	2648
	Examiner Name	Dominic E. Rego
	Attorney Docket Number	DALI0003USC6C1

CERTIFICATION STATEMENT

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

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

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See attached certification statement.

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

☒ 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	/Sarah Mirza/	Date (YYYY-MM-DD)	2020-12-09
Name/Print	Sarah Mirza	Registration Number	74866

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

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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.
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EFS Web 2.1.18

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.E.R/

THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	§	Confirmation No.:	7090
Paul LEMSON, et al.	§		
	§	Group Art Unit:	2648
Serial No.: 16/944,028	§		
	§	Examiner:	Dominic E. Rego
Filed: July 30, 2020	§		

For: REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS

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

STATEMENT OF SUBSTANCE

Dear Sir or Madam:

On November 5, 2020, a telephonic interview was held between Examiner Dominic E. Rego and Applicant's Representative Sarah Mirza (Reg. No. 74,866). During the interview, the following issues were discussed as reflected in the Examiner's Interview Summary dated November 20, 2020. Claims 1-20 were allowed on 09/09/2020. Applicant's representative filed IDS on 09/16/2020 and in that IDS, cited reference, EP1,924,109, is a potential reference that teaches all of the allowable subject matter of claims 1, 12, and 20. In the interview, Examiner thoroughly discussed the prior art in view of claims 1, 12, and 20, and Applicant's representative agreed to amend claims 1, 12, and 20 in such a way in order to overcome the prior art. The Examiner's interview summary is hereby incorporated herein by reference.

Respectfully submitted,

/Sarah Mirza/

Sarah Mirza
Registration No. 74,866
ARTEGIS LAW GROUP, LLP
710 Lakeway Drive, Suite 185
Sunnyvale, CA 94085
Telephone: (408) 715-1213
Facsimile: (408) 715-1201
Attorney for Applicant

Page 1

Electronic Acknowledgement Receipt	
EFS ID:	41721909
Application Number:	16944028
International Application Number:	
Confirmation Number:	7090
Title of Invention:	REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS
First Named Inventor/Applicant Name:	Paul LEMSON
Customer Number:	107456
Filer:	Sarah W. Mirza/Christine Fortier
Filer Authorized By:	Sarah W. Mirza
Attorney Docket Number:	DALI0003USC6C1
Receipt Date:	22-JAN-2021
Filing Date:	30-JUL-2020
Time Stamp:	16:23:15
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	Applicant summary of interview with examiner	DALI0003USC6C1_Statement_of_Substance.pdf	80350 e1256dd1197d636e87774079cb1ade23d7f8fb43	no	1

Warnings:

Information:	
Total Files Size (in bytes):	80350
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.	

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL (Submitted Only via EFS-Web)					
Application Number	16/944,028	Filing Date	2020-07-30	Docket Number (if applicable)	DALI0003USC6C1
				Art Unit	2648
First Named Inventor	Paul LEMSON			Examiner Name	Dominic E. Rego
This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application. Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV					
SUBMISSION REQUIRED UNDER 37 CFR 1.114					
Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).					
☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.					
☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____					
☐ Other _____					
☒ Enclosed					
☐ Amendment/Reply					
☒ Information Disclosure Statement (IDS)					
☐ Affidavit(s)/ Declaration(s)					
☐ Other _____					
MISCELLANEOUS					
☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____ (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)					
☐ Other _____					
FEES					
☒ The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed. The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No <u>506640</u>					
SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED					
☒ Patent Practitioner Signature					
☐ Applicant Signature					

Doc code: RCEX

Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (02-18)

Approved for use through 11/30/2020. OMB 0851-0031

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

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

Signature of Registered U.S. Patent Practitioner			
Signature	Sarah Mirza/	Date (YYYY-MM-DD)	2021-03-23
Name	Sarah Mirza	Registration Number	74866

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

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

EFS - Web 2.1.16

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.

EFS - Web 2.1.16

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	16944028
	Filing Date	2020-07-30
	First Named Inventor	Paul LEMSON
	Art Unit	2648
	Examiner Name	Dominic E. Rego
	Attorney Docket Number	DALI0003USC6C1

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							
If you wish to add additional U.S. Patent citation information please click the Add button.							Add	
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	20070223614	A1	2007-09-27	Kuchibhotla et al.			
	2	20100182984	A1	2010-07-22	Herscovici et al.			
	3	20080070632	A1	2008-03-20	Obuchi et al.			
	4	20070121543	A1	2007-05-31	Kuchibhotla et al.			
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FOREIGN PATENT DOCUMENTS							Remove	
Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²ⁱ	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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		16944028
	Filing Date		2020-07-30
	First Named Inventor	Paul LEMSON	
	Art Unit	2648	
	Examiner Name	Dominic E. Rego	
Attorney Docket Number		DALI0003USC6C1	

	1					
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.				T ⁵
	1	Notice of Allowance issued for U.S. Patent Application Serial No. 17/000,188 dated November 25, 2020, 13 pages				
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		16944028
	Filing Date		2020-07-30
	First Named Inventor	Paul LEMSON	
	Art Unit	2648	
	Examiner Name	Dominic E. Rego	
Attorney Docket Number		DALI0003USC6C1	

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	/Sarah Mirza/	Date (YYYY-MM-DD)	2021-03-23
Name/Print	Sarah Mirza	Registration Number	74866
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

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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
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Electronic Patent Application Fee Transmittal				
Application Number:		16944028		
Filing Date:		30-Jul-2020		
Title of Invention:		REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS		
First Named Inventor/Applicant Name:		Paul LEMSON		
Filer:		Sarah W. Mirza/Brandon Kistler		
Attorney Docket Number:		DALI0003USC6C1		
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
RCE- 2ND AND SUBSEQUENT REQUEST	2820	1	1000	1000
Total in USD (\$)				1000

Electronic Acknowledgement Receipt	
EFS ID:	42255098
Application Number:	16944028
International Application Number:	
Confirmation Number:	7090
Title of Invention:	REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS
First Named Inventor/Applicant Name:	Paul LEMSON
Customer Number:	107456
Filer:	Sarah W. Mirza/Brandon Kistler
Filer Authorized By:	Sarah W. Mirza
Attorney Docket Number:	DALI0003USC6C1
Receipt Date:	23-MAR-2021
Filing Date:	30-JUL-2020
Time Stamp:	12:52:56
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 1000
RAM confirmation Number	E20213MC53450555
Deposit Account	506640
Authorized User	Brandon Kistler
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.17 (Patent application and reexamination processing fees) 37 CFR 1.19 (Document supply fees)	

37 CFR 1.21 (Miscellaneous fees and charges)					
File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Continued Examination (RCE)	DALI0003USC6C1-RCE.PDF	1349897	no	3
			0de378d91ba71b4e69d4c9a0d925963d928694e0		
Warnings:					
Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	DALI0003USC6C1-IDS.PDF	1034385	no	4
			48562a240accb176e1fd8b55999b842366b1a782		
Warnings:					
Information:					
3	Non Patent Literature	NPL1- NOA-17000188-11-25-2020. PDF	692376	no	13
			5e41cec147a9ec3180f58e98cab295a29c4ef218		
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30444	no	2
			67000aae83c40e577f906e17d29ff38c7f96dd15		
Warnings:					
Information:					
Total Files Size (in bytes):			3107102		

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New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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



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

107456 7590 04/07/2021
Artegis Law Group, LLP
John Carey
7710 Cherry Park Drive Suite T #104
Houston, TX 77095

EXAMINER	
REGO, DOMINIC E	
ART UNIT	PAPER NUMBER
2648	

DATE MAILED: 04/07/2021

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/944,028	07/30/2020	Paul LEMSON	DALI0003USC6C1	7090

TITLE OF INVENTION: REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$600	\$0.00	\$0.00	\$600	07/07/2021

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

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

Page 1 of 3

PTOL-85 (Rev. 02/11)

PART B - FEE(S) TRANSMITTAL

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

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

By fax, send to: (571)-273-2885

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

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

107456 7590 04/07/2021
Artegis Law Group, LLP
John Carey
7710 Cherry Park Drive Suite T #104
Houston, TX 77095

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

Certificate of Mailing or Transmission

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

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/944,028	07/30/2020	Paul LEMSON	DALI0003USC6C1	7090

TITLE OF INVENTION: REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$600	\$0.00	\$0.00	\$600	07/07/2021

EXAMINER	ART UNIT	CLASS-SUBCLASS
REGO, DOMINIC E	2648	370-329000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

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

1 _____

2 _____

3 _____

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

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

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

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

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

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

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

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

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

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

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

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

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/944,028	07/30/2020	Paul LEMSON	DALI0003USC6C1	7090
107456	7590	04/07/2021	EXAMINER	
Artegis Law Group, LLP John Carey 7710 Cherry Park Drive Suite T #104 Houston, TX 77095			REGO, DOMINIC E	
			ART UNIT	PAPER NUMBER
			2648	

DATE MAILED: 04/07/2021

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

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

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

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

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

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

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

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

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

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

Notice of Allowability	Application No. 16/944,028	Applicant(s) LEMSON et al.	
	Examiner DOMINIC E REGO	Art Unit 2648	AIA (FITF) Status No

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

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 03/23/2021.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 1-20. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

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

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

* Certified copies not received: _____.

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

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

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

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

/DOMINIC E REGO/
Primary Examiner, Art Unit 2648

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

Allowable Subject Matter

2. Claims 1-20 are allowed for the same reasons presented in the office action mailed on 12/23/2020 and updated search performed on 03/30/2021.

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."

Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DOMINIC E REGO whose telephone number is (571)272-8132. The examiner can normally be reached on Monday-Friday, 8:00am-4:30pm.

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

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wesley Kim can be reached on 571-272-7867. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <https://ppair-my.uspto.gov/pair/PrivatePair>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DOMINIC E REGO/
Primary Examiner, Art Unit 2648
Tel 571-272-8132

Issue Classification 	Application/Control No. 16/944,028	Applicant(s)/Patent Under Reexamination LEMSON et al.
	Examiner DOMINIC E REGO	Art Unit 2648

CPC						
Symbol					Type	Version
H04W	/	72	/	0453	F	2013-01-01
H03F	/	1	/	3247	I	2013-01-01
H03F	/	3	/	24	I	2013-01-01
H04L	/	5	/	0048	I	2013-01-01
H04L	/	25	/	02	I	2013-01-01
H04W	/	24	/	02	I	2013-01-01
H04B	/	10	/	2575	I	2013-01-01
H04W	/	88	/	085	I	2013-01-01
H04B	/	10	/	25753	I	2013-01-01
H04L	/	5	/	0032	I	2013-01-01
H04Q	/	11	/	0067	I	2013-01-01
H04W	/	72	/	0486	I	2013-01-01
H04L	/	45	/	56	I	2013-01-01
H04L	/	47	/	125	I	2013-01-01
H04W	/	40	/	02	I	2013-01-01
H03F	/	2200	/	204	A	2013-01-01
H03F	/	2201	/	3224	A	2013-01-01
H03F	/	2201	/	3233	A	2013-01-01
H04Q	/	2213	/	1301	A	2013-01-01
H04Q	/	2011	/	0081	A	2013-01-01

CPC Combination Sets						
Symbol				Type	Set	Ranking
	/		/			

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	20	
/DOMINIC E REGO/ Primary Examiner, Art Unit 2648	30 March 2021	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	4

U.S. Patent and Trademark Office Part of Paper No.: 20210330

Issue Classification 	Application/Control No. 16/944,028	Applicant(s)/Patent Under Reexamination LEMSON et al.
	Examiner DOMINIC E REGO	Art Unit 2648

INTERNATIONAL CLASSIFICATION				
CLAIMED				
H04W	/	72	/	04
H04W	/	88	/	08
H04W	/	40	/	02
H04L	/	12	/	803
H04L	/	5	/	00
H04B	/	10	/	2575
NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS

CROSS REFERENCES(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	20	
/DOMINIC E REGO/ Primary Examiner, Art Unit 2648	30 March 2021	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	4

U.S. Patent and Trademark Office

Part of Paper No.: 20210330

Issue Classification 	Application/Control No. 16/944,028	Applicant(s)/Patent Under Reexamination LEMSON et al.
	Examiner DOMINIC E REGO	Art Unit 2648

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47																
CLAIMS																
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	20	
/DOMINIC E REGO/ Primary Examiner, Art Unit 2648	30 March 2021	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	4

U.S. Patent and Trademark Office Part of Paper No.: 20210330

Search Notes 	Application/Control No. 16/944,028	Applicant(s)/Patent Under Reexamination LEMSON et al.
	Examiner DOMINIC E REGO	Art Unit 2648

CPC - Searched*		
Symbol	Date	Examiner
H04W72/0453 H04W24/02 H04W40/02 H04W72/0486 H04W88/085	09/03/2020	DR
H04L5/0032 H04L5/0048 H04L25/02 H04L45/56 H04L47/125	09/03/2020	DR
H03F1/3247 H03F3/24 H03F2200/204 H03F2201/3224 H03F2201/3233	09/03/2020	DR
H04Q2213/1301	09/03/2020	DR

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

/DOMINIC E REGO/ Primary Examiner, Art Unit 2648	
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Search Notes 	Application/Control No. 16/944,028	Applicant(s)/Patent Under Reexamination LEMSON et al.
	Examiner DOMINIC E REGO	Art Unit 2648

Search Notes		
Search Notes	Date	Examiner
H04W72/0453 H04W24/02 H04W40/02 H04W72/0486 H04W88/085	09/03/2020	DR
H04L5/0032 H04L5/0048 H04L25/02 H04L45/56 H04L47/125	09/03/2020	DR
H03F1/3247 H03F3/24 H03F2200/204 H03F2201/3224 H03F2201/3233	09/03/2020	DR
H04Q2213/1301	09/03/2020	DR
EAST, Inventor, and Assignee search	09/03/2020	DR
IPR16/944,028 Reviewed Inter Partes Review of U.S. Patent No. 8,682,338 on 09/03/2020	09/03/2020	DR
Updated above search	12/16/2020	DR
NPL search using ip.com, google patent, and google scholar	12/16/2020	DR
Updated above search	03/30/2021	DR

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
	PGPUB Text Search-See interference search history	09/03/2020	DR
	Updated above search	12/16/2020	DR
	Updated above search	03/30/2021	DR

/DOMINIC E REGO/ Primary Examiner, Art Unit 2648	
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EAST Search History**EAST Search History (Prior Art)**

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	30	(dali near2 wireless).as.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:10
L2	241	((radio near3 (node device station terminal unit module equipment apparatus mean\$1) rru router access adj (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g" wireless-B wireless-G wireless near2 lan local near2 node wan wlan wireless near local near area near network wifi hot\$spot peronol near2 area near2 network\$3 pan) same (wcd wireless near communication near2 (mean\$1 terminal device unit apparatus station user subscriber phone cellular radio cell adj phone mobile equipment) cellular cell adj phone (wireless communication) near2 (mean\$1 terminal device unit apparatus station user subscriber phone cellular cell adj phone mobile equipment) phone telephone cordless hand\$free hand adj free hand\$held hand adj held subscriber electronic near2 (node device station terminal unit module equipment component apparatus mean\$1)) same control\$4 with switch\$3 same resource\$1).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:10
L3	0	L1 and L2	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:10
L4	912	(paul near lemson).in. (shawn near patrick near stapleton).in. (sasa near trajkovic).in. (albert near2 lee).in.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:10
L5	1	L4 and L2	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:10

3/30/2021 4:48:14 PM
C:\Users\drego\Documents\EAST\Workspaces\16944028.wsp

Main Concept Text NPL and Patent search using ip.com

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one or more central nodes that receive a number of a plurality of radio resources from an operator hub that enables wireless communications and that provides the plurality of radio resources to a radio access network using the Common Public Radio Interface (CPRI) protocol; and a plurality of wireless access points that is coupled to the one or more central nodes and distributes one or more wireless signals to one or more wireless subscribers, the plurality of wireless access points including at least a first access point and a second access point, wherein one or more central nodes assigns a first subset of the number of the plurality of radio resources to the first access point and a second subset of the number of the plurality of radio resources to the second access point, the first subset including more radio resources than the second subset, and wherein, in response to a change in need of a number of wireless subscribers coupled to the second access point, the one or more central nodes assign additional radio resources of the plurality of radio resources to the second access point

(No Concept Modifiers)

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Filters (1)

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Publication Date: From 2000-07-25 To 2010-09-14

Options

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De-dup: Simple Family Numbers (PAT only)

Cut-off: None

Sort: Relevance

Content: Patents + NPL (188)

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US Patents

US Designs

US Applications

EPO Patents

EPO Applications

China Patents

China Applications

Japan Patents

Japan Applications

Korea Patents

Korea Applications

WIPO Applications
 Argentina Patents
 Argentina Applications
 Brazil Patents
 Brazil Applications
 Canada Patents
 Canada Applications
 Chile Patents
 Chile Applications
 Colombia Applications
 Costa Rica Applications
 Cuba Patents
 Cuba Applications
 Dominican Republic Applications
 Ecuador Patents
 Ecuador Applications
 El Salvador Applications
 Guatemala Applications
 Honduras Applications
 Mexico Patents
 Mexico Applications
 Nicaragua Patents
 Panama Applications
 Peru Applications
 Trinidad & Tobago Patents
 Uruguay Applications
 Austria Patents
 Austria Applications
 Belarus Patents
 Belgium Patents
 Belgium Applications
 Bosnia & Herzegovina Patents
 Bosnia & Herzegovina Applications
 Bulgaria Patents
 Bulgaria Applications
 Croatia Patents
 Croatia Applications
 Czech Republic Patents
 Czech Republic Applications
 Czechoslovakia Patents
 Czechoslovakia Applications
 Denmark Patents
 Denmark Applications
 Estonia Patents
 Estonia Applications
 EUIPO Patents
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 Finland Applications

France Patents
France Applications
Germany Patents
Germany Applications
Great Britain Patents
Great Britain Applications
Greece Patents
Greece Applications
Hungary Patents
Hungary Applications
Iceland Patents
Iceland Applications
Ireland Patents
Ireland Applications
Italy Patents
Italy Applications
Latvia Patents
Latvia Applications
Lithuania Patents
Lithuania Applications
Luxembourg Patents
Malta Patents
Monaco Patents
Montenegro Patents
Montenegro Applications
Netherlands Patents
Netherlands Applications
Norway Patents
Norway Applications
Poland Patents
Poland Applications
Portugal Patents
Portugal Applications
Republic of Moldova Patents
Republic of Moldova Applications
Romania Patents
Romania Applications
San Marino Patents
San Marino Applications
Serbia Patents
Serbia Applications
Slovakia Patents
Slovakia Applications
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date, time	web site	search string
3/30/2021 5:10:24 PM	Google Patents	Keyword Group 1 [(radio) (resource) (access) (point)]
3/30/2021 5:10:48 PM	Google Patents	Keyword Group 1 [(radio) (resource) (access) (point)] Before Priority Date: priority:20100914
3/30/2021 5:12:05 PM	Google Patents	Keyword Group 1 [(radio) (resource) (access) (point) (assign) (set OR subset) first OR primary)] Before Priority Date: priority:20100914
3/30/2021 5:12:22 PM	Google Patents	Keyword Group 1 [(radio) (resource) (access) (point) (assign) (set OR subset) (first OR primary)] Before Priority Date: priority:20100914
3/30/2021 5:12:43 PM	Google Patents	Keyword Group 1 [(radio) (resource) (access) (point) (assign) (set OR subset) (first OR primary) (second OR secondary)] Before Priority Date: priority:20100914
3/30/2021 5:13:39 PM	Google Patents	Keyword Group 1 [(radio) (resource) (access) (point) (assign) (set OR subset) (first OR primary) (second OR secondary) (additional OR extra) (radio) (resource)] Before Priority Date: priority:20100914
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3/30/2021 5:14:39 PM	Google Scholar	(radio) (resource) (access) (point) (assign) (set OR subset) (first OR primary) (second OR secondary) (additional OR extra) (radio) (resource)
3/30/2021 5:18:33 PM	Google Scholar	(radio) (resource) (access) (point) (assign) (set OR subset) (first OR primary) (second OR secondary) (additional OR extra) (radio) (resource) [before:2010]

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L6	327,459	(different various multi\$3 many several numerous variety plurality alternat\$3 another other second primary secondary two) near2 (radio near3 (node device station terminal unit module equipment apparatus mean\$1) rru router access adj (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g" wireless-B wireless-G wireless near2 lan local near2 node wan wlan wireless near local near area near network wifi hot\$spot peronol near2 area near2 network\$3 pan)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:10
L7	37,972	L6 with (different various multi\$3 many several numerous variety plurality alternat\$3 another other second primary secondary two) near2 (wcd wireless near communication near2 (mean\$1 terminal device unit apparatus station user subscriber phone cellular radio cell adj phone mobile equipment) cellular cell adj phone (wireless communication) near2 (mean\$1 terminal device unit apparatus station user subscriber phone cellular cell adj phone mobile equipment) phone telephone cordless hand\$free hand adj free hand\$held hand adj held subscriber electronic near2 (node device station terminal unit module equipment component apparatus mean\$1))	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:10
L8	23	L7 same base\$band near2 control\$4	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:10
L9	23	L7 same base\$band near2 control\$4	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:11
L10	84,739	(H04W72/0453 H04W24/02 H04W40/02 H04W72/0486 H04W88/085 H04L5/0032 H04L5/0048 H04L25/02 H04L45/56 H04L47/125 H03F1/3247 H03F3/24 H03F2200/204 H03F2201/3224	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:11

		H03F2201/3233 H04Q2011/0081 H04Q2213/1301).cpc.				
L11	12	L9 and (@ad <= "20100914" @rlad <= "20100914" @pd <= "20100914")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:11
L12	1	L10 and L11	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:11
L13	566,159	(distribut\$3 near2 antenna near2 system das (array adaptive distribut\$3) near5 antenna\$1)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:12
L14	225,863	(different various multi\$3 many several numerous variety plurality alternat\$3 another other second primary secondary two) adj2 (radio near3 (node device station terminal unit module equipment apparatus mean\$1) rru router access adj (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g" wireless-B wireless- G wireless near2 lan local near2 node wan wlan wireless near local near area near network wifi hot\$spot perononal near2 area near2 network\$3 pan)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:12
L15	16,228	L14 with (different various multi\$3 many several numerous variety plurality alternat\$3 another other second primary secondary two) adj2 (wcd wireless near communication near2 (mean\$1 terminal device unit apparatus station user subscriber phone cellular radio cell adj phone mobile equipment) cellular cell adj phone (wireless communication) near2 (mean\$1 terminal device unit apparatus station user subscriber phone cellular cell adj phone mobile equipment) phone telephone cordless hand\$free hand adj free hand\$held hand adj held subscriber electronic near2 (node device station terminal unit module equipment component apparatus mean\$1))	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:12
L16	125	L13 same L15	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:12
L17	0	L16 same assign\$4 near6 radio near2 resourc\$1	US-PGPUB; USPAT;	OR	ON	2021/03/30 16:12

			USOCR; EPO; JPO			
L18	10	"20070223614" "20100182984" "20080070632" "20070121543"	US-PGPUB; USPAT; DERWENT	OR	ON	2021/03/30 16:22
L19	12,407	(distribut\$3 near2 antenna near2 system das) same (internet near2 protocol ip)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:42
L20	6,279	L19 same (wcd wireless near communication near2 (mean\$1 terminal device unit apparatus station user subscriber phone cellular cell adj phone mobile equipment) cellular cell adj phone mobile portable pda terminal device user equipment (wireless communication) near2 (mean\$1 terminal device unit apparatus station user subscriber phone cellular cell adj phone mobile equipment) phone telephone cordless hand\$free hand adj free hand\$held hand adj held wtru subscriber station\$1 electronic near2 (node device station terminal unit) apparatus mean\$1)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:42
L21	31	L20 same traffic near4 (data information)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:42
L22	50,547	(H04W72/0453 H04W24/02 H04W40/02 H04W88/085 H04L45/56 H04L47/125).cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:42
L23	15	L21 and L22	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:42
L24	30	(base\$band base near2 band) with control\$4 with assign\$4 near6 radio near2 resourc\$1	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:42
L25	16	L24 and (@ad <= "20100914" @rlad <= "20100914" @pd <= "20100914")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:42
L26	4	L24 with (different various multi\$3 many several numerous variety plurality alternat\$3 another other second primary secondary two) adj2 (radio near3 (node device station terminal unit module	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:43

		equipment apparatus mean\$1) rru router access adj (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g" wireless-B wireless-G wireless near2 lan local near2 node wan wlan wireless near local near area near network wifi hot\$spot pernonal near2 area near2 network\$3 pan)				
L27	22	L24 with (radio near3 (node device station terminal unit module equipment apparatus mean\$1) rru router access adj (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g" wireless-B wireless-G wireless near2 lan local near2 node wan wlan wireless near local near area near network wifi hot\$spot pernonal near2 area near2 network\$3 pan)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:46
L28	17	L10 and L27	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:46
L29	11	L28 and (@ad <= "20100914" @rlad <= "20100914" @pd <= "20100914")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:46
L30	5	base\$band near2 (control\$4 control near2 (node device station terminal unit module equipment component apparatus mean\$1)) near8 assign\$3 near6 resource\$1	US-PGPUB; USPAT; DERWENT	OR	ON	2021/03/30 16:46
L31	5	base\$band near2 (control\$4 control near2 (node device station terminal unit module equipment component apparatus mean\$1)) near8 assign\$3 near6 resource\$1	US-PGPUB; USPAT; DERWENT	OR	ON	2021/03/30 16:46
L32	1	L31 and (@ad <= "20100914" @rlad <= "20100914" @pd <= "20100914")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:46
L33	84,739	(H04W72/0453 H04W24/02 H04W40/02 H04W72/0486 H04W88/085 H04L5/0032 H04L5/0048 H04L25/02 H04L45/56 H04L47/125 H03F1/3247 H03F3/24 H03F2200/204 H03F2201/3224 H03F2201/3233 H04Q2011/0081 H04Q2213/1301).cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:46

L34	42	base\$band with (control\$4 control near2 (node device station terminal unit module equipment component apparatus mean\$1)) with assign\$3 near6 resource\$1	US-PGPUB; USPAT; DERWENT	OR	ON	2021/03/30 16:46
L35	11	L33 and L34	US-PGPUB; USPAT; DERWENT	OR	ON	2021/03/30 16:46
L36	1	L35 and (@ad <= "20100914" @rlad <= "20100914" @pd <= "20100914")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:46
L37	2	L34 and (@ad <= "20100914" @rlad <= "20100914" @pd <= "20100914")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:46
L38	2,385	(control\$4 control near2 (node device station terminal unit module equipment component apparatus mean\$1)) near8 assign\$3 near6 radio near3 resource\$1	US-PGPUB; USPAT; DERWENT	OR	ON	2021/03/30 16:47
L39	45	L38 with (different various multi\$3 many several numerous variety plurality alternat\$3 another other second primary secondary two) adj2 (wcd wireless near communication near2 (mean\$1 terminal device unit apparatus station user subscriber phone cellular radio cell adj phone mobile equipment) cellular cell adj phone (wireless communication) near2 (mean\$1 terminal device unit apparatus station user subscriber phone cellular cell adj phone mobile equipment) phone telephone cordless hand\$free hand adj free hand\$held hand adj held subscriber electronic near2 (node device station terminal unit module equipment component apparatus mean\$1))	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:47
L40	22	L39 and (@ad <= "20100914" @rlad <= "20100914" @pd <= "20100914")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 16:47
L41	8	L33 and L40	US-PGPUB; USPAT; DERWENT	OR	ON	2021/03/30 16:47
L42	133	(first primary) near2 sub\$set with radio near2 resource\$1 with second\$3 near2 sub\$set	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 17:15

L43	31	L42 same (additional extra more) with resource\$1	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 17:15
L44	84,739	(H04W72/0453 H04W24/02 H04W40/02 H04W72/0486 H04W88/085 H04L5/0032 H04L5/0048 H04L25/02 H04L45/56 H04L47/125 H03F1/3247 H03F3/24 H03F2200/204 H03F2201/3224 H03F2201/3233 H04Q2011/0081 H04Q2213/1301).cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 17:15
L45	17,992	assign\$3 near8 (additional extra more) near8 resource\$1	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 17:15
L46	100	L45 same (different various multi\$3 many several numerous variety plurality alternat\$3 another other second primary secondary two) near2 (router access adj2 (port point device terminal station equipment node\$1 unit) ap "802.11a" "802.11b" "802.11g")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 17:15
L47	30	L44 and L46	US-PGPUB; USPAT; DERWENT	OR	ON	2021/03/30 17:15
L48	3	L47 and (@ad <= "20100914" @rlad <= "20100914" @pd <= "20100914")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2021/03/30 17:15
L49	8	L33 and L40	US-PGPUB; USPAT; DERWENT	OR	ON	2021/03/30 17:15

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Doc code: IDS

Doc description: Information Disclosure Statement (IDS) Filed

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	Filing Date		2020-07-30
	First Named Inventor	Paul LEMSON	
	Art Unit	2648	
	Examiner Name	Dominic E. Rego	
	Attorney Docket Number	DALI0003USC6C1	

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	2	20100182984	A1	2010-07-22	Herscovici et al.			
	3	20080070632	A1	2008-03-20	Obuchi et al.			
	4	20070121543	A1	2007-05-31	Kuchibholla et al.			
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	Filing Date		2020-07-30
	First Named Inventor	Paul LEMSON	
	Art Unit	2648	
	Examiner Name	Dominic E. Rego	
Attorney Docket Number		DALI0003USC6C1	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	16944028
	Filing Date	2020-07-30
	First Named Inventor	Paul LEMSON
	Art Unit	2648
	Examiner Name	Dominic E. Rego
	Attorney Docket Number	DALI0003USC6C1

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

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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	/Sarah Mirza/	Date (YYYY-MM-DD)	2021-03-23
Name/Print	Sarah Mirza	Registration Number	74866

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

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(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/944,028	07/30/2020	Paul LEMSON	DALI0003USC6C1	7090

TITLE OF INVENTION: REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$600	\$0.00	\$0.00	\$600	07/07/2021

EXAMINER	ART UNIT	CLASS-SUBCLASS
REGO, DOMINIC E	2648	370-329000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

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

1 Artegis Law Group, LLP

2 _____

3 _____

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

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

DALI WIRELESS, INC.

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

Menlo Park, California

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

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

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

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

☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. 50-6640JCC

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

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

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

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

Authorized Signature /Sarah Mirza/

Date April 21, 2021

Typed or printed name Sarah Mirza

Registration No. 74866

Electronic Patent Application Fee Transmittal				
Application Number:		16944028		
Filing Date:		30-Jul-2020		
Title of Invention:		REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS		
First Named Inventor/Applicant Name:		Paul LEMSON		
Filer:		Sarah W. Mirza/Brandon Kistler		
Attorney Docket Number:		DALI0003USC6C1		
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	2501	1	600	600

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				600

Electronic Acknowledgement Receipt	
EFS ID:	42514887
Application Number:	16944028
International Application Number:	
Confirmation Number:	7090
Title of Invention:	REMOTELY RECONFIGURABLE DISTRIBUTED ANTENNA SYSTEM AND METHODS
First Named Inventor/Applicant Name:	Paul LEMSON
Customer Number:	107456
Filer:	Sarah W. Mirza/Brandon Kistler
Filer Authorized By:	Sarah W. Mirza
Attorney Docket Number:	DALI0003USC6C1
Receipt Date:	21-APR-2021
Filing Date:	30-JUL-2020
Time Stamp:	16:34:47
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$600
RAM confirmation Number	E20214KG35141295
Deposit Account	506640
Authorized User	Brandon Kistler
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.19 (Document supply fees) 37 CFR 1.20 (Post Issuance fees)	

37 CFR 1.21 (Miscellaneous fees and charges)					
File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	DALI0003USC6C1-Issue-Fee-Transmittal.pdf	118688	no	1
			25d4f095f65d9c8586c65c38d759af484acc0349		
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30552	no	2
			683b4c34c067725d6cba7f67e4523cc09f4705b6		
Warnings:					
Information:					
Total Files Size (in bytes):			149240		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					



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United States Patent and Trademark Office
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www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/944,028	06/01/2021	11026232	DALI0003USC6C1	7090

107456 7590 05/12/2021

Artegis Law Group, LLP
John Carey
7710 Cherry Park Drive Suite T #104
Houston, TX 77095

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

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

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

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

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

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

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

Paul LEMSON, Woodinville, WA;
DALI WIRELESS, INC., Menlo Park, CA;
Shawn Patrick STAPLETON, Vancouver, CANADA;
Sasa TRAJKOVIC, Burnaby, CANADA;
Albert S. LEE, Vancouver, CANADA;

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IR103 (Rev. 10/09)



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www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE	REQUEST ID
16/944,028	07/30/2020	Paul LEMSON	DALI0003USC6C1	154767

Acknowledgement of Loss of Entitlement to Entity Status Discount

The entity status change request below filed through Private PAIR on 12/20/2021 has been accepted.

CERTIFICATIONS:

Change of Entity Status:

☒ Applicant changing to regular undiscounted fee status.

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

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

Signature:	/Sarah Mirza/
Name:	Sarah Mirza
Registration Number:	74866

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

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

DOCKET NO. 2:22-cv-12	DATE FILED 1/7/2022	U.S. DISTRICT COURT Eastern District of Texas
PLAINTIFF DALI WIRELESS, INC.		DEFENDANT AT&T CORP., et al
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 8,682,338	3/25/2014	Dali Wireless, Inc.
2 9,197,358	11/24/2015	Dali Wireless, Inc.
3 11,026,232	6/1/2021	Dali Wireless, Inc.
4 10,334,499	6/25/2019	Dali Wireless, Inc.
5		

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

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

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

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE
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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 126 (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 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 _____ for the Western District of Texas _____ on the following

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

DOCKET NO. 6:22-cv-104	DATE FILED 1/27/2022	U.S. DISTRICT COURT for the Western District of Texas
PLAINTIFF Dali Wireless, Inc.		DEFENDANT Cellico Partnership d/b/a Verizon Wireless, et al.
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 11,026,232	6/1/2021	Dali Wireless, Inc.
2 10,334,499	6/25/2019	Dali Wireless, Inc.
3 11,006,343	5/11/2021	Dali Wireless, Inc.
4 8,682,338	3/25/2014	Dali Wireless, Inc.
5		

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

DATE INCLUDED	INCLUDED BY		
	☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading		
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK	
1			
2			
3			
4			
5			

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

DECISION/JUDGEMENT		
CLERK	(BY) DEPUTY CLERK	DATE

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