

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

COMMSCOPE TECHNOLOGIES, LLC,
Petitioner,

v.

DALI WIRELESS, INC.,
Patent Owner.

Case IPR2023-00820
U.S. Patent No. 11,006,343
Issued: May 11, 2021
Filed: May 13, 2019

PETITION FOR *INTER PARTES* REVIEW OF PATENT NO. 11,006,343

UNDER 35 U.S.C. §§ 311-319 and 37 C.F.R. §§ 42.1-.80, 42.100-.107

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<i>Sotera Wireless, Inc. v. Masimo Corporations (§ II.A)</i> , IPR2020-01019, Paper 12 (Dec. 1, 2020)	70

Petitioner's Exhibit List

Exhibit No.	Description
1001	U.S. Patent No. 11,006,343 (“’343 Patent”) to Stapleton et al., Provisional filing date of February 7, 2011.
1002	U.S. Patent No. 10,080,178 (“’178 Patent”) to Stapleton et al., Provisional filing date of February 7, 2011.
1003	U.S. Patent No. 9,531,473 (“’473 Patent”) to Lemson et al., Provisional filing date of September 14, 2010.
1004	Decision Granting Institution of <i>Inter Partes Review</i> for the 178 Patent (Case IPR2020-01473, Paper 18), Entered: March 12, 2021.
1005	Judgment Granting Request for Adverse Judgment After Institution of Trial for the 178 Patent (Case IPR2020-01473, Paper 21), Entered: June 30, 2021.
1006	Final Written Decision for the 473 Patent (Case PR2018-00571, Paper 53), Entered: August 12, 2019.
1007	U.S. Patent Pub. No. 2010/0128676 (“Wu”) to Dong Wu et al., Publication Date of May 27, 2010.
1008	U.S. Patent No. 6,963,552 (“Sabat-552”) to Sabat et al., Patent Issue Date of November 8, 2005.
1009	U.S. Patent Pub. No. 2009/0180426 (“Sabat-426”) to Sabat et al., Publication Date of July 16, 2009.
1010	ERICSSON AB ET AL., <i>CPRI Specification V4.0; Interface Specification</i> , June 30, 2008.
1011	U.S. Patent No. 7,286,507 (“Oh”) to Oh et al., Patent Issue Date of October 23, 2007.
1012	Corrected Declaration of Dr. Henry Houh in support of IPR for U.S. Patent No. 11,006,343 as filed originally in IPR No. IPR2022-01345.

1013	Selected File History for U.S. Patent No. 11,006,343.
1014	Intentionally Left Blank
1015	International Application Publication WO 2009/021359 A1 published on February 19, 2009 (“Leng”)
1016	Certified Translation of Leng (EX-1015)
1017	U.S. Patent Pub. No. 2010/0177760 A1 (“Cannon”) to Cannon et al., Patent Publication Date of July 15, 2010.
1018	U.S. Pat. No. 8,588,614 (“Larsen”) to Larsen, Filing Date of May 18, 2010.
1019	Decision Denying Institution of <i>Inter Partes Review</i> for the 10,334,499 Patent (“’499 Patent”) (Case IPR2020-01430, Paper 15), Entered: February 9, 2021.
1020	Select pages from prosecution history of 16/059,434 (that resulted in US Patent No 10,334,499)
1021	Related Patents.
1022	U.S. Provisional Patent Application Serial No. 61/374,593
1023	U.S. Patent No. 8,270,387 (“Cannon”) to Cannon et al., Filing Date of January 13, 2010
1024	Claim Construction Order, <i>Dali Wireless, Inc. v. Cellco P’Ship</i> , 6:22-cv-01313 (W.D. Texas Feb. 2, 2023)
1025	Complaint in <i>Dali Wireless, Inc. v. T-Mobile US, Inc., et al.</i> , No. 2:22-cv-414 (E.D.Tex.).
1026	Summons Returned Executed in <i>Dali Wireless, Inc. v. T-Mobile US, Inc., et al.</i> , No. 2:22-cv-414 (E.D.Tex.).

I. INTRODUCTION

CommScope Technologies, LLC (“Petitioner”) petitions for *Inter Partes Review* (“IPR”) of claims 1-22 (“the Challenged Claims”) of U.S. Patent No. 11,006,343 (“the ’343 Patent”). For the reasons explained below, there exists a reasonable likelihood that Petitioner will prevail with respect to at least one of the Challenged Claims. Indeed, the Board has already instituted review of the Challenged Claims in an IPR filed by Ericsson. This Petition presents the same grounds as the prior IPR and is based on the same expert declaration as the prior IPR. This Petition is accompanied by a motion for joinder.

The Challenged Claims are unpatentable under 35 U.S.C. § 103 in view of the prior art discussed herein. The ’343 Patent is a continuation of a continuation (the ’499 Patent), and shares an identical specification with, Patent No. 10,080,178 (the “’178 Patent”) (EX-1002). The ’343 Patent also shares an overlapping specification with Patent No. 9,531,473 (the “’473 Patent”) (EX-1003). This Petition demonstrates that the Challenged Claims are unpatentable for the same reasons and based on the same prior art that formed the bases of the Board’s institution of *inter partes* review of the ’178 Patent (IPR2020-01473, Paper 18 (EX-1004)), resulting in an adverse judgment against Dali Wireless, Inc. (“Patent Owner” or “PO”) canceling all claims of the parent ’178 Patent (IPR2020-01473, Paper 21 (EX-1005)).

This Petition demonstrates by a preponderance of the evidence that there is a reasonable likelihood that Petitioner will prevail with respect to at least one of the Challenged Claims. This Petition also demonstrates that the Challenged Claims are not patentably distinct from the claims canceled by adverse judgment in the '178 Patent such that PO is estopped under 37 C.F.R. §42.73(d)(3) from taking any action before the Office inconsistent therewith. Accordingly, Petitioner requests that the Board institute *inter partes* review of the '343 Patent pursuant to 37 C.F.R. §42.108.

II. OVERVIEW

The Challenged Claims are unpatentable as obvious over the following prior art reference that formed the basis for the cancellation of Claims 1-25 in the parent '178 Patent:

- Wu: Patent Application Pub. No. 2010/0128676 (EX-1007)

The Challenged Claims are unpatentable over Wu for the same reasons the Board instituted *inter partes* review of the parent '178 Patent – resulting in the cancellation of Claims 1-25 by PO and an entry of adverse judgment. See EX-1005. Specifically, in a decision to institute *inter partes* review of the parent '178 Patent, the Board found:

We determine that Petitioner has shown a reasonable likelihood of success in demonstrating that claims 1–25 are anticipated by Wu, [and] obvious over Wu, ...

EX-1004, 46.

The canceled claims of the parent '178 Patent are directed to distributed antenna systems (DASs) that include one or more digital access units (DAUs)(host units), each connected to one or more base stations (signal sources) and one or more digital remote units (DRUs). More specifically, the canceled claims are directed to a DAU (host unit) (independent Claims 1 and 21), system (independent Claim 10), and a method (independent Claim 15) for use in transport of wireless communications wherein:

- a. the host unit (DAU) receives a plurality downlink channel signals from at least one signal source (base station);
- b. the host unit (DAU) is configured to send digital representations of the plurality of downlink channel signals to a plurality of digital remote units (DRUs);
- c. the host unit sends digital representations of a first set of downlink channel signals to a first DRU;
- d. the host unit sends digital representations of a second set of downlink channel signals to the first DRU; and
- e. wherein the number of downlink channel signals in the first set is different from the number of downlink channel signals in the second set.

The Challenged Claims of the '343 Patent are substantially the same as the canceled claims of the parent '178 Patent. The Challenged Claims refer to the “host

unit” (DAU) as a “*digital access unit*” and to the “downlink channel signals” received from a signal source as “*radio resources*.” The Challenged Claims are directed to a system to transport wireless communications (independent Claim 1) and method for wireless communications (independent Claim 12). The substantially similar scope of the canceled claims and the Challenged Claims is illustrated by a side-by-side comparison of the independent system claim from each patent:

178 Patent – Claim 10	343 Patent – Claim 1
1. A system for transporting wireless communications, comprising:	1. A system to transport wireless communications, comprising:
a host unit;	a digital access unit;
a plurality of remote units, including at least a first remote unit and a second remote unit;	a plurality of remote units, including at least a first remote unit and a second remote unit;
wherein the host unit comprises at least one interface to communicatively couple the host unit to at least one signal source;	a plurality of signal sources, including at least a first signal source and a second signal source; wherein the digital access unit comprises a plurality of interfaces to communicatively couple the digital access unit to the plurality of signal sources;
wherein the host unit is configured to receive a plurality of downlink channel signals from the at least one signal source;	wherein the digital access unit is configured to receive a plurality of radio resources from the first signal source and the second signal source;
wherein the host unit is configured to send digital representations of the plurality of downlink channel signals to the plurality of remote units;	

wherein the host unit is configurable to send digital representations of a first set of downlink channel signals to the first remote unit at a first point in time, the first set of downlink channel signals for transmission at an antenna of the first remote unit;	wherein the digital access unit is configured to send a digital representation of a first set of radio resources to the first remote unit at a first point in time, the first set of radio resources for transmission at an antenna of the first remote unit;
wherein the host unit is configurable to send digital representations of a second set of downlink channel signals to the first remote unit at a second point in time, the second set of downlink channel signals for transmission at the antenna of the first remote unit;	wherein the digital access unit is configured to send a digital representation of a second set of radio resources to the first remote unit at a second point in time, the second set of radio resources for transmission at the antenna of the first remote unit;
wherein a number of downlink channel signals in the first set of downlink channel signals is different from a number of downlink channel signals in the second set of downlink channel signals; and	wherein a number of radio resources in the first set of radio resources is different from a number of radio resources in the second set of radio resources <i>at least based on dynamic load balancing and resource management</i> ; and
wherein the host unit is configured to receive digital signals from each of the plurality of remote units.	wherein the baseband unit is configured to receive digital signals from each of the plurality of remote units.

While Claim 10 of the '178 Patent does not recite the limitation “*at least based on dynamic load balancing and resource management*” recited in Claim 1 of the '343 Patent, the dependent claims of the '178 Patent (Claims 2-6 and 16-18) further specify that the number of signals sent to the remote unit is **at least based on dynamic load balancing and resource management** by changing from sending

the first set of signals to the first remote unit to sending the second set of signals. For example, the change may be based on a change in network conditions (Claims 3, 16), load balancing (Claims 4, 17), subscriber needs (Claim 5), or a schedule (Claims 6, 18).

In view of the substantial similarity in scope between the Challenged Claims and the canceled claims of the parent '178 Patent, the Challenged Claims are unpatentable as obvious over Wu for the same reasons that Claims 1-30 of the '178 Patent were canceled by adverse judgment.

Moreover, pursuant to 37 C.F.R. §42.73(d)(3), because the Challenged Claims are not patentably distinct from the claims canceled by adverse judgment in the parent '178 Patent, PO is estopped from taking any action before the Board that is inconsistent with its cancellation of the claims in the parent '178 Patent. Specifically, PO is estopped from refuting that the Challenged Claims are obvious over Wu as asserted in Ground 1 of this Petition or that Wu discloses each limitation recited independent Claims 1 and 12 as asserted in Ground 2 of this Petition.

III. GROUNDS FOR STANDING (37 C.F.R. § 42.104(a))

Petitioner certifies that the '343 Patent for which review is sought is available for *inter partes* review and that Petitioner is not barred or estopped from requesting an *inter partes* review of the Challenged Claims on the grounds identified herein.

IV. RELIEF REQUESTED (37 C.F.R. § 42.22(a))

Petitioner respectfully requests institution of an *inter partes* review pursuant to 37 C.F.R. § 42.108 and cancellation of the Challenged Claims of the '343 Patent.

V. REASONS FOR THE RELIEF REQUESTED

As set forth in §§II and VI-VIII of this Petition and in the Declaration of Dr. Henry Houh (EX-1012)-and for at least the same reasons and based on the same prior art that resulted in the cancellation of all claims in the parent '178 Patent—the systems and methods recited in the Challenged Claims are obvious over the prior art in view of the knowledge, skill and creativity of a POSA at the time of the invention.

A. Summary of the '343 Patent

The '343 Patent is titled “Distributed Antenna System” and describes wireless communication systems employing a distributed antenna system (DAS) that is “field reconfigurable” and purportedly “enables a high degree of flexibility to manage, control, enhance, [and] facilitate the usage and performance of a distributed wireless network.” EX-1001, Abstract. According to one embodiment of the described DAS, the system includes “one or more remotely monitored and controlled digital access units configured to assign particular packet transmissions to selected one of a plurality of remote units” which can be “configured in a daisy-chained rings.” EX-1001, 1:26-30; EX-1012, ¶29.

and a plurality of DRUs (125A through 125k). EX-1001, 4:43-46. The DRUs are connected to the DAU 105 in a ring configuration over optical fiber cable indicated at connection pairs 140A-145A and each DAU can support a plurality of rings through fiber optic pairs 140o-145o. EX-1001, 5:6-14; EX-1012, ¶31.

As shown in Figure 1, DAU 105 receives composite downlink signal 130, comprising carriers A–D from first base station 110A. EX-1001, 5:64-6:1. DAU 105 also receives composite signal 135, comprising carriers E–H from *p*th base station 110*p*. EX-1001, 6:1-6:4. A first optical output is directed to DRU 125A via bidirectional optical cable 140A, and a second optical output is directed to DRU 125C via bidirectional optical cable 145A. EX-1001, 6:11-14. The DRUs 125A-n are connected in a ring configuration such that all Carriers A-H are available to transport data to all DRUs within the ring. EX-1001, 6:14-22. The antenna ports of the DRUs receive uplink signals and transmit them to the base station via the DAUs. EX-1001, 5:34-47, 10:40-11:25; EX-1012, ¶32.

Software settings within each DRU are configured to control which carrier signals are present in the downlink output signal at the antenna port of a DRU. EX-1001, 6:19-40, 6:47-65. Figure 7, reproduced below, illustrates in block diagram form the interaction between the DAU embedded software module and the DRU embedded software module. EX-1001, 4:19-21; EX-1012, ¶33.

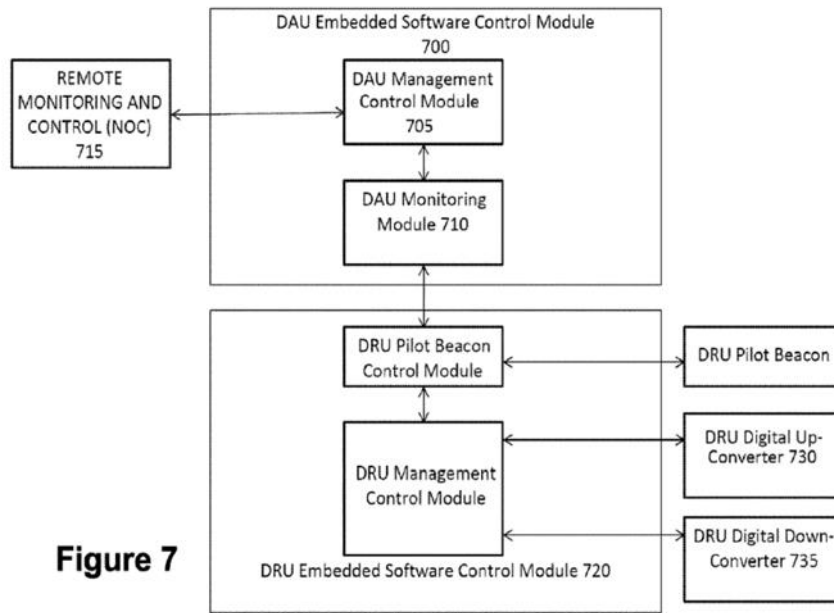


Figure 7

EX-1001, Fig. 7; EX-1012, ¶33.

With reference to Figure 7, an embedded software control module in a DAU, the DAU Management Control Module 705, “determin[es] and/or set[s] the appropriate amount of radio resources (such as RF carriers, CDMA codes or TDMA time slots) assigned to a particular DRU or group of DRUs to meet desired capacity and throughput objectives.” EX-1001, 12:3-9. Another embedded software control module, the DAU monitoring module 710, “detects which carriers and corresponding time slots for each carrier are active for each DRU.” EX-1001, 12:15-17. The DAU monitoring module 710 also provides information to the DAU Management Control Module 705 to help identify when a particular downlink carrier is loaded by a percentage greater than a predetermined threshold. EX-1001, 12:50-58. If the threshold is exceeded, “the DAU Management Control Module can

adaptively modify the system configuration” to deploy additional radio resources for use by a particular DRU needing those resources, and to remove resources from a DRU if it no longer needs the radio resources assigned to it. EX-1001, 12:58-13:2. The DAU Management Control Module 705 communicates with a DRU Embedded Software Control Module 720 which, in turn, by a DRU Management Control Module 725, sets individual parameters within the DRU to enable or disable specific radio resources from being transmitted by that DRU. EX-1001, 12:17-37; EX-1012, ¶34.

B. Summary of the Challenged Claims

The Challenged Claims are directed to a system and method to transport wireless communications wherein:

- a. a digital access unit (DAU) receives a plurality radio resources from a first and a second signal source (base stations);
- b. the digital access unit (DAU) is configured to send digital representations of a first and a second set of the radio resources to a remote unit (DRU);
- c. wherein the number of radio resources in the first set is different from the number of radio resources in the second set at least based on dynamic load balancing and resource management; and
- d. wherein the digital access unit is configured to receive digital

signals from each of the remote units.

Claim 1 is directed to the system and is representative of the claimed subject matter (bracketed notations added):

1. [pre] *A system to transport wireless communications, comprising:*

[1.a] *a digital access unit;*

[1.b] *a plurality of signal sources, including at least a first signal source and a second signal source;*

[1.c] *a plurality of remote units, including at least a first remote unit and a second remote unit;*

[1.d] *wherein the digital access unit comprises a plurality of interfaces to communicatively couple the digital access unit to the plurality of signal sources;*

[1.e] *wherein the digital access unit is configured to receive a plurality of radio resources from the first signal source and the second signal source;*

[1.f] *wherein the digital access unit is configured to send a digital representation of a first set of radio resources to the first remote unit at a first point in time, the first set of radio resources for transmission at an antenna of the first remote unit;*

[1.g] *wherein the digital access unit is configured to send a digital representation of a second set of radio resources to the first remote unit at a second point in time, the second set of radio resources for transmission at the antenna of the first remote unit;*

[1.h] *wherein a number of radio resources in the first set of radio resources is different from a number of radio resources in the second set of radio resources at least based on dynamic load balancing and resource management; and*
[1.i] *wherein the digital access unit is configured to receive digital signals from each of the plurality of remote units.*

C. Summary of the Prosecution History

1. The '343 Patent

The application from which the '343 Patent issued was filed on May 13, 2019 as a continuation of the application which issued as the '499 Patent which is a continuation of the application that issued as the '178 Patent.

The Challenged Claims were submitted to the Office by an amendment filed May 28, 2020. EX-1013, 37-48. The Office issued an Office Action on Aug. 10, 2020 rejecting the pending independent claims on the basis of obviousness-type double patenting over the corresponding independent system and method claims of the parent '499 Patent. EX-1013, 24-36. Specifically, Claim 1 (pending as Claim 2) directed to the system was rejected over system Claim 1 of the '499 Patent, and Claim 12 (pending as Claim 14) directed to the method was rejected over method Claim 13 of the '499 Patent.¹

¹ Previously, to gain allowance of, e.g., Claims 1 and 14 of the '499 Patent, PO had

PO filed a Terminal Disclaimer on Dec. 10, 2020, to overcome the double patenting rejection. EX-1013, 10-17, 18-19. A Notice of Allowance issued Jan. 7, 2021 wherein the Examiner identified the “closest prior art on record” as Sulzberger et al. (US 2005/0152695) and Bergman et al. (US 2011/0065438). EX- 1013, 1-9. The ’343 Patent issued May 11, 2021.

2. The Parent ’178 Patent

As discussed above, an adverse judgment canceling Claims 1-30 of the parent ’178 Patent was entered by the Board Jun. 30, 2021. *See* EX-1005. The adverse judgment was entered as a result of PO’s motion to cancel Claims 1-30 subsequent to the Board instituting *inter partes* review of the claims at least on the basis that Claims 1-30 were anticipated by or obvious over Wu. *See* EX-1005, EX- 1004.

D. Claim Construction

Petitioner proposes that each claim term in the Challenged Claims be given its plain and ordinary meaning in this proceeding, and that no specific construction of any claim term is required because the prior art relied on in this Petition meets each of the claim terms under any reasonable construction. EX-1012, ¶35.

submitted a Terminal Disclaimer in the prosecution of the ’499 patent to overcome a double patenting rejection over the now canceled claims of the ’178 Patent. EX-1020.

Petitioner acknowledges that in the case IPR2020-01430, which involved the related patent '499 Patent (US 10,334,499), the Board did not provide a specific construction for “radio resources,” however, the Board did determine that the plain and ordinary meaning of “radio resources” as would have been understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire patent disclosure: (1) includes RF carriers, CDMA codes, and TDMA time slots; and (2) excludes data that does not incorporate information used in the transmission of the radio resource from an antenna of the remote unit. EX-1019, 11-12. Similarly, a district court issued a claim construction order construing “radio resources” as follows:

Plain and ordinary meaning where the plain and ordinary meaning includes RF carriers, CDMA codes, and TDMA time slots, but does not include the underlying data that is transmitted.

Note: when data is modulated on an RF carrier, the RF carrier is a radio resource, but the data modulated on the RF carrier is not a radio resource.

EX-1024, 4.

E. Priority Date

The '343 Patent is a continuation of the '499 Patent which is a continuation of the '178 Patent which, through a series of serial continuation applications, claims the benefit of Provisional Patent Application No. 61/439,940 filed February 7, 2011.

For the purposes of this Petition, Petitioner does not challenge the claimed priority of February 7, 2011.

F. Person of Ordinary Skill in the Art

With respect to the '343 Patent, a POSA in February 7, 2011 would have been familiar with operations and carrier allocations in remote radio units in a DAS. EX-1012, ¶38. A POSA would have gained knowledge of these concepts through a mixture of training and work experience, such as by having a Bachelor's degree in electrical engineering and four years of experience; or by obtaining a Master's degree in electrical engineering, but having only one to two years of experience; or by having no formal education but experience in cellular communications of at least eight years. EX-1012, ¶38.

G. State of the Art

The following section describes the state of the art for DAS networks as of February 2011. EX-1012, ¶39. The prior art references, and the discussions of what was known to a POSA, provide the factual support for the general description of the state of the art at the time of the invention, and provide additional motivation to modify or combine the references. Accordingly, these references should be considered by the Board.

1. Prior Art DAS

A distributed antenna system (DAS) is used to improve the capacity and coverage area of wireless systems, particularly for improving coverage inside buildings and other indoor environments. DAS typically use fiber optic or unshielded twisted pair/shielded twisted pair (UTP/STP) cables to transmit digital radio signals, which typically are digital baseband signals. EX-1016, 1:11-14. The typical DAS configuration is shown below in Fig. 1. As shown in Fig. 1, the Remote radio heads (RRHs), 17, are placed in various locations, such as around a building, and the primary hub, 14, distributes the downlink radio signals to the RRHs as well as collects the uplink radio signals for the base station 11. EX-1016, 1:15-17. Additionally, as mentioned above, the signals are transported digitally, and thus, it is easy to support multiple carriers and multiple base stations at the same time. EX-1016, 1:17-18; EX-1012 ¶40.

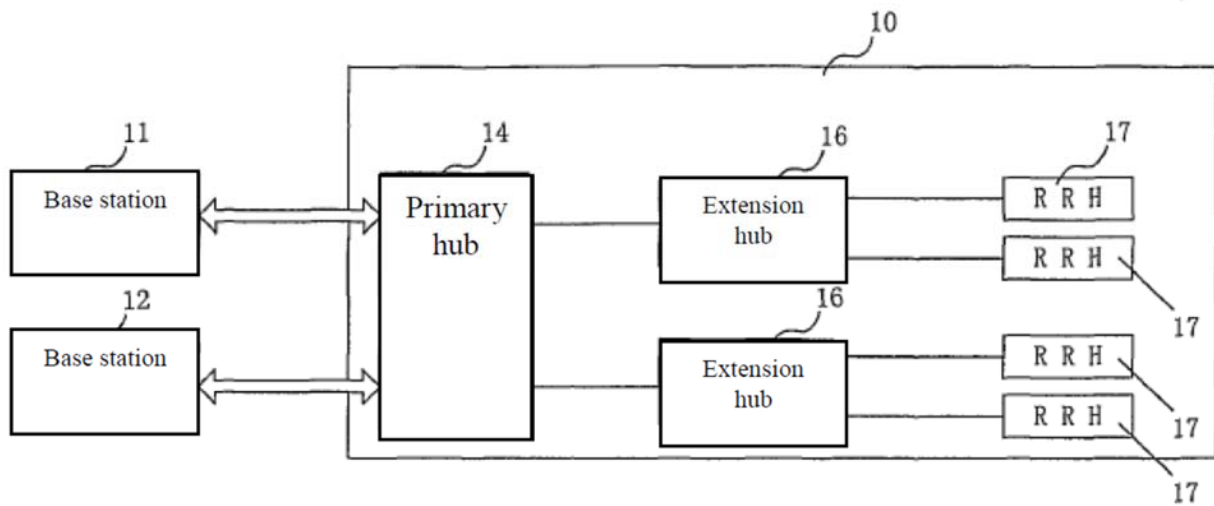


Fig. 1

EX-1016, Fig. 1; EX-1012 ¶40.

2. Allocation of carriers at remote radio units based on loading

One such prior art DAS allowed dynamic reallocation of the carrier frequencies used by the remote units based on the relative loading of the system as communication traffic of a region changed. EX-1016, 1:33-36. As shown in FIG. 2 below, a cell management device (CMU) 24 acts as the host and is connected to the base station 21, and is configured to distribute a downlink wireless signal to the radio remote unit 26 (RRH), collect an uplink wireless signal, and transmit the uplink radio signal to the base station 21. EX-1016, 3:20-25. CMU 24 also collects load information of the distributed antenna system 20 and reconfigures the distributed antenna system 20 based on the load information. EX-1016, 11:28-30; EX-1012 ¶41.

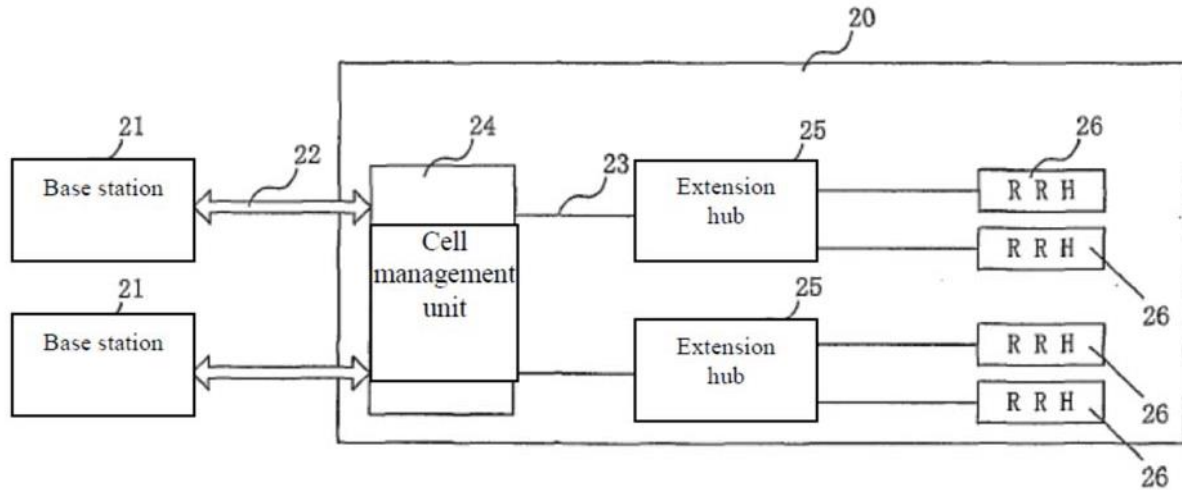


Fig. 2

EX-1016 Fig. 2; EX-1012 ¶41.

As shown the CMU 24 could serve multiple base stations 21, similarly several CMU could serve a base station. The transmissions between CMUs and the base stations preferably occur according to suitable standards such as the CPRI Standard (EX-1010). EX-1016 3:26-33; EX-1012, ¶42.

3. Prior art DAS systems allowed for efficient use of infrastructure

Another prior art system shown below allowed multiple service providers each to provide signals to a BTS which is in turn sent to a common DAS Head End (DAU).

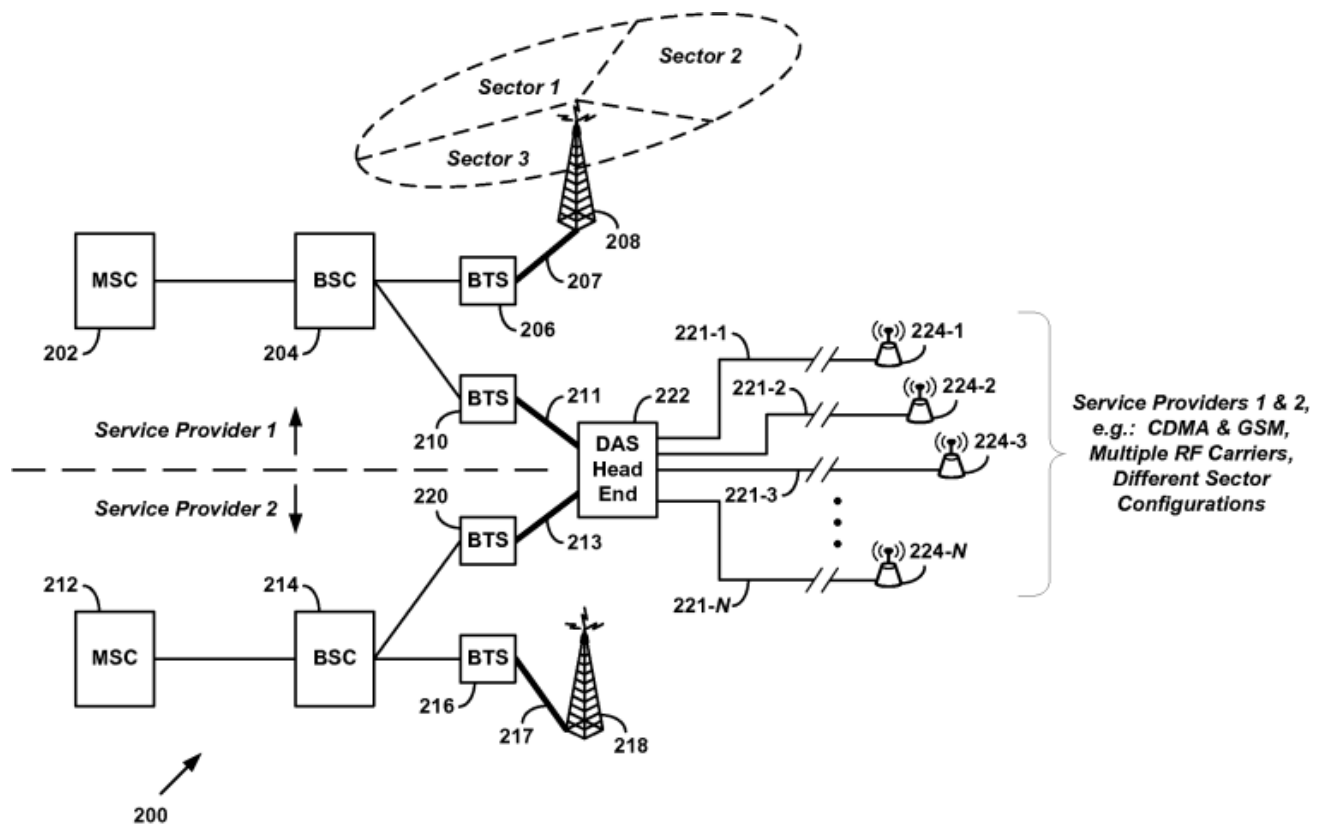


FIG. 2

EX-1018, Fig. 2; EX-1012, ¶43.

The interface between the RF module and the DAS head end is same as that between the RF modulation Subsystem and the radio/antenna Subsystem of a traditional BTS. **As such, multiple BTSs from multiple service providers can be connected to single DAS head end, thus allowing them to share a common access infrastructure.**

EX-1018, 2:24-29 (emphasis added); EX-1012, ¶43.

As illustrated in FIG. 2, multiple service providers or operators using different communications protocols (e.g., CDMA, GSM, etc.) could share common infrastructure resources and thus avoid the cost and complexity of each provider proving its own infrastructure. EX-1012, ¶44.

VI. IDENTIFICATION OF CHALLENGES

A. Challenged Claims

Claims 1-22 of the '343 Patent are challenged in this Petition.

B. Statutory Grounds for Challenges

The Challenges are set forth in detail below and summarized as follows:

Ground	Claims	Basis	Reference(s)
1	1-3, 5-10, 12-14, and 16-21	§ 103	Wu in view of the knowledge of a POSA
2	4, 11, 15, and 22	§ 103	Wu in view of Cannon

C. The Prior Art

1. Wu (EX-1007)

U.S. Patent Application Pub. No. 2010/0128676 titled “Carrier Channel Distribution System” published May 27, 2010 from an application filed November 11, 2009. Wu qualifies as prior art at least under § 102(e). Wu was provided to the Examiner by PO along with more than 390 other references. In response, the Examiner objected to the volume of the references provided and suggested that PO file new IDSs with a focused list of references. EX-1013, 26. Thus, while Wu was

cited on the face of the '343 Patent, it was not applied by the Examiner, nor did PO inform the Examiner that substantially similar claims had been found to be unpatentable by the Board over Wu in the Final Written Decision of the '473 Patent dated August 12, 2019 (IPR2018-00571, Paper 53; EX-1006); and in the institution decision of the '178 Patent dated March 12, 2021 (IPR2020-01473, Paper 18; EX-1004), each before the issuance of the '343 Patent.

2. Cannon (EX-1017)

U.S. Patent Pub. No. 2010/0177760 titled “Systems And Methods For Improved Digital RF Transport In Distributed Antenna Systems” published on July 15, 2010 from an application filed January 13, 2010 (EX-1017)(“Cannon”). Cannon qualifies as prior art at least under §102(e). Cannon was also provided to the Examiner by PO along with more than 390 other references as described above. EX-1013, 26. Thus, while Cannon was cited on the face of the '343 Patent, it was not applied by the Examiner, nor did PO focus the examiner on Cannon for disclosing the reconfiguration of the carriers of a remote radio unit.

VII. IDENTIFICATION OF HOW THE CHALLENGED CLAIMS ARE UNPATENTABLE

A. Ground 1: Claims 1-3, 5-10, 12-14, and 16-21 Are Obvious Over Wu in View of the Knowledge of a POSA

1. The Wu Reference

Wu is titled “Carrier Channel Distribution System” and describes a system for transporting wireless communications where base transceiver stations (BTSS)

communicate signals to remote transceiver units (RTUs) via one or more host units. EX-1007, Title, ¶0030. The system provides control over the communication by splitting carrier channels from their bands and routing only selected channels to RTUs according to a routing policy. EX-1007, ¶0009. The carrier channels may be routed “individually, collectively as shown, or in arbitrary groups” to RTUs as desired using a matrix switch according to a routing policy, where the routing policy can be updated or reconfigured as desired. EX-1007, ¶¶0049, 0009, 0011, 0038-39, 0047. Wu discloses that “more channels” can be allocated when needed to increase the bandwidth available in a particular region. EX-1007, ¶¶0039-46; EX-1012, ¶48.

Wu provides a schematic of the system in Figure 1:

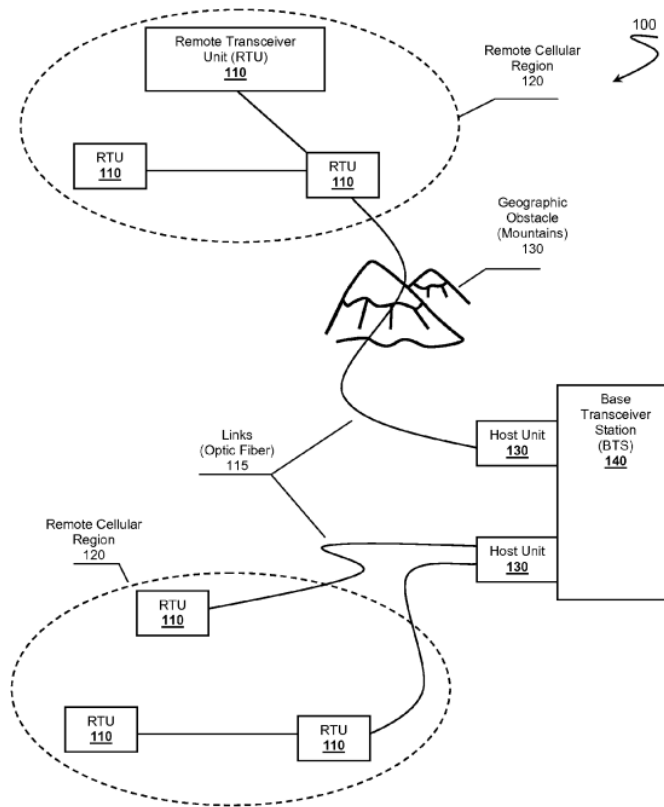


Figure 1

EX-1007 Fig. 1; EX-1012, ¶49.

Wu also provides a schematic of a BTS in Figure 2:

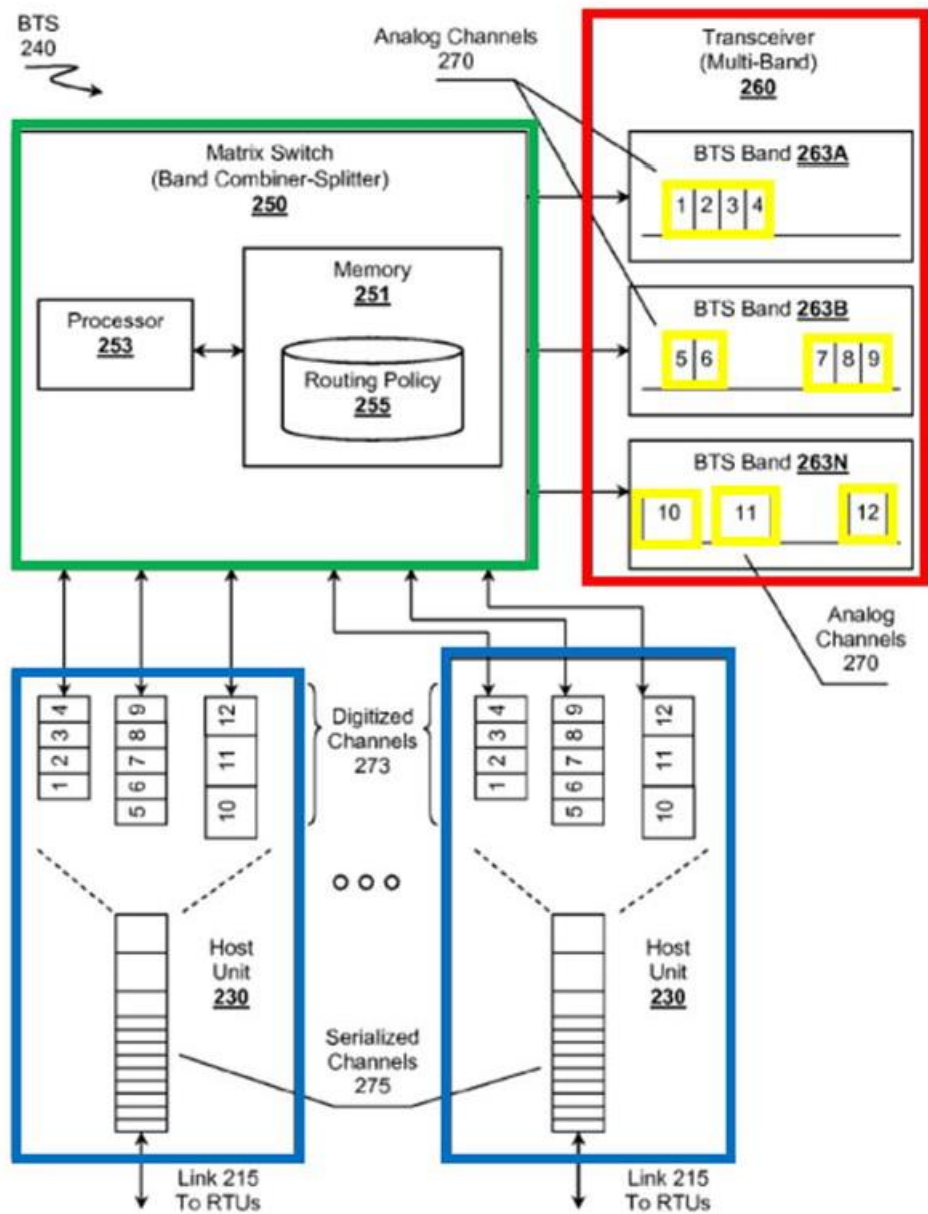


Figure 2

EX-1007 Fig. 2; EX-1012, ¶50.

Figure 2 illustrates base transceiver station (BTS) 240 comprising transceiver 260 (outlined in red), matrix switch 250 (outlined in green), and host units 230

(outlined in blue). EX-1007, ¶¶0015, 0034–36. Transceiver 260 receives signals on BTS bands 263A – 263N, and each band may include multiple analog channels 270 (outlined in yellow). EX-1007, ¶¶0035-37. Transceiver 260 forwards the received channels 270 to matrix switch 250 that routes the channels to host unit 230 according to Routing Policy 255. Host unit 230 further distributes the signals to RTUs over links 215. EX-1007, ¶0038. Transmissions between host units and RTUs are disclosed as preferably occurring according to suitable standards such as the CPRI Standard. EX-1007, ¶¶0031, 0049; EX-1012, ¶51.

The system is bi-directional, and carrier channel signals are received by host units 230 from RTUs and forwarded to transceiver 260 for transmission within bands 263. EX-1007, ¶¶0036, 0049. Wu also discloses that some signals may be received at an RTU with another RTU acting as intermediary. EX-1007, Figs. 1, 4, ¶¶0033, 0051; EX-1012, ¶52.

Policy 255 can be reconfigured to change the routing of channels to the one or more RTUs. EX-1007, ¶¶0048-49. For example, channels may be routed, allocated, or distributed based on anticipated requirements of remote regions during a certain time of day, or based on current traffic load within the region. EX- 1007, ¶¶0043-44; EX-1012, ¶53.

2. Detailed Application of Wu to Claims 1-3, 5-10, 12-14, and 16-21

a. Claim 1

i. [1.pre] *A system to transport wireless communications, comprising:*

Wu discloses a system to transport wireless communications. Wu is directed to “wireless carrier channel technologies” including “apparatus, systems and methods in which a carrier channel distribution system can route individual carrier channels to Remote Transceiver Units (RTUs).” EX-1007, ¶¶0002, 0011; EX- 1012, ¶54.

Wu provides a schematic of the system in Figure 1 showing how wireless communication signals are transported from BTS 140 and Host Unit 130 [*signal source and baseband unit*] to RTUs 110 [*remote units*]; EX-1012, ¶55.

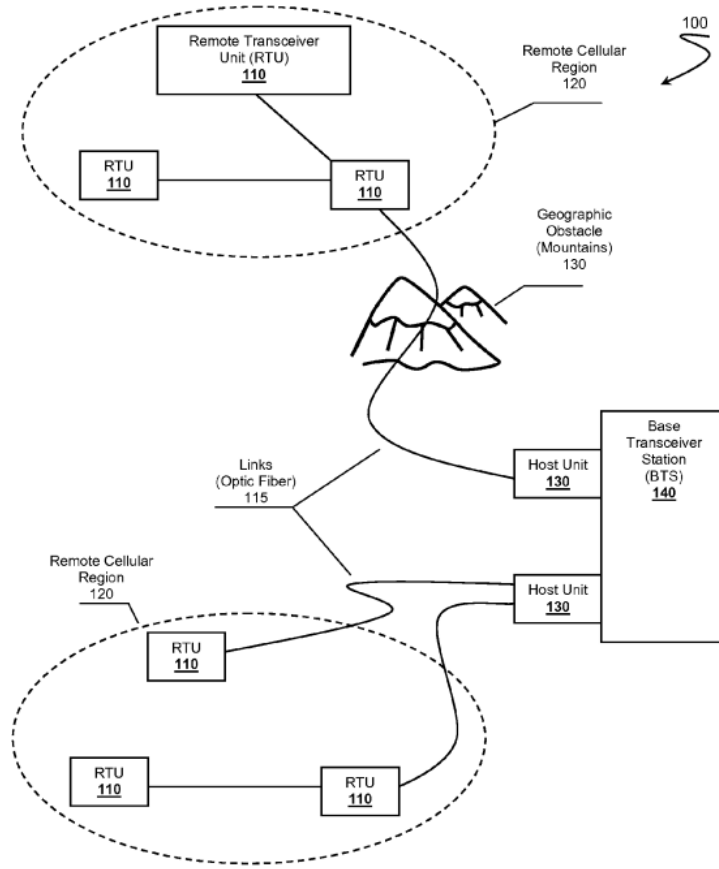


Figure 1

EX-1007 Fig. 1; EX-1012, ¶55.

ii. [1.a] a digital access unit;

Wu discloses a digital access unit in the form of a matrix switch 250 and host units 230. Wu provides a schematic of a base transceiver station (BTS) in Figure 2:

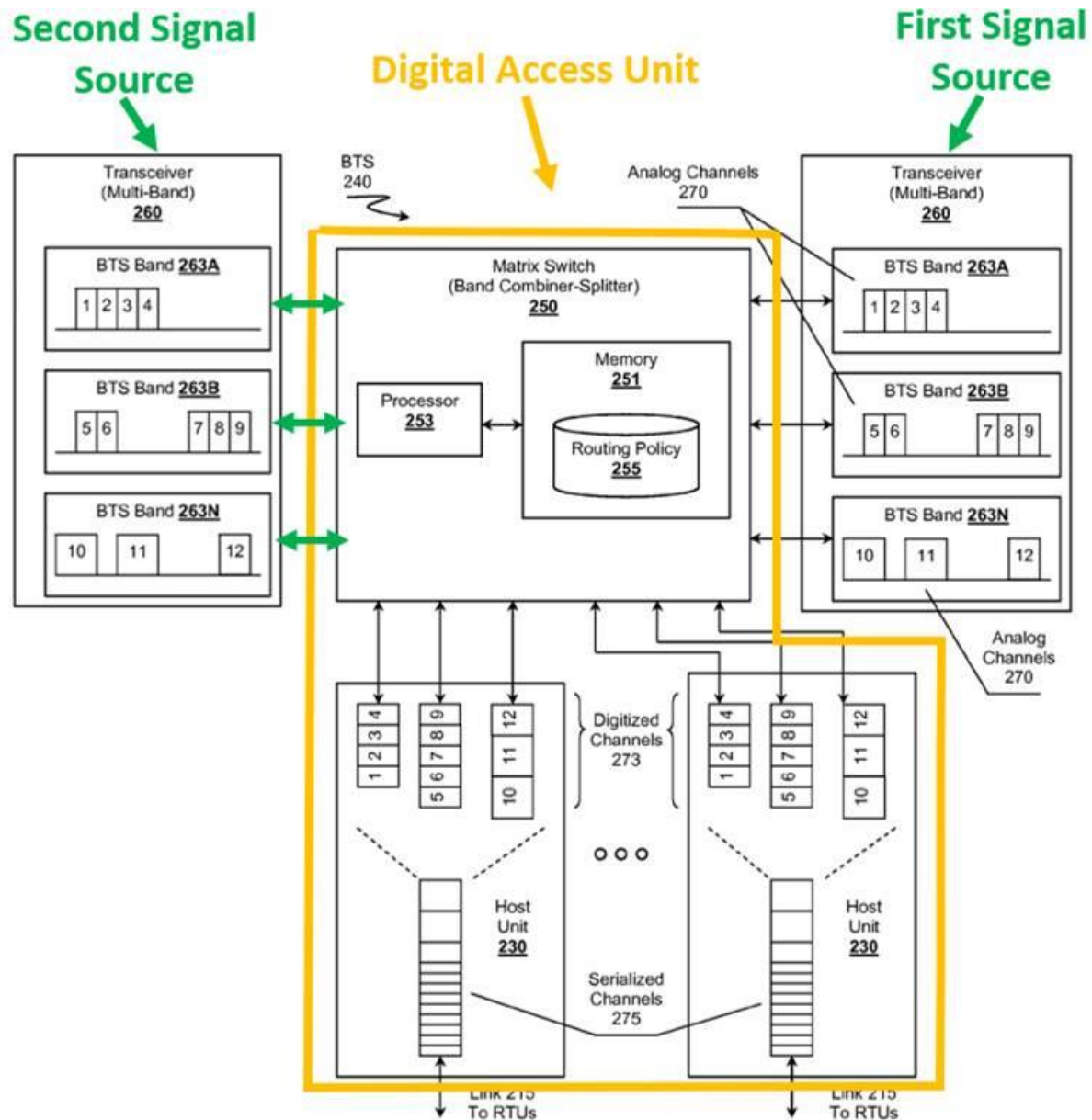


Figure 2

EX-1007, Fig. 2 (annotated); EX-1012, ¶156.

The BTS 240 comprises transceiver 260, matrix switch 250, and host units 230. EX-1007, ¶0015, Fig. 2. The combination of matrix switch 250 and host units 230 form a system [*digital access unit*] that manages two-way communications

between the RTUs 110 [*remote units*] and the transceiver 260 [*signal source*]. EX-1007, ¶¶0035-38; EX-1012, ¶57. The matrix switch and host units together disclose the *digital access unit* recited in the Challenged Claims.

In fact, the Board has already determined that the matrix switch 250 and host units 230 of Wu disclose the digital access unit or “host unit” recited in the claims of the parent ’178 Patent. Specifically, the Board found “Wu discloses the claimed host unit [*digital access unit*] as a combination of the matrix switch and host units” and that “it would have been obvious to place the functionality of both Wu’s matrix switch and host units in a single unit.” EX-1006, 21-22; EX-1004, 28.

The “host unit” recited in the claims of the ’178 Patent is the same element as the “*digital access unit*” recited in the Challenged Claims. Thus, Wu discloses the claimed digital access unit.

iii. [1.b] a plurality of signal sources, including at least a first signal source and a second signal source;

Wu discloses a plurality of signal sources, including at least a first signal source and a second signal source. As illustrated in annotated Fig. 2 above, Wu discloses a BTS 240 comprising transceiver 260 [*signal source*]. Wu explains that “multi-band transceiver 260 is preferably configured to receiver [sic] or to transmit wireless signals within a plurality of frequency bands as represented by bands

263A, 263B, through 263N” and that “[e]ach of bands 263 preferably comprises multiple channels.” EX-1007, ¶0035. Wu further explains that “BTS 240 can be coupled to more than one of multi-band transceiver 260.” EX-1007, ¶0034. Fig. 2 has been annotated to illustrate the disclosed by Wu wherein the BTS 240 is coupled to a first and a second transceiver 260 [*at least a first signal source and a second signal source*]. EX-1012, ¶60.

iv. [1.c] a plurality of remote units, including at least a first remote unit and a second remote unit;

Wu discloses a plurality of remote units, including at least a first remote unit and a second remote unit. As illustrated in Fig. 1 above and Fig. 4 below, Wu discloses a system 100 comprising a plurality of RTUs 110 [*a first remote unit and a second remote unit*]. EX-1007, Fig. 1, ¶¶0031-33; EX-1012, ¶61.

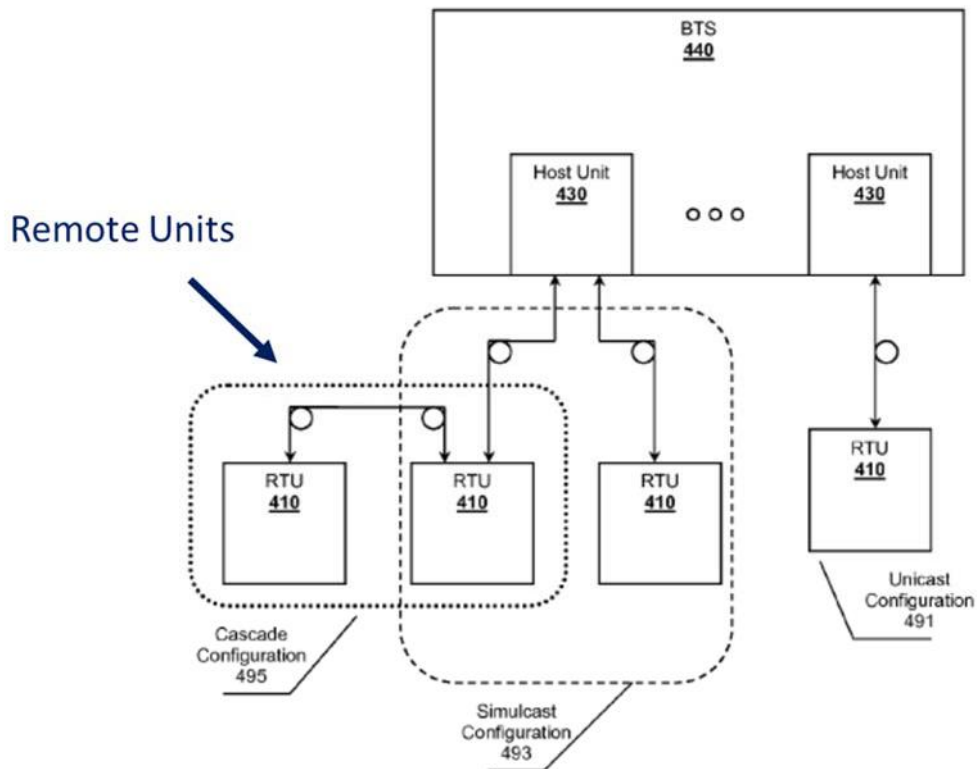


Figure 4

EX-1007, Fig. 4 (annotated); EX-1012, ¶61.

- v. ***[1.d] wherein the digital access unit comprises a plurality of interfaces to communicatively couple the digital access unit to the plurality of signal sources;***

Wu discloses the digital access unit comprising a plurality of interfaces to communicatively couple the digital access unit to the plurality of signal sources. Wu discloses that matrix switch 250 (a component of the digital access unit) is communicatively coupled to a plurality of BTS Bands 263A-263N from each of the first and second transceivers 260 and a POSA understood that each communication coupling includes an interface. EX-1007, ¶0042, Fig. 2. Thus, the digital access

unit, which includes matrix switch 250, comprises a plurality of interfaces to communicatively couple the digital access unit to a plurality of signal sources. EX-1012, ¶62.

- vi. ***[1.e] wherein the digital access unit is configured to receive a plurality of radio resources from the first signal source and the second signal source;***

Wu discloses a system where the digital access unit is configured to receive a plurality of radio resources from the first signal source and the second signal source. As illustrated in the annotated Fig. 2 above, the matrix switch 250 receives analog channels 270 [*radio resources*] including channels 1 – 12 from each of the BTS Bands 263 of the first and second transceivers 260. EX-1007, ¶¶0035-38, Fig. 2. A POSA understood that the carrier channels 1-12 are radio resources as recited in the Challenged Claims. EX-1012, ¶63.

- vii. ***[1.f] wherein the digital access unit is configured to send a digital representation of a first set of radio resources to the first remote unit at a first point in time, the first set of radio resources for transmission at an antenna of the first remote unit;***

Wu discloses a system where the digital access unit is configured to send a digital representation of a first set of radio resources to the first remote unit at a first point in time, the first set of radio resources for transmission at an antenna of the first remote unit. Wu explains that the combination of matrix switch 250 and units

230 [*digital access unit*] digitize the carrier channels [*radio resources*] and send digital representations of the channels 273 to the RTUs. EX-1007, ¶0049. Wu, as noted in the 178 Institution Decision, further explains that matrix switch 250 is configurable to route the digitized channels 273 [*digital representation of radio resources*] “individually, collectively ..., or in arbitrary groups” (*a first set*) to a first RTU [*first remote unit*]. EX-1007, ¶0049; EX-1004, 28; EX-1012, ¶64.

Wu also describes that the number of channels routed to an RTU may change by means of a routing policy that includes rules for reacting to events and conditions such as usage, load, weather, etc. EX-1007, ¶¶0038-47; EX-1012, ¶65.

As an example, “[t]he rules of policy 255 can include one or more criterion representing a trigger ... When the criteria are met, matrix switch 250 can take appropriate routing action.” EX-1007, ¶0041. Wu explains that the routing actions may include allocating more channels to a region to increase the bandwidth available at a first point in time. EX-1007, ¶0046; EX-1012, ¶66.

Wu discloses that the RTUs provide “wireless coverage” to remote cellular regions. EX-1007, ¶¶0030, 0004. A POSA understood that “wireless coverage” requires transmission of communications using an antenna, and that there are antennas associated with each RTU for transmitting radio resources. EX-1012, ¶67.

- viii. [1.g] wherein the digital access unit is configured to send a digital representation of a second set of radio resources to the first remote unit at a second point in time, the second set of radio resources for transmission at the antenna of the first remote unit;**

Wu discloses a system where the digital access unit is configured to send a digital representation of a second set of radio resources to the first remote unit at a second point in time, the second set of radio resources for transmission at the antenna of the first remote unit. As set forth for element [1.f] above, Wu describes a routing policy that includes rules for reacting to various events and conditions. EX-1007, ¶¶0038-47. The routing actions may allocate more channels [*a second set of radio resources*] to an RTU to increase the bandwidth available in the region of the RTU at a time following the triggering event [*a second point in time*]. EX-1007, ¶0046; EX-1012, ¶68.

- ix. [1.h] wherein a number of radio resources in the first set of radio resources is different from a number of radio resources in the second set of radio resources at least based on dynamic load balancing and resource management;**

Wu discloses a system wherein a number of radio resources in the first set of radio resources is different from a number of radio resources in the second set of radio resources at least based on dynamic load balancing and resource management. Wu explains the routing policy may change the configuration of the system “to

allocate more channels” to a first RTU in a region “to increase the bandwidth available” in the region in response to conditions. EX-1007, ¶0046. In such a scenario, the number of channels [*radio resources*] transmitted in the first set prior to the routing policy change is different than the number of channels transmitted in the second set after the change in policy. EX-1012, ¶69.

Wu discloses that the difference in the number of channels is at least based on dynamic load balancing and resource management. Wu teaches that the channels 270 of the system may be “routed or allocated according to policy 255 individually, collectively as shown, or in arbitrary groups” to the RTUs. EX-1007, ¶0049. Wu also teaches that matrix switch 250 may be configured using the routing policy 255 to dynamically reroute or reallocate the radio resources to the RTUs based on changing network conditions such as traffic rate, a consumed bandwidth, current traffic load, call rate, and load balancing. EX-1007, ¶¶0041- 0044; EX-1012, ¶70.

Wu discloses that processor 253 is configurable to analyze traffic metrics (e.g., data rate, call rate, consumed bandwidth, etc.) and that based on analyzing load characteristics, the system may be reconfigured automatically to allocate more or fewer radio resources to an RTU in response to changing circumstances – “when the criteria are met, matrix switch 250 can take appropriate routing action.” EX- 1007, ¶¶0011, 0044, 0045, 0041; EX-1012, ¶71.

For example, Wu discloses radio resources may be allocated to RTUs based on events such as “weather events, political events, trade shows, sporting events, government or police requests, emergencies or other types of events” such that “sufficient coverage is available as conditions change.” EX-1007, ¶0046; EX- 1012, ¶72.

Policy 255 can be configured to route, distribute, or allocate channels 270 collectively, as groups, individually, or in other desirable configurations. Matrix switch 250, based on policy 255, can allocate a first carrier channel to a first RTU while a second carrier channel from the same band can be routed to a second RTU. For example channel 1 from band 263A could be routed as an individual, separate from channels 2-4 from band 263A. Channels 5 and 6 could be grouped and routed together to an RTU, or could be split. Furthermore, individual channels from different bands could be split from their bands, and combined together. For example, channel 3 from band 263A could be combined with channel 12 from band 263N, which can then be routed together to an RTU as a group.

EX-1007, ¶0047; EX-1012, ¶72.

A POSA understood from the teachings of Wu that the number of radio resources transmitted to a first RTU at a first point in time (*first set*) would be

different from the number of radio resources transmitted to the first RTU at a second point in time (second set) based at least in part on load balancing and system resources. EX-1012, ¶73.

- x. ***and [1.i] wherein the digital access unit is configured to receive digital signals from each of the plurality of remote units.***

Wu discloses a system where the digital access unit is configured to receive digital signals from each of the plurality of remote units. Wu explains that the system is bi-directional such that the units 230 (components of the *digital access unit*) may receive digital representations of uplink signals from each of the plurality of RTUs. EX-1007, ¶¶0036, 0049. Wu discloses that the RTUs include analog-to-digital converters for digitizing received signals for digital transport to the host units 230. EX-1007, ¶0056; EX-1012, ¶74.

b. Patent Owner is estopped from arguing that Claim 1 is patentable over Wu

In IPR2020-01473, the Board determined that limitations [1.a]-[1.g] and [1.i] were disclosed by, or obvious over, Wu during its analysis of Claim 1 of the '178 Patent, and that limitation [1.h] was disclosed by, or obvious over, Wu during its analysis of, e.g., dependent Claims 2-4 of the '178 Patent. EX-1004, 25, 26, 32-34. Upon cancellation of the claims of the '178 Patent and entry of the adverse judgment against PO, PO is now estopped from arguing that Claim 1 of the '343 Patent is patentable over Wu because Claim 1 is not patentably distinct from the claims

canceled by adverse judgment in the '178 Patent (e.g., claims 1 and 4 of the '178 patent).

c. Claim 2

i. *The system of claim 1, wherein the system determines load and selects traffic paths based at least in part on the determined load.*

Wu discloses or renders obvious a system wherein the system determines load and selects traffic paths based at least in part on the determined load. See Claim 1, element [1.h]; EX-1012, ¶75. Wu discloses “[A] calculated metric is considered to be a metric that has a value, or multiple values, as derived from a function operating on other metrics.” EX-1007, ¶0042. These “calculated” metrics can be, *inter alia*, traffic rate, a consumed bandwidth, and an aggregated count all, all of which are metrics of a load determined by the system (*system determines load*). EX-1007, ¶0042; EX-1012, ¶75. Wu goes on to disclose the use of policies for routing radio resources such that “sufficient service coverage is available as conditions change.” Therefore, Wu clearly *selects traffic paths based at least in part on the determined load*. EX-1007, ¶0046; EX-1012, ¶75. This selection of traffic paths based on a determined load is illustrated in ¶0043 where Wu discloses dynamically allocating bandwidth to a region that:

might have a significant number of commercial businesses that require additional bandwidth during business hours. The first region could be allocated a large

number of channels during the business hours while a residential region might have a smaller number of channels during the same time frame.

EX-1007, ¶0043; EX-1012, ¶75.

Furthermore, Wu discloses radio resources may be allocated to RTUs based on events such as “weather events, political events, trade shows, sporting events, government or police requests, emergencies or other types of events.” EX-1007, ¶0046; EX-1012, ¶76.

Thus, Wu discloses determines the load by calculating metrics such as bandwidth and traffic rate and then selects traffic paths using routing policies based on, in part, the determined load. EX-1012, ¶77.

d. Claim 3

- i. The system of claim 1, wherein the dynamic load balancing and resource management controls routes from a digital access unit port to a remote unit port.***

Wu discloses or renders obvious a system wherein the dynamic load balancing and resource management controls routes from a digital access unit port to a remote unit port. Wu discloses the use policies stored as computer instruction in computer memory to configures a matrix switch [*digital access unit*] to properly route carriers to the RTU [*remote unit*]. EX-1007, ¶0040. The policies can configure the switch matrix to route channels to the RTU collectively, as groups, individually, or in other desirable configurations. EX-1007, ¶0047; EX-1012, ¶78.

A POSA understood from the teachings of Wu that the electrical connection between the Host Unit and the RTU will interface at a port. EX-1012, ¶79. Thus, Wu discloses or renders obvious a system wherein the dynamic load balancing and resource management controls routes from a digital access unit port to a remote unit port.

e. Claim 5

- i. *The system of claim 1, wherein the dynamic load balancing and resource management uses uplink summing to combine signals from at least the first and second remote units.***

Wu discloses or renders obvious a system wherein the dynamic load balancing and resource management uses uplink summing to combine signals from at least the first and second remote units. Wu discloses using a matrix switch 250, to route the carrier channels from the multiband transceiver to the various RTUs based on a policy. ¶0047. For example, Wu discloses,

channel 1 from band 263A could be routed as an individual, separate from channels 2-4 from band 263A. Channels 5 and 6 could be grouped and routed together to an RTU, or could be split.

EX-1007, ¶0047; EX-1012, ¶80.

Wu also discloses that the Matrix switch 250, also receives the carrier channels from the RTUs through the Host units and combine[s] the channels back

into their proper form for transmission within bands 263 for transmission via multi-band transceiver 260. EX-1007, ¶0038; EX-1012, ¶81.

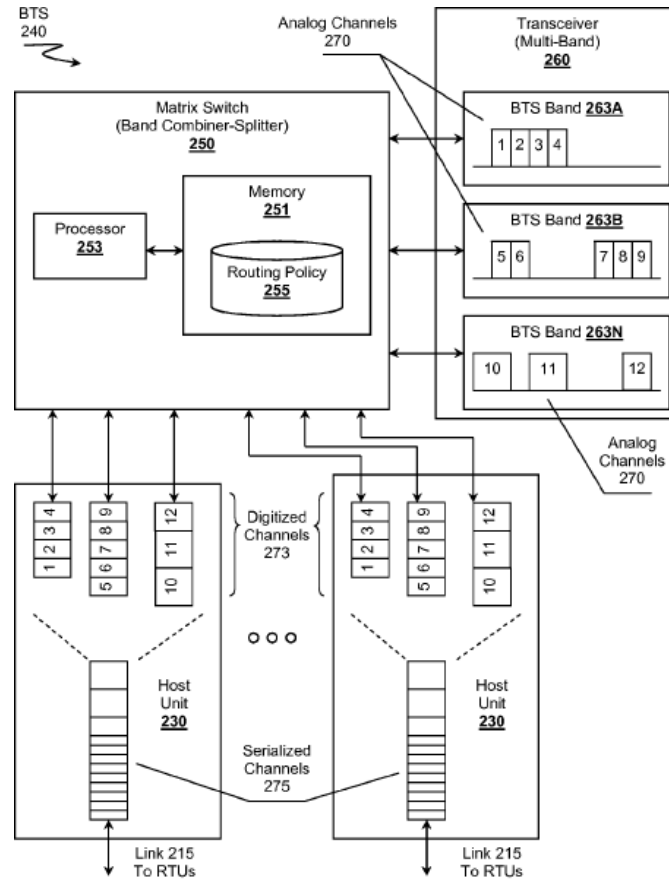


Figure 2

EX-1007, Fig. 2; EX-1012, ¶81.

The RTUs can be distributed throughout a region or multiple regions in various configurations, including a Simulcast configuration.

In FIG. 4, RTUs 410 are arranged into different carrier channel distribution configurations. BTS 440 comprises two of host unit 430, which route carrier channels to one or more of RTUs 410. Configurations can include one-to-one couplings, one-to-many couplings, or even many-to many couplings if an

application calls for such a configuration...Simulcast configuration 493 represents a configuration where a single host unit 430 couples to more than one RTU 410 in a one-to-many configuration. A single host unit 430 **can duplicate serialized carrier channels as necessary and send the serialized data over more than one fiber optic link to multiple RTUs 410**... Cascade configuration 495 also represents a one-to-many configuration where a host unit 430 couples to an RTU 410, which in turn cascades the serialized carrier channels to another RTU 410, preferably over another optic link.

EX-1007 ¶0051 (emphasis added); EX-1012, ¶82.

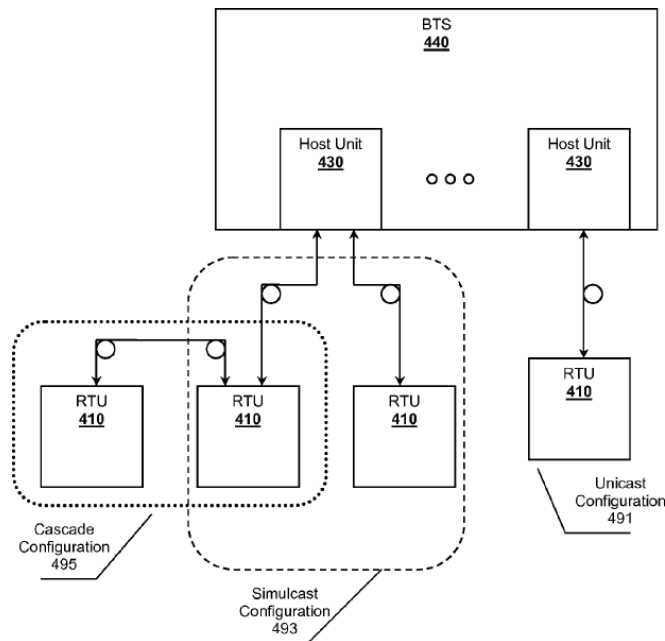


Figure 4

EX-1007, Fig. 4; EX-1012, ¶82.

Therefore, Wu discloses a system that takes a channel of a carrier signal and distributes the same channel to multiple RTUs through the Matrix switch and a Simulcast transmission. The two RTUs using the same channel will send back traffic on said channel at which point the Matrix switch will combine the signals for receipt by the multi-band transceiver.

Received channels 1-12 from bands 263 are forwarded to matrix switch 250. **Matrix switch 250 can operate as a combiner/splitter**, preferably an analog combiner/splitter, where bands 263 can have their individual channels 1-12 split into individual channels or groups of channels (e.g., 1-4, 5-6, 7-9, etc.). ... As referenced previously, **matrix switch 250 can also receive channel signals from host units 230 and can combine the channels** back into their proper form for transmission within bands 263 for transmission via multi-band transceiver 260.

EX-1007, ¶0038, *See also* ¶¶0047, 0051; EX-1012, ¶83.

This is consistent with the concept of “uplink summing” used by the ’343 Patent, which appears to discuss the concept in only a few places. Firstly, the ’343 Patent states that,

It is a further object of the present invention to provide a method of summing co-channel users’ uplink signals.

EX-1001, 3:40-41; EX-1012, ¶84.

To achieve this objective, the '343 Patent only briefly describes the following method of summing co-channel users' uplink signals:

[W]hen DRU 125A receives a strong enough signal at its receive antenna port within the Channel K bandwidth to be properly filtered and processed, the Digital Down Converters within DRU 125A facilitate processing and conversion. The signals from DRU 125A and DRU 125C are combined based on the active signal combining algorithm, and are fed to the base station connected to the uplink output port of DAU 105. **The term simulcast is frequently used to describe the operation of DRU 125A and DRU 125C with regard to uplink and 5 downlink signals within Channel K bandwidth.**

EX-1001, 10:63-11:1-10 (emphasis added); EX-1012, ¶85.

As described previously, the uplink signals from the four DRUs are combined within the respective DAU corresponding to each base station.

EX-1001 11:23-25; EX-1012, ¶85.

In other words, the term “uplink summing” is used to describe a method of combining two signals from different DRUs (RTUs) that are using the same channel, in this case, Channel K, to send to the base station. This process would occur in response to Simulcasts—identical to the Simulcast situation described in Wu. EX-1012, ¶86.

Thus, as described in detail above, Wu discloses *dynamic load balancing and resource management* in the Matrix switch routing the carrier signals based on a policy determined in part by a determined load. Wu also discloses the *dynamic load balancing and resource management uses uplink summing to combine signals from at least the first and second remote units* by combining the simulcast channel from a first and second RTU at the Matrix switch for uplink by the multi-band transceiver. EX-1012, ¶87.

A POSA understood from the teachings of Wu that the two RTUs using the same channel being combined into a common uplink, for example, in response to a simulcast transmission, would need to be combined using a summing algorithm or method of similar nature. EX-1012, ¶88; EX-1012, ¶88; EX-1009, ¶5 (“A means to distribute the base station’s signals to more than one antenna is termed simulcast. In the direction toward the wireless user, i.e., downlink/forward path, the signal is replicated for each remote location. On the return direction, i.e., uplink/reverse path, the signals from multiple remote locations are summed to create a single composite signal for the base station.”)

f. Claim 6

- i. *The system of claim 1, wherein the dynamic load balancing and resource management uses steering to route signal traffic in the system.***

Wu discloses or renders obvious a system wherein the dynamic load balancing and resource management uses steering to route signal traffic in the system. Wu discloses the use policies stored as computer instruction in computer memory to configure a Matrix switch to properly route [*steer*] carriers to the RTU. EX-1007, ¶0040. Wu discloses routing the channels based on the current traffic load to prevent potential traffic issues. EX-1007, ¶0044. Wu discloses that,

if the current or recent historical traffic metric have a profile that satisfies criteria of a signature for a triggering condition, Switch 250 can route, allocate, or distribute channels as defined by policy 255 to balance traffic load.

EX-1007, ¶0044; EX-1012, ¶89.

Thus, Wu discloses or renders obvious a system wherein the dynamic load balancing and resource management uses steering to route signal traffic in the system.

g. Claim 7

- i. *The system of claim 1, wherein the dynamic load balancing and resource management uses capacity steering to route signal traffic in the system.***

Wu discloses or renders obvious a system wherein the dynamic load balancing and resource management uses capacity steering to route signal traffic in the system. Wu discloses routing channels [*signal traffic*] based on the current traffic load and an analysis of traffic metrics such as data rate, call rate, consumed bandwidth and correlate various metrics with load balancing to detect potential traffic issues. EX-1007, ¶0044. If the traffic metric, such as consumed bandwidth for a remote unit reaches a triggering condition, the switch 250 can route various channels to balance traffic load. EX-1007, ¶0044. Wu discloses that,

if the current or recent historical traffic metric have a profile that satisfies criteria of a signature for a triggering condition, Switch 250 can route, allocate, or distribute channels as defined by policy 255 to balance traffic load.

EX-1007, ¶0044; EX-1012, ¶91.

A POSA understood that by using “consumed bandwidth” to route traffic, the system is practicing *capacity steering*. Thus, Wu discloses or renders obvious a system wherein the dynamic load balancing and resource management uses capacity steering to route signal traffic in the system. EX-1012, ¶92.

h. Claim 8

- i. *The system of claim 1, wherein the dynamic load balancing and resource management uses network capacity to route signal traffic in the system.***

Wu discloses a system wherein the dynamic load balancing and resource management uses network capacity to route signal traffic in the system. Wu discloses routing channels [*signal traffic*] based on the current traffic load and an analysis of traffic metrics such as data rate, call rate, consumed bandwidth and correlate various metrics with load balancing to detect potential traffic issues. EX-1007, ¶0044. If the traffic metric, such as consumed bandwidth, reaches a triggering condition, the switch 250 can route various channels to balance traffic load. EX-1007, ¶0044; EX-1012, ¶93.

A POSA understood from the teachings of Wu that balancing the load of the entire network based on current traffic would take into account the network capacity to determine whether the consumer bandwidth width was indicative of a load balancing issue. Without knowing the total network capacity there would be no context for how many of the total resources should be sent to a location resulting in too many or no resources in some locations. EX-1012, ¶94. Thus, Wu discloses or renders obvious a system wherein the dynamic load balancing and resource management uses network capacity to route signal traffic in the system.

i. Claim 9

- i. *The system of claim 1, wherein the first remote unit is a low power radio capable of using multiple frequency bands.***

Wu discloses a system wherein the first remote unit is a low power radio capable of using multiple frequency bands. Wu discloses that frequency channels from different frequency bands [*multiple frequencies*] can be sent to the same RTU [*first remote unit*]. EX-1007, ¶0047. For example, WU teaches, “channel 3 from band 263A could be combined with channel 12 from band 263N, which can then be routed together to an RTU as a group. EX-1007, ¶0047; EX-1012, ¶95.

Further, Wu discloses using a booster for the analog signal output of the RTU.

The channels can be digitized using an ADC individually or as a group within an envelope as shown. The digitized channels and their encapsulated data can then be sent as a serialized stream to the RTUs, where the streams are de-serialized and converted back to analog signals for presentation to boosters.

EX-1007, ¶0054; EX-1012, ¶96.

A POSA understood from the teachings of Wu that the RRH could be low power because of the need for a power booster prior to transmission, and because Wu teaches its systems can be deployed in indoor environments which are low power environments. EX-1012, ¶97 and EX-1007, ¶50. Thus, Wu discloses or

renders obvious a system wherein the first remote unit is a low power radio capable of using multiple frequency bands.

j. Claim 10

- i. *The system of claim 1, wherein the digital signals communicated between the digital access unit and the remote units are sent via optical cables.***

Wu discloses or renders obvious a system wherein the digital signals communicated between the digital access unit and the remote units are sent via optical cables. Wu discloses base station is communicatively coupled to the RTUs via the host units using communication links, 115. Wu further teaches that the “[h]ost units 130 [*digital access unit*] relay [*communicate*] digitized signals [*digital signals*] between BTS 140 and remote transceiver units (RTUs) 110 [*remote units*] within the remote cell regions 120 using the physical links 115, preferably fiber optic links [*optical cables*]. EX-1007, ¶0030; EX-1012, ¶98.

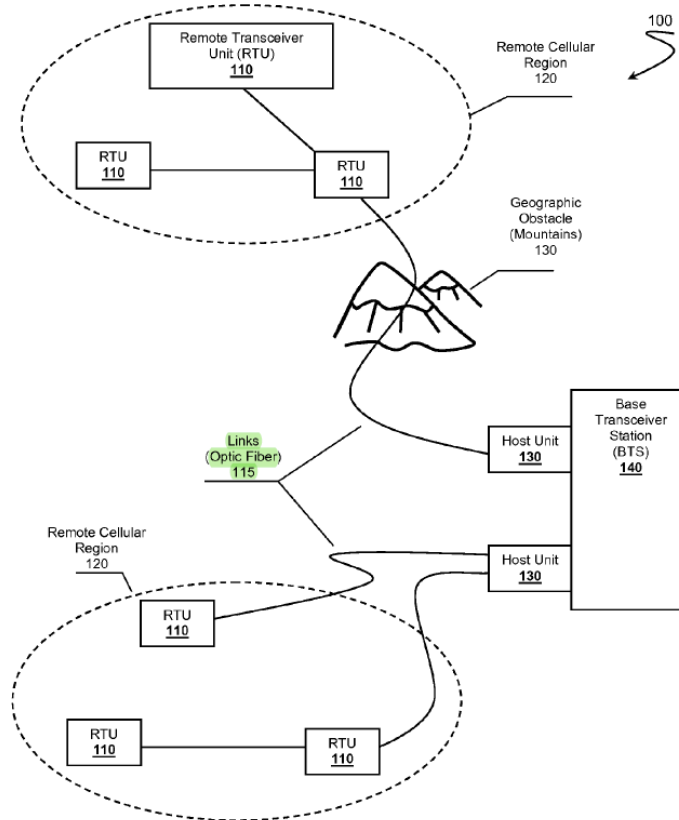


Figure 1

EX-1007, Fig. 1 (annotated); EX-1012, ¶98.

Thus, Wu discloses a system wherein the digital signals communicated between the digital access unit and the remote units are sent via optical cables.

k. Claim 12

i. [12.pre] A method for wireless communications comprising:

See Claim 1, element [1.pre].

- ii. ***[12.a] receiving at a digital access unit, a plurality of radio resources from a first signal source and a second signal source, wherein the digital access unit comprises a plurality of interfaces to communicatively couple the digital access unit to a plurality of signal sources;***

See Claim 1, elements [1.a], [1.b], and [1.e].

- iii. ***[12.b] sending, by the digital access unit, a digital representation of a first set of radio resources to a first remote unit at a first point in time,, the first set of radio resources for transmission at an antenna of the first remote unit;***

See Claim 1, element [1.f].

- iv. ***sending from the digital access unit, a digital representation of a second set of radio resources to the first remote unit at a second point in time, the second set of radio resources for transmission at the antenna of the first remote unit;***

See Claim 1, element [1.g].

- v. ***wherein a number of radio resources in the first set of radio resources is different from a number of radio resources in the second set of radio resources at least based on dynamic load balancing and resource management.***

See Claim 1, element [1.h].

l. Claim 13

- i. *The method of claim 12 further comprising determining load and selecting traffic paths based at least in part on determined load.***

See Claim 2.

m. Claim 14

- i. *The method of claim 12 wherein the dynamic load balancing and resource management controls routes from a digital access unit port to a remote unit port.***

See Claim 3.

n. Claim 16

- i. *The method of claim 12 wherein the dynamic load balancing and resource management uses uplink summing to combine signals from at least the first and second remote units.***

See Claim 5.

o. Claim 17

- i. *The method of claim 12 wherein the dynamic load balancing and resource management uses steering to route signal traffic in the system.***

See Claim 6.

p. Claim 18

- i. The method of claim 12 wherein the dynamic load balancing and resource management uses capacity steering to route signal traffic in the system.*

See Claim 7.

q. Claim 19

- i. The system of claim 12, wherein the dynamic load balancing and resource management uses network capacity to route signal traffic in the system.*

See Claim 8.

r. Claim 20

- i. The system of claim 12, wherein the first remote unit is a low power radio capable of using multiple frequency bands.*

See Claim 9.

s. Claim 21

- i. The system of claim 12, wherein the digital signals communicated between the digital access unit and the remote units are sent via optical cables.*

See Claim 10.

B. Ground 2: Claims 4, 11, 15, 22 Are Obvious Over Wu and Cannon

1. The Cannon Reference

Cannon is directed to a DAS for receiving and distributing RF signals within a coverage area. FIG. 1 of Cannon illustrates one embodiment:

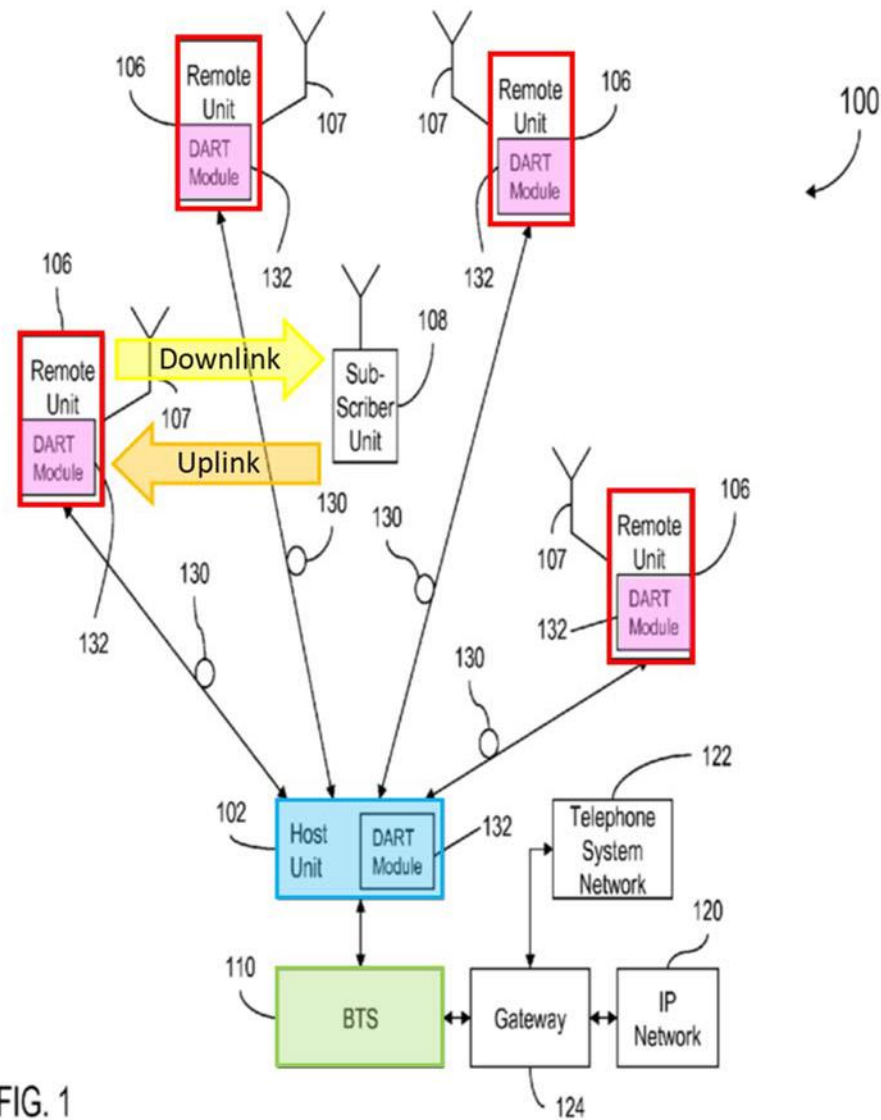


FIG. 1

EX-1017, FIG. 1 (annotated); EX-1012, ¶113.

DAS 100 includes a host unit 102 (blue) and a plurality of remote units 106 (red). Remote units 106 each house electronic devices and systems used for wirelessly transmitting (yellow) and receiving (orange) modulated RF communications via antenna 107 with one or more mobile subscriber units 108. Host unit 102 is coupled to at least one base station BTS 110 (green). BTS 110

communicates voice and other data signals between the respective host unit 102 and a larger communication network via a gateway 124 coupled to a telephone system network 122 (for example, the public switched telephone network and/or wireless service provider networks) and an internet protocol (IP) network 120, such as the Internet. EX-1017, ¶0019; EX-1012, ¶114.

In the embodiment of FIG. 1, each remote unit 106 and host unit 102 comprises a digital to analog radio frequency transceiver (DART) module 132 (pink) configured to conserve the available bandwidth of the communication links 130 by separating and individually processing spectral regions of interest from a larger RF spectrum. EX-1017, ¶0021; EX-1012, ¶115.

Cannon describes that the DART modules are realized using field programmable gate arrays (FPGAs), application specific integrated circuits (ASICs), digital signal processing (DSP) boards, or similar devices. EX-1017, ¶0022; EX-1012, ¶116.

FIG. 5 is a block diagram illustrating a DART Module 500 of one embodiment.

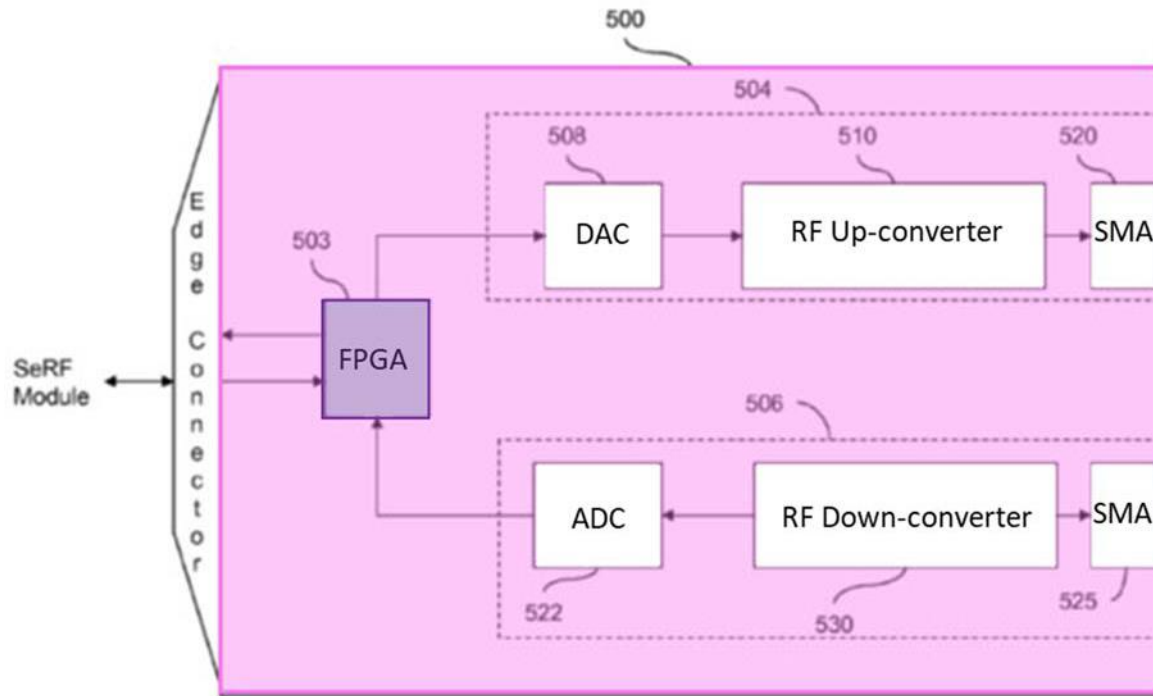


Fig. 5

EX-1017, Fig. 5 (annotated); EX-1012, ¶117.

DART module 500 (pink) has two main signal paths: a transmission path 504 and a reception path 506. For signals received from a SeRF module, DART module 500 forms parallel digital RF data from the incoming data stream. In this embodiment, FPGA 503(purple) is a logic device that is programmed to convert serial digital data into RF sampled data and programmed to convert RF sampled data into serial digital data. DART module 500 then converts the digital RF data to an analog signal with digital to analog converter (DAC) 508. Transmission path 504 continues with RF transmission interface 510 which filters, amplifies, and up-converts the analog signal for RF transmission. Cannon describes that RF

transmission interface 510 will typically include an assortment of filters, amplifiers, oscillators and attenuators known to a POSA. In one embodiment, the transmission path exits DART module 500 at a subminiature version A RF coaxial connector (SMA) connector 520. EX-1017, ¶0036; EX-1012, ¶118.

FIG. 6 is a block diagram providing further details for FPGA 503 (purple) for one embodiment.

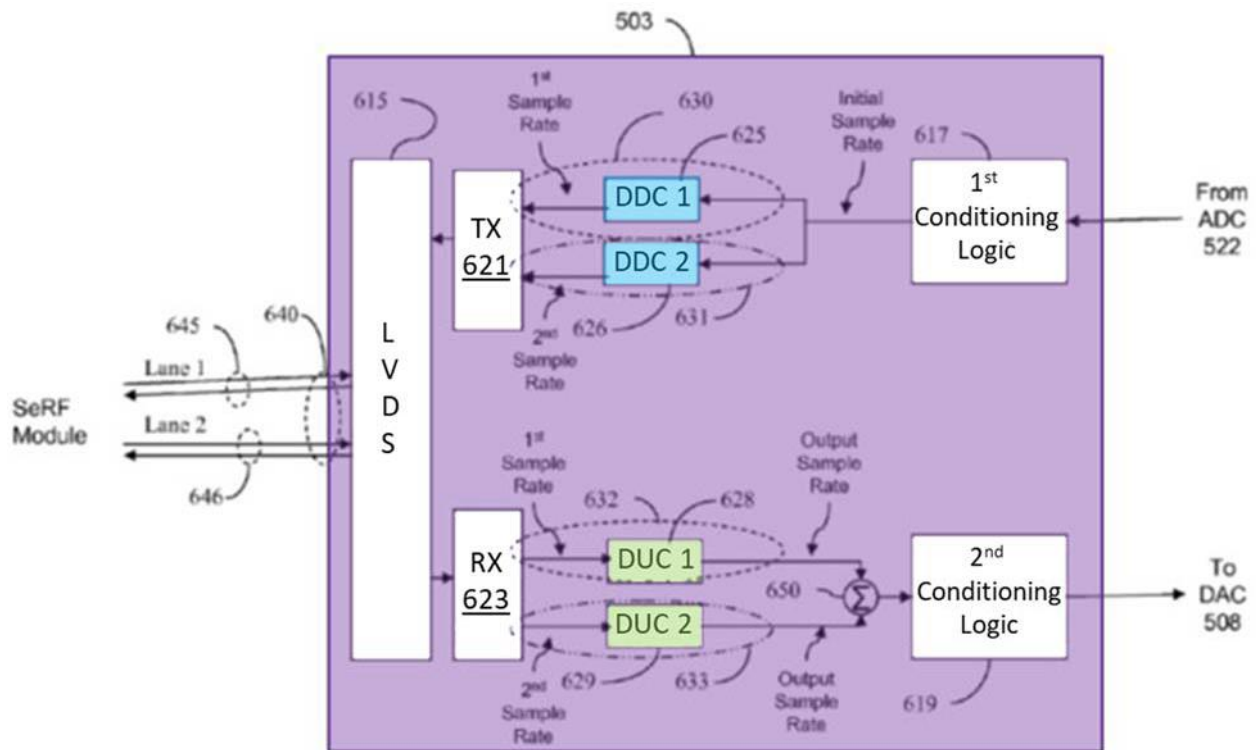


Fig. 6

EX-1017, Fig. 6 (annotated); EX-1012, ¶119.

FPGA 503, for both the upstream and downstream directions, provides separate signal processing paths for each discrete spectral region of a digitized RF spectrum (such as 400 or 460 from FIG. 4) that is to be mapped onto timeslots of

the transport frame 460. Cannon discloses that the number of carriers is not limited to only two, and that the DART can be programmed to handle three or more spectral regions and thus carriers, limited only by the limits of the implementing hardware. EX-1017, ¶0034; EX-1012, ¶120. Thus, a POSA understood that Cannon teaches that each FPGA could be programmed with a set of carrier frequencies.

Cannon describes that using a FPGA includes DUCs (green) and DDCs (blue) that can be programmed with a center frequency and bandwidth to reconfigure the carrier of the remote radio unit. EX-1017, FIG. 6; ¶0042; EX-1012, ¶121. Cannon describes that the use of a FPGA in a remote radio unit is beneficial because the remote radio unit can be adjusted to meet the changing needs of the end user very simply using programming. EX-1017, ¶0046; EX-1012, ¶121.

2. A POSA Would Combine the Teachings of Wu and Cannon

The '343 Patent, Wu and Cannon are all directed to dynamically allocating frequency spectrum in a DAS. All three provide examples of mobile subscribers communicating with a remote radio unit of a DAS. EX-1001, FIG. 1; EX-1007, FIG. 1; EX-1017, FIG. 1; EX-1012, ¶122. The '343 Patent describes reconfiguring each DRU based on the loading of each DRU. EX-1001, 12:50-13:2; EX-1012, ¶122. The '343 Patent describes that DRUs are reconfigured by the use of software-programmable frequency selective FPGAs, DUCs and DDCs. EX-1001, 6:36-46, 7:32-46; 10:13-27; EX-1012, ¶122. Wu likewise describes reconfiguring each RTU

based on the load of each unit. EX-1007, ¶¶0011, 0039, 0044; EX- 1012, ¶122. Wu describes that the carrier channels can be routed as desired based on the usage and load. EX-1007, ¶0039. Specifically, as described above, in one embodiment, Wu discloses programming a network routing policy to allocate carrier channels to different RTUs through a Matrix Switch 250 based on the loading demands in various scenarios such as sporting events. EX-1007, ¶¶0045- 0047. Cannon describes that the RRH can use a DART in the form of a FPGA. Cannon describes that using a FPGA includes DUCs and DDCs that can be programmed with a center frequency and bandwidth to reconfigure the carrier of the RRH. EX-1017, FIG. 6; ¶0047; EX-1012, ¶122. Cannon describes that the use of a FPGA in an RRH is beneficial because the unit can be simply adjusted to meet the changing needs of the end user using programming. EX-1017, ¶0046; EX-1012, ¶122.

A POSA would be motivated to modify the teachings of Wu to include a FPGA in the remote radio unit (RTUs) as taught by Cannon because Cannon expressly teaches that the use of a FPGA allows each remote radio unit to be adjusted to meet the changing needs of the end user, and Wu teaches that the needs of the end user can be determined by the load of the remote radio units. Specifically, a POSA understood that Wu teaches to reconfigure a remote radio unit in a DAS by changing the carriers of the remote radio unit based on the load of the remote radio unit, and that there are only a few finite ways to reconfigure a radio by changing its

carrier frequency. Cannon discloses one such suitable way to reconfigure the carrier frequency of the remote radio is the use of a FPGA and requires only a programming change. EX-1012, ¶123.

In view of this section (and discussed further below in the claims analysis) Petitioner has demonstrated at least:

i. Wu and Cannon themselves provided teaching, suggestion, or motivation that would have led a POSA to modify Wu's teaching of reconfiguring a remote radio unit in a DAS based on the loading of the remote radio unit, with the use of an FPGA in the remote radio unit as taught by Cannon because an FPGA is adjustable to meet the changing needs of the end user. EX-1012, ¶124.

ii. The general knowledge in the art was that Cannon's use of FPGA was an accepted, known and predictable mechanism to adjust the carrier frequencies of DUCs and DDCs in remote radio units in a DAS by using programming, and the use of software-programmable frequency selective DUCs and DDCs was identified as a known benefit in the '343 Patent. EX-1012, ¶124.

iii. The beneficial aspects of Wu's technique for dynamic reassignment of the DAS based on a real-time load distributing condition, improving the efficiency of the system, and achieving

reassignment on line without interrupting the service, would be accomplished by using an FPGA with predictable results. EX-1012, ¶124.

iv. A POSA would also be confident the modification would enjoy a high likelihood of success given the predictable nature and successful history of use of FPGAs and radio transceivers. EX-1012, ¶124.

3. Detailed Application of Wu and Cannon to Claims 4, 11, 15, and 22

a. Claim 4

- i. The system of claim 1, wherein the dynamic load balancing and resource management dynamically adjusts a capacity of at least the first remote unit.*

Wu in combination with Cannon discloses or renders obvious a system wherein the dynamic load balancing and resource management dynamically adjusts a capacity of at least the first remote unit. Wu discloses that Matrix switch, 250, may be configured using the routing policy, 255, to dynamically reroute or reallocate the radio resources [*adjust capacity*] to the RTUs [*of the first remote unit*] based on changing network conditions such as traffic rate, a consumed bandwidth, current traffic load, call rate, and load balancing. EX-1007, ¶¶0041-0044. Cannon

discloses a system wherein the dynamic load balancing and resource management dynamically adjusts a capacity of at least the first remote unit. EX-1012, ¶125.

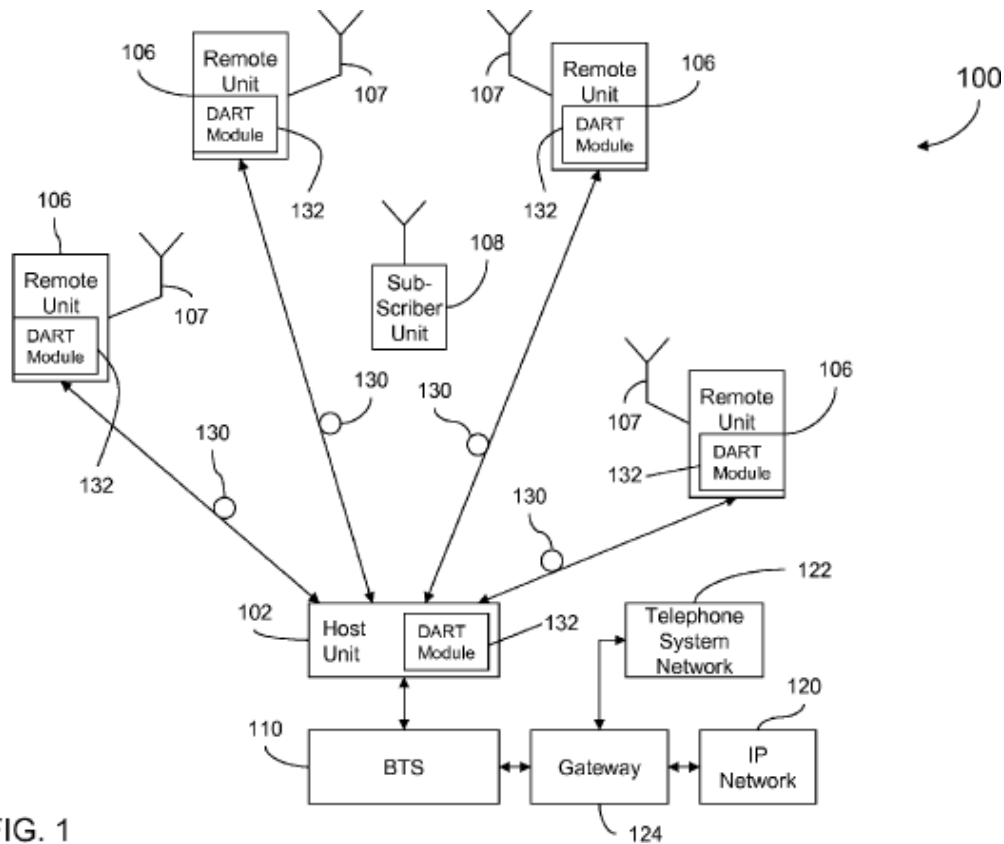


FIG. 1

EX-1017, Fig. 1; EX-1012, ¶125.

Cannon discloses a digital to analog radio frequency transceiver (DART) module that separates spectral regions of interest of the overall spectrum. In Fig. 5, shown above, the DART module in each remote unit contains a field programmable gate array (FPGA) 503. Each FPGA is programmable to automatically configure the remote unit itself to alter both the bandwidths and the frequencies that are processed by the remote unit [*adjust a capacity of the at least the first remote unit*].

EX-1017, ¶0046; EX-1012, ¶126. Cannon discloses that the FPGAs are adjusted “to meet changing needs of the end user,” EX-1017, ¶0046; EX-1012, ¶126.

This is consistent with the ’343 Patent, which discloses dynamically adjusting a gain control parameter of integrated frequency selective DUCs and DDCs in the DRUs as well as reconfiguring a FPGA in each DRU to determine which carrier signals will be in the downlink. EX-1001, 6:38-46, 7:32-46; EX- 1012, ¶127.

As described above, (§VII.B.2), it would have been obvious to combine the teachings of Cannon to the method and system of Wu. EX-1012, ¶128.

**b. Claim
11**

i. *The system of claim 1, wherein the remote units are automatically configured by the system.*

Wu in combination with Cannon discloses or renders obvious a system wherein the remote units are automatically configured by the system. Wu discloses storing policies that are programmatic instructions in computer memory that configures switch 250 to properly route radio resources. EX-1007, ¶0040. The switch matrix allocates carriers from the same band, from different bands as well as splitting and grouping the channels. EX-1007, ¶0047. Furthermore, Wu discloses the matrix switch, “automatically allocate the carriers channels according to the policy.” EX-1007, Claim 11; EX-1012, ¶129.

Cannon discloses a system wherein the remote units are automatically configured by the system. EX-1012, ¶130.

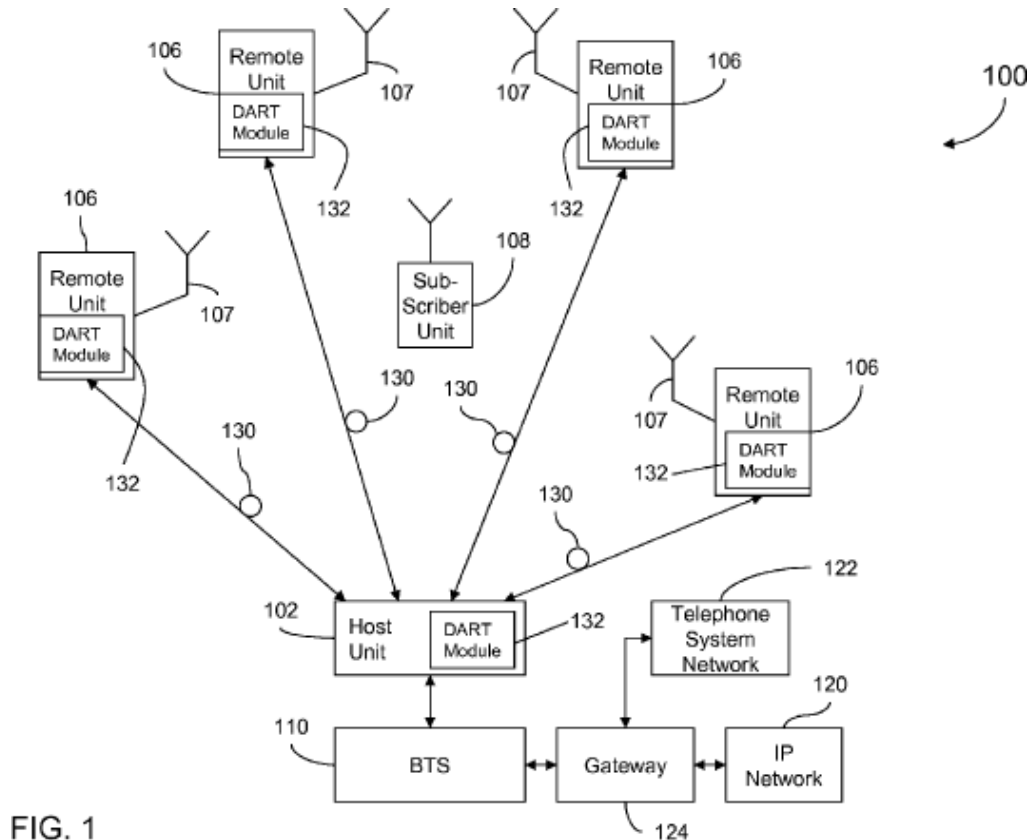


FIG. 1

EX-1017, Fig. 1; EX-1012, ¶130.

Cannon discloses a digital to analog radio frequency transceiver (DART) module that separates spectral regions of interest of the overall spectrum. In Fig. 5, shown above, the DART module in each remote unit contains a field programmable gate array (FPGA) 503. Each FPGA is programmable to automatically configure the remote unit itself to alter both the bandwidths and the frequencies that are processed by the remote unit. Cannon discloses that the FPGAs are adjusted “to meet changing needs of the end user,” EX-1017, ¶0046, and located in the remote

units to allow the remotes units to be adjusted automatically by using “predefined configuration builds [that] are stored in a memory,” such that “a DART Module's FPGA can be reconfigured by pushing a new build image onto the FPGA.” EX-1017, ¶0046; EX-1012, ¶131.

Wu further discloses the method of selecting the build image based on the reconfiguration information.

The method proceeds to 704 with selecting a build from a plurality of builds stored in a data storage device, such as but not limited to a flash memory. Selection of the build is based on the received configuration information.

The method proceeds to 706 with programming a field programmable device, such as an FPGA, by transferring the build to the field programmable device.

EX-1017, ¶0047 (emphasis added); EX-1012, ¶132.

This is consistent with the '343 Patent, which discloses dynamically adjusting a gain control parameter of integrated frequency selective DUCs and DDCs in the DRUs as well as reconfiguring a FPGA in each DRU to determine which carrier signals will be in the downlink. EX-1001, 6:38-46, 7:32-46; EX- 1012, ¶133.

As described above, (§VII.B.2), it would have been obvious to combine the teachings of Cannon to the method and system of Wu. EX-1012, ¶134.

c. Claim 15

- i. *The method of claim 12 wherein the dynamic load balancing and resource management dynamically adjusts a capacity of at least the first remote unit.***

See Claim 4.

d. Claim 22

- i. *The system of claim 12, wherein the remote units are automatically configured by the system.***

See Claim 11.

VIII. Patent Owner is Estopped From Arguing the Patentability of the Challenged Claims Over Ground 1.

As discussed above, PO canceled all claims in the parent '178 Patent in response to an *inter partes* review trial being instituted challenging those claims resulting in an adverse judgment entered Jun. 30, 2019. See EX-1005. Under 37 C.F.R. § 42.73(d)(3) and the doctrine of issue preclusion, PO is precluded from taking action inconsistent with the adverse judgment, including arguing the patentability before the Board of any claim that is not patentably distinct from a finally canceled claim.

In IPR2020-01473, Claims 1-25 of the '178 Patent were challenged as being anticipated or obvious over Wu. As a result of those challenges, Claims 1-25 of the '178 Patent were canceled by adverse judgment.

This Petition challenges Claims 1-22 as being obvious over Wu (Ground 1) or Wu in combination with Cannon (Ground 2) and demonstrates that those claims are not patentably distinct from Claims 1-25 of the '178 Patent canceled by adverse judgment. PO is therefore precluded from arguing the patentability of the Challenged Claims over Wu in Ground 1 and that Wu discloses independent Claims 1 and 12 in Ground 2.

IX. THE BOARD SHOULD NOT EXERCISE ITS DISCRETION AND DENY INSTITUTION

A. The Board Should Not Deny Institution Under 35 U.S.C. § 325(d)

PO may urge the Board to exercise its discretion and deny institution on the basis that Wu was before the examiner during prosecution of the '343 Patent. However, as determined by the Board in its decision to institute *inter partes* review in the Ericsson IPR and in the parent '178 Patent, the Examiner's failure to find that Wu disclosed or taught the limitations described by the Examiner as missing in the art of record constitutes sufficient Examiner error warranting the Board to decline to exercise its discretion under 35 U.S.C. § 325(d) to deny institution. EX-1004, 9-17.

Here, as discussed in the prosecution history of the '343 Patent, Wu and Cannon were disclosed among over 390 references in IDSs filed in the application that issued as the '343 Patent. Importantly, the examiner objected to the volume of the references provided and suggested that the Applicant file new IDSs with a focused list of references. The Applicant did not do so, and never focused the

examiners attention of the disclosures of Wu and Cannon as being relevant to the recited limitations. Similar to the prosecution of the '178 Patent, the Examiner failed to find that Wu disclosed or taught the limitations described as missing in the “closest prior art of record” identified by the Examiner in the Notice of Allowance. The Examiner’s failure with respect to Wu and Cannon constitutes sufficient error warranting the Board to decline to exercise its discretion under 35 U.S.C. § 325(d) to deny institution of trial based on this Petition.

B. The Board Should Not Exercise Its Discretion under 35 U.S.C. § 314(a) to Deny Institution.

Petitioner CommScope was first served with a complaint asserting the ‘343 patent on October 24, 2022 in the matter of Dali Wireless Inc. v. T-Mobile et al., Case No. 2:22-cv-00414-RWS (E.D. Tex.). EX-1025; EX-1026. No scheduling conference has yet been performed in that action, and there is no trial date yet scheduled in that action. If this petition for institution and motion for joinder is granted, a final written decision is expected by February/March 2024, well *before* any trial date in the action against Petitioner.

In addition, the petitioner in the Ericsson IPR, which this Petition seeks to join, adopted the stipulation from *Sotera*. Further, if the present IPR is also instituted and joined as requested, Petitioner CommScope will not pursue in the district court litigation any ground actually raised in this IPR for the challenged patent. Thus, under the Interim Guidance, the Board should not deny institution

because multiple petitioners have stipulated to restrict the grounds pursued in district court.

A holistic view of the *Fintiv* factors also weighs in favor of institution.

Factor 1 weighs against discretionary denial or at worst is neutral. In the other actions involving the '343 patent (but not asserting the '343 patent against Petitioner CommScope) a stay has been requested. A stay was requested on March 14, 2023 in *Dali Wireless, Inc. v. Ericsson Inc.*, 6:22-cv-1313 (W.D. Tex.), and a stay was requested on March 30, 2023 in *Dali Wireless, Inc. v. AT&T Corp.*, 2:22-cv-00012 (E.D. Tex.). No stay has yet been requested in *Dali Wireless, Inc. v. T-Mobile US Inc.*, No. 2:22-cv-414 (E.D. Tex.). Thus, this factor weighs against discretionary denial or at worst is neutral.

Factor 2 weighs “significantly against” a discretionary denial because no trial date has been set in any action asserting the '343 patent against Petitioner CommScope. *Google LLC v. Uniloc 2017 LLC*, IPR2020-00441, Paper 13 at 35 (PTAB July 17, 2020) (“The fact that no trial date has been set weighs **significantly** against exercising our discretion to deny institution of the proceeding.”) (emphasis added).

Factor 3 weighs against discretionary denial. Neither the district court nor the parties in the action against Petitioner have invested in the merits of the invalidity positions. As discussed above, no scheduling conference in that action has occurred,

no discovery has been taken, no invalidity contentions have been served, and no claim construction has occurred. Petitioner's invalidity contentions are not due until June, and the scheduling conference is set for April 24, 2023.

Factor 4 weighs against discretionary denial. Patent Owner has only identified Claim 1 of the '343 Patent in its complaint. In contrast, Petitioner is challenging all claims of the challenged patent.

Factor 5 weighs against discretionary denial or at worst is neutral. Petitioner is **not** a defendant for the '343 patent in any of Patent Owner's earlier actions asserting the '343 patent against other defendants such as Ericsson. Petitioner is only a defendant for the '343 patent in *Dali Wireless, Inc. v. T-Mobile US Inc.*, No. 2:22-cv-414 (E.D. Tex.), which has no trial date or schedule.

Factor 6 weighs against discretionary denial because the merits of the Petition are compelling. The compelling merits standard requires it be "highly likely that the petitioner would prevail with respect to at least one challenged claim." *OpenSky Indus., LLC v. VLSI Tech. LLC*, IPR2021-01064, Paper 102, 49–50 (PTAB Oct. 4, 2022) (precedential). As applied here, it is highly likely that at least claim 1 is invalid based on Wu as shown in Ground 1. Notably, the PTAB already found it highly likely that Wu invalidates claim 1 in the parent patent of the '343 patent (the '499 patent), which is substantially similar to claim 1 in the present '343 patent. *CommScope Techs. LLC v. Dali Wireless, Inc.*, IPR2022-01293, Paper 18 at 6-7, 17

(PTAB Mar. 9, 2023) (Institution Decision). The IPR for the parent patent of the '343 patent the PTAB specifically found the challenged based on the same Wu reference met the compelling case standard. *Id.* at 17. Further, there is a compelling case of unpatentability because, as shown above, the PTAB has already entered adverse judgment against substantially similar claims in the prior IPR of the related '178 patent to which the '343 patent claims priority. Still further, the Board already instituted the Ericsson IPR against the '343 patent on the same grounds.

When viewed holistically, the timing of the present Petition was reasonable, there has been relatively limited investment in the related litigation, and there is minimal overlap between the present IPR and the Related Parallel Litigation. Thus, the efficiency and integrity of the IPR process is best served by instituting review.

X. Mandatory Notices Under 37 C.F.R. §42.8

A. Real Parties-in-Interest (37 C.F.R. § 42.8(b)(1))

The real parties-in-interest in this Petition are CommScope Technologies, LLC, CommScope, Inc. of North Carolina, CommScope, Inc, and CommScope Holding Company, Inc. (collectively, "CommScope"). No other parties have directed, funded, or controlled the filing of this IPR, and this IPR was not filed at the behest of any other party.

Based on current law and information available at this time, it is not clear to Petitioner that there are any other real parties-in-interest. Petitioner notes the

following. Customer T-Mobile is a named defendant in the matter identified below. The customer is named as: T-Mobile US, Inc., and T-Mobile USA, Inc. No entity other than CommScope (the listed real-parties-in-interest) is funding, controlling, or otherwise had an opportunity to provide input regarding this Petition; no entity other than CommScope has reviewed this Petition.

B. Related Matters (37 C.F.R. § 42.8(b)(2))

1. Judicial Matters

As of the filing date of this Petition and to the best knowledge of Petitioner, the '343 Patent is involved in the following litigation:

- *Dali Wireless, Inc. v. Ericsson Inc.*, 6:22-cv-1313 (W.D. Tex.);
- *Dali Wireless, Inc. v. Cellco P'ship, et al.*, No. 2:23-cv-002 (E.D. Tex.);
- *Dali Wireless, Inc. v. T-Mobile US, Inc., et al.*, No. 2:22-cv-414 (E.D. Tex.).

2. Administrative Matters:

As of the filing date of this Petition and to the best knowledge of Petitioner, the '343 Patent is subject to the instituted *inter partes* review in IPR2022-01345.

3. Related Patents

See Exhibit 1021.

C. Lead/Back-up Counsel (37 C.F.R. § 42.8(b)(3))

Lead Counsel	Back-Up Counsel
Philip P. Caspers, Reg. No. 33,227 Capella Tower, Suite 4200	Samuel A. Hamer, Reg. No. 46,754 Capella Tower, Suite 4200

225 South Sixth Street Minneapolis, MN 55402 pcaspers@carlsoncaspers.com Phone: 612.436.9617 Fax: 612.436.9605	225 South Sixth Street Minneapolis, MN 55402 shamer@carlsoncaspers.com Phone: 612.436.9615 Fax: 612.436.9605
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D. Notice of Service Information (37 C.F.R. § 42.8(b)(4))

Please direct all correspondence to lead and back-up counsel at the above addresses. Petitioner consents to electronic service at the email addresses above.

XI. FEES

Petitioner authorizes the Patent Office to charge Deposit Account No. 502880 for the fee set forth in 37 C.F.R. § 42.15(a) and for any other required fees.

XII. CONCLUSION

For the reasons set forth above, Petitioner has established a reasonable likelihood of prevailing with respect to all Challenged Claims of the '343 Patent and requests the Board institute *inter partes* review and then cancel all claims as unpatentable.

Respectfully submitted,

Dated: April 6, 2023

/s/Samuel A. Hamer

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225 South Sixth Street, Suite 4200
Minneapolis, MN 55402
(612) 436-9600

XIII. CERTIFICATION OF SERVICE ON PATENT OWNER

Pursuant to 37 C.F.R. §§ 42.6(e), 42.8(b)(4) and 42.105, the undersigned certifies that on April 6, 2023, a complete and entire copy of this Petition for *Inter partes* Review of U.S. Patent No. 11,006,343, Motion for Joinder, Power of Attorney, and all supporting exhibits were served via Federal Express, postage prepaid, to the Patent Owner by serving the correspondence address of record for the '343 Patent:

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

Dated: April 6, 2023

/s/Samuel A. Hamer
Samuel A. Hamer, Reg. No. 46,754
Carlson Caspers Vandenburg & Lindquist
225 South Sixth Street, Suite 4200
Minneapolis, MN 55402
(612) 436-9600

XIV. CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24 *et seq.*, the undersigned certifies that this document complies with the type-volume limitations. This document contains 13,100 words as calculated by the “Word Count” feature of Microsoft Word 2010, the word processing program used to create it.

Dated: April 6, 2023

/s/Samuel A. Hamer

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