

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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COMMSCOPE TECHNOLOGIES, LLC,<sup>1</sup>  
Petitioner,

v.

DALI WIRELESS, INC.,  
Patent Owner.

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IPR2022-01293  
U.S. Patent No. 10,334,499

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**Supplemental Declaration of Dr. Anthony Acampora  
in Support of Petitioner Reply**

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<sup>1</sup> Previous co-petitioner Corning Optical Communications LLC was terminated as a party by PTAB order dated February 6, 2023..

I, Anthony Acampora, declare as follows:

**A. Introduction**

1. I am over the age of eighteen (18) and otherwise competent to make this Declaration.

2. I have been retained by CommScope Technologies LLC. I am being compensated at my rate of \$725 per hour for my services. No part of my compensation is dependent on my opinions or on the outcome of this proceeding. I have no financial interest in any of the parties to this proceeding.

3. This Declaration is in support of the *inter partes* review involving U.S. Patent 10,334,499 (the “’499 Patent” or “the Patent”) (EX1001), entitled “Distributed Antenna System.”

4. I previously submitted a declaration in support of the petition for *inter partes* review. I incorporate that declaration in its entirety here by reference including, for example, my qualifications, *curriculum vitae*, my understanding of the relevant legal standards, and the opinions expressed therein relating to the ‘499 patent. The opinions stated herein are my own. I note that PO raised similar arguments in a co-pending IPR2022-01345 and that Petitioner in that case submitted a Declaration from Dr. Henry Houh supporting Petitioner’s Reply. I have reviewed Dr. Houh’s declaration. Because PO raises similar arguments here,

this declaration makes many of the same points made by Dr. Houh in the ‘01345 IPR.

5. As described in detail below, I offer the following further opinions in this Declaration:

- A POSA would understand the claim term “a digital representation of a [first/second] set of radio resources” to be used in the claims of the ‘499 patent according to their ordinary and customary meaning and would not have found the term to have a special meaning that refers to or requires some further configuration or control information.
- A POSA would recognize that in the Wu reference (EX1005) the digitized carrier channels being sent by the units 230 to remote units are “digital information defining or describing a set of radio resources to be used for transmitting data over the air via the antenna of a remote radio unit.”
- The example booster disclosed in the Wu reference (EX1005) from Bravo Tech is designed to couple and operate with an antenna.
- Wu discloses sending digital representations of different sets of radio resources *for transmission at the same one or more antennas*.

**B. Claim Construction:**

**“send a digital representation of a [first/second] set of radio resources to the first remote unit”**

6. One of skill in the art would understand that the term “**a digital representation**” in the phrase “send a digital representation of a first set of radio resources to the first remote unit” is being used according to its plain and ordinary meaning to refer simply to sending a digital version of the radio resources to the remote unit. To one of skill in the art, this phrase, by itself, does not refer to or require sending additional control or configuration information along with the digital representation. Although control or configuration information is ubiquitous in wireless communication systems, nothing about the phrase “send a digital representation of a first set of radio resources to a remote unit” recites or requires configuration information such as gain control information be sent along with the digital representation.

7. One of skill in the art understands that a primary function of a base station in wireless communications systems is to take payload data arriving from the core network and using the desired air interface protocol (which may be, e.g., any of FDMA, TDMA, or CDMA) modulate that information onto a signal. By modulation, I mean, for example, manipulating the phase, amplitude, and/or frequency characteristics of a signal according to a predefined constellation protocol (e.g., QPSK, or QAM) to encode the signal with the desired payload data. The resulting signal will have a specific shape (defined by its phase, amplitude, and frequency characteristics) that can be detected after transmission over a wired

or wireless communication medium and then decoded to extract the original payload data. A base station outputs a modulated signal. Commonly, the output of a base station is an analog signal that is then amplified for wireless transmission from an antenna.

8. The specification of the '499 patent describes a distributed antenna system that receives such analog signals from base stations. As shown, for example, in Fig. 1, the DAU receives RF input signals from base stations. At col. 4:65-5:11, the specification describes that these base station signals are then “digitized” in the DAU and down-converted to baseband. That the DAU digitizes the incoming signals informs one of skill in the art that the signals were received by the DAU in analog form. Digitization is well-known and is performed by capturing samples of the incoming signal at regular intervals. The samples represent or record in digital form the shape of the incoming signals. Digitizing and down-converting to baseband does not change the shape of the signal or undo the modulation performed by the base station.<sup>2</sup> Digitizing merely captures a digital picture or version of the shape of the RF carriers arriving from the base stations. The resulting digital baseband signal preserves the shape of the original base station signal, i.e., the shape of its amplitude, frequency and phase modulations.

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<sup>2</sup> Down-converting here simply refers to shifting a signal to a lower position along the frequency spectrum while preserving the same shape (i.e., the same phase/amplitude/frequency modulation encoding).

One of skill in the art would understand that digitizing a signal by taking digital samples of a signal creates a digital representation of that signal. A digital baseband version of RF carrier signals from a base station is a digital representation of those RF carrier signals.

9. I disagree with the statement by Patent Owner and its expert that:

...it would not make sense for the claim term to refer to digitized forms of CDMA codes or TDMA time slots. *Id.* For example, a time slot cannot simply be “digitized” but rather must be referred to by some identifier. *Id.* The same is true of a code for encoding communications in Code Division Multiple Access systems.

PO Response 18. The radio resources are the capacity (RF carriers, time slots, and CDMA codes) used by the base stations to modulate a signal with the incoming payload data. These modulated signals containing radio resources are eventually transmitted over the air by antennas, but the radio resources are first used by the base station to modulate information onto the signals. Using more carriers, more time slots, or more CDMA codes allows the base station to modulate more information into signals for wireless transmission. In other words, using more radio resources increases the data-carrying capacity of the wireless transmission. For example, using two timeslots instead of one, increases the data carrying capacity of the modulated signal. Likewise, using two frequency carriers or two CDMA codes instead of one increases the capacity of the modulated signal. A signal from a base station that has been modulated using an FDMA protocol, will

have multiple carriers modulated across multiple time slots. A POSA would easily recognize that applying an analog to digital converter to such a signal during a specified timeslot is an example of creating a digital representation of that timeslot radio resource. Likewise, a POSA would easily recognize that applying an analog to digital converter to a signal that has been modulated using CDMA codes is an example of creating a digital representation of those CDMA code radio resources.

**C. Applying Patent Owner’s Claim Construction to Wu:**

10. Patent Owner’s construction of the *digital representation* limitation does not distinguish the Wu reference. Even under Patent Owner’s construction of the “digital representation” limitation (which Patent Owner construes as “sending digital information defining or describing a set of radio resources to be used for transmitting data over the air via the antenna of a remote radio unit”) Wu discloses this element by sending digitized carrier channels from units (130, 230, 430) to the remote transceiver units (110, 410). Just like the ‘499 patent, the Wu reference discloses that analog carrier channel signals received from the transceiver are digitized by analog-to-digital converters in units 230 and that the digitized carrier channels are thus sent in digital form to the remotes. EX1005 ¶¶0030, ¶¶0054, Fig. 6-2 (“ADC”). This well-known process of digitization using analog-to-digital converters produces a set of digital samples that accurately describe an input signal and are “information defining or describing a set of radio resources” which are

ultimately “to be used for transmitting data over the air via the antenna of a remote radio unit.” The digital samples describe and preserve the shape of the radio carriers (how the carriers have been modulated in phase, frequency and amplitude) so that after transmission over long distance fibers, the original modulated analog signal can be recreated from the digital samples at the remote units (by corresponding digital-to-analog converters) prior to transmission over the air by an antenna. Digital samples of a carrier signal carrier signal. In fact, it is because the digital samples so accurately describe the shape of the original analog carrier channels signals received from the transceivers that the remote units are able to convert the digital samples back into analog form and accurately recreate the original analog signal for transmission over the air via antennas. Because Wu digitizes the downlink carrier signals and transmits the carriers in digital form (i.e. after digitizing them using ADCs), Wu is sending “information defining or describing a set of radio resources to be used for transmitting data over the air via the antenna of a remote radio unit.” Patent Owner’s claim construction does not distinguish Wu.

**D. Wu discloses transmitting the second set of radio resources over the same one or more antennas as the first set.**

11. Patent Owner starting at Page 32 says that Wu does not disclose a first set of radio resources that is “for transmission at an antenna of the first remote



unit” and a second set that is “for transmission at the antenna of the first remote unit.”

12. I disagree with Patent Owner.

1. **A POSA knows that Wu’s carrier channels (radio resources) are “for transmission” at an “antenna of the remote unit”**

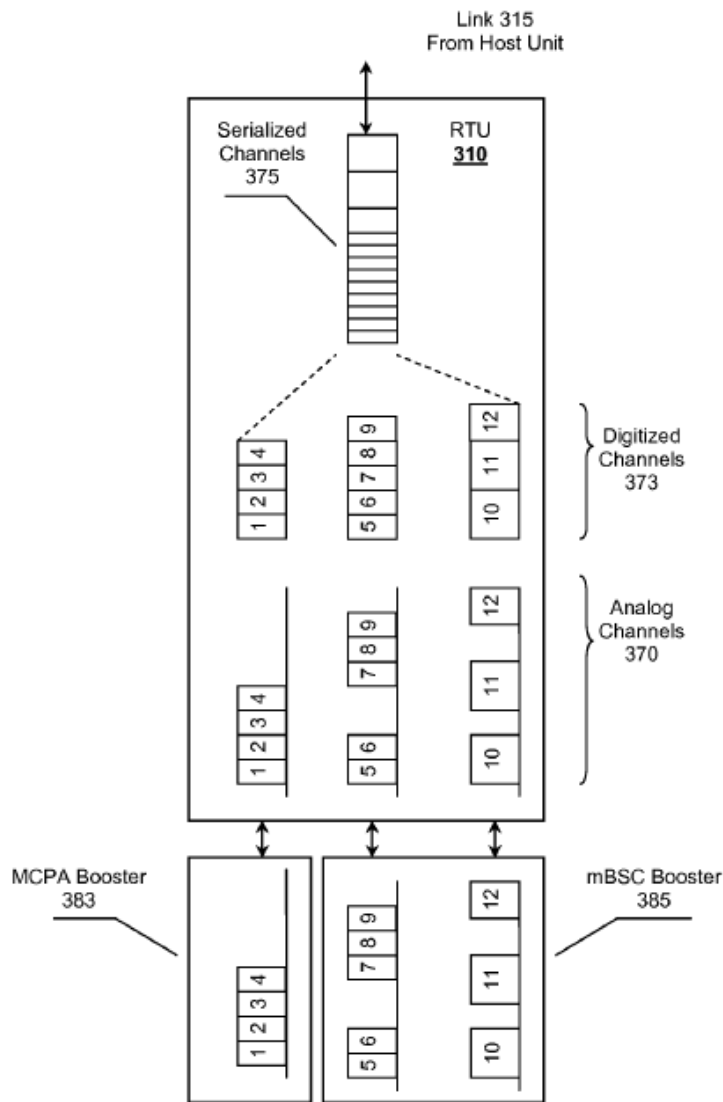
13. A POSA knows that Wu’s carrier channels (radio resources) are “for transmission” at an “antenna of the remote unit” for at least three reasons.

14. **First**, Wu teaches that its channels are distributed to “remote *transceiver* units” (RTUs), i.e., units that *transmit* and receive Wu (EX1005) ¶0004, Fig. 1. More specifically, Wu teaches that the RTUs—to which the Wu channels are distributed—are deployed to provide “wireless coverage.” Wu (EX1005) ¶0004 (“In FIG. 1, carrier channel distribution system 100 is deployed in an environment where cellular regions 120 require *wireless coverage*.”); see also Wu ¶0002 (“The field of the invention is *wireless carrier channel technologies*.”). In other words, the carrier channels are distributed to Wu’s RTUs so they can be transmitted wirelessly. A POSA knows that the structure to wirelessly transmit a carrier channel is an antenna. Thus, Wu RTUs must have an antenna in order to provide wireless coverage as taught by Wu, i.e., they inherently have an antenna. Correspondingly, when Wu’s matrix switch allocates channels to an RTU the channels are for transmission by an antenna of the remote unit as recited in the claim.

15. Other references corroborate that the structure to wirelessly transmit a carrier channel is an antenna. The Cannon reference (EX1069), for example, explains: “Remote units 106 each house electronic devices and systems used for *wirelessly transmitting* and receiving modulated radio frequency (RF) communications *via antenna 107* with one or more mobile subscriber units 108.” Cannon (EX1069) ¶0019. Similarly, the Wala reference (US Pat. No. 8,737,454) explains: “The remote units function to transmit/receive transmissions from the host unit and transmit/receive *wireless signals over accompanying antenna* to mobile costumers.” Wala (EX1031) Wala 3:2-5.

16. Wu itself cites a background reference that corroborates remote units have an antenna. Specifically, in its technology background section, Wu cites the Stratford reference (US Pat. No. 6,785,558) to explain the technology background of carrier channel distribution systems (which Wu is). Wu (EX1005) ¶0007. Stratford, in turn, explains: “Once received at the appropriate remote site, the digital carrier signal is sent via a local digital link to an antenna unit where it is converted to an analog carrier signal. The analog carrier signal is then frequency up-converted, amplified, and *transmitted from an antenna* to subscribers assigned to the various information channels of the carrier signal.” Stratford (EX1030) at 3:38-45.

17. *Second*, Wu expressly teaches that its RTUs have “boosters.” Wu (EX1005) ¶0050. Figure 3 shows these boosters (383, 385):



As the name suggests, a “booster” is a component that boosts (i.e., amplifies) the signal before retransmission by an antenna. It includes an amplifier that boosts the signal power so that it can be radiated wirelessly by an antenna. Thus, a POSA

would recognize that Wu's boosters connect to an antenna. Wu's boosters would have no purpose if they did not connect to an antenna.

18. Wu discloses specific commercially available boosters that are suitable for Wu's system that corroborate a booster connects to an antenna. Specifically, Wu discloses the "mBSC system" product from Bravo Tech Inc. as an example booster:

Channels 370 can then be distributed to one or more boosters for re-transmission as represented by MCPA booster 383 or mBSC booster 385. *Suitable boosters include those produced by Bravo Tech Inc, of Cypress Calif.* For example, the Bravo Tech Multi-Channel Power Amplifier (MCPA) series of products or Bravo Tech Multi-Band, multi-Standard & *multi-Carrier (mBSC) systems* can be deployed in the contemplated environments, including indoor or outdoor environments. The channels 370 can be allocated to the boosters as desired: one band per booster, two bands per booster, etc.

EX1005 ¶0050 (emphasis added).

19. I obtained the manual for mBSC product from the Federal Communications Commission (FCC) using the FCC's equipment authorization search at <https://apps.fcc.gov/oetcf/eas/reports/GenericSearch.cfm>. A POSA would expect that a booster for wireless transmission as taught by Wu would require FCC equipment authorization to wirelessly transmit in licensed bands; thus, this was a logical place to start.

20. The FCC's search form provides the option to locate materials by "Product Code." I entered "mBSC" to locate the mBSC system product. I sorted the entries in date order. The following shows the top-most entry that results:

39 results were found that match the search criteria:  
Product Code: **mBSC**

Displaying records 1 through 10 of 39.

View Form	Display Exhibits	Display Grant	Display Correspondence	Applicant Name	Address	City	State	Country	Zip Code	FCC ID	Application Purpose	Final Action Date	Lower Frequency In MHz	Upper Frequency In MHz
				BTI Wireless	11205 Knott Avenue - Suite A, Cypress, CA			United States	90630	WBKMBSC081921-19	Original Equipment	05/19/2010	1930.0	1990.0

21. The first entry (WBKMBSC081921-19) contained the manual for mBSC system product. Here is a screenshot of the corresponding list of attachments, once the "Detail" selection is clicked (for the entry WBKMBSC081921-19), with the linked page showing the link to a "Users Manual" at the bottom:

### OET Exhibits List

#### 8 Matches found for FCC ID **WBKMBSC081921-19**

View Attachment	Exhibit Type	Date Submitted to FCC	Display Type	Date Available
<a href="#">Confidential Request Letter</a>	Cover Letter(s)	05/19/2010	pdf	05/19/2010
<a href="#">External Photos</a>	External Photos	05/19/2010	pdf	05/19/2010
<a href="#">FCC ID Label Location</a>	ID Label/Location Info	05/19/2010	pdf	05/19/2010
<a href="#">FCC ID Label Drawing</a>	ID Label/Location Info	05/19/2010	pdf	05/19/2010
<a href="#">Internal Photos</a>	Internal Photos	05/19/2010	pdf	05/19/2010
<a href="#">Test Report</a>	Test Report	05/19/2010	pdf	05/19/2010
<a href="#">Test Setup Photos</a>	Test Setup Photos	05/19/2010	pdf	05/19/2010
<a href="#">Users Manual</a>	Users Manual	05/19/2010	pdf	05/19/2010

This Users Manual is Exhibit 1070 ("mBSC081921-12 Multi-Band, Multi-Standard, Multi-Carrier Coverage System, Operation Manual, Issue 2") from Bavo Tech Inc. I refer, however, to this Manual as simply the "Manual" for ease.

22. The Manual confirms it describes Bravo Tech Inc. mBSC system:



mBSC081921-12 System  
Operation Manual Issue 2

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#### **REVISION HISTORY**

Issue No.	Description	Date
1	Initial Draft	Dec. 15, 2009
2	Update the specification	Jan. 18, 2010

Manual at 2. Wu refers specifically to Bravo Tech. Inc of Cypress, Ca. Wu ¶0050.

The Manual also confirms this detail:

## 6 CUSTOMER CONTACT INFORMATION

### USA

#### **Bravo Tech Inc.**

6185 Phyllis Dr. Unit D. Cypress, CA 90630, USA

Tel: +1 714-230-8333

Fax: +1 714-230-8341

E-mail: \_\_\_\_\_

Customer Service: [CustomerService@bravotechinc.com](mailto:CustomerService@bravotechinc.com)

Sales: [sales@bravotechinc.com](mailto:sales@bravotechinc.com)

### China

#### **Bravo Tech (Shenzhen) Co., Ltd.**

No.8 Building, Zone #3, Tangtou Industrial Park,

Shiyan, Baoan District, Shenzhen, Guangdong

P.R.China 518102

Tel: +86 755-2951-2233

Fax: +86 755-2951-2299 \_\_\_\_\_

E-mail: [chinasales@bravotechinc.com](mailto:chinasales@bravotechinc.com)

In summary, the Manual matches Wu's disclosure, including product name, company name, and company location.

23. The FCC entry shows the "Date Available" for the Manual was May 19, 2010, which is in the prior art period:

### OET Exhibits List

#### 8 Matches found for FCC ID **WBKMBSC081921-19**

<a href="#">View Attachment</a>	<a href="#">Exhibit Type</a>	<a href="#">Date Submitted to FCC</a>	<a href="#">Display Type</a>	<a href="#">Date Available</a>
<a href="#">Confidential Request Letter</a>	Cover Letter(s)	05/19/2010	pdf	05/19/2010
<a href="#">External Photos</a>	External Photos	05/19/2010	pdf	05/19/2010
<a href="#">FCC ID Label Location</a>	ID Label/Location Info	05/19/2010	pdf	05/19/2010
<a href="#">FCC ID Label Drawing</a>	ID Label/Location Info	05/19/2010	pdf	05/19/2010
<a href="#">Internal Photos</a>	Internal Photos	05/19/2010	pdf	05/19/2010
<a href="#">Test Report</a>	Test Report	05/19/2010	pdf	05/19/2010
<a href="#">Test Setup Photos</a>	Test Setup Photos	05/19/2010	pdf	05/19/2010
<a href="#">Users Manual</a>	Users Manual	05/19/2010	pdf	05/19/2010

Patent Owner's earliest priority date for the '499 patent is Feb. 7, 2011. The Manual's copyright and revision history also confirm it predates the '499 patent:

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#### **REVISION HISTORY**

Issue No.	Description	Date
1	Initial Draft	Dec. 15, 2009
2	Update the specification	Jan. 18, 2010

Manual 2.

24. For completeness, Manual's date available on the FCC site (May 19, 2010) predates Wu's publication date (May 27, 2010). Thus, a POSA reading Wu's publication, could have located this Manual.

25. For completeness, I also note a POSA could also have readily identified and located this Manual by searching by the applicant's name. The FCC's search provides the option to locate materials by "Applicant Name." I entered the initials for Bravo Tech Inc. (BTI) for the Applicant Name and confirmed the results also contain the same entry with the Users Manual shown above. Further, the total results in the prior art period when searching by either Product Code or Applicant Name is small (less than 10).



26. The mBSC booster is connected to an antenna. As shown below, the mBSC had an antenna port:

**2.4.2 RU Interface Ports Description**  
Each interface port of Remote Unit, shown in Figure 2-7, is described in below Table 2-2.

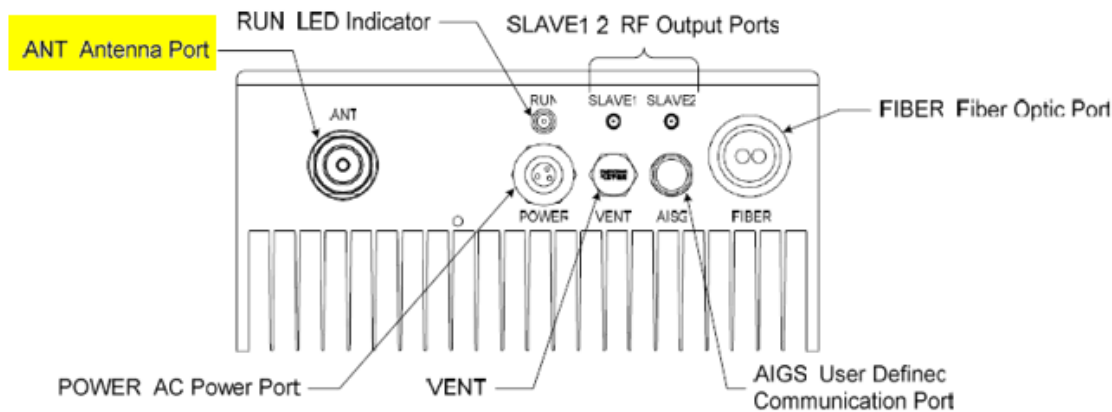


Figure 2-6. User Interface of Remote Unit

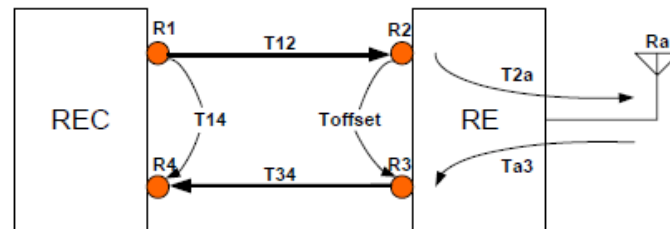
Table 2-2. Remote Unit User Interface

Label Name	Description
ANT	Interface port for Antenna Feed line
RUN	LED indicator for normal or critical fault status of RU. Normal: Green ON, Critical fault: Red ON
SLAVE 1, 2	RF output port to provide the input signal to Slave Remote unit when Dual or Triple Band application
FIBER	Fiber Optic Cable interface port for combined downlink and uplink signal
POWER	Interface port for the AC 220V power cable
AISG	User Defined Interface port for External Alarm. (Debug port for the default)
VENT	Port for the balance of the pressure inside and outside of the enclosure

Manual 8-9 (yellow added). As shown here, the boosters operate by coupling their output to an antenna. The antenna connects to the antenna port. The mBSC booster shown here would not function to wirelessly transmit signals without connecting an antenna to the antenna port.

27. **Third**, Wu teaches that its RTUs receive the channels (radio resources) via links that operate according to the CPRI standard. Wu (EX1005) ¶0031. In the CPRI standard, the radio resources are transmitted to the radio equipment (Wu' RTUs) for transmission over an antenna:

Reference points R1-4 correspond to the output point (R1) and the input point (R4) of REC, and the input point (R2), and the output point (R3) of an RE terminating a particular logical connection between SAP<sub>IQ</sub>. The antenna is shown as "Ra" for reference.

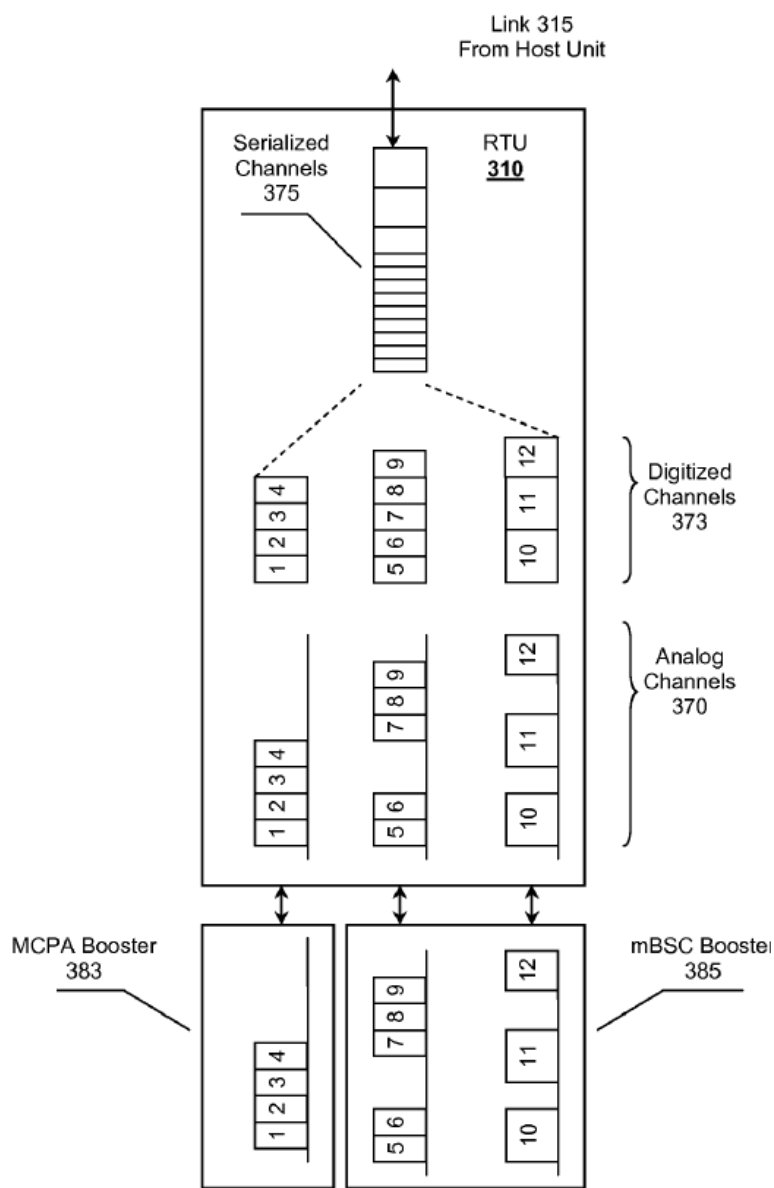


CPRI (EX1007) at 52. Note that the triangular structure (Ra) is a standard way to depict an antenna.

## 2. Patent Owner's argument about the "same" antenna does not distinguish Wu

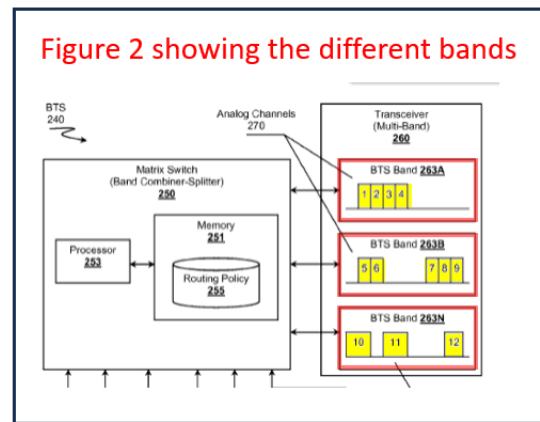
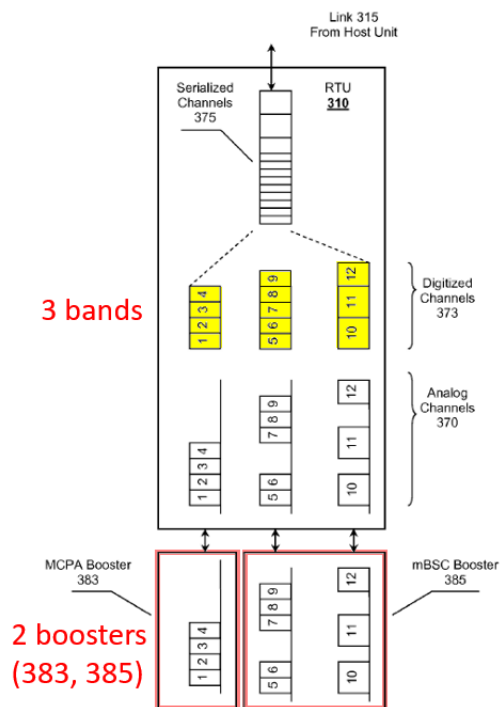
28. Patent Owner's argument about the "same" antenna does not distinguish Wu because Wu's disclosure covers scenarios in which the new set of carrier channels are for transmission by the same one or more antennas at that RTU.

29. PO gives one reason why Wu supposedly cannot transmit a first and second set of channels from the same set of one or more antennas. PO says Wu's Figure 3 shows some of Wu's channels are sent to "different boosters" such as channels 1-4 vs. channels 5-9:



PO's argument fails to distinguish the claims from Wu for multiple reasons.

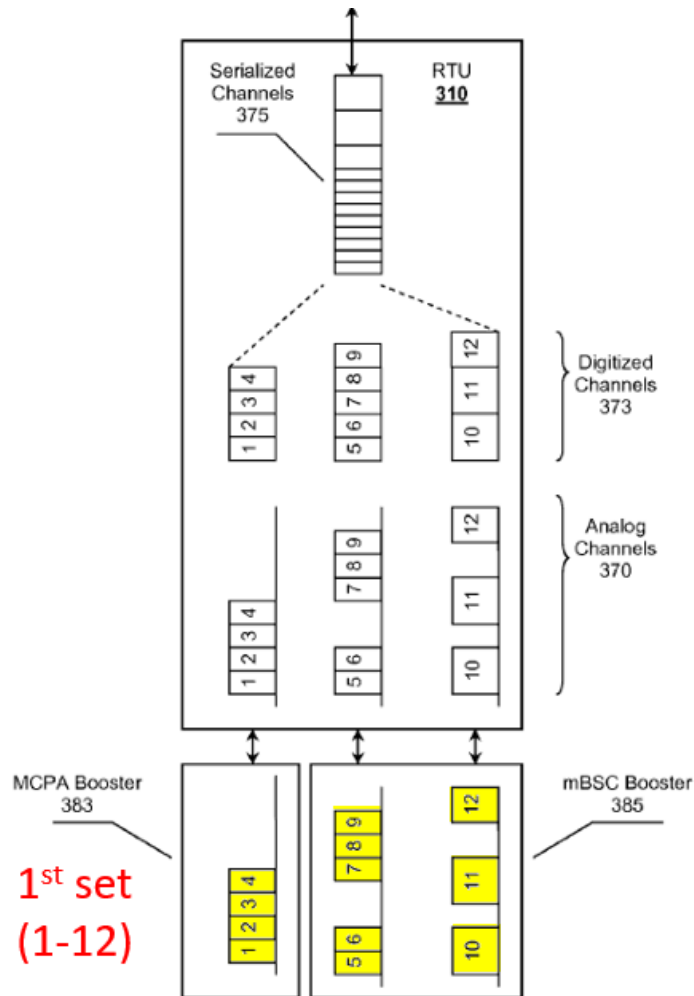
30. **First**, Wu teaches there could be just *one* booster, which moots Patent Owner's argument. Figure 3 is just an example, specifically, an example where there are three bands per two boosters (Figure 2, right, shows the three bands):"



Wu teaches: “channels 370 can be allocated to the boosters as desired: one band per booster, two bands per booster, *etc.*” EX1005 ¶0050 (emphasis added). The “etc.” means Wu also covers three bands per booster, i.e., all channels 1-12 per one booster. When there is only one booster, necessarily, every set of channels is transmitted by the same booster (and through it to the same inherent antenna).

31. **Second**, even in the case where there are two boosters, PO is making the wrong comparison. PO is comparing whether channels 1-4 and channels 5-9 are for transmission by the same individual booster. The correct comparison is whether the overall first carrier set is for transmission by one or more antenna (an antenna) and the second carrier set for that same one or more antennas (the antenna). Here is the correct comparison.

32. The first set of carrier channels. In Figure 3, the first “set” can be carrier channels 1-12 (indicated in digital form at 373 and in analog form at 370), which is for transmission by one or more boosters (383, 385) to the attached antennas.



Undisputed one or more antenna  
for “wireless” transmission

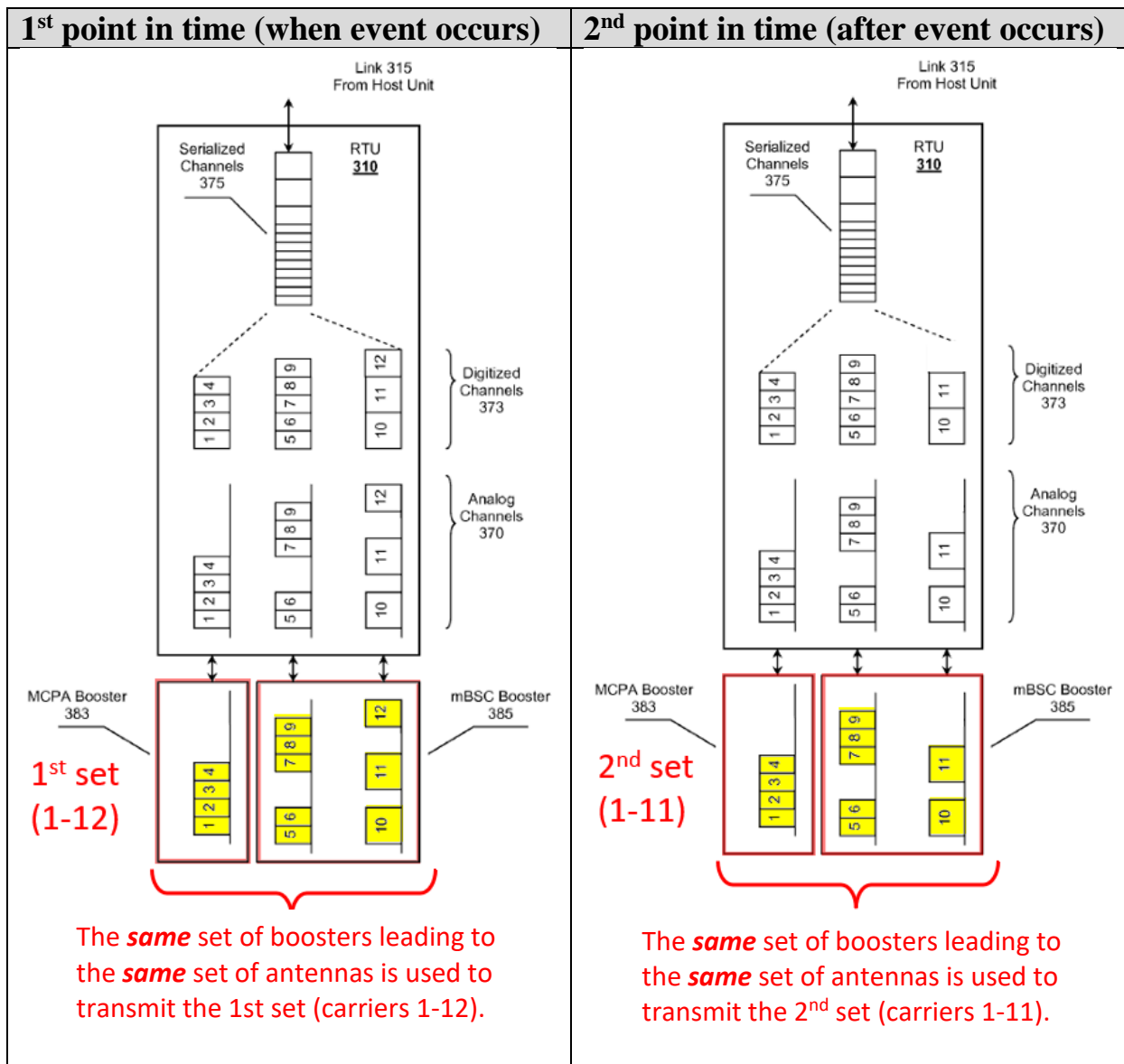
An example of this point in time is during an “event” such as a disaster when “more” channels are needed. Wu (EX1005) ¶0046. The first set of radio resources

(carrier channels 1-12) will be transmitted by whatever antennas are attached to the two boosters (383, 385). Nothing in the claim excludes this because the claim is not limited to “single” antenna. Thus, Figure 3 meets the limitation about a first set at a first point in time for transmission by an antenna.

33. The second set of carrier channels. Wu also meets the limitation about the “second” set of radio resources for transmission by “the” antenna. Wu’s matrix switch, as explained in my earlier declaration, can change the channels shown in Figure 3 and route them, for example, in any “arbitrary groups.” Wu (EX1005) ¶0049. For example, when the event that required all channels at a location is over and the additional channels are no longer needed, Wu’s matrix switch can allocate fewer channels in any “arbitrary group” (e.g., only channels 1-11 without channel 12 that is no longer needed).<sup>3</sup> Here is an annotation showing these two points in time:

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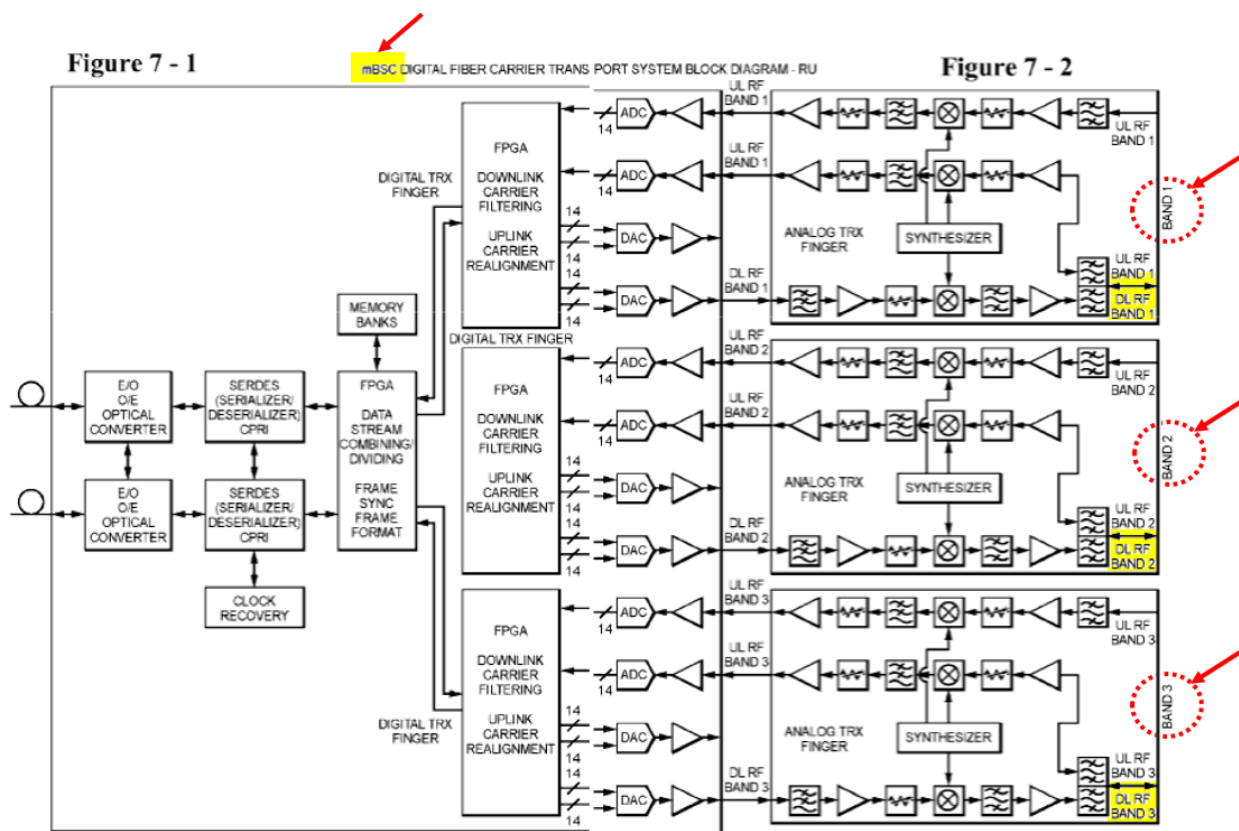
<sup>3</sup> Wu’s disclosure would include other examples as well (e.g., 1-10, 2-11, 3-12, etc.).



Note the overall first and second *sets* (1-12 and 1-11) are for transmission by the same two boosters attached to the same inherent antennas. Whether the boosters connect to one, two, or three antennas is irrelevant. All these meet the claim. If the two boosters feed one antenna, both the first set (channels 1-12) and second set (channels 1-11) are sent to that one antenna through the same boosters. If the two boosters feed two separate antennas, both the first set (channels 1-12) and second

set (channels 1-11) are sent to those two antennas through the same boosters. Both sets are transmitted by the number of antennas that are attached to the boosters, i.e., the same set of antennae.

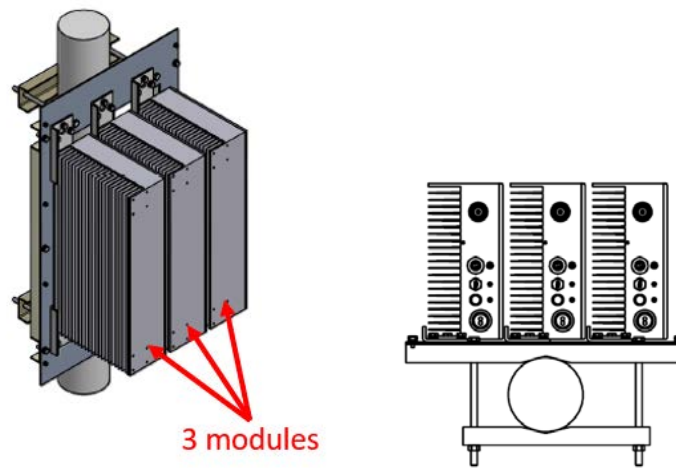
34. **Third**, Wu discloses a more detailed example where the different sets are transmitted by the same set of antennas. Figure 7 shows the RTU's hardware for transmitting the channels. Per the title, it shows an "mBSC" booster:



Bands 1-3 correspond to the three bands in Figure 2 (1-4, 5-9, 10-12). The yellow highlighting (right) shows that each band module outputs an RF signal for transmission. A POSA understands that each of these RF outputs is for transmission by an antenna because an antenna is the structure that radiates RF



signals. Thus, a POSA understands the RTU in this example has three antennas (one per band). As confirmation, Wu's specification teaches the mBSC booster can be a specific commercial product (from Bravo Tech.), and the information for that product confirms that the mBSC booster has three modules exactly as shown in Figure 7 and each module connects to an antenna:



From Manual (EX1070), Figure 2-4.

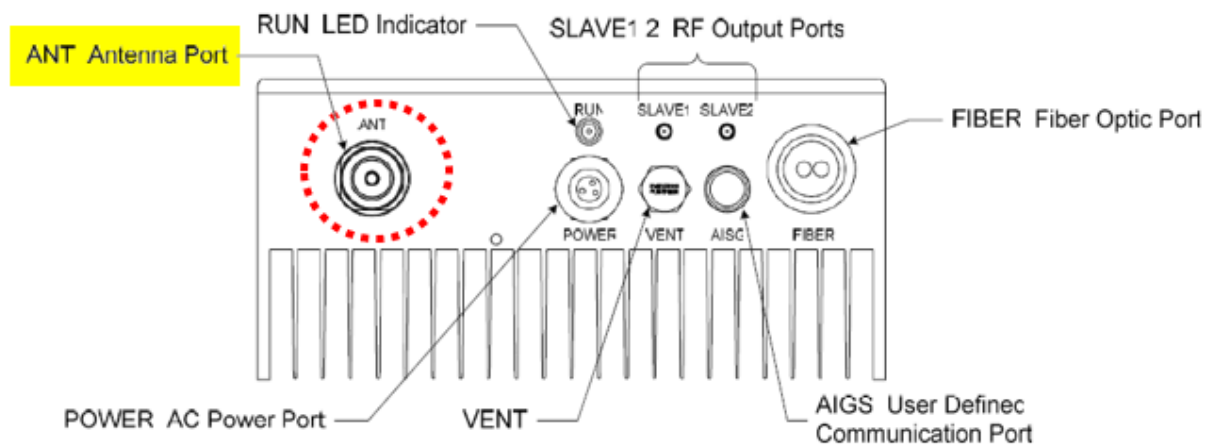


Figure 2-6. User Interface of Remote Unit

From EX1070, Figure 2-6, pp. 6-9.

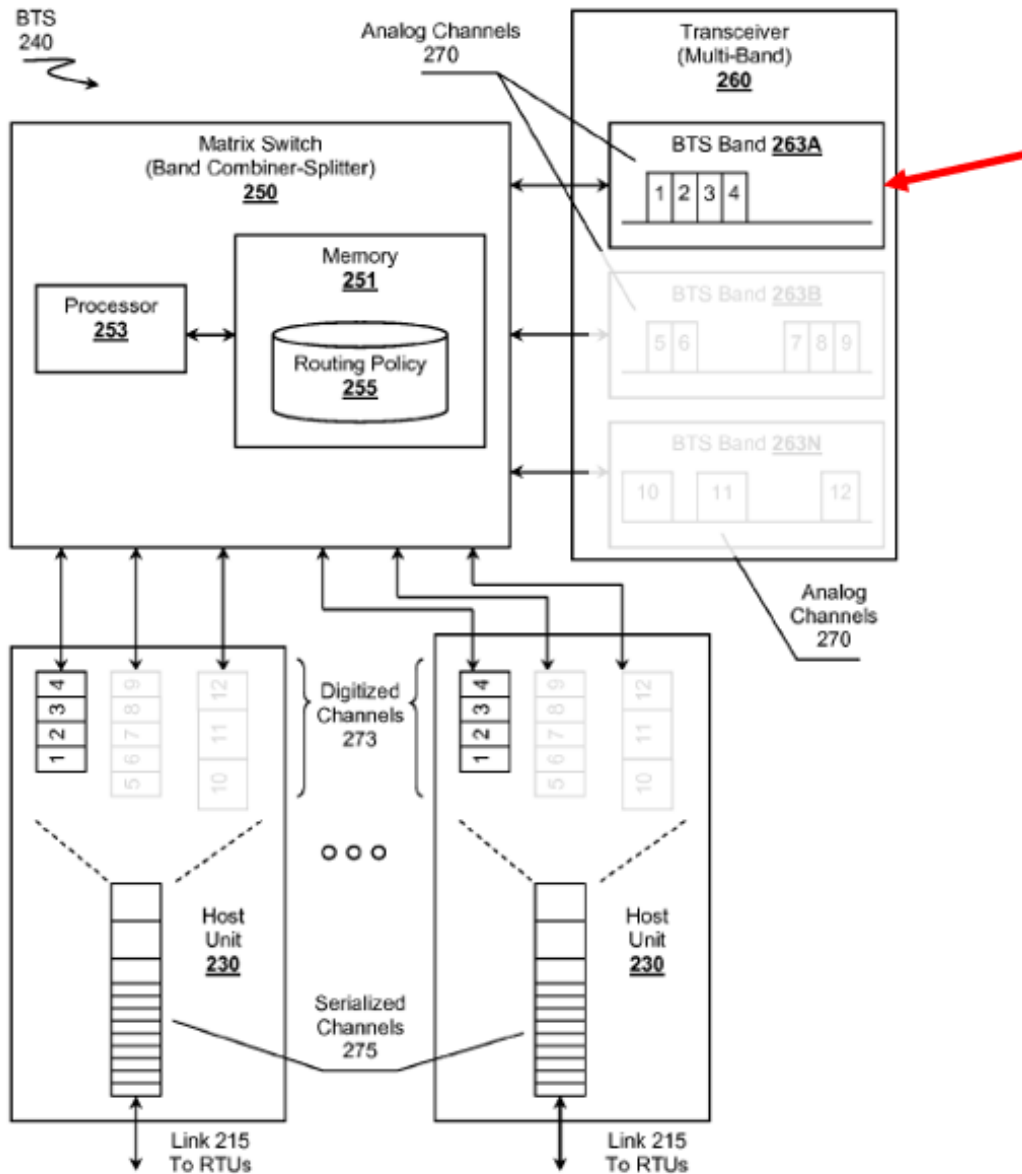
35. This gets to the key point: each of the sets of channels covering the three bands (e.g., a first set 1-12, which covers three bands, comprises 1-4, 5-9, 10-12 and a second set 1-11 without 12, which also covers the same three bands) is transmitted by the same set of one or more antennas (the three antennas).

36. The fact that there are three antennas for the mBSC example is not critical. If instead the three RF signals were combined for transmission over two antennas or one antenna, Wu still invalidates because the overall set of antennas used remains the same. Again, Wu never teaches to add/remove antennas at an RTU when redistributing channels.

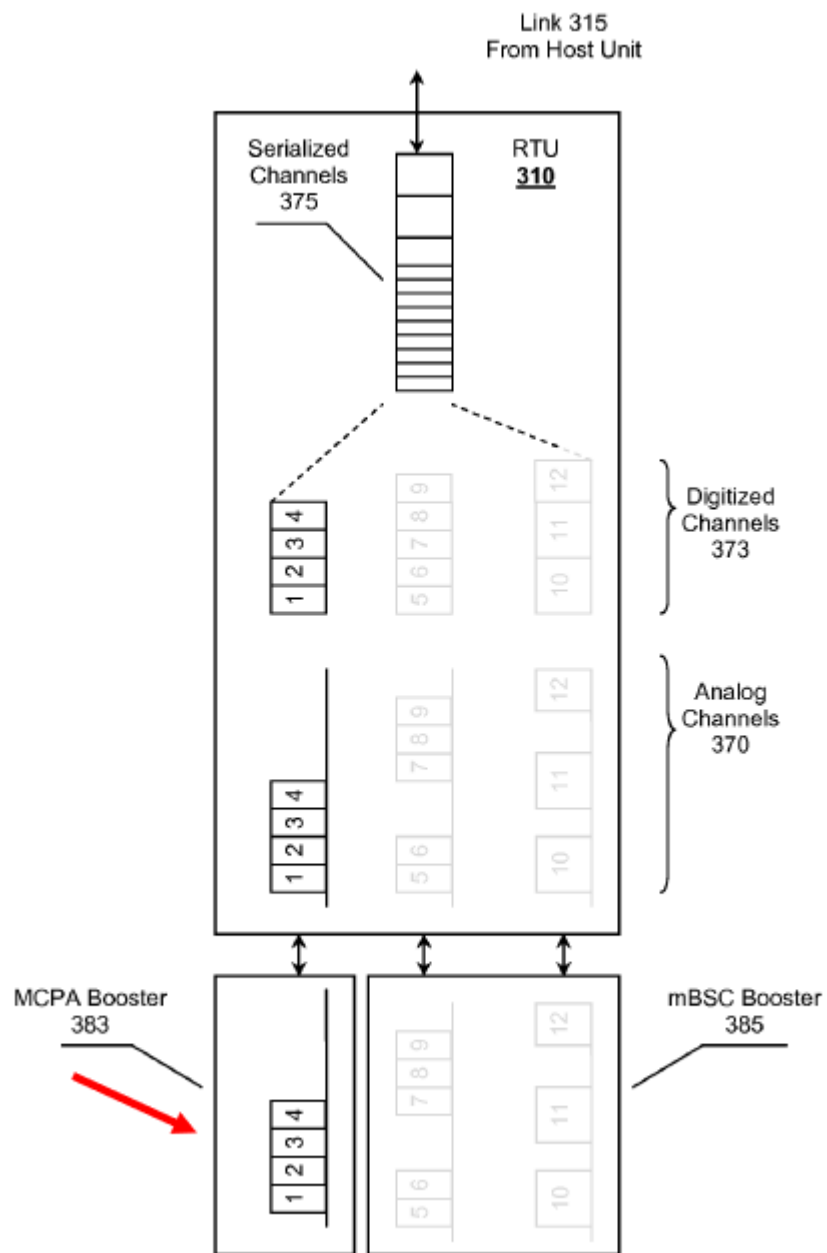
37. ***Fourth***, Patent Owner cannot distinguish another example from Wu that also moots Patent Owner's argument about different boosters. Wu expressly teaches there can be just one band (instead of the three bands shown in Figure 3). Wu ¶0011 ("one or more frequency bands"), ¶0030 ("one or more bands").

Consider the set of radio resources for just one band, e.g., band 263A comprising channels 1-4. Here is an annotation showing this one band at the matrix switch and RTU with the other bands grayed out:

***Matrix switch with one band (comprising channels 1-4)***



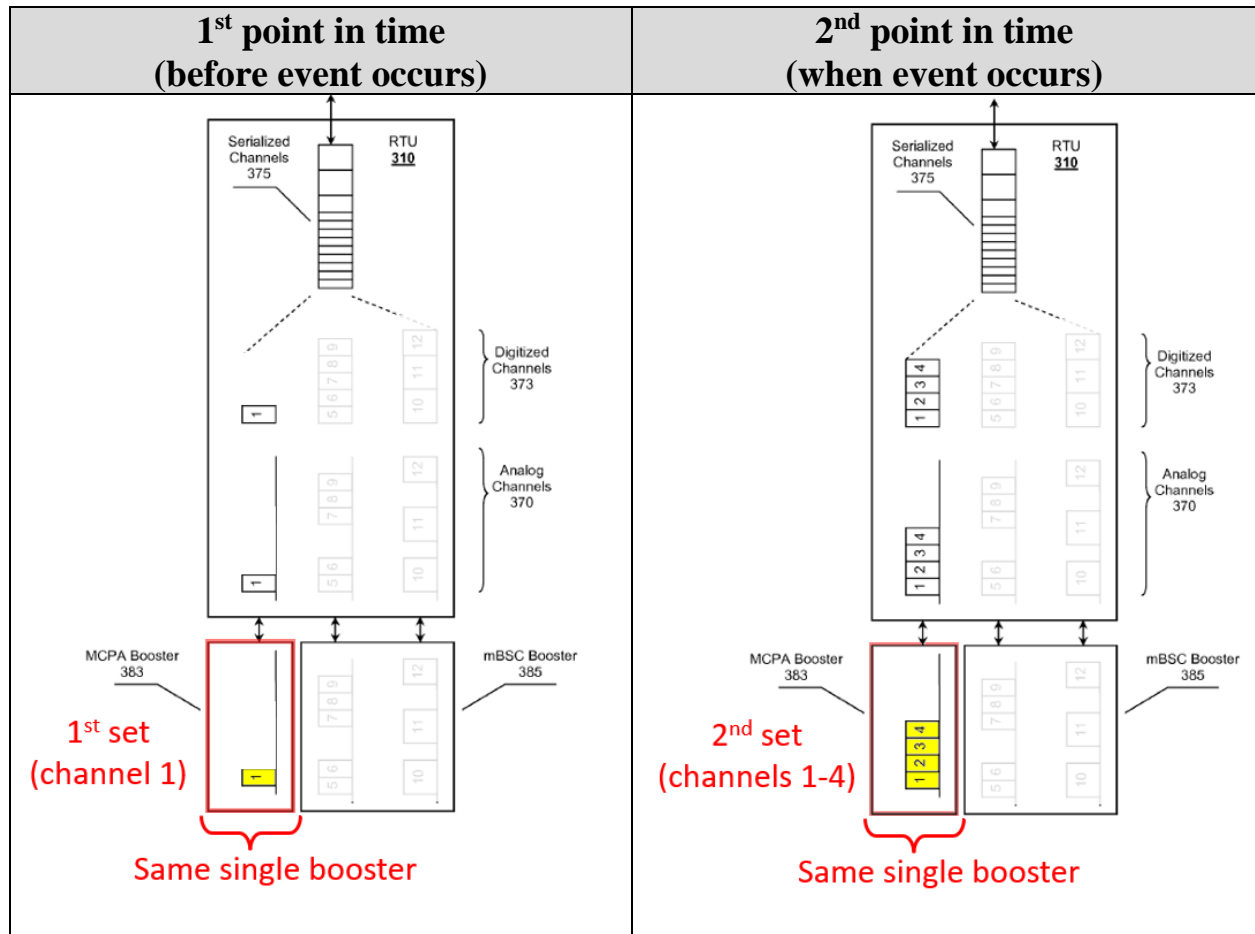
*RTU with one band (comprising channels 1-4)*



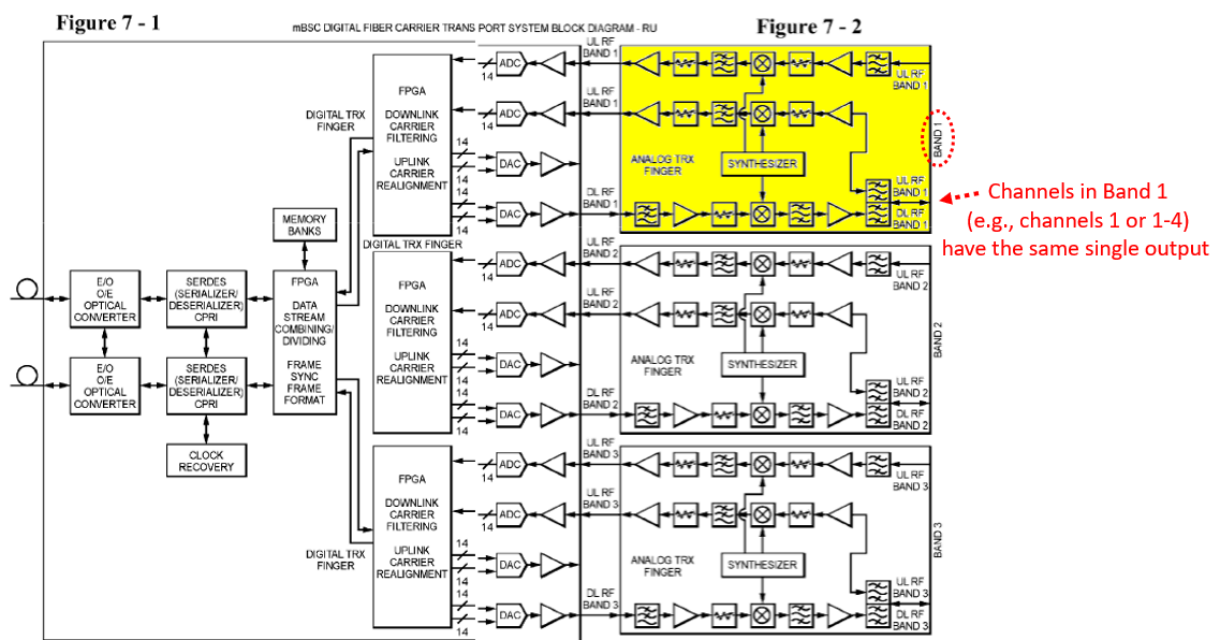
Wu teaches these channels can be routed individually (e.g., channel 1) or collectively in a group (e.g., channels 1-4). This is another example a first set of radio resources (channel 1) at a first point in time (e.g., at a point in time before a

triggering event occur) and a second set of radio resources (channels 1-4) at a second point in time (when the event occurs and “more” channels are needed).

Figure 3 shows both these sets are transmitted to the same, single booster:



38. Figure 7 shows that all the channels in an individual band can be transmitted by the same, single module:



39. The example booster (the mBSC system) shows that the transmission module for an individual band has a single antenna output:

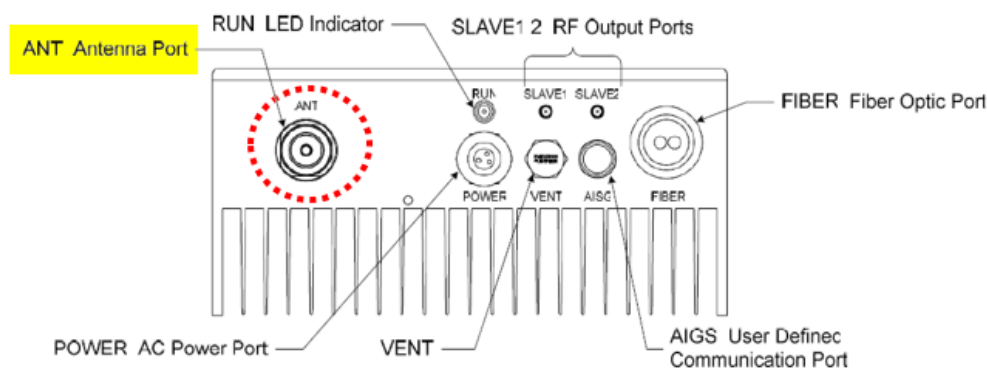


Figure 2-6. User Interface of Remote Unit

EX1070 Manual at 9.

40. Thus, the different sets of channels within a single band are transmitted to the same, single antenna. Wu teaches multiple examples of a first/second set of channels with a single band (e.g., channels 1 individually vs.

channels 1-4 or channels 5-6 together vs. channels 5 separately). Each is sufficient to teach the disputed limitations.

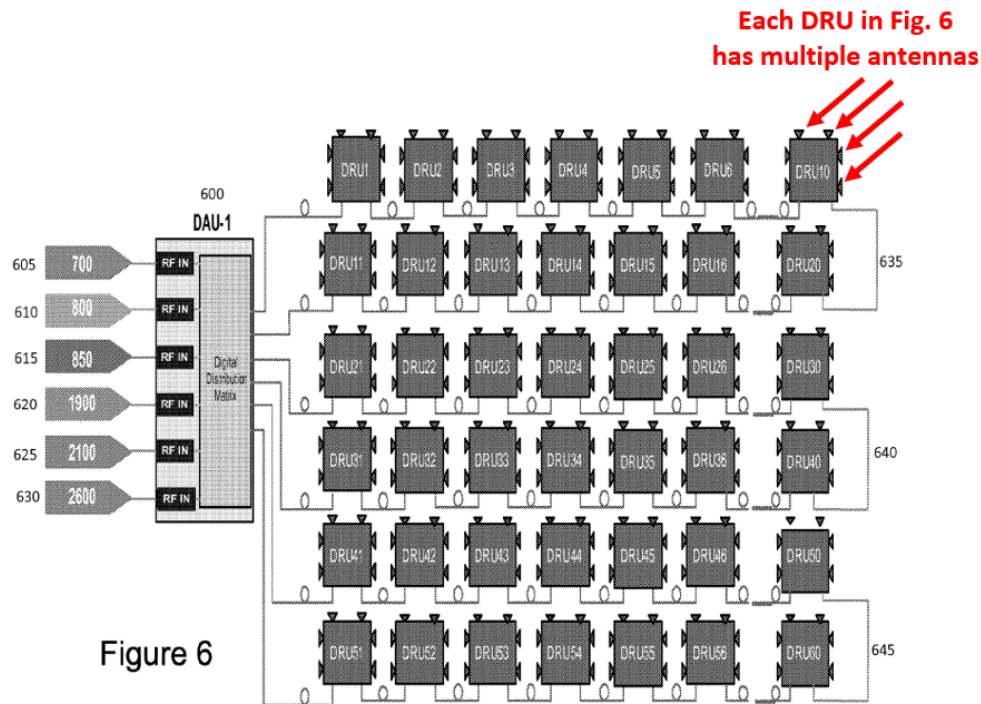
**3. PO's argument about a "single" antenna does not distinguish Wu**

41. PO's argument about a "single" antenna does not distinguish Wu for several reasons.

42. *First*, as just discussed, Wu's disclosure covers examples where a first and second set of channels are for transmission by a single antenna. Specifically, Wu teaches that different sets of channels within a single band are transmitted to the same, single antenna. Further, Wu teaches multiple examples of a first and second set of channels with a single band (e.g., channels 1 individually vs. channels 1-4 or channels 5-6 together vs. channels 5 separately). Each is sufficient to teach the disputed limitations.

43. *Second*, I understand the term "an" in the phrase "an antenna" generally means "one or more" (i.e., an antenna means one or more antenna). I do not see anything in the intrinsic record that shows the Patent Owner narrowed the meaning of "an antenna" to only a single antenna.

44. To the contrary, the specification for the '499 patent discloses an example where each remote unit does not have a single antenna, but rather has six antennas. Figure 5 shows each DRU has six antennas represented by six triangles:



A POSA knows that the triangle is a standard way to depict the presence of an antenna. The ‘499 patent corroborates that a triangle represents an antenna.

Figure 1 of the ‘499 patent depicts the antenna using a triangle (see, e.g., “antenna output port 125A” leading to triangle indicating antenna at the DRU).

45. I declare that all statements made herein of my knowledge are true, and that all statements made on information and belief are believed to be true, and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both.

Date: August 28, 2023

  
Dr. Anthony Acampora