

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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TOYOTA MOTOR CORP. and  
CONTINENTIAL AUTOMOTIVE SYSTEMS, INC.

Petitioners,

v.

INTELLECTUAL VENTURES II LLC

Patent Owner.

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Case No. IPR2022-01130  
U.S. Patent No. 8,811,356

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**PATENT OWNER'S PRELIMINARY RESPONSE**

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**PATENT OWNER'S EXHIBIT LIST**

|          |                                                                                                                                                                                                                             |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ex. 2001 | Declaration of Dr. Gary Lomp                                                                                                                                                                                                |
| Ex. 2002 | CV of Dr. Gary Lomp                                                                                                                                                                                                         |
| Ex. 2003 | “Interval” - <i>Merriam-Webster.com Dictionary</i> , Merriam-Webster, <a href="https://www.merriam-webster.com/dictionary/interval">https://www.merriam-webster.com/dictionary/interval</a> , (captured on October 4, 2022) |

## **I. INTRODUCTION**

The Petition challenges claims 1-7, 22-28 and 43-46 (“Challenged Claims”) of U.S. Patent No. 8,811,356 (“’356 Patent,” Ex. 1001) under three grounds of unpatentability. The Board should deny the institution for at least the following reasons.

Institution should be denied with respect to Ground 1 because IEEE Std 802.16-2004, IEEE Standard for Local and metropolitan area networks, Part 16: Air Interface for Fixed Broadband Wireless Access Systems (Ex. 1005) (“the Standard”) fails to teach all of the elements of the Challenged Claims.

Institution should be denied with respect to Grounds 2-3 because the Challenged Claims are not obvious over the Standard alone or in combination with U.S. Patent App. Pub. No. 2007/0105600 to Mohanty (Ex. 1009).

This Preliminary Response is accompanied by the Expert Declaration of Dr. Gary Lomp, Ex. 2001 (“Lomp Declaration”).

## **II. THE PROBLEM AND SOLUTION PRESENTED IN THE '356 PATENT**

### **A. The Problem Presented: How to Control the Uplink Channel in the Absence of Channel Reciprocity**

Cellular systems are often able to control the uplink channel based on the conditions of the downlink channel, when “channel reciprocity” exists. As explained in the '356 Patent:

Channel reciprocity gives equipment the ability to derive information about uplink channel conditions from downlink channel conditions based upon signals received by the user equipment (UE). Pathloss is one example of channel information that can be obtained from channel reciprocity. Knowledge of the uplink pathloss enables open-loop power control to be employed for uplink transmissions. ... A data terminal that can derive information needed to access uplink channels from the downlink transmissions (beacon signals) has a significant advantage over a terminal that relies on the (lengthy) configuration of a dedicated channel in order to establish a feedback channel. Ex. 1001, Col. 1, Ll. 23-45.

While channel reciprocity provides significant advantages, situations exist where channel reciprocity cannot be guaranteed. As the '356 Patent explains:

However, channel reciprocity cannot always be guaranteed. For example TDD transmissions may not be permitted in certain frequency spectrum allocations; this is a regulatory issue and may be used to protect other wireless equipment in the same or adjacent frequency bands. In these situations the correlation between uplink and downlink channels is lost because the channels are transported on carrier frequencies that are separated in frequency by an amount that is greater than the coherence bandwidth of the channel (usually, only a few MHz separation is sufficient to cause the uplink and downlink fading profiles to be independent). *Id.*, Col. 1, Ll. 46-56.

The '356 Patent goes on to explain further situations where there is decorrelation between the uplink and downlink channels, resulting in a loss of reciprocity. For example, “the use of multiple transmit and/or receive antennas at the network and/or the mobile terminal can introduce unintentional decorrelation between the uplink and downlink channels.” *Id.*, Col. 1, Ll. 62-65.

One of the stated goals of the '356 Patent is to “find a substitute for channel reciprocity” for applications “where the correlation between the uplink and downlink path loss is not guaranteed.” *Id.*, Col. 1, L. 66 – Col. 2, L. 2.

**B. Summary of the Invention – A New Feedback Technique For Use In Applications Where Channel Reciprocity Cannot Be Guaranteed**

The first paragraph of the “Summary of the Invention” provides an exemplary description of the '356 Patent’s solution - a new feedback technique for use where reciprocity cannot be guaranteed:

Although it is desirable to support air interfaces where the pathloss is not reciprocal, known conventional methods do not deal directly with the evolution or adaptation of an air interface that uses channel reciprocity to deliver key features and advantages where channel reciprocity is not guaranteed. *The adaptation provided in embodiments of the invention introduces a new technique for uplink channel control that uses a feedback scheme as a substitute for the absence of channel reciprocity, with minimal impact on the ability of the air interface to support uplink shared channels.* *Id.*, Col. 2, Ll. 6-16 (emphasis added).

The Summary of the Invention provides further details of this feedback scheme, which “enable active feedback control between a base station and user

equipment (UE).” *Id.*, Col. 2, Ll. 17-18. As explained in the Summary of the Invention, the solution includes a closed loop feedback scheme, where a timeslot for transmission of a control signal (referred to as ‘UL-Beacon’) is inserted in the uplink frame between time slots used for transmitting data:

... an uplink beacon function (for power control) and a modified random access process substitute for the information lost due to the lack of channel reciprocity in paired operation. Embodiments of the invention allow a terminal to transmit the uplink physical channel control signal (UL\_Beacon) independently from the uplink physical channel. Therefore, the implementation of closed loop feedback may operate in the absence of an uplink physical channel. In one embodiment, a UE allocates a time slot for a beacon signal separated from the time slots for data in a frame. A second time slot is allocated within the frame for the base station to transmit a control signal in response to the beacon signal. The control signal instructs the UE to adjust a transmission parameter. *Id.*, Col. 2, Ll. 21-34. (emphasis added).

### **C. Detailed Description of the Novel Feedback Technique**

The Detailed Description discloses an active feedback control system in which user equipment (UE) (e.g., a cell phone) transmits an uplink beacon (UL\_Beacon) to a base station. “When pathloss reciprocity is not available, the combination of an uplink physical channel control signal with a downlink feedback channel may be used to keep the terminal informed of the condition of the uplink channel. The uplink physical control signal is referred to herein as an ‘Uplink Beacon’ (UL\_Beacon).” *Id.*, Col. 4, Ll. 35-40. In the closed loop feedback system, “the base station detects the received power and/or other channel

information from the UL\_Beacon, and sends controlling commands back to each terminal to keep the terminal informed of the channel conditions observed at the base station.” *Id.*, Col. 4, Ll. 56-60. For example, the “base station may send power control commands on a shared downlink channel to each terminal based on the power received from the UL\_Beacon signal.” *Id.*, Col. 4, Ll. 63-65. This disclosed closed loop power control maintains the uplink channel for the duration of a communication session or sub-session. This “always on” aspect is what enables the invention to “substitute” for the reciprocity that would be available in, for example, a TDD system. Ex. 2001, ¶ 29.

The Detailed Description discloses the invention in the context of TDMA/CD-TDMA systems (‘356 Patent (Ex. 1001), Col. 5, Ll. 50-52), where a base station assigns timeslots in the uplink frame to individual UE’s serviced by the base station. Since multiple UEs can communicate with the base station using this framework, the patent describes using the “physical uplink shared channel” in the uplink frame. Of particular significance, the patent teaches that each UE transmits the UL-Beacon in a dedicated timeslot of the uplink frame, between time slots used for sending data to the base station. *Id.*, Col. 2, Ll. 29-33. This design is especially advantageous because, as explained more fully below, it allows the feedback control to operate during normal operation of the uplink channel even when a UE does not have data to send. Ex. 2001, ¶ 30.

An example of the patented uplink frame structure is illustrated in Fig. 2 of the '356 Patent:

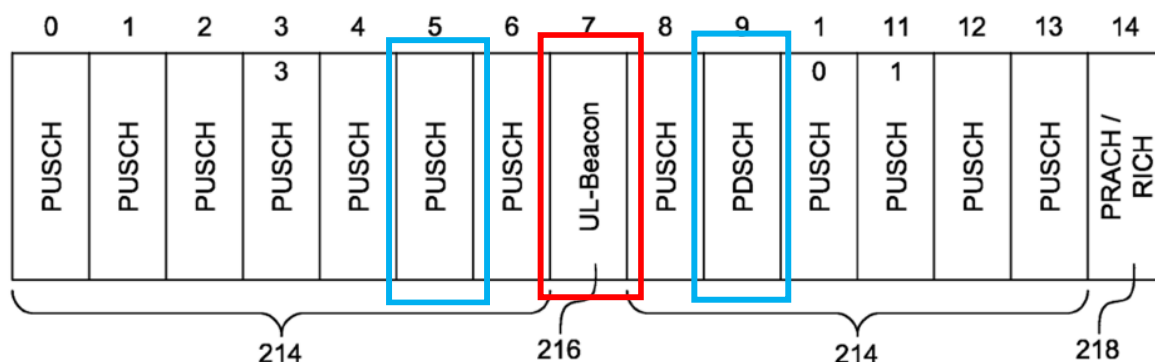


FIG. 2

In the uplink frame, data traffic (blue boxes) is carried in assigned intervals (timeslots) 214 of the frame. The UL-Beacon (red box) is transmitted in a timeslot that is between timeslots used for data traffic, i.e., in control timeslot 216 of the frame. *Id.*, Col. 5, Ll. 58-60. In this way, the UL-Beacon (time interval 216) is between the timeslots used by the UE for data traffic (assigned to time slots 214). Ex. 2001, ¶ 31.

Another example of the patented uplink frame structure is described in connection with Fig. 3 of the '356 Patent, where fractionalization is used for sending the UL\_Beacon signal. “When fractionation is employed, the RNC or other controller may allocate the UL\_Beacon timeslot in a given frame to a group of terminals depending on the current fractionation phase, thus increasing the

number of terminals that can be supported with active physical channel feedback control. The maximum fractionation cycle length may be determined by the feedback update rate that the system requires in order to meet its performance targets.” ’356 Patent, Col. 5, Ll. 42-49; *see also* Ex. 2001, ¶ 32.

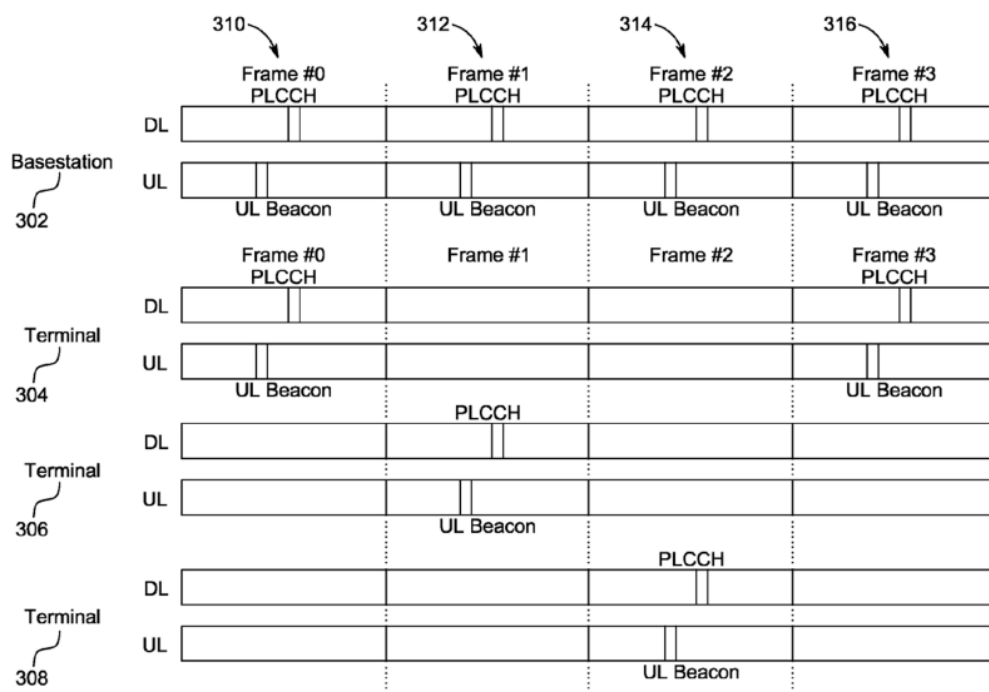


FIG. 3

Fig. 3 shows an example “where the fractionation phase is 3. For example, the fractionation phase of terminal 304 occurs in frame #0 310, the fractionation phase of terminal 306 occurs in frame #1 312, and the fractionation phase of terminal 308 occurs in frame #2 314. Since the fractionation phase is 3, the phase for terminal 304 occurs again in frame #3 316.” ’356 Patent, Col. 5, Ll. 66 – Col.

6, Ll. 4 (emphasis added). Again, in Fig. 3, the UL-Beacon is separated from the timeslots used by the UE for data traffic in the same frame.

The '356 Patent describes advantages of including the UL-Beacon within a dedicated time slot between data time slots in the frame:

By placing UL Beacon signals in a dedicated timeslot, a dedicated detection scheme can be applied which may include performance enhancing features such as intra-cell cancelling (for alleviating the effects of cross-correlation interference between UL\_Beacon signals transmitted by mutiple terminals in the same cell), or inter-cell cancelling (for reducing the interference from neighboring cells in the case where the UL\_Beacon timeslots are time synchronized). Ex. 1001, Col. 5, Ll. 21-28 (emphasis added).

The '356 Patent describes the UL\_Beacon as a “physical control channel signal” (*Id.*, Col. 4, Ll. 39-40), and explains that, since “the physical channel control signal is separate from the uplink (shared) physical channel, ... terminals are able to transmit a UL\_Beacon independently of their access to the uplink shared channel.” *Id.*, Col. 4, Ll. 51-55. This is significant, because it “allows the control feed-back to operate even when the terminal does not have data to send, with the consequence that uplink shared channels can be used with maximum efficiency.” *Id.*, Col. 6, Ll. 34-37.

#### D. Claims of the '356 Patent

Independent claim 1 of the '356 Patent captures the active feedback control system, reciting:

1. A user equipment (UE) comprising:  
a processor configured to receive resource allocation information associated with an uplink physical control channel, wherein the uplink physical control channel and a physical uplink shared channel have different resources;  
the processor is further configured to send data over the physical uplink shared channel in assigned time intervals;  
the processor is further configured, in a time interval that it is not sending information over the physical uplink shared channel, to send a signal over the uplink physical control channel based on the received resource allocation information; and  
the processor is further configured to receive feedback information from a downlink control channel.

Independent claim 1 recites an uplink physical control channel (e.g., data slots 214 in Fig. 2) and a physical uplink shared channel (e.g., time slot 216 in Fig. 2), which have different resources (e.g., different time slots). A UE “sends data over the physical uplink shared channel in assigned time intervals” (e.g., time slots 214 assigned by the base station). The “signal [sent] over the physical control channel” recited in claim 1 corresponds to the UL\_Beacon, which is sent in a time slot between data times slots. Challenged independent claims 22, 43 and 45 recite similar subject matter. Ex. 2001, ¶ 37.

### E. Claim Construction

| <u>Claim Term</u>                                                                                                                                                                                       | <u>Proposed Construction</u>                                                                                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| “the processor is further configured, <u>in a time interval that it is not sending information over the physical uplink shared channel</u> , to send a signal over the uplink physical control channel” | the processor is further configured to send a signal over the uplink physical control channel <u>between transmissions of information over the physical uplink shared channel</u> |

The claim recites that transmission of the uplink physical control channel occurs “in a time interval” that the UE is not transmitting information (data) over the uplink shared channel. The plain meaning of an “interval” is “a period of time between events or states.”<sup>1</sup> In the context of the '356 Patent, the recited “interval” is the period of time between transmissions over the physical uplink shared channel. Ex. 2001, ¶38 (“[a] person of ordinary skill in the art, reading the '356 Patent, would understand that the recited “interval” is the period of time between transmissions over the physical uplink shared channel.”) This interpretation aligns with the description in the '356 Patent’s specification.

A feature of the '356 Patent is a feedback control technique for controlling an uplink channel where channel reciprocity cannot be guaranteed. The feedback control technique maintains the uplink channel during operation of the channel

<sup>1</sup> “Interval” - *Merriam-Webster.com Dictionary*, Merriam-Webster, <https://www.merriam-webster.com/dictionary/interval>, (captured on October 4, 2022) (Ex. 2003).

(rather than at a set-up phase) by interposing an uplink control channel (UL Beacon) between data slots to maintain channel conditions during operation.  
Ex. 2001, ¶ 39.

The term “time interval” and “time slot” are used synonymously in the '356 Patent. In every instance, the term refers to a time slot within a frame, e.g., a TD-CDMA frame, where data is sent by a UE “over the physical uplink shared channel in assigned time intervals within a frame,” while another time interval between the data slots – i.e., “a time interval that it is not sending information over the physical uplink shared channel” – is used by the UE to send control information over the uplink physical control channel. Ex. 2001, ¶ 41. The specification is replete with statements that the timeslot used by the UE for the UL-Beacon is interposed in a frame structure between data time slots:

“a UE allocates a time slot for a beacon signal [UL Beacon] separated from the time slots for data in a frame. A second time slot is allocated within the frame for ...” ’356 Patent, Col. 2, Ll. 29-33 (emphasis added).

\* \* \*

“FIG. 2 illustrates a timeslot arrangement for uplink and downlink messages supporting the UL\_Beacon and its corresponding PLCCCH within a TD-CDMA frame structure ...” *Id.*, Col. 3, Ll. 9-11 (emphasis added).

\* \* \*

“[I]t is possible to adapt the TDMA frame structure to provide separation between the UL\_Beacon and the normal physical channels

by dedicating at least one uplink time slot per frame ... to carrying UL Beacon signals. *Id.*, Col. 5, Ll. 15-19 (emphasis added).

\* \* \*

“Those skilled in the art will recognize that there are a large number of possibilities for the arrangement of a UL Beacon and its associated PLCCH within the frame structure according to embodiments of the invention. More than one UL\_Beacon and PLCCH per frame could be supported if the feedback update rate is required to be faster than the frame rate ( at the expense of system capacity). For system applications that can tolerate a slower feedback rate, embodiments may fractionate the use of the UL\_Beacon timeslot (and the associated PLCCH).” *Id.*, Col. 5, Ll. 32-41. (emphasis added).

\* \* \*

“When fractionation is employed, the RNC or other controller may allocate the UL Beacon timeslot in a given frame to a group of terminals...” *Id.*, Col. 5, Ll. 42-45. (emphasis added).

\* \* \*

FIG. 2 illustrates an example of a timeslot arrangement supporting the UL\_Beacon and its corresponding PLCCH within a TD-CDMA frame structure ... The uplink frame comprises a UL Beacon control timeslot 216, an access control timeslot 218, and normal traffic carrying timeslots 214. *Id.*, Col. 5, Ll. 50-60 (emphasis added).

\* \* \*

“FIG. 3 illustrates an example where fractionation is employed. The UL-Beacon and PLCCH timeslots are active in every frame ... fractionation phase of terminal 304 occurs in frame #0 310, the fractionation phase of terminal 306 occurs in frame #1 312, and the fractionation phase of terminal 308 occurs in frame #2 314. Since the fractionation phase is 3, the phase for terminal 304 occurs again in frame #3 316” *Id.*, Col. 5, L. 61-Col. 6, L. 4. (emphasis added).

\* \* \*

“[t]his may also apply for the case where there are more than one UL\_Beacon timeslot per frame.” *Id.*, Col. 6, Ll. 22-24 (emphasis added).

Petitioners – as well as their expert Dr. Akl -- recognize that, in the '356 Patent, the uplink control signal (UL-Beacon) is interposed in the same frame with timeslots used by the UE for data:

“... in the '356 patent the BS allocates ... **regions of the uplink subframe** for both uplink data transmissions and uplink control transmissions, as Figure 2 shows. ... The allocated regions for uplink data transmission are called the ‘physical uplink shared channel,’ shown as ‘PUSCH’ 214. The allocated region for uplink control transmissions is called the “uplink physical control channel,” shown as “UL-Beacon 216.” Pet., at 30-31; Akl Decl. (Ex. 1003), ¶¶ 68-69 (emphasis added; citations omitted).

In IPR proceedings, claims must be construed under *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005). "The construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction." *Renishaw PLC v. Marposs Societe' per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998). Here, Patent Owner proposes that the limitation requiring “the processor if further configured, in a time interval that it is not sending information over the physical uplink shared channel, to send a signal over the uplink physical control channel” be construed to mean “the processor is further configured to send a signal over the uplink physical

control channel between transmissions of information over the physical uplink shared channel.” This construction is supported by the plain meaning of “interval” and the intrinsic evidence, aligns with the operation of the feedback control system taught by the specification, and is in keeping with one of the stated goals of the '356 Patent, *i.e.*, to “find a substitute for channel reciprocity” for applications “where the correlation between the uplink and downlink path loss is not guaranteed.” *Id.*, Col. 1, L. 66 – Col. 2, L. 2; *see also* Ex. 2001, ¶ 42 (“a person of ordinary skill in the art, reading Claim 1 in light of the Specification, would interpret the limitation requiring “the processor is further configured, in a time interval that it is not sending information over the physical uplink shared channel, to send a signal over the uplink physical control channel” to mean “the processor is further configured to send a signal over the uplink physical control channel between transmissions of information over the physical uplink shared channel.”)”).

By contrast, the Petition, through its mappings, interprets this limitation in a manner divorced from the '356 Patent's specification. Through those mappings, Petitioner construes these limitations as -- control information is sent when a UE joins the network, and data is sent later during operation of the channel. Such a reading has nothing to do with the problem posed by the '356 Patent -- controlling an uplink channel in the absence of channel reciprocity – nor the active feedback solution taught by the '356 Patent. Nowhere does the Petition explain how such a

mapping aligns with the '356 Patent specification or the stated goal of the '356 Patent.

### III. INSTITUTION MUST BE DENIED WITH RESPECT TO GROUND 1

#### A. The Petition Does Not Explain How The “Ranging Code” Is A Control Channel Signal

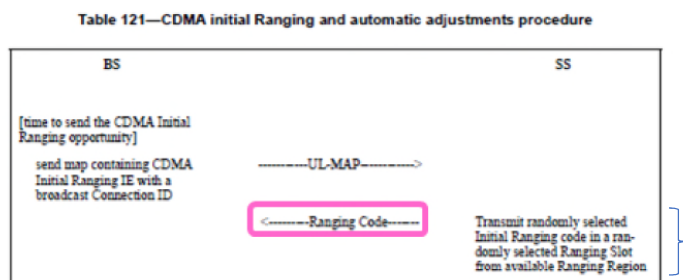
As explained above, '356 Patent is directed to an active feedback control system in which a UE (e.g., a cell phone) transmits an “uplink physical control signal [] referred to herein as [a] UL\_Beacon.” '356 Patent, Col. 4, Ll. 35-40 (emphasis added). The UL\_Beacon is a control channel signal, because it is used to control the uplink channel as conditions change. *Id.*, Col. 4, Ll. 56-60 (“the base station detects the received power and/or other channel information from the UL\_Beacon, and sends controlling commands back to each terminal to keep the terminal informed of the channel conditions observed at the base station.”) This aspect of the '356 Patent is captured in the limitation of Claim 1 which recites that “the processor is further configured to send a signal over the uplink physical control channel.” Interpreted in light of the Specification, this limitation requires, at a minimum, the transmission of a signal that is used in at least some way to control the uplink channel.

The Petition relies on IEEE Std 802.16-2004, IEEE Standard for Local and metropolitan area networks, Part 16: Air Interface for Fixed Broadband Wireless

Access Systems (Ex. 1005)(“the Standard”). In Ground 1, the Petition maps the “Ranging Code” sent over the “ranging subchannel” in the Standard to the ‘356 Patent’s claimed “uplink control channel signal.” Pet., at 34, 40. The “Ranging Code” is discussed earlier in the Petition (at pp. 16-17), as follows:

## 2. Ranging Code Message

The SS then transmits a Ranging Code message in the Initial Ranging opportunity—that is, on the Ranging Subchannel—identified in the UL-MAP, as Table 121 shows. Standard, 49, 154, 175, 666. ←



Standard, Table 121 (cropped and annotated); Akl, ¶55.

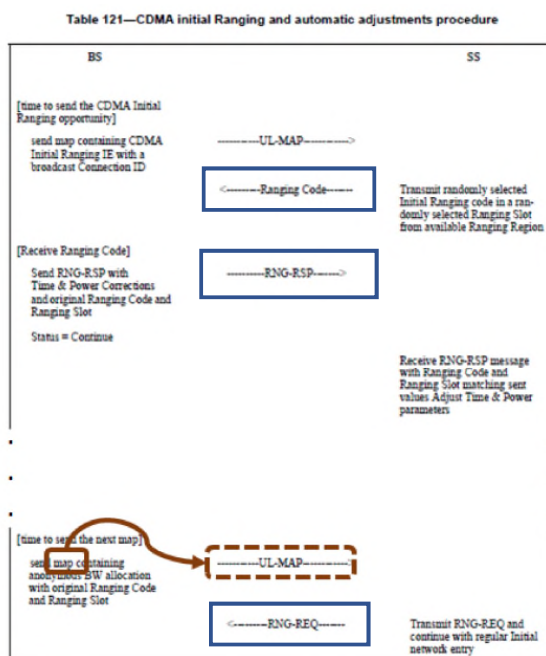
The Standard (shown above) simply refers to a “Ranging Code” – not a “Ranging Code Message” -- as the Petition alleges (Pet., at 40 (this distinction is discussed further below)). As shown in Table 121 above, in connection with the Ranging Code, the Standard discloses “Transmit randomly selected Initial Ranging code in a randomly selected Ranging Slot from available Ranging Region.” The Petition does not provide any support for how a randomly selected Ranging Code transmitted in a randomly selected slot constitutes the claimed “uplink control channel signal.”

Adding to this deficiency, the Petition cites to the Standard at pages 49, 154, 175 and 666 in connection with its description of the Ranging Code. Pet., 17. However, those pages of the Standard describe different messages, referred to in the Standard as the “Ranging Request (RNG-REQ) message”<sup>2</sup> and the “RNG-RSP message.”<sup>3</sup> The following Figure from page 19 of the Petition (annotated by Patent Owner with blue boxes) clearly shows that the Ranging Code (which Petition maps to the “uplink control channel signal”), is a different message from the RNG-RSP and RNG-REQ messages, which come later in the sequence:

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<sup>2</sup> Ex. 1005, Part 1, p. 49 (describing format of Ranging Request (RNG-REQ) message); p. 154 (“Via the Initial Ranging IE, the BS specifies an interval in which new stations may join the network. An interval, equivalent to the maximum round-trip propagation delay plus the transmission time of the RNG-REQ message .... Packets transmitted in this interval shall use the RNG-REQ MAC Management message format”); p. 175 (“... the SS shall put together a RNG-REQ message to be sent in an Initial Ranging Interval”).

<sup>3</sup> Ex. 1005, Part 3, p. 666 (showing tables for RNG-RSP message encodings).



Standard, Table 121 (cropped and annotated); Ak1, ¶57.

As mentioned above, the Standard refers to a “Ranging Code” – not a “Ranging Code Message” -- as alleged at p. 16 of the Petition. That is because, as shown below, the Ranging Code is just a code – nothing more.

### 8.4.7.3 Ranging codes

The binary codes are the pseudonoise codes produced by the PRBS described in Figure 243, which implements the polynomial generator  $1 + X^1 + X^4 + X^7 + X^{15}$ . The PRBS generator shall be initialized by the seed  $b_0 \dots b_{15} = 0, 0, 1, 0, 1, 0, 1, 1, s_0, s_1, s_2, s_3, s_4, s_5, s_6$  where  $s_6$  is the MSB, and  $s_6:s_0 = UL\_IDcell$ .

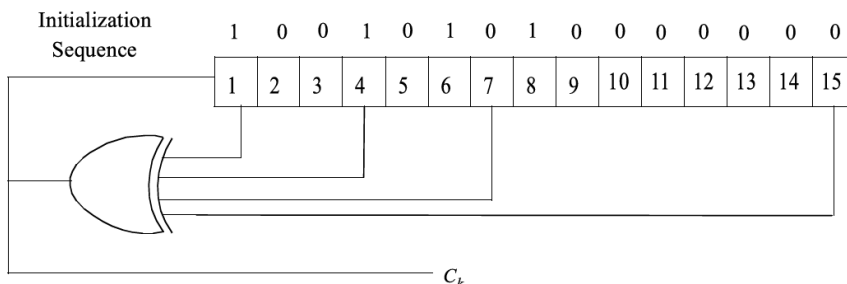


Figure 243—PRBS for ranging code generation

The binary ranging codes are subsequences of the pseudonoise sequence appearing at its output  $C_k$ . The length of each ranging code is 144 bits. These bits are used to modulate the subcarriers in a group of six (eight for the permutation defined in 8.4.6.2.5) adjacent subchannels. The index of the lowest numbered subchannel in the six (eight for the permutation defined in 8.4.6.2.5) shall be an integer multiple of six (eight for the permutation defined in 8.4.6.2.5). The six (eight for the permutation defined in 8.4.6.2.5) subchannels are called a ranging subchannel. The ranging subchannel is referenced in the ranging and Bandwidth Request messages by the index of lowest numbered subchannel.

For example, the first 144 bit code obtained by clocking the PN generator as specified, with  $UL\_IDcell = 0$ , the first code shall be 011110000011111... The next ranging code is produced by taking the output of the 145th to 288th clock of the PRBS, etc.

Ex. 1005, Part 3, p. 578.

The totality of the Petition’s explanation why the “Ranging Code” is an alleged “uplink control channel signal” is set forth on page 34 of the Petition:

The ranging subchannel is an “uplink ... control channel” because it is part of the uplink subframe and is used by the SS to transmit the Ranging Code message, which a POSA would have recognized is control information, not data.

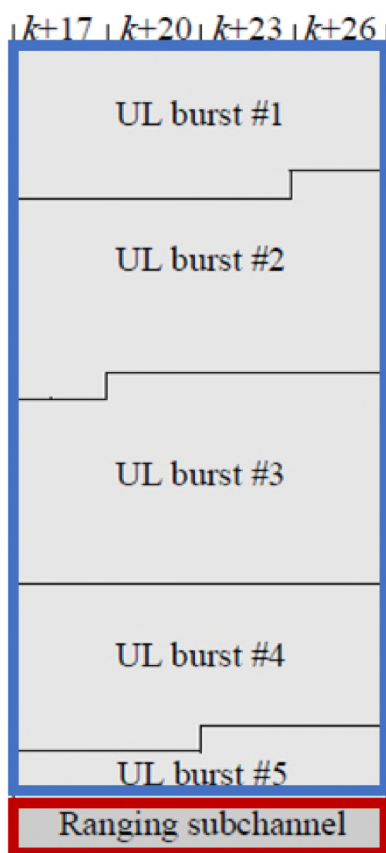
Petition, at 34 (emphasis added); *see also* Akl. Declaration, ¶ 73.

Dr. Akl's Declaration (at ¶73) makes the same conclusory remark (verbatim), without further explanation or citation to authority. Because it is conclusory, Dr. Akl's remark is entitled to no weight.

Petitioners have the burden of explaining how the "Ranging Code" sent over the ranging subchannel constitutes the claimed "uplink control channel signal." The diagrams in the Petition only allege that the Ranging Code is "randomly selected" and transmitted "in a randomly selected Ranging Slot." Such information -- combined with the Petition's citations to pages from the Standard describing different signals, and a one-sentence conclusory remark from Dr. Akl -- are insufficient to explain how the "Ranging Code" constitutes an "uplink control channel signal." Because of this deficiency, the Petition fails to demonstrate a reasonable likelihood of success with respect to Ground 1.

**B. The Standard Fails To Disclose Transmission of a Control Signal Interposed Between Data Transmissions**

As shown in the Petition (at p. 35), the uplink portion of the Standard is implemented using the following framework:



The Standard explains that a ranging code is sent over the ranging subchannel (red box) at initialization for “Initial Ranging,” that is, to allow a “new station to join the network.” Pet. at 41-42 (citing Standard, at 49, 154). As the Petition explains, it is not until sometime after the ranging code message is sent that the device begins sending data (blue box) over the uplink (UL-bursts).:

... at the time the Ranging Code message is sent by the SS, the SS has only received the First UL-MAP message, from which the SS determines the Ranging Subchannel over which to send the Ranging Code message. *Id.* It is not until the SS receives the Second UL-MAP message that the SS is allocated its uplink burst in which to send information to the BS. Pet., 41 (emphasis added).

The Petition maps the initial ranging code from the Standard to the claim limitation reciting “a signal [sent] over the uplink physical control channel,” and maps the UL bursts from the Standard to the limitation reciting “data [sent] over the physical uplink shared channel in assigned time intervals.” Simply put, this mapping fails because all of the Challenged Claims require that the “signal over the uplink physical control channel” be interposed between transmissions of data over the physical uplink shared channel. The Standard completely misses this aspect of the Challenged Claims. Ex. 2001, ¶44-45.

For this additional reason, the Standard does not anticipate the Challenged Claims.

**IV. INSTITUTION SHOULD BE DENIED UNDER GROUNDS 2 AND 3 BECAUSE THE STANDARD, EITHER BY ITSELF OR IN COMBINATION WITH MAHANTY, FAILS TO RENDER THE CHALLENGED CLAIMS OBVIOUS**

In Grounds 2 and 3, Petitioner argues that the Standard by itself, or in combination with Mohanty, renders certain of the Challenged Claims obvious. As was the case for Ground 1, in Grounds 2 and 3 the Petition again maps the initial ranging code from the Standard to the claim limitation reciting “a signal [sent] over the uplink physical control channel,” and again maps the UL bursts from the Standard to the limitation reciting “data [sent] over the physical uplink shared

channel in assigned time intervals.” For the reasons set forth with respect to Ground 1 above, these mappings fail.

## V. CONCLUSION

The Board should deny the institution of the Petition. The Petition fails to demonstrate a reasonable likelihood of success with respect to Ground 1 for at least two reasons. First, the Petition fails to explain how the “Ranging Code” constitutes an uplink control channel signal. Second, the Standard fails to teach a “signal over the uplink physical control channel” that is interposed *between* transmissions of data over the physical uplink shared channel. The Petition also fails to demonstrate a reasonable likelihood of success with respect to Grounds 2 and 3, because the mappings in those Grounds suffer from the same deficiencies as Ground 1.

Respectfully submitted,

Dated: October 5, 2022

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IPR2022-01130  
U.S. Patent No. 8,811,356

**CERTIFICATE OF COMPLIANCE WITH WORD COUNT**

Pursuant to 37 C.F.R. § 42.24(d), I certify that this Response complies with the type-volume limits of 37 C.F.R. § 42.24(b)(1) because it contains 4,560 words, excluding the parts of this Patent Owner's Preliminary Response that are exempted by 37 C.F.R. § 42.24(a), according to the word processing system used to prepare this Patent Owner's Preliminary Response.

Respectfully submitted,

Dated: October 5, 2022

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## **CERTIFICATE OF SERVICE**

The undersigned certifies that pursuant to 37 C.F.R. § 42.6(e), a copy of the foregoing **PATENT OWNER'S PRELIMINARY RESPONSE** was served via email (as consented to by counsel) on October 5, 2022 to lead and backup counsel of record for Petitioner as follows:

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