

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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APPLE INC.,  
Petitioner

v.

THL HOLDING COMPANY, LLC,  
Patent Owner

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Case No. IPR2024-00397  
Patent No. 8,768,381

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**PETITION FOR *INTER PARTES* REVIEW  
OF U.S. PATENT NO. 8,768,381**

## TABLE OF CONTENTS

|              |                                                                                                      |           |
|--------------|------------------------------------------------------------------------------------------------------|-----------|
| <b>I.</b>    | <b>INTRODUCTION .....</b>                                                                            | <b>1</b>  |
| <b>II.</b>   | <b>SUMMARY OF THE '381 PATENT .....</b>                                                              | <b>1</b>  |
| A.           | DESCRIPTION OF THE '381 PATENT .....                                                                 | 1         |
| B.           | FIELD OF ENDEAVOR AND PROBLEM SOLVED BY THE INVENTORS .....                                          | 3         |
| C.           | PRIORITY AND SUMMARY OF THE PROSECUTION HISTORY .....                                                | 4         |
| D.           | LEVEL OF SKILL OF A POSITA .....                                                                     | 4         |
| <b>III.</b>  | <b>REQUIREMENTS UNDER 37 C.F.R. § 42.104 .....</b>                                                   | <b>5</b>  |
| A.           | GROUND FOR STANDING UNDER 37 C.F.R. § 42.104(A) .....                                                | 5         |
| B.           | IDENTIFICATION OF CHALLENGE UNDER 37 C.F.R. § 42.104(B) .....                                        | 5         |
| C.           | CLAIM CONSTRUCTION .....                                                                             | 6         |
| <b>IV.</b>   | <b>SHOWING OF ANALOGOUS, PRIOR ART .....</b>                                                         | <b>7</b>  |
| A.           | KALAYJIAN .....                                                                                      | 7         |
| B.           | VAUCLAIR .....                                                                                       | 9         |
| C.           | KALLIOLA .....                                                                                       | 10        |
| D.           | HANEY .....                                                                                          | 13        |
| E.           | TRIMBLE .....                                                                                        | 14        |
| <b>V.</b>    | <b>DISCUSSION OF KALAYJIAN'S VARIOUS FIGURES OF<br/>THE MASTER DEVICE .....</b>                      | <b>14</b> |
| <b>VI.</b>   | <b>GROUND 1: CLAIMS 1-3 ARE OBVIOUS OVER KALAYJIAN<br/>AND VAUCLAIR .....</b>                        | <b>16</b> |
| A.           | CLAIM 1 .....                                                                                        | 16        |
| B.           | CLAIM 2 .....                                                                                        | 49        |
| C.           | CLAIM 3 .....                                                                                        | 51        |
| <b>VII.</b>  | <b>GROUND 2: CLAIMS 4 AND 6 ARE OBVIOUS OVER<br/>KALAYJIAN, VAUCLAIR, AND KALLIOLA .....</b>         | <b>52</b> |
| A.           | CLAIM 4 .....                                                                                        | 52        |
| B.           | CLAIM 6 .....                                                                                        | 54        |
| <b>VIII.</b> | <b>GROUND 3: CLAIMS 5 AND 11 ARE OBVIOUS OVER<br/>KALAYJIAN, VAUCLAIR, KALLIOLA, AND HANEY .....</b> | <b>58</b> |
| A.           | CLAIM 5 .....                                                                                        | 58        |
| B.           | CLAIM 11 .....                                                                                       | 64        |
| <b>IX.</b>   | <b>GROUND 4: CLAIMS 7-8 ARE OBVIOUS OVER KALAYJIAN,<br/>VAUCLAIR, AND HANEY .....</b>                | <b>66</b> |
| A.           | CLAIM 7 .....                                                                                        | 66        |

|              |                                                                                           |           |
|--------------|-------------------------------------------------------------------------------------------|-----------|
| B.           | CLAIM 8 .....                                                                             | 68        |
| <b>X.</b>    | <b>GROUND 5: CLAIM 9 IS OBVIOUS OVER KALAYJIAN,<br/>VAUCLAIR, HANEY, AND TRIMBLE.....</b> | <b>69</b> |
| A.           | CLAIM 9 .....                                                                             | 69        |
| <b>XI.</b>   | <b>DISCRETION UNDER 35 U.S.C. § 314(A) .....</b>                                          | <b>72</b> |
| <b>XII.</b>  | <b>CONCLUSION .....</b>                                                                   | <b>73</b> |
| <b>XIII.</b> | <b>MANDATORY NOTICES UNDER 37 C.F.R. § 42.8.....</b>                                      | <b>74</b> |
| A.           | REAL PARTIES-IN-INTEREST UNDER 37 C.F.R. § 42.8(B)(1).....                                | 74        |
| B.           | RELATED MATTERS UNDER 37 C.F.R. § 42.8(B)(2) .....                                        | 74        |
| C.           | LEAD AND BACK-UP COUNSEL UNDER 37 C.F.R. § 42.8(B)(3) .....                               | 74        |

## **I. INTRODUCTION**

Apple Inc. (“Petitioner”) respectfully requests *inter partes* review (“IPR”) of Claims 1-9 and 11 (the “Challenged Claims”) of U.S. Patent No. 8,768,381 (“the ’381 Patent”).

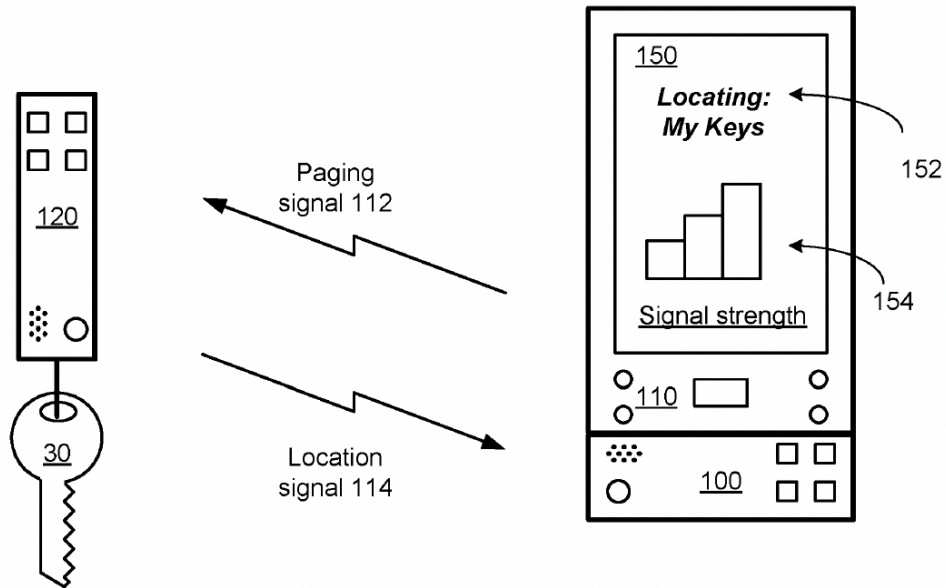
## **II. SUMMARY OF THE ’381 PATENT**

### **A. Description of the ’381 Patent**

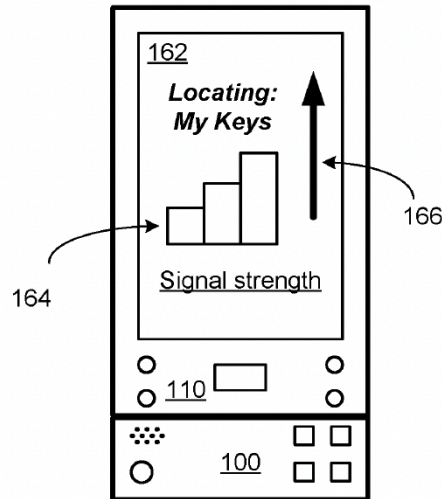
The ’381 Patent describes “a location system for use with a handheld wireless communication device 110[.]” ’381 Patent (Ex. 1001), 2:23-26. Device 110 includes long and short-range transceivers for wireless communication and user interfaces, such as a touchscreen. *Id.*, 4:15-25, 4:32-37. An adjunct device 100 couples with wireless communication device 110 and includes a short-range wireless receiver for communicating using various communication protocols, such as Bluetooth or UWB. *Id.*, 4:57-66.

Adjunct device 100 may be used to locate wireless device 120, which can be attached to keys, clothing, etc. *Id.*, 6:61-66. “Wireless device 120 also includes a short-range wireless receiver that receives a paging signal 112 transmitted by adjunct device 110 and “emits a detectable alert signal that helps the user locate the personal object” coupled to the wireless device. *Id.*, 7:3-8. The detectable alert may be a light or a sound. *Id.*

The wireless device 120 may also transmit “a location signal 114 via short-range wireless transceiver 130, such as a beacon signal or other location signal,” to adjunct device 100. *Id.*, 9:63-66.



*Id.*, Fig. 6. Information from the location signal 114 transmitted by the wireless device and to the adjunct device, such as signal strength information of the location signal or time of flight, is used to determine a distance or direction of the wireless device 120 from the adjunct device 100. *Id.*, 10:8-11, 10:43-47, 10:25-28 (describing time of flight). The signal strength 164 and an indication of direction 166 can be shown on the screen of the wireless communication device 110:



*Id.*, 11:24-28, Fig. 8.

### **B. Field of Endeavor and Problem Solved by the Inventors**

The claimed invention of the '381 Patent relates to wireless/mobile communication devices. '381 *Patent*, 1:41-43 (defining the Technical Field of the Invention as relating to “wireless communication devices”), 36:24, 37:32. These wireless/mobile communication devices perform functions relating to transmitting signals in response to user interactions with the device and receiving signals from other wireless devices. *Id.*, Abstract, 5:12-17, 7:8-25, 9:59-10:13, 15:3-17, 30:5-15, Figs. 1, 4, 6, 16. The wireless communication device performs these functions using wireless transceivers. *Id.*, 4:13-25, 8:26-44, Figs. 1, 5. Thus, the field of endeavor of the '381 Patent includes mobile communication devices that send and/or receive wireless signals. *Declaration* (Ex. 1003), ¶¶45-48.<sup>1</sup>

<sup>1</sup> All references to “*Dec.*” are to Exhibit 1003, Declaration of Dr. R. Michael Buehrer.

The '381 Patent is reasonably pertinent to the problem of employing a first wireless device, such as a mobile communication device, to locate a second wireless device. For example, the Detailed Description begins with reference to FIG. 1 and a “location system for use with a handheld wireless communication device,” indicating to a POSITA that at least one problem faced is location determination of a wireless communication device. *'381 Patent*, 4:10-15; *Dec.*, ¶¶49-50.

### **C. Priority and Summary of the Prosecution History**

The '381 Patent claims priority to Application No. 12/713,346, filed on February 26, 2010. *'381 Patent*, (63). Because the '381 Patent claims the benefit of a filing date before March 16, 2013, Petitioner applies the pre-AIA versions of §§ 102 and 103. Petitioner also adopts February 26, 2010, as the priority date for the Challenged Claims for purposes of this proceeding.

The '381 Patent did not face any prior art rejection during prosecution. *'381 File History* (Ex. 1002). The '381 Patent only faced a double patenting rejection that applicant overcame by filing a terminal disclaimer. *Id.*, 18, 45, 56-60.

### **D. Level of Skill of a POSITA**

A person of ordinary skill in the art (POSITA) at the time of the '381 Patent would have been a person having a bachelor's degree in computer science, computer engineering, electrical engineering, or a similar technical field and 2-4 years of experience with wireless ranging and positioning systems, wireless communication

devices, and associated computer programming. *Dec.*, ¶35. Additional industry experience or technical training may offset less formal education, while advanced degrees or additional formal education may offset lesser levels of industry experience. *Id.*

### **III. REQUIREMENTS UNDER 37 C.F.R. § 42.104**

#### **A. Grounds for Standing Under 37 C.F.R. § 42.104(a)**

Petitioner certifies the '381 Patent is eligible for IPR.

#### **B. Identification of Challenge Under 37 C.F.R. § 42.104(b)**

The Challenged Claims are unpatentable on the following grounds.

| <b>Ground</b> | <b>Claim(s)</b> | <b>35 U.S.C. §</b> | <b>References</b>                                   |
|---------------|-----------------|--------------------|-----------------------------------------------------|
| 1             | 1-3             | 103                | Kalayjian (Ex. 1006) and Vauclair (Ex. 1005)        |
| 2             | 4, 6            | 103                | Kalayjian, Vauclair, and Kalliola (Ex. 1004)        |
| 3             | 5, 11           | 103                | Kalayjian, Vauclair, Kalliola, and Haney (Ex. 1007) |
| 4             | 7-8             | 103                | Kalayjian, Vauclair, and Haney                      |
| 5             | 9               | 103                | Kalayjian, Vauclair, Haney, and Trimble (Ex. 1008)  |

### C. Claim Construction

In this proceeding, claims are interpreted under the same standard applied by Article III courts (i.e., the *Phillips* standard). 37 C.F.R. § 42.100(b); *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (*en banc*). For all terms not included below, Petitioner applies the ordinary and customary meaning of the claim terms as understood by a POSITA.

For purposes of this proceeding only,<sup>2</sup> Petitioner applies THL’s construction in the parallel litigation:

**“A pairing signal”** – Processor signal to initiate a wireless device pairing sequence.

*THL’s Proposed Constructions* (Ex. 1009), 4; *Western Digital Corporation v. Spex Technologies, Inc.*, IPR2018-00084, Paper 14, at 11 (PTAB Apr. 25, 2018) (finding Petition based on claim constructions urged by Patent Owner satisfies the claim construction requirements and that Petitioner is not required to express its subjective agreement regarding correctness of the proffered claim construction or take ownership of the construction); *10X Genomics, Inc. v. Bio-Rad Laboratories, Inc.*, IPR2020-00086, Paper 8, at 19-20 (PTAB Apr. 27, 2020).

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<sup>2</sup> Petitioner’s application of prior art to the Challenged Claims is not a waiver of any argument in litigation that any claim term in the ’381 Patent is indefinite or invalid.

#### IV. SHOWING OF ANALOGOUS, PRIOR ART

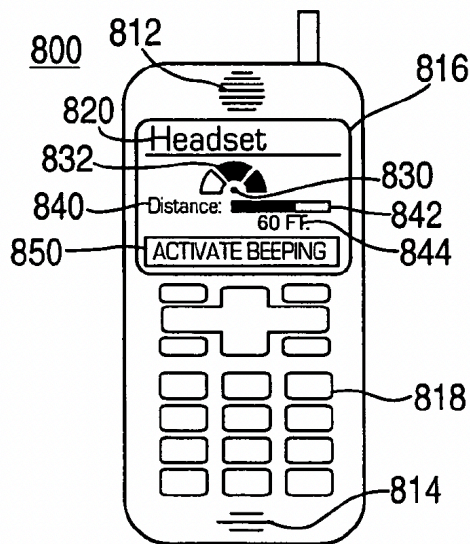
##### A. Kalayjian

Kalayjian, a U.S. patent application assigned to Apple, published on May 29, 2008, qualifying as prior art under 35 U.S.C. § 102(b). *Kalayjian* (Ex. 1006). Kalayjian was not cited or considered during the prosecution of the '381 Patent. Kalayjian describes “[a] method and system for locating objects using a Bluetooth communications protocol” where a first device, such as a cellular phone, is paired with a second device, such as a wireless Bluetooth headset.<sup>3</sup> *Kalayjian*, Abstract, [0033]-[0034]. “When a user wants to locate one of the slave devices 320, 400 and 500, the user can initiate the location discovery process through master device 310.” *Id.*, [0038]. “Master device 310 can transmit a signal to a slave device,” and “[u]pon receiving the signal, the slave device can guide a user to its location and/or notify a user of the distance from master device 310 to the slave device.” *Id.* The second devices “guide a user to their location by emitting auditory or visual signals,” which “allows a user to follow the sound or light to the misplaced object.” *Id.*, [0039].

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<sup>3</sup> Kalayjian refers to the first device as the “master device” and the second device as the “slave device.” *Kalayjian*, Abstract. Unless quoted, Petitioner refers to the “master device” as the “first device” and the “slave device” as the “second device.”

The second devices also “transmit[] a return signal to master device 310,” which calculates the distance between the devices “by comparing the amount of time delay between the transmission of the signal sent from the master device to the slave device and the reception of the return signal from the slave device.” *Id.*, [0040]-[0041]. The first device also uses directional antennas “to determine the direction towards the slave device from the master device.” *Id.*, [0042]. The distance 840 and direction 830 information is presented on the display of the first device in addition to a graphical button 850 that “enable[s] the user to prompt the slave device to beep, flash or perform a combination of both”:



*Id.*, Fig. 8, [0049].

Kalayjian is analogous to the claimed invention of the '381 Patent because it is from the same field of endeavor. Kalayjian is also directed to a mobile

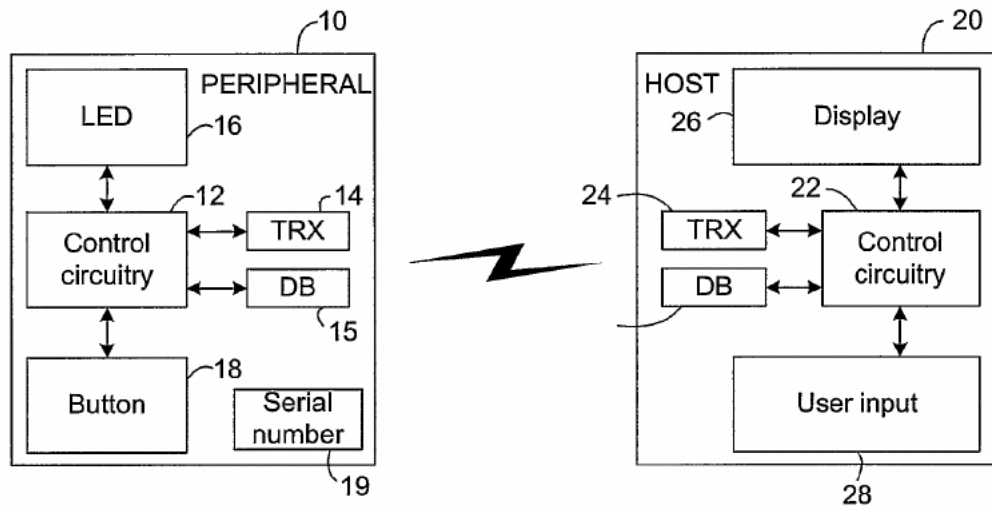
communication device (i.e., first device 310) that sends and receives wireless signals, including Bluetooth, for example. *Dec.*, ¶92.

Kalayjian is also reasonably pertinent to the particular problem with which the inventor of the '381 Patent was involved because it is directed to solving the same problem of helping a user locate other wireless devices. Kalayjian proposes using the first device to help the user locate wireless devices, such as the user's Bluetooth headset. *Dec.*, ¶93.

#### **B. Vauclair**

Vauclair published on December 25, 2008, qualifying as prior art under § 102(b). *Vauclair* (Ex. 1005). Vauclair was not cited or considered during the prosecution of the '381 Patent.

Vauclair discloses a pairing process between a first electronic device 10, which “is regarded as a peripheral device,” such as “a mobile telephone handsfree kit,” and a second electronic device 20, which “is regarded as a host device,” such as a “mobile telephone.” *Vauclair*, [0022]. The first and second devices “communicate according to any wireless or wired protocol” including “Bluetooth.” *Id.* Both the peripheral device 10 and the host device 20 include transceiver circuitry *Id.*, [0024], [0028].



*Id.*, Fig. 1.

Vauclair describes a pairing process between the host device 20 and the peripheral device 10 where the host device 20 sends and receives wireless signals from the peripheral device 10. *Id.*, Fig. 2, [0034].

Vauclair is analogous to the claimed invention of the '381 Patent because it is from the same field of endeavor. Vauclair is directed to wireless communication devices that send/receive wireless signals within a network and using various communication protocols, such as the Bluetooth protocol. *Dec.*, ¶101.

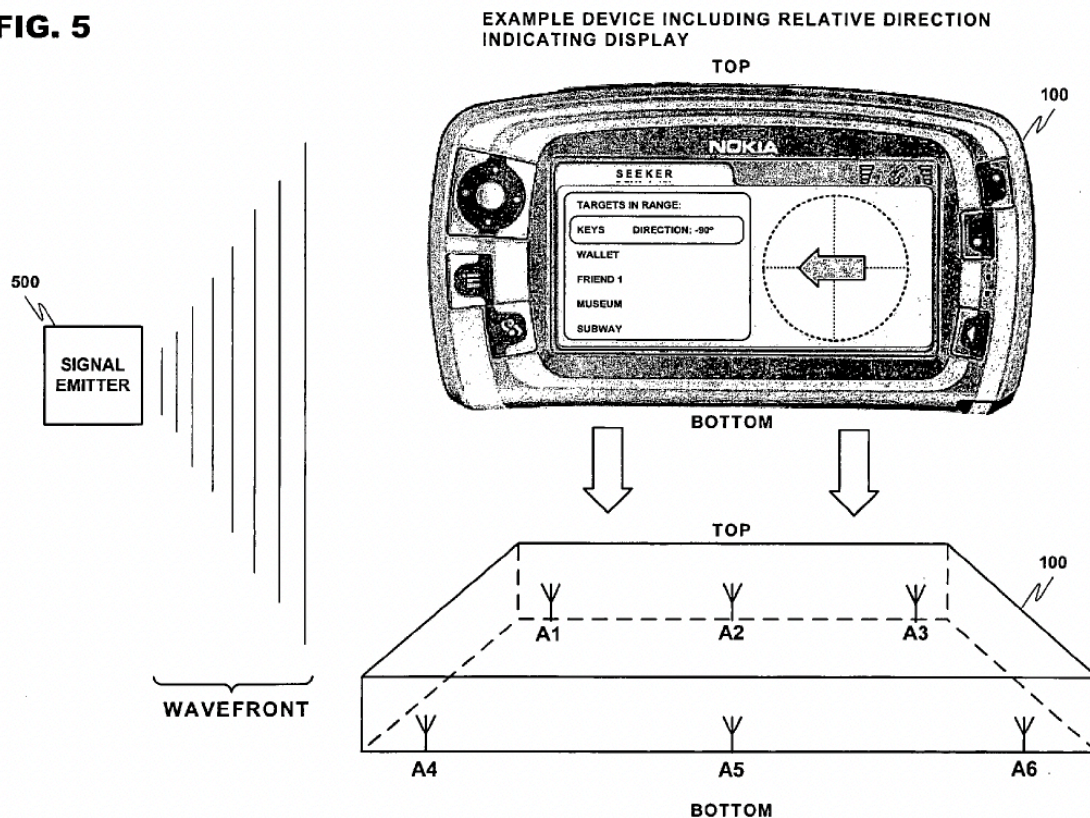
### C. Kalliola

Kalliola published on August 23, 2007, qualifying as prior art under § 102(b). *Kalliola* (Ex. 1004). Kalliola was not cited or considered during the prosecution of the '381 Patent. Kalliola proposes a “system for indicating the relative direction of a target object or location as determined from the current position of a wireless

communication device.” *Kalliola*, Abstract. The system includes a wireless communication device (WCD) that may be a cellular telephone or other handheld wireless device, such as a “wirelessly enabled palmtop or laptop computer.” *Id.*, [0035], [0038]. The WCD communicates via near-field (e.g., RFID), short-range (e.g., Bluetooth, WLAN, UWB), and long-range (e.g., cellular) wireless networks and protocols. *Id.*, Fig. 1, [0034]-[0037], [0047], [0049], [0050].

The system also includes remotely-activated signal emitter devices “such as battery-operated transmitters in a keychain, in a wallet, embedded in an ID badge, mounted in a vehicle such as an automobile, motorcycle, scooter, bicycle or in a piece of clothing, may be activated remotely by a user as needed.” *Id.*, [0077]. As depicted in Figure 5, the position-indicating signal transmitted by the signal emitter is received by an antenna array on the WCD, and the WCD determines the direction to the signal emitter, which is displayed for the user as an arrow:

**FIG. 5**



*Id.*, Fig. 5, [0069].

Kalliola is analogous to the claimed invention of the '381 Patent because it is from the same field of endeavor. Kalliola is also directed to a mobile communication device that sends and receives wireless signals, including cellular and Bluetooth, for example. *Dec.*, ¶112.

Kalliola is also reasonably pertinent to the particular problem with which the inventor of the '381 Patent was involved because it is directed to solving the same problem. *Id.*, ¶113. Kalliola proposes using the WCD to help the user locate wireless devices (i.e., signal emitters) associated with the user's personal items, such as their keys or wallet. *Id.*

**D. Haney**

Haney published on April 1, 2008, qualifying as prior art under § 102(b). *Haney* (Ex. 1007). Haney was not cited or considered during the prosecution of the '381 Patent. Haney describes a “system for exchanging GPS or other position data between wireless devices for purposes of group activities, child location monitoring, work group coordination, dispatching of employees, etc.” *Haney*, Abstract. Haney discloses “phones and other wireless devices [that] are programmed with software to have the user interface and functionality described [] to allow mutual tracking and optional position mapping displays[.]” *Id.*, 2:22-26. “The software that implements the Buddy Watch functionality can be downloaded from the web or installed at the point of sale of a cell phone or PDA.” *Id.*, 3:29-31.

Haney is analogous to the claimed invention of the '381 Patent because it is from the same field of endeavor. Haney is also directed to a mobile communication device (i.e., cellular phones) that sends wireless signals. *Dec.*, ¶116.

Haney is also reasonably pertinent to the particular problem with which the inventor of the '381 Patent was involved because it is directed to solving the same problem of helping a user locate other wireless devices. Haney proposes using cell phones to help the user locate other wireless devices to allow mutual tracking and positional mapping. *Id.*, ¶117.

**E. Trimble**

Trimble published on December 16, 2004, qualifying as prior art under § 102(b). *Trimble* (Ex. 1008). Trimble was not cited or considered during the prosecution of the '381 Patent.

Trimble describes “[a]n object locating system includes a transmitter unit for activating a plurality of electronic tags to assist in locating keys, remote control devices, cordless phones, eyeglasses, articles of clothing, etc. to which the tags have been attached.” *Trimble*, Abstract. [0056]. The tags can be simultaneously activated to emit an audible and/or visual indication to assist a user in locating the tag. *Id.*, [0056], [0068], [0081], [0007].

Trimble is analogous to the claimed invention of the '381 Patent because it is from the same field of endeavor. Trimble is directed to a mobile communication device (i.e., transmitter unit) that sends wireless signals. *Dec.*, ¶123.

Trimble is also reasonably pertinent to the particular problem with which the inventor of the '381 Patent was involved because it is directed to the problem of employing a first wireless device to locate a second wireless device. *Id.*, ¶124.

**V. DISCUSSION OF KALAYJIAN’S VARIOUS FIGURES OF THE MASTER DEVICE**

Each of the grounds relies on Kalayjian as the primary reference. Kalayjian discloses numerous features embodied in various figures of its disclosed first/second devices. *Dec.*, ¶94. A POSITA would have understood from the collective teachings

of Kalayjian that the applicant intended the disclosed features for the first/second devices to be available features in the described invention. *Id.*, ¶¶95-96. For example, Kalayjian discloses master device 310 and second device 320 in the form of a headset. *Kalayjian*, [0034]. Kalayjian then describes devices 400, 500 as attachable devices “in accordance with the principles of the present invention” for attaching to objects, such as keys. *Id.*, [0035]-[0036]. Kalayjian refers to devices 400, 500 as “slave devices” and then later refers to devices “320, 400 and 500” when discussing features of the “slave” (second) devices. *Id.*, [0035]-[0036], [0039]. Therefore, a POSITA would have understood features of second devices 320, 400, 500 to each be implementable with master device. *Dec.*, ¶¶94-96.

Similarly, Kalayjian discloses various screenshots of the master device but refers to each master device by separate reference numerals when describing the disclosed screenshot relative to the figures. *Kalayjian*, [0046]-[0049]; *Dec.*, ¶¶94-96. A POSITA would have reasonably understood master devices 600, 700, 800 to be substantially similar to first device 310 with the distinct reference numerals being employed by the applicant for discussion relative to the corresponding figures (e.g., Fig. 6 references first device 600, Fig. 7 references first device 700, etc.). *Dec.*, ¶¶94-96.

To the extent Patent Owner argues Figs. 6-8 are different or distinct embodiments, it would have been obvious that master device 310 includes each of

the collective features disclosed in Figs. 6-8 for the reasons discussed above, including that Figs. 6-8 simply illustrate different stages of the location finding process. *Id.* To the extent there is any change to Kalayjian’s master device, the combination of the disclosed features of Figs. 6-8 would have had a reasonable expectation of success at least because each of the features are minor software changes. *Id.*

## VI. GROUND 1: CLAIMS 1-3 ARE OBVIOUS OVER KALAYJIAN AND VAUCLAIR

### A. Claim 1

#### 1. *Claim 1[P]: “A wireless device for locating at least one remote object, the wireless device comprising:”*

Kalayjian teaches a “method and system **for locating objects using a Bluetooth communications protocol.**”<sup>2</sup> *Kalayjian*, Abstract, [0007], [0001]. “Bluetooth wireless technology...allow[s] intelligent devices to communicate with each other through **wireless, short-range communications.**” *Id.*, [0021].

Kalayjian’s “location discovery system” comprises a first device 310 and a second device 320, both of which are “devices capable of communicating using a Bluetooth protocol,” such as “cellular phone 310 and headset 320.” *Id.*, [0032], [0033]. Thus, Kalayjian’s first device 310 is a wireless device. *Dec.*, ¶126-127.

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<sup>2</sup> All emphases and annotations added unless otherwise indicated.

Second device 320 is at least one remote object locatable with the first device.

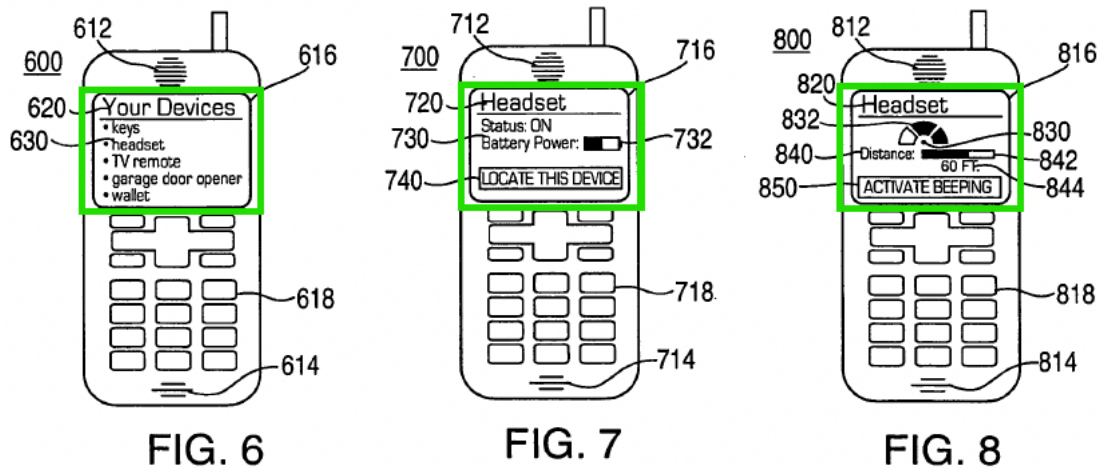
Kalayjian also teaches a second device 400 attachable “to any **object to be located**” and a second device 500 “attached to an object using adhesive 526” *Id.*, [0035]-[0036]. Thus, each second device 320, 400, 500 is at least one remote object. *Dec.*, ¶128.

Kalayjian’s first device is used for locating at least one remote object. *Kalayjian*, [0007], [0038] (disclosing using the first device to “initiate the location discovery process” and transmit a signal to the second device), Fig. 8 (illustrating a screenshot of the first device’s user interface when “attempting to **locate a slave device**.”); *Dec.*, ¶129.

## 2. *Claim 1(a): “a graphical user interface”*

Kalayjian’s first device 310 includes a graphical user interface, namely the “**graphical display** on screen 316.” *Kalayjian*, [0040], [0033], [0047]-[0049]. First device includes display screen, and graphics relating to the location of the second device are “presented to a user through **a graphical display on screen....**” *Id.*, [0040], [0043]-[0044]; *Dec.*, ¶¶130-135.

Kalayjian’s first device displays the following exemplary graphical user interfaces on screens 616, 716, 816:



*Id.*, Figs. 6-8, [0014]-[0016]; *Dec.*, ¶¶132-135.

3. ***Claim 1(a)(i): “[a graphical user interface] that generates a pairing signal in response to a first indication from a user to pair the wireless device to at least one remote device and”***

Petitioner applies Patent Owner’s construction of the term pairing signal as a “processor signal to initiate a wireless device pairing sequence.” *See* Section III.C.

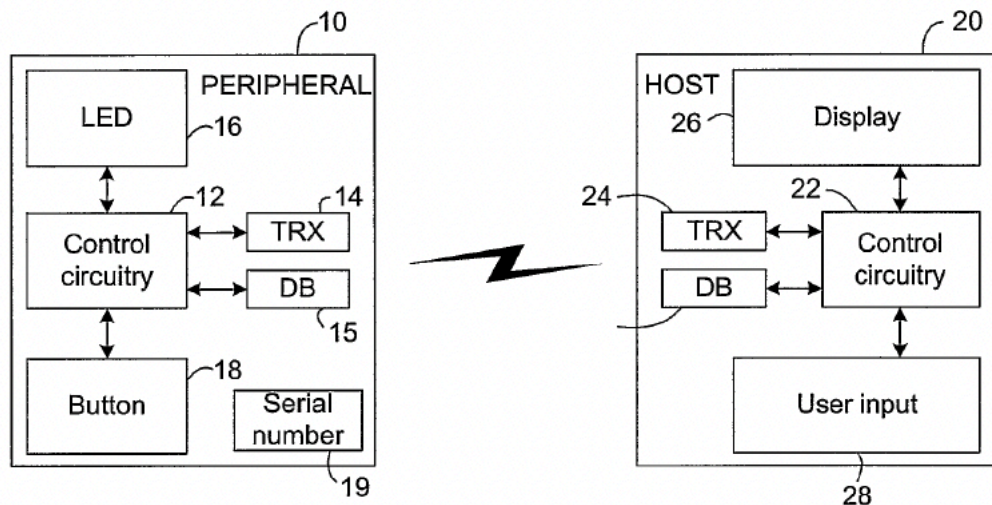
#### **(a) Kalayjian’s Teachings**

Kalayjian expressly teaches pairing, using Bluetooth protocol, its wireless first device with one or more second devices. *Kalayjian*, [0037]. “After being paired together,” the “user can initiate the location discovery process through master device[.]” *Id.*, [0038], [0024]. Additionally, method 1100 for locating an object includes “[a]t step 1110, a master device is paired with one or more slave devices using a Bluetooth communications protocol.” *Id.*, [0055]; *Dec.*, ¶¶ 137-138.

In related art, Vauclair discloses specific details regarding the pairing process.

**(b) Vauclair's Teachings**

Vauclair teaches a pairing process between a first electronic device 10, which is “a peripheral device,” such as “a mobile telephone handsfree kit,” and a second electronic device 20, which is “a host device,” such as a “mobile telephone.” *Vauclair*, [0022]. The first and second devices “communicate according to any wireless or wired protocol,” including “Bluetooth.” *Id.* Both the peripheral and host devices 10, 20 include suitably programmed processors connected to transceiver (TRX) circuitry 14, 24 for handling “radio frequency communications with other electronic devices able to use the same wireless protocol.” *Id.*, [0024], [0028]; *Dec.*, ¶140.



*Id.*, Fig. 1.

Vauclair teaches a pairing process where the user “establish[es] an ad hoc wireless network between the first and second electronic devices 10, 20” by

“operat[ing] the host device 20...” *Vauclair*, [0036], [0034]-[0035], [0049] (teaching “the host device 20 requests the initiation of a pairing procedure with the peripheral device 10”); *Dec.*, ¶143.

Vauclair teaches host device 20 includes a display 26 that displays “menu options” from which a user may select. *Vauclair*, [0030] (disclosing host device includes display 26 displaying menu options selectable via user input 28). “For example, **to initiate the [pairing] process, the user may select a pairing option from a menu, using the user input 28.**” *Id.*, [0036]. The user’s selection of a **pairing option** satisfies the claimed first indication from a user to pair the mobile communication device to at least one remote device. *Dec.*, ¶143.

Like Kalayjian, Vauclair teaches a display that is a graphical user interface because it presents “detailed message, or menu options, to the user” and allows for the user to interface with the display via the user input 28. *Id.*, [0030]; *Dec.*, ¶141.

Following user selection of the pairing option from the menu via user input 28, Vauclair teaches a signal is sent to the control circuitry to initiate the pairing process comprising a pairing sequence. *Vauclair*, [0030] (describing how user input 28 “allow[s] the user to select from available menu options, **to send a signal to the control circuitry 22**”), [0037]-[0049] (describing the discrete steps of the pairing process sequence); *Dec.*, ¶144.

Reading these collective teachings of Vauclair, a POSITA would have understood that Vauclair teaches (1) user selection of a pairing option at the GUI presented on the display, where the user selection of the pairing option *initiates* the pairing process (*Vauclair*, [0036]); and (2) selection of a menu option at the GUI presented on the display causes a signal to be sent to the control circuitry, where the control circuitry is a suitably programmed processor (*Vauclair*, [0030], [0028]). *Dec.*, ¶¶142, 145. Vauclair thus teaches a graphical user interface that generates a pairing signal. *Id.*

Applying THL’s construction of a pairing signal, the signal sent to the control circuitry responsive to the user’s selection of available menu options (*Vauclair*, [0030]) is a “processor signal,” at least because the control circuitry 22 is “a suitably programmed processor” and selection of a menu option “send[s] a signal to the control circuitry.” *Vauclair*, [0028], [0030]; *Dec.*, ¶144. After receiving the signal responsive to selecting the pairing option, the control circuitry/processor initiates the wireless device pairing sequence depicted in Figs. 2-3: “to initiate the process, the user may select a pairing option from a menu, using the user input 29.” *Vauclair*, [0036]; *see also id.* at [0037]-[0057], pinpoint at [0049], [0051] (describing pairing), [0028] (describing control circuitry 22 connected to transceiver circuitry 24), Figs. 2-3; *Dec.*, ¶145.

Thus, Vauclair teaches that user selection of the pairing option via user input (the first indication from a user to pair the wireless device to the at least one remote device) causes the graphical user interface of the display to “send a signal to the control circuitry” (the generate a pairing signal), connected to the transceiver, to cause pairing of the host device with a peripheral device. *Id.*, [0030], [0028]; *Dec.*, ¶¶139-145.

### (c) Motivation to Combine

A POSITA would have found it obvious and been motivated to configure Kalayjian’s first device’s GUI to (1) illustrate a pairing option in a menu, as taught by Vauclair; and (2) upon selection of the pairing menu option, generate and send a pairing signal to the first device’s processor in response to the user selecting the pairing option from the menu, as also taught by Vauclair. *Dec.*, ¶146. Because Kalayjian teaches that the first and second devices must first be paired, a POSITA would have understood that the user’s selection of a pairing menu option via the first device’s GUI would be a first indication from a user to pair the wireless device to the at least one remote device. *Id.*, ¶¶146, 150 (citing Kalayjian, Fig. 10 (step 1010), Fig. 11 (step 1110)).

A POSITA would have understood that selecting from menu items on the GUI would have generated signals corresponding to the user’s selections/inputs that would then be sent to the first device’s processor so that the processor can interpret

the user's inputs and take the appropriate action, per Vauclair. *Id.*, ¶149. Kalayjian expressly teaches user selection via the first device's GUI for selecting the second device to be located, indicating to a POSITA that Kalayjian's first device already includes the well-known hardware/software functionality of receiving and processing a user input at a GUI. *Id.*, ¶¶146, 149-150, 161; *Kalayjian*, [0048]. Thus, implementing Vauclair's teachings with respect to the Bluetooth pairing process would have been consistent with Kalayjian's teachings, would have involved minimal software changes (e.g., present a menu with a pairing option), and would have been met with a reasonable expectation of success, especially considering Kalayjian already teaches the first and remote devices being paired. *Dec.*, ¶¶147, 149-151.

Generating processor signals in response to an indication from a user was a well-known mechanism of wireless devices at the time of the alleged invention. *Id.*, ¶¶67-61, 155-156. Additionally Bluetooth pairing and corresponding Bluetooth pairing menus were well-known at the time as taught in Vauclair. *Id.*, ¶¶148-149, 72-76. Vauclair simply discloses one way in which a Bluetooth pairing menu and subsequent Bluetooth pairing process can be implemented in wireless devices. *Id.*, ¶¶97-99, 139-140.

A POSITA would have been motivated to turn to Vauclair for specificity regarding the pairing process to implement Kalayjian's teachings effectively

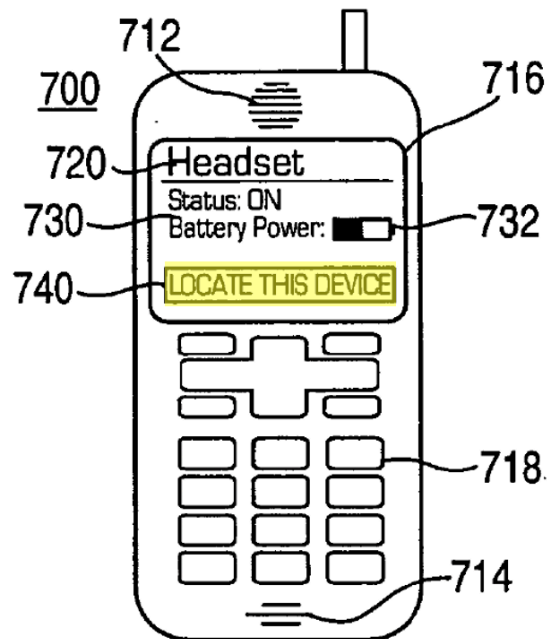
because doing so would have provided the same benefits claimed in Vauclair to Kalayjian's system. *Id.*, ¶¶146-147. Both Vauclair and Kalayjian are directed to similar systems (e.g., host/first device Bluetooth-paired with peripheral/second device). *Id.* Thus, a POSITA would have been motivated to combine prior art elements according to known methods as there would have been no change to the respective functions of either Kalayjian's first device or Vauclair's pairing menu, and this combination would have predictably resulted in a wireless device with a GUI that generates a pairing signal in response to a first indication from a user to pair the first device to the second device. *Id.*, ¶¶146-151.

4. ***Claim 1(a)(ii): “[a graphical user interface that]...generates a first location request signal in response to a second indication from a user to locate the at least one remote device; and”***

**(a) Kalayjian's Teachings**

Kalayjian teaches initiating a “location discovery system” upon a user selecting a second device to locate: “**when prompted by a user**, the master device can transmit a signal to one of the slave devices. The slave device can then take a predetermined action to attempt **to guide a user to its location.**” *Id.*, [0007], Title, Abstract. “When a **user wants to locate one of the slave devices 320, 400 and 500**, the **user can initiate the location discovery process through master device 310**. Master device 310 can transmit a signal to a slave device.” *Id.*, [0038].

Kalayjian teaches a second indication from a user to locate the at least one remote device, namely selection at the GUI of the “LOCATE THIS DEVICE” button 740. *Dec.*, ¶¶152-153. Kalayjian provides an exemplary screenshot of a first device illustrating “graphical button 740 to enable the user to prompt master device 700 to locate the selected slave device”:



*Id.*, [0048], Fig. 7. Kalayjian teaches the user’s selection of the “LOCATE THIS DEVICE” button 740 in Fig. 7 is for purpose of locating the remote/second device. *Id.*, [0038], Abstract, [0050]; *Dec.*, ¶153 (noting the *second* indication from the user to locate the remote device comes after the mapped *first* indication to pair the devices). Because the user selects the LOCATE THIS DEVICE button for purposes of locating a second device, Kalayjian further teaches that selection of button 740 is a first location request. *Dec.*, ¶¶154, 162.

Kalayjian teaches the first device engages in the location discovery process and sends a signal to the selected second device **responsive** to the user selection, via the first device, of the desired second device to locate, thus teaching in response to a second indication. Specifically, Kalayjian teaches “the user can initiate the location discovery process through master device 310. Master device 310 can transmit a signal to a slave device. Upon receiving the signal, the slave device can guide a user to its location and/or notify a user of the distance from master device 310 to the slave device.” *Id.*, [0038], [0039], [0042]. Claim 1(b)(iii)’s mapping, incorporated herein, includes additional discussion of Kalayjian’s teachings regarding location information being transmitted to the first device by the second device. *Dec.*, ¶155.

#### **(b) Vauclair’s Teachings**

Vauclair teaches the well-known concept of a GUI that generates a...signal in response to user selection at the GUI. *See* Claim 1(a)(i); *Dec.*, ¶156. Vauclair teaches user input 28 “allow[s] the user to select from available menu options, to **send a signal to the control circuitry 22[,]**” which includes “a suitably programmed processor.” *Vauclair*, [0030], [0028] (disclosing the control circuitry is connected to the transceiver circuitry). Thus, Vauclair teaches a graphical user interface that generates a...signal in response to user input. *Dec.*, ¶157; Claim 1(a)(i).

**(c) Combination of Kalayjian's and Vauclair's Teachings and Motivation to Combine**

Given Kalayjian's disclosure of user selection of button 740 is a location request and given Vauclair's teaching that user selection of a menu option on a GUI results in a signal being generated by the GUI and communicated to a processor, a POSITA would have understood the combination of Kalayjian-Vauclair renders obvious the claimed GUI...that generates a first location request signal. *Dec.*, ¶¶158-162. Per Dr. Buehrer, the signal sent from the GUI to the processor (taught by Vauclair, [0030]), in response to the user indicating which second device to locate (taught by Kalayjian), constitutes a location request signal, as the signal causes the Kalayjian processor to initiate the location discovery process to enable the user to locate the remote device. *Id.*, ¶¶154, 162.

A POSITA would have found obvious and been motivated to modify Kalayjian's first device, to the extent necessary, to generate a processor signal, as taught by Vauclair, in response to the user selecting a second device to locate (i.e., a second indication from the user to locate the at least one remote device), as taught by Kalayjian. *Id.*, ¶¶158-162. Kalayjian discloses user selection of a locate button to initiate a location discovery process. *Kalayjian*, [0038], [0048], Fig. 7. Vauclair provides additional specificity of the signals generated by a GUI and communicated to a processor responsive to user selection of a menu option on a GUI. *Vauclair*, [0030]. Because signal generation responsive to receiving and instructing user-

indicated commands is extremely well-known and expected for any electrical device relying on processors, to the extent not taught in Kalayjian, a POSITA would have found it obvious and been motivated to look to Vauclair for additional specificity required to achieve the features of Claim 1(a)(ii). *Dec.*, ¶¶158-162.

A POSITA would have understood or found obvious that Kalayjian's GUI, like Vauclair's interface, would have generated signals corresponding to user input, such as a user instruction to select a slave device to locate. *Id.*, ¶161 Selection of a GUI menu option and the commensurate signaling to a processor is application of a known technique (per Vauclair) with the predictable result that the processor is instructed to initiate or perform the action as indicated by the user via selection of the menu option displayed at the GUI. *Id.* Moreover, a POSITA would have understood or found obvious that the signals generated by the GUI would be sent to Kalayjian's processor so that the processor can interpret the user's inputs and take the appropriate action, per Vauclair. *Id.*, ¶161. A POSITA would have understood or found obvious that in Kalayjian, when the user inputs a request to locate a second device, the graphical user interface would generate a signal (i.e., a location request signal) indicative of that request that would be sent to the first device's processor, as taught by Vauclair. *Id.* Because there is no change to the respective functions of either Kalayjian's first device (or its location discovery process), or Vauclair's signal generation, a POSITA would have been met with a reasonable expectation of

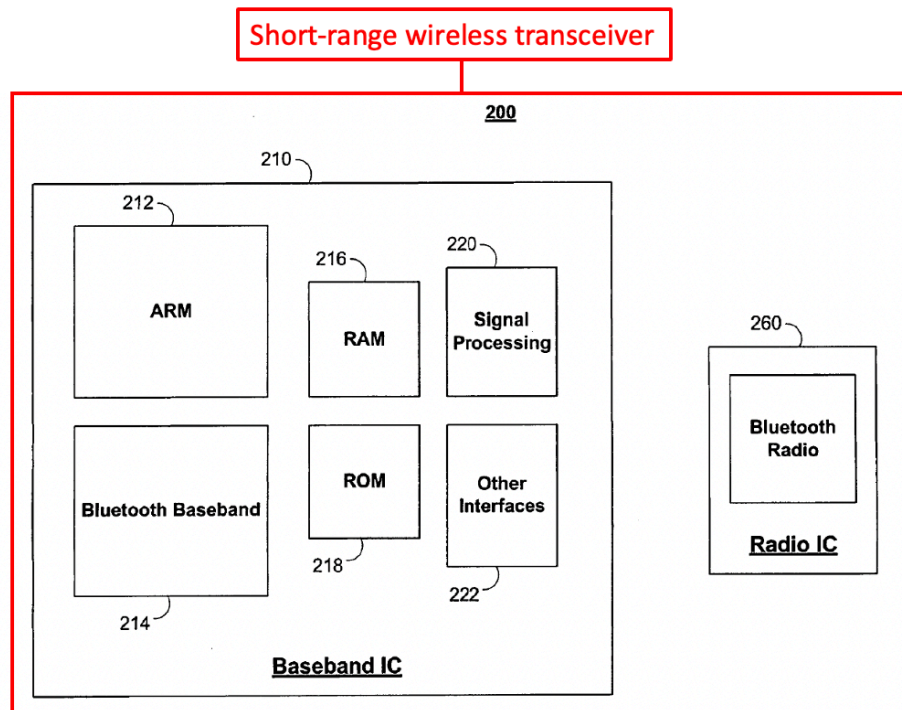
success, and this combination would have predictably resulted in a wireless device that generates a location request signal in response to a second indication from a user to locate the remote device. *Id.*, ¶161.

**5. Claim 1(b): “a short-range wireless transceiver, coupled to the graphical user interface,”**

**(a) Kalayjian’s Teachings**

Kalayjian teaches or renders obvious a short-range wireless transceiver, coupled to the graphical user interface. Kalayjian teaches that the first device is a device “capable of communicating using a Bluetooth protocol,” such as “a Bluetooth capable cellular phone.” *Kalayjian*, [0032]-[0033]. “FIG. 2 is a block diagram that illustrates one exemplary implementation of Bluetooth hardware [200]” that “has been divided into two ICs, baseband integrated circuit 210 and radio integrated circuit 260.” *Id.*, [0028], Fig. 2. The radio IC 260 “**transmit[s]** and **receiv[es]** radio signals.” *Id.*, [0028], Fig. 2 (disclosing Radio IC includes “Bluetooth Radio”), [0026] (disclosing the Bluetooth standard includes “code to generate/receive radio signals”). A POSITA would have understood that any device that transmits and receives signals is a transceiver. *Dec.*, ¶¶163-167. A POSITA would have also understood that Bluetooth protocol requires Bluetooth transceivers to operate in the short-range wireless unlicensed ISM band at 2.4 GHz. *Id.*, ¶167. Thus, it was well known that short-range wireless transceivers were necessary to facilitate Bluetooth communication protocol between Bluetooth-enabled devices. *Id.*, ¶¶167, 170.

Consequently, a POSITA would have understood or found obvious that Kalayjian's first device, which operates using the Bluetooth protocol (a wireless protocol), included a short-range wireless transceiver to transmit and receive Bluetooth signals to and from the second device. *Id.*, ¶¶163-167. A POSITA would have thus understood Kalayjian's Bluetooth hardware 200 expressly, implicitly, or inherently teaches or otherwise renders obvious a short-range wireless transceiver. *Id.*, ¶¶169-171.



*Id.*, ¶169 (citing Kalayjian, Fig. 2).

A POSITA would have further understood the short-range wireless transceiver is coupled to the graphical user interface. *Dec.*, ¶¶172-173. Kalayjian teaches the location discovery process is initiated upon a user selecting, via the GUI

with a graphical button, a second device to locate. *Kalayjian*, [0007], [0038], Fig. 7; Claim 1(a)(ii). *Kalayjian* teaches the user selection via the GUI results in the first device transmitting a Bluetooth communications signal to the second device. *Kalayjian*, [0007], [0047]. A detailed discussion about the signals sent from the short-range wireless transceiver in response to user selection via the GUI are provided in subsequent limitations.

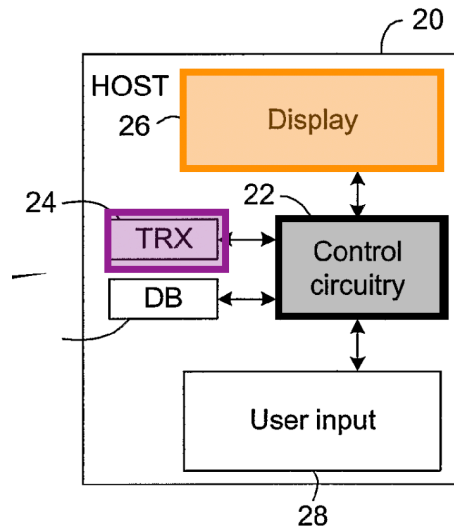
The '381 Patent defines “coupled” including “direct and indirect coupling between two elements,” such as “via another component...” ’381 Patent, 35:42-53. Because user selection via *Kalayjian*’s first device GUI causes its short-range wireless transceiver to send and receive Bluetooth communication protocol signals to carry out the location discovery process, *Kalayjian* expressly, implicitly, or inherently teaches or renders obvious a short-range wireless transceiver coupled to the graphical user interface, at least within the context of the '381 Patent. *Dec.*, ¶¶172-173.

**(b) Alternative Combination of *Kalayjian* and *Vauclair***

To the extent THL argues *Kalayjian* alone does not teach or render obvious Claim 1(b), *Vauclair*’s host device includes a transceiver connected to a GUI, thus expressly teaching a short-range wireless transceiver coupled to a graphical user interface.

Vauclair teaches a wireless host device that includes “transceiver (TRX) circuitry 24, which handles radio frequency (RF) communications with other electronic devices able to use the same wireless protocol” such as “Bluetooth.” *Vauclair*, [0028], [0022]. A POSITA would have understood that “Bluetooth **wireless** technology is an international, open standard for allowing intelligent devices to communicate with each other through **wireless, short-range communications.**” *Kalayjian* at [0021]; *Dec.*, ¶175. Thus, a POSITA would have understood that Vauclair’s Bluetooth transceiver is a short-range wireless transceiver. *Dec.*, ¶¶165-176.

Vauclair also teaches that display 26 “operates under the control of the control circuitry 22,” which is further “connected to transceiver (TRX) circuitry 24[.]” *Vauclair*, [0030]. Vauclair explains “user input 28, which may for example include a keypad, and one or more scroll buttons, allow[s] the user to select from available menu options, to send a signal to the control circuitry 22,” which is “a suitably programmed processor.” *Id.*, [0030], [0028]; Claim 1(a)(i) (discussing Vauclair’s pairing method in response to user selection via a GUI). Fig. 1 shows Vauclair’s hardware components including display 26, user input 28, control circuitry 22, and transceiver (TRX) 24 coupled to each other:



*Id.*, Fig. 1; *Dec.*, ¶176.

Petitioner notes the '381 Patent's definition of coupled discussed above. '381 *Patent*, 35:42-48. Therefore, consistent with the specification of the '381 Patent, Vauclair teaches a short-range wireless transceiver coupled to the graphical user interface. *Dec.*, ¶¶175-176.

### (c) Motivation to Combine

A POSITA would have found it obvious and been motivated to modify Kalayjian's first device (to the extent not taught in Kalayjian) to include a short-range wireless transceiver coupled to the GUI. *Dec.*, ¶¶177-179. Kalayjian teaches displaying a GUI on screen 316. *See* Claim 1(a). In the modified Kalayjian, the GUI is coupled to the Bluetooth transceiver via a processor, per Vauclair, [0030].

The proposed modification of Kalayjian with Vauclair with respect to the short-range wireless transceiver coupled to the GUI would have been obvious at least

for combining prior art elements according to known methods to yield predictable results. *Id.*, ¶178. Kalayjian describes a location discovery system that relies on Bluetooth communications protocol to communicate between a first device and a second device following user selection via a GUI. *Id.* Vauclair teaches a wireless device having a short-range wireless transceiver coupled to a display via a processor and receiving user instruction at the GUI. *Id.* Because there is no change to the respective functions of either Kalayjian's first device or Vauclair's short-range wireless transceiver, this combination would have predictably resulted in a first device that includes a short-range wireless transceiver coupled to a GUI, to the extent argued not taught by Kalayjian alone. *Id.*, ¶179. Thus, there would have been a reasonable expectation of success configuring Kalayjian's Bluetooth-capable first device to include a short-range wireless transceiver coupled to the GUI, as taught by Vauclair. *Id.*

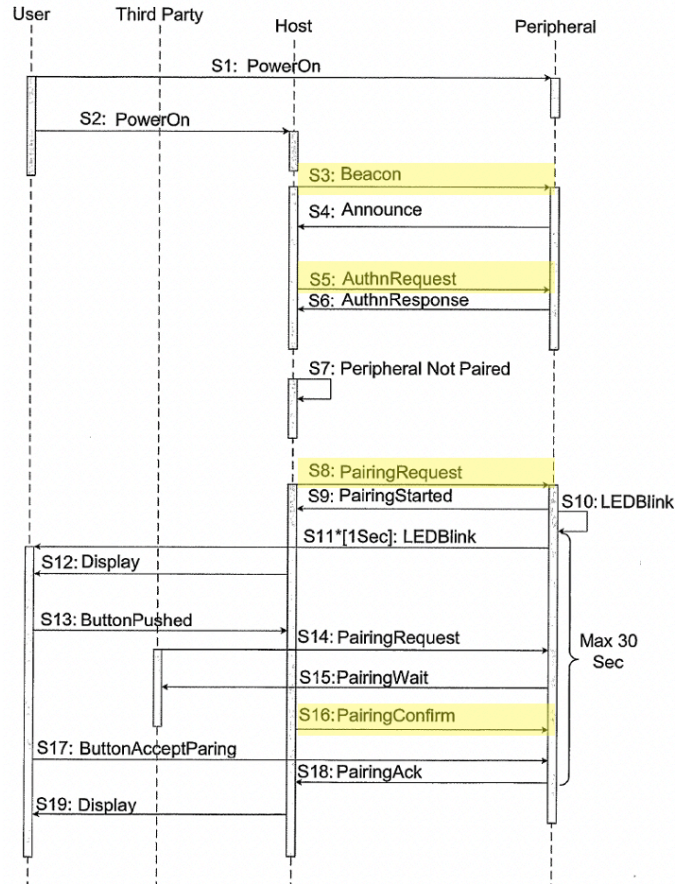
6. ***Claim 1(b)(i): “[a short-range wireless transceiver]...that responds to the pairing signal generated by the graphical user interface by communicating RF signals to pair the wireless device to the at least one remote device and”***

**(a) Vauclair's Teachings**

Vauclair teaches the pairing signal generated by the graphical user interface. See Claim 1(a)(i). Vauclair also teaches creation of a wireless network begins with the user selecting a pairing option and, in response, the host device seeking a nearby peripheral device. *Vauclair*, [0036]-[0037]. During an identification and

authentication process, the host and peripheral devices send a series of RF signals back and forth. *Id.*, [0037] (“the host device 20 then seeks a nearby peripheral device ... by sending a beacon signal (S3 in FIG. 2) containing its identification.”), [0040] (as part of the authentication process, the host device “sends an unpredictable challenge (S5 in FIG. 2) to the peripheral device 10”), [0024] and [0028] (disclosing the communications between host and peripheral device 10 (S19 in FIG. 2).” *Id.*, [0056]; *Dec.*, ¶¶180-182.

The following annotated version of Fig. 2 emphasizes the series of RF signals the host device’s transceiver communicates to the peripheral device during the pairing process:



*Dec.*, ¶182 (citing *Vauclair*, Fig. 2). Each of signals S3, S5, S8, and S16 is sent from the host device and to the peripheral device to pair the devices, per *Vauclair*’s teaching that the “pairing process is completed” after the signals are sent (and acknowledged by the peripheral device). *Dec.*, ¶183; *Vauclair*, [0056]. The signals are RF signals at least because *Vauclair* expressly teaches RF communications between host/peripheral devices ([0024], [0028]) and because a POSITA would have known or found obvious that the Bluetooth communications taught in *Vauclair* are RF signals. *Id.*

Vauclair also teaches the short range wireless transceiver...responds to the pairing signal...by communicating RF signals to pair.... Dec., ¶¶184-185. Vauclair teaches establishing a wireless network between two devices via the Fig. 3 process, which includes the user **initiating** the pairing process by selecting a pairing option from a menu. *Vauclair*, [0036]-[0037]; Dec., ¶185. Responsive to the user selecting the pairing option at Vauclair, [0036], Steps P1-P10 of Fig. 3 are performed. Dec., ¶185 (citing *Vauclair*, [0037]-[0056] and explaining that Vauclair describes at [0036] initiation of the pairing process by selecting the pairing option and then Vauclair proceeds to describe the pairing process at [0037]-[0056]).

As mapped for Claim 1(a)(i), the pairing signal is the signal sent to the control circuitry responsive to the user's selection of available menu options, such as the "pairing option" disclosed at Vauclair, [0036]. See Claim 1(a)(i). Responsive to the user selecting the pairing option (per Vauclair, [0036]), the GUI sends a signal to the control circuitry to cause initiation of the pairing process (per Vauclair, [0030]) and specifically, the sending of RF signals (per Vauclair, [0037]-[0056]). Dec., ¶185. Thus, Vauclair teaches the host device's transceiver circuitry both transmits and receives a series of RF signals to/from the peripheral device in response to the user selecting a pairing option from a menu on the host device and to pair the host device with the peripheral device. *Id.*

**(b) Motivation to Combine**

A POSITA would have found it obvious and been motivated to further configure Kalayjian's Bluetooth transceiver to respond[] to the pairing signal generated by the GUI by communicating RF signals to pair the wireless device to the at least one remote device, per Vauclair. *Dec.*, ¶¶186-189.

The claim requires the well-known element of allowing a user to initiate a pairing process between two wireless devices by interacting with a GUI to cause a transceiver to communicate RF signals with the remote device. *Id.*, ¶186. Kalayjian expressly describes both (1) the first and second devices being paired via Bluetooth prior to any location discovery process beginning; and (2) the location discovery process encompassing Bluetooth communications between the first and second devices. *Id.* Therefore, a POSITA would have understood Kalayjian discloses paired devices and that Kalayjian's system would include a mechanism by which to pair devices (e.g., communicating RF signals). *Id.*

Vauclair describes, in detail, a secure Bluetooth pairing process that allows the user to select a pairing option from a menu on a host device, which causes the host device's transceiver to communicate a series of RF signals to the peripheral device to complete a pairing process. *Id.*, ¶187. Vauclair simply provides additional specificity for a pairing process that would have been compatible with Kalayjian's system. *Id.* Indeed, a POSITA would have been motivated to implement Vauclair's

teachings for the pairing process to benefit Kalayjian in the same way—with a secure pairing method. *Id.* ¶188. Vauclair specifically highlights the benefit of a more secure pairing method to avoid communications being “overheard, and/or tampered with, by third parties. *Vauclair*, [0005]; *Dec.*, ¶187. Thus, a POSITA would have been motivated to modify Kalayjian with Vauclair’s pairing method for a more secure pairing. *Dec.*, ¶188. Because there is no change to the respective functions of either Kalayjian’s first device or Vauclair’s pairing process, this combination would have predictably resulted in a first device that allows the user to pair with a second device to ensure a secure communication channel. *Id.*, ¶187.

Bluetooth pairing was well-known for a decade prior to the ’381 Patent. *Id.*, ¶188. RF signaling between a Bluetooth host/first device and a peripheral device during the pairing process was well understood to POSITAs at the time of the ’381 Patent. *Id.*, ¶¶72-76, 188. Therefore, there would have been a reasonable expectation of success configuring Kalayjian’s Bluetooth transceiver to initiate the Bluetooth pairing RF signaling in response to an indication from the user to pair the first device to the second device. *Id.*, ¶¶188-189.

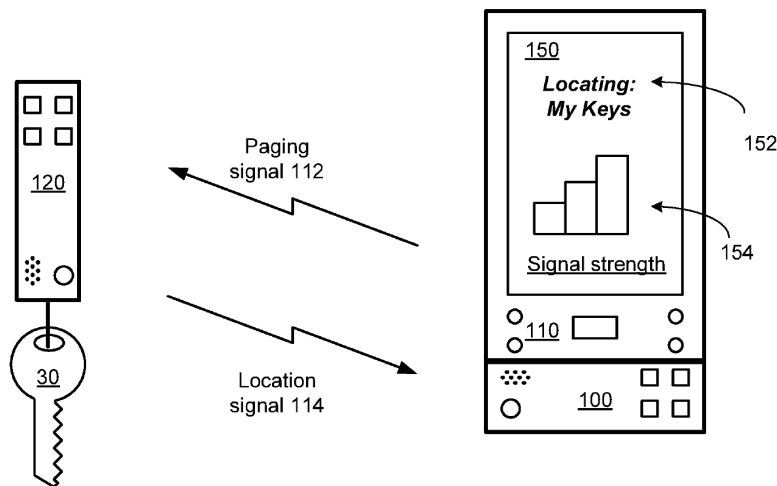
**7. *Claim 1(b)(ii): “[a short-range wireless transceiver]...that transmits a first RF paging signal to the at least one remote device in response to the first location request signal and”***

Petitioner provides two alternative mappings for this limitation to cover (1) the plain and ordinary meaning; and (2) THL’s apparent interpretation. As discussed

below, the paging signal in the second mapping causes the remote device to emit a detectable alert while the paging signal in the first mapping does not.

**(a) First Mapping**

Regarding the claimed paging signal, the '381 Patent discloses an embodiment where adjunct device 100 transmits “a paging signal 112” that causes the remote wireless device 120 to transmit “a location signal 114...such as a beacon signal or other location signal.” ’381 Patent, 9:62-66. “Adjunct device 100 aids the user of handheld wireless communication device 110 in homing in on the location signal 114 based on the signal strength of the location signal 114 as received by short-range wireless transceiver 140.” *Id.*, 9:66-10:3.

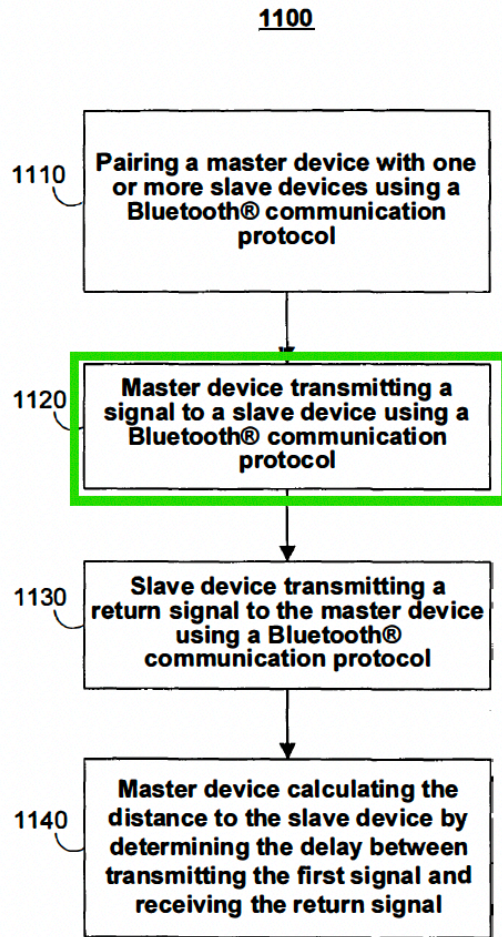


*Id.*, Fig. 6.

Kalayjian teaches a nearly identical process. As discussed above, Kalayjian-Vauclair teaches a first location request signal that initiates Kalayjian’s location discovery process. *See* Claim 1(a)(ii). After the user initiates the location discovery

process, the first device “transmit[s] a signal to a slave device.” *Kalayjian*, [0038].

Figure 11 is “a flowchart...for locating an object,” and “[a]t step 1120, the master device transmits a signal to a slave device using a Bluetooth communications protocol.” *Id.*, [0055] The signal 1120 from the first device to the second device is sent responsive to the user selection of button 740, which generates the first location request signal (per Claim 1(a)(ii))\_and “enable[s] the user to prompt master device 700 to locate the selected slave device.” *Kalayjian*, [0048], Abstract; *Dec.*, ¶192. “At step 1130, the slave device transmits a return signal to the master device using a Bluetooth communications protocol,” and “the master device calculates the distance to the slave device[.]” *Kalayjian*, [0055].



*Id.*, Fig. 11.

Because Kalayjian teaches that the first device transmits a Bluetooth signal to the second device to cause the second device to transmit a return signal back to the first device, the Bluetooth signal transmitted at step 1120 is a paging signal within the meaning of the '381 Patent. *Dec.*, ¶192. A POSITA would have understood that Bluetooth signal 1120 is an RF signal transmitted by the first device's Bluetooth transceiver (short-range wireless transceiver). *Kalayjian*, [0022], [0002], [0029]-[0030]; *Dec.*, ¶¶193; Claim 1(b). Therefore, the first device's Bluetooth transceiver

transmits a first RF paging signal to the at least one remote device in response to the first location request signal. Dec., ¶193.

**(b) Second/Alternative Mapping**

The '381 Patent describes an alternative embodiment where remote “wireless device 120...receives a paging signal 112 transmitted by adjunct device 110. In response to the paging signal 112, a light or sound emitter of wireless device 120 emits a detectable alert signal that helps the user locate the personal object.” '381 Patent, 7:3-8, Fig. 4. In co-pending litigation, THL appears to interpret a first RF paging signal as a signal that causes the remote device to emit a sound. *THL's Infringement Contentions*, Ex. 1039, 113 (“The Mac Pro’s Bluetooth wireless transceiver transmits a first RF paging signal to the AirPods in response to the location request signal to ‘Play Sound.’ That first RF paging signal is sent to the AirPods to play a sound from each AirPod.”).

To the extent THL argues that Claim 1 is limited to the embodiment where the first RF paging signal causes the remote device to emit a detectable alert, such is also expressly suggested and rendered obvious by Kalayjian. Dec., ¶194. Specifically, Kalayjian teaches an embodiment where the first device “transmit[s] a signal to a slave device” in response to the user “initiat[ing] the location discovery process through master device 310.” *Kalayjian*, [0038]. “Upon receiving the signal, the slave device can guide a user to its location and/or notify a user of the distance

from master device 310 to the slave device.” *Id.* The second device “guide[s] a user to their location by **emitting auditory** or visual **signals**,” and “notif[ies] a user of the distance between the slave device and master device 310” by “transmitting a return signal to master device 310.” *Id.*, [0039], [0040]. Thus, a POSITA would have understood the collective teachings of Kalayjian, [0038]-[0040] teach that the first device sends a single signal that causes the second device to send a return signal **and** emit an auditory signal to guide the user to its location. *Dec.*, ¶194. Thus, the Bluetooth signal that causes the second device to emit an audible alert and transmit a return signal qualifies as the claimed first RF paging signal under THL’s apparent interpretation of the claim. *Id.*

It would have been obvious, and a POSITA would have been motivated to configure the first device’s Bluetooth transceiver to send a signal in response to the user selection of button 740, which generates the first location request signal (per Claim 1(a)(ii)), where the signal causes the second device to emit an audible alert and send a return signal back to the first device. *Id.*, ¶194. A POSITA would have understood that it would have been convenient to allow the user to trigger an audible alert and transmission of the return signal with one button press instead of requiring the user to separately press the “ACTIVATE BEEPING” button. *Id.*, ¶195. A POSITA would have been motivated to configure the first device to transmit a first RF paging signal that causes the second device to emit an audible alert and transmit

a return signal in response to the user's selection of button 740 based on Kalayjian's express suggestion to have the first device transmit a single signal that triggers the audible alert **and** the return signal. *Id.* Because this modification would have only required minor software changes to the first and second devices, there would have been a reasonable expectation of success. *Id.*, ¶196.

8. ***Claim 1(b)(iii): “[a short-range wireless transceiver]...that receives a location signal from the at least one remote device;”***

Kalayjian expressly teaches the first device's Bluetooth transceiver receives a location signal from the at least one remote device. Kalayjian teaches “[w]hen prompted by a user, the master device can transmit a signal to one of the slave devices. The slave device can then take a predetermined action to attempt to guide a user to its location. For example, the **slave device can transmit a return signal to the master device[.]**” *Kalayjian*, [0007], [0038]. The slave device can then “attempt to guide a user to its location.” *Id.*; Claim 1(c) (discussing Kalayjian's teachings of displaying distance/directional graphics to assist user in locating the second device); *Dec.*, ¶197.

Kalayjian additionally teaches that after the “[m]aster device transmit[s] a signal to a slave device using a Bluetooth communication protocol,” the “[s]lave device transmit[s] a return signal to the master device using a **Bluetooth communication protocol**.” *Kalayjian*, [0055]. Kalayjian, Fig. 11 shows Step 1130 (blue) in which the Kalayjian master device receives a signal from the second device:

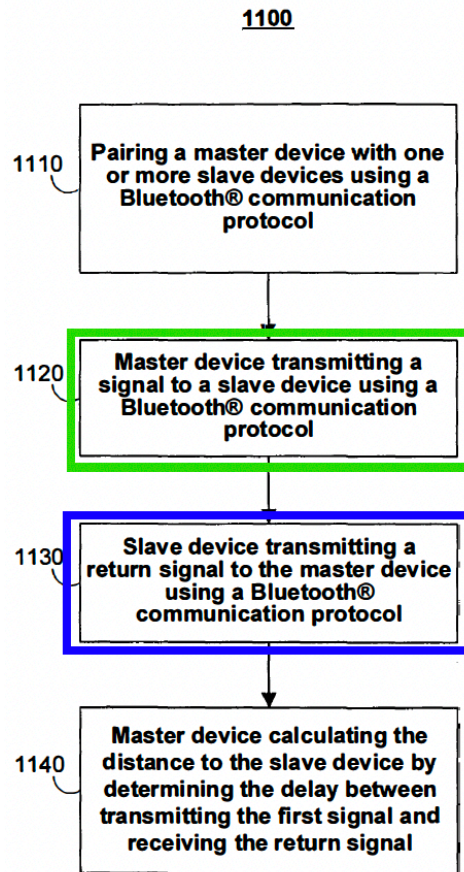


**FIG. 11**

*Kalayjian, Fig. 11; Dec., ¶197.*

Regarding the claimed short-range wireless transceiver...that receives the signal, Kalayjian, or Kalayjian-Vauclair renders obvious a short-range wireless transceiver, as discussed for Claim 1(b). Claim 1(b)(i) discusses Kalayjian alone or Kalayjian-Vauclair rendering obvious the short-range transceiver *transmitting* a signal. For similar reasons, Kalayjian alone or Kalayjian-Vauclair renders obvious the transceiver *receiving* a signal. *See* Claim 1(b). The return signal sent from the second device and to the first device is a Bluetooth signal (per Kalayjian, Step 1130,

[0055]), which would have been understood by a POSITA to be received by the Bluetooth transceiver of either Kalayjian alone or Kalayjian-Vauclair. *Dec.*, ¶202.

Kalayjian further teaches the signal received from the second device is a location signal. *Dec.*, ¶¶198-201. Kalayjian teaches that a distance between the first/second devices is determined based on time-of-flight of a signal sent from the first device to the second device: “The distance between the devices can be calculated by comparing the amount of time delay between the transmission of the signal sent from the master device to the slave device and the reception of the return signal from the slave device.” *Kalayjian*, [0040]-[0042], pinpoint at [0041]; *compare to '381 Patent*, 33:12-32, pinpoint at 33:14-17 (describing using a time of flight of a paging signal sent from the adjunct (wireless) device to the remote device and a return “location signal” sent from the remote device to the wireless device). Kalayjian teaches: “Once this distance is calculated, it can be displayed to the user through graphics on the master device.” *Id.*, [0041]. Because Kalayjian’s receive signal from the second device is used for time-of-flight calculations to determine the distance between the first/second devices, Kalayjian’s receive signal is a location signal. *Dec.*, ¶199.

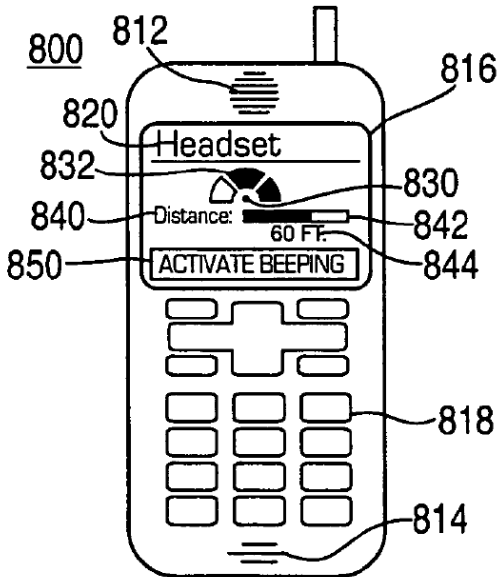
Additionally or alternatively, Kalayjian discloses determining distance by measuring the signal strength of the return signal from the second device, as similarly disclosed in the '381 Patent. *Compare '381 Patent*, 10:5-26 (“The signal

strength of the location signal 114...is converted to signal strength data....[S]ignal strength is...a measure of approximate distance to a remote device...”), with *Kalayjian*, [0041] (“[T]he distance between the two devices can be calculated by switching the amount of power used to transmit signals and measuring the comparative strength of the received signals.”). A POSITA would have understood *Kalayjian* teaches that the signal received by the first device and from the remote device is a location signal within the context of the ’381 Patent. *Dec.*, ¶200.

9. ***Claim 1(c): “wherein the graphical user interface presents a display that visually assists the user to locate the at least one remote device”***

As discussed for Claim 1(b)(iii), *Kalayjian* teaches determining a distance between the first/second devices. *Kalayjian* teaches that “[o]nce this distance is calculated, it can be **displayed to the user through graphics on the master device.**” *Kalayjian*, [0042]. *Kalayjian*, Fig. 8 illustrates a distance graphic 840 (e.g., 60 ft.) displayed on the first device’s GUI, in addition to a “**directional graphic 830** to indicate to the user the direction where the slave device should be located.” *Kalayjian*, [0049] (additionally disclosing Fig. 8 “includes a screenshot of the user interface of the master device 800 when the master device is attempting to locate a slave device”). *Kalayjian* further teaches presenting information about the direction of the second device “to a user through a graphical user interface on the master’s screen **to direct the user to the missing slave device.**” *Kalayjian*, [0043], [0044]

(teaching “the slave device’s location can be determined and presented to the user through the master device”); *Dec.*, ¶204.



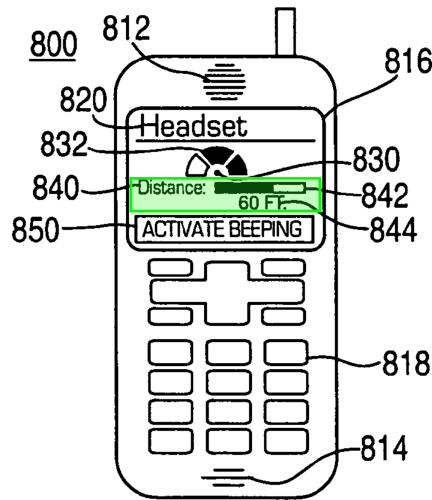
*Id.*, Fig. 8.

Therefore, Kalayjian teaches the graphical user interface, namely the graphical user interface displayed on screen 816, presents a display, namely the display of the location-finding graphics 830, 840, that visually assists the user to locate at least the one remote device by “direct[ing] the user the user to the missing device” ([0043]) or “indicat[ing] to the user where the slave device should be located” ([0049]). *Dec.*, ¶205.

**B. Claim 2 : “The wireless device of claim 1 wherein the display visually assists the user based on a signal strength of the location signal from the at least one remote device”**

Kalayjian teaches the first device receiving a return signal from the second device, using the return signal to calculate the distance to the second device, and

presenting the calculation on the first device's GUI via distance graphic 840. Claim 1(c); *Kalayjian*, [0040], [0049].



*Id.*, Fig. 8. *Kalayjian* teaches calculating the distance by “measuring the comparative strength of the received signals” and displaying to the user via distance graphic 840 and symbolic representation 842, such as a horizontal bar graphic. *Id.*, [0041], [0049].

A POSITA would have understood that distance graphic 840 displayed by GUI on screen 816 satisfies Claim 2. *Dec.*, ¶¶206-209. The GUI displays distance graphic 840 on display as a bar graph of distance or the distance measurement itself that visually assists the user. *Kalayjian*, [0041], [0049]; *Dec.*, ¶¶208-209. *Kalayjian* teaches the distance is calculated based on a signal strength of the signal received from the second device. *Kalayjian*, [0041]. The “received signals” comprise a

location signal from the at least one remote device, as the received signals are received from the second device. *Id.*; *Dec.*, ¶¶206-207.

**C. Claim 3: “The wireless device of claim 1 wherein the display visually assists the user by displaying an indication of a signal strength of the location signal from the at least one remote device”**

Kalayjian also teaches Claim 3 for the same reasons provided for Claim 2 (incorporated herein). Specifically, the distance displayed in Kalayjian is an indication of a signal strength because Kalayjian’s distance (displayed via distance graphic) is a measure of “the comparative strength of the received signals.” *Kalayjian*, [0041]; *Dec.*, ¶210. The distance graphic 840 or distance measurement satisfies the claimed indication because the distance graphic 840 or distance visually displays to the user the distance from the first device to the second device, which is determined from the signal strength of the location signal from the second device. *Dec.*, ¶211. The ’381 Patent confirms that an indication of signal strength is met by a distance measurement, stating “signal strength is...a measure of approximate distance to a remote device....” ’381 *Patent*, 10:25-28. Because Kalayjian teaches distance as a comparative strength of received signals, and because the ’381 Patent similarly describes signal strength as a measure of approximate distance, a POSITA would have understood Kalayjian’s displayed distance is an indication of signal strength. *Dec.*, ¶212.

**VII. GROUND 2: CLAIMS 4 AND 6 ARE OBVIOUS OVER KALAYJIAN, VAUCLAIR, AND KALLIOLA**

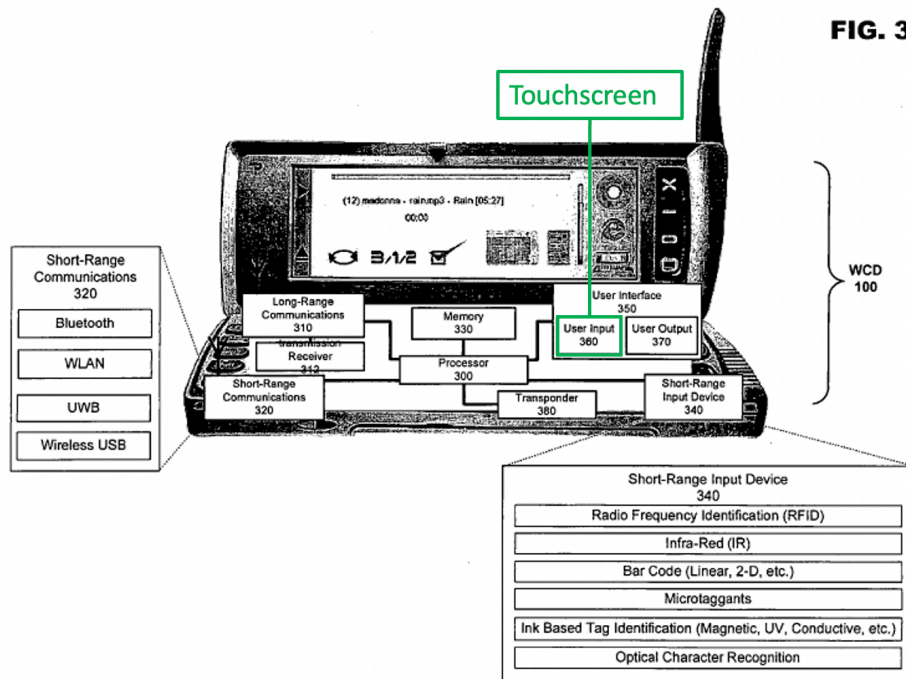
- A. Claim 4: “The wireless device of claim 1 wherein the wireless device is a handheld wireless communication device and the graphical user interface includes a touch screen of the handheld wireless communication device”**

**1. *Kalayjian’s Teachings***

Kalayjian teaches first device is a cellular phone, thus teaching a handheld wireless communication device. *Kalayjian*, [0031], [0033]; *Dec.*, ¶213; *compare to ’381 Patent*, 4:16-25 (describing cellular phone as a wireless communication device); Claim 1(b) (discussing Kalayjian or Kalayjian-Vauclair’s first device includes a short-range wireless transceiver). Thus, Kalayjian teaches a wireless device that is a handheld wireless communication device. *Dec.*, ¶213. As mapped in Claim 1(a), Kalayjian teaches first device includes a GUI. *See* Claim 1(a).

**2. *Kalliola’s Teachings***

Like Kalayjian and the ’381 Patent, Kalliola teaches a wireless communication device (WCD) 100 that is a “cellular telephone or other handheld wireless device.” *Kalliola*, [0038], [0041], [0035], [0002]. Kalliola’s WCD includes a user interface 350 that “includes a user input 360 and a user output 370.” *Id.*, [0051]. “User input 360 may include one or more components that allow a user to input information,” including “keypads, **touch screens**, and microphones.” *Id.*



*Dec.*, ¶214 (citing *Kalliola*, Fig. 3). Because user input 360 includes a touch screen, *Kalliola* teaches a handheld wireless communication device including a touchscreen. *Id.*

### 3. Motivation to Combine

A POSITA would have found it obvious and been motivated to modify Kalayjian's first device to include a touchscreen, as taught by *Kalliola*. *Dec.*, ¶¶215-216. A POSITA would have understood that a touchscreen is a well-known type of user input allowing user selections on a GUI to facilitate the functions of a wireless device. *Id.*, ¶¶ 67-71, 216. Thus, a POSITA would have been motivated to combine the well-known elements of *Kalliola*'s touchscreen with Kalayjian's handheld wireless communication device, including a GUI, to yield the predictable result of allowing the user to interact directly with the GUI via the touchscreen. *Id.*, ¶216.

Mobile electronic devices included touchscreens for user input since at least the early 1990s. *Id.*, ¶¶216, 67-61. Touchscreens were also ubiquitous in smartphones since the Apple iPhone’s release in 2007 (well before the 2010 priority date). *Id.* Because touchscreens were well-known and conventional prior to the alleged invention of the ’381 Patent, there would have been a reasonable expectation of success incorporating a touchscreen in the GUI of Kalayjian’s first device. *Id.*

**B. Claim 6: “The wireless device of claim 1 wherein the at least one remote device emits a detectable alert signal in response to the first RF paging signal to assist the user in locating the handheld wireless communication device”**

***1. Interpretation of Claim 6***

The claimed handheld wireless communication device has no antecedent basis. The term appears in Claim 4 as a further narrowing of Claim 1’s wireless device, but Claim 6 depends from Claim 1 (not Claim 4). For purposes of this IPR, Petitioner provides two mappings: (1) a first mapping relying on Kalayjian should the handheld wireless communication device be interpreted as the at least one remote device of Claim 1; and (2) a second mapping relying on Kalliola should the handheld wireless communication device be interpreted as a second wireless device (in addition to Claim 1’s wireless device).

## 2. *Kalayjian's Teachings*

Kalayjian teaches the second device emits a detectable alert signal in response to the signal (first RF paging signal) sent from the first device to the second device as part of the location discovery process.

Kalayjian teaches method 1000 for locating an object. *Kalayjian*, [0054], [0038] (“the slave device can guide a user to its location and/or notify a user of the distance from master device 310 to the slave device”). As discussed for Claim 1(b)(i), Kalayjian teaches the first RF paging signal is transmitted to the second device. *See* Claim 1(b)(i). After the first device transmits the RF paging signal to the second device, “the slave device takes a predetermined action to guide a user to its location. The predetermined action could be, for example, **turning on a light**, [or] **emitting a sound**[.]” *Id.*, [0054]; *Dec.*, ¶¶219-220. “In one embodiment, slave devices 320, 400 and 500 can guide a user to their location by **emitting auditory or visual signals**.” *Id.*, [0039]. Using the auditory or visual signals, the user can “follow the sound or light to the misplaced object.” *Id.* Kalayjian further teaches that distance information “can also affect an auditory or visual signal emitted by the slave device. For example, a beeping alarm might change in pitch, rate of beeping, or volume as a user approaches a second device. In that instance, the beeping could get faster as the user gets closer to the missing device, or the sound could get louder as the user gets closer.” *Id.*, [0042]; *Dec.*, ¶220.

Kalayjian expressly teaches the second device emits detectable alert signals, such as light or sound, “to guide a user to its location.” *Id.*, [0039] (“slave devices 320, 400 and 500 can **guide a user to their location by emitting auditory or visual signals.**”); [0054] (“the slave device takes a predetermined action **to guide a user to its location.**”). Thus, a POSITA would have understood the purpose of Kalayjian’s second device emitting auditory or visual signals is to assist the user in locating the remote device. *Dec.*, ¶¶221-222.

### 3. *Kalliola’s Teachings and Motivation to Combine*

Kalliola teaches WCD as a wireless device that locates various target devices. *See* Claim 4. Kalliola specifically teaches locating a target device that is “a **wireless communication device** owned or controlled by another user[.]” *Kalliola*, [0107], [0009] (disclosing a “person might want to find the current location of a set of keys, a wallet, a jacket, **the wireless communication device of another user**, etc.”), [0078] (teaching locating a friend’s WCD). Kalliola thus teaches using one wireless communication device to locate a second wireless communication device. *Dec.*, ¶223.

For the same reasons discussed with respect to Kalayjian’s cellular phone first device, a POSITA would have understood or found obvious that Kalliola’s WCD 100 constitutes a handheld wireless communication device. *Dec.*, ¶214 (*citing Kalliola*, [0038]); Claim 4. A POSITA would have similarly understood the friend’s

WCD, used as the target device in Kalliola's teaching to be a handheld wireless communication device for the same reasons articulated for Claim 4, incorporated herein. *Dec.*, ¶¶223, 214. As such, Kalliola teaches locating a remote device comprising a handheld wireless communication device. *Id.*

As discussed above, Kalayjian teaches a remote device emitting a detectable alert signal, as claimed. *Kalayjian*, [0007]; Claim 1(b)(ii); *Dec.*, ¶¶219-221. A POSITA would have found it obvious and been motivated to modify Kalayjian's second device to be implemented as a handheld wireless communication device of another user as taught by Kalliola. *Dec.*, ¶¶224. In the proposed modification, the second handheld wireless communication device would emit alert signals as already described for Kalayjian's second devices. *Id.*, ¶225.

Kalayjian contemplates a variety of second devices and expressly teaches that a second device "can be any device[] capable of communicating using a Bluetooth protocol." *Kalayjian*, [0032]. Kalayjian further teaches that the second device "can have additional uses (e.g. **telephone**, audio headphones, music player, etc.)." *Id.* Kalayjian specifically notes the frustration associated with small items that are often lost "such as keys or remote controls" and highlights the desirability of a system to locate "physical devices using a Bluetooth communications protocol." *Id.*, [0001]-[0002]; *Dec.*, ¶225. Kalliola similarly acknowledges the usefulness of being able to locate "a set of keys, a wallet, a jacket, the **wireless communication device of**

**another user**, etc.” *Kalliola*, [0009]. Kalliola specifically acknowledges the value in being able to locate one handheld wireless communication device using another wireless device. *Id.*; *Dec.*, ¶224. A POSITA would have been met with a reasonable expectation of success at least because Kalliola’s wireless communication device already includes “light emitting diodes (LEDs), tactile emitters and one or more audio speakers” for emitting the claimed detectable alert signal and would therefore integrate into Kalayjian’s location discovery system without major hardware modifications. *Kalliola*, [0051]; *Dec.*, ¶225. Additionally, Kalayjian explains that its second device can be any number of devices so the combination would have predictably resulted in a second device that comprises a handheld wireless communication device. *Dec.*, ¶224.

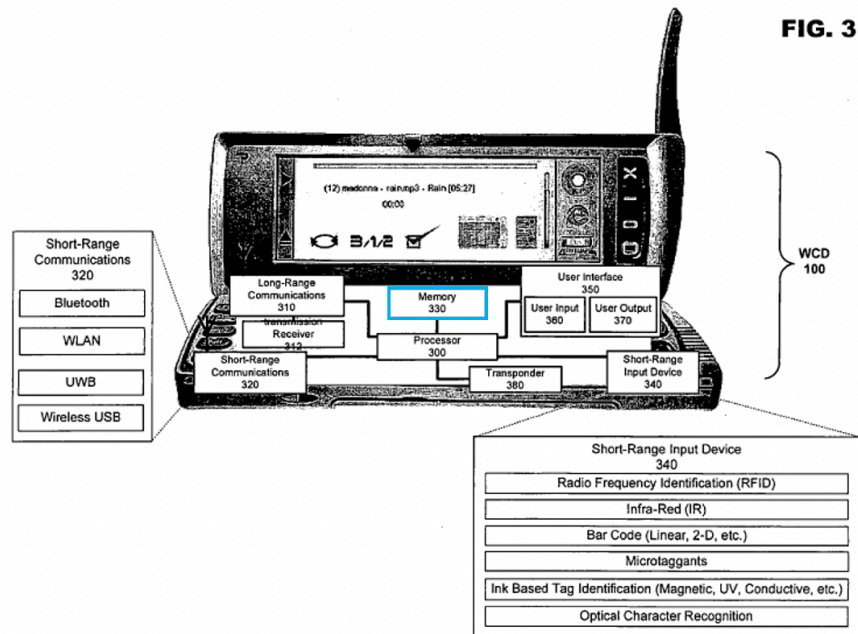
## **VIII. GROUND 3: CLAIMS 5 AND 11 ARE OBVIOUS OVER KALAYJIAN, VAUCLAIR, KALLIOLA, AND HANEY**

### **A. Claim 5**

#### **1. Claim 5(a): “The wireless device of claim 4 further comprising: a memory”**

##### **(a) Kalliola’s Teachings**

Kalliola teaches a WCD 100, which is a “cellular telephone or other handheld wireless device.” *Kalliola*, [0038]; Claim 4. Kalliola’s WCD includes a memory 330, such as RAM, ROM and which may store “instructions that can be executed by processor 300.” *Kalliola*, [0045]-[0046], Fig. 3.



*Id.*, Fig. 3; *Dec.*, ¶226.

### (b) Motivation to Combine

A POSITA would have been motivated to combine the prior art elements of Kalayjian's first device with Kalliola's memory to yield the predictable result of enabling the first device to store the software required to perform the described location-finding functions. *Dec.*, ¶227. Because it was well known that cellular phones included memory for storing software and data, there would have been a reasonable expectation of success configuring Kalayjian's first device to include a memory, as described by Kalliola. *Id.*

2. ***Claim 5(b): “a processor, coupled to the memory and to the touch screen”***

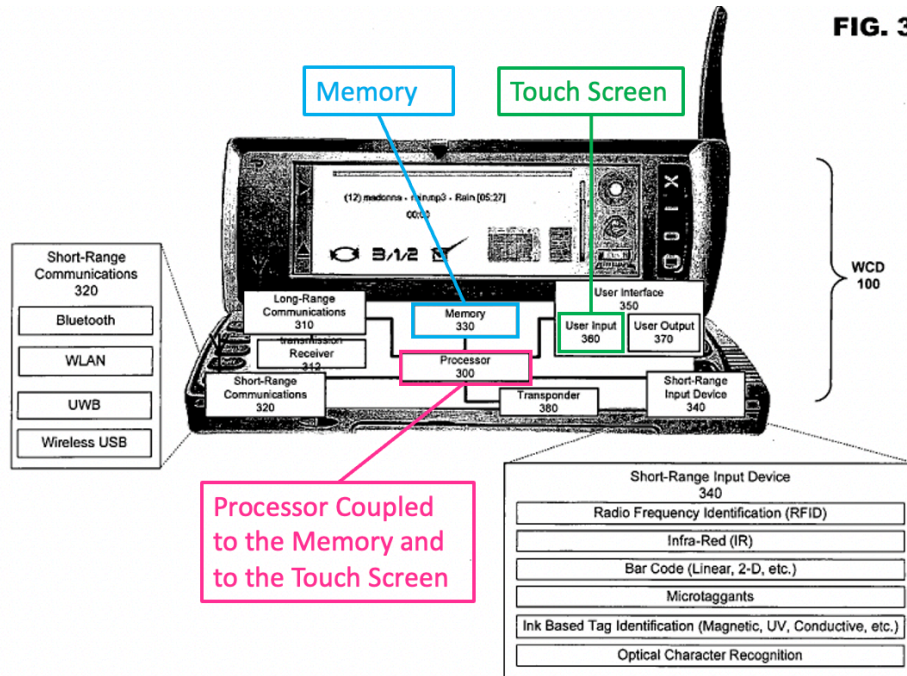
**(a) Kalliola’s Teachings**

Kalliola teaches a processor, coupled to the memory and to the touch screen.

Kalliola’s WCD includes processor 300 that “controls overall device operation” of the WCD. *Kalliola*, [0044]. “Processor 300 may be implemented with one or more microprocessors that are each capable of executing software instructions stored in memory 330.” *Id.* Kalliola expressly teaches “**coupling** separate hardware components corresponding to processor 300,...memory 300,...user interface 350...” *Id.*, [0054]. Kalliola’s memory stores software components “that can be executed by processor 300,” further indicating to a POSITA the processor is coupled to the memory. *Id.*, [0046], [0044]; *Dec.*, ¶228. Because memory stores software components that control operations, including operation of communication sections 310, 320 and user interface manager, and further because the processor executes software instructions stored in memory, Kalliola expressly teaches or renders obvious the processor coupled to the memory. *Kalliola*, [0046], [0044]; *Dec.*, ¶228.

Kalliola also expressly teaches the processor 330 is coupled...to the touch screen, namely user interface 350 implemented as a touch screen: “As further shown in FIG. 3, user interface 350 is also **coupled** to processor 300.” *Kalliola*, [0051]. As discussed above, user interface 350 includes user input 360, including a touch

screen. *See* Claim 4. Figure 3 also illustrates the processor coupled to the memory and user interface via the lines connecting the components:



*Dec.*, ¶¶229-230 (*citing Kalliola, Fig. 3*).

### (b) Motivation to Combine

A POSITA would have been motivated to combine the prior art elements of Kalayjian's first device with Kalliola's processor coupled to the memory and the touch screen to yield predictable results. *Id.*, ¶¶231-232. For the reasons discussed above, it would have been obvious to include Kalliola's touchscreen in Kalayjian's first device. *See* Claim 4. It would have also been obvious to couple the touchscreen to the processor to yield the predictable result of passing the user's inputs via the touchscreen so that the processor can interpret the user's input and take the appropriate actions. *Dec.*, ¶231.

For the reasons discussed above, it would have been obvious to include Kalliola's memory storing software in Kalayjian's first device. *See* Claim 5(a). It would have been obvious to a POSITA to couple the memory with the processor to yield the predictable result of allowing the processor to access the memory and execute the software required to perform the described location-finding functions. *Dec.*, ¶232. There would have been a reasonable expectation of success given the predictability of coupling processors to other hardware components including memory and input elements such as touchscreens. *Id.*

3. ***Claim 5(c): “[a processor]...that executes an application that is downloaded to the memory in response to actions of the user”***

**(a) Haney's Teachings**

Haney teaches a location application that is downloaded for use on a wireless device such as a cell phone. *Haney*, 2:22-28, 3:29-31 (disclosing the location software can be downloaded from the web), 12:33-38, 13:4-10 (disclosing a user downloading the application to their phone by keying an activate code into their phone), 24:8-14, 2:54-59, 6:25-27 (referring to the Buddy Watch application program). Haney discloses a Buddy Watch application and phone or PDA platform that is “able to request software needed to execute commands **given by the user** from the Buddy Watch server, **receive a download** of the software requested, **install it into random access memory** and **execute it to carry out the requested**

**command.”** *Id.*, 26:54-58; *Dec.*, ¶¶233-234. Thus, Haney teaches an application that is downloaded to the memory in response to actions of the user.

**(b) Motivation to Combine**

Based on the teachings of Haney, a POSITA would have found it obvious and been motivated to modify Kalayjian’s location discovery process to be implemented as an application that is downloaded to memory, where Kalayjian’s processor...executes [the Haney] application. *Dec.*, ¶¶235-237. A POSITA would have understood that implementing Kalayjian’s location discovery process as an application downloaded to memory would have been a well-known method of utilizing a location application on a mobile device. *Id.*, ¶235. Further, a POSITA would have recognized the benefit of implementing Kalayjian’s location discovery process as an application to allow for the user to initiate the location discovery process at will via the execution of the application by Kalayjian’s processor. *Id.*, ¶236. A POSITA would have appreciated the first device, which is a cellular phone, would need to have the location-finding software installed on it. *Id.* Based on the teachings of Haney, it would have been obvious to a POSITA to allow the user to download the location-finding application so that it can be installed on the first device. *Id.*, ¶¶236-237. Thus, a POSITA would have been motivated to combine prior art elements according to known methods to yield predictable results. *Id.*

Mobile devices, such as smartphones, that allowed users to download applications that were stored in memory were popular prior to the '381 Patent. *Dec.*, ¶237. Because downloading mobile applications to memory were well-known and conventional prior to the alleged invention of the '381 Patent, there would have been a reasonable expectation of success implementing Kalayjian's location discovery system as an application downloaded to memory. *Id.*

4. ***Claim 5(d): "wherein the application presents the display that visually assists the user of the wireless device to locate the at least one remote device"***

Kalayjian's first device presents the display that visually assists the user to locate the at least one remote device. *See* Claim 1(c). Thus, the modified Kalayjian with its location discovery system implemented as an application downloaded to memory satisfies Claim 5(d). *Dec.*, ¶238.

B. **Claim 11: "The wireless device of claim 7 wherein the user interface generates paging data in response to actions of the user and wherein the first RF paging signal includes the paging data"**

1. ***Kalliola's Teachings***

The '381 Patent describes paging data "such as text, a text message, voice, graphics or other data that is conveyed from the device...that initiated the paging signal...to the device that receives the page." '381 Patent, 15:44-49.

Kalliola teaches an embodiment in which "User 110 may want to locate a friend that user 110 believes to be in the immediate area." *Kalliola*, [0078]. As such, "User 110 may **send a message** to the friend's WCD requesting an activation of a

position-indicating transmission.” *Id.* The message can be “any of the short-range mediums previously discussed,” which includes Bluetooth communications. *Id.*, [0049], [0078]. Thus, Kalliola’s message sent to the friend’s WCD is paging data at least because it is a text message or other data. *Dec.*, ¶242.

## 2. *Motivation to Combine*

Based on the teachings of Kalliola, it would have been obvious and a POSITA would have been motivated to configure Kalayjian’s first device to include a GUI that allows the user to create a text message sent to a friend’s device with the first RF paging signal (per Claim 1(b)(ii)) so that the user can request the friend’s location. *Id.*, ¶243. Per Kalliola, a POSITA would have understood that it would be advantageous to allow the user to locate their friends/family in addition to their personal items. *Id.* Thus, a POSITA would have been motivated to configure Kalayjian’s first device to include a GUI (user interface) that generates paging data in response to actions of the user (a message to the user’s friend) that is included in the first RF paging signal to improve similar location-finding systems in the same way. *Id.* Generating and sending paging data, such as a message or other data, was well understood to POSITAs at the time of the ’381 Patent. *Id.*, ¶244. Therefore, there would have been a reasonable expectation of success configuring Kalayjian’s GUI to generate paging data and include the data in the first RF paging signal sent to the remote device (the friend’s device). *Id.*

**IX. GROUND 4: CLAIMS 7-8 ARE OBVIOUS OVER KALAYJIAN, VAUCLAIR, AND HANEY**

- A. Claim 7: “The wireless device of claim 1 wherein the at least one remote device includes a plurality of remote devices and wherein the application allows selection of a particular one of the plurality of remote devices to be located”**

Claim 7 recites “the application,” which lacks antecedent basis. As discussed for Claim 5, Haney teaches a location application, and a POSITA would have found obvious and been motivated to modify Kalayjian to implement the Kalayjian location discovery process as an application, per Haney. *See* Claim 5(b).

Kalayjian’s first device is “paired, using a Bluetooth protocol, with **one or more slave devices**” and “keep[s] a record of the various slave devices to which the master device is paired.” *Kalayjian*, [0037]. Kalayjian further teaches “[w]hen a user wants to locate one of the slave devices 320, 400 and 500, the user can initiate the location discovery process through master device 310.” *Id.* Figure 6 illustrates a plurality of remote devices, namely a “**list 630 of the slave devices** that are associated with master device 600.” *Id.*, [0047].

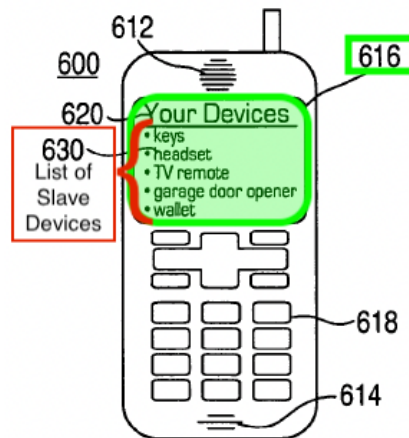


FIG. 6

*Id.*, Fig. 6. Thus, Kalayjian teaches the at least one remote device includes a plurality of remote devices. *Dec.*, ¶246.

Kalayjian teaches the first device allows the user “to **select a slave device** from list 630.” *Id.*, [0047], Fig. 6. Once the second device has been selected, the first device’s GUI presents title and “status information 730 about the selected slave device.” *Id.*, [0048].

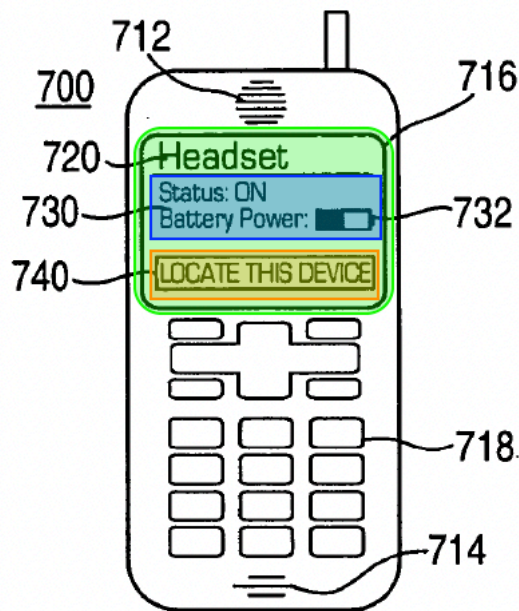


FIG. 7

*Id.*, Fig. 7. As shown, “screen 716 can include graphical button 740 to enable the user to prompt master device 700 to locate the **selected slave device**.” *Id.*, [0048]. Thus, Kalayjian’s location discovery system allows selection of a particular one of the plurality of remote devices to be located. *Dec.*, ¶¶247-248.

**B. Claim 8: “The wireless device of claim 7 wherein the display visually indicates the selection of the particular one of the plurality of remote devices to be located”**

As discussed for Claim 7, Kalayjian teaches the display visually indicates the selection of the particular one of the plurality of remote devices to be located, such as headset in Fig. 7:

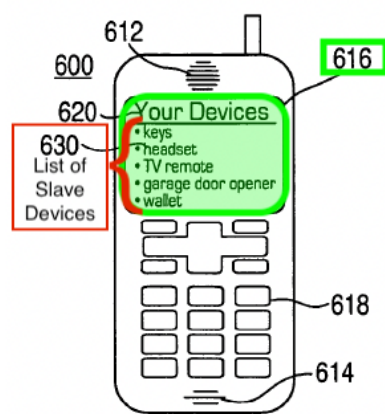


FIG. 6

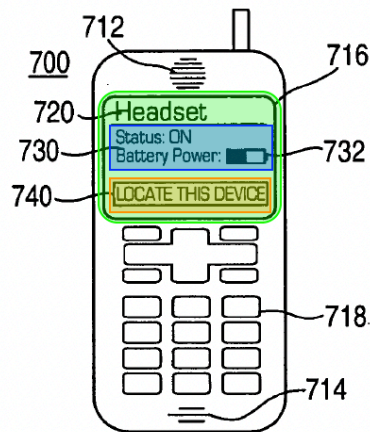


FIG. 7

*Kalayjian*, Figs. 6-7; Claim 7. *Kalayjian* teaches “FIG. 7 includes a screenshot of the user interface of the master device 700 **after a slave device has been selected.**” *Id.*, [0048]. Because Fig. 7 illustrates selection of the headset from the list of second devices of Fig. 6 (e.g., via RN 720 including the title “Headset”), *Kalayjian* teaches Claim 8. *Id.*; *Dec.*, ¶¶249-250.

**X. GROUND 5: CLAIM 9 IS OBVIOUS OVER KALAYJIAN, VAUCLAIR, HANEY, AND TRIMBLE**

- A. Claim 9: “The wireless device of claim 7 wherein the plurality of remote devices comprise a first paging network wherein each of the plurality of remote devices emits corresponding detectable alert signals in response to the first RF paging signal to assist the user in locating at least one of the plurality of remote devices”**

Regarding the claimed paging network, the '381 Patent describes “three or more devices can be paired together in this fashion to form a paging network,” where “paging signals 16 or 112 sent by a single device are received by all other devices

and cause each of the receiving devices to generate a detectable alert signal.” ’381 *Patent*, 15:18-23.

### 1. *Kalayjian’s Teachings*

Kalayjian teaches a plurality of second devices (i.e., a plurality of remote devices), with the first device paired to multiple second devices. *See* Claims 7, 1(b). Thus, Kalayjian teaches a first paging network. *Dec.*, ¶251. Kalayjian also discloses the first device transmitting a signal to the second device, the second device returning a signal used to calculate the distance to the second device, and the second device emitting an “auditory or visual signal,” such as a “beeping alarm,” to assist a user in locating the second device with the first device. *Kalayjian*, [0039]-[0042]; Claim 1(b)(ii); *Dec.*, ¶252. In related art, Trimble expressly discloses that each of a plurality of remote devices emits an alert signal in response to a paging signal transmitted by the first device.

### 2. *Trimble’s Teachings*

Trimble teaches “[a]n object locating system [that] includes a transmitter unit for activating a plurality of electronic tags to assist in locating keys, remote control devices, cordless phones, eyeglasses, articles of clothing, etc. to which the tags have been attached.” *Trimble*, Abstract. “The tags are self-contained, battery powered devices that signal their presence, when activated, **by an audible** and/or visual indication **to get the attention of the user.**” *Id.* Each tag includes an audible alarm

generating device 62 that may be “a piezo sound device or piezo-electric transducer,” for example. *Id.*, [0092], [0093], Fig. 11, [0081] (disclosing the number of simultaneous activation of tags could be “dozens or even hundreds of items”); *Dec.*, ¶253.

A transmitter 10 includes an RF signal transmitter 16 for transmitting address codes to activate various number of tags. *Id.*, [0056], [0074]. A master address code identifies “**a number of electronic tags that are attached to a number of separate items, which are selected by the user to be part of a group or family of items.**” *Id.*, [0074]. Transmission of a master coded RF signal results “**in the simultaneous activation of the multiple electronic tags.**” *Id.*, [0081]; *Dec.*, ¶254.

Thus, Trimble teaches each of the plurality of remote devices emits corresponding detectable alert signals (i.e., audible alarm) in response to an RF signal (i.e., the master coded RF signal) to assist the user in locating at least one of the plurality of remote devices. *Dec.*, ¶¶253-254.

### 3. *Motivation to Combine*

A POSITA would have found it obvious and been motivated to modify Kalayjian-Vauclair-Haney to include the paging network disclosed in Trimble. *Dec.*, ¶¶255-257. The claimed first RF signal corresponds to Kalayjian’s Bluetooth signal, which is transmitted in response to the user selecting which second device to locate. *See* Claim 1(b)(i). Kalayjian also teaches second devices with speakers to emit

audible alert signals in response to receiving the RF paging signal (master Bluetooth signal). *See* Claims 1(b)(ii), 6. Based on the teachings of Trimble, it would have been obvious to configure Kalayjian’s first device to give the user the option of locating several second devices at the same time via a Bluetooth signal sent from the first device to each of the second devices. *Dec.*, ¶¶255-257.

Trimble expressly motivates the combination in teaching the simultaneous activation of audible alerts for numerous tags is “particularly applicable for use in a retirement home” or “nursing home” for “locating items left behind by several residents of the facility.” *Trimble*, [0081]; *Dec.*, ¶256. A POSITA would have understood that allowing the user to locate multiple second devices simultaneously would have saved time and enhanced the system’s usability. *Id.* A POSITA would have been met with a reasonable expectation of success at least because including simultaneously-emitted audible indications in Kalayjian’s location discovery system would have required only minor software changes. *Id.* ¶257. Thus, a POSITA would have also been motivated to improve similar object-finding systems in the same way to yield the predictable result of enhancing the convenience and usability of Kalayjian’s object-finding system. *Id.*, ¶256.

#### **XI. DISCRETION UNDER 35 U.S.C. § 314(A)**

Petitioner stipulates that if the Petition is instituted, Petitioner will not seek resolution in the district court of any ground of invalidity raised in the Petition or

that could have been raised in the Petition. *Sotera Wireless v. Masimo*, IPR2020-01019, Paper 12 at 18-19 (Dec. 1, 2020) (precedential). This stipulation “mitigates concerns of potentially conflicting decisions and duplicative efforts between the district court and the PTAB,” and the Director has instructed that the Board will not discretionarily deny institution under 35 U.S.C. § 314(a). *Interim Procedure for Discretionary Denials*, pp. 7-8 (June 21, 2022).

## **XII. CONCLUSION**

For the foregoing reasons, Petitioner respectfully requests *inter partes* review of the Challenged Claims.

Respectfully submitted,

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Christina Canino, *pro hac vice* (to be filed)

*COUNSEL FOR PETITIONER*

### **XIII. MANDATORY NOTICES UNDER 37 C.F.R. § 42.8**

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

Petitioner is the real party in interest.

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

The '381 Patent is presently the subject of a patent infringement lawsuit filed against Petitioner in the United States District Court for the Western District of Texas Waco Division. *THL Holding Company, LLC v. Apple, Inc.*, Case No. 6:23-cv-00077.

#### **C. Lead and Back-Up Counsel Under 37 C.F.R. § 42.8(b)(3)**

Petitioner provides the following designation and service information for lead and back-up counsel. 37 C.F.R. § 42.8(b)(3) and (b)(4).

| <b>Lead Counsel</b>                                                                                                                                                                                                                                                           | <b>Back-Up Counsel</b>                                                                                                                                                                                                                                                                                                                                        |
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## APPENDIX OF EXHIBITS

|                     |                                                                                                                                                                                                                                                                                                                      |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Exhibit 1001</b> | U.S. Patent No. 8,768,381 to Howard et al.                                                                                                                                                                                                                                                                           |
| <b>Exhibit 1002</b> | File History of U.S. Patent No. 8,768,381                                                                                                                                                                                                                                                                            |
| <b>Exhibit 1003</b> | Declaration of R. Michael Buehrer, Ph.D.                                                                                                                                                                                                                                                                             |
| <b>Exhibit 1004</b> | U.S. Patent Publication No. 2007/0197229A1 to Kalliola et al.                                                                                                                                                                                                                                                        |
| <b>Exhibit 1005</b> | U.S. Patent Publication No. 2008/0320587A1 to Vauclair et al.                                                                                                                                                                                                                                                        |
| <b>Exhibit 1006</b> | U.S. Patent Publication No. 2008/0125040A1 to Kalayjian                                                                                                                                                                                                                                                              |
| <b>Exhibit 1007</b> | U.S. Patent No. 7,353,034 to Haney                                                                                                                                                                                                                                                                                   |
| <b>Exhibit 1008</b> | U.S. Patent Publication No. 2004/0252030 to Trimble et al.                                                                                                                                                                                                                                                           |
| <b>Exhibit 1009</b> | THL's Opening Claim Construction Brief dated September 14, 2023                                                                                                                                                                                                                                                      |
| <b>Exhibit 1010</b> | ISO/IEC 24730-2:2006(E) <i>Information technology – Real-time locating systems (RLTS) – Part 2: 2,4 GHz air interface protocol</i> . International Organization for Standardization and the International Electrotechnical Commission (2006)                                                                         |
| <b>Exhibit 1011</b> | Hui Liu, Houshang Darabi, Pat Banerjee, and Jing Liu, <i>Survey of Wireless Indoor Positioning Techniques and Systems</i> , IEEE Transactions on Systems, Man, and Cybernetics-Part C: Applications and Reviews, Vol. 37, No. 6 (November 2007)                                                                      |
| <b>Exhibit 1012</b> | <i>A Comprehensive Look into the RTLS System</i> , <a href="https://www.mokosmart.com/look-into-rtls-system/">https://www.mokosmart.com/look-into-rtls-system/</a> (August 2021, retrieved August 25, 2023) (“Moko Smart”)                                                                                           |
| <b>Exhibit 1013</b> | Roy Want, Andy Hopper, Veronica Falcão, and Jonathan Gibbons, <i>The Active Badge Location System</i> , ACM Transactions on Information Systems, Vol. 10, No. 1 (January 1992)                                                                                                                                       |
| <b>Exhibit 1014</b> | Paramvir Bahl and Venkata N. Padmanabhan, <i>RADAR: An In-Building RF-based User Location and Tracking System</i> , Proceedings IEEE INFOCOM 2000. Conference on Computer Communications. Nineteenth Annual Joint Conference of the IEEE Computer and Communications Societies pp. 775-784 vol. 2, (March 2000)      |
| <b>Exhibit 1015</b> | Gwen Moritz, <i>Larry W. Fullerton: World Class Innovator</i> , Arkansas Business, <a href="https://www.arkansasbusiness.com/article/58921/larry-w-fullerton-world-class-innovator">https://www.arkansasbusiness.com/article/58921/larry-w-fullerton-world-class-innovator</a> (April 2002, retrieved June 26, 2023) |
| <b>Exhibit 1016</b> | Bob Paddock, <i>A Guide to online information about: Radio Frequency Identification (RFID)</i> , <a href="https://web.archive.org/web/20060513161655/http://archive.chipce">https://web.archive.org/web/20060513161655/http://archive.chipce</a>                                                                     |

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|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     | nter.com/circuitcellar/october00/c1000rp52.htm (August 2001, retrieved September 7, 2023)                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Exhibit 1017</b> | IEEE Std. 802.15.4a-2007, entitled “ <i>IEEE Standard for Information technology—Local and metropolitan area networks—Specific requirements—Part 15.4: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for Low-Rate Wireless Personal Area Networks (WPANs): Amendment 1: Add Alternate PHYs</i> ”                                                                                                                                                         |
| <b>Exhibit 1018</b> | Kaveh Pahlavan, Xinrong Li, and Juha-Pekka Mäkelä, <i>Indoor Geolocation Science and Technology</i> , IEEE Communications Magazine (March 2002)                                                                                                                                                                                                                                                                                                                                         |
| <b>Exhibit 1019</b> | Jeffrey Hightower and Gaetano Borriello, <i>A Survey and Taxonomy of Location Systems for Ubiquitous Computing</i> , Technical Report UW-CSE 01-08-03 (August 2001)                                                                                                                                                                                                                                                                                                                     |
| <b>Exhibit 1020</b> | <i>PARC History – A Legacy of Innovation and Inventing the Future</i> , <a href="https://www.parc.com/about-parc/parc-history/">https://www.parc.com/about-parc/parc-history/</a> (retrieved June 26, 2023)                                                                                                                                                                                                                                                                             |
| <b>Exhibit 1021</b> | Guifx, <i>Touchscreens That Changed the World</i> , <a href="https://www.guifx.com/touchscreens-that-changed-the-world/">https://www.guifx.com/touchscreens-that-changed-the-world/</a> (retrieved June 26, 2023)                                                                                                                                                                                                                                                                       |
| <b>Exhibit 1022</b> | <i>iPhone User’s Guide</i> , Apple Inc. (2007)                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Exhibit 1023</b> | <i>Majority of smart phones now have touch screens</i> , <a href="https://www.canalys.com/newsroom/majority-smart-phones-now-have-touch-screens">https://www.canalys.com/newsroom/majority-smart-phones-now-have-touch-screens</a> 2/7 (February 8, 2010, retrieved October 11, 2023)                                                                                                                                                                                                   |
| <b>Exhibit 1024</b> | Steve Kolokowsky and Trevor Davis, <i>Touchscreens 101: Understanding Touchscreen Technology and Design</i> , Cypress Semiconductor Corp. (June 2009)                                                                                                                                                                                                                                                                                                                                   |
| <b>Exhibit 1025</b> | U.S. Patent Publication No. 2006/0026521A1 to Hotelling et al.                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Exhibit 1026</b> | <i>The History of Bluetooth</i> , The History of Bluetooth - Auris, Inc (theauris.com) Auris, Inc. (retrieved June 26, 2023)                                                                                                                                                                                                                                                                                                                                                            |
| <b>Exhibit 1027</b> | <i>Ericsson T39 User’s Guide First Edition</i> , Ericsson Mobile Communications AB (March 2001)                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Exhibit 1028</b> | <i>How does Bluetooth work?</i> , Scientific American <a href="https://www.scientificamerican.com/article/experts-how-does-bluetooth-work/#:~:text=Bluetooth%20technology%20uses%20the%20principles,devices%20that%20are%20actively%20inquiring">https://www.scientificamerican.com/article/experts-how-does-bluetooth-work/#:~:text=Bluetooth%20technology%20uses%20the%20principles,devices%20that%20are%20actively%20inquiring</a> , (November 5, 2007, retrieved September 8, 2023) |

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|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Exhibit 1029</b> | IEEE Std. 802.15.1-2005, entitled “ <i>IEEE Standard for Information technology—Telecommunications and information exchange between systems—Local and metropolitan area networks—Specific requirements—Part 15.1: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for Wireless Personal Area Networks (WPANs)</i> ”     |
| <b>Exhibit 1030</b> | <i>Specification of the Bluetooth System</i> , Bluetooth Core Specification version 1.2 (05 November 2003)                                                                                                                                                                                                                                           |
| <b>Exhibit 1031</b> | Varun Almalu and David Cheng, <i>Bluetooth Triangulator</i> , Department of Computer Science and Engineering, University of California, San Diego, (2006)                                                                                                                                                                                            |
| <b>Exhibit 1032</b> | Josef Hallberg, Marcus Nilsson, Kåre Synnes, <i>Positioning with Bluetooth</i> , 10 <sup>th</sup> International Conference on Telecommunications (April 2003)                                                                                                                                                                                        |
| <b>Exhibit 1033</b> | Julie A. Kientz, Shwetak N. Patel, Arwa Z. Tyebkhan, Brian Gane, Jennifer Wiley, and Gregory D. Abowd, <i>Where’s My Stuff? Design and Evaluation of a Mobile System for Locating Lost Items for the Visually Impaired</i> , Proceedings of the 8 <sup>th</sup> international ACM SIGACCESS conference on Computers and accessibility (October 2006) |
| <b>Exhibit 1034</b> | Rudolf F. Graf, <u>Modern Dictionary of Electronics</u> , Newnes (7 <sup>th</sup> edition, 1999)                                                                                                                                                                                                                                                     |
| <b>Exhibit 1035</b> | Harry Newton, <u>Newton’s Telecom Dictionary</u> , CMP Books (20 <sup>th</sup> edition, 2004)                                                                                                                                                                                                                                                        |
| <b>Exhibit 1036</b> | WO 2009/130509A2 to Elsom-Cook                                                                                                                                                                                                                                                                                                                       |
| <b>Exhibit 1037</b> | <i>iPhone 3G User’s Guide</i> , Apple Inc. (2008)                                                                                                                                                                                                                                                                                                    |
| <b>Exhibit 1038</b> | <u>Microsoft Computer Dictionary</u> , Microsoft Press (5 <sup>th</sup> ed. 2002)                                                                                                                                                                                                                                                                    |
| <b>Exhibit 1039</b> | THL’s Disclosure of Asserted Claims and Infringement Contentions Dated May 30, 2023                                                                                                                                                                                                                                                                  |

**CLAIM LISTING APPENDIX**  
**U.S. Patent No. 8,768,381 for Claims 1-9 and 11**

| <b>Claim Designation</b> | <b>Claim Language</b>                                                                                                                                                                                              |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claim 1[P]               | A wireless device for locating at least one remote object, the wireless device comprising:                                                                                                                         |
| Claim 1(a)               | a graphical user interface                                                                                                                                                                                         |
| Claim 1(a)(i)            | [a graphical user interface] that generates a pairing signal in response to a first indication from a user to pair the wireless device to at least one remote device and                                           |
| Claim 1(a)(ii)           | [a graphical user interface that]...generates a first location request signal in response to a second indication from a user to locate the at least one remote device; and                                         |
| Claim 1(b)               | a short-range wireless transceiver, coupled to the graphical user interface,                                                                                                                                       |
| Claim 1(b)(i)            | [a short-range wireless transceiver]...that responds to the pairing signal generated by the graphical user interface by communicating RF signals to pair the wireless device to the at least one remote device and |
| Claim 1(b)(ii)           | [a short-range wireless transceiver]...that transmits a first RF paging signal to the at least one remote device in response to the first location request signal and                                              |
| Claim 1(b)(iii)          | [a short-range wireless transceiver]...that receives a location signal from the at least one remote device;                                                                                                        |
| Claim 1(c)               | wherein the graphical user interface presents a display that visually assists the user to locate the at least one remote device.                                                                                   |
| Claim 2                  | The wireless device of claim 1 wherein the display visually assists the user based on a signal strength of the location signal from the at least one remote device.                                                |
| Claim 3                  | The wireless device of claim 1 wherein the display visually assists the user by displaying an indication of a signal strength of the location signal from the at least one remote device.                          |
| Claim 4                  | The wireless device of claim 1 wherein the wireless device is a handheld wireless communication device and the graphical user interface includes a touch screen of the handheld wireless communication device.     |
| Claim 5(a)               | The wireless device of claim 4 further comprising: a memory;                                                                                                                                                       |

| <b>Claim Designation</b> | <b>Claim Language</b>                                                                                                                                                                                                                                                                                                         |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claim 5(b)               | a processor, coupled to the memory and to the touch screen,                                                                                                                                                                                                                                                                   |
| Claim 5(c)               | [a processor]...that executes an application that is downloaded to the memory in response to actions of the user                                                                                                                                                                                                              |
| Claim 5(d)               | wherein the application presents the display that visually assists the user of the wireless device to locate the at least one remote device.                                                                                                                                                                                  |
| Claim 6                  | The wireless device of claim 1 wherein the at least one remote device emits a detectable alert signal in response to the first RF paging signal to assist the user in locating the handheld wireless communication device.                                                                                                    |
| Claim 7                  | The wireless device of claim 1 wherein the at least one remote device includes a plurality of remote devices and wherein the application allows selection of a particular one of the plurality of remote devices to be located.                                                                                               |
| Claim 8                  | The wireless device of claim 7 wherein the display visually indicates the selection of the particular one of the plurality of remote devices to be located.                                                                                                                                                                   |
| Claim 9                  | The wireless device of claim 7 wherein the plurality of remote devices comprise a first paging network wherein each of the plurality of remote devices emits corresponding detectable alert signals in response to the first RF paging signal to assist the user in locating at least one of the plurality of remote devices. |
| Claim 11                 | The wireless device of claim 7 wherein the user interface generates paging data in response to actions of the user and wherein the first RF paging signal includes the paging data.                                                                                                                                           |

**CERTIFICATION OF WORD COUNT**

The undersigned certifies pursuant to 37 C.F.R. §42.24 that the foregoing Petition for *Inter Partes* Review, excluding any table of contents, mandatory notices under 37 C.F.R. §42.8, certificates of service or word count, or appendix of exhibits, contains 13,647 words according to the word-processing program used to prepare this document (Microsoft Word).

Dated: January 19, 2024

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**CERTIFICATE OF SERVICE ON PATENT OWNER  
UNDER 37 C.F.R. § 42.105(a)**

Pursuant to 37 C.F.R. §§ 42.6(e) and 42.105(b), the undersigned certifies that on January 19, 2024, a complete and entire copy of this Petition for *Inter Partes* Review and Exhibits were provided via Federal Express to the Patent Owner by serving the correspondence address of record for the '381 Patent:

Garlick & Markison  
2025 Guadalupe Street, Ste. 260  
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Further, a courtesy copy of this Petition for *Inter Partes* Review was sent via email to Patent Owner's litigation counsel:

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