

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,
Petitioner

v.

GEOSCOPE TECHNOLOGIES PTE. LTD.
Patent Owner

Case No. IPR2023-01214
Patent 8,320,264

**PETITION FOR INTER PARTES REVIEW
OF U.S. PATENT NO. 8,320,264**

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I. INTRODUCTION

Google LLC (“Petitioner”) requests *inter partes* review of Claims 1, 3, 6, 11, 13, 15, 20-21, 23, and 25-27 (“Challenged Claims”) of U.S. Patent No. 8,320,264 (“the ’264 Patent”) (EX1001) under 35 U.S.C. §§311-319 and 37 C.F.R. §42.100 *et seq.* Patent Owner (Owner) characterizes the innovation of the Challenged Claims as “determining path loss values using an active communication channel, as opposed to a distinct channel dedicated specifically to making such determinations, without disabling any other communication channel.” EX1012, ¶76.

Owner characterizes prior art systems as determining a “path loss value by assigning a dedicated frequency channel to the wireless device and disabling interfering frequency channels”. EX1001, at 3:39-42. “The claimed invention avoids these inefficiencies by forgoing the use of a dedicated channel for path loss determination.” EX1024, p.4.

The USPTO erred in granting the ’264 Patent because: (1) previously unconsidered U.S. Patent 6,137,993 (Almgren) discloses determining path loss by measuring signal strengths on active radio communication channels without disabling other channels; and (2) previously unconsidered U.S. Patent 5,491,837 (Haartsen) similarly discloses determining path loss values by measuring signal

strengths (a) on active “traffic” channels and/or (b) using active channel “pilot signals”, without disabling other channels. *See* EX1004, EX1005 in their entirety.

II. MANDATORY NOTICES PURSUANT TO 37 C.F.R. §42.8(a)(1)

A. Real Party-In-Interest

Pursuant 37 C.F.R. §42.8(b)(1), Petitioner certifies that Google LLC is the real party-in-interest. Google LLC is a subsidiary of XXVI Holdings Inc. which is a subsidiary of Alphabet Inc. XXVI Holdings Inc. and Alphabet Inc. are not real parties-in-interest to this proceeding.

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

The following judicial or administrative matters would affect, or be affected by, this proceeding:

Related District Court and PTAB Matters

1. *Geoscope Technologies Pte. Ltd. v. Google LLC f/k/a Google Inc.*, Civ. Action No. 1:22-cv-01331 (EDVA) filed November 22, 2022 (pending) (the “Related Litigation”); and

2. *Geoscope Technologies Pte. Ltd. v. Apple Inc.*, Civ. Action No. 1:22-cv-01373 (EDVA) filed December 1, 2022 (pending).

Related Applications

The ’264 Patent issued from U.S. Patent Application No. 11/920,076 filed December 15, 2008 as a National Stage of International Application No.

PCT/US2006/017517 filed May 17, 2006, claiming priority to U.S. Provisional Application No. 60/681,475 filed May 17, 2005.

C. Lead and Backup Counsel

Pursuant 37 C.F.R. §42.8(b)(3) and §42.10(a), Petitioner's lead and backup counsel are:

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A Power of Attorney is filed concurrently herewith pursuant 37 C.F.R. §42.10(b).

D. Service Information Under 37 C.F.R. §42.8(b)(4)

Petitioner consents to e-mail service at BIR-GoogleGeoscope@bipc.com.

III. PAYMENT OF FEES

The undersigned authorizes the Office to charge Deposit Account No. 02-4800 for fees required by 37 C.F.R. §42.15(a).

IV. REQUIREMENTS UNDER 37 C.F.R. §42.104

A. Grounds for Standing

Petitioner certifies that the '264 Patent is available for *inter partes* review pursuant 37 C.F.R. §42.102(a)(2). Petitioner is not barred or estopped from requesting *inter partes* review challenging the '264 Patent.

This Petition is filed within one year of service of a Complaint by Owner in the Related Litigation asserting infringement of the '264 Patent.

Neither Petitioner nor its privies have received a final written decision under 35 U.S.C. §318(a) regarding any '264 Patent claim on any ground that was raised or could have been raised by Petitioner or its privies in any *inter partes* review, post grant review, or covered business method patent review.

B. Identification of Challenges and Precise Relief Requested

Petitioner challenges the Challenged Claims and requests that they be found unpatentable pursuant Petitioner's Grounds:¹

Ground	Reference(s)	Basis	Claims
1	US Patent 6,137,993 ("Almgren") (EX1004), as evidenced by: US Patent 6,498,932 (EX1006), US Patent 6,184,829 (EX1007); US Patent 5,917,811 (EX1010) and US Patent 5,023,900 (EX1011)	§§102/103	1, 3, 6, 11, 13, 15, 20-21, 23, 25-27
2	US Patent 5,491,837 ("Haartsen") (EX1005), as evidenced by: US Patent 6,498,932 (EX1006), US Patent 6,184,829 (EX1007); US Patent 5,917,811 (EX1010) and US Patent 5,023,900 (EX1011)	§§102/103	1, 3, 6, 11, 13, 15, 20-21, 23, 25-27

¹ Owner asserts infringement of Claims 13, 15, and 20 of the '264 Patent in the Related Litigation.

Petitioner also relies upon evidence listed in the Exhibit List, including the Declaration and *Curriculum Vitae* of David Hilliard Williams (EX1008, ¶¶1-12, and *see generally* ¶¶13-499; EX1009).

C. Prior Art Qualification of Asserted References

For this Petition, Petitioner assumes an earliest effective filing date of May 17, 2005 for the '264 Patent.² All prior art cited herein for the grounds of this Petition are prior art under pre-AIA 35 U.S.C. §102(b).

V. BACKGROUND

A. The '264 Patent

The '264 Patent discloses determining a communication channel signal “path loss” using “received and transmitted signal strengths” on “an active communication channel without disabling the frequency use plan to provide a dedicated frequency channel.” EX1001, 3:47-50; 4:60-63. This purportedly avoids “[d]edicating a specific channel for path loss measurements and rearranging the remaining channels on the frequency use plan to accommodate the path loss-dedicated frequency channel.” EX1001, 1:55-58; *see also* 3:51-60; and 4:43-46.

² Petitioner does not concede that any challenged claim is entitled to an effective filing date of May 17, 2005.

Using an active communication channel to calculate a path loss value was known before the '264 Patent was filed. EX1008, ¶¶23-26.

B. Examination History

The '264 Patent issued from U.S. Patent Application No. 11/920,076 filed December 15, 2008 claiming priority to PCT/US2006/017517 filed May 17, 2006 and U.S. Provisional Application No. 60/681,475 filed May 17, 2005; EX1001, cover; EX1008, ¶32.

A first Office Action rejected all claims of the '264 Patent over U.S. Publications 2005/0271012 (“Agrawal”, EX1014); 2002/0172160 (“Moulsley”, EX1015); 2002/0172223 (EX1016); and U.S. Patents 6,751,187 (“Walton”, EX1017) and 6,522,888 (“Garceran”, EX1018). EX1002, pp.311-335; EX1008, ¶28.

Owner asserted Walton fails to disclose “using an active communication channel to determine the signal strength of the wireless device” (EX1002, pp.297), and that the USPTO misapplied Agrawal by “incorrectly equating a pilot signal and/or measurement thereof to an actual communication signal.” EX1002, pp.298-99 (underlining added). *See* EX1002, pp.158-159, 101, 103-04, 35-37; EX1008, ¶¶28-29.

The Examiner allowed the '264 Patent, stating the cited art failed “to teach the combination of identifying a geographic area where path loss is to be

determined, identifying a first cell, a first sector, and a first frequency channel associated with the geographic area wherein said wireless device is actively communicating with said receiver using said first frequency channel without disabling any other communication channel” EX1002, pp.22 (underlining added); EX1008, ¶30.

C. The Prior Art

1. Almgren (EX1004)

U.S. Patent 6,137,993 (“Almgren”) discloses determining path loss on active “radio channels in the radio communications system”, by “selecting at least one radio channel” having “transmitters (MSi) that transmit on the selected channel” and “a number of receivers (BSx) on the channel,” (EX1004, Abs. 11. 5-19) and “measuring the power level received by a base station or a mobile station receiver on a certain, or given, radio channel.” EX1004, 2:66-3:1 (underline added); *see also* Fig. 8. No specific channel is dedicated for path loss measurement nor is a frequency use plan rearranged. EX1008, ¶¶47-48.

Almgren’s Figs. 3/7 determine path loss measurement by storing transmitted power levels (steps 302, 705) and received power levels (steps 303, 706). EX1004, 12:4-16; *see also* 8:4-28; 11:61-12:16; EX1008, ¶49.

Statistical properties of path loss, or attenuation, in the radio communications system are “estimated continuously.” EX1004, 3:46-48.

Almgren's process for cellular networks identifies an area where path loss is to be determined, identifies a cell, sector and frequency channel of active communication, receives a signal with an indication of transmission signal strength, measures received signal strength, and determines path loss of the frequency channel. *See* EX1004, *in entirety*; EX1008, ¶50.

2. Haartsen (EX1005)

U.S. Patent 5,491,837 (Haartsen) discloses determining path loss on an active communication channel for "adaptive allocation of channels" while an active call is "in progress" using measurements sent "on the current traffic channel." EX1005, Abs. ll. 1-3; 5:20-22; 9:36-39; *see* Fig. 5; EX1008, ¶51.

Haartsen's channel allocation uses periodic measurements by base stations and mobile stations "to determine the best channel." EX1005, 5:34; 5:31-35; EX1008, ¶52. If a "best channel" is not the current channel, a channel "re-allocation" is initiated while an active call is "in progress." EX1005, 9:22-24; 9:37; *see* 9:22-50; EX1008, ¶53. "The status of the current traffic and interference condition is derived from measurements taken both by the mobile station and the base station" and "channel allocations are periodically updated." EX1005, 3:48-51; 7:5-9:38; EX1008, ¶54.

Fig. 3 shows plural base stations and mobile stations operating on frequency channels including “downlink signals 305, 315, and 345” and “uplink traffic channel 335.” EX1005, 6:67–7:1-3; *see* 6:30-67; 14:33-45; EX1008, ¶55.

A mobile telephone switching office (*e.g.*, MTSO 300) instructs a mobile station to “monitor[] the signals transmitted by surrounding base stations, including that to which it is currently connected.” EX1005, 6:48-51; EX1008, ¶56.

Figs. 5/6 show a channel allocation scheme when a wireless device is actively communicating on a frequency channel. EX1005, Figs. 5/6 (“Call In-Progress” modes 503/603); *see* 5:19-30; EX1008, ¶57.

Haartsen does not disable other frequency channels when measuring path loss. EX1008, ¶58. In one embodiment, an active pilot signal operates at a known frequency which the mobile station can measure. EX1005, 5:37-40; 6:57-61; EX1008, ¶59. The functionality of the pilot signal, “(i.e., a set-up or control channel),” is not disrupted, nor is any dedicated channel allocated for path loss measurement. EX1005, 5:39; EX1008, ¶60.

Alternately, traffic channels (*e.g.*, traffic channel 335) between a mobile station and a base station “to which [a mobile station] is currently connected” are used to measure path loss. EX1005, 6:50-51; 7:3; *see* 6:48-7:12; EX1008, ¶61.

3. Silventoinen (EX1006), Stilp (EX1007), and Weaver (EX1010)

Silventoinen is cited as evidence that a Slow Associated Control Channel (“SACCH”) is associated with an active traffic channel for active communication between a base station and a mobile station. *See* EX1006, 1:53-2:11.

Stilp is cited as evidence that base stations of cellular communication systems have antenna configurations providing at least one cell having at least one sector. *See* EX1007, 9:27-38.

Weaver is cited as evidence that base stations having at least one cell include one or more sectors. *See* EX1010, 6:48-56.

4. Tayloe (EX1011)

Tayloe discloses a telephone radio diagnostic system using mobile subscribers operating in a radio communications network to “evaluate system performance.” EX1011, 1:6-12. EX1008, ¶192. Tayloe discloses geolocation of a mobile device: “the position of at least one of the mobile units operating within the geographic area is located when a call is received by the base station.” EX1011, 2:48-54. Tayloe locates mobile units using at least “global positioning systems” using a “locator” within each base station “which employs signal strength measurements and timing advance techniques for locating and tracking the position of mobile units engaged in active calls.” EX1011, 3:43-50.

D. Person of Ordinary Skill in the Art (“POSITA”)

A POSITA would have been someone knowledgeable in wireless networks, cellular radio systems, mobile communication devices and radio navigation systems, having at least a bachelor’s degree in electrical engineering, with a background in radio frequency communications and/or navigation system technology as well as approximately two years of industry experience working on radio communication and/or navigation systems. EX1008, ¶31, *see also id.* at ¶¶6-12.

VI. CLAIM CONSTRUCTION

Claim terms are interpreted according to *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (*en banc*), and its progeny. Some terms of the ’264 Patent are in dispute and a Markman Order (EX1028) issued in the Related Litigation addressing those disputes. The Challenged Claims would have been obvious over the asserted prior art under all constructions below.

Solely for purposes of this proceeding, constructions of certain claim terms are proposed. Other claim terms are afforded their “ordinary and customary meaning” (*i.e.*, plain meaning) consistent with the *Phillips* standard. 37 C.F.R. §42.100(b). *See Phillips*, 415 F.3d at 1312-1314.

Assertions under 35 U.S.C. §112 are not available challenges in an IPR proceeding. Claim constructions provided herein do not waive any such available

challenges, including challenges of indefiniteness asserted in the Related Litigation.

A. “path loss” (Claims 1, 3, 13, 15, 23, 25)

The phrase “path loss” should be construed as:

the difference between the transmitted signal power and the received signal power

In Related Litigation, Petitioner and Owner stipulate that “path loss” should be construed as “the difference between the transmitted signal power and the received signal power.” EX1023, p.2.

This construction is consistent with the '264 Patent specification and prosecution history. *See, e.g.*, EX1001, 1:19-29, 1:38-40, 1:65-67; EX1008, ¶¶36-38.

The '264 Patent, explains that “[p]ath loss is a measure of signal attenuation. Path loss is the difference between the transmitted signal power and the received signal power.” EX1001, 1:19-21.

B. “wireless device” (Claims 1, 6, 11, 13, 21, 23, 27)

The phrase “wireless device” should be construed as:

a mobile device configured to communicate while unattached to any physical wires

Petitioner's construction is consistent with the Markman Order. EX1028, p.32. A wireless device "may include a wireless transmitter, radio frequency transmitter, mobile telephone, cellular telephone, text messaging device, portable computer, laptop computer, personal digital assistant, vehicle security device, vehicle tracking device and pager." EX1001, 5:40-43.

C. "indication of transmission signal strength" (Claims 1, 13, 23)

The phrase "indication of transmission signal strength" should be construed as:

information specifying the strength (e.g., in dBm) at which said signal was transmitted by the wireless device.

This construction is consistent with the Markman Order. EX1028, p.34.

VII. PETITIONER HAS A REASONABLE LIKELIHOOD OF PREVAILING

The Challenged Claims are unpatentable over the prior art. EX1008, ¶62, *see also id.* at ¶¶23, 27, 63-514.

A. Claims 1, 3, 6, 11, 13, 15, 20-21, 23, and 25-27 Are Anticipated Or Rendered Obvious Over US Patent 6,137,993 ("Almgren") (Ground 1).

The Challenged Claims are anticipated by Almgren. EX1008, ¶¶64, *see also id.* at ¶¶65-309.

The Patent Office recognizes that an alternate 35 U.S.C. 102/103 ground is permitted if it is unclear whether a reference teaches a particular limitation with

sufficient specificity. *See, e.g., Pfizer, Inc. v. Genentech, Inc.*, IPR2017-02020, Paper 16 at 30-31 (PTAB Feb. 12, 2018).

1. **Claim 1 (Preamble): “A method for determining a path loss value of a signal transmitted from a wireless device and received by a receiver, where the wireless device and the receiver operate within a wireless communication system having at least one cell having at least one sector operating on at least one frequency channel”**

Almgren discloses determining a path loss value in a radio communication system EX1004, Abs. ll. 1-2, EX1008, ¶74. Path loss is signal attenuation, or the “inverse of radio channel amplification” of signals transmitted between a transmitter and a receiver. EX1004, 2:5; *see* 1:6-11, 2:2-7; 4:25-33. EX1008, ¶¶65-68.

Almgren determines path loss on different connections in a wireless communications system from “values of transmitted and received power levels on radio channels.” EX1004, 2:51-54; *see* 3:10-14, 4:35-59, Fig. 1; EX1008, ¶69. Almgren’s “path loss” measurements “enable interference on connections in the radio communication system to be predicted.” EX1004, 2:63-65; EX1008, ¶70.

Almgren discloses “selecting a radio channel and determining the power level at which those transmitters that send on the radio channel transmit. The power level received on said radio channel in a number of receivers in the radio communication is measured.” EX1004, 3:15-19; *see* 3:15-53. Using a recursive procedure, “estimated values are generated channel-wise” to enable “statistical

properties of path loss, or attenuation, in the radio communications system to be estimated continuously.” EX1004, 3:33, 3:46-48; *see also* 3:15-53 and EX1008, ¶71.

Almgren determines path loss values by determining “power levels ($p_{iy,t}$) transmitted by those transmitters (MS_i) that transmit on the selected channel”, and measuring “power level ($s_{xy,t}$) received in a number of receivers (BS_x) on the channel (ch_y).” EX1004, Abs. ll. 6-9; *see* Figs. 3/7, 3:15-53, 8:4-9:11, 13:16-15:39, 17:17-18:15; EX1008, ¶72.

“A wireless communication system having at least one cell having at least one sector” encompasses a cellular communication system having a wireless device. EX1001, Fig. 1, 3:15-25; EX1008, ¶¶42-43. For example, “FIG. 1 is a schematic representation of a conventional cellular communication system” which “includes cells 110” and “several directional antennas each radiating at a specified sector.” EX1001, 3:15-17; 3:22-23. The Fig. 1 cellular communication system is the only embodiment of a “wireless communication system” described in the ’264 Patent. *See Asyst Technologies Inc. v. Emtrak, Inc.*, 402 F.3d 1188, 1194-1195 (Fed. Cir. 2005). EX1008, ¶43.

Almgren’s “cells C1-C6” are drawn as hexagons in Fig. 1. EX1004, 4:44; *see* 4:34-45, Fig. 1; EX1008, ¶73. The base stations (BS1-BS6) include “a number of receivers for receiving signals on the uplink radio channels, and a number of

transmitters for transmitting signals on the downlink radio channels.” EX1004, 4:49-52; EX1008, ¶71.

a. Element [1.1]: “identifying a geographic area where the path loss value is to be determined;”

Almgren’s identified geographic area encompasses a cellular communication system divided into cells, just as the ’264 Patent’s Fig. 1 shows geographic area 100 “divided into cells 110.” EX1001, 3:18; *see* 3:16-35; EX1008, ¶¶75-76.

Almgren identifies a geographic area in Fig. 1 with “cells C1-C6 . . . represent[ing] the geographical areas covered by the base stations BS1-BS6. The mobile stations MS1-MS2 communicate with the base station in the cell in which they are located”. EX1004, 4:44-47 (underline added); EX1008, ¶¶76-77.

A radio channel is selected for path loss estimation, and the “base station membership for those transmitters that send on the same radio channel and those receivers in which power level is measured are identified.” EX1004, 3:28-31. “The base station BSx to which respective mobile stations MSi belong is known at each moment in time, i.e. the coverage area or cells of which base stations the mobile stations are located.” (underline added) EX1004, 7:48-51; EX1008, ¶¶78-80.

Identifying the coverage area is used for estimating “the interference level that is likely to be experienced by a connection” for radio channel allocation that helps ensure other base stations do not experience high interference. EX1004, 17:49-50; *see* 17:42-18:5; EX1008, ¶¶81-84.

b. Element [1.2]: “identifying a first cell, a first sector, and a first frequency channel associated with the geographic area wherein said wireless device is actively communicating with said receiver using said first frequency channel without disabling any other communication channel;”

(1) a first cell

A cell encompasses an area of a cellular communication system defined by a receiver EX1001, 3:17-25; EX1008, ¶¶85-86. Almgren identifies a first cell by identifying “base station membership for those transmitters that send on the same radio channel and those receivers in which power level is measured.” EX1004, 3:28-30; Fig. 1; EX1008, ¶¶86, 89. Almgren’s transmitters (*e.g.*, mobile stations) “belong to the base station to which they are connected.” EX1004, 5:64-65. The “cells C1-C6 . . . represent the geographical areas covered by the base stations BS1-BS6,” and each base station is associated with at least one cell. EX1004, 4:43-45; *see* 4:34-59; EX1008, ¶¶87-89.

(2) a first sector

A sector encompasses a portion of a cell. EX1001, 3:21-35; EX1008, ¶90. Almgren identifies a first sector by identifying the first cell because a cell includes one or more sectors, depending on the cell’s configuration of base station antennas. *Id.* This is admitted prior art of the ’264 Patent (EX1001, Fig. 1, 3:16-35), as evidenced by U.S. Patent 6,184,829 (“Stilp”) (EX1007). EX1008, ¶91.

Stilp states: “cell sites will have one of the following antenna configurations: (i) an omnidirectional site with 1 or 2 receive antennas or (ii) a sectored site with 1, 2, or 3 sectors, and with 1 or 2 receive antennas used in each sector.” EX1007, 9:27-30; EX1008, ¶85. U.S. Patent 5,917,811 (“Weaver”)(EX1010) states: “[t]he term base station can be assumed to refer to either a sector of a base station or a single sectored base station.” EX1010, 6:54-56; EX1008, ¶92. In a “single sectored base station”, a sector is the cell. EX1008, ¶93.

Each cell of Almgren includes at least one base station antenna representing at least one “sector.” *See* EX1004, 4:48-59; 7:6-9; EX1008, ¶¶94-98.

(3) a first frequency channel

A frequency channel encompasses a communication channel of a cell operating on at least one frequency. EX1001, 3:16-26; 3:51-58; EX1008, ¶95. Almgren identifies a first frequency channel by “selecting at least one radio channel” over which a transmitter (*e.g.*, mobile station) and receiver (*e.g.*, base station) “form a connection” for communication that is “subjected to path loss and interference.” EX1004, Abs. ll. 5-6; 18:37-39; *see* Claim 1; EX1008, ¶95. A cellular radio channel is defined by a certain frequency, as selected in Almgren’s step 301. EX1004, 1:24-25; *see* Fig. 3; EX1008, ¶96. The radio channel selected can be an “uplink” or a “downlink” radio channel connecting the “mobile station to the base station.” EX1004, 1:18-22; *see* 1:15-30; 3:15-45; EX1008, ¶96.

Almgren identifies “uplink radio channels” and “downlink radio channels” for path loss determinations. *See* EX1004, 3:15-45; 8:43-9:11; Fig. 3; EX1008, ¶¶97. In selecting a radio channel (*e.g.*, ch1) having a connection between receiver (*e.g.*, BS1) and a transmitter (*e.g.*, MS1), a frequency channel associated with the geographic area is identified by the “base station membership” or “coverage area or cell.” EX1004, 3:28; 7:50; *see* 5:11-25. *See* Element [1.1], *supra*. EX1008, ¶¶98-99.

(4) actively communicating

“Actively communicating” encompasses a receiver and a wireless device engaged in transmitting and/or receiving at least one signal over a frequency channel. EX1001, 3:55-60; 4:6-16; EX1008, ¶100.

Almgren’s wireless device (*e.g.*, mobile station transmitter) actively communicates with a receiver using a first radio frequency channel, with path loss being determined on established channel connections during mutual communication between the transmitter and receiver (*see*, EX1004, Claim 6); EX1008, ¶100.

Almgren’s active communication signals for estimating path loss are sent via traffic channels normally used for voice and/or data traffic. EX1004, 18:6-25; EX1008, ¶101. Path loss measurements are employed for channel assignment so the assigned channel has “low interference.” *Id.*

Almgren's Claim 6 discloses determining path loss using power levels " $(p_{iy,t})$ " transmitted by transmitters (MSi) on a selected channel (Fig. 3 step 302). The power level " $(s_{xy,t})$ " received in receivers (BSx) on the channel (chy) concerned is measured (Fig. 3 step 303). EX1004, Abs. ll. 1-10; *see* 3:15-53, 5:15-65, 6:65-7:50, 8:3-37, 9:42-47, 11:60-12:46; EX1008, ¶102.

The power level " $p_{iy,t}$ " is "determined continually" in step 302. EX1004, 8:12-14; EX1008, ¶96. The power level " $s_{xy,t}$ " received on the radio channel chy is "measured continually" in step 303 in receivers included in base stations BSx. EX1004, 8:17-19; EX1008, ¶103.

Fig. 2 illustrates a "base station BS1 receives a signal from a mobile station MS1 in the own cell, whose transmitter transmits a power level $p_{11,t}$ on a radio channel chl." EX1004, 5:15-18; EX1008, ¶104. BS1 is thus engaged in active communication receiving signals from MS1 using a first frequency channel. *Id.*; EX1008, ¶¶104-105. Path losses are continually measured during this communication. EX1004, Abs. ll. 6-10; *see* 3:15-51, 5:15-65, 8:4-47, 11:60-12:46; EX1008, ¶¶106-111.

Almgren's "mobile stations MS1-MS6 receive messages informing of the power level to be transmitted by said stations and the radio channel that they shall use" via a Slow Associated Control Channel (SACCH). EX1004, 13:26-29; EX1008, ¶¶112-113. Fig. 8 shows the SACCH constitutes active communication.

Id. The Provisional Application to the '264 Patent confirms that a SACCH is used over frequency channels engaged in active communication for path loss determination. *See* EX1003, pp.34-61 (performance can be extracted from SACCH; mobile transmitter level from SACCH), EX1008, ¶114.

a) *Silventoinen Is Evidence That The SACCH Of Almgren Is An Active Channel*

U.S. Patent 6,498,932 (“Silventoinen”, EX1006) shows in Fig. 2, a SACCH associated with a traffic channel. EX1008, ¶¶115-116. A SACCH is a time slot for a traffic channel (*e.g.*, a traffic time slot) within an established frequency channel connection between a transmitter and receiver. EX1008, ¶117. A mobile station transmits measurements via a SAACH to the base station with a full-rate traffic channel, a half-rate traffic channel or a Standalone Dedicated Control Channel (SDCCH). EX1008, ¶117. A base station uses the SACCH to transmit commands related to power control to the mobile station. EX1006, Fig. 2; 1:66-2:11; EX1008, ¶117.

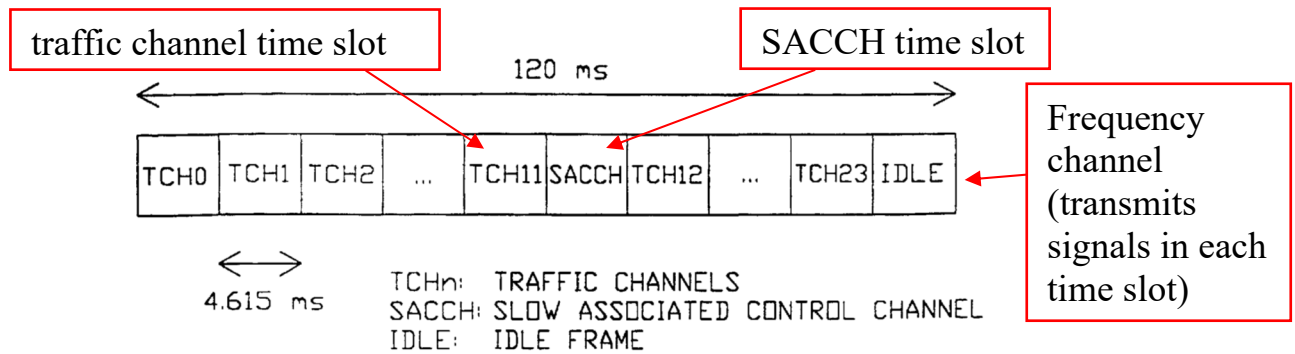


Fig. 2

Fig. 2 (annotated) shows a conventional multi-frame structure of 26 frames according to the GSM recommendation. EX1006, 6:23-26; EX1008, ¶118.

A “dedicated channel” in Silventoinen is not a dedicated frequency channel, but rather a time slot:

The GSM network belongs to the group of systems operating on the basis of TDMA (Time Division Multiple Access) ... [wherein] data are transmitted using successive TDMA frames. ... The time slots are used for transmitting control channels and traffic channels. On the control channels, signaling and synchronization information between a base station (BS) and a number of mobile stations (MS) is exchanged, whereas, on the traffic channels (TCH), data and speech are transmitted. See FIG. 1. One time slot of a traffic channel is assigned to each mobile station so that a base station may be simultaneously connected in a parallel fashion to a number of mobile stations using the same carrier frequency.

EX1006, 1:29-44 (underline added); EX1008, ¶119.

Almgren's SACCH confirms that the transmitter/receiver are actively communicating because, as evidenced by Silventoinen, a SACCH is associated with a single frequency channel for active communication. EX1008, ¶120.

Silventoinen confirms that a POSITA would have understood Almgren's SACCH to be associated with a traffic channel used in actively communicating data and speech. EX1008, ¶121.

Silventoinen teaches that a Broadcast Control Channel (BCCH) establishes a communication connection, while a SACCH is used with transmission of traffic information: “In order to establish a proper communication between a mobile station and a base station, general information concerning the base station is transmitted from the base station (BS) to the mobile station, i.e. in the downlink direction, using the so called [] (BCCH)” as shown in Figs. 1/2. EX1006, 1:53-58; EX1008, ¶122. Fig. 3 of Silventoinen shows the SACCH paired with a TCH (*e.g.*, traffic channel) transmitted from a mobile station to a base station:

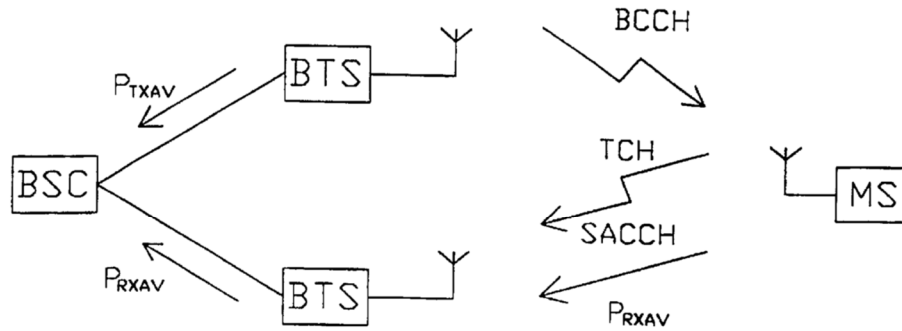


Fig. 3

EX1008, ¶122. The “detected signal level P_{RXAV} is part of the measurement results which are reported regularly from a particular mobile station MS to the base transceiver station BTS-n concerned.” EX1006, 7:17-22 (underline added); EX1008, ¶122.

Almgren’s determination of path loss with a frequency channel having a SACCH confirms path loss measurements over an active communication channel because of the existence of the SACCH, as evidenced by Silventoinen. EX1008, ¶123.

(5) without disabling any other communication channel

The phrase “without disabling any other communication channel” encompasses not dedicating a specific frequency channel for measuring path loss. EX1001, 1:58-61, 3:39-45, 3:48-50, 4:60-63; EX1008, ¶124. Almgren discloses

active communication occurring “without disabling any other communication channel.” *See, e.g.*, EX1004, 18:6-15; Claim 1; EX1008, ¶124.

Almgren estimates “interference of any connections that may be set up on different radio channels” (*i.e.*, no channels are disabled). EX1004, 18:6-15; ; EX1008, ¶125. Almgren uses “already established” connections (*i.e.*, active communication) to determine path loss. EX1004, 17:17-41; EX1008, ¶126. Almgren discloses the alleged innovation of the ’264 Patent by using “already established” connections (*i.e.*, active communication) to assess path loss without setting aside an otherwise active frequency channel or disturbing the frequency use plan. EX1001, 1:59-61; EX1008, ¶127.

Almgren establishes new connections with low interference. EX1008, ¶128. The system knows “which radio channels are used by which mobile stations, base station membership, and transmitted power levels.” EX1004, 18:7-9; EX1008, ¶129. Almgren selects “a radio channel which is estimated to subject the newly established connection with solely low interference, while preferably not introducing too much interference in respect of any other connection.” EX1004, 18:12-15; EX1008, ¶¶129-31. New connections do not disable other communication channels. *Id.*

c. Element [1.3]: “receiving at said receiver the signal transmitted from said wireless device on said first frequency channel;”

Almgren discloses a receiver (*e.g.*, base station) receiving a signal transmitted from a transmitter (*e.g.*, mobile station) over a first frequency channel. EX1008, ¶¶132-134. “The base station BSI [*receiver*] receives a signal from a mobile station MSI [*wireless device*] in the own cell, whose transmitter transmits a power level p_{11} , on a radio channel chl [*first frequency channel*].” EX1004, 5:15-18; *see* 2:65-3:45, 5:11-6:6, Figs. 3/7. EX1008, ¶133.

d. Element [1.4]: “receiving at said receiver an indication of transmission signal strength of said signal;”

Almgren discloses receivers (*e.g.*, base stations) receiving indications of transmission signal strength as power levels. (“signal strength or power level received by a receiver.” EX1004, 1:56-60); EX1008, ¶¶135-136, 143.

The power level “ $p_{iy,t}$ ” transmitted by mobile stations MS_{*i*} on the current radio channel chy is determined continually in step 302. EX1008, ¶137. The values are stored in a power level vector “ $P_{y,t}$.” EX1004, 8:12-16. EX1008, ¶137.

Almgren’s base station receives indications of transmission power from different transmitters. EX1008, ¶¶137-141. “[T]he three base stations are each in contact with a respective further mobile station MS₂, MS₄ and MS₆ which transmit the power levels $p_{25,t}$, $p_{45,t}$ and $p_{65,t}$ on the radio channel $ch5$.” EX1004, 44-

47 (underline added). Base station BS1 “receives on radio channel ch5 signal contributions from all system transmitters that transmit on said radio channel ch5.” EX1004, 5:49-51 (underline added); EX1008, ¶138. The “power level $p_{iy,t}$ that a transmitter transmits on radio channel chy is determined by the base station controller BSC.” EX1004, 7:40-43; EX1008, ¶¶139-140.

Almgren discloses mobile stations transmitting indications of signal power levels to receivers (*e.g.*, base stations) for determining path loss. *See* EX1004, 2:63-3:53, 5:1-6:5, 11:61-12:67, Figs. 3/7; EX1008, ¶¶141-142.

e. Element [1.5]: “measuring at said receiver the received signal strength of said signal;”

Almgren discloses measuring a received signal strength as a power level received at a receiver (*e.g.*, base station). EX1004, 8:17-21; EX1008, ¶¶144-146. *See* Element [1.4], *supra*. EX1008, ¶¶124-130.

“[R]eceived power level on downlink radio channels may, of course, be measured in each mobile station and processed in the same way as in the uplink case.” EX1004, 17:3-6; *see also* 2:65-3:45, 5:11-7:61, 8:4-9:11, Figs. 3/7; EX1008, ¶¶135-143.

f. Element [1.6]: “determining the path loss value of said first frequency channel as a function of the indication of transmission signal strength and the received signal strength.”

“Determining the path loss value ... as a function of the indication of transmission signal strength and the received signal strength” at least encompasses determining the path loss value using the indication of transmission signal strength and the received signal strength. EX1001, 1:19-31, 1:46-54. EX1008, ¶¶150-151.

Almgren discloses estimating path loss on a radio channel based on the transmit power level and the received power level over the radio channel. Almgren’s claim 1 recites “estimating a statistical measurement of the path loss in a radio communications system” by “generating an estimated value of a statistical measurement ($G_{ax,t}^r$) of a stochastically distributed amplification factor ($G_{ax,t}$) ... in dependence on the transmitted power levels ($p_{iy,t}$) ... and the power levels ($s_{xy,t}$) measured.” EX1004, 18:26-27; 18:48-53; *see* Claim 1; EX1008, ¶151.

The “amplification factor” is a path loss value: “path loss of single radio connections are modelled as amplification factors.” EX1004, Abs. ll. 3-5; 4:32-33; EX1008, ¶136.

Almgren discloses path loss of a frequency channel is determined “in dependence on” transmitted power levels and measured power levels throughout the reference. EX1004, 2:66-3:45, 5:11-6:6, 7:28-9:5, Figs. 3/7; EX1008, ¶¶152-

153. Path loss of a frequency channel is used for ascertaining interference effects. EX1004, 17:35-18:15; EX1008, ¶154.

Almgren discloses a “recursive algorithm that gives the mean value of path loss.” EX1004, 10:4-5. By “measuring the received power level $s_{xy,t}$ on a radio channel chy in a receiver in a base station BSx,” “power levels transmitted from the transmitters in mobile stations that transmit on the radio channel chy” are used to identify an amplification element vector for the radio channel. EX1004, 9:41-45; *see* 9:30-48; EX1008, ¶155.

Almgren’s Fig. 7 flow chart identifies “amplification factors of pair-wise combinations of transmitters that transmit on a given radio channel chy and a receiver that receives power level on said radio channel chy.” EX1004, 11:61-11:65; *see* 11:61-12:67; EX1008, ¶156.

The interference that would be introduced on other base stations existing connections that use this radio channel can also be estimated. This estimation can be made by using the values in the generated row. These values relate to the actual path loss between mobile stations belonging to the existing base stations and the new basis stations.

EX1004, 17:55-65; EX1008, ¶156.

g. Claim 1 Is Obvious Over Almgren In View of Stilp, Weaver And Silventoinen

To the extent Almgren does not expressly disclose “a first sector ... wherein said wireless device is actively communicating,” these features would have been obvious over Almgren in view of Stilp, Weaver, Silventoinen, and the '264 Patent's admitted prior art. EX1008, ¶¶158-168.

Stilp, Weaver, and the '264 Patent's admitted prior art constitute evidence that base stations of Almgren's radio communication system necessarily represent one or more cells having one or more sectors. (EX1001, Fig. 1, 3:15-45, EX1007, 9:27-30; EX1010, 6:54-56, *supra*, at Element [1.2]). EX1008, ¶159.

Almgren's radio communication system includes one or more base stations (BS1-BS6) each having a cell (C1-C6). Each base station has one or more transmitter, receiver, and/or transceiver antennas. EX1004, 4:43-52, 7:8. Almgren does not expressly define each cell as having “sectors.” A POSITA would have understood each base station of Almgren as constituting a cell having at least one sector. EX1008, ¶160.

Stilp, Weaver, and the '264 Patent's admitted prior art disclose base stations of a “conventional cellular communication system” each defining a “cell” having at least one “sector.” A “[c]onventional frequency use plan uses several directional antennas each radiating at a specified sector” in each cell. EX1001, 3:15-25. Stilp discloses that “cell sites” include one of an “omnidirectional site” or a “sectored

site.” EX1007, 9:27-29. According to Stilp, “sectored cell sites have become the predominant configuration.” EX1007, 9:32-33. A base station represents a cell that forms either an “omnidirectional site” (i.e., single sectored site having a single antenna) or a “sectored site” (i.e., multi-sectored site having multiple antennas) depending on the antenna configuration of the base station. EX1008, ¶160.

Almgren does not specify whether the antennas forming cells C1-C6 are configured for omnidirectional single sectored sites or multi-sectored sites. Weaver confirms that “[a] typical wireless communication system contains some base stations having multiple sectors. A multi-sectored base station comprises multiple independent transmit and receive antennas as well as some independent processing circuitry.” EX1010, 6:48-51; EX1008, ¶161. According to Weaver, “[t]he term base station can be assumed to refer to either a sector of a [multi-sector] base station or a single sectored base station.” EX1010, 6:54-56.

A POSITA would have understood Almgren’s base station to constitute either a single sectored site or a multi-sectored site based on the configuration of transmit and receive antennas. EX1008, ¶161. The admitted prior art of the ’264 Patent, Stilp, and Weaver acknowledges that cells and sectors in a wireless communication system were known and conventional in the art. *Id.* A POSITA would have understood Almgren’s base station to constitute at least one cell having at least one sector. *Id.*

A POSITA would have been motivated by Stilp to configure the “transmitter and receiver antennas” (EX1004, 7:8) of Almgren’s base stations to form sectors because “each antenna is uniquely affected by multipath, fading, and other disturbances,” as “it is well known in the field that when two antennas are separated in distance by more than one wavelength, then each antenna will receive the signal on an independent path” providing for “additional and unique information to be gained” and “mitigating multipath” by “using multiple antennas.” EX1006, 58:4-15; EX1008, ¶162. Such antenna configurations for base stations would have been a routine implementation according to known methods of sectoring a cell to obtain predictable results of forming sectors that can differentiate signals between antennas with a high probability of success. *Id.* A POSITA would similarly be motivated by Weaver to use sectors in Almgren’s system “to reduce the total interference power to remote units located within the coverage area of the base station while increasing the number of remote units that can communicate through the base station.” EX1010, 13:59-62; EX1008, ¶162.

Silventoinen confirms that conventional frequency channels using a SACCH transmit signals over an active communication channel used for transmitting traffic between a base station and a mobile station. Silventoinen discloses that a SACCH is a “dedicated channel[]” associated with a “traffic channel” in an active

communication channel “used by the mobile station for transmitting different measurement results to the base station.” EX1006, 2:1-4.

For example, “the base station uses the [SACCH] to transmit commands related to power control to the mobile station.” *Id.*, 2:8-10. Silventoinen discloses that a traffic channel (*e.g.*, active communication channel) “is *always* allocated together with a [SACCH].” *Id.*, 2:5-8. A POSITA would have understood that Almgren’s radio channels constitute active communication channels due to the use of a SACCH between the base stations and mobile stations. EX1008, ¶163.

A POSITA would have understood that Almgren’s SACCH could be configured on an active communication channel in the manner disclosed by Silventoinen. *Id.* In fact, Almgren discloses using the SACCH for the same purpose. *See* EX1004, 13:26-35; EX1008, ¶164. A POSITA would have been motivated to employ the SAACH of Almgren on an active communication channel because that is consistent with the manner in which Almgren and Silventoinen operate. EX1008, ¶164. A POSITA would have considered this to be a routine, known implementation in a radio communication network that would yield predictable results of measuring signal strengths for path loss with a high expectation of success in the manner disclosed by Almgren. Petitioner’s expert confirms that a communication channel that implements a SACCH is an active communication channel. EX1008, ¶164.

A POSITA would have understood that a SACCH of Almgren is “always” used on an active communication channel because Silventoinen expressly teaches this. EX1006, 2:5-8; EX1008, ¶164. To have all active channels of Almgren available for path loss measurement, a POSITA would have been motivated to use a conventional SACCH on a channel that is used for path loss measurement in order to collect measurement results over active communication channels. *See* EX1006, 1:66-2:11.

There is nothing in Almgren to suggest the SACCH is not used on an active communication channel. As taught by Silventoinen, “transmission of measurement results [*e.g.*, using the SACCH] is even performed during an ongoing call during which speech data are transmitted.” EX1006, 2:46-49. Such use would constitute a routine use of a SACCH. EX1008, ¶166.

Thus, a POSITA would be motivated to apply the teachings of Stilp, Weaver, and Silventoinen with the disclosure of Almgren to use conventional configurations of wireless communication networks for determining path loss. EX1008, ¶¶165, 167-168.

2. Claim 3: “The method of claim 1, further comprising determining the path loss value for a plurality of geographic areas to compile a database.”

Almgren discloses each element of Claim 3. EX1008, ¶¶169-175.

Almgren determines multiple path loss values (*e.g.*, amplification factors) for multiple geographic regions (*i.e.*, multiple base stations) and compiles a database as an “amplification element matrix.” EX1004, 17:17-18:15; EX1008, ¶16671 Almgren generates “amplification factors of all combinations of transmitter and receiver pairs” in the amplification element matrix. EX1004, Abs. ll. 12-16; EX1008, ¶172. Determining path loss for “all radio channels in the radio communications system, or for a subset of these radio channels,” constitutes determining a path loss value for a plurality of geographic areas. EX1004, Abs. ll. 19-20; EX1008, ¶173.

Path loss values of the matrix (*i.e.*, database) are used for establishing connections, introducing new base stations, and moving base stations. EX1004, 17:17-18:15; EX1008, ¶174.

3. **Claim 6: “The method of claim 1, wherein the wireless devices is selected from the group consisting of wireless transmitter, radio frequency transmitter, mobile telephone, cellular phone, text messaging device, portable computer, laptop computer, personal digital assistant, vehicle security device, vehicle tracking device and pager.”**

A wireless device encompasses a mobile device capable of wirelessly transmitting signals over a frequency channel to a receiver, and includes a mobile telephone, and cellular telephone. EX1001, 5:40-43. A wireless device is unattached to any physical wires.

Almgren's mobile stations include wireless transmitters, radio frequency transmitters, mobile telephones, and/or cellular phones. EX1004, 8:15, Fig. 1, 3:58-61; EX1008, ¶¶176-178. Mobile stations with wireless transmitters establish "call connections" and communicate over channels in a "cellular mobile radio network." EX1004, 4:17-48, 7:28-32; EX1008, ¶¶179-180.

4. Claim 11: "The method of claim 1, further comprising identifying the location of the receiver and the wireless device."

Almgren identifies locations of transmitters and receivers as base station membership. EX1004, 8:22-23. *See* Element [1.1], *supra*. EX1008, ¶¶181-188.

Locations of base stations are generally known by the system (*e.g.*, cell location). EX1004, 4:42-45; EX1008, ¶¶183-184.

Almgren's disclosure concerning the identification of a receiver and a wireless device matches the location identification provided in the '264 Patent (*e.g.*, a location of the base station 120 and a wireless device 140 shown in Fig. 1 of the '264 Patent). EX1008, ¶¶1185. For example, the '264 Patent determines "the location of the wireless device and/or the receiver" and "[i]n an alternative embodiment, only the cell and the sector housing the wireless device is determined." EX1001, 4:38-42; EX1008, ¶186. The '264 Patent explains that "conventional locating means can be used" to locate the receiver and the wireless device. EX1001, 5:15-18; EX1008, ¶187.

a. Claim 11 Is Also Obvious In View of Tayloe

A POSITA would have recognized Almgren's path loss estimation as involving information to calculate a wireless device location, using power level measurements to identify locations of a receiver and a wireless device (e.g., mobile station). EX1008, ¶¶189-191.

To the extent Almgren does not expressly disclose "identifying the location of the receiver and the wireless device," U.S. Patent 5,023,900 ("Tayloe", EX1011) describes a telephone radio diagnostic system similar to Almgren's system, using mobile subscribers operating in a radio communications network to "evaluate system performance." EX1011, 1:6-12. EX1008, ¶192. "During operation, the position of at least one of the mobile units operating within the geographic area is located when a call is received by the base station" in Tayloe's system. EX1011, 2:48-54, EX1008, ¶193. A mobile unit may be located by "a host of radiolocation means" including "radio ranging to global positioning systems." Tayloe uses a "locator" within each base station "which employs signal strength measurements and timing advance techniques for locating and tracking the position of mobile units engaged in active calls." EX1011, 3:43-50. These are the conventional locating means referenced in the '264 Patent. EX1001, 5:15-18; EX1008, ¶194.

A POSITA would have been motivated to use power level (*e.g.*, signal strength) and other measurements collected over radio channels during active calls to locate a mobile station in Almgren's system based on Tayloe's disclosure (*e.g.*, "to pinpoint the area within a cell that possesses the electromagnetic characteristics" such as path loss or amplification factors). EX1011, 4:18-20; EX1008, ¶195. Identifying the receiver and wireless device locations using conventional locating methods would have been routine implementation of known methods to yield a predictable result for channel assignment, base station moving, and incorporation of a new base station. EX1004, 17:17-18:15; EX1008, ¶¶196-198. Such receiver and wireless device locations would have been recognized to assist with selection of optimal power levels and avoidance of interference in Almgren's system. *Id.*

5. Claim 13 (Preamble): "A method for determining a path loss value of a signal transmitted from a wireless device and received by a receiver, where the wireless device and the receiver operate within a wireless communication system"

Almgren discloses the preamble of Claim 13. Claim 1 Preamble, *supra*.

EX1008, ¶¶199-203.

a. Element [13.1]: "identifying a first frequency channel in an active communication between the wireless device and the receiver without disabling any other communication channel;"

Element [13.1] matches Element [1.2]. EX1004, 4:43-45; EX1007, 8:64-67; EX1010; *see* Element [1.2], *supra*. EX1008, ¶¶204-206, 210.

b. Element [13.2]: “geolocating the wireless device and the receiver;”

Geolocating encompasses identifying a geographic location. Geolocating encompasses a geo-positioning system (“GPS”). EX1001, 6:11-15, EX1008, ¶¶207-208. Almgren discloses identifying a geographic location of the wireless devices and receivers by determining amplification factors for a combination of base stations depending “on where the mobile stations are located geographically and depending on the topography between the base stations.” EX1004, 6:22-25, *see id.* at 4:25-34; EX1008, ¶203. The “base stations BSx to which respective mobile stations MSi belong is also known at each moment in time, *i.e.*, the coverage area or cells of which base stations the mobile stations are located.” EX1004, 7:47-51, EX.1008, ¶209.

(1) Element [13.2] Is Also Obvious In View of Tayloe

To the extent Almgren does not expressly disclose “geolocating the wireless device and the receiver,” Element [13.2] would have been obvious over Almgren in view of Tayloe. *See* Claim 11, *supra*. EX1004, 4:42-45. EX1008, ¶¶205, 223-232.

Tayloe teaches locating the position of a mobile unit by a host of radiolocation means “which vary in their levels of sophistication from radio ranging to global position systems.” EX1011,3:42-46; EX1008, ¶226. Tayloe

teaches locating the position of the mobile unit by geolocating using, for example, global positing systems. EX1011, 3:40-46; EX1008, ¶227.

A POSITA would have been motivated to use global positioning systems to geolocate wireless devices and receivers within the system of Almgren based on Tayloe (*e.g.*, “to pinpoint the area within a cell that possesses the electromagnetic characteristics”). EX1004, 4:18-20; EX1008, ¶228. Such geolocating would have constituted routine locating methods (*e.g.*, global positioning systems) to provide a predictable result for geolocating wireless devices and receivers for channel assignment, base station moving, and incorporation of a new base station into a cellular network disclosed by Almgren. EX1004, 17:17-18:15; EX1008, ¶229. Geolocation information would have improved the determination of amplification factors pursuant Almgren’s teaching that such positioning is useful in developing such factors. EX1004, 6:19-25; EX1008, ¶230. A POSITA would have known that geolocating the receiver and wireless device would assist in selecting optimal power levels and avoidance of interference objectives in Almgren’s system. *Id.* EX1008, ¶2231.

c. Element [13.3]: “receiving at the receiver the signal transmitted from said wireless device on said first frequency channel;”

Element [13.3] matches Element [1.3]. EX1004 5:15-18, *see* Element [1.3], *supra*. EX1008, ¶¶211-213.

d. Element [13.4]: “receiving at said receiver an indication of transmission signal strength of said signal;”

Element [13.4] matches Element [1.4]. EX1004, 5:44-51; 5:32-36; 8:12-16; *see* Element [1.4], *supra*. EX1008, ¶¶214-216.

e. Element [13.5]: “measuring at said receiver the received signal strength of said signal;”

Element [13.5] matches Element [1.5]. EX1004, 8:17-21; *see* Element [1.5], *supra*. EX1008, ¶¶217-219.

f. Element [13.6]: “determining the path loss value of said first frequency channel as a function of the indication of transmission signal strength and the received signal strength.”

Element [13.6] matches Element [1.6]. EX1004, 17:35 to 18:15; 18:26-27; 18:48-53; *see* Element [1.6], *supra*. EX1008, ¶¶220-222. Accordingly, Claim 13 is anticipated by Almgren and is obvious over Almgren in view of Tayloe. EX1008, 222-223.

6. Claim 15: “The method of claim 13, further comprising determining the path loss value for a plurality of geographic areas to compile a database.”

Claim 15 matches Claim 3. EX1004, Abs. ll. 12-20; 15:53-66; *see* Claim 3, *supra*. EX1008, ¶¶233-236.

7. Claim 20: “The method of claim 13, wherein the receiver is a plurality of receivers each disposed at a different location from each other and a different from the location of the wireless device.”

Almgren discloses a method wherein the receiver is a plurality of receivers (*e.g.*, multiple base stations) each disposed at a different location from each other and at different locations from a location of the wireless device, such as with the “number of base stations” in Fig. 1 (*e.g.*, BS1-BS-6) and Fig. 2 (BS1-BS3). EX1008, ¶¶237-243. Each base station shown is “disposed at a different location from each other” and at different locations “from the location of the wireless device.” EX1008, ¶240.

Almgren discloses signals transmitted from a mobile station to multiple receivers each at a different location. EX1008, ¶241. “The signals on the radio channel chl from the mobile stations MS2 and MS3 do not only reach the own base stations BS2 and BS3 but also the receiver in the base station BS1.” EX1004, 5:26-29. Almgren measures signals “in a number of receivers that are included in base stations BSx in the illustrated case.” EX1004, 8:18-19; EX1008, ¶242.

8. Claim 21: “The method of claim 13, wherein the receiver is a base station or a wireless location sensor (“WLS”) or a combination of the base station and WLS.”

Almgren discloses a receiver is a base station, receiving a signal transmitted from a transmitter (*e.g.*, mobile station): “The base station BS1 [receiver] receives a signal from a mobile station MS1 [wireless device] in the own cell, whose

transmitter transmits a power level p11, on a radio channel chl [first frequency channel].” EX1004, 5:15-18; EX1008, ¶¶244-247. Almgren also provides similar disclosures throughout, *e.g.*, EX1004, 2:65-3:51, 5:1-5, 5:25-6:5, 7:28-51,8:9-27, 8:55-65, 9:30-35, 10:35-40, 11:60-65, 12:5-21, 13:1-61, 14:1-36, 14:42-67, 15:13-39, 16:52-18:15, Figs. 3/7; EX1008, ¶¶248-249.

9. Claim 23 (Preamble): “A system for determining a path loss value of a signal transmitted from a wireless device and received by a receiver, where the wireless device and the receiver operate within a wireless communication system having at least one cell having at least one sector operating on at least one frequency channel”

Almgren discloses the Preamble of Claim 23. EX1008, ¶¶250-255.

Almgren’s system determines a path loss value of a signal transmitted from a wireless device and a receiver that operate within a cellular wireless communication system having at least one cell having at least one sector operating on at least one frequency channel. *See* Claim 1, *supra*. EX1004, Abs. ll. 1-2., Fig. 1. EX1008, ¶254.

a. Element [23.1]: “a circuitry including a microprocessor and a memory for compiling a database for receiving the path loss values, the circuitry configured with instructions to:”

Almgren discloses a function device (204), a power level measuring device (113), a device for generating an amplification matrix (116), a memory storage device (210), and various other circuitry devices for compiling a database of path

loss values (*e.g.*, amplification factors). EX1004, cols. 13-14; EX1008, ¶192. Figs. 8/9 of Almgren depict this circuitry. EX1008, ¶¶256-258.

Device 116 includes “means that execute the recursive algorithm” connected to memory device 210 disclosed by Almgren. EX1004, 15:53-57. This circuitry includes the processor and memory. EX1008, ¶¶2258-260.

b. Element [23.2]: “identify a geographic area where the path loss value is to be determined;”

Element [23.2] essentially matches Element [1.1]. EX1008, ¶¶261-262.

Almgren discloses circuitry to identify a geographic area associated with a coverage area or cell where a mobile station is located. EX1004, 4:42-47; 7:48-51, *see* Element [1.1], *supra*. EX1008, ¶¶263-264.

c. Element [23.3]: “identify a first cell, a first sector, and a first frequency channel associated with the geographic area wherein said wireless device is actively communicating with said receiver using said first frequency channel without disabling any other communication channel;”

Element [23.3] essentially matches Element [1.2]. EX1008, ¶¶265-266.

Almgren discloses circuitry to identify a cell, a sector, and a radio channel associated with the geographic area where a mobile station and base station are actively communicating using the radio channel without disabling other radio channels in a radio communications network. EX1004, 4:43-45; EX1007, 8:64-67; EX1010; *see* Element [1.2], *supra*. EX1008, ¶¶267-268.

d. Element [23.4]: “receive at said receiver the signal transmitted from said wireless device on said first frequency channel;”

Element [23.4] essentially matches Element [1.3]. EX1008, ¶¶269-270.

Almgren discloses circuitry to receive at a receiver (*e.g.*, base station) a signal transmitted from a transmitter (*e.g.*, mobile station) over a radio channel. EX1004 5:15-18; *see* Element [1.3], *supra*. EX1008, ¶¶271-272.

e. Element [23.5]: “receive at said receiver an indication of transmission signal strength of said signal;”

Element [23.5] essentially matches Element [1.4]. EX1008, ¶¶273-274.

Almgren discloses transmitters (*e.g.*, mobile stations) transmitting power levels and circuitry so that receivers (*e.g.*, base stations) determine the transmitter power levels based on the transmitted power level indications provided by the transmitters. EX1004, 5:44-51; 5:32-36; 8:12-16; *see* Element [1.4], *supra*. EX1008, ¶¶275-276.

f. Element [23.6]: “measure at said receiver the received signal strength of said signal;”

Element [23.6] essentially matches Element [1.5]. EX1008, ¶¶277-278.

Almgren discloses circuitry to measure a power level received at a receiver (*e.g.*, base station). EX1004, 8:17-21; *see* Element [1.5], *supra*. EX1008, ¶¶279-280.

g. Element [23.7]: “determine the path loss value of said first frequency channel as a function of the indication of transmission signal strength and the received signal strength.”

Element [23.7] essentially matches Element [1.6]. EX1008, ¶¶281-282.

Almgren discloses circuitry to determine a path loss value for a radio channel based on the transmit power level and the received power level over the radio channel. EX1004, 17:35 to 18:15; 18:26-27; 18:48-53; *see* Element [1.6]. EX1008, ¶¶283-284.

h. Claim 23 is Also or Alternatively Rendered Obvious By Almgren In View of Silventoinen, Stilp And Weaver

Claim 23 of the '264 Patent is anticipated by Almgren and/or would have been obvious. EX1008, ¶¶285-288 To the extent that secondary references Silventoinen, Stilp, and Weaver are deemed to modify the disclosure of Almgren, any such modifications to Almgren would constitute routine combining of prior art elements with a high expectation of success to yield predictable results. *See* Section VII.A.1.g, *supra*. EX1008, ¶¶286.

10. Claim 25: “The system of Claim 23, wherein the circuitry is further programmed with instructions to determine the path loss value for a plurality of geographic areas to compile a database.”

Claim 25 has elements similar to Claim 3. EX1008, ¶¶289-293.

Almgren determines multiple path loss values (*e.g.*, amplification factors) for multiple radio channels and base stations throughout a radio communications

system and stores the path loss values to compile an “amplification element matrix.”

EX1004, Abs. ll. 12-20; 15:53-66; *see* Claim 3, *supra*. EX1008, ¶¶291-293.

11. **Claim 26: “The system of claim 23, wherein the receiver is selected from the group consisting of wireless transmitter, radio frequency transmitter, mobile telephone, cellular phone, text messaging device, portable computer, laptop computer, personal digital assistant, vehicle security device, vehicle tracking device, pager, base station and wireless location sensor.”**

Almgren’s receiver includes a wireless transmitter, radio frequency transmitter, and/or base station; “[e]ach base station BS1-BS6 includes a number of receivers for receiving signals on the uplink radio channels, and a number of transmitters for transmitting signals on the downlink radio channels.” *See* Section VII.A.10.; EX1004, 4:49-52, 5:11-25; Fig. 2; EX1008, ¶¶294-297.

12. **Claim 27: “The system of claim 23, wherein the wireless devices is selected from the group consisting of wireless transmitter, radio frequency transmitter, mobile telephone, cellular phone, text messaging device, portable computer, laptop computer, personal digital assistant, vehicle security device, vehicle tracking device and pager.”**

Almgren’s mobile stations include wireless transmitters, radio frequency transmitters, mobile telephones, and/or cellular phones. EX1004, Fig. 1, 3:58-60, 4:17-48, 7:28-32, 8:14-15; *see* Claim 6, *supra*. EX1008, ¶¶298-301.

B. Challenged Claims 1, 3, 6, 11, 13, 15, 20-21, 23, and 25-27 Are Anticipated Or Rendered Obvious Over US 5,491,837 to Haartsen (Ground 2).

The Challenged Claims are anticipated by Haartsen. EX1008, ¶302 *see also id.* ¶¶302-493.

Haartsen alternatively renders the claims obvious. *See, e.g., Pfizer, Inc. v. Genentech, Inc.*, IPR2017-02020, Paper 16 at 30-31 (PTAB Feb. 12, 2018).

1. Claim 1 (Preamble)

Haartsen discloses the Claim 1 Preamble. EX1008, ¶¶303-304. Haartsen discloses a method for determining path loss values of a signal transmitted from a wireless device and received by a receiver for “adaptive allocation of channels within a radio communication system, specifically a cellular network”. EX1005, 7:5-28; 8:10-25; Abs. ll. 1-6; Fig. 9.

Haartsen determines path loss values for dynamic channel allocation using “periodic measurements performed both by one or more base stations and one or more mobile stations to determine the best channel.” EX1005, 5:30-35; EX1008, ¶305. If a best channel/base station combination is not currently used, a re-allocation for a new channel and/or base station is initiated “while a call is already in progress.” EX1005, 9:22-50; , 3:34-53; 7:5-9:38, Figs. 5/6; EX1008, ¶¶306-307.

Haartsen discloses at least one cell in Fig. 2(a). EX1005, 2:66-67 (*see also* Fig. 9). EX1008, ¶308. At least one sector is within each cell. EX1008, ¶309.

Haartsen's Fig. 11 base stations have three antennas: "two, 1002 and 1004, are used for receiving signals, whereas only one antenna 1006, is used to transmit signals." EX1005, 18:44-47; EX1008, ¶¶310-312. As evidenced by Stilp, cell sites have antenna configurations, such as: "(i) an omnidirectional site with 1 or 2 receive antennas or (ii) a sectored site with 1, 2, or 3 sectors, and with 1 or 2 receive antennas used in each sector." EX1007, 9:27-30; EX1008, ¶311. A POSITA would have understood Haartsen's cell site base station with 2 receive antennas to be at least one sector defined by associated antennas, with further sectors defined by added antennas to the base station. EX1008, ¶312.

Haartsen's "cells" operate on at least one frequency channel and Fig. 3 shows three base stations and two mobile stations operating over frequency channels (*e.g.*, channel 335). EX1005, 6:30-67; 7:1-4. EX1008, ¶¶313-314.

a. Element [1.1]

Haartsen's network identifies a geographic area where the disclosed path loss values are determined for channel allocation and transmit power control. *See* Section VII.A.1.a.; EX1008, ¶¶315-316. Haartsen determines path loss in a "region around base station A" when "mobile station A is close to base station A and wants to initiate a call" over the specific channel. EX1005, 14:34-38, 46-53. EX1008, ¶317. The identified geographic area includes "the region around [a] base station", as shown in Fig. 9. EX1005, 14:36-37; EX1008, ¶¶318-319.

b. Element [1.2]

(1) a first cell

Haartsen identifies a first cell as a base station wherein a wireless device (mobile station) is actively communicating. *See* Section VII.A.1.b.; EX1008, ¶¶320-321. The mobile station “is located so that it receives signals not only from the base station to which it is connected (i.e., signal 345 transmitted from base station A) but from several other surrounding base stations.” EX1005, 6:51-57, EX1008, ¶322. A cell is identified as the base station. EX1005, 14:46-53; EX1008, ¶¶323-326.

(2) a first sector

Haartsen’s base stations each have at least one sector. *See* Section VII.A.1.b.; EX1008, ¶¶324-326. Fig. 11 base stations have three antennas. EX1005, 18:44-47. Stilp serves as evidence that cell sites use antennas to define sectors. EX1007, 9:27-30. A POSITA would have understood Haartsen’s base stations to include one or more sectors. EX1008, ¶326.

(3) a first frequency channel

Haartsen’s Fig. 3 shows a first frequency channel is identified for “active communication” between a mobile station and base station. EX1005, 5:21. Fig. 3 shows “three downlink signals” and “an uplink traffic channel.” EX1005, 6:67; 7:1-3; EX1008, ¶327. A mobile station initiates a call over an identified first

frequency channel when a cell base station is identified. EX1005, 14:35; EX1008, ¶328.

(4) actively communicating

Haartsen determines path loss values with a wireless device that is actively communicating on a frequency channel to implement “channel allocation”. EX1005, 5:21-22; 2:1-23; Fig. 5, Fig. 6; EX1008, ¶¶329-332, *see also id.* at ¶¶333-340.

“In most cases, the mobile station operates in one of three possible modes. The first to be considered occurs *when the mobile station is in active communication (i.e., a call is in progress)* and where the mobile station maintains active knowledge of the radio environment.” EX1005, 5:19-23 (emphasis added). Fig. 5 shows the active communication mode for “Call In-Progress” mode 503 wherein “RSSI measurements” are used “to calculate the path losses between the base stations whose signals were measured and the mobile station performing the measurements.” EX1005, 7:5-8; 10:4-6.

Periodic measurements determine a best channel (EX1005, 5:30-35), and channel re-allocation occurs as the mobile station is actively communicating with a base station receiver “while a call is already in progress.” *See* Section VII.A.1.b.; EX1005, 9:22-50. EX1008, ¶¶337-339. A mobile telephone switching office (*e.g.*, MTSO 300) instructs a mobile station to “monitor[] the signals transmitted by

surrounding base stations, including that to which it is currently connected.” EX1005, 6:48-59; Fig. 3; *see also* Fig. 6, step 6 (“Call In-Progress” mode 603). EX1008, ¶330.

(5) without disabling any other communication channel

Haartsen’s path loss determination identifies a first cell, a first sector and a first frequency channel wherein a wireless device is actively communicating, without disabling any other communication. EX1005, 5:21-22; 2:1-23; 9:22-63; Figs. 5/6, EX1008, ¶¶331-339.

Haartsen discloses a pilot signal, which functions primarily as a “set-up or control channel” (EX1005, 5:39; 9:40-45) for mobile device handover at a known frequency, to measure path loss. EX1005, 6:58-59, EX1008, ¶335. Haartsen also discloses using traffic channels (*e.g.*, traffic channel 335) of a base station “to which [a mobile station] is currently connected” to measure path loss. EX1005, 6:50-51, EX1008, ¶334.

The pilot signals are not transmitted on a dedicated frequency channel and their primary purpose of mobile device handover as a “set-up or control channel” is not disrupted when used for measuring path loss. EX1005, 5:37-40; Figs. 5/6. EX1008, ¶335.

Pilot signals are distinct from “beacon” signals discussed in the ’264 Patent “Background”. EX1008, ¶344. Haartsen independently references a “beacon” from which “path losses may be directly obtained.” EX1005, 14:61-15:2. EX1008, ¶336.

c. Element [1.3]

Haartsen discloses receiving at a receiver (*e.g.*, base station) a signal transmitted from a wireless device (*e.g.*, mobile station) on a frequency channel. EX1005, Figs. 3/5/6/9, 3:45-56, 5:30-6:65, EX1008, ¶¶341-342.

Haartsen discloses that while “a call is presently in progress” over a frequency channel on which mobile station A receives signal “345 transmitted from base station A”, mobile station A also receives “signal 305 transmitted from base station B (numbered 340), and signal 315 transmitted from base station C (numbered 360).” EX1005, 6:26-29, 6:51-57, 7:1-8:53; EX1008, ¶¶343-344. Base station A receives RSSI measurement data to calculate path loss between base stations whose signals were measured. EX1005, 7:1-64; EX1008, ¶344.

A POSITA would have understood “periodic measurements performed both by one or more base stations and one or more mobile stations to determine the best channel” (EX1005, 5:30-35), to mean signals may be received both at receivers transmitted by mobile stations and received at mobile stations transmitted by receivers. EX1008, ¶¶345-346.

d. Element [1.4]

Haartsen's discloses that base stations and mobile stations receive indications of transmission signal strength of a signal. EX1005, Abs. ll. 9-11, 7:44-48, EX1008, ¶¶347-348, *see* Element [1.3], *supra*.

Indications of base station transmit power, which is “fixed, or otherwise known by the network”, is received and/or reported to a base station controller on the current traffic channel. EX1005, 7:9-11; 9:15-21, Figs. 5/6, EX1008, ¶¶349-351. A mobile station sends this transmit power indication over the SACCH to the base station to which it is connected. *Id.* This information can then be directed to the base station controller of base station. *Id.* The Provisional Application to the '264 Patent confirms that a SACCH is used for the same purpose as in Haartsen. *See* EX1003, pp.34-61 (performance can be extracted from SACCH; mobile transmitter level from SACCH).

Base stations “broadcast information identifying the particular base station and its power level on [a] frequency. The mobile station can measure the RSSI of this signal and demodulate the identification information.” EX1005, 15:2-6, EX1008, ¶352. Base stations broadcast an indication of their transmit power to mobile stations over the SACCH. EX1005, 7:1-65, 9:15-21,35-42; 13:21-14:60, EX1008, ¶¶353-354.

A POSITA would have understood Haartsen to disclose indications of transmission signal strengths (*e.g.*, power level) are transmitted by a mobile station or base station to a base station receiver to determine path loss using signals from the mobile station and RSSI measurements. EX1005, Figs. 5/6, 3:45-55, 5:30-40; 15:2-11, 7:1-46, 9:35-50, EX1008, ¶3355. A POSITA would have understood that Haartsen teaches indications of transmission signal strength provided to a base station receiver and to a mobile station, with path loss determinations being performed at the base station or at the mobile station. EX1005, 7:1-46, 8:10-17, 9:15-21; EX1008, ¶¶356-357.

e. Element [1.5]

Haartsen discloses mobile stations and base stations measuring the received signal strength (*e.g.*, received signal strength indicator) of signals from base stations. EX1008, ¶¶358-359. Measurements of the signal power of pilot signals broadcast from surrounding base stations are performed by the mobile station which “periodically measures the received signal strength (RSSI) of a number of individual pilot signals transmitted from surrounding base stations.” EX1005, 5:51-57; 6:52-53; 6:66-67, 3:45-55, 5:30-42; EX1008, ¶360.

Base stations measure the RSSI on “traffic channels” and a base station “continuously monitors the interference levels” on its traffic channels. EX1005, 7:40-63, EX1008, ¶361. A base station scans through all channels and takes RSSI

measurement samples. EX1005, 7:49-55, EX1008, ¶362. These are “the potential voice channels which may be allocated” to replace the current channel used for the in-progress call. EX1005, 7:39-41, 6:26-30. EX1008, ¶¶362-363.

f. Element [1.6]

Haartsen determines a path loss value over a first frequency channel as a function of the indication of transmission signal strength and received signal strength (*e.g.*, for the pilot signals whose RSSI is measured by the mobile stations and base stations). *See* Section VII.A.1.f.; EX1005, 5:51-57; 6:26-30, 6:52-53; 6:66-67, 7:39-55. EX1008, ¶¶364-365.

RSSI measurements are “used to calculate the path losses between the base stations whose signals were measured and the mobile station performing the measurements.” EX1005, 7:4-15, EX1008, ¶366. Path loss is calculated using the indication of base station transmit power and the RSSI measurement. *Id.*; EX1008, ¶367. “The RSSI measurement together with the base transmit power (which is either fixed, or otherwise known by the network 300 and reported to the base station controller of base station A) provide all the information required to calculate the signal path loss (PL) for each signal.” EX1005, 7:8-37; EX1008, ¶367.

Haartsen’s base station receivers determine path loss. EX1005, 7:8-65, 8:17-53, 9:15-21, Figs. 5/6, EX1008, ¶368. For instance, “[i]n addition to the power levels required on potential channels, the base stations are provided “the prevailing

transmit power on the current traffic channel. The mobile can, for example, send this information over the SACCH to the base to which it is connected. This information can then be directed to the base station controller.” EX1005, 9:15-21EX1008, ¶368.

Haartsen’s path loss value of a first frequency channel is determined as a function of the indication of transmission signal strength and the received signal strength:

Known Transmit Power of Base Station C	=	0 dBm
Measured RSSI of Base Station C by	=	<u>-125 dBm</u>
mobile station		
Path Loss between mobile station A	=	125 dB
and base station C		

EX1005, 7:18-28, *see also id.* at 7:30-46, 8:10-53, 9:1-37, 10:15-67, 11:1-53.

EX1008, ¶369.

A POSITA would have understood that path loss is calculated both by a receiver (*e.g.*, base station) and a wireless device (*e.g.*, mobile station) from Haartsen’s disclosure. Haartsen discloses that “periodic measurements performed both by one or more base stations and one or more mobile stations to determine the best channel” (EX1005, 5:30-35) and “the mobile station has the same ability as the base station to scan the full range of voice channels.” (EX1005, 10:64-66). EX1008, ¶¶370-372.

A POSITA would have understood that a receiver or wireless device possessing capabilities of measuring signals performs a simple path loss measurement. EX1008, ¶¶371-372.

g. Claim 1 Is Obvious Over Haartsen In View of Stilp, Weaver And Silventoinen

To the extent Stilp, Weaver, and Silventoinen are deemed to modify the disclosure of Haartsen, any such modifications would have constituted routine combining of prior art features according to known methods with a high probability of success to yield predictable results (*e.g.*, cellular networks determining path loss). EX1008, ¶¶373-374.

Stilp and Weaver are evidence that Haartsen's base stations represent cells having sectors. EX1005, 2:1-56, 3:58-62, *see* Section VII.A.1.g., *supra*. EX1008, ¶375. Haartsen discloses a cellular system having base stations representing cells. *See* EX1005, 1:12-22, 14:33-45, Fig. 9. Haartsen discloses base stations having "three antennas, of which two, [] are used for receiving signals, whereas only one antenna [] is used to transmit signals." EX1005, 18:44-47, *see* Fig. 11. A POSITA would have understood, as explained in Stilp and Weaver, that Haartsen's cellular network base stations to represent cells having at least one sector depending on the configuration of the antennas on the base station. EX1008, ¶¶376-377.

Haartsen's disclosed SACCH communication scheme would have been recognized by a POSITA as active communication, as disclosed by Silventoinen.

See Section VII.A.1.g., *supra*. EX1005, 7:1-30, 9:35-40. EX1008, ¶378. The SACCH communication scheme is a well-known signaling scheme for cellular networks, defined by a known standard, IS-54B. EX1005, 7:3-4, 5:14-16, 1:42-45. EX1008, ¶¶379-380.

2. Claim 3

Haartsen determines path loss value for plural geographic areas to compile a database. EX1008, ¶¶381-382. Haartsen's system determines path loss values between a mobile station and multiple base stations, and between base station pairs: "path losses between all of the base stations can be measured when the system is installed and stored within the network database. These data can be periodically updated as characteristics of the terrain evolve." EX1005, 14:28-32, EX1008, ¶¶383-384. The "memory 1101, in addition to storing current channel allocation assignments, can contain a database including information regarding the geographical characteristics of the surrounding area which can be used to make predictions. Alternatively, such a database could be located at the MTSO." EX1005, 18:67-19:5, EX1008, ¶385.

A POSITA would have understood from the teachings of Haartsen that all path loss values measured between mobile stations and base stations would have been stored in a database. EX1008, ¶¶386-387.

3. Claim 6

Haartsen's base stations and mobile stations include a wireless transmitter and/or a radio frequency transmitter. *See* Section VII.A.3, EX1005, Figs. 3/9/10/11; EX1008, ¶¶388-391.

4. Claim 11

Haartsen identifies the location of the base station and mobile station. Haartsen's MTSO 300 and base station controller know "[t]he location of these bases and the power levels they are currently using on the considered channel." EX1005, 13:23-24; EX1008, ¶¶392-394. MTSO 300 sends the location of the base stations "to the base station controller of base A, together with the location of bases L, M, and N. The network knows, a priori, the distances between base station A and the L, M, and N base stations." EX1005, 14:46-49, EX1008, ¶395.

Haartsen identifies the location of a mobile station within a cell of a base station receiver "to which [the mobile device] is currently connected." EX1005, 6:50-55, EX1008, ¶396. The receiver location is identified within a cell of the base station to which the receiver is connected. *Id.*

Haartsen discloses a mobile station "locating feature" such that when a mobile station location is not exactly known, "a locating feature" can "determine the location of the mobile within the cell." EX1005, 14:54-56, EX1008, ¶397. The '264 patent admits use of "conventional locating means" to locate the receiver

and wireless device. EX1001, 5:15-18, EX1008, ¶398. Implementing such a feature in Haartsen would have been routine, consistent with well-known functionality to provide a predictable result with a high expectation of success. EX1008, ¶¶398-400; EX1001, 5:15-18.

5. Claim 13 (Preamble)

See Claim 1 Preamble, *supra*. EX1008, ¶¶401-404.

a. Element [13.1]

See Element [1.2], *supra*. EX1005, 5:30-40, 6:50-67, 7:1-3, 9:35-50, 14:35-15:2. EX1008, ¶¶405-407.

b. Element [13.2]

Haartsen discloses geolocating mobile stations and base stations: “[t]o predict the downlink interference, one should identify the base stations in a wide range around the mobile station that are transmitting on the same channel. The location of these bases and the power levels they are currently using on the considered channel, must be directed to the base station controller.” *See* Section VII.A.5.j.; EX1005, 13:22-30; 14:9-15, EX1008, ¶¶408-409. The “location of the mobile station is not exactly known (unless the system contains a locating feature which can determine the location of the mobile within the cell).” *Id.* at 14:54-57, EX1008, ¶410.

Haartsen discloses identifying locations of the mobile station and base station because these locations are known by the network. The MTSO 300 and

base station controller know “[t]he location of these bases and the power levels they are currently using on the considered channel.” EX1005, 13:23-24; 14:46-49; *see* Claim 11, *supra*. EX1013; EX1008, ¶¶411-412.

(1) Element [13.2] Is Also Obvious In View of Tayloe

To the extent Haartsen does not expressly disclose “geolocating the wireless device and the receiver,” Element [13.2] would also have been obvious over Haartsen (and Silventoinen) in view of Tayloe. EX1008, ¶¶425-432. Haartsen contemplates a mobile station “locating feature.” EX1005, 14:54-56; Claim 11, *supra*. EX1008, ¶27. Tayloe teaches “[m]obile unit location may be determined by a host of radiolocation means which vary in their levels of sophistication from radio ranging to global position systems.” EX1011, 3:40-46, EX1008, ¶428. Tayloe teaches locating the position of the mobile unit” by geolocating using, for example, global positioning systems (GPS). EX1011, 3:40-46, EX1008, ¶429.

A POSITA would have been motivated to use Tayloe’s disclosed GPS to geolocate wireless devices and receivers within Haartsen’s system as the “locating feature”. EX1005, 14:54-56, EX1008, ¶430. Such geolocating would have been routine, conventional technology to provide a predictable result with a high degree of success. EX1005, 7:5-28; 10:23-32; 14:33-45; EX1008, ¶430. Geolocating is consistent with Haartsen’s teaching that base station and mobile station geographical locations be utilized to evaluate interference. EX1005, 13:22-30,

14:5-14, EX1008, ¶¶431-432. A POSITA would have implemented geolocating a receiver and wireless device in Haartsen's path loss determinations to attain Haartsen's optimal interference prediction and mobile handoff objectives. *Id.*

c. Element [13.3]

Haartsen discloses Element [13.3], similar to Element [1.3]. *See* Element [1.3], *supra*. EX1005, Figs. 3/5/6/9, 3:45-55, 5:30-6:65. EX1008, ¶¶413-415.

d. Element [13.4]

Haartsen discloses Element [13.4], similar to Element [1.4]. *See* Element [1.4], *supra*. EX1005, Abs. ll. 9-11, 7:44-48. EX1008, ¶¶416-418.

e. Element [13.5]

Haartsen discloses Element [13.5], similar to Element [1.5]. *See* Element [1.5], *supra*. EX1005, 5:51-57, 6:52-53, 6:66-67, 7:40-63, 7:49-55, 7:39-41, 6:26-30. EX1008, ¶¶419-421.

f. Element [13.6]

Haartsen discloses Element [13.6], similar to Element [1.6]. *See* Element [1.6], *supra*. EX1005, 7:4-15, 7:8-65, 8:17-53, 9:15-21, Figs. 5/6. EX1008, ¶¶422-424. Accordingly, Claim 13 is anticipated by Haartsen and is obvious over Haartsen in view of Tayloe.

6. Claim 15

Haartsen discloses the limitations of Claim 15, which are similar to Claim 3. EX1005, 14:28-32, 18:67-19:5; *see* Claim 3, *supra*. EX1008, ¶¶433-436.

7. Claim 20

Haartsen discloses a receiver (*e.g.*, base station or mobile station) is a plurality of receivers each disposed at a different location from each other and different from a location of the wireless device. EX1008, ¶¶437-439.

Haartsen discloses “[t]he network knows, a priori, the distances between base station A and the L, M, and N base stations” EX1005, 14:47-49; see Fig. 3 (*e.g.*, base stations A, B, and C, mobile station A and F); Fig. 9 (base stations A-R), EX1008, ¶440. Each base station and mobile station is “disposed at a different location from each other” and at different locations “from the location of the wireless device” as recited in Claim 20. EX1005, Figs. 3/9, 14:33-60, EX1008, ¶¶441-442. Haartsen states: “a typical system can, and most likely will, include many more base stations and many more mobile stations than shown in this exemplary illustration EX1005, 6:14-22.

8. Claim 21

Haartsen discloses a receiver is a base station or a wireless location sensor or a combination thereof. EX1005, Figs. 5/6, and 5:30-40; 15:2-6, 7:1-30, 9:35-42. *See* Elements [1.2]-[1.5], *supra*; Section VII.A.10, EX1008, ¶¶443-446.

9. Claim 23 (Preamble)

Haartsen’s discloses a system for determining “path loss, calculated as the RSSI divided by the base transmit power” which is “an expression of the

attenuation that a signal will experience as it propagates between the base station and the mobile station.” EX1005, 7:12-15; *see* Claim 1 Preamble, *supra*. EX1008, ¶¶447-451.

a. Element [23.1]

Haartsen discloses a circuitry including a microprocessor (central processing unit (CPU)) and memory for compiling a network database of path loss values. EX1008, ¶¶452-453.

Fig. 12 shows “an exemplary base station controller” having a “CPU 1100” to perform steps of the allocation of channels. EX1005, 18:62-64. The base station controller also includes “memory 1101, in addition to storing current channel allocation assignments, can contain a database including information regarding geographical characteristics.” EX1005, 18:67; 19:1-2; Fig. 3. A “database could be located at the MTSO” or “connected to the base station controller.” EX1005, 19:4; 14:13-14, EX1008, ¶¶454-455.

b. Element [23.2]

Haartsen discloses Element [23.2]. *See* Element [1.1], *supra*. EX1005, 14:34-38; 14:49-53. EX1008, ¶¶456-458.

c. Element [23.3]

Haartsen discloses Element [23.3]. *See* Element [1.2], *supra*. EX1005, 6:51-57; 18:44-47; EX1007, 8:64-67. EX1008, ¶¶459-461.

d. Element [23.4]

Haartsen discloses Element [23.4]. *See* Element [1.3], *supra*. EX1005, Abs. ll. 9-11; 5:31-35; 6:51-57. EX1008, ¶¶462-464.

e. Element [23.5]

Haartsen discloses Element [23.5]. *See* Element [1.4], *supra*. EX1005, Abs. ll. 9-11; 5:9-10; 7:9-11; 9:15-21. EX1008, ¶¶465-467.

f. Element [23.6]

Haartsen discloses Element [23.6]. *See* Element [1.5], *supra*. EX1005, 5:51-57; 6:52-53; 6:66-67. EX1008, ¶¶468-470.

g. Element [23.7]

Haartsen discloses Element [23.7]. *See* Element [1.6], *supra*. EX1008, ¶¶471-473. Haartsen discloses circuitry to determine path loss on a channel based on the transmit power level and the RSSI over the channel between a base station and mobile station. EX1005, 7:8-40; EX1008, ¶¶472-473.

h. Claim 23 is Also Obvious Over Haartsen In View of Stilp, Weaver And Silventoinen

To the extent Claim 23 is not expressly disclosed by Haartsen, Claim 23 would have been obvious over Haartsen in view of Stilp, Weaver, and Silventoinen. EX1008, ¶¶474-475. Stilp, Weaver, and Silventoinen are evidence in support of Haartsen's disclosure. To the extent any combinations or modifications to Haartsen based on these secondary references are deemed necessary, such combinations and

modifications of noted features would have been routine and conventional, yielding predictable results with a high degree of success to improve similar devices (*e.g.*, cellular networks determining path loss) in a manner consistent with Haartsen's disclosure. *See* Sections VII.B.1.g., VII.A.1.g. *supra*; EX1008, ¶¶476-478.

10. Claim 25

Haartsen determines multiple path loss values between a mobile station and multiple base stations throughout a radio communications system and determines path loss values between base station pairs. Haartsen stores the path loss values in a network database. EX1005, 14:28-32; *see* Claim 3, *supra*. EX1008, ¶¶479-483.

11. Claim 26

Haartsen discloses a receiver is a base station. EX1005, Figs. 5/6, and 5:30-40; 15:2-6, 7:1-30, 9:35-42, EX1008, ¶¶484-488. *See* Elements [1.2]-[1.5], *supra*.

Haartsen also discloses mobile stations including a wireless transmitter, radio frequency transmitter, mobile telephone, and/or cellular phone. EX1008, ¶487, Fig. 10.

12. Claim 27

Haartsen discloses base stations (*e.g.*, wireless devices) including a wireless transmitter and/or a radio frequency transmitter. EX1005, 18:44-50; Fig. 11, *see* Claim 6, *supra*. EX1008, ¶¶489-493.

VIII. OTHER CONSIDERATIONS

A. Secondary Considerations

Petitioner is not aware of any secondary considerations evidence bearing any nexus to the purported claimed invention. Any such evidence Owner may present in this proceeding would be insufficient to overcome the strong evidence of obviousness of the Challenged Claims. EX1008, ¶¶494-496. Such evidence is also irrelevant as it concerns the anticipation of any claim.

B. Discretion to Institute

1. The Board should not deny this Petition under §314(a)

The '264 Patent has not been challenged in any prior AIA trial proceeding, and this Petition is not a “follow-on” petition. Events in Related Litigation do not warrant denial, and application of the *Fintiv* factors weighs against discretionary denial.

a. Factor 1: Whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted

The Related Litigation is ongoing and Petitioner will seek a pre-institution stay. At worst, this factor is neutral because the Board has declined to predict whether the district court will stay the related litigation. *Sand Revolution II v. Continental Intermodal Group-Trucking LLC*, IPR2019-01393, Paper 24 at 7 (PTAB June. 16, 2020); *Apple Inc. v. Parus Holdings*, IPR2020-00686, Paper 9 at 10 (Sept. 23, 2020).

b. Factor 2: Proximity of the court’s trial date to the Panel’s projected statutory deadline for a final written decision

“The PTAB will weigh this factor against exercising discretion to deny institution under Fintiv if the median time-to-trial is around the same time or after the projected statutory deadline for the PTAB's final written decision.” Katherine K. Vidal, *Interim Procedure for Discretionary Denials in AIA-Post Grant Proceedings with Parallel District Court Litigation*, USPTO, at 8-9 (June 21, 2022). Such is the case here and trial has not yet been scheduled. Thus, this factor favors institution or at worst is neutral. *See Microsoft Corporation v. D3D Technologies, Inc.*, IPR2021-00703, Paper 10 at 12 (PTAB Oct. 12, 2021) (concluding that although the final written decision is projected to issue about a month after the trial date, *Fintiv* Factor 2 is neutral); *Laboratory Corporation of America Holdings v. Ravgen, Inc.*, IPR2021-01054, Paper 11 at 17 (Nov. 5, 2021) (“Given the present uncertainty on this record about when trial in the district court might occur for the Labcorp lawsuit, we determine that this factor does not weigh in favor of discretionary denial.”).

c. Factor 3: Investment in the parallel proceeding by the court and the parties

Discovery in the Related Litigation is ongoing. The parties have exchanged preliminary infringement disclosures, invalidity contentions, and opening expert reports. Contention discovery has been completed; however expert discovery is

incomplete. A Markman order issued on July 19, 2023 (EX1028), which only marginally, if at all, weighs in favor of denial. *See Fintiv*, Paper 15 at 14-15 (finding that a *Markman* order, completed contention discovery, incomplete expert discovery and lack of substantive motion practice weighted somewhat in favor of denying institution); *Sand Revolution II*, Paper 24 at 11 (holding that *Fintiv* Factor 3 weighs only marginally, if at all, in favor of exercising discretion to deny institution.).

Petitioner's diligence in filing its Petition outweighs any investment. *See Fintiv* at 11 ("If the evidence shows that the petitioner filed the petition expeditiously ... this fact has weighed against [denial]"). The preliminary identification of asserted claims occurred on March 27, 2023, which was subsequently amended on May 10, 2023 to add claims 13, 15-17, and 20 and further amended on June 12, 2023. Petitioner filed its Petition less than three months after being made aware of the full set of asserted claims. *Dish Network LLC v. Broadband iTV, Inc.*, IPR2020-01332, Paper 14 at 29 (Jan. 27, 2021) (finding that Petitioner diligently filed its Petition less than three months after receiving Owner's full set of asserted claims). This factor is neutral.

d. Factor 4: Overlap between issues raised in the petition and in the parallel proceeding

Petitioner has not filed a stipulation in Related Litigation. However, Petitioner reserves the right to file such a stipulation based on the contents of Owner's Preliminary Response.

e. Factor 5: Whether the petitioner and the defendant in the parallel proceeding are the same party

Petitioner is the defendant in the district court proceeding and "it is far from an unusual circumstance that a petitioner in *inter partes* review and a defendant in a parallel district court proceeding are the same" *Sand Revolution II*, IPR2019-01393, Paper 24 at 12-13. This factor is neutral.

f. Factor 6: Other circumstances that impact the Panel's exercise of discretion, including the merits

"[W]here the PTAB determines that the information presented at the institution stage presents a compelling unpatentability challenge, that determination alone demonstrates that the PTAB should not discretionarily deny institution under Fintiv". Interim Procedure at 4-5. Such is the case here. It is highly likely that Petitioner would prevail with respect to at least one challenged claim for the reasons explained in the above Grounds, and this favors institution under *OpenSky*. Thus, trial should be instituted given the compelling merits.

2. The Board should not deny this Petition under §325(d)

The factors recited in *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 at 17 (PTAB Dec. 15, 2017) (precedential) weigh in favor of institution. *Id.* at 4. In the present Petition substantially different prior art and arguments not considered by the USPTO during prosecution warrant institution.

3. Becton Factors (a) through (f) weigh in favor of institution

Arguments presented by Petitioner address material error of the original prosecution's failure to consider material, non-cumulative prior art relied upon herein. Almgren, Haartsen, Silventoinen, Weaver and Tayloe were never previously considered by the USPTO and are non-cumulative, material prior art as discussed herein.

Stilp was cited in an IDS during prosecution and was indicated as being considered by the Examiner on July 2, 2010. EX1002, p.376. However, Stilp was not fully appreciated and relied upon in any rejection. Overlooked citations from this prior art in the new combinations set forth in this Petition, raise unpatentability issues that warrant institution. *REG Synthetic Fuels, LLC v. Neste Oil, Oyj*, IPR2018-01374, Paper 11 (PTAB Feb. 19, 2019) (explaining, "it is unclear to what extent the reference was evaluated during examination, as we cannot draw any particular inference from the mere inclusion of the reference on an Information Disclosure Statement.").

IX. CONCLUSION

Petitioner has shown a reasonable likelihood of success. This Petition should be granted and the Board should institute trial.

Date: August 9, 2023

Respectfully submitted,

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APPENDIX A - LIST OF EXHIBITS

Exhibit No.	Description
1001	U.S. Patent No. 8,320,264, issued on November 27, 2012 (“the ’264 Patent”)
1002	File History of U.S. Patent Application No. 11/920,076, filed on December 15, 2008 (“the ’076 Application”)
1003	U.S. Provisional Application No. 60/681,475, filed on May 17, 2005
1004	U.S. Patent No. 6,137,993, issued on October 24, 2000 to M. Almgren and M. Frodigh (“Almgren”)
1005	U.S. Patent No. 5,491,837, issued on February 13, 1996 to J. Haartsen (“Haartsen”)
1006	U.S. Patent No. 6,498,932, issued on December 24, 2002 to M. Silventoinen and H. Posti (“Silventoinen”)
1007	U.S. Patent No. 6,184,829, issued on February 6, 2001 to L. Stilp (“Stilp”)
1008	Declaration of David Hilliard Williams
1009	<i>Curriculum Vitae</i> of David Hilliard Williams
1010	U.S. Patent No. 5,917,811, issued on June 29, 1999 to L. Weaver <i>et al.</i> (“Weaver”)
1011	U.S. Patent No. 5,023,900, issued on June 11, 1991 to D. Tayloe <i>et al.</i> (“Tayloe”)
1012	Complaint dated November 22, 2022, <i>Geoscope Technologies Pte. Ltd. v. Google LLC f/k/a Google Inc.</i> , Civ. Action No. 1:22-cv-01331 (EDVA) filed on November 22, 2022 (the “Related Litigation”)
1013	Preliminary Identification of Asserted Claims dated March 27, 2023, <i>Geoscope Technologies Pte. Ltd. v. Google LLC f/k/a Google Inc.</i> , Civ. Action No. 1:22-cv-01331 (EDVA) filed on November 22, 2022

Petition for *Inter Partes* Review of U.S. Patent No. 8,320,264

Exhibit No.	Description
1014	U.S. Patent Application Publication No. 2005/0271012, published on December 8, 2005 to A. Agrawal <i>et al.</i> (“Agrawal”)
1015	U.S. Patent Application Publication No. 2002/0172160, published on November 21, 2002 to T. Mouldsley (“Mouldsley”)
1016	U.S. Patent Application Publication No. 2002/0172223, published on November 21, 2002 to L. Stilp
1017	U.S. Patent No. 6,751,187, issued on June 15, 2004 to J. Walton and J. Ketchum (“Walton”)
1018	U.S. Patent No. 6,522,888, issued on February 18, 2003 to J. Garceran <i>et al.</i> (“Garceran”)
1019-1022	<i>Not Assigned</i>
1023	Stipulation Regarding Agreed Upon Claim Constructions dated May 23, 2023, <i>Geoscope Technologies Pte. Ltd. v. Google LLC f/k/a Google Inc.</i> , Civ. Action No. 1:22-cv-01331 (EDVA) filed on November 22, 2022
1024	Plaintiff Geoscope Technologies PTE. LTD.’s Opening Claim Construction Brief dated May 26, 2023, <i>Geoscope Technologies Pte. Ltd. v. Google LLC f/k/a Google Inc.</i> , Civ. Action No. 1:22-cv-01331 (EDVA) filed on November 22, 2022
1025-1027	<i>Not Assigned</i>
1028	Claim Construction Memorandum Opinion & Order dated July 19, 2023, <i>Geoscope Technologies Pte. Ltd. v. Google LLC f/k/a Google Inc.</i> , Civ. Action No. 1:22-cv-01331 (EDVA) filed on November 22, 2022

CERTIFICATE OF COMPLIANCE WITH 37 C.F.R. §42.24

The undersigned hereby certifies that the foregoing Petition totals 13,859 words, excluding the parts which are exempted by 37 C.F.R. §42.24(a)(1).

Date: August 9, 2023

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that on this 9th day of August, 2023, a true and correct copy of the foregoing **PETITION FOR *INTER PARTES* REVIEW FOR U.S. PATENT NO. 8,320,264 and EXHIBITS 1001-1018, 1023, 1024, and 1028**, are being served via overnight UPS on the correspondence address of record* for **U.S. Patent No. 8,320,264** as follows:

Duane Morris LLP
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**Duane Morris LLP is no longer located at 505 9th Street, N.W., Suite 1000, Washington, DC 20004. Counsel for Petitioner is serving these papers to the current address noted above and confirmed upon contacting Duane Morris.*

and a courtesy copy is being served to Patent Owner's litigation counsel as follows:

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