IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF WISCONSIN

NOKIA CORPORATION, Plaintiff, v. APPLE INC., Defendant.	CIVIL ACTION NO. 10-CV-249
APPLE INC., Counterclaim-Plaintiff, v. NOKIA CORPORATION and NOKIA INC., Counterclaim-Defendants.	

APPLE INC.'S MEMORANDUM IN SUPPORT OF ITS MOTION FOR CLAIM CONSTRUCTION OF CERTAIN DISPUTED TERMS

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I. INTRODUCTION

This brief addresses the disputed claim terms of six patents asserted by Apple Inc. ("Apple") against Nokia Corporation ("Nokia"): United States Patent Nos. 5,946,647; 5,612,719; 7,380,116; 7,054,981; 5,379,430; 7,760,559 (collectively, "the Apple patents").[1] The Apple patents teach and claim a range of innovations that have created user-friendly computer and mobile experiences, providing seamless integration between computers and mobile devices, as well as innovative circuit design. These technologies have contributed to Apple's cutting-edge and immensely popular consumer electronics products, including the iPhone, the iPod, and the iPad. Nokia contends that five terms in six of Apple's patents require construction, and two terms are incapable of construction because they are indefinite. But the terms are not indefinite and only one requires construction; the rest should be given their plain and ordinary meanings.

This brief also addresses the disputed claim terms of six patents asserted by Nokia against Apple: United States Patent Nos. 6,317,083; 6,348,894; 6,603,431; 7,558,696; 7,532,680; and 5,752,172 (collectively, "the Nokia patents"). Nokia seeks to treat the claims of its patents as so malleable that they can extend to cover Apple's fundamentally different products. The law has long prohibited this: "A patentee may not proffer an interpretation for the purposes of litigation that would alter the indisputable public record consisting of the claims, the specification, and the prosecution history, and treat the claims as a 'nose of wax.'" *Southwall Techs., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1578 (Fed. Cir. 1995).

Apple and Nokia pursue two fundamentally different approaches to claim construction: Apple adheres to the plain and ordinary meaning of claim terms expressed in plain and ordinary language, and (to the extent necessary) seeks constructions of complicated technical terms that

[1] The patents are referred to by the final three digits of their number. The parties do not request construction of any terms in U.S. Patent Nos. 7,710,290 or 6,373,345. Apple expressly reserves the right to seek construction of additional terms prior to trial.

are true to the intrinsic evidence—the claim language, specifications, file histories—and applicable extrinsic evidence. Nokia proposes constructions that depart from these guideposts of claim interpretation. The law requires construing claims in accordance with the intrinsic evidence and relevant extrinsic evidence, and that is what Apple has done.

II. THE LAW OF CLAIM CONSTRUCTION

To construe a patent claim term, the Court should consider the claim language, specification, and prosecution history. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (*en banc*). This "intrinsic record" is the most important source of evidence in claim construction. *See e.g.*, *Bell & Howell Document Mgmt. Prods. Co. v. Altek Sys.*, 132 F.3d 701, 706 (Fed. Cir. 1997). "The touchstone for discerning the usage of claim language is the understanding of those terms among artisans of ordinary skill in the relevant art at the time of invention." *Home Diagnostics, Inc. v. LifeScan, Inc.*, 381 F.3d 1352, 1355 (Fed. Cir. 2004).

Claim Language

"[T]he words of a claim 'are generally given their ordinary and customary meaning.'" *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (*en banc*) (citing *Toro Co. v. White Consol. Indus., Inc.*, 199 F.3d 1295, 1299 (Fed. Cir. 1999) ("[T]he general rule [is] that words in patent claims are given their ordinary meaning in the usage of the field of the invention, unless the text of the patent makes clear that a word was used with a special meaning.")). "[A] determination that a claim term 'needs no construction' or has the 'plain and ordinary meaning,' however may be inadequate when a term has more than one 'ordinary' meaning or when reliance on a term's 'ordinary' meaning does not resolve the parties' dispute." *O2 Micro Int'l Ltd. v. Beyond Innovation Tech.*, 521 F.3d 1351, 1361 (Fed. Cir. 2008).

The Specification

"Claims must be read in view of the specification, of which they are a part." *Markman*, 52 F.3d at 979; *see also Phillips*, 415 F.3d at 1315. The specification "may act as a sort of dictionary, which explains the invention and may define terms used in the claims." *Markman*, 52 F.3d at 979. In addition, "the specification is always highly relevant to the claim construction analysis …. [and] is the single best guide to the meaning of a disputed term." *Vitronics Corp. v. Conceptronic Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996).

The Court, however, should not "import limitations" into claims from the specification by "confining claims to [particular] embodiments." *Phillips*, 415 F.3d at 1323; *Innogenetics, N.V. v. Abbott Labs.*, 512 F.3d 1363, 1370 (Fed. Cir. 2008) ("[T]his court will not at any time import limitations from the specification into the claims . . .." (quotation marks and citation omitted)).

The Prosecution History

The prosecution history is the "'undisputed public record'" of the Patent Office proceedings and "is of primary significance in understanding the claims." *Markman*, 52 F.3d at 980 (quoting *Autogiro Co. of Am. v. United States*, 384 F.2d 391, 397 (Ct. Cl. 1967)); *see also Phillips*, 415 F.3d at 1317. Contributing to the understanding of the claims are statements made during reexamination and reissue proceedings, which also become part of the prosecution history and are relevant for interpreting the claims. *Cordis Corp. v. Medtronic AVE, Inc.*, 339 F.3d 1352, 1359-60 (Fed. Cir. 2003); *E.I. du Pont de Nemours & Co. v. Phillips Petroleum Co.*, 849 F.2d 1430, 1439 (Fed. Cir. 1988).

Extrinsic Evidence

Courts also may consider "extrinsic" evidence, such as expert testimony, dictionaries, and learned treatises, to ascertain how a skilled artisan would have understood claim terms. *See*

Markman, 52 F.3d at 980; *Phillips*, 415 F.3d at 1317. Although extrinsic evidence carries less weight than intrinsic evidence, it may be useful "because extrinsic evidence can help educate the court regarding the field of the invention and can help the court determine what a person of ordinary skill in the art would understand claim terms to mean, it is permissible for the district court in its sound discretion to admit and use such evidence." *Phillips*, 415 F.3d at 1319.

Means-Plus-Function Claims

A patent may describe a particular element in a so-called "means-plus-function" format, meaning that the claim describes what the particular element does (its function) rather than how it is made (its structure). *See* 35 U.S.C. § 112, ¶ 6. If the means-plus-function format is used, special rules for claim construction apply (discussed in detail below in connection with Nokia's means-plus-function claims in Nokia's patents).

III. THE NOKIA PATENTS

A. United States Patent No. 7,558,696

1. The Technology of the '696 Patent

The '696 patent claims a method and device for position determination, using a "position method selection device." (Dkt. No. 43-2, '696 patent, Abstract and col. 2:13-21.) When Nokia filed the '696 patent application, multiple positioning methods—including Global Positioning Systems ("GPS"), cellular positioning methods, Enhanced Observed Timing Difference ("E-OTD"), and Time of Arrival ("TOA")—had been integrated into a variety of electronic devices to allow users to determine their geographical location. (See Dkt. No. 43-2, '696 patent, col. 1:3-19.) As mobile devices became more sophisticated, multiple software applications would have a need for the positioning information provided by these positioning methods. (*Id.* at col. 1:57-2:9.) The "position method selection device" described in the patent "manages and controls the

use of the various positioning methods by the applications and ensures that the positioning data provided corresponds as closely as possible with the quality requirements specified by the user and/or the application." (*Id.* at col. 2:33-39.) The "position method selection device" performs this function through a controller (such as a central processing unit or CPU) with a "decision-making algorithm" that selects, for each application, a positioning method whose parameter(s) correspond best with the parameter(s) requested by the application or the user. (*Id.* at col. 2:14-18; col. 8:61-11:49; *see also* Claims 1, 3, 5 and 9.)

By way of background, electronic devices into which position determining systems can be integrated often comprise several common components, including a processor for performing various functions and operations. Specifically, electronic devices may contain a processor that executes software, which represents a series of instructions, wherein each instruction tells the processor to perform a certain task. Often, the manner in which a processor performs each task depends on the value of one or more parameters or data. These parameters may be contained in registers—which are small data storage devices—that a processor accesses when it executes software.

By grouping a series of software instructions together in a particular way, a processor can perform a series of tasks called an "algorithm" or "routine." Algorithms and routines can be grouped together to form more complicated and intricate functions and operations in an "application." A mobile device may contain several applications that a processor can execute to provide additional functionality to the user, and some of these applications (e.g., GPS) may evaluate positioning information to determine the location of the mobile phone.

2. Disputed Claim Terms

a. "position method selection device"

Apple's Construction	Nokia's Construction
This term is governed by 35 U.S.C. § 112 ¶ 6. The claimed function is to centrally manage a use of one or more positioning methods for more than one application. The corresponding structure disclosed in the specification is a device that includes an interface to two or more applications; an interface to two or more positioning methods; a register that stores parameters provided by the applications or the user describing the quality of the positioning data requested, and that stores parameters provided by the positioning methods describing the quality of the positioning data provided; and a controller that implements a decision-making algorithm. The decision-making algorithm selects, for each application, a positioning method whose parameter(s) correspond best with the parameter(s) requested by the application or the user.	an interface between applications and one or more positioning methods which centrally manages the use of said one or more positioning methods

The primary dispute between the parties for the '696 patent is whether the "position method selection device"—which includes the generic term "device"—is a means-plus-function limitation. Under applicable Federal Circuit law, because the term does not connote any structure, it must be construed as a means-plus-function limitation under 35 U.S.C. § 112 ¶ 6. Apple's proposed construction does so, while Nokia's does not.

Means-Plus-Function Claim Terms. A patent may describe a claim element in "means-plus-function" format, meaning that the claim describes what the particular element does (its function) rather than how it is made (its structure). *See* 35 U.S.C. § 112, ¶ 6 ("[A]n element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof."). If a claim uses means-plus-function format, the "means" element must be construed to cover the "corresponding

structure, material or acts described in the specification" and equivalents. *Id.* This statutory rule prevents a patentee from simply defining a claim element by its function, without also providing the structure or process that performs this function. *Blackboard, Inc. v. Desire2Learn, Inc.*, 574 F.3d 1371, 1383 (Fed. Cir. 2009).

The Federal Circuit has repeatedly recognized that the "generic terms 'mechanism,' 'means,' 'element,' and '***device***,' typically do not connote sufficiently definite structure" to avoid means-plus-function treatment. *Mass. Inst. of Tech. v. Abacus Software*, 462 F.3d 1344, 1354 (Fed. Cir. 2006) (emphasis added); *see also Welker Bearing Co. v. PhD, Inc.*, 550 F.3d 1090, 1096 (Fed. Cir. 2010). Although § 112 ¶ 6 presumptively applies only when a claim uses the word "means," that presumption is rebutted where, as here, a claim term recites a function without reciting sufficient structure for performing that function. *Mass. Inst. of Tech.*, 462 F.3d at 1354; *see also Watts v. XL Sys.*, 232 F.3d 877, 880 (Fed. Cir. 2000). A claim recites sufficient structure only when the words of the claim would be recognized as the name of a structure to a person of ordinary skill in the art. *Mass. Inst. of Tech.*, 462 F.3d at 1354 ("colorant selection mechanism" construed as a means-plus-function limitation because "it does not connote sufficient structure to a person of ordinary skill in the art").

Because "device" is a "nonce" term that conveys no structure, courts have consistently construed terms like "position method selection device" as means-plus-function. *See, e.g.*, *Invention AG v. Thyssenkrupp Elevator Americas Corp.*, 2010 U.S. Dist. LEXIS 59020, at *26-27 (D. Del. June 15, 2010) ("modernizing device" construed as means-plus-function because it recited "function without providing a sufficient structure for performing that function."); *Widevine Techs, Inc. v. Verimatrix, Inc.*, 2009 U.S. Dist. LEXIS 102768, at *40-41 (E.D. Tex. Nov. 4, 2009) ("first device" and "second device" construed as means-plus-function because

claim provided "no structural context," requiring person skilled in art to "turn to the patent's specification to derive a structural connotation.") (internal citations omitted); *Aguayo v. Universal Instruments Corp.*, 2003 U.S. Dist. LEXIS 27846, at *53-54 (S.D. Tex. June 10, 2003) ("disabling device that disables . . . after loading" and "disabling device that disables . . . at the beginning of a loading operation" construed as means-plus-function; "[t]here are no . . . dictionary definitions connoting structure for the term 'device' or 'disabling device.'").

Although claim language that further defines a generic term like "device" can sometimes add sufficient structure to avoid means-plus-function treatment, there is no such language here. The term "position method selection," which modifies "device," is purely functional. Like the "colorant selection mechanism" in issue in *Massachusetts Institute of Technology*, "position method selection device" does not recite ***any*** structure, much less "sufficient structure" for purposes of claim construction. "Position method selection" does not have a dictionary definition. Nor does it have an understood meaning to persons skilled in the art, let alone an understood meaning that would convey structure. (Braasch Decl. at ¶ 10.) Therefore, the term is a means-plus-function limitation subject to construction under § 112 ¶ 6. *See Mass. Inst. of Tech.*, 462 F.3d at 1354 ("colorant selection" which modified "mechanism" did not connote structure to a person of skill in the art because it was not defined in specification, had no dictionary definition, and there was no suggestion that it had a generally understood meaning in the art).

Relevant Function and Structure. Construing a means-plus-function term under § 112 ¶ 6 is a two-step process. *JVW Enters. v. Interact Accessories, Inc*., 424 F.3d 1324, 1330 (Fed. Cir. 2005). The first step is to "identify the claimed function, staying true to the claim language and the limitations expressly recited by the claims." *Omega Eng'g, Inc. v. Raytek Corp*., 334

F.3d 1314, 1321 (Fed. Cir. 2003) (citations omitted). Here, the claims of the '696 patent expressly recite the claimed function of the "position selection method device" as "centrally manag[ing] a use of one or more positioning methods" for "more than one application." (Dkt. No. 43-2, '696 patent, *e.g.*, claims 1, 3, 5, and 9.)

The second step in construing a means-plus-function term is to "identify the corresponding structure that performs that function." *JVW*, 424 F.3d at 1330. "[I]n order to qualify as corresponding structure, the structure must not only perform the claimed function, but the specification must clearly associate the structure with performance of the function." *Id.* at 1330 n.1 (internal quotation marks and citation omitted).

In cases like this one, where a patent claims a computer-implemented invention with means-plus-function elements, the particular structure disclosed in the specification must be more than a general purpose computer microprocessor. *See Aristocrat Techs. Austl. Pty Ltd. v. Int'l Game Tech.*, 521 F.3d 1328, 1333 (Fed. Cir. 2008) (Federal Circuit "consistently require[s] that the structure disclosed in the specification be more than simply a general purpose computer or microprocessor"). More specifically, "the disclosed structure is not the general purpose computer, but rather the special purpose computer programmed to perform the disclosed algorithm." *WMS Gaming, Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1349 (Fed. Cir. 1999); *see also Harris Corp. v. Ericsson Inc.*, 417 F.3d 1241, 1253 (Fed. Cir. 2005) ("A computer-implemented means-plus-function term is limited to the corresponding structure disclosed in the specification and equivalents thereof, and the corresponding structure is the algorithm.").

In the '696 patent, the "position method selection device" that performs the claimed function includes an interface to two or more applications (Dkt. No. 43-2, '696 patent, col. 5:51-57); an interface to two or more positioning methods (*id.* at col. 5:58-64); a register that stores

parameters provided by the applications or the user describing the quality of the positioning data requested, and that stores parameters provided by the positioning methods describing the quality of the positioning data provided (*id.* at col. 6:6-26); and a controller that implements a "decision-making algorithm." (*Id.* at col. 6:3-5.)

Specifically, as described in conjunction with Fig. 1, the application interface 109 and the position method interface 110 are necessary to connect the applications and the positioning methods to the position method selection device. (*Id.* at col. 5:52-64.) Furthermore, the registers are needed to store parameters relating to the positioning accuracy requested by the applications (QoP REQ 114) (*id.* at col. 6:6-10); the expected quality of the positioning data provided by the positioning methods (QoP EXP 115) (*id.* at col. 6:16-22); the default values for the parameters representing the quality of the positioning data (QoP DEF 116) (*id.* at col. 6:27-35); and the actual quality of the positioning data provided by the positioning methods (QoP ACT 117) (*id.* at col. 6:36-40). The controller 111 is the key component of the position method selection device, and uses these parameters to execute the "decision-making algorithm" to select the appropriate positioning methods for the applications, thereby centrally managing the use of the positioning methods for the application. (*Id.* at Fig. 4; col. 8:1-6; col. 8:63-9:3; col. 9:26-10:58).

It is this "decision-making algorithm" that performs the actual position method selection. (*Id.* at col. 8:61-62.) The algorithm selects, for each application, a positioning method whose parameter(s) correspond best with the parameter(s) requested by the application or the user. (*Id.* at col. 8:61-11:49 (details of algorithm).)

Nokia's Proposed Construction. Nokia asks the Court to construe "position method selection device" as simply "an interface" between applications and one or more positioning methods. This construction not only ignores that "position method selection device" is a means-

plus-function limitation, but also impermissibly broadens the scope of the invention, and disregards and contradicts the specification.

Nokia's proposed construction finds no support in the claim language. The word "interface" does not appear in any of the claims of the '696 patent. Instead, Nokia chose to claim a functional component—a "position method selection device"—rather than "an interface."

Moreover, Nokia's proposed construction is flatly inconsistent with the specification. Although the "position method selection device" described in the specification ***includes*** interfaces to the applications and the positioning methods, the primary feature of the device is the controller that executes the "decision-making" algorithm:

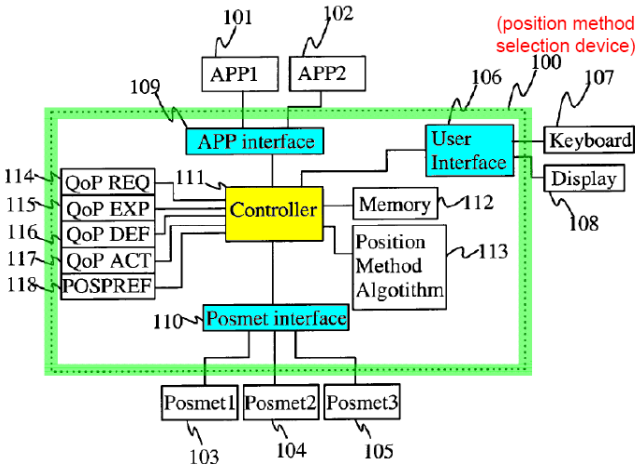


Fig. 1

(*See* Dkt. No. 43-2, '696 patent, Fig. 1.)[2] The specification consistently uses the word "interface" to describe ***components*** of the "position method selection device"—as opposed to the device itself. (*See, e.g.*, *id.* at col. 5:39-64, col. 5:52-53, col. 5:58-59, col. 5:48-50). The specification thus confirms that Nokia knew the distinction between a "device" and an "interface," and chose not to use the term "interface" in any of the '696 patent claims.

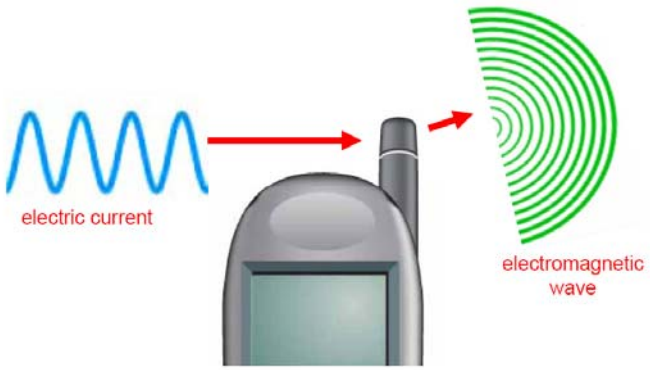
[2] Color shading and color annotations have been added to patent figures to call out their features.

Construction of "position method selection device" is necessary to resolve a disputed issue concerning infringement. The accused products do not have the structure disclosed in the specification or an equivalent structure, as required for infringement under § 112 ¶ 6. Further, because the concepts involved in the patent are difficult to fully describe in writing and are more efficiently addressed with demonstrative presentations, and because the parties would benefit from the opportunity to answers any questions from the Court, Apple respectfully requests a claim construction hearing to address it.

B. United States Patent No. 6,603,431

1. Background of Antenna Technology[3]

When two devices are connected by a wire, an electric current can pass signals back and forth between them, allowing the devices to communicate. However, devices cannot communicate wirelessly using electric current, because current generally cannot travel through the air. Before a signal can be sent wirelessly, it must be transformed from a current into an electromagnetic wave, which can travel through the air.



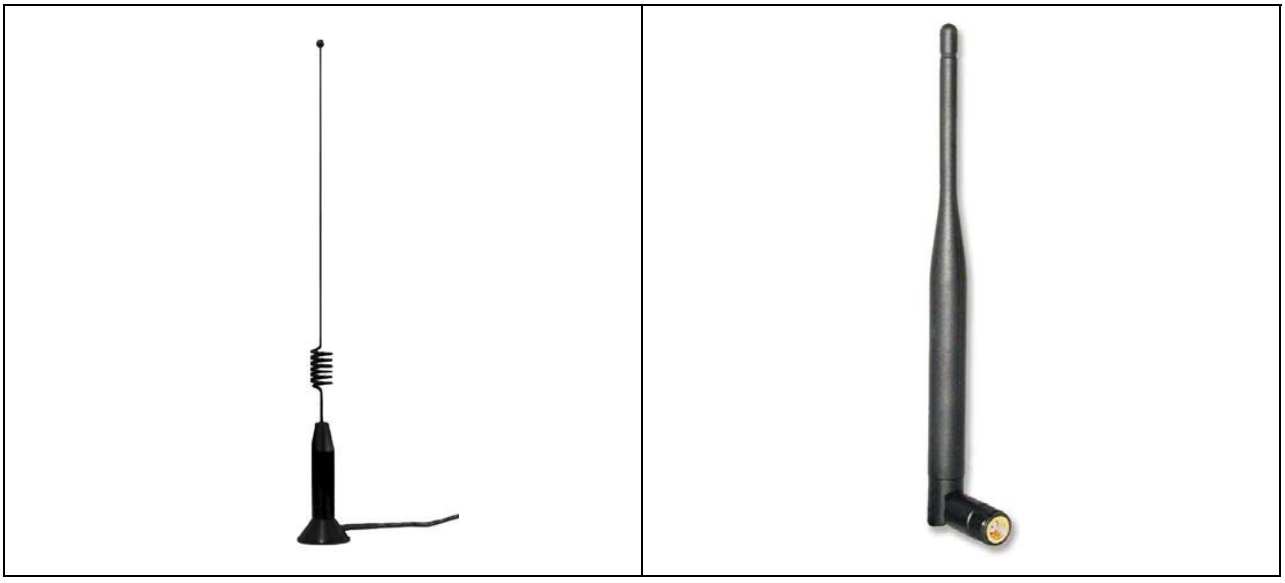
An antenna is a device that converts current into electromagnetic waves to send signals, and converts electromagnetic waves into current to receive signals. Based on a concept known as reciprocity, if a given current causes the antenna to transmit an electromagnetic wave, that

[3] This background explains concepts relevant to the three Nokia patents related to antennas—the '431 patent, the '894 patent, and the '083 patent. . (See Portney Decl. Ex. L, Sievenpiper Decl. at ¶¶ 11-18.)

same wave when received by the antenna will generate the same current. Thus, antennas work the same way regardless of whether they are transmitting or receiving.[4]

Generally, any alternating electric current that is not contained within a cable or other "waveguide" will generate electromagnetic waves as radiation. A cable or waveguide acts as a transmission line to transport the signal from the source to an antenna, where the signal can be released. To generate electromagnetic waves that will carry a signal through the air, the signal travels through the cable or waveguide to the antenna structure in the form of alternating electric current, where the signal is released—or "radiated"—by the antenna structure into the air in the form of electromagnetic waves. The shape, size, and configuration of the antenna structure determine the frequencies at which the antenna is capable of radiating.

Antennas come in many different forms. One well-known structure is the "whip" antenna, illustrated below, which is common on automobiles and older mobile phones.

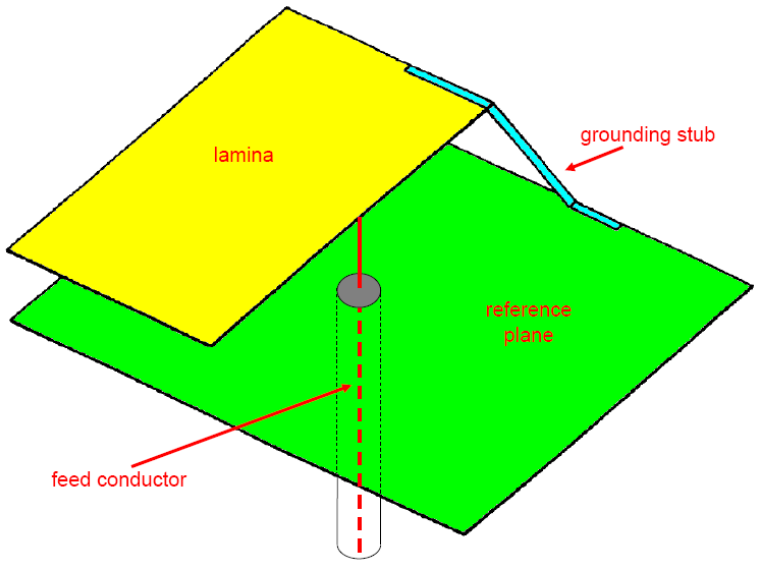


When mobile devices (such as mobile phones) use whip antennas, these antennas are typically external to the device. A whip antenna includes a stiff (often retractable) vertical wire.

[4] The discussion of antenna functionality below will focus on antenna structures when in the transmit mode. Under the principle of reciprocity, this discussion is equally applicable to such structures when in the receive mode.

In addition to the wire, a whip antenna also includes a "ground plane." A "ground plane"—sometimes called a "reference plane"—is a structure that interacts with the wire antenna to allow for the release of a signal from the antenna.

But not all antennas use stiff vertical wires. Another type of antenna common in mobile phones is often described as a planar antenna, one example of which is illustrated below:



Instead of a wire, a planar antenna includes a plate of metal (lamina) suspended over the reference plane. This metal plate goes by many different names, including "lamina," "resonating region," "resonator," or "radiating sheet." In other contexts (including in the '431 patent), the metal plate is itself referred to as the "antenna," while other terms such as "antenna assembly" are used to describe the overall antenna structure, including the lamina ("antenna"), ground plane, and other components.

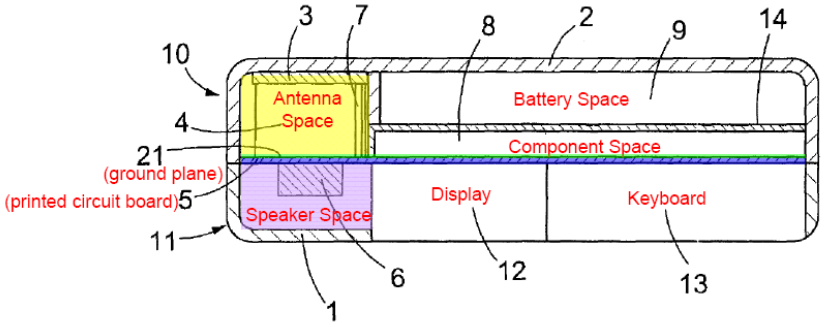
2. The Technology of the '431 Patent

The '431 patent concerns the location of an integrated planar antenna assembly within a mobile phone. The specification of the '431 patent describes the basic prior art "antenna assembly" as having three parts: the "antenna" (i.e., the metal sheet or "lamina"), the "ground

plane," and a "raising component." (*See, e*.g., Dkt. No. 43-5, '431 patent, col. 3:22-25.) As was well known in the prior art, in a planar antenna, the farther apart the antenna and the ground plane are, the better the performance of the antenna will be. (*See, e.g.*, *id.* at col. 1:55-58.) Accordingly, the third component of the claimed "antenna assembly"—the "raising component"—separates the antenna from the ground plane. (*Id.* at col. 1:50-53.)

The '431 patent concerns dividing up the area within a mobile phone into discrete modules or "spaces." (*See id.* at col. 2:14-19.) The supposed invention of the '431 patent is placing an internal antenna arrangement in the same space as the phone's speaker, while excluding the phone's circuit board from this space. (*See, e.g. id.* at col. 2:25-28 ("An essential idea of the invention is that the spaces used by the antenna and speaker of the [phone] are combined and that the antenna is higher than the space between the back cover and the circuit board in the [phone].").)

Older and larger mobile phones—like those described in the '431 patent—were traditionally divided into discrete modules or "spaces." The '431 patent describes and illustrates six such "spaces": (i) an "antenna space"; (ii) a "speaker space"; (iii) a "component space" for the components on the circuit board; (iv) a display space for the screen; (v) a keyboard space; and (vi) a "battery space." (*Id.* col. at 3:13-45 & Fig. 1):



Prior Art
Fig. 1

In this "well-known" prior art configuration, the antenna ground plane 21 (shown in green) sits on the circuit board 5 (shown in blue) and extends into the antenna assembly space. (*Id.* at col. 2:27-28.)

The purported invention of the '431 patent is to combine the speaker and antenna spaces by shortening the circuit board, and moving the antenna's ground plane from the main circuit board to the bottom of this speaker/antenna assembly space. (*Id.* at col. 3:63-67.)

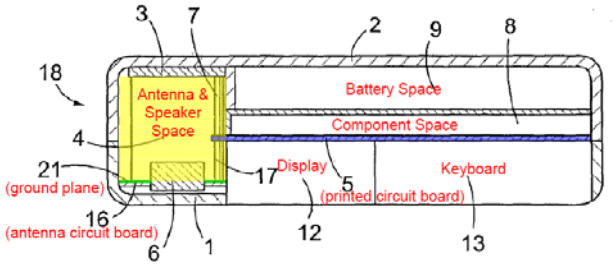


Fig. 2

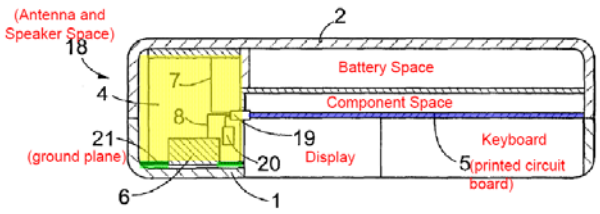


Fig. 3

In the configuration of the '431 patent, the circuit board is shorter and does not extend into the antenna assembly space. (*Id.* at col. 4:3-5.) Because the circuit board is no longer in the antenna assembly space, the ground plane (which is part of the antenna assembly) cannot sit on the circuit board. Instead, the '431 patent describes the ground plane 21 for the claimed "antenna assembly" sitting on a separate "antenna circuit board 16" located inside the "antenna assembly space." In the embodiment of Figure 3, the ground plane 21 is a separate element, not on any circuit board.

3. Disputed Claim Term

a. "antenna assembly space" / "space"

Apple's Construction	Nokia's Construction
space that contains the antenna assembly (antenna, ground plane, and raising component)	no construction necessary

Apple's proposed construction of "antenna assembly space" in claim 1 and "space" in claim 6 makes clear that the claimed space contains the parts of the antenna assembly: the antenna, its ground plane, and the raising component. Nokia would not construe the term at all, leaving an ambiguity as to the "space" in which the claimed antenna assembly is contained, and into which the circuit board cannot extend. Proper construction of this term is necessary to prevent Nokia from reading the '431 patent onto more advanced products—such as the accused products—which no longer have separate "antenna assembly" and "circuit board" spaces.

The claim language, the specification, and the prosecution history all support Apple's proposed construction. Claim 1 of the '431 patent requires "an antenna assembly space defined as part of said overall space, wherein said antenna assembly is mounted." (Dkt. No. 43-5, '431 patent, col. 5:14-15.) By defining the antenna assembly space to include "***said*** antenna assembly," the claim refers back to the earlier use of the phrase "antenna assembly" in the preamble of the claim. *See, e.g.*, *Intamin, Ltd. v. Magnetar Techs., Corp.*, 483 F.3d 1328, 1333 (Fed. Cir. 2007) ("The use of the word 'said' in a claim refers to an earlier use of the term in the claim."). In the preamble to the claim, the "antenna assembly" is described as including "an antenna ground plane[,] an antenna, and an antenna raising component." (Dkt. No. 43-5, '431 patent, col. 5:8-10.)[5] Thus, according to the claim language itself, the "antenna assembly space" contains the "antenna assembly," which in turn includes: (1) an "antenna," (2) its "ground plane," and (3) a "raising component."

Claim 6 recites "a circuit board" mounted so that "it does not extend into ***said space***." (Dkt. No. 43-5, '431 patent, col 6:19-21 (emphasis added).) The only possible antecedent basis for "said space" is the phrase "the antenna arrangement is arranged in a space"—thus, the

[5] Because the preamble provides the antecedent basis for the claimed "said antenna assembly," it limits the scope of the claim. *Seachange Int'l, Inc. v. C-COR Inc.*, 413 F.3d 1361, 1376 (Fed. Cir. 2005).

claimed "space" is the space containing the "antenna arrangement." (*Id.* at col. 6:16-17.) In turn, claim 6 defines the "antenna arrangement" as "comprising an integrated antenna, an antenna ground plane and an antenna elevation piece"—i.e., (1) an antenna; (2) its ground plane; and (3) a raising component. (*Id.* at col. 6:13-15.) Thus, the claimed "space" must contain all three of these elements.

The specification further supports Apple's construction. When the specification refers to the "antenna assembly"—including in the patent's abstract and summary of the invention section—it consistently defines the "antenna assembly" to include all three components. (*See, e.g.*, Dkt. No. 43-5, '431 patent, (Abstract) ("The antenna, the antenna ground plane and the antenna raising component are arranged in a space shared with a speaker of the mobile station."); *id.* at col. 2:14-17 ("The [phone] of the invention is characterized in that the antenna, the antenna ground plane and the antenna raising component are arranged in a space shared with a speaker . . . .").)

Finally, the prosecution history of the '431 patent makes clear that Nokia and the examiner understood the claimed "antenna assembly space" to include an antenna, its ground plane, and a raising component. During prosecution, Nokia added the limitation containing the phrase "wherein said printed circuit board does not extend into said antenna assembly space" by amendment. (*See* Portney Decl. Ex. A at 3, '431 file history, amendment.) In explaining the amendment, Nokia describes its "invention" as follows:

> The subject invention relates to an antenna assembly, which includes an antenna, an antenna support (raising component) and a ground plain [sic], for a mobile telephone or the like.

(Portney Decl. Ex. A at 11, '431 file history, amendment.) The examiner relied primarily on this amendment in allowing the claims of the patent to issue. (Portney Decl. Ex. B at 2, '431 file history, notice of allowability) Thus, the examiner and Nokia both understood the claimed

"antenna assembly space" just as Apple's construction defines it—as a space that contains an antenna, its ground plane, and the raising component. *See, e.g., Phillips*, 415 F.3d at 1317 ("[T]he prosecution history provides evidence of how the PTO and the inventor understood the patent.").

Construction of "antenna assembly space" / "space" is necessary to resolve a disputed issue concerning infringement. The accused products do not have a "space that contains the antenna assembly (antenna, ground plane, and raising component)" that also excludes the printed circuit board as required by the claims. Further, because the concepts involved in the patent are difficult to fully describe in writing and are more efficiently addressed with demonstrative presentations, and because the parties would benefit from the opportunity to answers any questions from the Court, Apple respectfully requests a claim construction hearing to address it.

C. United States Patent No. 6,348,894

1. The Technology of the '894 Patent

The '894 patent concerns the shape and the location of a mobile phone's "radio frequency antenna"—as distinct from its telephone antenna. By the time Nokia filed the application for the '894 patent, sophisticated mobile phones were able to transfer information, such as contact names and phone numbers, to and from computers. The connection between the phone and the computer could be made physically, using a cable that plugged into the computer on one end, and the phone on the other. Specifically, the cable plugged into what the '894 patent refers to as the phone's "system connector"—a plastic block on the phone with metal pins for making an electric connection. (Dkt. No. 43-4, '894 patent, col. 5:2-11.)

At the time of the '894 patent application, new wireless technologies had been developed that made it possible to connect a phone and a computer wirelessly, rather than by a cable. The '894 patent refers to two such wireless technologies: "Bluetooth" and "Wireless Local Area

Network (WLAN)." (*Id.* at col. 9:16-22; 1:15-21.) Both "Bluetooth" and "WLAN" are standardized protocols for transferring data wirelessly over very short distances. The Bluetooth standard allows two devices to communicate using signals with very high frequencies—frequencies in the range of 2.4 Gigahertz (GHz). (*Id.* at col. 1:26.) The WLAN standard allows devices to communicate using even higher frequency signals, in the range of 5.6 GHz. (*Id.* at col. 5:22.) By contrast, cellular telephone signals are much lower frequency, typically in the range of 800-1900 MHz ranges. (*See* Portney Decl. Ex. L, Sievenpiper Decl. at ¶ 19.)

As discussed above, an antenna's physical characteristics determine the frequencies at which it can send and receive signals. Because Bluetooth and WLAN operate at significantly higher frequencies than cellular telephones, a Bluetooth- or WLAN-capable mobile phone requires ***two*** antennas—one for the telephone frequencies, and one for the Bluetooth or WLAN frequencies. (*Id.* at col. 1:53-56.) Bluetooth/WLAN antennas tend to be much smaller than cellular or telephone antennas, because Bluetooth/WLAN signals operate at higher frequencies. (Portney Decl. Ex. L, Sievenpiper Decl. at ¶ 20.)

The '894 patent discloses a way to have both wired and wireless data transfer for a mobile phone, using a single system connector—by mounting a "radio frequency antenna" on the same system connector that handles wired connections to a computer. In other words, the '894 patent describes a dual-mode system connector—one that can make either a physical or a wireless connection to a computer.

Figure 9 illustrates this dual-mode system connector:

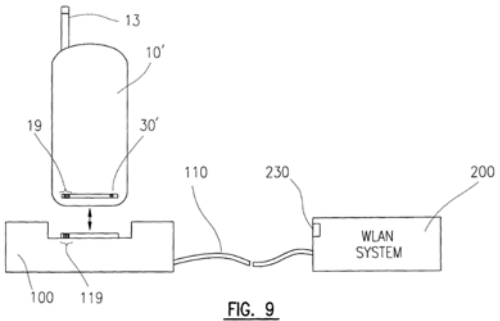
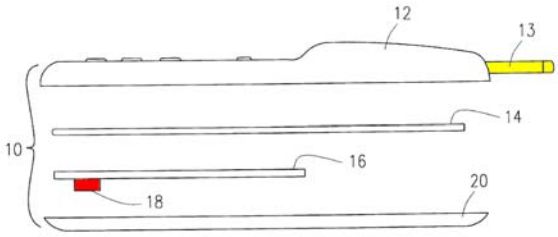
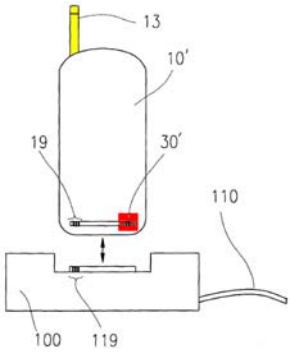


FIG. 9

The phone can connect to the "WLAN system" (which connects to a computer), either by physically connecting the system connector's pins (19) to the corresponding pins (119) in the dock (100), or by using a "radio frequency antenna" (30') mounted on the system connector.

The '894 patent refers to the antenna communicating on Bluetooth or WLAN frequencies as the "radio frequency (RF) antenna," and it refers to the antenna communicating over the cellular network as the phone's "telephone antenna." (Dkt. No. 43-4, '894 patent, col. 3:3-9.)





(*Id.* Figs. 1 & 9 (radio frequency antenna in red; telephone antenna in yellow).) According to the patent, one "major challenge" at the time of filing was designing a small mobile phone "integrating such an RF antenna" in the same device as the existing telephone antenna and other circuitry. (*Id.* at col. 1:35-36.) The '894 patent purports to solve this problem by mounting the "radio frequency antenna" on "the system connector" (which is shown in the illustrative figures to be on the opposite end from the telephone antenna), and by building the "radio frequency

antenna" with a folded or "non-planar resonating region" (*id.* at col. 1:l.65), illustrated in figures 2 and 3A:

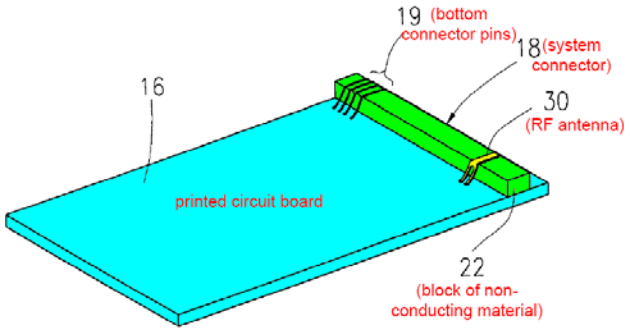


FIG. 2

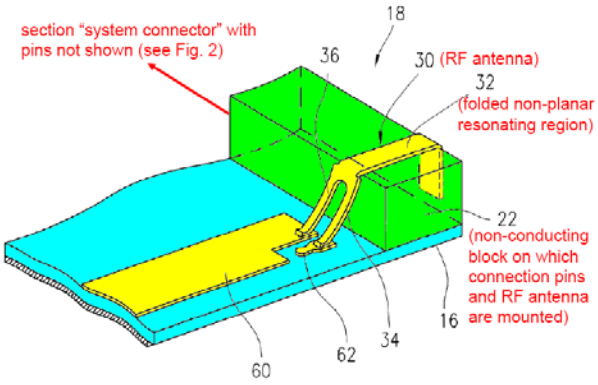


FIG. 3A

So that the phone needs only one system connector for both wired and wireless (Bluetooth/WLAN) connections, the radio frequency antenna "is mounted on the system connector adjacent to the bottom connector pins" that provide this physical connection. (*See, e.g.*, Dkt. No. 43-4, '894 patent, col. 2:33-35; *see also id.* at col. 3:10-13 ("[T]he system connector 18 consists of a block 22 of electrically non-conducting material, such as plastic, for mounting the RF antenna 30 along with other bottom connector pins 19.").) Thus, in the language of the '894 patent's claims, the radio frequency antenna must be "integrated into the system connector." (*See, e.g.*, *id.* at col. 5:53-54.)

2. Disputed Claim Term

a. "radio frequency antenna is integrated into the system connector" / "resonating region is integrated into the system connector"

Apple's Construction	Nokia's Construction
the radio frequency antenna, as distinct from the telephone antenna, is part of the system connector in that it is mounted on the same insulating block that the system connection pins are mounted on /	no construction necessary; alternatively, construe "integrated into" as "formed as a part of"

the resonating region of a radio frequency antenna, as distinct from the telephone antenna, is part of the system connector in that it is mounted on the same insulating block that the system connection pins are mounted on	

The parties' proposed constructions differ in three important respects: (1) Apple's construction distinguishes between the "radio frequency antenna" and the "telephone antenna," while Nokia's does not; (2) Apple's construction clarifies that "integrated into the system connector" means mounted on the same insulating block as the system connection pins, while Nokia merely restates "integrated into" as "formed as a part of"; and (3) Apple's construction makes clear that the "resonating region" is part of a "radio frequency antenna," while Nokia's construction does not.

First, Apple's construction is consistent with the meaning of "radio frequency antenna" used in the claims, specification, and prosecution history. *See, e.g.*, *Phillips*, 415 F.3d at 1316 ("[T]he specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor's lexicography governs."). The '894 patent specifically contrasts "radio frequency antennas" and "telephone antennas." (*See, e.g.*, Dkt. No. 43-4, '894 patent col. 3:3-9.) Although the term "radio frequency antenna" might ordinarily be read broadly to include telephone antennas, the '894 patent uses "radio frequency antenna" in contrast to "telephone antenna" to describe an antenna in a mobile phone ***other than*** the telephone antenna, thus demonstrating Nokia's intent to provide a special meaning for the term.

This distinction is consistent throughout the patent. Claim 2 recites a hand-held communication device in which the "radio frequency antenna" and "telephone antenna" are on

opposite ends, "so as to physically separate the radio frequency antenna and the telephone antenna." (*Id.* at col. 5:60-61.) Because the claims identify the "radio frequency antenna" and the "telephone antenna" as distinct structures that can be "physically separate[d]," the "radio frequency antenna" cannot be the same thing as a "telephone antenna," either in claim 2 or in the other claims using the term "radio frequency antenna." *See, e.g.*, *Wilson Sporting Goods Co. v. Hillerich & Bradsby Co.*, 442 F.3d 1322, 1328 (Fed. Cir. 2006) ("[T]he same terms appearing in different claims in the same patent . . . should have the same meaning . . ."); *Gaus v. Conair Corp.*, 363 F.3d 1284, 1288 (Fed. Cir. 2004) (where one claim required that "electrical operating unit" and "electrically exposed conductive probe networks" be separate structures in the accused device, the two structures had to be construed as separate structures throughout the claims); *Epistar Corp. v. Int'l Trade Comm'n*, 566 F.3d 1321, 1335 (Fed. Cir. 2009) (where two claims treated the terms "metal electrical contact" and "transparent window layer" as "separate and distinct elements," the two claim terms could not be construed to be single element).

Likewise, the specification—including the figures—consistently distinguishes between the "radio frequency antenna" and the "telephone antenna." The specification explains that a mobile phone includes several distinct pieces: "a front portion," "a telephone antenna," "a chassis," "a printed circuit board . . . including a system connector," and "a back cover." (Dkt. No. 43-4, '894 patent, col. 3:3-6.) The "RF antenna" is "mounted on the system connector"—a part of the phone distinct from the telephone antenna. (*Id.* at col. 3:7-8.) In the figures, the "telephone antenna" is shown with index label number 13, while the "radio frequency antenna" is differentiated with index label number (either 30 or 30', depending on the figure) and shown as a distinct structure—on the separate side of the phone from the "radio frequency antenna" (30'). (*e.g.*, *id.* at Fig. 9.) Nowhere in the specification does the '894 patent ever describe the

"radio frequency antenna" as capable of telephone communications. To the contrary, the only communications frequencies that the specification discloses for the "radio frequency antenna" are local area Bluetooth and WLAN frequencies, not cellular telephone frequencies. (*See, e.g.*, *id.* at col. 1:12-13 (disclosing antenna corresponding to "Bluetooth device having a radio link operating at 2.45 GHz"); *id.* at col. 3:52-53 (disclosing "operating frequency around 2.45 GHz"); *id.* at col. 5:20-22 (disclosing antennas "operating at a radio frequency range of 2.4–2.5 GHz, or another frequency range around 5.6 GHz").)

Finally, Nokia's statements in the prosecution history expressly distinguish the claimed "radio frequency antenna" from a "telephone antenna." The examiner initially rejected claim 2 of the '894 patent in view of a European patent application—"*Erkocevic*"—that disclosed "two RF antennas . . . positioned on opposing ends of a communication device." (Portney Decl. Ex. C at 3, '894 file history, office action) In response, Nokia argued that the disclosure of two radio frequency antennas on opposite ends of a communication device did not invalidate the claim, because, in the '894 patent "the system connector is placed apart from the ***telephone antenna*** so that the radio frequency antenna is also positioned apart from the ***telephone antenna***." (*Id.* at 11 (emphases added).) Thus, Nokia's distinction between "telephone antennas" and the claimed "radio frequency antenna" during prosecution confirms that a "telephone antenna" cannot be the claimed "radio frequency antenna." *See Phillips*, 415 F.3d at 1317.

Second, Apple's construction explains what "integrated into the system connector" means in the context of the '894 patent—while Nokia's proposed construction does not. Before determining whether the "radio frequency antenna" is "integrated into the system connector," the jury will first have to understand what the "system connector" is. The specification of the '894 patent explains precisely how to identify the "system connector" in a mobile phone: it is the

"block of electrically non-conducting material, such as plastic, for mounting the RF antenna along with other bottom connector pins." (Dkt. No. 43-4, '894 patent, col. 3:9-12 (index numbers omitted).) The specification stresses the importance of the location of the "connector pins" relative to the "radio frequency antenna," and uniformly describes the claimed "system connector" by reference to its "connector pins." (*See, e.g.*, *id.* at col. 2:33-34, col. 3:12-14.) Apple's construction is consistent with this disclosure.

Likewise, the specification specifies that the radio frequency antenna is "mounted" on the system connector. (*See, e.g.*, *id.* at col. 2:33 (disclosing antenna "mounted on the system connector"); *id.* at col. 3:7-9 ("It is preferred that the RF antenna 30, according to the present invention, be mounted on the system connector 18, as shown in FIG. 2."); *id.* at col. 3:21-22 ("[T]he antenna . . . is mounted on the plastic block . . . .").) By contrast, Nokia's proposed construction—"formed as a part of"—appears nowhere in the specification or the file history of the '894 patent. Apple's construction is fully consistent with the intrinsic evidence, while Nokia's is without support. *See O2 Micro Int'l*, 521 F.3d at 1362 n.3 (criticizing "claim construction arguments [that] appear to contain no support from the intrinsic record" as "fraught with problems").

Finally, Nokia's construction of "resonating region is integrated into the system connector" offers no explanation whatsoever of what the phrase "resonating region" refers to. By contrast, consistent with the specification, Apple's construction explains that the claimed "resonating region" is the resonating region "of a radio frequency antenna." In fact, ***every time*** the specification refers to a "resonating region," it does so in the context of a "radio frequency antenna." (*See, e.g.*, '894 Patent [Abstract] ("An RF antenna having a non-planar resonating region . . ."); *id.* at col. 1:64-65 ("The radio frequency (RF) antenna, according to the present

invention, includes a non-planar resonating region . . . .").) Given the '894 patent's express differentiation between "RF antennas" and "telephone antennas," and given the absence of any disclosure in the specification of a resonating region of a telephone antenna, the construction should make clear that the claimed "resonating region" is the resonating region of an "RF antenna," not a "telephone antenna." *See, e.g., Enzo Biochem, Inc. v. Applera Corp.*, 599 F.3d 1325, 1342 (Fed. Cir. 2010) ("The specification lends no support to [the patentee's] proposed construction because it contains no disclosure whatsoever of [this proposed construction]").

Construction of "radio frequency antenna is integrated into the system connector" / "resonating region is integrated into the system connector" is necessary to resolve a disputed issue concerning infringement. The accused products do not have a radio frequency antenna mounted on the same insulating block that the system connection pins are mounted on. Further, because the concepts involved in the patent are difficult to fully describe in writing and are more efficiently addressed with demonstrative presentations, and because the parties would benefit from the opportunity to answers any questions from the Court, Apple respectfully requests a claim construction hearing to address it.

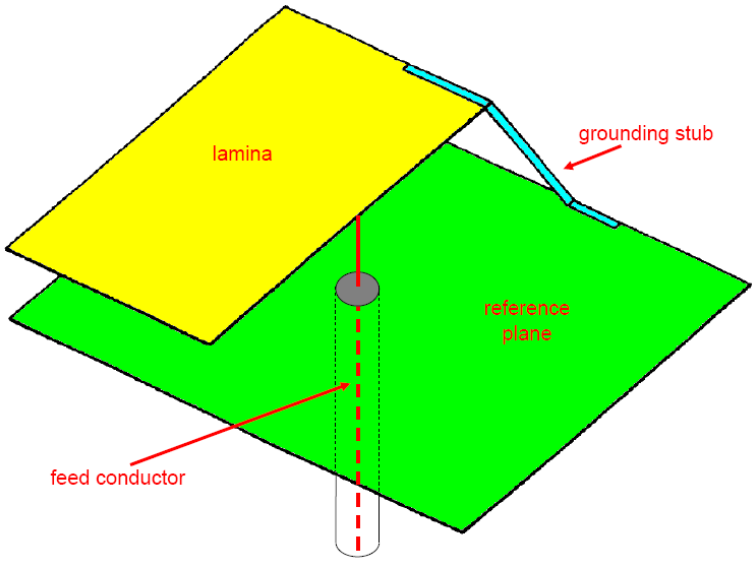
D. United States Patent No. 6,317,083

1. The Technology of the '083 Patent

The '083 patent relates to the point at which wireless communication signals are initially released or "unshielded" within an antenna structure.

In the prior art disclosed in the '083 patent, described as "PIFA" or "planar inverted-F antennas", the antenna structure includes a "flat conductive sheet" (lamina), a reference or "ground" plane, a "grounding stub" between the lamina and the reference plane, and a "feed" conductor which extends up to the reference plane contained in coaxial cable, and then proceeds unshielded between the lamina and the reference plane. (Dkt. No. 43-3, '083 patent, col. 1:33-

51.) The following diagram reflects a prior art PIFA antenna structure fitting the narrative description set forth in the ’083 patent. (*Id*.)



The broadcast strategy utilized in these prior art PIFA antennas is to intentionally release the signal into the gap between the reference plane and the lamina (resonant chamber), by allowing the feed conductor to extend without shielding between the ground plane and the lamina. This initial release of signal energy then resonates within the resonant chamber, allowing it to be efficiently radiated out into space. The process is similar to an acoustic guitar, where the initial vibration of the guitar string is released into the guitar’s acoustic chamber, at which point it then resonates and radiates into free space as harmonic sound. (*See* Portney Decl. L, Sievenpiper Decl. ¶ 24.)

The ’083 patent identifies the key distinguishing feature between the invention and this PIFA antenna prior art as follows. In the prior art, the signal conductor is left unshielded in between the reference plane and the lamina, allowing the initial signal release to occur between

them.[6] (Dkt. No. 43-3, '083 patent, col. 1:33-51.) In contrast, under the approach taken by the '083 patent, the signal is "shielded" or "contained and guided" all the way from the reference plane to the lamina, after which it is released. (*Id.* col. at 2:43-47.) According to the '083 patent, by containing and guiding the signal continuously from the reference plane to the lamina, the disclosed structure reduces losses and increases the efficiency of the antenna.[7]

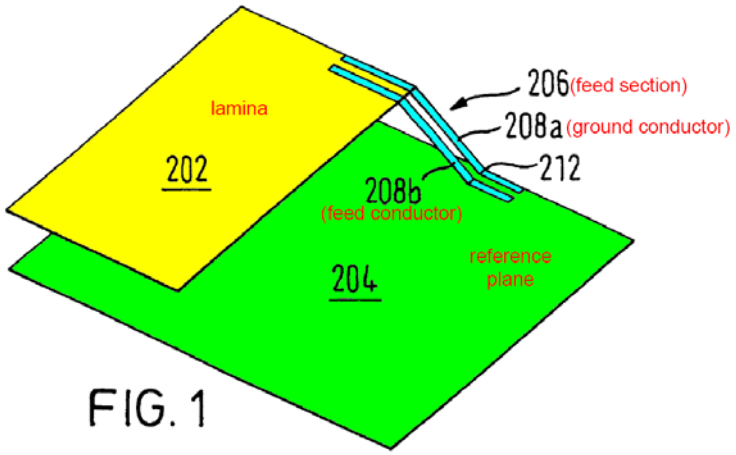


FIG. 1

As shown in Figure 1, the '083 patent discloses containing and guiding the signal by using a particular "feed section" structure (206) between the reference plane 204 and the lamina 202. (*Id.* col. at 3:20-22.) Within this "feed section," two conductors (a feed conductor 208b and a ground conductor 208a) interact to trap the signal, containing and guiding the signal from the reference plane to the lamina (rather than allowing the signal to be released between the reference plane and the lamina as the prior art did). The prior art permitted the initial release of signals by allowing the feed signal conductor to proceed "unshielded" (without a parallel ground conductor) between the reference plane and the lamina. (*Id.* col. at 1:33-51.) The '083 patent

[6] The '083 patent describes the "well known" prior art antenna as a PIFA antenna, in which "the feed is shielded by the outer conductor as far as the ground plane but then extends, unshielded, to the radiating sheet [lamina]." (Dkt. No. 43-3, '083 patent, col. 1:33-51.)

[7] *See e.g.*, Dkt. No. 43-3, '083 patent, col. 2:18-25 ("Since the feed section is arranged as a transmission line (otherwise known as a waveguide), energy is contained and guided between the conductors of the transmission line. This results in a low Q factor and hence a higher impedance bandwidth compared with conventionally-fed planar antennas. The bandwidth is increased considerably while retaining the efficiency, size and ease of manufacture of planar antennas. The feed section should be as low-loss as possible."); *id.* at col. 2:61-63 ("There is little radiation from the feed section because the energy is guided along the conductors of the transmission line feed section.").)

claims an improvement over this prior art, by continuously shielding the feed conductor from the reference plane to the lamina through use of a parallel ground conductor next to (or surrounding) the feed conductor for this distance. (*Id.* col. at 1:46-51.)

The patent touts the advantages of establishing this shielded "feed section," and states that it "should be as low-loss as possible." (*Id.* col. at 2:25; *see also e.g.*, col. at 2:18-20 ("Since the feed section is arranged as a transmission line (otherwise known as a waveguide), energy is contained and guided between the conductors of the transmission line."); *id.* at col. 2:61-63 ("There is little radiation from the feed section because the energy is guided along the conductors of the transmission line feed section.").

2. Disputed Claim Term

a. "feed section extending from the reference plane to the lamina and coupled to the reference plane and the lamina"

Apple's Construction	**Nokia's Construction**
two conductors that each extend from the reference plane to the lamina	feed section . . . with an electromagnetic interaction to the reference plane and the lamina

Apple's construction will properly guide the jury as to the central feature claimed by the '083 patent: containing and guiding the signal between the reference plane and the lamina within a transmission line. Nokia's proposed construction would blur the requirement that both conductors extend and shield the signal from the reference plane all the way to the lamina, hoping instead to broaden the reach of the '083 patent to antenna systems (such as the accused products) where the shielding terminates, and the release of signals begins, ***between*** the reference plane and the lamina.

Apple's proposed construction comes directly from the '083 patent's claim language, and is confirmed by the specification. The claims specify that the "feed section" is composed of two conductors. (Dkt. No. 43-3, '083 patent, col. 5:19-6:52 (all claims include a "feed section compris[ed]" of a "first conductor" and a "second conductor").) The claim term at issue further provides that this two-conductor "feed section" "extend[s] from the reference plane to the lamina and [is] coupled to the reference plane and the lamina." (*See id.* at col. 5:16-18 (Claim 1); *see also id.* col. at 2:13-17 ("In accordance with the invention there is provided an antenna comprising . . . a feed section coupled to the reference plane and the lamina, the feed section being arranged as a transmission line.").) Apple's proposed construction synthesizes these two concepts into an understandable construction that accurately reflects the claimed invention.

The specification's preferred embodiments repeatedly emphasize the central feature of their claimed invention—***fully*** shielding of the signal from the reference plane to the lamina. Figure 1 shows in a feed section 206 composed of two planar conductors (208a and 208b) extending from the reference plane 204 to the lamina 202.

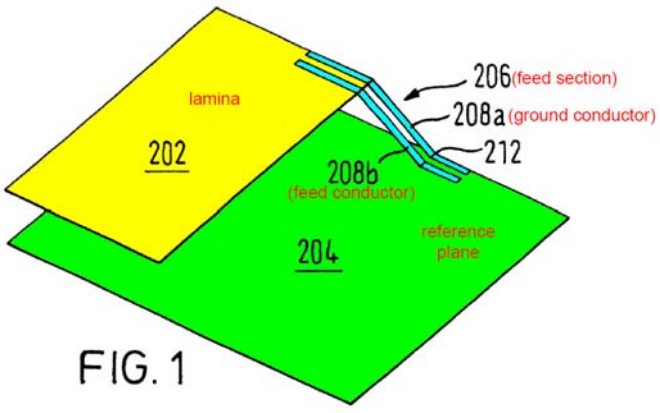


FIG. 1

(Dkt. No. 43-3, '083 patent, Fig. 1 (color shading and annotations added).) Likewise, in Figure 7, the patent shows another dual conductor embodiment (coaxial cable), used to contain and guide the signal all the way to the lamina. In this figure (which shows a cross-section of cable

extending from the reference plane to the lamina), the outer ground conductor 74 completely surrounds the inner feed conductor 72, thereby "containing and guiding" the signal within the coaxial cable all the way from the reference plane 204 to the lamina 202.[8]

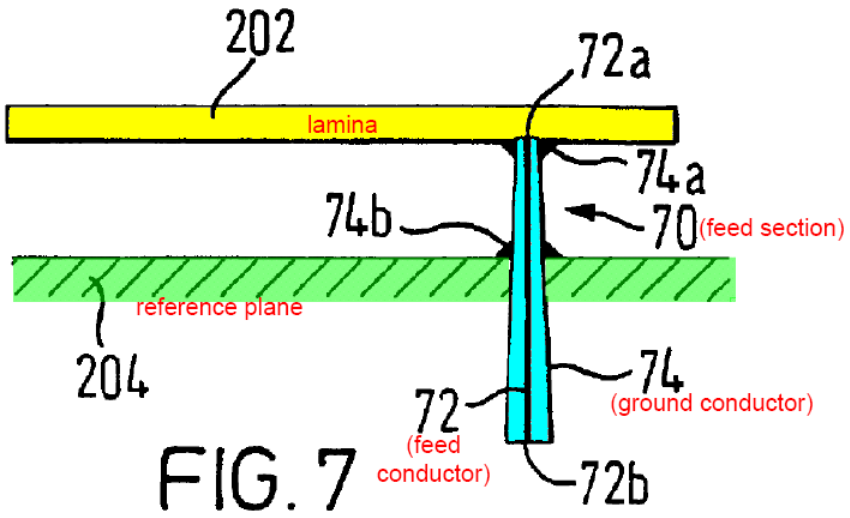


FIG. 7

To further illustrate this supposedly novel feature of the invention—and to differentiate the admitted prior art which allowed the initial release of unshielded signal energy between the reference plane and the lamina—the specification provides detailed drawings of the junction between both conductors and the lamina, reflecting that each of the two conductors of the claimed "feed section" must "extend from the reference plane to the lamina." (*Id.* at col. 5:14-17 (Claim 1).)

[8] "One end 72a of the inner conductor 72 is connected to the lamina 202 and the other end 72b of the inner conductor 72 is connected to the source of the feed signal (not shown). One end 74a of the outer conductor 74 is connected to the lamina 202 and part 74b of the outer conductor remote from the end 74a is connected to the ground plane 204." (Dkt. No. 43-3, '083 patent, col. 4:64-67.)

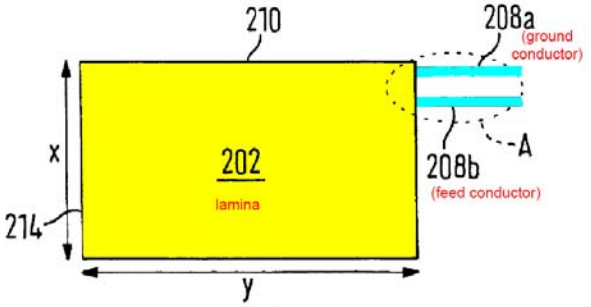


FIG. 3

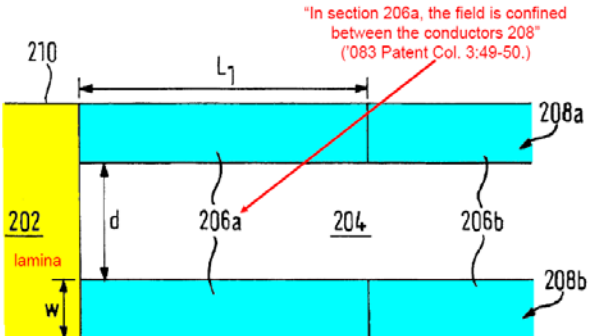
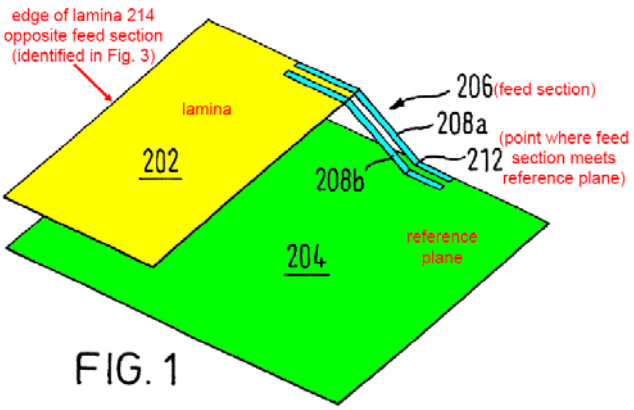


FIG. 4

Finally, Apple's proposed construction is consistent with the electrical properties described in the patent—while Nokia's construction is not. The '083 patent specification describes two advantageous electrical properties achieved when the feed signal is contained within the two-conductor transmission line all the way to the lamina—properties that cannot be achieved unless both conductors each extend this full distance. The first electrical property claimed by the '083 patent is that the "feed section generally has a graded impedance characteristic [that] advantageously varies along the length of the feed section in a uniform manner." (*Id.* at col. 2:30-35.) If there were a break in either of the conductors before they reached the lamina, this would result in a radical impedance change at the point of the break—not a "graded" impedance that varies in a "uniform" manner as touted in the '083 patent to be an advantage of the invention. (*See* Portney Decl. Ex. L, Sievenpiper Decl. at ¶ 25.)

The second advantageous electrical property claimed by the '083 patent is that a "resonant circuit" is formed from the feed section conductors and the lamina, which allows for an increased "electrical length" of the antenna. (Dkt. No. 43-3, '083 patent, col. 1:52-61.) In the claimed structure, this "electrical length of the resonant circuit [] extends from the open circuit

on an edge 214 of the antenna sheet [lamina] 202, along the feed section 206 and to the point 212 at which the feed section meets the ground plane [204]." (*Id.* at col. 3:51-57)



(*Id.* Fig. 1.) To achieve this advantage, the feed section conductors must extend all the way to the lamina; if there were a break in electrical contact within the span from 214 through 206 to point 212, the "electrical length" would terminate at the point of the break, and would no longer extend from edge 214 to point 212 as claimed in the '083 patent. (*See* Portney Decl. Ex. L, Sievenpiper Decl. ¶ 27.) Thus, Apple's construction stays true to the '083 patent because the advantageous electrical properties ascribed to the invention can only be achieved using two conductors that each extend from the reference plane to the lamina.

Nokia's proposed construction is vague, would itself require construction, and is infinitely broad. Nokia's construction only requires an "electromagnetic interaction" between the feed section, ground plane and lamina. Yet, at some level every piece of metal within a structure such as a mobile phone has an "electromagnetic interaction" with every other piece of metal within that structure. (*See* Portney Decl. Ex. L, Sievenpiper Decl. at ¶ 29.) By introducing this boundless phrase into the claims, Nokia hopes to expand the '083 patent claims to cover devices where the shielding conductor does not extend the full distance to the lamina. Moreover,

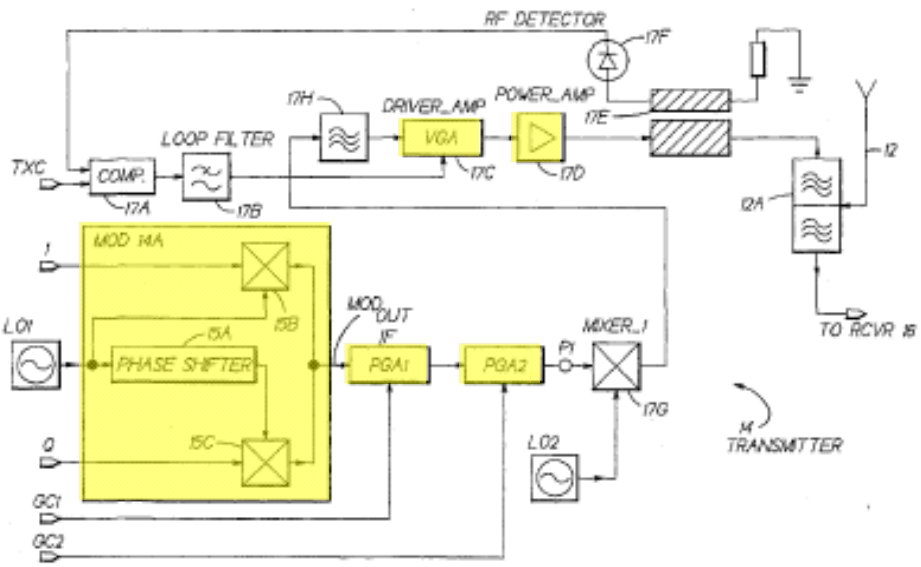
the vague and undefined term "electromagnetic interaction" is never used within the '083 patent's claims, specification, or file history, and therefore completely lacks intrinsic support.

Construction of "feed section extending from the reference plane to the lamina and coupled to the reference plane and the lamina" is necessary to resolve a disputed issue concerning infringement. The accused products do not have "two conductors that each extend from the reference plane to the lamina" as required by the claims. Further, because the concepts involved in the patent are difficult to fully describe in writing and are more efficiently addressed with demonstrative presentations, and because the parties would benefit from the opportunity to answers any questions from the Court, Apple respectfully requests a claim construction hearing to address it.

E. United States Patent No. 5,752,172

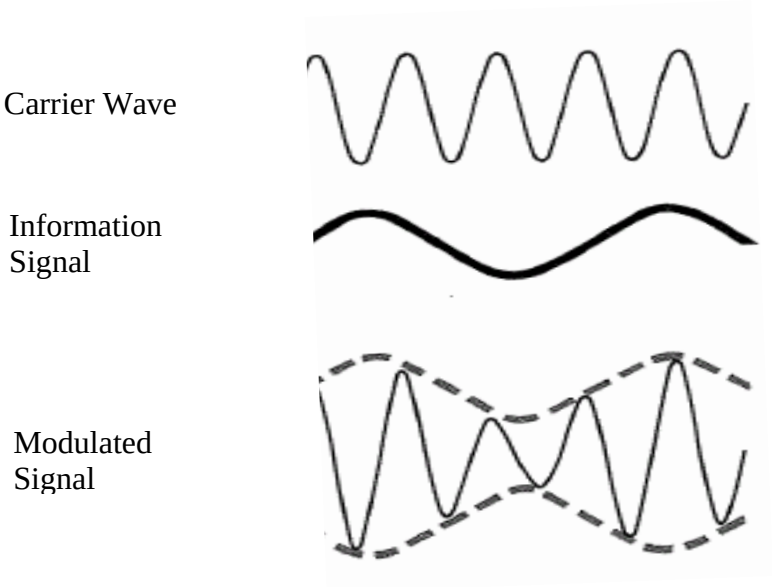
1. The Technology of the '172 Patent

The '172 patent describes a transmitter for a mobile device, such as a mobile telephone. The transmitter generates the RF signal that the antenna transmits to the network. As Nokia acknowledged in the background section of the '172 patent, transmitters with "modulators," "variable gain driver amplifiers," and "power amplifiers" were known and used prior to Nokia's purported invention. (Dkt. No. 43-7, '172 patent, col. 1:24-26.) The patent focuses on adding one or more "programmable gain amplifiers" (PGA1 and PGA2 in Figure 1 below) after the modulator (MOD 14A), but prior to the variable gain driver amplifier (VGA 17C) and power amplifier (POWER AMP 17D):



(Dkt. No. 43-7, ’172 patent, Fig. 1 (highlighting added).) Each of these components is discussed, in turn, below.

The Modulator. A transmitter cannot directly transmit speech or data “over the air” to a network. Instead, it must first place the speech or data signal on a “carrier wave,” which “carries” this information to a network base station. The modulator performs this function by modifying, or “modulating,” the carrier wave based on the speech or data information to produce a modulated signal that can be transmitted to the network:



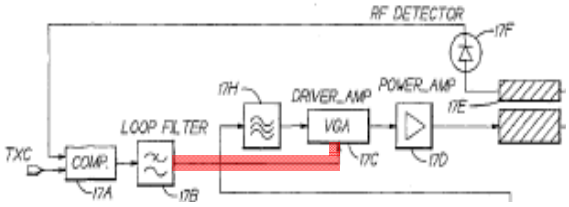
As shown in the diagram above, the carrier wave, like a wave in the ocean, cycles between peaks and valleys at a particular frequency. The modulator adjusts the peaks and valleys, frequency, or timing of the carrier wave based on the speech or data signal to create the modulated signal. (Portney Decl. Ex. M, Fay Decl., ¶ 11.)

The Power Amplifier. Modulators operate with relatively low power signals in order to conserve power and battery life, and to minimize noise and interference within the transmitter. The transmitter accordingly must increase, or "amplify," the strength of the modulated signal before transmitting it to the network base station so that the signal will be strong enough to reach the base station. The "power amplifier" is the last amplifier in the transmitter. Like the amplifier in a set of stereo loudspeakers, the power amplifier increases the strength of the signal so that it can reach the base station. (Portney Decl. Ex. M, Fay Decl., ¶ 12.)

The Variable Gain Driver Amplifier. The power required to transmit the modulated signal from the transmitter to the base station varies depending, in part, on the distance between the mobile telephone and the base station. (Dkt. No. 43-7, '172 patent, col. 1:18-23.) When a telephone is far away from the base station, it typically needs to transmit the modulated signal

with more power to ensure that it reaches the base station. Conversely, when it is close to the base station, it can transmit the signal with less power. Some prior art transmitters accordingly included a "variable gain driver amplifier" between the modulator and the power amplifier to adjust the strength of the modulated signal, to account for these variations, before supplying the signal to the power amplifier for transmission. (*Id.* at col. 1:24-26; Portney Decl. Ex. M, Fay Decl., ¶ 14.)

The "variable gain driver amplifier" adjusts the magnitude of the modulated signal based on a feedback loop which varies the "gain" of the amplifier. This feedback loop, or "power control loop" (shown in Figure 3 below), compares the actual strength of the modulated signal output from the power amplifier with the desired strength, and generates a gain control signal (highlighted in red) based on this comparison:



(*Id.* at Fig. 3.)[9] When the actual power of the signal output from the power amplifier is less than the desired power, the power control loop generates a gain control signal that gradually increases the gain of the variable gain driver amplifier over a continuous range of values until the actual power reaches the desired power. (*See, e.g.*, Dkt. No. 43-7, '172 patent, col. 4:13-18; Ex. M, Fay Decl., ¶ 15.) Conversely, when the actual power is greater than the desired power, the gain

[9] In more detail, the power control loop contains an RF detector 17F and a comparator 17A. The detector 17F detects the actual power of the modulated signal output from the power amplifier 17D, and the comparator 17A determines the difference between the actual power of the signal and the desired power (represented by the signal TXC). (*See, e.g.*, Dkt. No. 43-7, '172 patent, col. 4:13-26.) The power control loop also includes a filter 17B, which operates in conjunction with the comparator 17A, to output the gain control signal (highlighted in red) to change the gain of the amplifier 17C, which in turn, changes the magnitude of the signal that the amplifier 17C outputs. Specifically, when the actual power of the signal is less than the desired power, the comparator 17A and filter 17B output a gain control signal to gradually increase the gain over a continuous range of values until the desired output power equals the actual output power. (*See, e.g., id.*, col. 4:13-18; Portney Decl. Ex. M, Fay Decl., ¶ 15.) On other hand, when the actual power is greater than the desired power, the gain control signal gradually decreases the gain over a continuous range of values until the actual and desired powers are equal. (*Id.*)

control signal gradually decreases the gain over a continuous range of values until the actual and desired powers are the same. (*Id.*)

Nokia's claimed invention. The background section of the '172 patent states that conventional transmitters, which use a single variable gain amplifier between the modulator and the power amplifier, are "not an optimum solution" because the variable gain amplifier must be designed to precisely adjust the magnitude of the modulated signals over a large dynamic range (e.g., up to 60 dB). (Dkt. No. 43-7, '172 patent, col. 1:23-34.) The purported invention of the '172 patent is a transmitter that includes one or more "programmable gain amplifiers" after the modulator, but prior to and in addition to the variable gain driver amplifier and the power amplifier. (*See, e.g., id.* at col. 1:60-67; Claims 1-15.) The programmable gain amplifiers have a gain that is set, or "programmed," in discrete "steps" (*e.g.*, at 1 dB intervals). (*See, e.g.*, Dkt. No. 43-7, '172 patent, col. 2:47-53; 4:36-42; 4:66-5:5; Portney Decl. Ex. M, Fay Decl., ¶ 16.)

The gain of the programmable gain amplifiers can be programmed to compensate for factors such as component tolerance variations due to, for example, variations during the manufacturing process of the transmitter components. (*See, e.g.*, Dkt. No. 43-7, '172 patent, col. 2:47-53; col. 4:36-48; col. 4:63-5:5; Portney Decl. Ex. M Fay Decl., ¶ 17.) Since the programmable gain amplifiers adjust the magnitude of the signal before it is input to the variable gain driver amplifier, the variable gain driver amplifier can operate over a smaller dynamic range (e.g., up to 40-45 dB). (Dkt. No. 43-7, '172 patent, col. 6:20-24; col. 6:24-7:9; Portney Decl. Ex. M, Fay Decl., ¶ 17.)

2. Disputed Claim Term

a. "variable gain driver amplifier"

Apple's Construction	Nokia's Construction
Driver amplifier that modifies an input signal based on a gain value to produce an output signal, where the gain value can be varied over a continuous range of values	amplifier whose gain can be varied, and whose output drives the input of a subsequent stage along a signal path

All the '172 patent claims separately require both a "variable gain driver amplifier" and a "programmable gain amplifier." The primary dispute between the parties for the '172 patent is whether the "variable gain driver amplifier" has a gain value that can be varied "over a continuous range of values."[10]

Nokia's proposed construction—which requires only that the "variable gain driver amplifier" have a "gain" that "can be varied"—ignores the critical distinction in the claim language and the specification between a "variable gain driver amplifier" and a "programmable gain amplifier." The focus of the patent, and the claims, is the concept of adding a "programmable gain amplifier" prior to the "variable gain driver amplifier." If the claims are to have any meaning, they must provide some basis for distinguishing between these two components. Nokia's proposed construction for "variable gain driver amplifier" is so broad, however, that it captures both.

The claim language and specification confirm that the "variable gain driver amplifier" and "programmable gain amplifier" are separate components, with separate meanings. The claims require ***both*** a "variable gain driver amplifier" and a "programmable gain amplifier." (*See, e.g.*, Dkt. No. 43-7, '172 patent, col. 7:16-10:4.) The specification confirms that each operates differently. The "variable gain driver amplifier" adjusts the magnitude of the modulated signal based on a "power control loop," and accordingly, its gain varies over a continuous range

[10] Apple has no objection to the latter portion of Nokia's proposed construction (the claim language confirms that the amplifier is a "driver" amplifier, so there is no dispute that its output "drives the input of a subsequent stage along a signal path").

of values. (*See, e.g., id.* at Fig. 3; *id.* at col. 4:13-18; Portney Decl. Ex. M, Fay Decl., ¶ 18.) The "programmable gain amplifiers," in contrast, adjust the gain in set "steps" (e.g., at 1 dB intervals). (*See, e.g.*, Dkt. No. 43-7, '172 patent, col. 2:47-53; col. 4:36-42; col. 4:63-5:5; Portney Decl. Ex. M, Fay Decl., ¶ 18.) The '172 patent specification repeatedly states that the variable gain driver amplifier performs a "power ramping" function, further confirming that its gain can be varied over a continuous range of values. (*See, e.g., id.* at col. 1:26-30; *id.* at 4:32-34; *id.* at 6:65-67; Portney Decl. Ex. M, Fay Decl., ¶ 18.)[11]

Apple's proposed construction is not only consistent with the claim language and the specification, but also provides a basis for distinguishing between the "variable gain driver amplifier" and the "programmable gain amplifier." A person of ordinary skill in the art would understand that the "variable gain driver amplifier" has a gain that can be varied "over a continuous range of values." (Portney Decl. Ex. M, Fay Decl., ¶ 19.) The "programmable gain amplifier," in contrast, has a gain that is programmed to be varied in set "steps" or intervals (e.g., in 1 dB intervals). (*Id.*)

Nokia's proposed construction, in contrast, provides no basis for distinguishing between the "variable gain driver amplifier" and the "programmable gain amplifier." As the specification confirms, both components have a "gain" that "can be varied." Nokia's construction accordingly violates the well-established principle that the claims should be construed so that each term has a separate meaning. *See, e.g.*, *Comaper Corp. v. Antec, Inc.*, 596 F.3d 1343, 1348 (Fed. Cir. 2010) (recognizing inference that "two different terms used in a patent have different meanings").

Construction of "variable gain driver amplifier" is necessary to resolve a disputed issue concerning infringement. The accused products do not have an "amplifier that modifies an input signal based on a gain value to produce an output signal, where the gain value can be varied over

[11] "Power ramping" is discussed in more detail in conjunction with the '680 patent below.

a continuous range of values" as required by the claims. Further, because the concepts involved in the patent are difficult to fully describe in writing and are more efficiently addressed with demonstrative presentations, and because the parties would benefit from the opportunity to answers any questions from the Court, Apple respectfully requests a claim construction hearing to address it.

F. United States Patent No. 7,532,680

1. The Technology of the '680 Patent

Like the '172 patent, the '680 patent relates to a mobile telephone transmitter having (1) a "modulator" to modulate a carrier signal with an information signal, (2) a "variable gain amplifier" to adjust the power level of the modulated signal before it is input into the power amplifier, and (3) a "power amplifier" to increase the strength of the signal before it is transmitted to the network

Nokia filed the '680 patent application at a time when the industry was considering a significant change to the relevant telecommunications standards, including the standards defining the technical requirements for modulators. The new standard included a "dual timeslot system" that alternated between two different forms of modulation: "GMSK" modulation and "8-PSK" modulation.

In the '680 patent, Nokia described some changes to the power amplifier to accommodate this proposed dual timeslot system. More specifically, it proposed using a "programmable power amplifier" that can operate as either a "variable gain power amplifier" (for GMSK modulation) or as a "fixed gain power amplifier" (for 8-PSK modulation). (*See*, *e.g.*, Dkt. No. 43-6, '680 patent, col. 1:27-31; 3:32-38.) Fig. 1A shows the transmitter 10 when the power amplifier 12 is operating as a "variable gain power amplifier" to transmit a GMSK modulated signal:

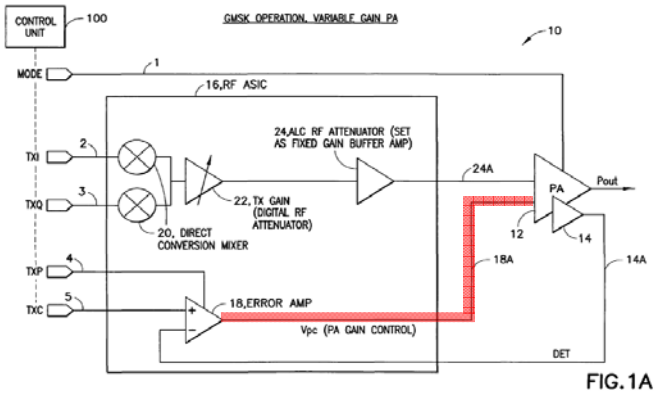
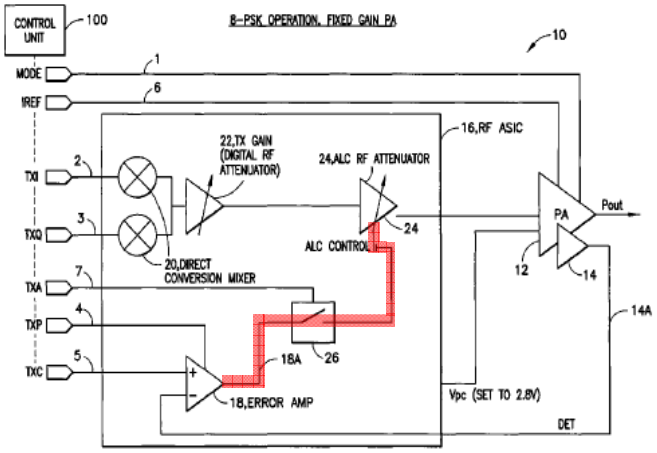


FIG. 1A

In this mode, the power amplifier 12 has a gain that is adjusted by a power control loop. This power control loop, like the power control loop in the '172 patent, compares the actual strength of the signal output from the power amplifier with the desired signal strength, and varies the gain of the variable gain power amplifier 12 until the actual and desired power are the same. (Dkt. No. 43-6, '680 patent, col. 4:6-12.)[12]

In contrast, Fig. 1B below shows the transmitter 10 when the power amplifier 12 is operating as a "fixed gain power amplifier" to transmit an 8-PSK modulated signal:



[12] As shown in Fig, 1A, the power control loop includes an RF detector 14 and an error amplifier 18. The detector 14 outputs a signal (DET) corresponding to the actual power of the signal transmitted from the power amplifier 12, and the error amplifier 18 outputs a gain control signal (Vpc) (highlighted in red) corresponding to the difference between the actual power and the desired power (represented by the signal TXC) to vary the gain of the amplifier 12 over a continuous range. (*See*, *e.g.*, Dkt. No. 43-6, '680 patent, col. 3:38-41; 3:50-53; 4:6-20; Portney Decl. Ex. M, Fay Decl., ¶ 23.)

In this mode, the power amplifier 12 has a gain that is "fixed," so it cannot adjust the magnitude of the modulated signal with a variable gain. The power amplifier 12 accordingly must be used with a variable gain RF attenuator 24 that is capable of adjusting the magnitude of the signal based on, for example, varying distances between the mobile telephone and the base station. (Dkt. No. 43-6, '680 patent, col. 3:47-50; 4:6-12)[13]

Although the terminology is similar, the "programmable ***power*** amplifier" of the '680 patent is a different component than the "programmable ***gain*** amplifier" of the '172 patent. The "programmable power amplifier" is a power amplifier, that can be programmed to operate in different operational modes (*i.e.*, a variable gain mode and a fixed gain mode), and that functions to increase the strength of the modulated signal before it is transmitted to the network. The "programmable gain amplifier" is an amplifier, whose gain can be programmed, and that functions to amplify the modulated signal before it is input to the power amplifier. In other words, in the programmable power amplifier, the ***operational mode*** of the power amplifier is programmed, whereas in a programmable gain amplifier, the actual value of the ***gain*** is programmed. (Portney Decl. Ex. M, Fay Decl., ¶ 26.)

2. Disputed Claim Terms

a. "variable gain [power amplifier/amplifier/ circuit]"

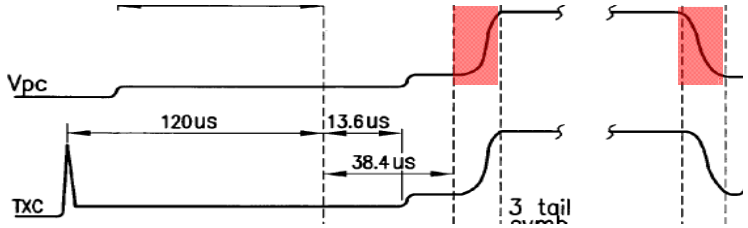
Apple's Construction	Nokia's Construction
[power amplifier/amplifier/circuit] that modifies an input signal based on a gain value to produce an output signal, where the gain value can be varied over a continuous range of values	[power amplifier/amplifier/circuit] whose gain can be varied

[13] In Fig. 1B, the error amplifier 18 outputs a gain control signal (ALC control) (highlighted in red) based on the difference between the actual output power (represented by the signal (DET) from the detector 14) and the desired output power (represented by the signal TXC). (*See, e.g.*, Dkt. No. 43-6, '680 patent, col. 3:47-50; 3:59-63; 4:6-20; Portney Decl. Ex. M, Fay Decl., ¶ 25.)

The ’680 patent claims include a number of “variable gain” terms that raise the same primary dispute as the ’172 patent claims—whether the “variable gain” power amplifier, amplifier, and circuit have a gain whose value can be varied “over a continuous range of values.”

As with the ’172 patent, the ’680 patent claim language and specification strongly support Apple’s proposed construction of the “variable gain” power amplifier, amplifier, and circuit as components whose gain can be varied over a continuous range. A person of ordinary skill in the art would understand that the “variable gain” amplifier, power amplifier, or circuit has a gain that can be varied “over a continuous range of values.” (Portney Decl. Ex. M, Fay Decl., ¶ 27.) As explained above, the specification discloses that the gain of these components is adjusted based on the disclosed “power control loops,” further confirming that they have a gain that can be varied over a continuous range. (*Id.*)

Fig. 3A further confirms that, when the power amplifier 12 is operating as a “variable gain power amplifier,” its gain is varied over a continuous range of values:



The above excerpt from the figure illustrates the “output power ramping” feature of the power amplifier 12 when it is operating in the “variable gain” mode. The portions of the figure highlighted in red show the gain control signal (Vpc) “ramping up” and “ramping down” the

gain of power amplifier 12 by increasing and decreasing the gain over a continuous range of values. (Portney Decl. Ex. M, Fay Decl., ¶ 28.)[14]

Construction of "variable gain [power amplifier/amplifier/ circuit]" is necessary to resolve a disputed issue concerning infringement. The accused products do not have a power amplifier, amplifier, or circuit "that modifies an input signal based on a gain value to produce an output signal, where the gain value can be varied over a continuous range of values" as required by the claims.

b. "variable gain means"

Apple's Construction	Nokia's Construction
This term is governed by 35 U.S.C. § 112 ¶ 6. The claimed function is accomplishing a variable gain (i.e., modifying an input signal based on a gain value to produce an output signal, where the gain value can be varied over a continuous range of values). The corresponding structure disclosed in the specification is an RF attenuator that receives an automatic level control signal.	electronic circuit component whose gain can be varied

In addition to a "variable gain amplifier," "variable gain power amplifier," and "variable gain circuit," the '680 patent claims also refer to a "variable gain means." The primary dispute for this term is whether it is a means-plus-function term, or a structural term.

[14] The transmitter 10 transmits modulated signals in "time slots," and the power amplifier 12 is switched between the fixed and variable gain modes during the "guard period" between adjacent time slots. (*See*, *e.g.*, Dkt. No. 43-6, '680 patent, col. 2:57-60; 4:12-17). According to the patent, smoothly ramping the output power down, switching the operational mode of the power amplifier 12, and then smoothly ramping the power back up during the guard period enables the transmitter 10 to avoid transmitting unwanted power transients and spikes during the guard period. (*See*, *e.g.*, Dkt. No. 43-6, '680 patent, col. 2:34-35; 2:57-60; 4:29-33.) When the power amplifier 12 operates in the "variable gain" mode, the output power is smoothly ramped down (and up) by continuously decreasing (and increasing) the gain control signal (Vpc) to continuously increase (and decrease) the gain of the amplifier 12 over a range of values. (*See*, *e.g.*, Dkt. No. 43-6, '680 patent, col. 4:6-12; 4:32-5:23; Portney Decl. Ex. M Fay Decl., ¶ 29.)

"Variable gain means" is presumptively a means-plus-function term because it expressly uses the term "means." *Net MoneyIn, Inc. v. Verisign, Inc.*, 545 f.3d 1359, 1366 (Fed. Cir. 2008). To rebut this presumption, Nokia would have to establish that the claim recites sufficient structure for performing the function of accomplishing a variable gain. *Sage Prods. v. Devon Indus. Inc.*, 126 F.3d 1420, 1427-28 (Fed. Cir. 1997). Nokia cannot meet this burden because the term "variable gain" connotes ***no*** structure. Instead, it refers merely to a function.[15] (Portney Decl. Ex. M, Fay Decl., ¶ 30.)

The structure corresponding to the "variable gain means" appears to be the RF attenuator 24 shown in Fig. 1B that receives the automatic level control ("ALC") control signal. Independent claim 16, which recites the "variable gain means," also comprises a "programmable power amplifier means." (*See, e.g.*, Dkt. No. 43-6, '680 patent, col. 7:36-39.) The structure for the programmable ***power amplifier*** means clearly is the power amplifier 12 shown in Figs. 1A and 1B. The only other structure that the patent discloses as having a variable gain is the RF attenuator 24, which is shown in Fig. 1B and which receives the ALC control signal. (*See, e.g.*, *id.*, col. 3:47-48; 4:5-10.)

The prosecution history is consistent with this construction. The claims that were allowed in the parent application for the '680 patent included an "RF attenuator," which was added via Examiner's Amendment in the Notice of Allowance. (Portney Decl. Ex. D at 5-6, '680 file history, Notice of Allowance.) In the '680 patent application, Nokia cancelled the original claims and added new claim 35, which recited a "variable gain means." (Portney Decl. Ex. E at 3, 6, '680 file history, Preliminary Amendment.) Nokia further stated that "[o]riginally

[15] Indeed, if the term is not construed as means-plus-function, the claims premised on this term are invalid for indefiniteness. *Halliburton Energy Services, Inc. v. M-I LLC*, 514 F.3d 1244, 1256 (Fed. Cir. 2008 (finding ambiguous claim term invalid for indefiniteness). The '680 claims refer to multiple "variable gain" components including a "variable gain amplifier," a "variable gain power amplifier," and a "variable gain circuit." If the "variable gain means" is not a means-plus-function term, it is indefinite because it could refer to any of these components.

filed claims 1-19 are cancelled and claims 20-38 are newly added. The independent claims are similar to the claims that were allowed in the parent application. Note in this regard that the 'RF attenuator' does not appear in the independent claims and, instead, the claims refer to … a 'variable gain means' (claim 35)." (*Id.* at 7.)

Construction of "variable gain means" is necessary to resolve a disputed issue concerning infringement. The accused products do not have the structure disclosed in the specification or an equivalent structure, as required for infringement under § 112 ¶ 6. Further, because the concepts involved in the patent are difficult to fully describe in writing and are more efficiently addressed with demonstrative presentations, and because the parties would benefit from the opportunity to answers any questions from the Court, Apple respectfully requests a claim construction hearing to address it.

IV. THE APPLE PATENTS

The Apple patents asserted against Nokia are directed to innovative features important to today's mobile electronic devices, such as smartphones, including graphical user interfaces with multi-function button images, high speed connections for transferring large data files, user interfaces that detect patterns in data (such as indentifying a telephone number or email address in an email message), integrated circuits for reducing power consumption and improving battery life, and interfaces for connecting video displays. In contrast to the complicated technical terms in Nokia's patents (*e.g.*, feed section, reference plane, lamina, resonating region, antenna assembly space, variable gain amplifier, power amplifier, and driver amplifier), the Apple patents with disputed terms describe and claim their technological advances in plain and ordinary language. Thus, the majority of the terms identified by Nokia for construction in Apple's patents

can be readily understood without further interpretation (*e.g.*, during use, disabling access, linking actions, and distinct gestures).

A. United States Patent No. 5,612,719

1. The Technology of the ’719 Patent

The ’719 patent, entitled “Gesture Sensitive Buttons For Graphical User Interfaces,” claims a gesture sensitive button that is responsive to multiple gestures (*e.g.*, a “tap” and a “double tap”). Each gesture associated with the gesture sensitive button corresponds to a particular function on the computer system (*e.g.*, a “tap” turns a particular function on or off, and a “double tap” brings up a popup menu). (Dkt. No. 44-2, ’791 patent, col. 2:13-20.) When a gesture is inputted on the button (via a pointer), the system initiates the function associated with that gesture. (*Id.* at col. 2:21-22.) Upon detecting one of the gestures associated with the gesture sensitive button, the user interface (1) provides feedback to the user that the button has been selected (*e.g.*, the button is highlighted), and (2) provides feedback to the user indicative of the function corresponding to the inputted gesture (*e.g.*, a popup menu is displayed). The system then initiates the function or process associated with the inputted gesture.

A significant advantage of the invention of the ’719 patent is that it allows a single “soft” button (*i.e.*, a button image on a computer screen) to control multiple functions of a computer system. (*Id.* at col. 2:37-39.) The ability to perform numerous functions with fewer displayed buttons allows for a larger viewable screen area on a smaller device (such as a smartphone or tablet computer). (*See id*. at col. 2:39-41.)

The innovative technology of the ’719 patent was developed for the Apple Newton—a first-of-its kind Personal Digital Assistant (PDA) that Apple designers in the early 1990s (correctly) predicted would “someday be as ubiquitous as radios and televisions--only far more powerful, interactive, and useful.” (Portney Decl. Ex. F at 2, ’719 file history, cited references,

M. Soviero, "Your World According to Newton," Popular Science, Sep. 1992.) During its development, the Newton was hailed as "Apple's boldest technological innovation since the company redefined the idea of the personal computer with its revolutionary Macintosh . . . ." *Id.* Today, technology developed for the Newton either led to or is incorporated in many of Apple's innovative products. In particular, the innovation of the '719 patent has allowed Apple to develop portable devices (such as the iPhone and iPad) that have extensive functionality in a sleek, user-friendly design.

2. Disputed Claim Terms

a. "pointer"

Apple's Construction	Nokia's Construction
any mechanism or device for pointing to a particular location on a screen of a computer display, including a finger or stylus	a mechanism or device for pointing to a particular location on a screen of a computer display

The parties dispute whether the term "pointer" includes a finger or is limited to a stylus. Although the parties' proposed constructions are nearly identical (and the agreed upon portions are taken from the specification), Apple's construction properly reflects that the claims cover ***any*** pointer "for pointing to a particular location on a screen of a computer display," including a finger (such as a "pointer" finger). Nokia's refusal to agree to Apple's proposal—and its selective quotation from the specification—reflects an (improper) attempt to limit the asserted claims to "pen-based" pointers, such as a stylus.

Both parties agree that the term "pointer" is at least partially defined in the '719 patent specification, which states that "the terms 'pointer', 'pointing device', 'pointing means', and the like ***will refer to <u>any</u> mechanism or device for pointing*** to a particular location on a screen of a computer display." (*See* Dkt. No. 44-2, '791 patent, col. 4:19-22). However, Apple's

construction accurately reflects that the specification defines a "pointer" as "***any* mechanism or device for pointing,**" not "***a*** mechanism or device for pointing" as Nokia contends. Apple's proposed construction also clarifies that the claimed "pointer" can be a finger. Apple's proposal is consistent with the claims and the specification, and accurately reflects how the patentee and the Examiner understood the term during prosecution—and consequently how a person of ordinary skill in the art would understand the term at the time of filing. *See Phillips*, 415 F.3d at 1316 (PTO determines the scope of claims "in light of the specification as it would be interpreted by one of ordinary skill in the art." (internal quotation marks omitted)). Nokia's construction not only selectively quotes from the specification (omitting the word "*any*" and replacing it with "*a*"), it ignores the prosecution history in its entirety.

As an initial matter, the asserted claims support Apple's construction. Here, "the claims themselves provide substantial guidance as to the meaning of [the claim term 'pointer']." *Phillips*, 415 F.3d at 1314. Independent claim 7 claims "an inputted gesture made upon said computer display screen ***by a pointer***." (Dkt. No. 44-2, '791 patent, claim 7 at col. 9:54-55 (emphasis added).) This claim does not include any limitation on the ***type*** of pointer (and certainly does not exclude a finger). Claim 10, however, which depends from claim 7, claims a specific type of pointer; namely a "***pointer [that] is a stylus***." (Dkt. No. 44-2, '791 patent, claim 10 at col. 10:10-12 (emphasis added).) Because independent claim 7 recites a "pointer" and dependent claim 10 further limits that "pointer" to a "stylus," under the doctrine of claim differentiation, the "pointer" of claim 7 is presumed to include devices other than a "stylus." *See Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 910 (Fed. Cir. 2004) ("the presence of a dependent claim that adds a particular limitation raises a presumption that the limitation in

question is not found in the independent claim."). Nothing in the '719 patent specification rebuts this presumption.

The '719 patent specification further supports Apple's construction and makes clear that the claimed "pointer" is not limited to any particular type of pointing device. Indeed, the specification explicitly states that "***for the purposes of illustration***, the invention will be described in connection with a pen-based system" (*id*. at col. 3:19-20 (emphasis added)), but that "***[o]ther types of pointing devices can also be used in conjunction with the present invention***." (*Id*. at col. 4:13-22 (emphasis added).) The patent goes on to describe a "pointer" as "***any*** mechanism or device for pointing to a particular location on a screen of a computer display." (*Id.* at col. 4:19-22 (emphasis added).)

The '719 prosecution history confirms that the claimed "pointer" includes a finger. Throughout prosecution, the Examiner, who was required to evaluate the scope of the claims "in light of the specification as it would be interpreted by one of ordinary skill in the art," *In re Am. Acad. of Sci. Tech Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004), consistently characterized the cited prior art as having the claimed "pointer" through the use of a finger:

- "Liljenwall teaches a gesture sensitive button that consists of: digital computation means, a screen means coupled to said digital computation means, ***pointer means for pointing to locations on said screen means (namely, a finger . . .***)" (Portney Decl Ex. G at 2-3, '719 file history, office action.; Portney Decl. Ex. H at 3-4, '719 file history, office action.)
- "Sach et al teach a method for providing a gesture sensitive button comprising ***. . . a pointer (a finger)*** . . . ." (Portney Decl. Ex. I at 2, '719 file history, office action.)
- More et al discloses a graphical interface system comprising a touch-sensitive surface . . . for detecting ***the position of pointer (a pen or finger)*** . . . ." (*Id*.); and
- More et al teaches ***a pointer can be a stylus or a finger***" (*Id*.)

The applicants never disputed that the use of a finger in the prior art satisfied the claimed "pointer," and never distinguished the prior art on the basis that the claimed "pointer" excluded a

finger. The applicants and the Examiner – skilled artisans reading the intrinsic record – understood "pointer" to mean "***any*** mechanism or device for pointing to a particular location on a screen of a computer display, including a finger or stylus."

b. "distinct gestures"

Apple's Construction	Nokia's Construction
This term does not require construction. Plain and ordinary meaning applies. To the extent construction is necessary, Apple proposes: at least two different gestures	different types of input from the pointer formed by making different marks upon the display screen

The phrase "distinct gestures" does not require construction. A person of ordinary skill in the art reading the claims, specification and prosecution history of the '719 patent would understand that the phrase "distinct gestures" should be given its ordinary and customer meaning; namely, "at least two different gestures." *See Phillips*, 415 F.3d at 1312 ("We have frequently stated that the words of a claim are generally given their ordinary and customary meaning.") (internal quotation marks omitted); *Medrad, Inc. v. MRI Devices Corp.*, 401 F.3d 1313, 1319 (Fed. Cir. 2005) ("we must look at the ordinary meaning in the context of the written description and the prosecution history.") (internal quotation marks omitted).

Not only is Nokia's proposed construction unnecessary, it is improper. Nokia replaces two well-known words—"distinct" and "gesture"—with a lengthy construction introducing the undefined concept of "different marks" in an apparent attempt to import limitations into the asserted claims. The limitations Nokia seeks to import conflict with the plain and ordinary meaning of the claim language, and are not supported by the specification or prosecution history. Indeed, they would foreclose from the phrase "distinct gestures" a tap and double tap, and a click

and double click, even though, as discussed below, the Examiner who allowed the '719 patent expressly contemplated that these would be "distinct gestures."

In the '719 patent, "gestures" are not (as Nokia contends) "distinct" simply because they are "formed using different marks." To the contrary, the intrinsic evidence—the claims, the specification, and the prosecution history—is explicit that gestures are "distinct" when they result in different ***functions***. Nokia's attempt to read non-existent limitations into the claims—requiring that different gestures be "formed by different marks"—is improper as a matter of law. *See, e.g.*, *Liebel-Flarsheim*, 358 F.3d at 904, 906 (it is improper to read limitations from specification into claims).

In fact, the asserted claims contradict Nokia's construction. The independent claims distinguish "distinct gestures" by their associated functions, not by a particular "mark." In particular, asserted claim 7 claims a "method for providing and utilizing a gesture sensitive button for a graphical user interface, wherein the gesture sensitive button ***has a plurality of distinct gestures*** associated therewith, ***each distinct gesture that is associated with the gesture sensitive button having a distinct process associated therewith***. (*See* Dkt. No. 44-2, '791 patent, claim 7). This claim does not use the language "formed by different marks" to describe the claimed gestures or otherwise require different "marks," as Nokia contends. The asserted claim does, however, require that each distinct gesture "hav[e] a distinct process associated therewith," confirming that it is the ***function*** associated with a gesture that makes one gesture distinct from another. *See, e.g.*, *Phillips*, 415 F.3d at 1312 (claims of a patent define the invention).

The specification confirms that the phrase "distinct gestures" means "at least two different gestures" that result in different functions or processes. In the "Summary of the Invention," the claimed gesture sensitive button is described as "responsive ***to at least two***

different button gestures including a tap gesture and a more complex gesture." (Dkt. No. 44-2, '791 patent, col. 2:18-20 (emphasis added)). The specification is explicit that it is not simply the "mark" made by a user that defines a "distinct gesture," but the different ***function or process*** associated with the gesture that makes it distinct. (*See id.* at col. 6:18-20 ("It can be seen from a comparison of FIGS. 3a and 4a that ***the two different gestures on the button*** 66 ***resulting in two*** 20 ***different functions or processes*** being undertaken by the system 10." (emphasis added)); *see also* '719 patent at col. 6:9-13 ("***this alternative gesture*** 76 ***creates a different result*** then the tap gesture 72 of FIG. *3a*." (emphasis added).)

The prosecution history further establishes that "distinct gestures" are defined by being associated with different functions, not simply by making different "marks." Indeed, the Examiner treated a "tap" / "click" and a "double tap" / "double click" as "distinct gestures" – even when those gestures were made in the same location – when they were associated with different functions. (*See* Portney Decl. Ex. J at 8, '719 file history, office action ("one example is within Microsoft Windows (official notice taken), where in order to close a window, ***one 'double clicks' the 'go away' button in the upper left corner (one gesture), but if the user 'single clicks' (another gesture), a menu (equivalent to a choice palette) 'pops' up."*** (emphasis added); Portney Decl. Ex. K at 4, '719 file history, office action ("Agulnick teaches a plurality of small box areas (190) (see figure 4) ***can be able to recognize two different gestures (single tap (621)) and a doubletap (622)) which is same as applicants' button*** (see figure **45** and column **11,** lines 4-18) (emphasis added).) The applicants never disputed the Examiner's characterization of "distinct gestures," and never argued that the distinct gestures must be "formed by making different marks."

Finally, Nokia's construction is confusing and will not assist the jury in understanding the scope of the asserted claims. Nokia's proposal introduces the ambiguous concept of "formed by different marks" into the claims, without defining what Nokia's intends to mean by making a "mark" on a computer screen in the context of the graphical user interface described in the '719 patent. A gesture is not a "mark," although in certain contexts a gesture may result in a mark being made on a computer screen. Still, the intrinsic record does not support substituting the word "mark" for "gesture" and doing so only injects ambiguity into the plain language of the claims. For these reasons, Nokia's construction should be rejected. *See, e.g., Power-One, Inc. v. Artesyn Techs, Inc.*, 599 F.3d 1343, 1348 (Fed. Cir. 2010) ("The terms, as construed by the court, must ensure that the jury fully understands the court's claim construction rulings and what the patentee covered by the claims.") (internal quotation marks omitted).

c. "gesture sensitive button"

Apple's Construction	Nokia's Construction
This term does not require construction. Plain and ordinary meaning applies. To the extent construction is necessary, Apple proposes: image produced on a screen which can be activated by a gesture	an image provided on the display screen that is sensitive to more than a tap gesture

Like the phrase "distinct gestures," the claim term "gesture sensitive button" does not require construction. A person of ordinary skill in the art reading the claims, specification and prosecution history of the '719 patent would understand that the term should be given its ordinary and customer meaning—a "soft" button image produced on a screen that is sensitive to (*i.e.*, can be activated) by a gesture. *See Phillips*, 415 F.3d at 1312; *Medrad*, 401 F.3d at 1319.

The claims of the '719 patent confirm that the term "gesture sensitive button" does not require construction, and certainly not the construction that Nokia proposes. Asserted (independent) claim 7 explicitly defines the claimed "gesture sensitive button" as a "button image on a computer display screen" that is associated with and responsive to "distinct gestures." (*See* Dkt. No. 44-2, '791 patent, claim 7 at col. 9:53-61 ("providing ***a button image on a computer display screen***; detecting an inputted gesture made upon said computer display screen by a pointer; determining whether said ***inputted gesture is associated with said button image*** by determining whether said gesture contacts said button image and ***determining whether said gesture is one of the distinct gestures that is associated with the gesture sensitive button…and (c) initiating the process associated with said inputted gesture and the button image."***) (emphasis added).) There is no ambiguity in this claim language that requires construction—the claim itself defines the term "gesture sensitive button."

Nokia ignores this claim language and seeks a construction that would read a limitation into the claims requiring the "gesture sensitive button" to ***always*** be "sensitive to more than a tap gesture." The claims, however, do not limit "gesture sensitive button" in this way. Independent claim 7 defines a "gesture sensitive button" as being "sensitive" to distinct gestures, but does not require that one of those gestures be "more than a tap gesture," as Nokia asserts. Indeed, the claim does not limit in any way the ***type*** of gestures that can be used with the gesture sensitive button of the invention. (*See* Dkt. No. 44-2, '791 patent, claim 7.)

The doctrine of claim differentiation demonstrates that Nokia's construction is improper. Under the doctrine of claim differentiation, "the presence of a dependent claim that adds a particular limitation raises a presumption that the limitation in question is not found in the independent claim." *See, e.g.*, *Liebel-Flarsheim*, 358 F.3d at 910. Claim 11 of the '719 patent is

a dependent claim (depending from claim 7) that adds a specific limitation not found in claim 7—that "a tap gesture is a first one of the distinct gestures associated with said button image." (Dkt. No. 44-2, '791 patent, col. 10:14-15). Accordingly, a person of ordinary skill in the art reading the claims would understand that the "gesture sensitive button" of claim 7 is not limited to a button image "sensitive to ***more than*** a tap gesture," as Nokia proposes. The addition of the "tap gesture" limitation in claim 11 raises the presumption that claim 7 encompasses buttons responsive to gestures other than a "tap gesture" and is not limited to buttons responsive to at least a "tap gesture." Nothing in the claim language or the '719 patent specification rebuts this presumption. If claim 7 were already limited to button images responsive to a "tap gesture," which it is not, the language (and additional limitation) of dependent claim 11 would be meaningless.

The '719 patent specification also confirms that Nokia's construction is improper. For example, the "Summary of the Invention" states that the "present invention provides a gesture sensitive button for graphical user interfaces ***which is capable of detecting more than one screen gesture***." (*Id.* at col. 2:7-9 (emphasis added).) Although the specification describes a gesture sensitive button as being "responsive to at least two different button gestures ***including*** a tap gesture and a more complex gesture" (*id*. at col. 2:18-20 (emphasis added)), this describes just one example of what the distinct gestures may ***include*** and never suggests that one of the distinct gestures ***must be*** a tap and the other gesture ***must be*** some other type of gesture.

Finally, the prosecution history demonstrates that Nokia's construction is wrong. During prosecution, the Examiner initially rejected the claims of the '719 patent because, *inter alia*, the prior art disclosed a button responsive to distinct gestures—both of which were tap gestures (*i.e.*, a tap and a double tap). (*See* Portney Decl. Ex. K at 4, '719 file history, office action ("Agulnick

teaches a plurality of small box areas (190) (see figure 4) ***can be able to recognize two different gestures (single tap (621)) and a double tap (622)) which is same as applicants' button*** (emphasis added).) The applicants did not dispute that a tap and double tap were distinct gestures, and never argued (to overcome the prior art) that the "gesture sensitive button" of the claimed invention must be "sensitive to more than a tap gesture." Accordingly, Nokia's attempt to read into *all* the asserted claims a limitation that the "gesture sensitive button" must be "sensitive to more than a tap gesture" finds no support in the intrinsic record, and must be rejected.

B. United States Patent No. 7,054,981

1. The Technology of the '981 Patent

The '981 patent, entitled "Methods And Apparatus For Providing Automatic High Speed Data Connection In Portable Device," relates to high speed data transfer between electronic devices. For example, the '981 patent describes the direct, high speed data transfer between a remote computer device, such as a personal computer, and the local memory of a portable device, such as an iPod, through a high speed serial port (a physical interface on devices through which information transfers in or out). (Dkt. No. 44-5, '981 patent, col 2:6-15; col. 3:32-37.) The innovative technology of the '981 patent was developed for Apple's iPod device, which provides for high speed transfer of large data files (such as music and video files) from a personal computer to enhance the user's experience.

The '981 patent describes how prior systems were limited in their ability to perform high speed data transfer between a personal computer and a portable device. (*Id.* at col. 1:55-62.) These prior systems were unable to take advantage of the full capabilities of high speed data connections because they routed the data to be transferred through the central processing unit

("CPU") of the portable device. (*Id.*) This resulted in slow data transfer and was undesirable for transferring large data files.

The invention of the '981 patent solves this problem by describing a direct, high speed connection between a remote computer device (such as a desktop computer) and the local memory of a portable device (such as a smartphone) by using a direct memory access ("DMA") bus (*i.e.*, a direct connection between the memory and the remote computer). (*Id.* at col. 2:28-39.) The DMA bus allows for direct, high speed data transfer between the remote computer device and the local memory of the portable device by bypassing the CPU. *Id.*

2. Disputed Claim Term

a. "Disabling access between the CPU and the local memory"

Apple's Construction	**Nokia's Construction**
This term does not require construction. Plain and ordinary meaning applies.	preventing the CPU from accessing the local memory for the duration of the high speed data transfer connection while permitting the CPU to access the main system bus and any device connected thereto

The parties dispute whether the phrase "disabling access between the CPU and the local memory" appearing in claim 16 should be given its ordinary meaning requiring disabling the CPU from accessing the local memory (Apple's position), or whether it should be construed to include additional requirements regarding ***the duration*** for which the CPU is disabled ***and*** the ability of the CPU to access ***different devices***, such as the "main system bus and any device connected thereto," during that time (Nokia's position).

The phrase "disabling access between the CPU and the local memory" is written in plain, simple words that do not need construction. *See, e.g.*, *Phillips*, 415 F.3d at 1312 (claim terms should be given their ordinary and customary meaning). As demonstrated by Nokia's mere

repeat of the words "access," "CPU," and "local memory" in its proposed construction, these terms should be given their plain and ordinary meanings and require no further interpretation. Similarly, the simple, ordinary word "disabling" needs no further construction and should be given its plain meaning.

Not only is Nokia's construction unnecessary, it is improper. Nokia's proposed construction attempts to add several additional limitations that are found nowhere in the disputed claim language. Nokia's attempt to construe the term "disabling" to require a specific period of time during which the CPU is unable to access the local memory ***and*** to also require that the CPU is ***permitted*** to access the main system bus (a connection between the memory and the CPU) and any device connected thereto throughout that period finds no support in the meaning of the term "disabling" and is contrary to the express language of claim 16.

Nothing in the meaning of the term "disabling" requires access to be disabled throughout "the duration of the high speed data transfer connection," as Nokia contends. Claim 16 does not specify a particular period of time during which access is disabled, nor does claim 16 expressly require access to be "enabled" during any particular period of time. Nokia's attempt to read a specific beginning, end, and "duration" into the claims, where none is recited, is improper. *Interactive Gift Express, Inc. v. Compuserve Inc.*, 256 F.3d 1323, 1342 (Fed. Cir. 2001) (unless claims "actually recite an order, the steps are not ordinarily construed to require one").

Similarly, there is nothing in the meaning of the phrase "***disabling***" that requires the exact opposite of disabling access, i.e., "***permitting*** access," between the CPU and other devices not even mentioned in the phrase being construed – "the main system bus and any device connected thereto." Claim 16 recites, in express language that Nokia has ***not*** proposed to construe, that the CPU is "connected to a main system bus." Claim 16 says nothing, however,

about whether the CPU can access "any device" connected to the main system bus or whether such access must occur throughout the duration of the high speed data transfer connection, as Nokia contends.

Finally, there is nothing in the specification's description of exemplary embodiments of the invention that provides any basis for limiting the plain and simple phrase "disabling access between the CPU and the local memory." Nokia has not identified any portion of the specification or file history of the '981 patent in which the patentee provided any express definition of that phrase, or clearly and unambiguously disavowed the full scope of its meaning. Thus, the Court should reject Nokia's attempt to read non-existent limitations into this phrase.

C. United States Patent No. 5,946,647

1. The Technology of the '647 Patent

The '647 patent, entitled "System And Method For Performing An Action On A Structure In Computer-Generated Data," discloses a computer-based system for detecting structures, or patterns, in data (like an email message) and linking and performing one or more actions on those detected structures. These structures can include email addresses, street addresses, telephone numbers, or the like.

The system of the '647 patent includes an input device, an output device, a memory, and a processing unit. (Dkt. No. 44-1, '647 patent, col. 2:21-25.) The memory includes software, such as an analyzer server, a user interface, and an action processor. (*Id.* at col. 2:25-27.) The analyzer server (a software program) detects structures in data received by the input device and links one or more actions to those structures. (*Id*. at col. 2:28-31.) The user interface enables the user to select a detected structure and a linked action. The action processor (another software program) performs the selected action linked to the selected structure. (*Id*. at col. 2:32-34.) Such

actions can include dialing a phone number detected in an email, storing a phone number in an address book, or opening a map showing the street address. (*Id*. at col. 2:36-41.)

As discussed in the background of the ’647 patent, prior systems suffered from significant shortcomings. In particular, prior systems that identified structures in computer data were limited because they did not enable automatic performance of an action on an identified structure. (*Id.* at col. 1:37-39.) For example, the user of a prior system might receive a long email message including telephone numbers. Although the prior system might have identified the telephone number as a structure, the system could not recognize the structure as a valid phone number and the user could not perform an action directly on the structure (e.g., moving the telephone number to an electronic telephone book). Rather, the prior system might have required the user to select a telephone number from the email message, “copy” the telephone number from the email message, locate and open the electronic telephone book application, and “paste” the telephone number into the appropriate field in the application. (*Id*. at col. 1:37-50.) This procedure was time consuming, cumbersome, and did not provide a desirable user experience.

The invention of the ’647 patent solves the problems with prior systems by providing a system that identifies structures in computer data, associates actions with the structures, enables selection of an action, and automatically performs the user-selected action on the structure. This technology either has led to or is used in many of Apple’s innovative products available today. In particular, the innovation of the ’647 patent has allowed Apple to develop devices (such as the iPhone and iPad) with extensive functionality and an enhanced user experience.

2. Disputed Claim Term

a. “linking actions to the detected structure”

Apple's Construction	Nokia's Construction
This term does not require construction. Plain and ordinary meaning applies. To the extent construction is necessary, Apple proposes: linking computer routines to the detected structure(s)	Upon detection of structure(s) in the data, linking the detected structure(s) to computer subroutine(s) that cause the CPU to perform a sequence of operations on the detected structure(s)

The parties dispute whether the phrase "linking actions to the detected structure" in claims 1, 15 and 22 should be given its ordinary meaning (Apple's position), or should be construed to include additional requirements regarding ***when*** such linking occurs ("upon detection of structure(s) in the data").

The phrase "linking actions to the detected structure" is written in plain, simple words that do not need construction. *See, e.g.*, *Phillips*, 415 F.3d at 1312. As demonstrated by Nokia's mere repeat of the words "linking" and "detected structure" in its proposed construction, these terms should be given their plain and ordinary meanings and require no further interpretation. Similarly, the simple, ordinary word "actions" needs no further construction and should be given its plain meaning. To the extent construction of "action" is appropriate, Apple agrees that "actions" are "computer subroutines that cause the CPU to perform a sequence of operations" on the particular structures to which they are linked.

Nokia's attempt, however, to insert a non-existent limitation into the claim language is improper. *See, e.g.*, *Liebel-Flarsheim*, 358 F.3d at 904, 906. There is nothing in the meaning of the phrase "linking actions to the detected structure" that requires the linking to occur only and immediately "upon detection of structure(s) in the data," as Nokia contends. The claims of the '647 patent do not include any language limiting "linking" to occurring only "upon detection of structure(s) in the data." Rather, under the plain language of the claims, "linking" need only

occur before the selection of a linked action. Nokia's attempt to read a particular order into the methods of claims 15 and 22, and to limit ***apparatus*** claim 1 to a particular order of functional steps, is incorrect as a matter of law and should be rejected. *See, e.g.*, *Interactive Gift*, 256 F.3d at 1342-43.

D. United States Patent No. 7,760,559

1. The Technology of the '559 Patent

The '559 patent, entitled "Integrated Circuit With Separate Supply Voltage For Memory That Is Different From Logic Circuit Supply Voltage," relates to power management for integrated circuits ("ICs" or "chips"), such as those used in portable, battery-powered electronic devices like smartphones. Specifically, the invention of the '559 patent is a system that reduces the overall power consumption of an integrated circuit by splitting the supply voltages (*i.e.*, the amount of voltage supplied from a power source) for memory and logic circuits into different domains and by reducing the voltage supplied to the logic circuit.

Power consumption in an integrated circuit is related to its supply voltage. (Dkt. No. 44-7, '559 patent, col. 1:33-34.) Reducing the supply voltage generally leads to reduced power consumption. (*Id*. at col. 1:41-43.) As supply voltage decreases below a certain voltage, however, the ability of the memory circuit to read and write data reliably also decreases. (*Id.*) Power consumption is a particularly acute concern for mobile, battery-operated devices, such as smartphones, because the number of transistors in a single integrated circuit chip can exceed *one billion*, placing tremendous strain on battery life.

To solve the problems with prior devices, the '559 patent discloses a logic circuit and an associated memory circuit operating in different voltage domains, wherein each voltage domain receives power from a distinct input to the integrated circuit. (*Id*. at col. 2:8-20.) The patent describes how power consumption can be reduced, without adversely affecting the performance

of the memory circuit, by operating the logic circuit at a lower voltage than the memory circuit. (*Id.*)

Reducing the supply voltage reduces the power consumed by each transistor in the integrated circuit. The voltage reduction associated with each transistor may be small (*e.g.*, 0.05 volts). But because of the tremendous number of transistors in an integrated circuit (*e.g.*, billions), the total savings in power consumption can be substantial.

2. Disputed Claim Term

a. "during use"

Apple's Construction	Nokia's Construction
This term does not require construction. Plain and ordinary meaning applies.	Nokia contends that this term is indefinite

Nokia argues that the common, everyday words "during use" are so insolubly ambiguous that the phrase (and therefore any asserted claim in which the words appear) is indefinite and invalid as a matter of law. Nokia's position lacks merit. The phrase "during use" is not ambiguous—and certainly not so hopelessly ambiguous that it is incapable of being understood by a person of ordinary skill in the art. *Young v. Lumenis, Inc.*, 492 F.3d 1336, 1346 (Fed. Cir. 2007) (claim terms cannot be "insolubly ambiguous," when "those terms can be given any reasonable meaning"); *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1347 (Fed. Cir. 2005) (same). "During use" is a commonly understood term that means what it says. *See, e.g.*, *Boston Scientific SciMed, Inc. v. ev3 Inc.*, 502 F. Supp. 2d 931, 937 (D. Minn. 2007) ("the phrase 'wherein, during use' is readily understood. Therefore, the Court declines to construe the phrase"). (*See also* Portney Decl Ex. O at 4, Webster's Dictionary (defining "during" as

"throughout the entire time" or "in the course of"); *Id*. at 3 (defining "use" as "to put or bring into action or service . . . .").)

Nokia's argument that the phrase "during use" is indefinite is not only ill-suited for purposes of claim construction, *Douglas Dynamics, LLC v. Buyers Prods. Co.*, 2010 WL 744253, at *17 (W.D. Wisc. Mar. 2, 2010) (Crabb, J.) ("invalidity of a patent's claim based on indefiniteness is better dealt with at summary judgment"), it is contradicted by the claims, the specification, and the prosecution history.

The claim language itself confirms the plain and ordinary meaning of the phrase "during use." *See, e.g., Phillips*, 415 F.3d at 1313, 1323 (claims should be read in their context). The claim language surrounding the phrase "during use" recites a "logic circuit ***operating*** in a first voltage domain *during use*." (*See* Dkt. No. 44-7, '559 patent, claim 1 (emphasis added).) In other words, according to the claim language, the logic circuit is operating (*i.e.*, working) when it is being used (*i.e.*, during use). This claim language is plain and straightforward, and confirms that "during use" means exactly what it says—***during use***.

The specification also demonstrates that the phrase "during use" has a plain, ordinary, and easily understood meaning. In particular, the specification describes that an important advantage of the invention is to allow the memory circuit to ***operate*** (*i.e.*, working to read, write and store data) during use, regardless of whether it is supplied with different voltage than the logic circuit:

> By separating the supply voltage for the logic circuits 12 and the memory circuits 14, the supply voltage for the logic circuits 12 (V_L) may be reduced below the level at which the memory circuits 14 may operate robustly. ***The supply voltage for the memory circuits 14 (V_M) may be maintained at the minimum supply voltage <u>that provides for robust memory operation</u>*** (or greater, if desired). ***Thus, the V_L supply voltage may be less than the V_M supply voltage <u>during use</u>. At other times, the V_L supply voltage may exceed the V_M supply voltage <u>during use</u> (e.g., at times when higher performance is desired and higher power consumption is acceptable to achieve the higher performance***)

(Dkt. No. 44-7, ’559 patent, col. 3:26-37 (emphasis added).) There is no ambiguity in the specification about the meaning of the phrase “during use.”

“During use” is a commonly and readily understood term, and nothing in the intrinsic record is inconsistent with the term’s plain and ordinary meaning. As a result, the Court should reject Nokia’s indefiniteness argument. *See Harris Co. v. Federal Exp. Co.*, 698 F. Supp. 2d 1345, 1351-52 (M.D. Fla. 2010) (rejecting indefiniteness argument because the meaning of the term “airport based,” even though not “specifically define[d]” in the specification,” “is readily apparent, even to lay judges, and involves little more than the application of the widely accepted meaning of commonly understood terms”); *see also LG Display Co., Ltd. v. AU Optronics Corp.*, 686 F. Supp. 2d 429, 441 (D. Del. 2010) (“the term ‘area’ not indefinite and should be construed according to its plain meaning”).

E. United States Patent No. 7,380,116

1. The Technology of the ’116 Patent

The ’116 patent, entitled “System For Real-Time Adaptation To Changes In Display Configuration,” claims ways to accommodate changes in the display environment of a computer system when the system is connected to a new display device (such as a video monitor or HDTV). In particular, when a new display device is detected, the operating system modifies the allocation of display space to the new display device, without the need to restart or reboot the computer system, or awaken it from a power-saving “sleep” mode. (Dkt. No. 44-4, ’116 patent, col. 2:31-57.)

In prior computer systems, changes in the configuration of the display typically became effective only after restarting or rebooting the computer. (*Id.* at col. 1:47-63.) During the startup procedure, the operating system in prior systems would detect the presence of each device driver (the software that enables a hardware component, such as a monitor, to work properly) and

register each device driver to allow communication between the operating system and the driver. (*Id.*) If a new device driver was added to the computer system after the startup procedure, the driver was not registered with the operating system, and therefore, it could not be used before rebooting the system. (*Id.*)

The invention of the ’116 patent overcomes this problem by shifting the responsibility for recognizing changes in the display environment from the operating system to a device manager (a software routine for controlling hardware components and software services). (*Id.* at col. 2:32-36.) Upon the addition/removal of an input/output device, such as the addition/removal of an HDMI cable used to connect a computer system to an HDTV, an interrupt signal informs the device manager of the fact that a change in configuration has occurred. (*Id*. at col. 2:37-40.) An interrupt signal is a signal generated by a hardware device or software routine that can be used to inform another hardware device or software routine that an event has occurred that may require attention and a temporary interruption of the current operation of the system. In the invention of the ‘116 patent, the device manager determines whether the change relates to the computer’s display function. (*Id*. at col. 2:40-43.) If so, the device manager communicates with the display manager to reconfigure the display space for the computer system. (*Id*. at col. 2:43-49.) This approach allows the added display device to be available for real-time use, *i.e.*, dynamically without rebooting or restarting the system. (*Id.* at col. 2:49-51.)

2. Disputed Claim Term

a. “Modifying the allocation of display space”

Apple's Construction	Nokia's Construction
This term does not require construction. Plain and ordinary meaning applies. To the extent construction is necessary, Apple proposes: reconfiguring the display space	Nokia contends that this term is indefinite. To the extent not indefinite, automatically making a change to a portion of the two-dimensional global coordinate display space to be displayed

Nokia argues that the phrase "modifying the allocation of display space," like "during use," is indefinite and incapable of construction. Nokia is wrong. This phrase is capable of being understood by a person of ordinary skill in the art. *See Star Scientific, Inc. v. R.J. Reynolds Tobacco Co.*, 537 F.3d 1357, 1373 (Fed. Cir. 2008) ("The test for indefiniteness does not depend on a potential infringer's ability to ascertain the nature of its own accused product to determine infringement, but instead on whether the claim delineates to a skilled artisan the bounds of the invention."). Indeed, *Nokia* itself has proposed a construction of this term, demonstrating that it is "capable of construction." *See, e.g., Pulse Eng'g, Inc. v. Mascon, Inc.*, 2009 WL 755321, at *5-6 (S.D. Cal. Mar. 9, 2009) (claim term not indefinite because "the parties have articulated several possible constructions"); *Freescale Semiconductor, Inc. v. ProMOS Techs., Inc.*, 561 F. Supp. 2d 732, 741-42 (E.D. Tex. 2008) (accused infringer's "alternate proposed construction reveals that there is at least some possible construction that would prevent a finding that this claim term is 'insolubly ambiguous'"); *Power-One, Inc. v. Artesyn Tech., Inc.*, 2007 WL 896093, at *5 n.3 (E.D. Tex. Mar. 22, 2007) (accused infringer "initially proposed a construction of [the term] indicating that the meaning of this term can be discerned"); *see also Mannatech, Inc. v. Glycobiotics Int'l, Inc.*, 2007 WL 4386244, at *6 n.4 (N.D. Tex. Dec. 14, 2007) ("[T]he fact that defendant proffered a proposed construction of this claim term undermines its argument that the term is 'insolubly ambiguous' and not amenable to construction.") (citations omitted).

Although the phrase "modifying the allocation of display space" is capable of construction, construction is not required because the phrase can easily be understood by its ordinary and customary meaning. *See Phillips*, 415 F.3d at 1312 ("We have frequently stated that the words of a claim are generally given their ordinary and customary meaning.") (internal quotation marks omitted). To the extent construction is appropriate, Apple proposes "reconfiguring the display space." This construction is consistent with the plain meaning of the phrase and is supported by the intrinsic evidence, which consistently describes a process by which the display manager ***reconfigures the display space*** of the computer system. For example, the '116 patent specification explains that "the device manager makes a call to the computer's display manager, to inform it of the fact that the display configuration has changed. In response to this call, ***the display manager reconfigures the display space for the computer system*** . . . ." (Dkt. No. 44-4, '116 patent, col. 2:45-50 (emphasis added).)

Nokia's construction departs from this plain meaning by inserting non-existent limitations into the claim. There is nothing in the claims or the specification requiring that the modification (or reconfiguration) step occur "automatically." Rather, the specification describes that the modified display becomes available for use *after* the completion of several steps. (*Id.* at col. 6:46-47 ("In response to this information, the display manager carries out a number of operations, depicted in Steps 56-64.").) Although the specification describes using "a device manager to automatically recognize and react to changes in the reconfiguration of a display environment," that is not in reference to the modification step, but rather to the "dynamic" capabilities of the invention, *i.e.*, the ability to determine the status of the display environment during runtime without restarting, rebooting, or awakening the system from sleep mode. These

were among the limitations of the prior art upon which the '116 patent improved. (*Id.* at col. 1:47 – col. 2:14; col. 5:63-6:15.)

Nokia's construction also contradicts the claim language by limiting the modification step of claim 1 to instances where there is "a change to a portion of the two-dimensional global coordinate display space to be displayed." Although claim 2 refers to a modification of the assigned "portion of the display space," the modification step in asserted claim 1 is not so limited. *See Liebel-Flarsheim*, 358 F.3d at 910 ("the presence of a dependent claim that adds a particular limitation raises a presumption that the limitation in question is not found in the independent claim."). Neither is claim 1 limited by the exemplary embodiment disclosed in the specification describing a similar sequence. (Dkt. No. 44-4, '116 patent, col. 6:57-66.) *See Interactive Gift*, 256 F.3d at 1342 (unless claims "actually recite an order, the steps are not ordinarily construed to require one"). For these reasons, the Court should reject Nokia's indefiniteness argument.

V. CONCLUSION

Apple respectfully requests that the Court enter an order construing the disputed terms of the patents-in-suit as herein proposed by Apple.

Respectfully submitted,

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IN THE UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF WISCONSIN

CERTIFICATE OF SERVICE

I hereby certify that on December 17, 2010, I served the forgoing *Apple Inc.'s Opening Markman Brief* to Nokia Corporation and Nokia Inc by electronic mail on the following:

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