IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

NOKIA CORPORATION, Plaintiff, v. APPLE INC., Defendant.	C.A. No. 09-791-GMS **JURY TRIAL DEMANDED**
APPLE INC. Counterclaim-Plaintiff, v. NOKIA CORPORATION and NOKIA INC. Counterclaim-Defendants.	

APPLE INC.'S ANSWERING AND OPENING *MARKMAN* BRIEF

OF COUNSEL:

William F. Lee
WILMERHALE
60 State Street
Boston, MA 02109
Tel: 617 526 6000

Mark D. Selwyn
WILMERHALE
950 Page Mill Road
Palo Alto, CA 94304
Tel: (650) 858-6000

Kenneth H. Bridges
Michael T. Pieja
BRIDGES & MAVRAKAKIS LLP
540 Cowper Street, Suite 100
Palo Alto, CA
Tel: (650) 681-4475

Richard L. Horwitz (#2246)
David E. Moore (#3983)
POTTER ANDERSON & CORROON LLP
Hercules Plaza, 6th Floor
1313 N. Market Street
Wilmington, DE 19899
Tel: (302) 984-6000
rhorwitz@potteranderson.com
dmoore@potteranderson.com

Attorneys for Defendant/Counterclaim-Plaintiff Apple Inc.

Dated: March 15, 2011

TABLE OF CONTENTS

TABLE OF AUTHORITIES

CASES

I. INTRODUCTION

The parties' proposed claim constructions reflect fundamentally different approaches. For its part, Apple has proposed constructions that are solidly grounded in the plain language of the claims, the patent specifications and file histories, and the applicable extrinsic evidence. Nokia, by contrast, proposes constructions that depart radically from these long-established guideposts of claim interpretation.

With respect to its own asserted patents, Nokia proposes constructions that seek either to stretch the claims to cover technologies that Nokia did not patent (in an effort to cover Apple's very different products), or to narrow the claims in a manner wholly inconsistent with the intrinsic and extrinsic record (in an attempt to avoid invalidating prior art). Conversely, with respect to Apple's asserted patents, Nokia's constructions attempt to import non-existent limitations into the claims (in an effort to avoid infringement), or improperly seek to expand claims (apparently hoping to manufacture new invalidity arguments). The Federal Circuit has repeatedly rejected similar attempts to treat patent claims as a "nose of wax" so malleable that they can be extended or pulled back depending on the state of litigation.

While improper, Nokia's proposed constructions are hardly surprising. At its core, this litigation has nothing to do with the supposed merits of Nokia's substantive positions, and everything to do with Nokia's admitted inability to compete in the marketplace with Apple's wildly successful consumer products. Nokia's shifting claim construction methodology is just one part of Nokia's broader effort to regain improperly through patent litigation what it has fairly lost to Apple in the marketplace. The Court should not permit Nokia to advance these improper motives through the *Markman* process.

II. NOKIA'S ASSERTED PATENTS

A. U.S. Patent No. 6,694,135 ("the '135 patent")

The '135 patent concerns network requests for a mobile device to report surrounding cell conditions. Two terms are in dispute: (i) "a first polling code representative of a first polling state provided in a header portion of the downlink transfer"; and (ii) "a second polling code[] representative of a second polling state provided in a header portion of the downlink transfer."

1. Nokia's Claimed Invention

Before the '135 patent, GSM (and other) networks could transmit "polling" messages to mobile devices, including those that polled the device: (i) for an "acknowledgment" (ACK) or "non-acknowledgment" (NACK), to confirm the device was correctly receiving communications from the network; and (ii) to measure its surrounding cell conditions (e.g., strength of received signals) and report the results to the network in a measurement report. ('135 patent, 2:16-21, 2:36-49.) Prior art GSM networks used the "Supplementary/Polling" (S/P) field in the header of an RLC/MAC message to inform a mobile device ***whether*** to send an ACK/NACK, and used the "Relative Reserved Block Period" (RRBP) field in the same header to tell the device ***when*** to send the ACK/NACK. (*Id.*, 4:1-53, Fig. 2 (showing both fields in "MAC Header").) Moreover, by sending a "Network_Control_Order" in a control message (but not in a header field), GSM networks could poll a mobile device to take and report cell measurements. (*Id.*, 2:36-63.)

Due to limits imposed entirely by the design of the GSM protocol, a mobile device could respond to network requests for measurement reports only once every four polling requests (the other three responses had to be ACK/NACKs). (*Id.*, 2:28-49, 2:66-3:5, 3:11-14.) To increase the frequency of measurement report transmissions within the confines of that protocol design, GSM networks needed to send polling messages more often. (*Id.*, 3:2-5.) The '135 inventors proposed a tweak to the GSM protocol design—one never incorporated into the GSM standard—

that used the already existing S/P and RRBP header fields to request ***both*** ACK/NACKs and cell measurement reports. According to the inventors, this approach allows for more frequent measurement reports, without increasing the overall number of polling requests.

2. "A First Polling Code Representative of a First Polling State Provided in a Header Portion of the Downlink Transfer" (Claim 11)

Apple's Construction	Nokia's Construction
"A value representative of a first polling state provided in a header field of the downlink transfer"	This phrase does not require construction. Plain and ordinary meaning applies.

The parties only dispute the meaning of "a header portion," which the intrinsic evidence confirms is "a header field." In fact, the only "portions" of a header mentioned in the '135 patent and file history are the S/P and RRBP ***fields***. ('135 patent, 1:54-58 (explaining GSM "approach" using S/P and RRBP header fields "is to make use of a header portion"); *id.*, 2:16-20 (describing "polling" with "[RRBP] field in the RLC data block header"); *id.*, 3:46-47 (referring to "the header portion" for examples using RRBP and S/P fields); *id.*, 4:1-5:29 (repeatedly referring to "RRBP field" and "S/P field" in describing portions of header).) *See Bell Atl. Network Servs., Inc. v. Covad Commc'ns Grp., Inc.,* 262 F.3d 1258, 1271 (Fed. Cir. 2001) ("[W]hen a patentee uses a claim term throughout the entire patent specification, in a manner consistent with only a single meaning, he has defined that term by implication").)

Nokia admits that "a field is a subset of the header," and that the only embodiment of the '135 patent "shows that the header portion may contain fields," but contends that "a header portion" is not limited to header fields because the inventors used the supposedly "broader" term "portion." (D.I. 236 ("Nokia Br.") 7-8.) That argument fails, particularly given the complete lack of evidence disclosing that a header portion can be anything other than a header field. Indeed, Nokia itself offers no evidence or argument of what a "portion" of a header might be, if not a field.

3. "A Second Polling Code[] Representative of a Second Polling State Provided in a Header Portion of the Downlink Transfer" (Claim 11)

Apple's Construction	Nokia's Construction
"A value representative of a second polling state provided in a header field of the downlink transfer that is separate from the header field of the first polling code"	This phrase does not require construction. Plain and ordinary meaning applies.

The parties dispute the meaning of "a header portion," which is a "header field" for the reasons noted above. Their only other dispute is whether the second polling code must be "separate from the header field of the first polling code." The intrinsic record confirms it must.

The plain language of the claims—which requires "***a first*** polling code" and "***a second*** polling code"—is consistent with requiring the two polling codes to be separate from one another. *See, e.g., Envirco Corp. v. Clestra Cleanroom, Inc.*, 209 F.3d 1360, 1365 (Fed. Cir. 2000) (distinguishing "first baffle means" from "second baffle means"); *Biax Corp. v. Nvidia Corp.*, 2010 WL 2539769, at *19 (D. Colo. 2010) (construing "second circuit" as distinct from "first circuit"); *Newtech Touch-Up Systems, Inc. v. Front Line Ready GA LLC*, 2010 WL 5394962, at *5 (W.D. Wash. 2010) (construing "first cloth," "second cloth," "third cloth," and "fourth cloth" as four separate cloths); *Regents of the University of MN v. AGA Med. Corp.*, 660 F. Supp. 2d 1037, 1041-42 (D. Minn. 2009) (construing "first and second occluding disks" as "physically distinct and separate first and second occluding disks"); *Taltech Ltd. v. Esquel Enter. Ltd.,* 410 F. Supp. 2d 977, 996-97 (W.D. Wash. 2006) (construing "first stitch" and "second stitch" to mean two separate stitches, and not merely "repeated instances" of the same stitch).

That conclusion is reinforced by the '135 specification, which explicitly states the importance of keeping the first and second polling codes "separated." ('135 patent, 3:42-45

("[S]uperfluous polling can be avoided because the messages are ***separated***.");[1] *id.*, 5:30-35 ("By modifying the downlink RLC/MAC header in this way, the pollings for the neighbor measurement and the packet acknowledgment messages are ***separated***....").) Apple's construction is also required by the '135 file history, in which the applicants overcame a prior art rejection only after arguing that "the solution provided by the present invention is to modify the downlink header in such a way that pollings for the measurement and for the packet acknowledgment ***are separated***." ('135 File History [8/9/02 Resp.] at 1672.)[2]

Nokia admits that the '135 patent "modifie[s] the RLC/MAC header to enable pollings for the neighbor measurement [second polling code] and packet acknowledgment messages [first polling code] ***to be separated***" (Nokia Br. 3), but contends that claim 11 does not require the two codes to reside in separate header fields. Nokia is wrong.

First, Nokia argues that the words "first" and "second" merely indicate that the two polling codes are "repeated instances of an element," such that "the second polling code is merely a second instance of a polling code." (Nokia Br. 5.) To make that argument, however, Nokia ignores the many cases (including those discussed above) holding that, as used in the '135 patent, the terms "first" and "second" indicate two physically separate elements. Nor is Nokia helped by its two cited cases. Consistent with Apple's position, *Free Motion Fitness* held that a "first extension arm" and "second extension arm" connoted ***separate*** "location of attachment of the first arm as opposed to the location of attachment of the second arm." *Free Motion Fitness, Inc. v. Cybex Int'l*, 423 F.3d 1343, 1348 (Fed. Cir. 2005). Moreover, the "repeated instance" language that Nokia cites from *3M* merely affirmed that "first" and "second" steps in a method

[1] Bold/italics emphasis is added throughout this brief, unless otherwise noted.

[2] The parties will provide the Court with copies of the asserted patents and their file histories as part of a joint appendix to be submitted at the conclusion of *Markman* briefing.

claim did not specify any "serial or temporal limitation"—an issue not in dispute here. *3M Innovative Props. Co. v. Avery Dennison Corp.*, 350 F.3d 1365, 1370 (Fed. Cir. 2003); *see Taltech*, 410 F. Supp. 2d at 996-97 (distinguishing *3M's* "repeated instance" language consistent with Apple's position here).

Second, Nokia argues that claim 11 only requires the "first polling code" and "second polling code" to differ with respect to the polling states they represent. (Nokia Br. 5.) But the language that Nokia cites only concerns the ***value*** of the two polling codes—requiring them to be "different." Other claim language (e.g., "first," "second," "a header portion"), along with the "separate" focus of the '135 specification and file history, specify the ***location*** of the two polling codes—i.e., in separate header fields.

Third, Nokia argues that Apple's position would render claim 3 "logically impossible" because it "specifically requires that *both* the first polling code and second polling code contain bits that are in the ***S/P field***." (Nokia Br. 5-6.) But claim 3 does not say that—it merely requires the bits to reside in "***a header*** of the RLC/MAC block." The claim says nothing about the specific ***fields*** of the header in which the S/P bits must reside.[3]

Finally, Nokia claims that Apple's construction would exclude the preferred embodiment in which "the first and second polling concedes [*sic*] both contain bits in the S/P field." (Nokia Br. 7.) But it was ***Nokia*** that excluded its own embodiment during prosecution to obtain the

[3] Nokia appears to suggest that claim differentiation applies. It does not. Claim 3 is a ***method claim*** (unlike asserted apparatus claim 11) that depends from a ***different*** independent claim (claim 1), and that adds multiple limitations not required by claim 11 (e.g., a "GPRS system" where "the first and second polling codes are transmitted in a downlink RLC/MAC block"). *See SunRace Roots Enter. Co., Ltd. v. SRAM Corp.*, 336 F.3d 1298, 1303 (Fed. Cir. 2003) (holding claim differentiation is most relevant "when the limitation in dispute is the only meaningful difference between an independent and dependent claim, and one party is urging that the limitation in the dependent claim should be read into the independent claim") (citation omitted).

'135 patent. Specifically, Nokia initially applied for claims that only required "one or more unique polling codes"—language that arguably would have covered its preferred embodiment. ('135 File History ['135 Appl.] at 1617-18.) After the PTO rejected those claims, however, Nokia canceled them, filed new claims requiring "a first polling code" and "a second polling code," and argued that the new claims were valid over the prior art because the two polling codes must be "***separated***": "Thus, it will be appreciated that the solution provided by the present invention is to modify the downlink header in such a way that pollings for the measurement and for the packet acknowledgment messages are separated." (*Id.* [8/9/02 Resp.] at 1672.)

Having disclaimed coverage of its preferred embodiment to obtain the '135 patent, Nokia cannot rely on that unclaimed embodiment now to recapture abandoned subject matter. *N. Am. Container, Inc. v. Plastipak Packaging, Inc.*, 415 F.3d 1335, 1346 (Fed. Cir. 2005) ("[L]imitations may be construed to exclude a preferred embodiment if the prosecution history compels such a result."); *Rolls-Royce, PLC v. United Tech.*, 603 F.3d 1325, 1334 (Fed. Cir. 2010) ("[T]his court must not allow the disclosed embodiment to outweigh the language of the claim, especially when the court's construction is supported by the intrinsic evidence."); *Seachange Int'l, Inc. v. C-COR, Inc.*, 413 F.3d 1361, 1372-73 (Fed. Cir. 2005) ("Where an applicant argues that a claim possesses a feature that the prior art does not possess in order to overcome a prior art rejection, the argument may serve to narrow the scope of otherwise broad claim language.").

B. <u>U.S. Patent No. 6,359,904 ("the '904 patent")</u>

The '904 patent relates to the format of "radio blocks" that mobile devices use to send user data (such as email and internet data) over cellular networks. The parties dispute one term: "channel coding means."

1. Nokia's Claimed Invention

A radio block is a basic unit of information that cellular networks use to communicate with mobile devices. Before a radio block can be transmitted, it must be processed in several steps. One such step is "channel coding," which adds bits to the radio block to enable the recipient to confirm its accuracy. ('904 patent, 5:53-60.) In the '904 patent, as in prior GSM systems, channel coding is performed in two stages: "block coding" and "convolutional coding." (*Id.*, 5:52-55, Fig 3.) Block coding adds bits, including a "block check sequence" (BCS), to the radio block, while convolutional coding adds other bits and performs operations on the data. (*Id.*, 5:53-60, 7:31-33.)

The '904 patent focuses on the format of radio blocks, using the well-known concept of fill bits (i.e., empty bits) to keep the user data portion of the radio block "octet-aligned" (i.e., divisible by 8 bits, that together constitute a "byte" of data). The patent applies this concept to four channel coding schemes in the GSM/GPRS standard ("CS-1" through "CS-4"), each of which results in a different number of bits used to transfer user data, and is explicit that "[a] mobile station ***must*** support all four alternatives." (*Id.*, 2:61-62, 4:8-11, 5:53-61, 7:11-12, Table 1.) The radio block includes a "payload" comprising: (i) "check bits" to check the accuracy of user data; and (ii) "transfer bits" to transfer user data to the network. The "transfer bits" include a first portion that contains user data and is "octet-aligned," and a second portion that is fill bits. The number of fill bits chosen ensures that the user data remains "octet-aligned." (*Id.*, 4:34-36.)

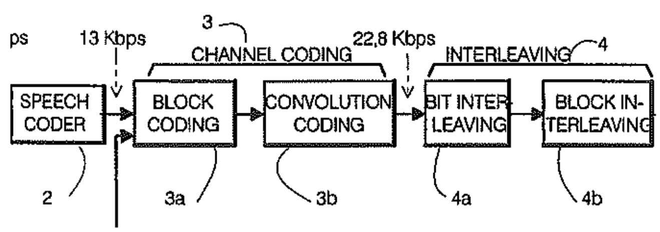
2. "Channel Coding Means" (Claim 5)

Apple's Construction	Nokia's Construction
Function: channel coding of a radio block using a coding method **Structure**: a block coder and convolutional coder as shown in elements 3a and 3b of Figure 3, which perform channel coding using	**Function**: channel coding of a radio block using a coding method **Structure**: a microprocessor programmed to perform convolutional coding having a coding rate of 1/2, 2/3, or 3/4

the coding schemes illustrated in Table 1	

The parties agree that "channel coding means" is a means-plus-function element, and that the claimed function is "channel coding of a radio block using a coding method." They disagree, however, about the structure required to perform that function. Nokia's construction improperly omits two essential elements of this structure: the algorithms for (i) "block coding" and (ii) coding scheme CS-4 (i.e., the coding scheme corresponding to a coding rate of "1"). *See Harris Corp. v. Ericsson Inc.*, 417 F.3d 1241, 1253 (Fed. Cir. 2005) (finding for "[a] computer-implemented means-plus-function term … the corresponding structure is the algorithm").

The '904 specification is explicit that the "channel coding" structure includes ***both*** "convolutional coding" ***and*** "block coding." For example, as shown in Figure 3, channel coding 3 includes block coding 3a and convolutional coding 3b:



('904 patent, Fig. 3.) The specification further explains that, "after speech encoding 2 ***it is performed channel coding 3*** for example ***in two stages*** ... when at first one part of the bits ... are protected using ***block code 3a*** ... and after that these and the next most important bits ... are further protected using ***convolutional code 3b....***" (*Id.*, 5:52-61.) All of the disclosed coding schemes include block coding, and coding schemes CS-1 through CS-3 include convolution coding. (*Id.*, 7:10-32 (block coding includes addition of "block check sequence BCS"); *id.*, Table 1 (showing BCS bits for all four coding schemes).)

The '904 specification also confirms that the structure required to perform the claimed function "must" include all four coding schemes, CS-1 through CS-4. (*Id.*, 4:11-12 ("A mobile station ***must support all four alternatives.***").) The patent explicitly discusses all four channel coding schemes with their corresponding code rates (1/2 for CS-1, 2/3 for CS-2, 3/4 for CS-3, 1 for CS-4), and shows them in each example table. (*Id.*, Tables 1-3; *id.*, 7:10-11, 7:28-29 (discussing "channel coding methods CS-1 ... CS-4"); *id.*, 8:13-14, 8:16-18, 9:4-8, 9:18-21 ("[I]n channel coding method CS-4 it is selected 7 additional bits ... as the fill bits."); *id.*, 9:42-43 (referring to "channel coding ... presented in Table 1").)

Nokia contends that "block coding" cannot be part of "channel coding ***of a radio block***" because the radio block in Figure 4 includes bits added by block coding. (Nokia Br. 19-22.) But the patent confirms that block coding is performed on a ***preexisting*** radio block. For example, in describing Figure 4 ("a radio block according to the invention"), the specification explains, "[i]n the first stage of coding [i.e., block coding] it is ***added at the end of a radio block*** a block check sequence BCS (Block Check Sequence) for error detection." ('904 patent, 7:31-33.) As Nokia admits, a radio block must exist before BCS bits can be added to it. (Nokia Br. 20 (BCS bits "are added ***to the radio block*** ... in the first stage of channel coding called 'block coding'").)

Trying to avoid prior art withheld from the PTO, Nokia also seeks to omit CS-4 from the required structure, arguing that no convolutional coding is performed using that scheme. (Nokia Br. 21.) This argument directly contradicts the specification: "***[f]or the channel coding*** there are ***four*** different coding schemes CS-1, CS-2, CS-3 ***and CS-4*** ... A mobile station must support ***all four alternatives***." ('904 patent, 4:9-12.) The specification further confirms that "block coding," a type of channel coding, ***is*** performed using CS-4—explaining that, "[i]n the first stage of coding [i.e., block coding] it is added at the end of a radio block a block check sequence BCS (Block Check Sequence) for error detection," and showing in Table 1 that block coding using CS-4 adds 16 BCS bits at the end of the radio block. (*Id.*, 7:31-33, Table 1.)

Accordingly, the Court should adopt Apple's proposed structure, or modify Nokia's proposed structure as follows: "a microprocessor programmed to perform ***block coding and/or*** convolutional coding using coding schemes having coding rates of 1/2, 2/3, 3/4***, and 1***."

C. U.S. Patent No. 5,802,465 ("the '465 patent")

The '465 patent relates to the transfer of data (e.g., email and internet data) between a mobile device and cellular network. The parties dispute two terms: (i) "setting up a real data communication channel" and (ii) "establishment of a real data communication channel."

1. Nokia's Claimed Invention

Nokia filed the parent application that issued as the '465 patent at a time when standard-setting organizations like ETSI were beginning to consider proposals for handling the rapidly increasing volume of data communications which, in contrast to voice communications, are typically transmitted in short bursts of packets (e.g., when an email or text message is sent). As the patent states, one such proposal involved creating a separate, "***permanent channel***" for data communications that would be "***constantly available***, irrespective of a momentary need." ('465 patent, 2:23-26.) The '465 inventors explicitly criticized this approach. (*Id.*, 2:7-26, 4:66-67.)

The '465 patent instead proposes a different solution that would involve as few changes as possible to then-existing GSM networks. (*Id.*, 4:53-57 ("The implementation of the system must be such that it requires ***only a few changes*** in digital cellular systems in current use and, as an additional feature, it is well appropriate for use in current systems such as GSM....").) Rather than create a separate, permanent channel for data communications, the '465 patent proposes a process to more quickly assemble and tear down channels for data communications within the ***existing channels already in use*** for voice communications and related control information. To do so, the inventors proposed forming a "virtual data communication channel" between the mobile device and network, before establishing a "real data communication channel," to expedite later establishment of the real data communication channel. (*Id.*, 1:33-2:6, 2:29-58, 4:3-34, 4:53-57, 5:1-30.) The patent explains that this "virtual data communication channel" involves a "non-physical registration relationship," in which the mobile device stores a parameter relating to a "fixed station" on the network (e.g., a network switching center), and the fixed station stores a parameter relating to the mobile device. (*Id.*, 19:13-18.)

The inventors claimed that this "fast transition" process would provide major benefits over the prior art proposals for a permanent data communications channel. (*Id.*, 2:59-67 ("Thus, a communication channel does not have to be continually open, even during no actual transmission of data. Thus, the costs of transmitting data are reduced.").)

2. "Setting up a Real Data Communication Channel" / "Establishment of a Real Data Communication Channel" (Claim 28)

Apple's Construction	Nokia's Construction
"Assembling a channel for the transfer of real data, where there is no channel permanently available for the transfer of real data"	This phrase does not require construction. Plain and ordinary meaning applies.

Apple's construction is supported by the plain claim language, which unambiguously uses the terms "setting up" and "establish[ing]" to refer to assembling something that did not previously exist. There would be no need to "set up" or "establish" a channel for the transfer of data, if a permanent channel for data transfer already existed. (Ex. 1 [Am. Heritage] at 628 (defining "establish" as "1b. To bring about, generate," and synonymously with "set up").)[4]

Apple's construction is also consistent with the specification, in which the '465 inventors explicitly contrasted their claimed invention with an earlier proposal for "a ***permanent channel*** … for packet transfer, being ***constantly available***, irrespective of a momentary need." ('465

[4] All cited exhibits are attached to the Declaration of Bryan S. Conley in Support of Apple Inc.'s Answering and Opening *Markman* Brief.

patent, 2:23-26, 2:59-67.) The specification advocates, as an alternative, a process to more quickly assemble and tear down a channel for data transfer within the existing channels already in use for voice communications and related control information. In the claimed invention, there are ***no*** permanent channels for data communications. (*Id.*, 4:66-67 ("For transferring packet data no allocated radio channel and data route via the network are maintained continuously.").) Instead, a channel is "set up" or "established" only when needed (*id.,* 7:33-9:13)—an approach the inventors touted as having major advantages over a permanent channel for data transfer (*id.*, 2:59-67 ("These aspects of the invention provide the advantage that a real data communication channel can be established quickly and when a mobile station desires to transmit data .... ***Thus, a communication channel does not have to be continually open, even during no actual transmission of data.***").)

That conclusion is further reinforced by the file history, in which the inventors repeatedly distinguished the prior art by arguing that the '465 patent does not require a channel or "tube" permanently available for transferring data: "There are no reserved time slots, and no physical path that must be reserved and maintained. No allocated spread codes. No waste of capacity. No 'existing' tube. There is no burden put on the route provider and nothing that need require a cost or charge unless and until a packet transmission becomes available. Then, and only then, need a 'tube', i.e., a physical channel, be established." ('465 File History [8/19/96 Resp.] at 232; *id.* at 234 (emphasizing lack of need for "any continuous reservation of resources").)

In its brief, Nokia contends that "setting up" or "establishing" a "real data communication channel" involves "creating a physical relationship and reserved path between the radio telephone and the network," and that the real data communication channel is "a physical path reserved, upon being established, for carrying the data transmission at the time of and during transmission." (Nokia Br. 10, 11.) Apple agrees. There would be no need to set up such a path, however, if there was a channel ***permanently*** available for the transfer of data.

The parties' primary dispute centers on the last clause of Apple's proposed construction: "where there is no channel permanently available for the transfer of real data." Nokia contends that this clause is "disfavored" as a "negative limitation," citing *Omega Eng'g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1335 (Fed. Cir. 2003). (Nokia Br. 12.) In *Omega*, however, the Federal Circuit confirmed that negative limitations ***are appropriate*** when, as here, they are supported by the claims and/or a disclaimer in the specification or file history. *Omega*, 334 F.3d at 1332. Indeed, although *Omega* rejected the district court's negative limitation, it added its own new negative limitation ("without adding ...") based on prosecution statements distinguishing prior art. *Id.* at 1334; *see also Altair Eng'g v. LEDdynamics*, 2011 WL 836440 (Fed. Cir. 2011) (construing term to include negative limitation ("not spaced-apart") supported by specification and file history).

The same result applies here. As in *Omega*, Apple's proposed construction is not only warranted, but compelled by the claim language and Nokia's numerous statements in the '465 specification and file history explicitly disclaiming and distinguishing prior proposals with permanent channels for data transfer, as described in detail above. Having expressly disclaimed coverage of prior systems using permanent data channels to obtain its patent, Nokia can hardly complain about a claim construction that accounts for that disclaimer.

Nokia alternatively contends that it would be ambiguous to include the phrase "where there is no channel permanently available for the transfer of real data." (Nokia Br. 12.) There is no ambiguity. The '465 inventors repeatedly described (and disclaimed) the use of a "permanent channel," and Apple's proposed construction merely uses that same term—as the inventors did—

to refer to a shared channel. ('465 patent, 2:6-26.)

Finally, Nokia contends that Apple's use of "real data" is confusing. (Nokia Br. 13.) Apple disagrees, but would not object to replacing the term "real data" with "data."

D. U.S. Patent No. 6,775,548 ("the '548 patent")

The '548 patent relates to processes that mobile devices use to access cellular networks. The parties dispute two terms: (i) "the access transmission comprising a preamble and at least one message frame"; and (ii) "pilot channel."

1. Nokia's Claimed Invention

Before a mobile device can transmit a voice call or data over a cellular network, it must first provide the network with basic information about the transfer, including the identity of the mobile device and other authentication information. The mobile device typically transmits this type of information over an "access channel," and the network uses the transmitted information to set up the connection. To send these types of transmissions, a higher data rate is generally preferred (particularly in packet-switched networks) because it reduces delays—but transmitting data at a higher data rate is not always possible, particularly if channel conditions are poor. ('548 patent, 1:37-57, 1:66-2:1, 2:11-14, 2:42-3:25, Abstract.)

Nokia suggests in its brief that the '548 inventors addressed this issue by dynamically varying the data rate and frame size of transmissions based on channel conditions (i.e., they used a higher data rate under good conditions, and a slower data rate under poor conditions). (Nokia Br. 14-15.) As Nokia acknowledged during prosecution, however, prior art systems already had this same capability. ('548 File History [7/21/03 Suppl. Br.] at 2181.) The '548 patent focuses on determining the highest data rate for access transmissions based on channel conditions, and then accessing the network at that data rate using a variable rate access transmission. The claimed access transmission has a "preamble" and one or more variable-rate "message frames" that are sent at the highest available data rate, to achieve the patent's stated purpose of minimizing access delays. ('548 patent, Title, Abstract, 1:7-10, 2:23-29.)

2. "The Access Transmission Comprising a Preamble and at Least One Message Frame" (Claim 24)

Apple's Construction	Nokia's Construction
"A transmission to gain access to a network, where the mobile station transmits the preamble and at least one message frame, without waiting for an acknowledgment before sending the message frame"	This phrase does not require construction. Plain and ordinary meaning applies.

Apple's construction is supported by the singular focus of the plain claim language (requiring "***an*** access transmission"), and by the specification's explicit and repeated description of the access transmission as a ***contiguous*** transmission—without any delay or acknowledgment occurring between the preamble and message frame. For example, Figure 4A, which shows the timing of the access transmission, depicts a contiguous transmission in which the preamble is sent over a pilot channel and the "message capsule" (i.e., the message frame) is sent over an access channel, without any intermediate delays. (*Id.*, 6:63-7:3, Fig. 4A.) These same transmissions occur in ***every embodiment*** disclosed in the specification. (*Id.*, 8:34-39, 8:58-63, 8:34-9:36 (noting for each embodiment that "mobile station 114 transmits the access probes of FIGs. 4A and 4B using a message capsule with data transmitted at [certain rates]").)

Indeed, ***waiting*** for an acknowledgment ***before*** sending the message frame would necessarily increase access time and undermine the stated purpose of the '548 patent: to reduce access delays. (*Id.*, Title ("Access Channel for Reduced Access Delay…."); '548 File History [8/21/01 Appeal Br.] at 2059 (arguing no motivation to combine references that "may actually increase access time rather than reduce it").) *See Fujitsu Ltd. v. Netgear Inc.*, 620 F.3d 1321, 1335 (Fed. Cir. 2010) (rejecting construction that "ignores the power saving purpose of the invention").

Finally, and perhaps most critically, the file history confirms that Nokia ***expressly disclaimed*** coverage of systems that send a preamble, but then wait for an acknowledgment before sending a message frame. The PTO initially rejected the '548 claims based, in part, on U.S. Patent No. 5,612,950 ("Young patent")—a reference Nokia itself described as disclosing a system that transmits a "control frame header" (a preamble), but then waits for an "acknowledgment" before sending the "data frames" (message frames). ('548 File History [7/21/03 Suppl. Br.] at 2180-81, 2185; Ex. 2 [Young patent] at Abstract ("sending node" sends "[a] control frame header," waits for an acknowledgment, and only then sends data frames, which can be sent at different data rates and frame sizes).) Nokia argued that the '548 patent did not cover Young's system of transmitting a preamble, but then waiting for an acknowledgment before sending the message frame: "***None*** of these references [including Young] disclose transmission or reception of an access transmission formed of a preamble and message frame as recited in the claims." ('548 File History [7/21/03 Suppl. Br.] at 2193).)

Having made this argument to obtain its patent, Nokia cannot now broaden the same claims here by seeking to cover exactly what it represented they do not cover—i.e., a system that waits for an acknowledgment before transmitting a message frame. *Seachange*, 413 F.3d at 1372-73 ("Where an applicant argues that a claim possesses a feature that the prior art does not possess in order to overcome a prior art rejection, the argument may serve to narrow the scope of otherwise broad claim language.").

3. "Pilot Channel" (Claim 25)

Apple's Construction	Nokia's Construction
"A channel over which pilot signals are sent"	This phrase does not require construction. Plain and ordinary meaning applies.

The term "pilot channel" appears only in dependent claim 25, which provides "wherein said mobile station transmits said preamble on a pilot channel and transmits said at least one message frame on an access channel." Consistent with the plain meaning of that usage (and common sense), a pilot channel means "a channel over which pilot signals are sent."

Nokia contends that "pilot signals" are limited to signals sent on ***forward*** pilot channels, and do not include signals sent on ***reverse*** pilot channels. (Nokia Br. 17.) Tellingly, Nokia has not provided a single citation for its counterintuitive theory that a "reverse pilot" channel does not carry a "pilot signal"—because there is none. In fact, one '548 inventor expressly acknowledged in a later patent that pilot signals are transmitted on reverse pilot channels. (Ex. 3 ['277 patent] at 3:19-23 ("The pilot signal is communicated upon a reverse pilot channel….").)

Nokia appears confused as to whether Apple's construction is limited to forward pilot channels—which it is not. Nevertheless, to resolve this "dispute," Apple would not object to making explicit that the "pilot channel" includes both forward and reverse pilot channels: "***A forward or reverse channel over which pilot signals are sent.***"

E. U.S. Patent No. 5,862,178 ("the '178 patent")

The '178 patent relates to speech transmission in a mobile communications system. The parties dispute two limitations: "speech coding means for coding a speech signal" and "channel encoding means for channel-encoding the speech-encoded signal."

1. Nokia's Claimed Invention

Communication systems typically subject speech signals (e.g., voice data for a phone call) to two types of coding: speech coding and channel coding. Speech coding reduces the number of bits used to represent a speech signal (thereby reducing the amount of data that needs to be transmitted), while channel coding adds bits to the speech signal (to help detect and correct errors). (*Id.*, 1:17-1:26, 1:60-65, 2:16-18.) As the '178 patent explains, speech and channel coding were well known, as was how to integrate multiple speech and channel coding methods into a single communication system. (*Id.*, 1:34-41, 2:20-25, 3:47-63.)

The '178 patent purports to address a way to incorporate additional speech and channel coding methods into an existing system—by dividing the additional channel coding method into two steps, and reusing the original channel coding method as one of the steps. (*Id.*, 5:40-6:6.) According to the '178 patent, this technique "allows for the quality of voice in an existing system to be improved with as small changes as possible." (*Id.*, 6:5-6.)

2. "Speech Coding Means for Coding a Speech Signal" (Claim 9)

Apple's Construction	Nokia's Construction
Function: coding a speech signal **Structure**: a processor programmed to combine a Full Rate speech coder with a speech coder that has a transmission rate of 8 kilobits per second and that divides the speech signal into 10-millisecond frames, each containing 80 bits	**Function**: coding a speech signal **Structure**: a processor or integrated circuit that is programmed to employ two or more speech encoders 202 having mutually different speech coding transmission rates (S1, S2,..., SN) where: a first one of the speech encoders 2021 is an existing speech encoder having a speech coding transmission rate of S1, such as the known RPELTP speech encoder used in a full-rate speech transmission channel of the GSM mobile telephone system having a speech coding transmission rate of S1=13 kbit/s; and a second one of the speech encoders 2022 is a newer or later-added speech encoder having a speech coding transmission rate of S2, where S1 > S2

The parties agree that "speech coding means for coding a speech signal" is a means-plus-function limitation, and that the claimed function is "coding a speech signal." They disagree about the structure required to perform that function—which the intrinsic record confirms is "a processor programmed to combine a Full Rate speech coder with a speech coder that has a transmission rate of 8 kilobits per second and that divides the speech signal into 10-millisecond frames, each containing 80 bits."

That construction is supported by the '178 specification, which explains that the claimed "speech coding" function is an algorithm that, as Nokia admits, "reduces the number of bits used for representing a speech signal." (Nokia Br. 23.) The patent identifies only one structure that does so: a processor programmed to combine a Full Rate speech coder with a second speech coder that has a transmission rate of 8 kilobits per second and that divides the speech signal into 10-millisecond frames of 80 bits each. ('178 patent, 11:11-35.) The claim is thus limited to that disclosed structure and its equivalents. *See Harris Corp.*, 417 F.3d at 1253 ("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."); *WMS Gaming, Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1349 (Fed. Cir. 1999) ("[T]he disclosed structure is not the general purpose computer, but rather the special purpose computer programmed to perform the disclosed algorithm.").

In its brief, Nokia attempts to defend its far broader and function-based proposed construction. That effort fails for several reasons.

First, Nokia's construction fails to identify ***any structure*** that corresponds to the claimed "speech coding means," and instead only identifies ***functional*** language describing what the structure must do. That deficiency alone is sufficient to reject Nokia's construction. *See J & M Corp. v. Harley-Davidson, Inc.*, 269 F.3d 1360, 1367 (Fed. Cir. 2001) ("[Required structure] does not extend to all means for performing a certain function," and "is sharply limited to the structure disclosed in the specification and its equivalents.").

Second, that result does not change based on Nokia's citation to Figure 2. (Nokia Br. 25-26.) Contrary to Nokia's assertion, that figure does not disclose any structure that reduces the number of bits used to represent a speech signal—as Nokia admits the claimed "speech coding means" must do. (Nokia Br. 23.) Nor does the portion of the specification describing Figure 2 remedy that missing disclosure. That excerpt merely states that items 202 comprise some

unspecified speech encoders with different transmission rates. ('178 patent, 7:18-35.) It says nothing about any corresponding structure for the speech encoders; i.e., the algorithm that reduces the number of bits per second used to represent the speech signal.

Third, Nokia's reliance upon *Altiris, Inc. v. Symantec Corp.*, 318 F.3d 1363 (Fed. Cir. 2003) is misplaced. Unlike here, the patent in *Altiris* disclosed two alternative embodiments, both of which disclosed structure. *Id.* at 1376-77. Here, by contrast, the '178 patent discloses only one structural embodiment ('178 patent, 11:11-21), properly identified in Apple's proposed construction, along with a generic functional description, relied upon by Nokia. *Altiris* does not hold that the corresponding structure of a means-plus-function limitation can be so broad that it covers such purely functional descriptions devoid of structure.

Fourth, Nokia's proposed construction includes elements recited almost verbatim in claim 9 ("two or more speech encoders 202 having mutually different speech coding transmission rates (S1, S2, ..., SN)"; "an existing speech encoder having a speech coding transmission rate of S1"; "a second ... speech encoder having a speech coding transmission rate of S2, where S1 > S2"). But again, these recited elements are ***functional***—they describe all possible speech encoders with different transmission rates. Having defined the scope of its claim using means-plus-function terms, Nokia cannot seek to broaden that scope based entirely on such functional disclosures.

In the end, Nokia is left to argue that its claim covers all possible structures for carrying out the claimed "speech coding means," as long as the first speech coder uses a transmission rate greater than that of the second speech coder—a purely ***functional*** limitation. This is improper. *Biodex Corp. v. Loredan Biomedical*, 946 F.2d 850, 863 (Fed. Cir. 1991) ("[T]his Court has specifically cautioned against reading means-plus-function limitations to cover all possible means that perform the recited function.").

3. "Channel Encoding Means for Channel-Encoding the Speech-Encoded Signal" (Claim 9)

Apple's Construction	Nokia's Construction
Function: channel-encoding the speech-encoded signal **Structure**: A processor programmed to combine a Full Rate channel encoder with a channel encoder that takes the output of the speech coding means and adds 100 error-correction bits	**Function**: channel-encoding the speech-encoded signal **Structure**: A processor or integrated circuit that is programmed to employ two channel encoders 203, 205, where: (i) the first channel encoder 203 provides a first channel coding bit rate that is specific to a speech encoder 202, where the speech encoder 202 is selected from one of N≥2 speech encoders 2021, 2022, ...202N having mutually different speech coding transmission rates of S1, S2, ..., SN, where the transmission rates of the N different speech encoders have the following relationship: S1≥S2≥...≥SN, and where the first channel coding bit rate of the first channel encoder 203 is correspondingly 0, S1-S2, ..., S1-SN, depending on which speech encoder 202 is employed, such that the transmission rate obtained as a result of the selected speech encoder 202 and first channel encoder 203 is kept constant at S1 regardless of the transmission rate of the speech encoder employed; and (ii) the second channel encoder 205 provides a second channel coding bit rate of C > 0 that is always the same irrespective of which speech encoder 202 and first channel encoder 203 are used, such that, at the output of the second channel encoder 205, the total transmission rate is a constant S1+C

The parties agree that "channel encoding means for channel-encoding the speech-encoded signal" is a means-plus-function limitation, and that the claimed function is "channel-encoding the speech-encoded signal." But they again disagree about the structure required to perform that function—which the intrinsic record confirms is "a processor programmed to combine a Full Rate channel encoder with a channel encoder that takes the output of the speech coding means and adds 100 error-correction bits."

Apple's construction is confirmed by the '178 specification, which makes clear that the structure required to perform "channel-encoding [of] the speech-encoded signal" is an algorithm that, as Nokia admits, adds "error detection or error correction bits ... to the speech coding bits." (Nokia Br. 23.) The patent only discloses one such structure: a processor programmed to combine a Full Rate channel encoder with a channel encoder that takes the output of the speech coding means and adds 100 error correction bits. ('178 patent, 11:11-35.) No other disclosed structure adds error detection or error correction bits.

Nokia's attempt to defend its proposed construction fails largely for the same reasons discussed above in connection with the "speech coding means" limitation.

First, Nokia fails to identify any ***structure*** corresponding to the claimed "channel coding means," and again improperly identifies purely ***functional*** terms. Contrary to Nokia's proposal, the claims cannot properly cover all possible structures for performing the claimed function of the "channel coding means," as long as the first channel coder operates at ***any*** rate S1 and the second channel coder operates at ***any*** rate S1+C. *See J & M Corp.*, 269 F.3d at 1367.

Second, Nokia again relies on Figure 2 for its construction, but that figure and the cited specification text do not disclose an algorithm for adding error detection bits. Rather, they merely disclose two stages of ***unspecified*** channel encoding, in which a first channel encoder has a first ***unspecified*** channel coding bit rate (S1) and the second channel encoder has an unspecified channel coding bit rate (C > 0). ('178 patent, 5:53-60, 7:14-16, 8:13-20.) This is language of function, not structure.

Third, Nokia proposes a construction that includes elements recited almost verbatim in claim 9, arguing that structure can be found in elements such as "first channel coding bit rate that is specific to a speech encoder 202 … such that the transmission rate … is kept constant at S1 regardless of the transmission rate of the speech encoder employed" and "second channel coding bit rate of C > 0 that is always the same irrespective of which speech encoder 202 and first channel encoder 203 are used, such that … the total transmission rate is a constant S1+C." Again, however, these are ***functional*** descriptions, not corresponding structure.

Finally, Nokia asserts that Apple's construction would improperly limit the claims to an "exemplary embodiment" disclosed in the specification. (Nokia Br. 27-28.) But that is not true. By choosing to claim the "speech coding means" and "channel coding means" in means-plus-function format—and failing to disclose any structure within claim 9 for performing the claimed functions—Nokia elected to be bound by the structure of its disclosed embodiments. And by disclosing only a single embodiment of the "speech coding means" and "channel coding means," Nokia cannot avoid having the limitations construed in accordance with that exemplary structure.

F. U.S. Patent Nos. 6,882,727 and 7,009,940 ("the '727 and '940 patents")

The '727 and '940 patents concern the security of messages transmitted between devices. The parties dispute: (i) "input parameter" ('727 patent); and (ii) "input value" ('940 patent).

1. Nokia's Claimed Invention

A message sent from one device to another (e.g., between two cell phones) is susceptible to unwanted interception and tampering. Security algorithms can "randomize" or "code" digital messages sent through the air (via radio waves), so that unintended recipients cannot understand or alter the message; for example, "ciphering" algorithms can "encrypt" or encode a message during transmission, and "integrity" algorithms can help prevent others from tampering with a message by checking its authenticity. The randomization process used by these types of algorithms involves inputting certain information ***about*** the message into the algorithm (e.g., information about the time at which the message is sent, called its "count"), in addition to the message itself. ('727 patent, 1:10-61; '940 patent, 1:30-37, 1:61-2:6.)

The '727 and '940 patents purport to identify an additional type of information about the message that can be used for integrity and ciphering algorithms—i.e., information that identifies the specific radio channel on which the message will be sent (which the patents variously call "information relating to the identity of the channel," "radio bearer ID," and "RB ID"). The patents add this RB ID information alone as a separate "input parameter" ('727 patent),[5] or as appended to one or more other existing "input values," without changing the number of separate input parameters ('940 patent). ('727 patent, 9:11-20, Figs. 4A-4C; '940 patent, 11:5-12:39, Figs. 4, 6.)

2. "Input Parameter" ('727 patent) / "Input Value" ('940 patent)[6]

Apple's Construction	Nokia's Construction
"input parameter": "a discrete parameter that is input into an algorithm separately from any other parameters" **"input value"**: "a discrete value that is input into an algorithm separately from any other values"	**"input parameter"**: This term does not require construction. Plain and ordinary meaning applies. **"input value"**: This term does not require construction. Plain and ordinary meaning applies.

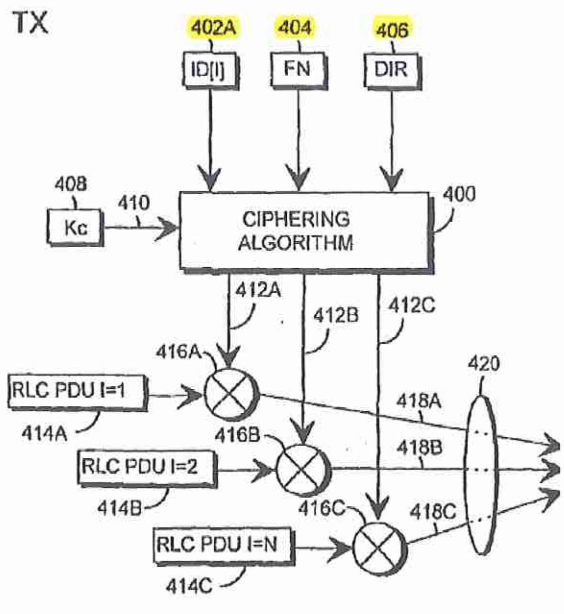
Apple's constructions are confirmed by the plain language of the claims. For example, claims of the '940 patent require the RB ID parameter to be "combined" with another input value—a requirement that only makes sense if the RB ID parameter is separately input ***before*** it is later "combined." ('940 patent, claims 1, 3, 6-20.) Nokia's construction, by contrast, would improperly read the term "combined" out of these claims. *See Haemonetics Corp. v. Baxter*

[5] The '727 patent also discusses including information relating to a message's "frame number" as a separate input parameter. ('727 patent, 9:55-60.)

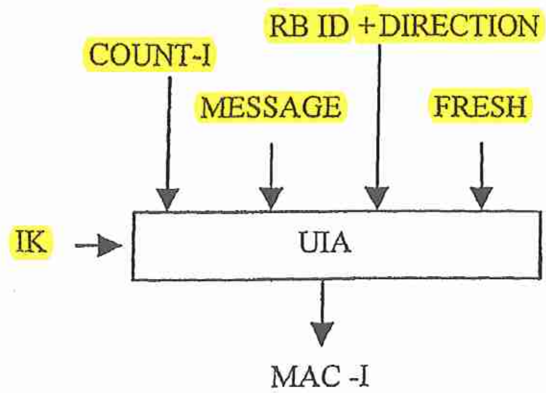
[6] Nokia criticizes Apple's joint treatment of "input parameter" and "input value," both of which describe security algorithm inputs, but does not offer any substantively different meaning for either term and admits the patents are "[s]imilar in some respects." (Nokia Br. 28, 32.)

Healthcare Corp., 607 F.3d 776, 781 (Fed. Cir. 2010) ("[W]e construe claims with an eye toward giving effect to all of their terms."); *Mangosoft, Inc. v. Oracle Corp.*, 525 F.3d 1327, 1330-31 (Fed. Cir. 2008) (rejecting construction that would render term "superfluous").

Apple's constructions are also consistent with the '727 and '940 specifications, which use a ***solid arrow*** convention to make clear that the claimed "input parameters" and "input values" are discrete parameters/values input ***separately*** into the algorithms. For example, Figure 4A from the '727 patent uses solid arrows to show channel ID 402A, frame number 404, direction 406, and key 408 as discrete parameters separately input into ciphering algorithm 400:



('727 patent, Fig. 4A excerpt (highlighting added); *id.*, Figs. 4B and 4C (showing same input scheme).) The same holds true for the '940 specification, which as depicted in Figure 6 below, uses solid arrows to show discrete input values ***separately*** input into integrity algorithm UIA:



(*Id.*, Fig. 6 (showing RB ID appended to DIRECTION parameter and then added separately from the other inputs) (highlighting added); *id.,* Fig. 4 (showing RB ID appended to one or more parameters that are then separately input into the algorithm); *id.*, Fig. 3 (prior art algorithm with five discrete input parameters separately input into algorithm UIA).) The '940 specification expressly describes RB ID as a "separate input" when it has a solid arrow path to the algorithm (*id.*, 3:31-32), and explains that RB ID in this configuration "is input ***separately*** and is used in the calculation performed by the integrity algorithm UIA." (*Id.*, 12:23-32.)

The '940 patent also repeatedly emphasizes that RB ID is a separate input value by identifying "the possible ***places*** where [RB ID] can be included without modifying the integrity algorithm UIA"—i.e., with existing "input values" IK, MESSAGE, COUNT-I and FRESH. (*Id.*, 11:35-37; *id.*, 11:42-45 (appending RB ID "(as a string) to one or more of the existing algorithm input parameters"); *id.*, 11:46-12:30 (discussing embodiment where RB ID is split between separate "input parameters" FRESH and COUNT-I); *id.*, 12:14-17 ("Thus, instead of just the MESSAGE ***alone*** being input to the integrity algorithm, the bit string fed into the integrity algorithm would become [RB ID] and the MESSAGE."); *id.*, 12:33-39 ("This embodiment [appending RB ID to DIRECTION] would effectively make the existing i.e., 'old' DIRECTION parameter longer and thus have effect on the integrity algorithm UIA").) These passages only make sense if "input values" are all added in separate "place<u>s</u>" as separate inputs, and not if they combined and added together in a single "place."

Apple's construction is also required by the file history. During prosecution of the '940 patent, Nokia originally included broad claims that did not require RB ID information to be input separately into integrity algorithms. ('940 File History [10/10/01 Amend.] at 2459-60 (original claim 1 only requiring "at least one of said values being arranged to comprise information relating to the identity of said channel").) However, the PTO rejected these broader claims until Nokia agreed to amend them with the "combined with only [at least] one other input value" limitation—which, as explained above, requires the "input values" to be discrete parameters that are separately input into algorithms. (*Id.* [5/5/05 Office Action] at 2638-48; *Id.* [8/5/05 Resp.] at 2653-63.) Having disclaimed this claim scope via the "combined" limitation to obtain its patent, Nokia cannot argue here that the same limitation is meaningless. *See Haemonetics*, 607 F.3d at 781; *Mangosoft*, 525 F.3d at 1330-31.

Nokia's brief contends that Apple's constructions would improperly exclude a preferred embodiment because the figures of the '727 and '940 patents supposedly "show[] *multiple* input parameters all provided to a ciphering algorithm *together*." (Nokia Br. 34-35.) As noted above, however, using solid arrows, each of the cited figures clearly show each of the inputs as discrete parameters that are input ***separately*** into algorithms. Had the inventors intended to convey that the various inputs shown in the figures are added "together," as Nokia argues, they easily could have used the ‖ symbol—used by those of skill in the art to show values that are combined (also called "concatenated") and then input into an algorithm "together."

In fact, the '940 inventors did just that with respect to Figure 8, using the ‖ convention to show AV as equal to concatenated values "RAND‖XRES‖CK‖IK‖AUTN." ('940 patent, Fig. 8.) The same conclusion is reinforced by a book written by one of the '940 inventors, which shows in the added red circle (on the left below) the values COUNT, BEARER, DIRECTION and a string of 0 bits all concatenated before being input in to the KASUMI security algorithm—in stark contrast to Figure 4A of the '727 patent (on the right below), which shows in the added red circle the same values ID 402A (equivalent to BEARER), FN 404 (frame number), and DIR 406 (direction) each input separately into the security algorithm:

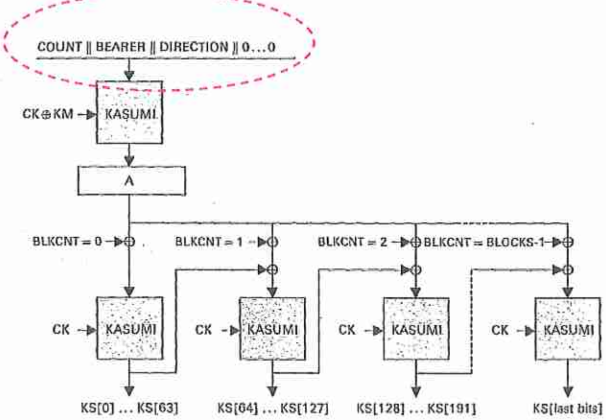


Figure 6.3 The f8 stream cipher mode
CK = Confidentiality Key; KM = Key Modifier; BLKCNT = block counter; KS = keystream

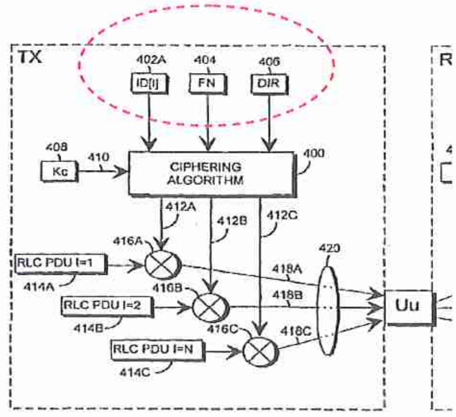


Fig 4A

(Ex. 4 [*UMTS Security*] at 150, 247; '727 patent, Fig. 4A.) The record therefore confirms that the inventors knew how to indicate concatenated values when they intended to do so.

III. APPLE'S ASSERTED PATENTS

A. U.S. Patent No. 6,239,795 ("the '795 patent")

The '795 patent teaches how to customize the appearance and behavior of interface objects (e.g., icons and windows) on a computer's graphical user interface (e.g., a monitor). The parties dispute one term: (i) "a control means for switching the display from one set of graphical interface objects to another set of graphical interface objects."

1. The Solution of the '795 Patent

Prior to the '795 invention, computers could run multiple applications at once, but each application had its own user interface, making it "annoying and confusing" for users to work with multiple applications. ('795 patent, 3:2-10.) Although users (e.g., application developers and end-users) could theoretically change the appearance of interface objects, they could do so only with access to and extensive knowledge of the software code used to draw the user interface, and only after a laborious process repeated for each object used by each application. As a result, it was not effectively possible to generate a unified "theme" across all applications, leaving users with little control over the overall appearance and ease of use of the user interface. (*Id.*, 2:15-29.)

Consistent with Apple's long history of pioneering advances in user-friendly computing, the '795 inventors solved these problems by developing a layer of software called the "appearance management layer"—which acts as a translator between users and the software code that draws interface objects (called "drawing procedures"). (*Id.*, 3:25-29, 5:21-24 (explaining "drawing procedures" are "pieces of code which are responsible for drawing interface objects and which define the shape of those objects, e.g., window definitions").) Unlike the prior art, in which each application controlled its own interface objects (and changing objects required direct access to software code), the appearance management layer can control the interface objects for ***all*** applications. (*Id.*, 3:22-25, 5:26-29.) As such, the appearance management layer permitted users for the first time to dynamically customize the appearance and behavior of interface objects through "coordinated designs of interface objects and object parts that create a distinct visual appearance on the display," or "themes." (*Id.*, 3:17-34, 5:56-62, 6:12-15.)

2. "A Control Means for Switching the Display from One Set of Graphical Interface Objects to Another Set of Graphical Interface Objects" (Claim 9)

Apple's Construction	Nokia's Construction
Function: switching the display from one set of graphical interface objects to another set of graphical interface objects	**Function**: switching the display from one set of graphical interface objects to another set of graphical interface objects **Structure**: appearance management layer that

Structure: appearance management layer that switches pointers to drawing procedures or switches data used by drawing procedures	(1) loads the theme by switching pointers to drawing procedures or switching data used by drawing procedures, and (2) draws the theme by using a pattern look-up table to instruct a graphic subsystem to draw a pattern on the display

The parties agree that "a control means for switching the display from one set of graphical interface objects to another set of graphical interface objects" is a means-plus-function limitation, and that the claimed function is "switching the display from one set of graphical interface objects to another set of graphical interface objects." The parties disagree as to the structure required to perform that claimed function.

The '795 specification supports Apple's position by unambiguously identifying the appearance management layer as the structure that performs the claimed "switching" function: "***The appearance management layer 40*** is responsible for orchestrating various changes which allow ***switching*** of the user interface's appearance and behavior." (*Id.*, 6:13-15, 22:19-44 (describing steps taken by appearance management layer to switch themes).)[7] The specification also specifically explains ***how*** the appearance management layer performs the claimed function: (i) by switching pointers to drawing procedures; or (ii) by switching data used by drawing procedures. ('795 patent, 5:33-36, 6:19-34 (explaining when switching "pointers to drawing procedures," the appearance management layer directs a pointer pointing to one drawing procedure (e.g., procedure for drawing a car icon) to point to another drawing procedure (e.g., procedure for drawing a butterfly icon); *id.*, 6:35-44 (explaining, when switching "data used by drawing procedures," the appearance management layer changes the data used by a drawing procedure (e.g., data for drawing a car icon) to another procedure (e.g., data for drawing a

[7] The prosecution history similarly confirms that the "appearance management layer … gives a user the ability to customize the appearance and behavior of the desktop." ('795 File History [5/9/00 Resp.] at 1636.)

butterfly icon).)

Consistent with Apple's construction, the specification also explains that, by using one of the two switching procedures, the appearance management layer performs the claimed function of switching the display from one set of graphical interface objects to another set of graphical interface objects. (*Id.*, 5:26-36 ("By switching the pointers 44 to the drawing procedures 46, or by switching the data used by the procedures 46, the appearance and behavior of the interface can be readily changed."); *id.*, 9:23-39 (describing methods of switching drawing procedures).)

Nokia agrees the required structure includes the appearance management layer that switches pointers to drawing procedures or switches data used by drawing procedures, but seeks to add other structure not required to perform the claimed function: a "pattern look-up table to instruct a graphic subsystem to draw a pattern on the display." (D.I. 227 [Joint Chart] at 10-11.) This is improper for several reasons.

First, as the '795 specification explains, the pattern look-up table is merely a database of patterns and colors. ('795 patent, 5:37-42, 5:51-54.) The specification ***never*** states that the pattern look up table is part of the structure used for "switching the display from one set of graphical interface objects to another set of graphical interface objects." Instead, the patent consistently explains that the ***appearance management layer*** is what performs the claimed function by switching pointers to drawing procedures or switching data used by drawing procedures. (*Id.*, 6:13-15, 22:19-44.)[8] The pattern look-up table is not part of the structure required to perform the claimed switching function. *See Wegner Mfg., Inc. v. Coating Mach.*

---

[8] The '795 patent distinguishes between the function of switching themes—performed "by switching pointers to drawing procedures or switching data being applied to these procedures"—and the function of ***abstracting colors and patterns from the interface***—which can be performed using the database of colors and patterns provided by pattern look-up tables. (*Id.*, Abstract.)

Systems, Inc., 239 F.3d 1225, 1233 (Fed. Cir. 2001) ("[A] court may not import ... structural limitations from the written description that are unnecessary to perform the claimed function.").

Second, Nokia's argument conflicts with the '795 patent claims. In particular, claim 9 requires ***both*** a "control means for switching" ***and*** a "storage means for storing data relating to first and second sets of graphical user interface objects." ('795 patent, 25:26-27, 25:30-32.) In claim 11, which depends from claim 9, "***the storage means***" stores "***a pattern look-up table*** with indexed entries containing data related to patterns and colors used to create interface objects." (*Id.*, 25:44-47.) Thus, the claims confirm that the pattern look-up table is "data" that is stored, and not structure that performs a "switching" function.

B. U.S. Patent No. 5,848,105 ("the '105 patent")

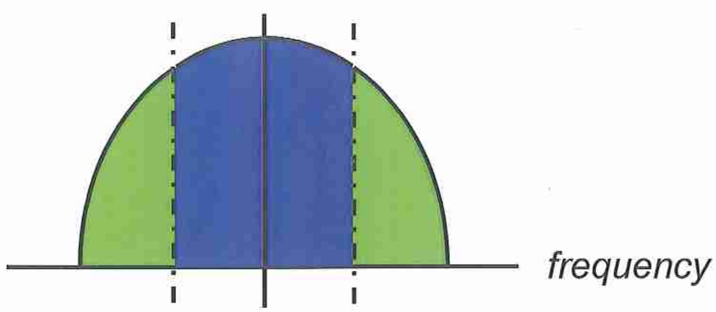
The '105 patent describes a method and apparatus that reduces problems resulting from interference. The parties dispute two terms: (i) "linear combining means for weighting and summing said output signals to produce an estimate of said signal of interest"; and (ii) "means for producing an estimate of said signal of interest."

1. The Solution of the '105 Patent

In a typical wireless communication environment, devices (e.g., mobile phones) are exposed to a large number of signals—most of which are not the "signal of interest" for the device (e.g., the signal representing an incoming call intended for the device). ('105 patent, 1:7-19.) These other signals can cause interference that, among other effects, prevents the receiver from properly detecting the entire "signal of interest." This can cause problems, such as limiting the range of wireless devices, dropped calls, and/or poor voice quality. (*Id.*, 4:18-31.)

Prior to the '105 invention, wireless systems attempted to minimize interference by increasing the "spacing" between signals intended for different receivers across frequency ranges. But this resulted in an inefficient use of the available frequency range, significantly limited the number of communications that could occur within a period of time, and still left communications vulnerable to interference. Prior art systems that corrected problems resulting from interference, such as the loss of communication data, also required computationally complex processing that was impractical for consumer devices. (*Id.*, 2:19-30, 4-10-31.)

The '105 inventors made the fundamental discovery that GMSK signals[9] have a property called "cyclostationarity" that causes information of interest (e.g., the voice data in a cell phone signal) to be repeated in different portions of a received signal. (*Id.*, 4:62-63.) Because of this property, the same information that exists in one portion of the signal at a first frequency may also be obtained from another portion of the signal at a different frequency. In simple terms, it is like the keys of a piano, where the same information (e.g., the note "C") is found in multiple places at different frequencies (e.g., different octaves). This concept is illustrated in the highly simplified figure below, which depicts a signal represented as a curve over different frequencies:



In this example, information from the portion of the signal shaded in blue can also be obtained from the portion of the signal shaded in green.

Following their discovery, the '105 inventors developed a set of filters, and methods of using the filters, that taking advantage of the "cyclostationarity" property of signals, could "rebuild" or extract a signal of interest that had been obstructed by interference. Specifically, by

---

9 Gaussian Minimum-Shift Keyed ("GMSK") signals and Minimum-Shift Keyed ("MSK") signals are commonly used in cellular communications. (*Id.*, Abstract, 3:66-4:9, 4:32-42.)

using the repeated portions of the signal to replace missing or distorted portions of the signal, the '105 invention can overcome the loss or distortion of data resulting from interference.

One example is set forth in Figure 24 of the '105 patent, shown below:

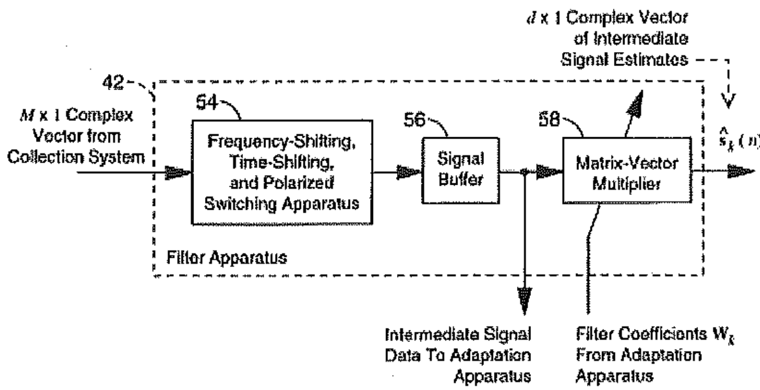


FIG. – 24

(*Id.*, Fig. 24.) Time-shifter and frequency-shifter 54 processes incoming signals. (*Id.*, 18:29-32, 23:13-20.) The time- and frequency-shifted signals are temporarily stored in signal buffer 56 and then "weighted" and summed by matrix-vector multiplier 58. Specifically, the matrix-vector multiplier multiplies each component of the output signal by a "coefficient" value received from the "Adaptation Apparatus" (not shown), and sums the output signals to generate an estimate of the signal of interest, shown as "$\hat{s}_k(n)$" in Figure 24. (*Id.,* 2:47-49, 22:40-45, 23:20-29.)

The '105 invention improved both (i) the "quantity of service," by allowing greater numbers of devices to operate simultaneously in the same physical area; and (ii) the "quality of service," by reducing the number of dropped calls and improving signal quality. (*Id.*, 4:18-31.)

2. "Linear Combining Means for Weighting and Summing Said Output Signals to Produce an Estimate of Said Signal of Interest" (Claims 1, 5)

Apple's Construction	Nokia's Construction
Function: "weighting and summing said output signals to produce an estimate of said signal of interest" **Structure:** Matrix-Vector Multiplier [58]	**Function:** "weighting the time shifted output signal and frequency shifted output signal and then summing the weighted time shifted output signal and weighted frequency shifted output signal to produce an estimate of the signal of interest"

	Structure: Adaptation apparatus 44 calculates weighing filter coefficients W^k using either the training augmented constant-modulus (TACM) partially blind adaptive equalization or training constrained constant-modulus (TCCM) partially blind adaptive equalization adaptation algorithm and provides it to a linear combiner in the form of Matrix-Vector Multiplier 58. Matrix-Vector Multiplier 58 applies the weighing filter coefficients Wk to said time-shifted output signal and frequency-shifted output signal to produce an estimate of said signal of interest.

The parties agree that "linear combining means" is a means-plus-function element, but disagree as to both the claimed function and the structure required to perform that function.

The claims explicitly define the required function as "weighting and summing said output signals to produce an estimate of said signal of interest." ('105 patent, 25:29-31, 26:15-17.) Nokia seeks to add a temporal limitation to the claimed function: that weighting is performed prior to summing. (D.I. 227 [Joint Chart] at 13) ("weighting … and then summing").) But the claims have no such requirement. *See Micro Chem., Inc. v. Great Plains Chem. Co.*, 194 F.3d 1250, 1258 (Fed. Cir. 1999) (explaining § 112, ¶ 6 "does not permit limitation of a means-plus-function claim by adopting a function different from that ***explicitly*** recited in the claim").

The '105 specification confirms that the structure performing the claimed weighting and summing function is the ***matrix-vector multiplier***. As shown in Figure 24 above, for example, matrix-vector multiplier 58 receives two inputs: (i) frequency- and time-shifted output signals from apparatus 54; and (ii) filter coefficients from the adaptation apparatus (not shown). Matrix-vector multiplier 58 then uses the received coefficients to perform its function of weighting and summing the received output signals to produce the estimate of the signal of interest. ('105 patent, 23:25-29 ("Matrix-Vector Multiplier 58 applies the filter coefficients to the received data, producing output $\hat{s}_k(n)$ ….”); *id.*, 22:40-45 (“This vector of received data is then provided as input to a Filter Apparatus 42, which takes as its other input the filter coefficients (W) provided by an Adaptation Apparatus 44, to produce a digitized discrete-time sequence of d×1 complex vector signal estimates $\hat{s}_k(n)$.”).) The ’105 patent therefore explicitly discloses that matrix-vector multiplier 58 is the structure that performs the claimed weighting and summing function.

Nokia concedes that matrix-vector multiplier 58 performs weighting and summing. (D.I. 227 [Joint Chart] at 14.) But in an improper attempt to narrow the claim, Nokia contends that the required structure also includes the adaptation apparatus. That argument fails.

First, the ’105 specification repeatedly and consistently explains that the sole function of the adaptation apparatus is merely to ***determine*** filter coefficients that the ***matrix-vector multiplier*** then uses to perform its weighting and summing function. (’105 patent, 23:25-29, 24:40-45, Fig. 24.) The ’105 patent does ***not*** describe the adaptation apparatus as having ***any*** role in actually using those coefficients or the frequency- and time-shifted output signals from apparatus 54 to calculate the estimate of the signal of interest $\hat{s}_k(n)$—i.e., the claimed weighting and summing function. Instead, the patent repeatedly states that the matrix-vector multiplier applies the coefficients to perform weighting and summing. (’105 patent, 23:25-29, 22:40-45.)

Second, Nokia cannot overcome this deficiency by arguing that the adaptation apparatus and matrix-vector multiplier 58 are somehow part of the same structure. The patent repeatedly makes clear that they are not. The specification explains that the filtering structures, including the linear combining means, are a separate category of structures from the adaptive structures that generate the coefficients. (*Id.*, 1:22-30 (“The background of the present invention falls into two general categories: (i) work pertaining to the filtering structures … and (ii) work pertaining to the adaptive algorithms….”); *id.*, 15:16-22 (“[E]ach of the foregoing filter structures include filters (comprising time-shifters and linear combiners), frequency shifters, polarized switchers (conjugators or real or imaginary part selectors), and summers (***linear combiners***).").) As shown in Figures 22 and 24 below, matrix-vector multiplier 58 is part of filter apparatus 42, while adaptation apparatus 44 is located in an entirely separate structure (in a different box)—the reason adaptation apparatus does not even appear in Figure 24, as shown below:

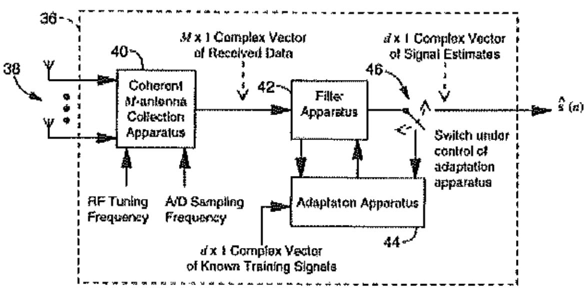


FIG. – 22

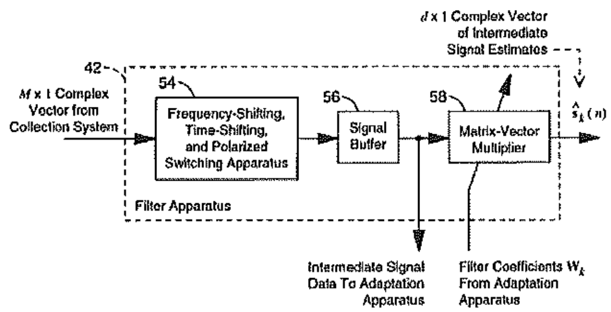


FIG. – 24

(*Id.*, Figs. 22, 24.)

The '105 claims also describe the adaptation apparatus and matrix-vector multiplier as separate elements. Specifically, claim 8 requires "means for ***adapting*** said filter means" (i.e., the adaption apparatus) and separate "means for ***producing*** an estimate of said signal of interest" (i.e., the matrix-vector multiplier). ('105 patent, 23:25-27 ("Matrix-Vector Multiplier 58 applies the filter coefficients to the received data, producing output $\hat{s}_k(n)$…"); *id.*, Fig. 24 (showing signal estimates, $\hat{s}_k(n)$).)

Finally, even Nokia's proposed construction confirms that matrix-vector multiplier 58 alone is what applies the coefficients to perform the claimed weighting and summing function: "***Matrix-Vector Multiplier 58 applies*** the weighing filter coefficients Wk to said time-shifted output signal and frequency-shifted output signal ***to produce an estimate of said signal of interest***." (D.I. 227 [Joint Chart] at 14.) Nokia's proposed structure also tellingly omits apparatus 54 (the component providing the other input used by matrix-vector multiplier 58), confirming that even Nokia does not believe that a component should be treated as part of the required structure merely because it provides a value that the matrix-vector multiplier uses to perform the claimed weighting and summing function.

3. "Means for Producing an Estimate of Said Signal of Interest" (Claim 8)

Apple's Construction	Nokia's Construction
Function: "producing an estimate of said signal of interest" **Structure:** Matrix-Vector Multiplier [58]	**Function:** "producing an estimate of said signal of interest" **Structure:** The matrix vector multiplier 58 operating in conjunction with the switch 46 which is controlled by the adaptation apparatus 44

The parties agree that "means for producing an estimate of said signal interest" is a means-plus-function limitation, and that the claimed function is "producing an estimate of said signal of interest." The parties disagree about the structure that performs the claimed function.

As discussed in the prior "linear combining means" section, the '105 specification repeatedly describes matrix-vector multiplier 58 as the structure that "produces" the estimate of the signal of interest. ('105 patent, 23:25-29 ("A Matrix-Vector Multiplier 58 applies the filter coefficients to the received data, ***producing output*** $\hat{s}_k(n)$ [the estimate of said signal of interest] …."); *id.*, 22:40-45 (identifying filter apparatus 42, which includes matrix-vector multiplier 58, as "***produc[ing]*** … complex vector signal estimates $\hat{s}_k(n)$ [estimate of signal of interest]."); *id.*, Fig. 24 (showing estimate of signal of interest, $\hat{s}_k(n)$ as output of matrix-vector multiplier 58).)

Nokia agrees that matrix-vector multiplier 58 performs the claimed function of producing the estimate of the signal of interest, but it attempts to add two other components as well: switch 46 and adaption apparatus 44. Neither is properly part of the required structure.

First, switch 46 does nothing to "produce" an estimate of the signal of interest. As shown in Figure 22, the switch merely "***directs***" the signal of interest—***after*** it has already been "produced" and output by filter apparatus 42 (which contains matrix-vector multiplier 58). (*Id.*, 22:50-51 ("[T]he switch 46 is moved to ***direct*** the output of the Filter Apparatus 42....").) Switch 46 is not part of the structure that "produces" the estimate of the signal of interest.

Second, for the reasons explained above in connection with "linear combining means," adaptation apparatus 44 does not produce the estimate of the signal of interest. Adaptation apparatus 44 produces coefficients, but it is matrix-vector multiplier 58 that applies those coefficients and sums the signals to "produce" the estimate of the signal of interest, as claimed. (*Id.*, 23:25-29 ("A Matrix-Vector Multiplier 58 applies the filter coefficients to the received data, ***producing output*** $\hat{s}_k(n)$ [estimate of signal of interest] ...."); *id.*, 22:40-45.) In fact, as noted above, claim 8 specifically lists the "means for ***adapting*** said filter means" and "means for ***producing*** an estimate of said signal of interest" as separate elements. (*Id.*, 26:43-45.) It would be improper to import structure for "adapting" into the "means for producing."

C. <u>U.S. Patent No. 6,189,034 ("the '034 patent")</u>

The '034 patent is directed to a system and method to dynamically launch conferencing applications as needed, upon detection of an incoming call. The parties dispute three claim terms: (i) "call director unit"; (ii) "demon conference component"; and (iii) "listen string."

1. The Solution of the '034 Patent

"Conferencing applications," such as instant messaging, text messaging, email, and video-chat, enable the transfer of data between devices. Prior to the '034 invention, a device could not receive a call signal (e.g., an incoming text message) using these types of conferencing applications unless the device had the application open and running. Keeping conferencing applications continuously open and running, however, consumed significant amounts of memory and processing power. ('034 patent, 1:14-21, 23-27, 36-51.)

The '034 patent solved this problem by disclosing a system that dynamically launches conferencing applications upon receipt of an incoming call signal. In one embodiment, a component called the "demon conference component" listens for incoming call signals on behalf of conferencing applications. When the demon conference component detects an incoming call, the system determines the intended application by comparing the characteristics of the incoming signal to a collection of parameters called a "listen string." A component called the "call director unit" then launches the intended application and transfers the incoming call to that application. In this manner, the '034 invention allows a system to dynamically launch a conferencing application only as needed to receive and process a call—thereby preserving significant processing and memory resources. (*Id.*, 1:42-60, 2:17-20, 7:26-29.)

2. "Call Director Unit" (Claims 1, 10, 17)

Apple's Construction	Nokia's Construction
"Unit responsible for launching, and transferring incoming call signals to, conferencing applications"	"A faceless background process loaded at initialization of the computer system that initiates the automatic launching of a conferencing application when a call is received and initiates and interacts with the demon conference component to control the transfer of calls to a conferencing application"

As its name suggests, the plain meaning of "call director unit" is a ***unit*** that ***directs calls***. (*Id.*, claims 1, 10, 17.) That conclusion is reinforced by the '034 specification, which expressly states that the call director unit directs calls by launching and transferring incoming call signals to conferencing applications: "Call director 502 is responsible for dynamically ***launching*** (if necessary) and ***transferring an incoming call to*** the conferencing application which requested persistent listening." (*Id.*, 7:26-29; *id.*, 6:1-3 ("One of the main functions of call director 502 is to initiate the automatic ***launching of a conferencing application*** when a call is received by the computer system.").) Similarly, during prosecution, the applicants explained that "[t]he call director performs several functions, such as initiating the automatic ***launching of a conferencing application*** when a call is received by the system and initiating and interacting with the demon conference component to control the ***transfer of calls to a conferencing application***." ('034 File History [8/15/00 Br.] at 1446.)

Nokia appears to agree that the intrinsic evidence cited above supports Apple's proposed construction, but seeks to import three additional requirements such that the call director unit must also: (i) be "a faceless background process"; (ii) be "loaded at initialization of the computer system"; and (iii) "initiate[] and interact with the demon conference component." (D.I. 227 [Joint Chart] at 15.) There is no basis for any of these limitations.

First, nothing in the claims suggests, much less requires, the call director unit to be a "faceless background process," to load "at initialization of the computer system," or to "initiate[] and interact with the demon conference component." Indeed, for that reason, even Nokia does not cite to the claims as purported support for its three additional limitations.

Second, Nokia's sole support for requiring the call director unit to be a "faceless background process" that is "loaded at initialization of the computer system" appears to be a single statement in the '034 specification describing Figure 5. (*Id.* (citing '034 patent, 5:66-6:16).) But Nokia ignores language only eight lines earlier explaining that Figure 5 merely "illustrates ***a preferred embodiment*** of the invention…." ('034 patent, 5:57.) It would be error to limit the claims to Figure 5 given that "a particular embodiment appearing in the written description may not be read into a claim when the claim language is broader than the embodiment." *Superguide Corp. v. DirecTV Enter., Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004).

3. "Demon Conference Component" (Claims 1, 10, 17)

Apple's Construction	Nokia's Construction
"A faceless background component responsible for listening for incoming call signals"	"A faceless background task created by the call director unit that engages in persistent listening for incoming call signals and communicates with other conference components to transfer call signals to the

	intended recipient application using a shared data structure in memory"

Apple's construction is confirmed by the plain claim language requiring "processing [the] incoming call signal in [the] demon conference component." ('034 patent, claims 1, 10, 17.) To process the incoming call signal, the demon conference component must logically first listen for and receive the incoming call signal. The specification also describes the demon conference component as "responsible for listening for incoming calls on behalf of all conferencing applications that request persistent listening." (*Id.*, 7:23-25; *id.*, 6:18-21 (describing as "responsible for performing the 'persistent listening'….") This listening by the demon conference component is one way in which the '034 patent avoids the wasteful prior art need for applications to be constantly open and listening for incoming calls.

Nokia appears to agree that the demon conference component is responsible for listening for incoming call signals, but also seeks to require the "demon conference component" to: (i) be "created by the call director unit"; and (ii) "communicate[] with other conference components … using a shared data structure in memory." (D.I. 227 [Joint Chart] at 15-16.) The intrinsic record does not support these additional requirements.

First, Nokia's newly manufactured "created by the call director unit" limitation is inconsistent with the claims. Claim 1 requires "a call director unit to set up a demon conference component." To construe the term "demon conference component" to include a requirement for it to be "created by the call director unit" would render the earlier language of claim 1 superfluous—requiring, for instance, "a call director unit to set up a [task created by the call director unit]."

Second, the claims do not impose a requirement for the demon conference component to communicate with other conference components at all—let alone using a shared data structure in memory. Although the specification describes "conference components communicat[ing] … through the use of shared memory" with respect to Figure 5, the patent specifically characterizes that example as a "preferred embodiment." (*Id.*, 5:57.) In fact, the patent specifically states that use of a shared data structure "***is not intended to be limiting***," and that "***other methods*** of allowing inter-component communication can be used to achieve the same functionality." (*Id.*, 6:49-7:4 (noting information can be "passed from one conferencing component to another" without storage in memory, or by separate, independent "registers").) It would be error to limit the claims to the "shared data" embodiment alone. *See Superguide Corp.*, 358 F.3d at 875.

4. "Listen String" (Claims 1, 9, 10, 17)

Apple's Construction	Nokia's Construction
"Parameters used for directing an incoming call signal"	"The encapsulation of the parameters of a conference API including two parts, a fixed portion identifying a service name and a variable portion identifying one or more service types"

Apple's construction is supported by the plain claim language, which identifies the listen string as containing an: (i) application signature; (ii) application signal type; and (iii) application signal port. ('034 patent, claims 1, 9, 10, 17.) Each is a parameter used to direct an incoming call signal to the appropriate conferencing application. (*Id.*, claim 8 ("[A]ctivate a conferencing application ***based on a listen string***, said listen string containing an ***application signature***, an ***application signal type***, and an ***application signal port***.").)

The specification also repeatedly explains that the listen string is used to direct incoming call signals to their intended recipient applications by comparing parameters in the listen string with parameters of an incoming call. (*Id.*, 9:2-9 (explaining conferencing application is launched "when an incoming call matches the profile contained in listen string 420"); *id.*, 5:29-31 (listen string is "the encapsulation of the parameters … for each conference component"); *id.*, 8:23-25

("[E]ach listen string corresponds to a particular conference component and contain[s] the service and the ports for which that conference component is responsible.") The specification confirms that "listen string" refers to the parameters used for directing an incoming call signal.

The prosecution history corroborates that particular applications are launched based on the use of listen strings that "correspond" to the applications: "Applicant's invention uses a daemon conference component ... to listen and dynamically launch conferencing applications as necessary based on having been previously set up with ***listen strings corresponding to conferencing applications requesting persistent listening.***" ('034 File History [4/9/99 Resp.] at 1362.)

Nokia agrees that the listen string refers to parameters used for directing an incoming call signal, but again seeks to import additional requirements into the claims—arguing that a "listen string" also must: (i) be "the encapsulation of the parameters" of a conference application programming interface ("conference API"); and (ii) include "a fixed portion identifying a service name and a variable portion identifying one or more service types." (D.I. 227 [Joint Chart] at 16.) The intrinsic evidence does not support either requirement.

First, Nokia's proposed construction improperly limits the listen string to an embodiment describing the "QuickTime Conferencing" product, in which the listen string is generated when an application makes a specific type of request to an application programming interface (API). (*Id.*, 5:29-31, 7:30-41, 11:29-30.) As an initial matter, the listen string is not defined by the manner in which it is set up—it is defined by what it is: i.e., the parameters that correspond to a particular application and that are used to direct incoming call signals. In any event, it would be improper to limit the manner in which a listen string is generated to this one example. *See Superguide*, 358 F.3d at 875.