No. 2015-1190

IN THE UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

ATLAS IP, LLC,

Plaintiff-Appellant,

v.

ST. JUDE MEDICAL, INC., and
ST. JUDE MEDICAL S.C., INC.,

Defendants-Appellees.

Appeal From The United States District Court
For The Southern District Of Florida In No. 1:14-cv-21006-CMA,
Judge Cecilia M. Altonaga.

BRIEF FOR APPELLEES

Wayne M. Barsky
GIBSON, DUNN & CRUTCHER LLP
2029 Century Park East, 40th Floor
Los Angeles, CA 90067
(310) 552-8500

Mark A. Perry
Principal Attorney
GIBSON, DUNN & CRUTCHER LLP
1050 Connecticut Avenue, N.W.
Washington, D.C. 20036
(202) 955-8500

Neema Jalali
GIBSON, DUNN & CRUTCHER LLP
555 Mission Street, Suite 3000
San Francisco, CA 94105
(415) 393-8200

Counsel for Appellees St. Jude Medical, Inc. and St. Jude Medical S.C., Inc.

Claim 11	Claim 14
A communicator for wirelessly transmitting frames to and receiving frames from a least one additional communicator in accordance with a predetermined medium access control protocol, the communicators which transmit and receive the frames constituting a Group, each communicator including a transmitter and a receiver for transmitting and receiving the frames respectively, the medium access control protocol controlling each communicator of the Group to effect predetermined functions comprising:	A communicator for wirelessly transmitting frames to and receiving frames from a least one additional communicator in accordance with a predetermined medium access control protocol, the communicators which transmit and receive the frames constituting a Group, each communicator including a transmitter and a receiver for transmitting and receiving the frames respectively, the medium access control protocol controlling each communicator of the Group to effect predetermined functions comprising:
[a] designating one of the communicators of the Group as a hub and the remaining the communicators of the Group as remotes;	[a] designating one of the communicators of the Group as a hub and the remaining the communicators of the Group as remotes;
[b] the hub establishing repeating communication cycles, each of which has intervals during which the hub and the remotes transmit and receive frames;	[b] the hub establishing repeating communication cycles, each of which has intervals during which the hub and the remotes transmit and receive frames;
[c] the hub transmitting information to the remotes to establish the communication cycle and a plurality of predeterminable intervals during each communication cycle, the intervals being ones when the hub is allowed to transmit frames to the remotes, when the remotes are allowed to transmit frames to the hub, and when each remote is expected to receive a frame from the hub;	**[c] the hub transmitting information to the remotes to establish the communication cycle** and a plurality of predeterminable intervals during each communication cycle, the intervals being ones when the hub is allowed to transmit frames to the remotes, when the remotes are allowed to transmit frames to the hub, and when each remote is expected to receive a frame from the hub;
[d] the remotes powering off their transmitters during times other than those intervals when the remote is allowed to transmit frames to the hub, by using the information transmitted from the hub;	[d] the remotes powering off their transmitters during times other than those intervals when the remote is allowed to transmit frames to the hub, by using the information transmitted from the hub;
[e] the remotes powering off their receivers during times other than those intervals when the remote is expected to receive a frame from the hub, by using the information transmitted from the hub;	[e] the remotes powering off their receivers during times other than those intervals when the remote is expected to receive a frame from the hub, by using the information transmitted from the hub;
the hub assigning transmission opportunities to the remotes, each transmission opportunity being an interval for a remote to transmit frames to the hub;	
the hub transmitting transmission opportunity allocation information in a frame transmitted by the hub;	
the hub monitoring the frames transmitted by each remote during its transmission opportunity; and	
the hub revoking a previous transmission opportunity allocation of a remote which has not transmitted more than a predetermined number of frames during a previous number of communication cycles.	
	the hub establishing the length of each communication cycle; and
	the hub transmitting a frame containing information describing the length of the communication cycle prior to the end of the communication cycle whose length is established.
A71 ('734 Patent, col. 47:62-48:36) (boldface added).	A72 ('734 Patent, col. 49:31-68) (boldface added).

CERTIFICATE OF INTEREST

Counsel for Defendants-Appellees and Cross-Appellants St. Jude Medical, Inc. and St. Jude Medical S.C., Inc., certifies the following:

1. The full name of every party or amicus represented by me is:

St. Jude Medical, Inc., St. Jude Medical S.C., Inc.

2. The names of the real parties in interest (if the party named in the caption is not the real party in interest) represented by me are:

N/A

3. All parent corporations and any publicly held companies that own 10 percent or more of the stock of the parties or amici curiae represented by me are:

St. Jude Medical, Inc. is a publicly held corporation. No publicly held company owns ten percent or more of the stock of St. Jude Medical, Inc. St. Jude Medical S.C., Inc. is a wholly owned subsidiary of St. Jude Medical, Inc.

4. The names of all law firms and the partners or associates who appeared for the parties now represented by me in the trial court or agency or are expected to appear in this Court are:

GIBSON, DUNN & CRUTCHER LLP: Wayne M. Barsky, Neema Jalali, Ellen Lin, H. Mark Lyon, Mark A. Perry, Jennifer Rho

FELDMAN GALE P.A.: James Anthony Gale, Richard Guerra, Rafael A. Perez-Pineiro

Dated: April 24, 2015

/s/ Mark A. Perry

Mark A. Perry
GIBSON, DUNN & CRUTCHER LLP
1050 Connecticut Avenue, N.W.
Washington, D.C. 20036
Telephone: (202) 955-8500
Facsimile: (202) 530-9696
mperry@gibsondunn.com

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STATEMENT OF RELATED CASES

The case entitled *Atlas IP, LLC v. Medtronic Minimed, Inc.*, Nos. 2015-1071, -1105 (Fed. Cir.), may directly affect or be directly affected by this Court's decision in the pending appeal.

PRELIMINARY STATEMENT

The patent-in-suit claims a protocol for communication over a wireless network in which a hub device defines repeating communication cycles, each consisting of intervals during which the hub and one or more remote devices may communicate. Based on control information transmitted from the hub to the remotes, the remotes may power down their transmitters and receivers during periods in which they are not expected to send or receive communications to or from the hub. "Thus, the control information and the communication cycle conserve considerable power because the receivers and transmitters of the remotes may remain powered off for a considerable portion of time without degrading communications." A50 col. 5:62-66 (Summary of the Invention).

This appeal involves a single disputed limitation in the two asserted claims: "[T]he hub transmitting information to the remotes to establish the communication cycle." A71 col. 48:10-13 (claim 11); A72 col. 49:47-50 (claim 14).

The district court initially ruled, after a claim construction hearing, that this limitation means "the hub transmitting to the remotes information necessary to know *in advance* the starting time and duration of the communication cycle." A23 (emphasis added). As the court explained, the hub transmits this control information to the remotes "in advance" to allow the remotes to "power down at appropriate times—a key innovation of the '734 patent." A21-23. The district court subsequently ruled, after a summary judgment hearing, that "in order to know

[when] the cycle starts, the information must be transmitted in advance of the very communication cycle at issue." A7. The starting time of each communication cycle must be transmitted to the remotes before the cycle begins because the remotes, which will have powered down their receivers before the end of the previous communication cycle, "must know when to power up [their receivers] for the beginning of the next communication cycle, or they would be unable to receive the information frame" containing timing information for subsequent cycles. A8.

Atlas conceded below that the accused devices transmit *neither* the starting time *nor* the duration of any communication cycle in advance of that cycle, and thus do not infringe under the district court's construction. A6, A8. Accordingly, the district court entered summary judgment of non-infringement. A10.

On appeal, Atlas contends that the "transmitting" limitation should be construed as allowing the starting time and duration of a communication cycle to be transmitted from the hub to the remotes *after* the cycle has begun. Atlas maintains that the district court's contrary construction renders *other* limitations "facially nonsensical"; however, those limitations are properly directed to *additional* aspects of the alleged invention, such as allocating transmission opportunities among multiple remotes, and are not rendered superfluous or redundant by the district court's construction. Atlas also insists that the district court's construction conflicts with a single drawing (Figure 3) that depicts the transmission of control information during a cycle; but the written description makes clear that to the extent this control

information concerns the starting time or duration of a *cycle* (rather than an interval), it either describes a *subsequent* cycle or is an intentionally redundant *retransmission* of information regarding the end of the current cycle that was previously transmitted in advance of the cycle.

If the "transmitting" limitation were construed as allowing transmission of the starting time and duration of a communication cycle after the cycle has begun, as Atlas proposes, it would directly conflict with express limitations of the asserted claims, would exclude every disclosed embodiment of the invention, and would be fundamentally incompatible with the objective of the claimed protocol—*i.e.*, allowing the remotes' transmitters *and* receivers to power down to conserve battery power when they are not expected to communicate with the hub. Indeed, Atlas's proposed construction, if adopted, would render the disclosed network *inoperable* because if the starting time of a cycle is not transmitted until *after* the cycle has already begun, the remotes (whose receivers were powered down during the previous cycle) would have no way of knowing when to power on their receivers again. Although this point was central to the district court's analysis, Atlas never addresses it on appeal.

Because the district court correctly construed the "transmitting" limitation, the judgment of non-infringement should be affirmed.

STATEMENT OF THE ISSUE

The "transmitting" limitation at issue recites "the hub transmitting information to the remotes to establish the communication cycle." Atlas does not challenge the initial construction of this limitation as "the hub transmitting to the remotes information necessary to know in advance the starting time and duration of the communication cycle." The sole question on appeal is whether the specified information—*i.e.*, starting time and duration of the communication cycle—must be transmitted to the remotes *before* the communication cycle begins (as the district court ruled) or whether this information may be transmitted for the first time *after* the communication cycle has begun (as Atlas contends).

STATEMENT OF THE CASE

Atlas IP, LLC acquired U.S. Patent No. 5,731,734 after it expired, and then asserted claims 11 and 14 against St. Jude Medical, Inc. and St. Jude Medical S.C., Inc. (collectively, "St. Jude"). *See* A35-77 ('734 patent); A71 (claim 11); A72 (claim 14); Dkt. 32 (Amended Complaint); Dkt. 74 at 2 n.1 (Joint Motion for Extension of Pretrial Deadlines). After construing the disputed claim terms, the district court granted summary judgment of non-infringement to St. Jude. *See* A11-34 (Claim Construction Order); A2-10 (Summary Judgment Order); A1 (Final Judgment).

1. The '734 patent recites that "the present invention relates to a medium access control (MAC) technique or protocol for selectively activating and deactivating the transmitters and receivers of the means for communicating between the resources to save electrical power consumed while still permitting . . . functionality." A48 col. 1:23-28 (Field of the Invention); *see also* A35 (Abstract).

The specification explains that "a variety of different MAC techniques have been employed in wireless network systems," and that "[a] major obstacle to adequate battery life for battery-operated wireless network interfaces is that conventional MAC protocols . . . all assume that the network receivers are capable of receiving frames at all times that they are not actively transmitting." A48-49 col. 2:4-9, 2:56-58, 4:23-25, 4:56-62 (Background of the Invention).

According to the specification, "[i]t is the overall objective of the present invention to provide a reliable [MAC] protocol for wireless . . . network communications among a plurality of resources, such a[s] battery powered portable computers." A50 col. 5:9-13 (Summary of the Invention). "[T]he present invention provides a MAC protocol which may be very effectively implemented with communicator stations used with portable computers, because it obtains significant reductions in battery power drain by permitting the receivers as well as the transmitters of the communicator stations to be powered off during a majority of the time, but selectively and predictably powered on to send or receive relevant communications." A50 col. 5:25-33 (Summary of the Invention).

The specification discloses how a wireless network functioning in accordance with the claimed protocol operates:

> [A] communicator wirelessly transmits frames to and receives frames from a[t] least one additional communicator in accordance with a predetermined MAC protocol. Each communicator includes a transmitter and a receiver. The communication occurs among members of a Group of communicators. The MAC protocol controls each communicator of the Group. One of the communicators of the Group is designated as a "hub" and the remaining communicators are designated as "remotes". The hub establishes repeating communication cycles, each of which has intervals during which the hub and the remotes transmit and receive frames. The hub transmits control information to the remotes to establish the communication cycle and to establish a plurality of predeterminable intervals during each communication cycle. These intervals allow the hub to transmit frames to the remotes, allow the remotes to transmit frames to the hub, and allow each remote to anticipate receiving frames from the hub. Due to the defined intervals of the communication cycle and the information conveyed by the hub, the remotes are able to power off their transmitters during

> times other than those intervals when the remote is allowed to transmit frames to the hub. In addition, and very significantly, the remotes are able to power off their receivers during times other than those intervals when the remote is expected to receive frames from the hub. Thus, the control information and the communication cycle conserve considerable power because the receivers and transmitters of the remotes may remain powered off for a considerable portion of the time without degrading communications.

A50 col. 5:34-66 (Summary of the Invention); *see also* A51-69 (Detailed Description).

The specification also explains that because wireless networks inevitably experience transmission errors, the claimed protocol incorporates intentional redundancies for the hub's transmission of the control information to the remotes. For example, "[t]he hub preferably transmits the information to the remotes twice during each communication cycle to reduce the possibility of a remote failing to receive the information during any communication cycle." A50 col. 6:33-38. Moreover, communication cycles are continually repeating, and thus "the duration of the current communication cycle . . . *as well as the durations of the next two communication cycles*, are reported in each information frame." A61 col. 28:53-56 (emphasis added).

2. Asserted claims 11 and 14—which are reproduced in full inside the front cover of this brief—are identical with respect to their preambles and five initial limitations. A71 col. 47:62-48:25 (claim 11); A72 col. 49:31-62 (claim 14); *see also Atlas IP, LLC v. Medtronic, Inc.*, No. 1:13-cv-23309-CMA (S.D. Fla. Jul. 22,

2014), Dkt. 129 at 1 (Joint Claim Construction Stipulation) ("The preamble . . . is a limitation"). The parties disputed a number of claim terms. *See* Dkt. 46-1 (Joint Claim Construction Statement). After briefing and a hearing, the district court issued an order construing the disputed terms. A11 (Claim Construction Order).

The district court first construed the "establishing" clause of limitation [b]—*i.e.*, "the hub establishing repeating communication cycles"—"to mean 'the hub defining in advance the starting time and duration for each repeating communication cycle.'" A22. This information must be transmitted in advance, the court reasoned, to allow the remotes to power down their receivers "at appropriate times—a key innovation of the '734 Patent." A21.

The court next construed the first "transmitting" clause of limitation [c]—*i.e.*, "the hub transmitting information to the remotes to establish the communication cycle"—"to mean 'the hub transmitting to the remotes information necessary to know in advance the starting time and duration of the communication cycle.'" A23. The court explained its construction in light of the claim language and specification:

> Consistent with the Court's construction [of the "establishing" clause], the hub, by "establishing repeating communication cycles," defines in advance the starting time and duration for each repeating communication cycle. As a result, the hub must transmit to the remotes the information necessary to know these starting times and durations. Furthermore, the '734 Patent explicitly states, "Due to the defined intervals of the communication cycle and the information conveyed by the hub, the remotes are able to power off their transmitters during times other than those intervals when the remote is allowed to

> transmit frames to the hub." ([A50], col. 5, ll. 54-58). The "information" the hub conveys must provide remotes the ability to know in advance when the communication cycle starts and its duration.

Id.

Finally, the court construed the second "transmitting" clause of limitation [c]—*i.e.*, "the hub transmitting information to the remotes to establish . . . a plurality of predeterminable intervals during each communication cycle"—to mean "the hub transmitting to the remotes information necessary to know in advance the starting time and duration of each of . . . two or more predeterminable intervals during each communication cycle." A24 (alterations in original).

3. Following claim construction, St. Jude moved for summary judgment of non-infringement. "Atlas [did] not take issue with St. Jude's five paragraphs of material facts concerning non-infringement, admitting as true all of them." A6. The sole remaining dispute was whether the district court's construction of the first "transmitting" limitation required the hub to transmit to the remotes information necessary to know the starting time and duration of each communication cycle "in advance" of *the entire communication cycle* (as St. Jude contended) or "in advance" of *the first interval within the cycle during which a remote is allowed to transmit to the hub* (as Atlas contended). *See* A7 (quoting parties' submissions).

The district court concluded that "[t]he 'information' the hub conveys . . . must provide remotes the ability to know in advance when the communication cycle starts and its duration. In order to know [when] the cycle starts, the information

must be transmitted in advance of the very communication cycle at issue." A7. The court continued: "[T]he remotes must know when to power up for the beginning of the next communication cycle, or they would be unable to receive the information frame." A8.

"As Atlas admit[ted] the accused products do not infringe under this interpretation of 'in advance,' there [was] no genuine issue of material fact whether the accused devices are encompassed by the claims." A10 (citation omitted). More specifically, Atlas conceded that the accused devices transmit *neither* the starting time nor the duration of any repeating communication cycle in advance of that cycle. A6, A8. The court therefore granted summary judgment to St. Jude "on the ground the accused devices do not infringe [the asserted claims of] the '734 Patent." A10.

SUMMARY OF THE ARGUMENT

I. The district court correctly construed the first "transmitting" limitation to mean that the hub must transmit to the remotes the starting time and duration of each communication cycle before that cycle begins. The objective of the invention is to allow the remotes to conserve power by powering down their transmitters *and* receivers when they are not in use; to achieve that objective as to the remotes' *receivers*, the hub must transmit to the remotes at least the starting time of each cycle before the cycle begins. Otherwise, the network would be inoperable, because the remotes would have no way of knowing when they need to power up their receivers after having powered them down. Atlas's objections to the district court's construction do not take this fundamental feature of the patent's claims and disclosure into account, and should be rejected.

A. Atlas first argues that "the district court's construction requiring that the hub transmit in advance of a communication cycle information regarding the starting time and duration of that communication cycles [*sic*] and its constituent intervals renders other language in claims facially nonsensical." Atlas Br. 18.

Not one of the claim limitations identified by Atlas is rendered superfluous or "nonsensical" by the district court's construction of the first "transmitting" limitation. These additional limitations pertain to *different* aspects of the networking protocol, such as the allocation of transmission opportunities among multiple remotes, the dynamic adjustment of cycle duration, or the intentionally redundant re-

transmission of information. Atlas's brief completely ignores the context of these other limitations, as set forth in the claims and specification.

At the same time, Atlas's proposed construction of the first "transmitting" limitation as allowing the first transmission of a cycle's starting time and duration after the cycle begins would render other limitations anomalous or ineffectual. The patent expressly claims "the remotes powering off their receivers during times other than those intervals when the remote is expected to receive a frame from the hub." A71 col. 48:22-25 (claim 11); A72 col. 49:59-62 (claim 14). If the time at which the remotes are expected to receive a frame from the hub—*e.g.*, at the beginning of each communication cycle when an information frame is transmitted—were not transmitted to the remotes until *after* that time had already passed (as Atlas contends is permissible), the remotes would never find out when they need to power back on their receivers. The district court made this point expressly: "[T]he remotes must know when to power up for the beginning of the next communication cycle, or they would be unable to receive the information frame." A8. Atlas ignores this anomaly, choosing not to address it in its opening brief.

B. Atlas's second argument is that the district court's construction is inconsistent with the specification of the '734 patent. According to Atlas, "the district court took the sole teaching from the specification that suggests transmission before a communication cycle and converted it into a claim limitation," while Figure 3 of the '734 patent (A38) depicts "a specification embodiment excluded from the

scope of the claims by the district court's construction." Atlas Br. 19, 20. Atlas is wrong on both counts.

1. The claims and specification make clear that the hub transmits certain information to the remotes before the communication cycle begins in order to implement the objective of selectively and predictably powering off and on the remotes' transmitters *and* receivers. Every example in the written description discloses transmission of information necessary to know each communication cycle's starting time in advance of the cycle. Far from importing a limitation from the specification, as Atlas asserts, the district court's construction is the only one that is consistent with the claimed invention.

2. Nor does the district court's construction exclude any preferred embodiments. Figure 3, on which Atlas stakes near-total reliance, is simply a snapshot of *one* exemplary communication cycle in a series of *repeating* communication cycles; as such, it is wholly consistent with the district court's construction of the "transmitting" limitation. The "information frame" of each communication cycle provides the timing of *subsequent* communication cycles or intervals within the present cycle, or at most includes the *redundant* re-transmission of information regarding the present cycle that was previously transmitted in advance of that cycle. Nowhere does the patent disclose transmitting the starting time of a communication cycle *for the first time* during the cycle itself, as Atlas contends is permissible.

Indeed, transmitting the starting time of a cycle for the first time after the cycle has begun would render the disclosed network inoperable.

II. Because the district court's construction of the "transmitting" limitation was correct, the summary judgment of non-infringement should be affirmed.

STANDARD OF REVIEW

The claim construction at issue in Atlas's appeal rests exclusively on the intrinsic evidence and is therefore reviewed *de novo*. *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 841 (2015) ("when the district court reviews only evidence intrinsic to the patent (the patent claims and specifications, along with the patent's prosecution history), the judge's determination will amount solely to a determination of law, and the Court of Appeals will review that construction *de novo*").

ARGUMENT

Atlas's appeal challenges the district court's construction of a single phrase—the first "transmitting" clause of limitation [c] of asserted claims 11 and 14 of the '734 patent. The claim language is "the hub transmitting information to the remotes to establish the communication cycle"; the district court construed it to mean "the hub transmitting to the remotes information necessary to know in advance the starting time and duration of the communication cycle" (A23), and further construed it to mean that this information "must be transmitted in advance of the very communication cycle at issue" (A7). Because that construction is correct, the judgment of non-infringement should be affirmed.*

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* After the district court issued its claim construction order, St. Jude asked the court to construe the "each of which" clause of limitation [b]—*i.e.*, "repeating communication cycles, each of which has intervals during which the hub and the remotes transmit and receive frames." The parties differed as to whether this clause "calls for a *required* (rather than *allowed*) transmission from at least one remote in each of the 'repeating communication cycles' established by the hub." Dkt. 101 at 1 (Supplemental Claim Construction Order) (internal quotation marks omitted). In the parallel case against Medtronic, the district court adopted Atlas's proposed construction: "The plain meaning necessitates the hub and the remotes transmit and receive frames during each communication cycle, not that the hub and the remotes simply *may* do so during a communication cycle . . . ." *Id.* at 2 (internal quotation marks omitted). Based on that construction, the court denied as "moot" St. Jude's request for a different construction in this case. *Id.* St. Jude filed a conditional cross-appeal from that ruling, but this Court dismissed the cross-appeal on March 25, 2015. Order, Fed. Cir. Dkt. 40.

I. The District Court Correctly Construed The "Transmitting" Limitation

"The construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1316 (Fed. Cir. 2005) (en banc) (internal quotation marks omitted).

The district court initially construed the first "transmitting" clause of limitation [c] to mean "the hub transmitting to the remotes information necessary to know in advance the starting time and duration of the communication cycle." A23. Atlas does not challenge that initial construction in its principal brief, and therefore has waived any such challenge. *See Advanced Magnetic Closures, Inc. v. Rome Fastener Corp.*, 607 F.3d 817, 833 (Fed. Cir. 2010) (this Court "has consistently held that a party waives an argument not raised in its opening brief"); *see also SmithKline Beecham Corp. v. Apotex Corp.*, 439 F.3d 1312, 1319 (Fed. Cir. 2006).

Atlas's sole argument in this appeal is that the "transmitting" limitation, as initially construed by the district court, should be further construed to "allow for the hub to transmit information to the remotes defining the length and/or starting time of communication cycles and their constituent intervals *during* the communication cycle itself, as opposed to in advance of such cycle." Atlas Br. 17. That proposed construction of the "transmitting" limitation, however, is flatly inconsistent with the claims and specification, as the district court correctly ruled in its summary judgment order. *See* A6-10. There, the district court explained that "the

information must be transmitted in advance of the very communication cycle at issue." A7. That is because "the remotes must know when to power up for the beginning of the next communication cycle, or they [will] be unable to receive the information frame." A8.

Limitation [e] of the asserted claims requires the remotes to "power[] off their receivers during times other than those intervals when the remote is expected to receive a frame from the hub, by using the information transmitted from the hub." A71 col. 48:22-25 (claim 11); A72 col. 49:59-62 (claim 14). The specification explains that this limitation "permit[s] the receivers as well as the transmitters of the [remote] communicator stations to be powered off during a majority of the time, but *selectively and predictably* powered on to receive relevant communications." A50 col. 5:25-33 (emphasis added).

Powering off the receivers—as required by the claims and disclosed in the specification—*requires* the transmission of (at minimum) information necessary to know the starting time of each communication cycle before the cycle begins, because otherwise the remotes would not know when to power back on. Atlas's entire submission to this Court fails to grapple with this foundational feature of its own "invention," and its proposed construction is not only irreconcilable with the claims and unsupported by the specification but, indeed, would render the disclosed network inoperable. The district court's construction, in contrast, avoids all these problems.

A. The Claims Require Transmission Of Each Repeating Communication Cycle's Starting Time And Duration Before The Cycle Begins

The asserted claims recite a wireless networking protocol pursuant to which "the hub defin[es] in advance the starting time and duration for each repeating communication cycle" (limitation [b], as construed (A22)); "the hub transmit[s] information to the remotes to establish the communication cycle" (limitation [c]); and the remotes "power[] off" their transmitters/receivers "during times other than" those in which they are "allowed"/"expected" to transmit/receive frames to/from the hub (limitations [d] and [e]).

In the context of limitation [c], the district court reasoned that because the remotes must know when to power on their receivers during the repeating communication cycles, the hub must transmit information necessary to know the starting time and duration of each repeating communication cycle to the remotes in advance of that communication cycle. A23 ("The 'information' the hub conveys must provide remotes the ability to know in advance when the communication cycle starts and its duration"); A8 ("the remotes must know when to power up for the beginning of the next communication cycle, or they would be unable to receive the information frame"). Atlas nowhere mentions the district court's straightforward and logical explanation for its construction of the "transmitting" limitation. And indeed, Atlas's proposed construction is inconsistent with this objective of the claimed network protocol.

Atlas does not dispute that the district court's construction of the first "transmitting" limitation is entirely consistent with claim 11—one of the two claims asserted against St. Jude. *See* Atlas Br. 9-11, 17 (contending only that the district court's construction is inconsistent with claims 5, 12, 14, 21, and 32-34). Nor does Atlas dispute that the district court's construction of this limitation is consistent with the limitation itself.

Instead, Atlas invokes (as "Tenet 1") the general principle that "'[a] claim construction that renders asserted claims facially nonsensical cannot be correct.'" Atlas Br. 16 (quoting *Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1255 (Fed. Cir. 2010)). While this principle is undoubtedly sound, it is not implicated here because the additional limitations identified by Atlas neither affect nor or are affected by the district court's construction of the first "transmitting" limitation (which appears in all the patent claims). Indeed, it is Atlas's proposed construction that would render other limitations—specifically, those requiring the remotes to power up and down their receivers at specified times—nonsensical.

1. Atlas's principal contention appears to be that the district court's construction of the "transmitting" limitation is inconsistent with asserted claim 14's separate limitation of "the hub transmitting a frame containing information describing the length of the communication cycle prior to the end of the communication cycle whose length is established." A72 col. 49:65-68. Atlas argues, without

further elaboration, that the challenged construction renders this limitation "facially nonsensical." Atlas Br. 18. It does not.

Because it is critical that the remotes be informed of the timing of the repeating communication cycles, the specification explicitly discloses that the duration of each communication cycle is transmitted to the remotes *four times* before the cycle begins, and then *twice more* during the cycle itself, in "information frame" **76** and "alternate information frame" **82** of the current cycle and the two preceding communication cycles. A53 col. 12:5-9; A54 col. 13:23-28; A60 col. 26:41-47; A61 col. 27:57-61, col. 28:54-61; A65 col. 36:2-10. Multiple re-transmissions are intended to "provide[] a reasonable margin for RF communication errors," since transmissions over wireless networks—the field of invention of the '734 patent—are susceptible to becoming lost or corrupted while en route to an intended recipient due to factors such as radio-frequency noise or interference. A48 col. 2:28-49; A53 col. 12:5-9; A61 col. 27:66-68, col. 28:54-61.

The intentionally redundant re-transmission of duration information is necessary because "at a minimum, *a remote must successfully receive* one information frame or alternate information frame out of every two communication cycles (1 out of 4 such frames) to remain synchronized with the hub." A61 col. 28:57-61 (emphasis added); *see also* A53 col. 12:5-9; A65 col. 36:2-10. A remote would lose synchronization with the hub if it were to fail to receive all four information frames and alternate information frames sent prior to a communication cycle, because

those frames inform the remote when to power on its receiver to receive transmissions from the hub during that cycle. *See* A48 col. 2:28-49; A53 col. 12:5-9; A61 col. 27:66-68, col. 28:54-61.

Duration is also subject to dynamic adjustment by the hub. A65 col. 35:46-56; A65-66 col. 36:11-37:54. Such adjustments represent another means of reducing the risk of transmission errors by "avoid[ing] possible interferences with a hub's transmissions created by regularly occurring noise and to minimize periodic interference with other RF devices due to this hub's transmissions." A65 col. 35:56-62. There is, accordingly, no inconsistency between the district court's construction of the first "transmitting" clause and the additional "length" limitation of claim 14.

Moreover, duration is only *one* of the two pieces of control information that the hub must transmit to the remotes in advance of each repeating communication cycle, according to the district court's claim construction. As explained below, the hub must also transmit the *starting time* of the cycle, since that is when each remote must ensure that its *receiver* is powered on to receive the critical "information frame" from the hub. Atlas's suggestion that the "starting time" of the cycle may be transmitted "*during* the communication cycle itself" (Atlas Br. 17) would result in a system that could not satisfy the limitations of both asserted claims.

"It is *necessary* for battery operated remotes to recognize when to expect the beginning of the next communication cycle, in order to power-up their RF modems to receive the information frames at the beginning of each cycle." A65 col. 35:65-36:2 (emphasis added). That is because claims 11 and 14 provide for "the remotes powering off their receivers during times other than those intervals when the remote is expected to receive a frame from the hub" (limitation [e]). A71 col. 48:22-25 (claim 11); A72 col. 49:59-62 (claim 14). *Before* any remote can power off its receiver as recited in the asserted claims, the remote must learn from the hub when its receiver will need to be powered back on. And because each remote must have its receiver powered on at the beginning of each communication cycle to receive the "information frame," the remotes must therefore be informed of when each cycle will begin *before it begins*. *See* A64 col. 33:28-31 ("Based on the information conveyed in the information frame **200**, all remotes **66** enable their RF modems **96** at the time of the expected arrival of each information frame **200**"); *see also* A64 col. 34:24-31; A61 col. 28:44-61. This is true regardless of whether the *duration* of a cycle is sent before the cycle and even if that duration may be modified during the cycle.

Atlas *does not even mention* the "powering off" limitation in its appellate brief, much less attempt to explain how allowing the starting time of a cycle to be transmitted for the first time during that cycle could possibly be reconciled with the "powering off" limitation. That is because no such reconciliation is possi-

ble: Atlas's proposed construction of the "transmitting" limitation is flatly inconsistent with the "powering off" limitation of the asserted claims. If accepted, Atlas's proposed construction would render the disclosed system inoperable.

2. The district court's construction of the first "transmitting" limitation also is not inconsistent with the other claim limitations identified by Atlas. Certainly it does not render any of those other limitations "nonsensical." *See* Atlas Br. 16-17.

Claims 5 and 12 include as an additional limitation "the hub transmitting a frame containing the transmission opportunity allocation information during the communication cycle." A72 col. 49:11-13 (claim 12). However, "transmission opportunities" are *not* communication cycles; they are *intervals* within communication cycles. *See* A50 col. 5:44-47 ("The hub establishes repeating communication cycles, each of which has intervals during which the hub and the remotes transmit and receive frames"), col. 5:67-6:1 ("Another desirable aspect of the MAC protocol of the present invention is that the hub allocates transmission opportunities (Txops) to the remotes"), col. 6:13-15 ("Thus, the desirable aspects of TDMA are achieved by providing specific predeterminable intervals for Txops"); *see also* A38 Fig. 3. As reflected in the district court's construction of other claim phrases not disputed by Atlas in this appeal (*see* A23-24), and consistent with claims 5 and 12, the hub may transmit timing information for transmission opportunities earlier in the very cycle containing those transmission opportunities. *See* A64 col. 33:15-27 ("Information in the information frame **200** includes the . . . al-

location of Txops to the remotes **66** during the inbound portion **74** of this communication cycle **70**"). This is irrelevant to the "transmitting" phrase in dispute here, since "transmission opportunity allocation information" is wholly different from the starting time and duration of a communication cycle. Thus, contrary to Atlas's assertion, these claims are fully consistent with the district court's construction of the first "transmitting" clause in limitation [c], which is directed to the timing of *cycles*, not *intervals*. A22-23.

Similarly, claim 21 includes as an additional limitation "the hub transmitting two frames containing information to establish the plurality of predeterminable intervals during each communication cycle, the second frame containing the information to establish[] the plurality of predeterminable intervals occurring before the intervals in which the remotes are allowed to transmit frames to the hub." A73 col. 51:3-9. Just as with claims 5 and 12, this limitation is directed to the timing of *intervals*, not *cycles*, and is therefore consistent with the district court's constructions of the first "transmitting" clause.

Finally, claims 32, 33, and 34 (A73-74 col. 52:43-54:38) are also consistent with the district court's construction because the additional limitations to which Atlas refers are directed to the possible *adjustment* of the duration of a communication cycle during the cycle, just as with claim 14, as well as with the establishment of *intervals* within the cycle, just as with claims 5, 12, and 21. Claim 34 is in fact inconsistent with Atlas's proposed construction, as it includes as a limitation "the

hub transmitting information to the remotes during a first communication cycle to establish the length of the first communication cycle *and to establish the time for the beginning of the next subsequent second communication cycle*." A74 col. 54:28-32 (emphasis added). This limitation confirms that the start time of a cycle must be transmitted in advance of that cycle (in order, again, to allow the receivers to power on at the appropriate time) and thus *cannot* be sent for the first time during the cycle itself, as Atlas contends. This limitation also indicates that cycle duration information *may* be transmitted during the communication cycle, but does not suggest that cycle duration information would not also have been transmitted in advance of the cycle. Additionally, where claims 32 and 33 call for the hub to transmit information to the remotes to establish a "first interval" in the communication cycle, such transmission would occur prior to the start of the cycle, consistent with the claim language, the specification, and the district court's construction of limitation [c]. *See* A65 col. 35:66-36:5; *see also* A38 Fig. 3.

In sum, not one of the additional limitations to which Atlas points is rendered superfluous or redundant by applying the district court's construction of the "transmitting" limitation to any (or every) claim of the patent. Because the other limitations identified by Atlas provide *additional* constraints on the claimed protocol, the entirety of each claim identified by Atlas would have meaning even with the district court's construction in place. *See*, *e.g.*, *Curtiss-Wright Flow Control Corp. v. Velan, Inc.*, 438 F.3d 1374, 1380-81 (Fed. Cir. 2006). Certainly none of

these limitations is rendered "facially nonsensical" as Atlas asserts, albeit without any support or explanation. Atlas Br. 18. Atlas's "Tenet 1" argument therefore fails.

B. The Specification Confirms That Starting Time And Duration Information Must Be Transmitted In Advance Of Each Cycle

The specification of the '734 patent confirms the correctness of the district court's construction of the "transmitting" clause of limitation [c] of asserted claims 11 and 14.

The Summary of the Invention, in particular, discloses that the hub transmits the information in advance of the communication cycle to allow the remotes to power off their transmitters and receivers at the appropriate times, thereby conserving power:

> The hub transmits control information to the remotes to establish the communication cycle and to establish a plurality of predeterminable intervals during each communication cycle . . . . Due to the defined intervals of the communication cycle and the information conveyed by the hub, the remotes are able to power off their transmitters during times other than those intervals when the remote is allowed to transmit frames to the hub. In addition, and very significantly, the remotes are able to power off their receivers during times other than those intervals when the remote is expected to receive frames from the hub. Thus, the control information and the communication cycle conserve considerable power because the receivers and transmitters of the remotes may remain powered off for a considerable portion of time without degrading communications.

A50 col. 5:47-66.

The district court relied extensively on this passage in both its claim construction order (*see* A12-13, A21-23) and its summary judgment order (*see* A3-4, A7). Yet Atlas *does not even mention* it in its appellate brief. Atlas does not argue that the district court erred in relying on this part of the specification in construing the disputed limitation, nor does Atlas argue that this passage is inconsistent with the district court's construction.

Without addressing what the specification actually says, Atlas presents two arguments that the district court's construction is inconsistent with the specification. The first (which Atlas labels "Tenet 2") is that the district court imported a limitation from the specification into the claims; the second (which Atlas calls "Tenet 3") is that the district court's construction excludes a preferred embodiment. *See* Atlas Br. 19-21. Atlas is wrong on both counts.

1. The Court Did Not Import A Limitation From The Specification Into The Claims

Atlas concedes that at least one passage in the specification—"the hub transmits the length of each of the next two communication cycles as part of the information frame at the beginning of each communication cycle" (A65 col. 36:3-5)—"suggests transmission before a communication cycle." Atlas Br. 19. Atlas contends, however, that this is the "sole teaching from the specification" that supports the district court's construction, and on that basis complains that the court improperly "converted it into a claim limitation." *Id.*

Because Atlas's premise is false, so too is its conclusion. To be sure, the district court cited that passage in its summary judgment order (A7-8), but it cited many more parts of the specification both in that order (*see id.*) and in its claim construction order (*see* A20-24). As Atlas does not dispute, these additional passages support the district court's construction.

Indeed, in addition to the Summary of Invention (*see* A50 col. 5:25-33), the specification explicitly discloses that the claimed protocol achieves battery savings precisely because the remote transmitters and receivers know in advance of the communication cycle when to turn off and on. A54 col. 13:33-36 ("As a consequence of the predictable times when frames may be both received and transmitted, the remotes can power their radio interfaces down to preserve power at other times"); *see also*, *e.g.*, A53 col. 11:28-42; A54 col. 13:29-50; A65 col. 35:66-36:2; A69 col. 44:8-49. Additionally, throughout the specification, each communication cycle's information frame contains the durations of successive communication cycles. *See* A54 col. 13:23-28; A60 col. 26:41-47; A61 col. 27:57-61, col. 28:54-61; A65 col. 36:2-10. As the asserted claims call for communication cycles to be "repeating," the remotes use this length information to determine the starting time of each cycle before the cycle begins. *See* A60-61 col. 26:59-27:53; A65 35:66-36:10; A38 Fig. 3; A47 Fig. 19. Put another way, the information frame of one communication cycle informs the remotes of the timing of subsequent communication cycles. *Id.*

Moreover, nowhere does the specification suggest that the starting time is transmitted at any time other than in advance of the communication cycle. In every part of the disclosure, and each embodiment, this information is transmitted in advance of the communication cycle. As makes sense: This Court, after all, does not inform litigants of an oral argument's starting time during that same argument. In this patent, the information needed to begin the communication cycle is similarly transmitted from the hub to the remotes in advance of that cycle, not during it. That construction ensures that the receivers are "selectively and *predictably* powered on to receive relevant communications." A50 col. 5:25-33 (emphasis added); *see also* A65 col. 35:65-36:2. Atlas's proposed construction does not.

The claims are to be construed in light of the specification. *Phillips*, 415 F.3d at 1315-16. The district court did just that. Tellingly, with the exception of one drawing—Figure 3, discussed next—Atlas does not even attempt to argue that the district court's construction of the "transmitting" limitation creates a conflict or inconsistency with any part of the specification. That is not because the court imported a limitation from the specification, as Atlas urges, but because the court construed the limitation in light of the specification, as precedent requires. *See id.*

2. The Court's Construction Does Not Exclude A Preferred Embodiment

Atlas contends that Figure 3 (A38) "is a specification embodiment excluded from the scope of the claims by the district court's construction." Atlas Br. 19-20.

Figure 3 is a snapshot of *one* of the repeating communication cycles described in the patent:

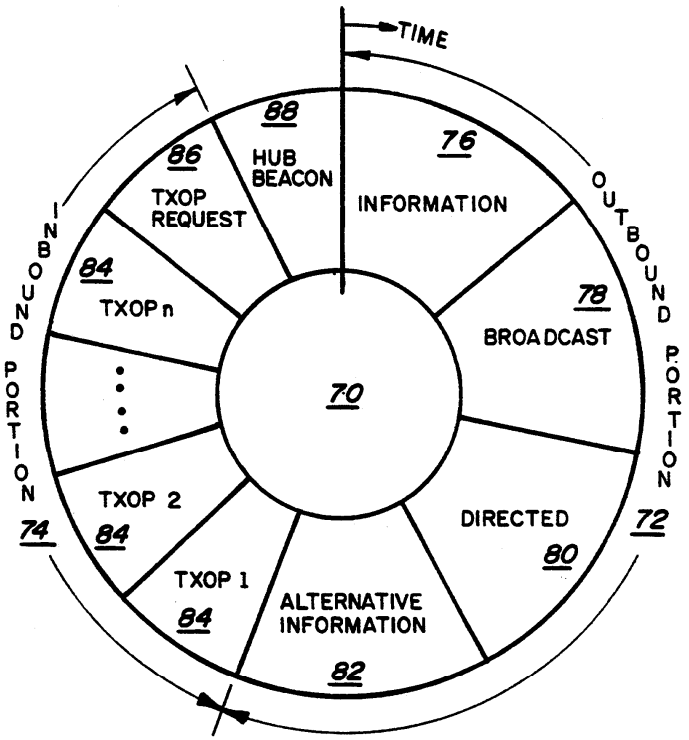


Fig_3

A38; *see also* Dkt. 114 at 4-5 (Atlas's Responsive Statement of Facts, Nos. 18-21); Dkt. 124 at 4-5 (St. Jude's Reply Statement of Facts, Nos. 18-21). The patent acknowledges the repeating nature of the communication cycle depicted in Figure 3, as it refers to "*this* communication cycle **70**" and "*the previous* communication cycle **70**" in the very same sentence. *See* A64 col. 33:15-27 (emphases added).

Atlas argues that Figure 3 "clearly shows [information] interval 76 *within* the outbound portion of the communication cycle 72." Atlas Br. 20. That is true as far as it goes, but Atlas's argument wrongly assumes that the starting time and

duration of the current cycle would not have been transmitted by the hub in a *previous* cycle. As the district court correctly recognized (A7), and Atlas does not dispute (Atlas Br. 21), nothing in the written description supports this assumption. As the following graphic (prepared by St. Jude in connection with its summary judgment argument) illustrates, information frame **76** of each repeating communication cycle contains information regarding the timing of the subsequent communication cycle:

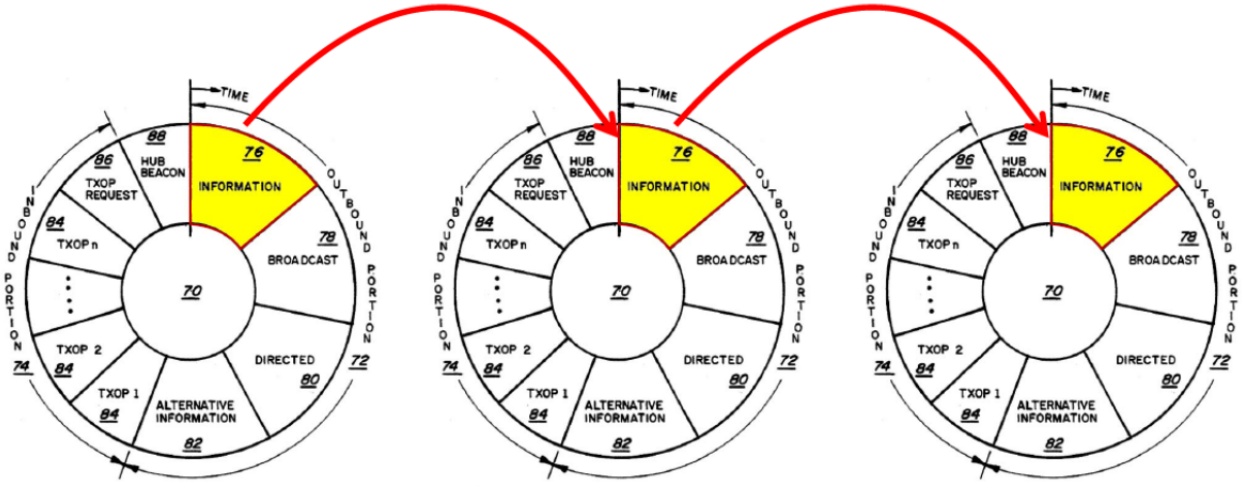


Fig_3 Fig_3 Fig_3

The hub transmits the *duration* of a communication cycle, in "information frame" **76** and "alternate information frame" **82,** for at least the current cycle and the next cycle. A60 col. 26:41-47; *see also* A53 col. 12:5-9; A54 col. 13:23-28. Elsewhere the specification discloses that the hub transmits the durations of the next two subsequent cycles in the information frame. A61 col. 27:57-61, col. 28:54-61; A65 col. 36:2-10. As the specification explains, "at a minimum, a remote must successfully receive one information frame or alternate information

frame out of every two communication cycles (1 out of 4 such frames) to remain synchronized with the hub." A61 col. 28:57-61. This helps ensure synchronization and enhance reliability even in the event of wireless transmission errors.

More importantly, nowhere does the patent disclose that the *starting time* of the current communication cycle is transmitted for the first time after the cycle begins, nor could it: Time's arrow flies only forward. The remotes would not be able to power off their receivers as required by limitation [e] of the asserted claims unless the hub were to transmit the starting time of each communication cycle in advance of the cycle. A8; *see also* A53 col. 11:56-62; A54 col. 13:23-28; A61 col. 28:44-61; A65 col. 35:65-36:10. Atlas's proposed construction, in contrast, would require the remotes to keep their receivers powered on most or all of the time, in contravention of the claims and contrary to the specification.

Atlas argues, however, that "the hub need only transmit the subject information to the remotes before the intervals in which the remotes are allowed to broadcast [*sic*: should be transmit] to the hub, allowing the remotes to have their transmitters powered off during any other intervals." Atlas Br. 21.

Atlas is confusing "intervals" with "cycles." The district court ruled that information regarding each interval must be transmitted in advance of that interval, *rejecting* Atlas's contention that intervals "should be construed together" with cycles. A23. Atlas has not appealed that claim construction, and thus has waived any challenge to the district court's separate construction of the "cycle" clause.

Atlas, moreover, focuses only on the "inbound" portion **74** of the communication cycle, during which the remotes may *transmit* frames to the hub, and mistakenly ignores the critical "outbound" portion **72** of the communication cycle, during which the remotes are expected to *receive* frames from the hub, including the "information frame" containing critical timing information for the cycles and intervals. *See* A53 col. 11:56-62; A54 col. 13:23-28; A61 col. 28:44-61; A65 col. 35:65-36:10; A38 Fig. 3; *see also* A53 col. 12:5-9. When a remote powers down its receiver, it must already know when its receiver will need to be powered back on, since the remote will not be able to receive *any* information from the hub while its receiver is powered down. Atlas has not pointed to any teaching in the specification or otherwise suggested how the system can operate without the remotes knowing ahead of time when each cycle will start. Thus, if the remotes were informed for the first time of a communication cycle's starting time after that cycle had already begun—as Atlas now proposes—the claimed wireless network would not function. *See AIA Eng'g Ltd. v. Magotteaux Int'l S/A*, 657 F.3d 1264, 1278 (Fed. Cir. 2011) (holding that "a construction that renders the claimed invention inoperable should be viewed with extreme skepticism") (internal quotation marks omitted).

Remarkably, Atlas's brief in this Court never discusses the receivers, much less their ability to power off and on during the communication cycle. Indeed, Atlas's brief only uses the word "receiver" twice—both times within block

quotes from other sources. Atlas Br. 7 (quoting Summary Judgment Order), 9 (quoting "transmitting" limitation). In so doing, Atlas ignores not only one of the expressed bases for the district court's claim construction, but also the "invention" itself as described in the patent.

A critical aspect of the claimed protocol is allowing the remote *receivers* to power down when they are not needed. A50 col. 5:59-62 ("very significantly, the remotes are able to power off their receivers during times other than those intervals when the remote is expected to receive frames from the hub"). Before they power down, the receivers have to know when *in the future* they will be needed. Without information about the start time of the next cycle, the remote receivers do not know when to power up again.

Thus, while Atlas accuses the district court of adopting a construction that excludes a preferred embodiment (or, more accurately, an illustration of one aspect of the invention), it is Atlas's alternative construction that would exclude *every* embodiment disclosed in the patent. Such a construction is "rarely, if ever, correct and would require highly persuasive evidentiary support." *Adams Respiratory Therapeutics, Inc. v. Perrigo Co.*, 616 F.3d 1283, 1290 (Fed. Cir. 2010). Yet Atlas's proposed construction has no support whatsoever in the intrinsic evidence.

In addition to being inconsistent with both the claims and the specification, the construction of the first "transmitting" limitation now advanced by Atlas cannot be reconciled with the sworn testimony of the inventor:

> Q. And because of the information that is sent by the hub to the remotes in advance, the remotes also know when their receivers need to be powered on so that they can be ready to have a communications exchange with the hub?
>
> A: Well, certainly so that they can receive something. I don't know about—exchange implies a turn around to transmit. I don't know that it implies exchange, but certainly it implies the ability to receive. That portion I would agree with.
>
> Q. Yes. And that's actually the subject of the next sentence in your Summary of the Invention, right, at column 5, line[] 58, and I'll read that into the record.
>
> A. Yes.
>
> Q. "In addition, and very significantly, the remotes are able to power off their receivers during times other than those intervals when the remote is expected to receive frames from a hub."
>
> A. Yes.

A26-27 (Claim Construction Order) (quoting Videotaped Deposition of Michael Fischer, June 4, 2014 60:3-23). The district court expressly relied on this testimony in construing other claim limitations. *See id*.

Atlas's proposed construction would also (further) cast into doubt the validity of the '734 patent. If the start time of a communication cycle were not transmitted from the hub to the remotes until after the communication cycle had begun, the network would be inoperable because the remotes would not know when to power on their receivers. It is therefore not clear under Atlas's proposed construction what utility, if any, the claimed network protocol would have or whether the patent could satisfy the enablement requirement. The district court's construction avoids these problems.

II. The District Court Correctly Granted Summary Judgment

If the Court sustains the district court's construction of the first "transmitting" clause of limitation [c], the summary judgment of non-infringement can only be affirmed. To recapitulate, the district court construed this clause to mean "the hub transmitting to the remotes information necessary to know in advance the starting time and duration of the communication cycle," and further clarified that "in advance" means in advance of the communication cycle at issue. A23, A7. Atlas concedes that the alleged hub in the accused devices transmits *neither* the starting time *nor* the duration of any alleged communication cycle in advance of that cycle. A6; A8; *see also* Dkt. 90 at 2 (St. Jude's Statement of Undisputed Material Facts, Nos. 1-5); Dkt. 114 at 1-2 (Atlas's Responsive Statement of Facts, Nos. 1-5); Dkt. 124 at 1-2 (St. Jude's Reply Statement of Facts, Nos. 1-5). Thus, if this Court ratifies either aspect of the district court's construction of the "transmitting" limitation by concluding that the hub must transmit each repeating communication cycle's starting time *or* duration information (or both) before the start of the cycle, the Court should affirm the judgment of non-infringement.

CONCLUSION

The judgment of the district court should be affirmed.

Respectfully submitted.

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/s/ Mark A. Perry

Mark A. Perry
Principal Attorney
GIBSON, DUNN & CRUTCHER LLP
1050 Connecticut Avenue, N.W.
Washington, D.C. 20036
Telephone: (202) 955-8500
Facsimile: (202) 530-9696
mperry@gibsondunn.com

Wayne M. Barsky
GIBSON, DUNN & CRUTCHER LLP
2029 Century Park East, 40th Floor
Los Angeles, CA 90067
(310) 552-8500

Neema Jalali
GIBSON, DUNN & CRUTCHER LLP
555 Mission Street, Suite 3000
San Francisco, CA 94105
(415) 393-8200

Counsel for Appellees St. Jude Medical, Inc. and St. Jude Medical S.C., Inc.

CERTIFICATE OF SERVICE

I hereby certify that on April 24, 2015, I served a copy of the foregoing on counsel of record via CM/ECF and a courtesy copy to Medtronic's counsel by U.S. Mail (Jeanne M. Heffernon, Kirkland & Ellis LLP, 601 Lexington Avenue, Citigroup Center, New York, NY 10022).

/s/ Mark A. Perry
Mark A. Perry

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Dated: April 24, 2015

/s/ Mark A. Perry
Mark A. Perry