

IPR2024-00796 (U.S. Patent No. 7,483,686)
Patent Owner's Sur-Reply

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MEDIATEK INC.,
Petitioner,

v.

PARKERVISION, INC.
Patent Owner.

U.S. Patent No. 7,483,686
Issue Date: January 27, 2009

Title: UNIVERSAL PLATFORM MODULE AND METHODS AND
APPARATUSES RELATING THERETO ENABLED BY UNIVERSAL
FREQUENCY TRANSLATION TECHNOLOGY

Inter Partes Review No. IPR2024-00796

PATENT OWNER'S SUR-REPLY

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PATENT OWNER'S EXHIBIT LIST

Exhibit No.	Description
2001	Complaint, ParkerVision, Inc. v. MediaTek Inc. et al., Case No. 6:23-cv-00375-ADA (WDTX)
2002	Amended Scheduling Order, ParkerVision, Inc. v. MediaTek Inc. et al., Case No. 6:23-cv-00375-ADA (WDTX)
2003	Dani Kass, "Catching Up On Patent Litigation With Judge Albright," LAW360 (Mar. 14, 2023)
2004	Sonrai Memory Ltd. v. Kingston Tech. Co., Inc., Case No. 6:21cv-1284-ADA, Order Denying Kingston Tech. Co. and Kingston Tech. Corp.'s Opposed Motion to Stay Pending Resolution of Inter Partes Review, Dkt. 94 (W.D. Tex., Oct. 18, 2022)
2005	Agreed Scheduling Order, ParkerVision, Inc. v. MediaTek Inc. et al., Case No. 6:23-cv-00375-ADA (WDTX)
2006	Declaration of Dr. David Ricketts
2007	Rudolf Graf, Modern Dictionary of Electronics (7th ed. 1999)
2008	Special Master's Recommended Claim Constructions, ParkerVision, Inc. v. NXP BV, NXP Semiconductors NV, NXP USA, Inc. f/k/a NXP Semiconductors USA, Inc.
2009	Notice of Intent to Issue Reexamination Certificate of U.S. Patent No. 6,266,518 dated March 1, 2024.
2010	Transcript of Lawrence E. Larson, Ph.D. dated February 28, 2025
2011	A 1 GHz CMOS RF Front-End IC for a Direct-Conversion Wireless Receiver, A. Rofougaran, et al.
2012	Declaration of Scott Samay
2013	Deposition Transcript of Lawrence Larson, dated August 4, 2025

I. “Energy Transfer Signal”

A. Petitioner's Reliance On Plain-and-Ordinary Meaning Is Wrong.

With regard to “energy transfer signal,” Petitioner proposes “plain and ordinary meaning” and states that “no additional construction is necessary.” Reply,8. PO, on the other hand, proposes a construction with which Petitioner disagrees. Because there is a dispute, a construction (other than plain-and-ordinary meaning) is required under *O2 Micro. O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1360 (Fed. Cir. 2008) (“When the parties raise an actual dispute regarding the proper scope of these claims, the court...must resolve that dispute.”).

Petitioner seeks to justify its position because, in district court, PO agreed to “energy transfer signal” having its plain-and-ordinary meaning. Reply,2-3. Petitioner then criticizes PO for proposing a construction in this IPR. *Id.* But PO has good basis to do so.

In the 5/3/2024 joint claim construction statement, PO agreed to plain-and-ordinary meaning. Ex.-1009. Then, *weeks later*, on 5/21/2024, Petitioner filed this IPR. At this time, it became clear that Petitioner was applying an overly-broad/improper interpretation. Recognizing this dispute, PO proposed a construction in its POR, consistent with *O2 Micro*.

Accordingly, Petitioner cannot rely on plainand-ordinary meaning.

B. Petitioner's View Of "Energy Transfer Signal" Is Wrong.

Petitioner appears to contend that the plain-and-ordinary meaning of "energy transfer signal" encompasses *any* signal that causes a switch to close and thereby enable energy transfer. Reply,23-24. This interpretation is overly-broad and incorrect.

Under Petitioner's logic, *any* signal that triggers a switch to close would be an "energy transfer signal." But if that were correct, the claims would have simply recited "a signal." They do not. Petitioner's view essentially reads out "energy transfer" from the term and, as discussed below, ignores the specification's discussion of that term.

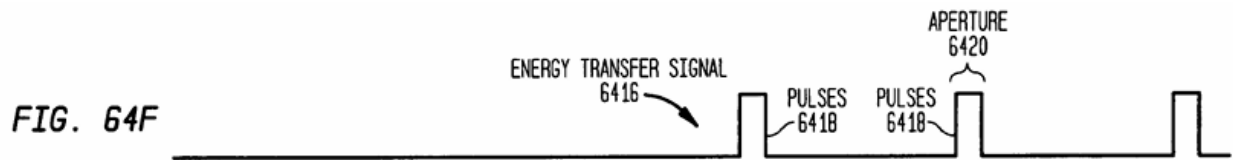
II. Petitioner's Criticisms Of PO's Construction Fail.

Petitioner criticizes PO's construction.

First, Petitioner argues that PO's proposed language—"pulses with non-negligible apertures"—merely describes embodiments. Not so. The specification clearly *defines* this as a *requirement* of an "energy transfer signal": "[w]hen the *pulses* of the control signal 2006 have *non-negligible apertures*... the control signal 2006 is *referred to as* an *energy transfer signal*."¹ EX1001,13:27-31. The patent also refers to the module that receives those pulses as an "*energy transfer*

¹ Unless otherwise notes, all emphasis has been added.

module.” *Id.* Notably, the Reply fails to identify any other type of signal (e.g., sinewave) disclosed in the patent as an “energy transfer signal.” This is because pulses are the type of signals that have apertures. EX1001, Fig. 64F.



Further, Petitioner concedes that an “*energy transfer signal must close a switch for a sufficient aperture to transfer a non-negligible amount of energy.*” Reply,8,15 (“Avitabile teaches an ‘energy transfer signal’ *because it teaches a signal which closes a switch for a non-negligible aperture.*”). And Petitioner’s expert admits that transferring non-negligible amounts of energy requires non-negligible apertures. Ex.-2013,10:21-11:9.

Second, Petitioner cites to another ParkerVision patent to argue that, when PO intended to limit claims to “pulses,” it did so explicitly.² But claims commonly use different language to cover similar/related concepts. Regardless, the absence of

² Petitioner points to claim 2 of the ’551 patent, which recites an “energy transfer signal,” and claim 3, which recites a “train of pulses.” But a “train of pulses” simply specifies a particular form of a pulse-based signal. The use of “train of pulses” is not inconsistent with “pulse” being inherent in claim 2.

the word “pulse” in the ’686 patent claims does not negate the fact that, as discussed above, the patent expressly defines (and illustrates) “pulses” as a *requirement* of an “energy transfer signal.” *See also* EX1001, Figs. 49B/C, 51A/B, 52C, 61, 64F, 71A; EX1008, Figs. 49A-H, 50C/51C/52C/53C/54C/55C/57C/58C/59C/60C/61C/62C/75C/83C, 72A-B, 56B/67B. Petitioner identifies no specification disclosure to the contrary.

Third, Petitioner argues that “a signal” can close a switch for a defined aperture regardless of whether it is a pulse. Reply,8. This is a red herring. The issue is not whether a signal can cause a switch to close but, instead, whether the signal itself consists of pulses with non-negligible apertures. The claims do not recite merely “a signal.” And Petitioner fails to identify any disclosure describing an “energy transfer signal” as anything than a signal with pulses having non-negligible apertures. There is no such disclosure.

Fourth, Petitioner relies on the PTAB’s prior construction of a *different* term—“switch”—to argue that including “independent control input” is inappropriate. Reply,2-3. But the PTAB’s ruling merely held that an “independent control input” is not a feature of a *switch* itself. Here, by contrast, the issue is the nature of the control input to a switch and whether that input is independent

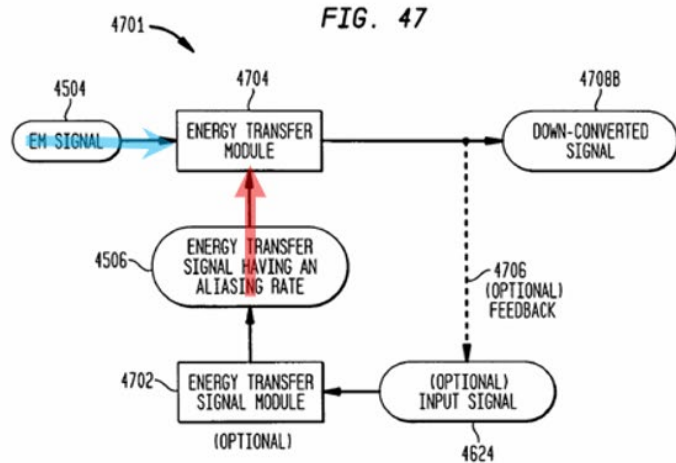
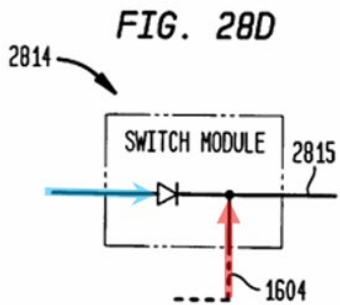
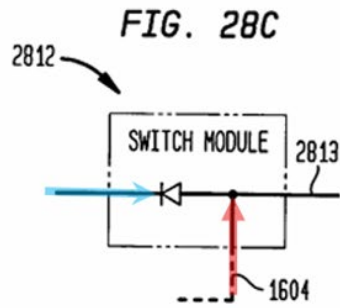
(separate from) other input signals (i.e., a characteristic of the signal itself, not the switch).³ That is a distinct question.

As explained in the POR, the specification contains no disclosure/teaching/suggestion that an “energy transfer signal” is anything other than an independent control input. POR,35. Contrary to Petitioner's assertion, PO is not trying to limit the claims to an embodiment.⁴ Reply,3. PO is simply providing a construction based on the intrinsic evidence, as the law requires.

Fifth, Petitioner cites to its discussion of Figures 28C, 28D ('551 patent) and Figures 47, 52C ('686 patent) to argue an “energy transfer signal” is not an “independent control input.” But these figures show the opposite. Each illustrates an input signal that is independent of any other input signal to a switch—i.e., an independent control input.

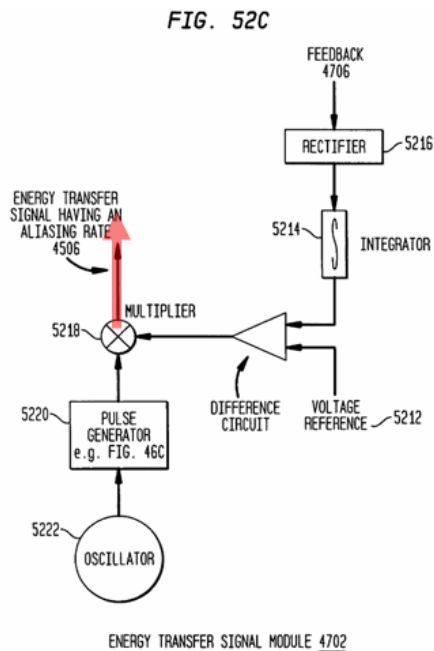
³ Though Petitioner contends that “switch” and “energy transfer signal” are “inextricably linked” (Reply,3), this does not change the fact that they are still different terms that require separate analysis/constructions.

⁴ Petitioner essentially asserts that looking to the specification equates to limiting the claims to an embodiment. Under that logic, the only time one could provide a construction is if there was lexicography. That is not the law.



As shown above, the control signals (red) are distinct inputs/independent of any other input signal (blue).⁵ And, as shown below, Figure 52C merely illustrates a control signal generator that produces the signal input into e.g., Figure 47, nothing more. The presence of a feedback path in Figures 47/52C does not change the fact that the “energy transfer signal” remains independent from any other input to a switch.

⁵ Though Petitioner criticizes Ricketts for opining that the system would not work without using an independent control input, Petitioner has not attempted to counter this to show that the system could work without an independent control input.



Petitioner has not shown any evidence that an “energy transfer signal” is anything other than an “independent control input.”

Sixth, Petitioner relies, yet again, on the PTAB’s prior construction of a *different* term—“storage module”—to argue that including “energy transfer system” is inappropriate. Reply,5. But the PTAB excluded “energy transfer system” based on *lexicography* specific to “storage module.” Here, the term is “*energy transfer* signal.” And unlike the claims in the prior PTAB decision, the ’686 claims expressly recite “*transfer[ing] energy*,” “*stor[ing] said transferred energy*,” and a signal “*generated from said stored energy*.” This is all indicative of an “energy transfer system.” POR,22; Ex.-2006,¶¶131-32. The Reply does not dispute this.

Finally, Petitioner attempts to refute that “energy transfer signal” is a term reserved for an “energy transfer system.” Reply, 6. Again, Petitioner argues that the patent does not *define* the claim term in this way. But that is not the standard. Claim terms must be construed in light of the specification’s disclosure, not only where there is lexicography.

To support is position, Petitioner points to Figure 32C of the ’551 patent (below, Petitioner annotated), which shows an under-sampling signal but labels the figure as “energy transfer signal module 3002.” Reply,6-7. But Petitioner failed to read the specification’s description of Figure 32C. Had it done so, Petitioner would have recognized the figure’s labeling as a clear *typographical error*.

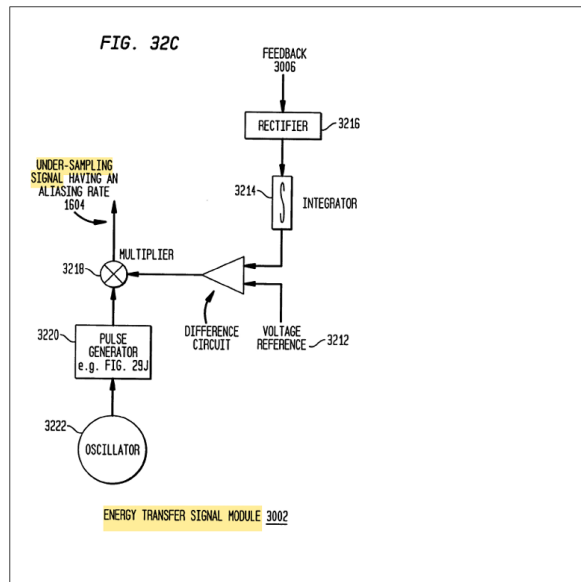


Figure 32C appears in Section 5 of the patent, which describes a sample-and-hold (under-sampling) system. Ex.-1008,59:29-30. Consistent with this, the

specification (when describing Figure 32C) and all related figures refer to 3002 as an “*under-sampling* signal module 3002.” Id.,62:52-53; *see also id.*,Figs.30,32A; 57:45-49,53-54; 58:19-28, 43; 59:36-37; 62:18-20.⁶

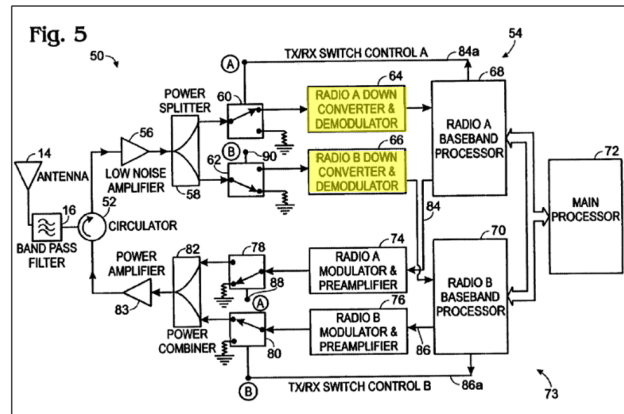
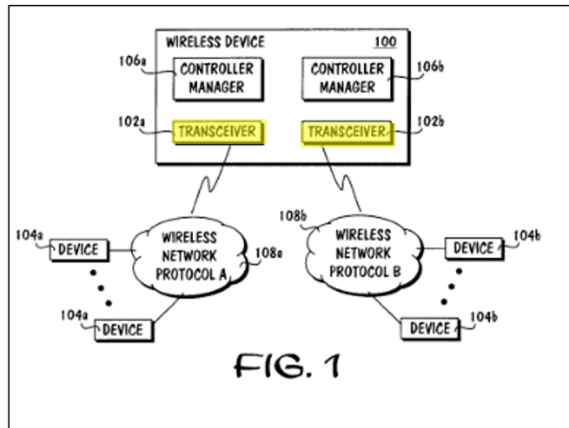
At bottom, whereas PO has provided uncontroverted evidence showing that the term “energy transfer signal” is only associated with an energy transfer system, Petitioner has done nothing to demonstrate the contrary.

For the foregoing reasons, PO's construction should be adopted.

III. Petitioner Has Not Demonstrated A Motivation To Combine.

The claims require a specific circuit configuration that supports *at least two* protocols/standards. Nevo and Young fail to disclose any receiver architecture and, instead, merely show high-level black-boxes (yellow below). So Petitioner relies on Avitable and Estabrook for receiver implementations.

⁶ Petitioner also cites Figure 46 but ignores that the '551 patent uses the act of “under-sampling” to refer to both energy transfer and sample-and-hold systems.



Ex.-1004, Ex.-1003.

While Petitioner offers *general* motivation/benefits to combine the references, Petitioner fails to explain why a POSITA would be motivated to *specifically*: (1) insert Avitabile's receiver into Nevo's black-boxes, or (2) insert Estabrook's receiver into Young's black-boxes. Indeed, Petitioner offers no rationale for selecting these *particular* combinations out of the countless receiver/down-conversion references in the field.

As discussed below, these combinations are illogical and unsupported.

A. There Is No Motivation To Combine Nevo/Avitabile.⁷

Petitioner asserts that because Nevo teaches transceivers that down-convert, a POSITA would have been motivated to look for some sort of down-conversion

⁷ Contrary to Petitioner's assertion, PO is not arguing bodily-incorporation.

Reply,21. PO asserts that using Avitabile would not result in a multi-protocol

circuit to use in those transceivers. Reply,21. But such a broad/generic assertion would allow Petitioner to combine Nevo with any prior art simply because it discloses a down-converter. This is not proper.

Nevo pertains to consumer wireless standards—**Bluetooth, 802.11(WiFi), and Home RF**. POR,42; Ex.-1004,1:31-50; 4:45-54. Avitabile, by contrast, pertains to *radar* technology—a completely different technology. In particular, Avitabile is entitled “S-band digital downconverter *for radar applications...*” and describes a “*Doppler-radar* receiver.” Ex.-1006, 337,338; POR,60, 63.

Notably, Petitioner does not even attempt to argue that radar and Bluetooth, 802.11(WiFi), or Home RF are related/comparable technologies. They are not. Nor does Petitioner offer any explanation why a POSITA would ever look specifically to radar-related art—like Avitabile—to implement a down-converter in Nevo's *consumer* wireless applications.

Recognizing this problem, Petitioner now contends that Avitabile is not limited to radar systems, relying on a single sentence in Avitabile's “Introduction” that states “[r]adar *and communication systems* often require complex waveform detection....” Reply, 20. Specifically, Petitioner asserts that a POSITA would have

system and, thus, a POSITA would not be motivated to combine Avitabile with Nevo.

believed Avitabile describes a down-conversion circuit broadly applicable to any communication system. *Id.*

This is nonsensical. Avitabile's "Introduction" provides nothing more than a general background. More importantly, once past the "Introduction," Avitabile's discussion focuses entirely on radar applications (not some unidentified communication system) and a "Doppler radar receiver"—hence, Avitabile's title "for radar applications."

Petitioner would have the Board believe that a POSITA, starting with Nevo (which pertains to Bluetooth, 802.11/WiFi, and Home RF applications), would search for references to fill in Nevo's black-box transceivers, encounter Avitabile's title —"for radar applications" or its disclosure of "Doppler-radar receiver"—and conclude that Avitable is relevant art for Nevo applications. This is objectively illogical/baseless. After seeing Nevo pertains to Bluetooth, 802.11/WiFi, and HomeRF, there is no reason that a POSITA would ever look to Avitable other than hindsight to try to recreate the claimed technology. This is not permitted.

The reverse scenario is equally implausible. Petitioner would have the Board believe that a POSITA starting with Avitabile's "radar applications," would look for a reference to create a multi-protocol device, and view Nevo as relevant art for Avitabile's radar application. And, unlike Nevo, which discloses using *two* different protocols, Avitable addresses only *one* type of technology (radar). It is

objectively illogical/baseless that, after seeing that Avitable pertains to radar applications/receivers, a POSITA would look to Nevo. Again, only hindsight would lead to this conclusion, which is impermissible.

B. There Is No Motivation To Combine Young/Estabrook.

Petitioner asserts that “Young teaches receivers which include ‘down converter’ blocks, but omits description of those blocks so that a POSITA would naturally need to look for a down-converter.” Reply,31. But again, such a broad/generic assertion would allow Petitioner to combine Young with any prior art simply because it discloses a down-converter. This is not proper.

Young’s entire purpose is to address degradation in receiver sensitivity when two transceivers operate in close proximity (within a single enclosure). Ex.-1003,1:43-48. Young proposes “a solution for simultaneous dual mode operations in [[a] shared spectrum using different transceivers in a single enclosure.” *Id.*,1:53-56. Petitioner (who bears the burden here) makes no attempt to explain how Estabrook’s receiver could function in such a configuration or meet Young’s stated purpose. Petitioner’s motivation to combine fails for this reason alone.

Further, Young pertains to communication systems (Bluetooth, 802.11/WiFi, Home RF) that operate in the “**2.4GHz** ISM band.” POR,79,81,86-87; Ex.-2006, ¶306; Ex.-1003,1:20-22. Estabrook-Thesis, Estabrook-1988, and Estabrook-1989, however,, describe a direct conversion receiver specifically

designed for signals at “**1GHz or lower**” (i.e., the receiver is not designed to operate at higher frequencies). Ex.-2006, ¶¶304,306,324; Ex.-1005, Abstract (“Designs for a low conversion loss RF mixer whose input frequency is *1GHz or lower*...are developed and analyzed”); see Exs.-1016, 1017 (“This paper discusses the application of direct conversion to the design of a mobile cellular radio at *900 MHz*); Ex.-1017,63 (discussing processing signals “with center frequency’s *between 50 and 900 MHz*”).⁸

Petitioner provides no rationale why a POSITA would ever look to Estabrook’s receiver—designed only for “1GHz or lower” operation—to fill in Young’s black-box receivers intended for significantly higher frequency applications.

Petitioner would have the Board believe that a POSITA, starting with Young (2.4GHz wireless devices), would look for references to fill in Young’s black-box receivers, encounter Estabrook’s receiver (explicitly limited to a *maximum* operation of *1GHz*), and conclude that Estabrook is relevant art for Young’s applications. This is objectively illogical/baseless. After seeing that Young pertains to 2.4GHz applications, there is no reason a POSITA would ever turn to Estabrook unless guided by hindsight.

⁸ 1GHz is 1000MHz.

The reverse is equally implausible. Petitioner would have the Board believe that a POSITA, starting with Estabrook's receiver (designed for a *maximum* operation of 1GHz), would look for a reference to create a multi-protocol device, and view Young (targeting applications at 2.4GHz) as relevant art. This is objectively illogical/baseless. Again, one would only do so only through impermissible hindsight.

Finally, PO's expert, Dr. Ricketts ("Ricketts"), provides extensive simulations showing that a combined Young/Estabrook system would not meet the requirements for Bluetooth or 802.11/WiFi protocols/standards. If putting Estabrook into Young would not meet the protocols/standards, there is no motivation to combine. Petitioner has provided no affirmative evidence (including their own simulations) to counter this.

IV. Petitioner Has Failed to Demonstrate That The Combined Nevo/Avitable System Will Work For A Plurality Of Protocols/Standards.

Petitioner misunderstands or misconstrues PO's point regarding protocols/standards. In order to demonstrate the multiple protocol/standard claim element, the *combined* Nevo/Avitable system must work to meet at least two protocols/standards disclosed in Nevo—Bluetooth, 802.11/WiFi, Home RF. Avitable's receiver, being a critical/essential component in the combined system,

must operate in a way so that the *combined* system supports two protocols/standards. Petitioner bears the burden to show this but has not done so.

As Petitioner recognizes, one must look at the combined system, not just Nevo itself. Reply,17 (“POSITAs would have assessed compliance with a wireless standard based on the performance of the *overall device*”). Yet, tellingly, when it comes to this claim element, Petitioner relies only on Nevo's disclosure. Reply,16-17. The fact that Nevo discusses multiple protocols/standards does not mean that any receiver, when combined with Nevo, would meet those multiple protocols/standards. And Petitioner has the burden to prove its combined system would work for multiple protocols/standards. Petitioner has failed to do so.

Unlike Petitioner, Ricketts explains specific and significant reasons why the combined system (using Avitabile's receiver) could not meet the performance requirements necessary for Bluetooth or 802.11/WiFi. POR,60-61; Ex.-2006,¶¶250-54. In particular, Ricketts explains that, in order to meet protocols/standards, the combined system must “meet fundamental performance requirements in terms of dynamic range, sensitivity, and interference tolerance.” *Id.*,¶251. Ricketts states that there is nothing in Avitabile, even when combined with Nevo, that explains how to meet these requirements. *Id.* Further, Ricketts

specifically identifies problems with the combined system related to dynamic range and sensitivity.⁹

Rather than meeting its burden, Petitioner and its expert, Dr. Larson (“Larson”), shift the burden to PO and criticize Ricketts’s opinion. But it is Petitioner who must *affirmatively demonstrate* that the proposed *combination* could actually function to meet multiple protocols/standards (or any protocols/standards for that matter). Tellingly, Petitioner/Larson do nothing to show this.

Instead, Petitioner simply asserts that a POSITA could have figured it out: “Designing a complete transceiver compliant with Bluetooth and IEEE 802.11 protocols would have been well within the scope of a POSITA at the time.” Reply,22; *see id.*,17-18. That a POSITA could have “figured it out” is *not* the

⁹ Petitioner appears to misunderstand PO’s discussion of Estabrook simulations with regard to Nevo/Avitabile. Reply,20. In the POR, PO explained (and showed through simulations) that the Young/Estabrook receiver combination would not comply with protocols/standards. Thus, PO’s point was that just because one combines a receiver into black-boxes of a multi-protocol system does not mean that the combined system would necessarily comply with standards/protocols. POR,61.

standard necessary to show invalidity or motivation to combine. Indeed, Petitioner provides no explanation of how someone would “figure it out” or that “figuring it out” would not involve undue experimentation. Without doing so, Petitioner cannot meet its burden.

If Petitioner/Larson could have demonstrated that the combined system satisfies multiple protocols/standards, they certainly would have. But they cannot. So instead, Petitioner/Larson attempt to side-step the issue, claiming a POSITA could simply “figure it out” because the '686 patent allegedly does not describe how to meet various protocols/standards and similarly relies on the skill of a POSITA to do so. Reply,18-19; Ex.-1049,¶80. Not so. The patent provides such disclosure. Petitioner just ignores it.

Notably, during his deposition, Larson made admissions demonstrating that the '686 patent (and the incorporated '551 patent) provide guidance regarding how to meet Wi-Fi/Bluetooth standards. In other words, contrary to Petitioner/Larson's assertions, the patent does not just leave it to a POSITA to figure it out.

Specifically, the '551 patent provides capacitor values to use (e.g., 18 pF)¹⁰ and teaches using an amplifier/filtering stage after a switch/capacitor to provide

¹⁰ Larson admits that this disclosure relates to accurately reproducing a signal and meeting Wi-Fi and Bluetooth standards for sensitivity. Ex.-2013,22:2-25:14.

“*additional receiver sensitivity, bandwidth control, or signal conditioning.*” Ex.-1008, 67:14-24; Fig.110, 113:56-58. Larson admits that these performance characteristics relate to Wi-Fi/Bluetooth standards. Ex.-2013,13:3-16:22; 54:13-55:14 (describing that sensitivity is related to dynamic range); 56:15-59:7 (describing meeting sensitivity requirements (characterized by noise figures) to meet Wi-Fi/Bluetooth standards); 64:10-66:22 (discussing filtering and increasing power consumption to reduce distortion which relates to meeting WiFi/Bluetooth standards); 71:4-74:1 (discussing that good sensitivity, dynamic range, and frequency selectivity lead to a high C/I to meet Wi-Fi/Bluetooth standards).

Further, the '551 teaches the use of differential input/output configurations and pulse signals designed to avoid *interference*. *Id.*,103:1-7, Fig.76A-E, Figs.106-109,114:1-6¹¹. Larson admits that using differential configurations addresses noise and other sorts of interference in order to meet Wi-Fi/Bluetooth devices. Ex.-2013,26:3-17, 29:1-30:19; 41:4-11; 32:12-33:9, 35:2-15 (admitting that the patent discloses various differential configurations); 59:8-60:20 (discussing meeting interference tolerance standards to meet Wi-Fi/Bluetooth standards).

¹¹ Larson admits that this disclosure relates to “improved sensitivity” (which will improve performance) which is relevant to meeting Wi-Fi/Bluetooth standards. Ex.-2013, 35:18-38:21.

Additionally, the '686 patent provides *formulas* for calculating the frequency of the control signal based on the frequency of the input signal. *Id.*, 11:28-12:67. Larson admits that these formulas can cover Wi-Fi/Bluetooth frequencies. Ex.-2013, 42:18-43:8, 43:20-44:14.

The patent also explains how to achieve *frequency selectivity* before down-conversion using the apparent filter of the patented receiver. Ex.-1001:27:17-24; *see also id.*, 27:62-28:2¹². Larson admits that frequency selectivity is “important” for Wi-Fi/Bluetooth standards. Ex.-2013, 44:15-46:13, 46:22-49:2; 60:21-62:3 (discussing improving interference tolerance to meet Wi-Fi/Bluetooth standards by improving frequency selectivity); 73:8-74:1 (discussing that good frequency selectivity leads to a high C/I to meet Wi-Fi/Bluetooth standards).

Moreover, the patent discloses the use of “tank circuitry to *improve [down]conversion efficiency*” and input impedance matching to *filter out unwanted signals and maximize power/energy transfer and improve efficiency*.¹³ Ex.-

¹² Larson admits that this disclosure relates to Wi-Fi/Bluetooth standards. Ex.-2013, 49:3-50:11

¹³ Ex.-1008, 66:40-44. Larson admits that the disclosure of using impedance matching relates to meeting Wi-Fi and Bluetooth standards. Ex.-2013, 39:2-40:19; 62:4-64:9 (discussing filtering and matching to improve image rejection for Wi-

1001,15:20-23, 21:32-33, 21:40-43, Fig. 60A/16:25-28 (discussing use of tank circuits to *produce a more stable input/output impedance*), 16:30-32 (discussing *optimizing energy transfer* by using an inductor).

Regardless, even if the '686/'551 patents lacked implementation details (which they do not), this does not negate Petitioner/Larson's burden to show the combined Nevo/Avitabile system would work for multiple protocol/standards and that making it work would not require undue experimentation. Petitioner/Larson have not done so.

In view of the foregoing, Petitioner has failed to meet its burden to show invalidity with regard to Nevo/Avitabile.

V. Petitioner Has Failed to Demonstrate That The Combined Young/Estabrook System Will Work For A Plurality Of Protocols/Standards.

Similar to Nevo/Avitabile, Petitioner misunderstands or misconstrues PO's point regarding protocols/standards regarding Young/Estabrook. In order to demonstrate the multiple protocol/standard claim element, the *combined* Young/Estabrook system must work to meet at least two protocols/standards

Fi/Bluetooth). Larson also admits that the disclosure of impedance matching relates to removing unwanted signals which an "important consideration" for Wi-Fi and Bluetooth. Ex.-2013,50:12-53:15.

disclosed in Young —Bluetooth, 802.11/WiFi, Home RF. Estabrook's receiver, being a critical/essential component in the combined system, must operate in a way so that the *combined* system supports two protocols/standards. Petitioner bears the burden to show this but has not done so.

Again, despite arguing that one must look at the combined system to determine compliance with wireless standards (Reply,17), when it comes to this claim element, Petitioner relies solely on Young's disclosure (*id.*,28). But the fact that Young discusses multiple protocols/standards does not mean that any receiver combined with Young will meet those multiple protocols/standards. Petitioner has the burden to prove that its proposed combination would work for multiple protocols/standards. Petitioner has failed to do so.

As a threshold matter, Estabrook's receiver would not work in Young to meet the wireless protocols/standards set forth in Young. As discussed in Section III.B above, Young discloses systems using 2.4 GHz signals (Ex.-1003,1:20-22), whereas Estabrook designed a receiver that only works with signals of *1GHz or less*. Ex.-1005, Abstract; Ex.-1016, 1107; Ex.-1017,63. And Petitioner/Larson provide no evidence that scaling Estabrook's design to operate at nearly 2.5 times its operating frequency would work and could be done without undue experimentation.

Further, unlike Petitioner/Larson, Ricketts explains specific and significant reasons (using extensive simulations) why the combined system could not meet the performance requirements necessary for Bluetooth or 802.11/WiFi. POR, 78-85; Ex.-2006, ¶¶ 311-30. In particular, using simulations, Ricketts explains that Estabrook's receiver lacks image rejection, exhibits high second-order intermodulation, and has inadequate C/I ratio performance. *Id.*, ¶ 330.

Again, Petitioner/Larson act as if PO has the burden here and take to criticizing Ricketts opinions/simulations. Petitioner/Larson, as the party with the burden, should be *affirmatively demonstrating* that the *combined* system could actually function to meet multiple protocols/standards. Tellingly, Petitioner/Larson do nothing to show this.

Indeed, Petitioner/Larson could have run their own simulations (correcting all of the alleged problems in Ricketts simulations), submitted the Bluetooth, 802.11/WiFi, and/or Home RF specifications, and demonstrated that the combined Young/Estabrook system would meet the specifications for these protocols/standards. They did not do so because they would get the same results that Ricketts observed.

So, once again, Petitioner/Larson makes the pronouncement that a POSITA would have "figured it out." Reply, 28 (asserting that PO "ignores the ordinary skill of a POSITA to implement known protocols"). But, as discussed above, this is not

the standard. And, again, Petitioner provides no explanation of how someone would “figure it out” or that “figuring it out” would not involve undue experimentation. Without doing so, Petitioner cannot meet its burden.

If Petitioner/Larson could have shown that the combined system meets multiple protocols/standards, they certainly would have. But they cannot. So, Petitioner/Larson, yet again, attempt to side-step the issue asserting that if the '686 patent can leave implementation to a POSITA, this is acceptable for the prior art as well. But, as discussed above in Section IV, the '686 patent does not leave implementation to a POSITA. The patent teaches a POSITA how to achieve compliance with protocols/standards.

Nevertheless, even if the '686 patent lacked implementation details (which it does not), this does not negate Petitioner/Larson's burden to show the combined system would work for multiple protocols/standards and that making it work would not require undue experimentation. Petitioner/Larson has not done so.

In view of the foregoing, Petitioner has failed to meet its burden to show invalidity with regard to Young/Estabrook.

VI. Nevo/Avitabile

A. Nevo/Avitabile does not teach/disclose “a second EM signal is generated from said stored energy”

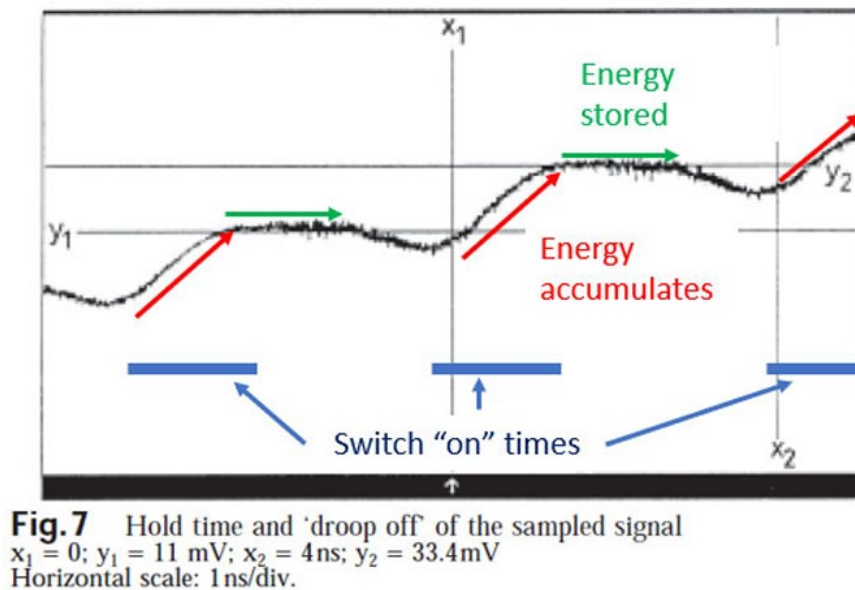
Nevo/Avitabile do not teach/disclose “a second EM signal is generated from said stored energy.” Petitioner relies on Avitabile for this element. But there is no dispute that Avitabile is a voltage sampling system, Avitabile recreates the baseband signal by reading voltage values, and that the second signal does not include energy stored in Avitabile's capacitors.

Indeed, Petitioner admits that the second signal is generated from reading the voltage sitting on Avitabile's capacitor. Reply,12. Petitioner, however, ignores the totality/context of claim 11 of the '686 patent (and its dependent claims), which recite “a switch *transfer[ing] energy*,” “a storage module stor[ing] said *transferred energy*,” and a signal “generated *from said stored energy*.” In other words, the claims require that a second signal is generated *from* the stored energy itself (i.e., the energy makes up/becomes part of the second signal). It does not say the signal is generated *based on* stored energy or *as a result of* storing energy, which is how Petitioner reads the claim language.

Petitioner asserts that generated *from* the stored energy does not mean that the energy makes up/becomes part of the second signal. *Id.* The claims, however, are not read in a vacuum as Petitioner has done. Claims must be read in light of the

specification and what the specification says about “generated from said stored energy.” And, here, Petitioner does not dispute that (1) the claim language describes an energy transfer system, and (2) in such a system, the specification discloses that the second signal (down-converted signal) is generated from the stored energy itself (the energy becomes part of the second signal). Nor does Petitioner point to the specification to support that the language of the claim pertains to a voltage sampling system like Avitable. Thus, consistent with PO's position, “generated *from* said stored energy” should be interpreted to be just what it says—the second signal itself must include the stored energy.

Petitioner discussion of the reexamination (Ex.-2009) of ParkerVision's U.S. Patent No. 6,266,518 fares no better. Reply,13-14. For this argument, Petitioner talks out of both sides of its mouth. Petitioner asserts that the re-exam decision is not relevant because, unlike the '686 patent, the claims of the '518 patent recite generating the second signal by *integrating* energy. But, at the same time, as shown below, in order to meet the construction of “storage module” (a module that “stores non-negligible amounts of energy”), Petitioner asserts that the “stored energy” is, indeed, integrated/accumulated. *Id.*,11-12.



Thus, Petitioner's own argument belies Petitioner's assertion that for the '686 patent, the "stored energy" used to generate the second signal is not integrated energy. Accordingly, the claim language in the re-exam is just like the claim language here. Thus, the PTO's finding that Avitabile does not disclose "generating [a] second signal from the integrated energy" should apply equally to the claim language of the '686 patent—"a second EM signal [] generated from said stored energy."

Finally, Petitioner asserts that, in the ParkerVision/Qualcomm case, the Federal Circuit rejected PO's argument regarding the meaning of "a second EM signal is generated *from said stored energy*." Reply,14. Not so. In that case, the claim recited that energy is being "transferred from a carrier signal" which would be through a switch module. The claim then recited that the second signal is

“generated *from the transferred energy*” (i.e., energy transferred through the switch module). The claim does not say that a second signal is generated from the stored energy as in the '686 patent. Moreover, only than conclusory assertions, Petitioner/Larson provide no analysis of the Weisskopf prior art which was the subject of the Federal Circuit litigation.

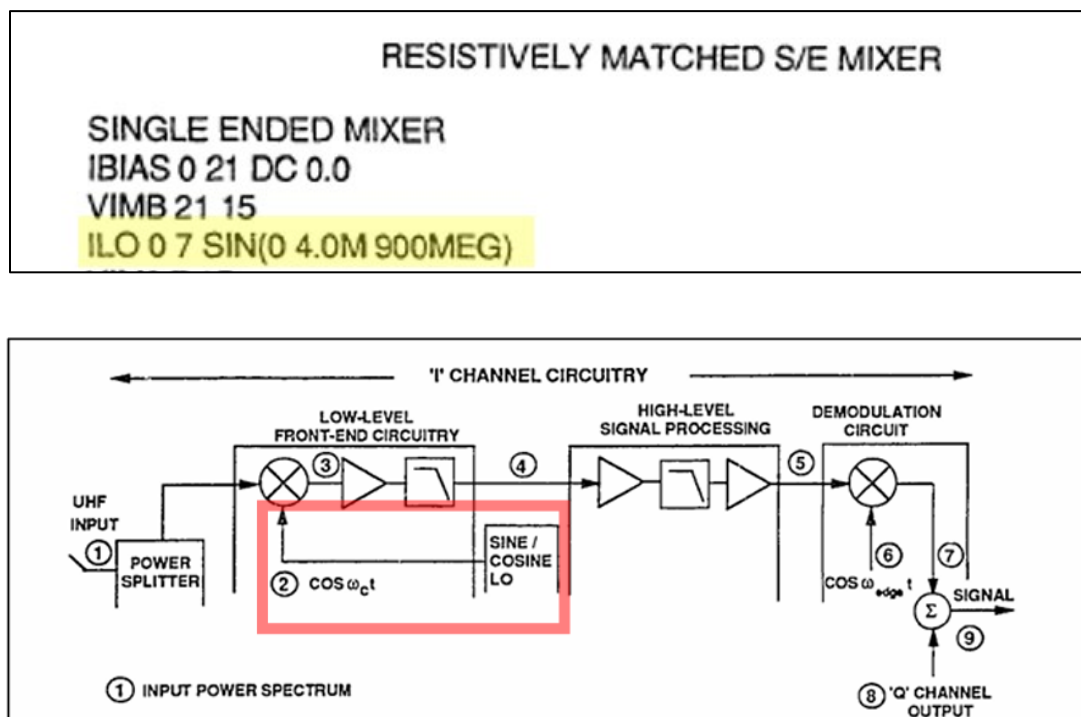
B. Nevo/Avitabile does not teach/disclose an “energy transfer signal.”

Petitioner asserts that Avitabile teaches an energy transfer system merely because it transfers energy to a storage device and a second signal is generated based on that energy. Reply,15. These are not the features of an “energy transfer system” as described in the specification. Nor does (nor can) Petitioner point to anything in the specification to support such a position. An “energy transfer system” not only requires energy to be transferred from a switch to a storage module but the transferred energy stored in the storage module must be transferred into the second (down-converted) signal (become part of the second signal) along with energy from the switch. POR,23-28. Avitabile does not work that way because it is a voltage sampling system. Petitioner does not deny this.

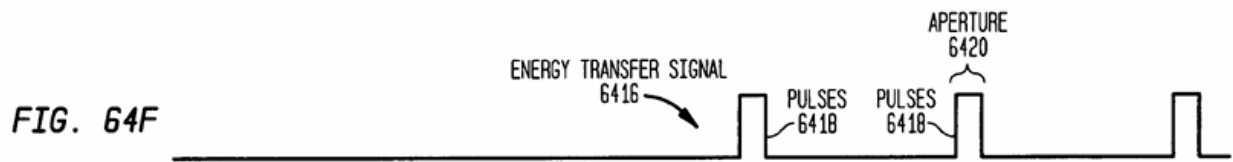
VII. Young/Estabrook

A. Young/Estabrook does not disclose/teach “a switch configured to operate according to an energy transfer signal”

As discussed above, the patent specifically defines an energy transfer signal as being a pulse with non-negligible apertures. In Reply, Petitioner does not (and cannot) dispute that Young/Estabrook do *not* disclose a pulse having non-negligible apertures. This is because, as shown below, Estabrook is using a *sinewave*. POR,73-74.

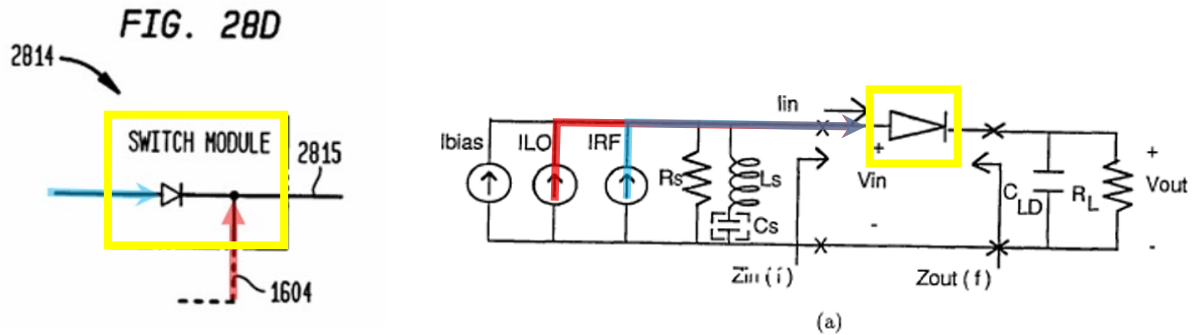


Moreover, as discussed above in Section III, Petitioner concedes that an “energy transfer signal” must have non-negligible apertures. As shown below (Ex.-1001, Fig. 64F), an aperture is a discrete period of time when there is a control (LO) signal.



A sine-wave does not have apertures – a sinewave is a continuous waveform.

Moreover, Estabrook does not disclose an “independent control input.” An “independent” control input.



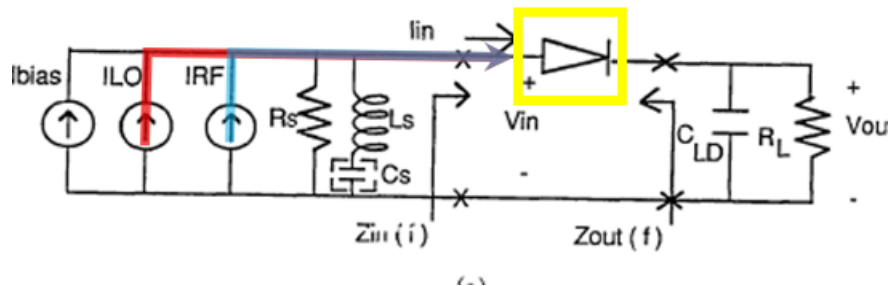
This can be seen by comparing Figure 28D of the '686 patent (above left) with Estabrook (above right) which both use diodes. As can be seen in Figure 28D, the control signal 1604 (red) is independent of any other input (blue) to the switch module (yellow). However, in Estabrook, the ILO (red) is not an independent input to the diode (the alleged switch) (yellow). Instead, the input to the diode is a combination of both ILO and IRF.

Unable to address this, Petitioner uses a different meaning for “independent” signal – a signal that does not depend on “anything else.” Reply,24. But it is

unclear what this means. Petitioner then uses this ambiguity to assert that Estabrook discloses an “independent” control input. Petitioner's view is wrong. Unlike PO (*see* Section III above), Petitioner provides no support in the specification for its position.

B. Estabrook's diode is not operating according to an “energy transfer signal”

Petitioner asserts that Estabrook's diode is the claimed “switch” and the ILO is the “energy transfer signal.” And Petitioner does not dispute that the input to the diode is a combination of two sinusoidal signals—ILO and IRF.



The claims recite “a switch configured to operate according to an energy transfer signal.” As shown above, in Estabrook, the diode (yellow) is not operating according to the ILO (red). Instead, the diode is operating according to a newly *combined* signal (purple). One cannot disaggregate the ILO from the IRF.

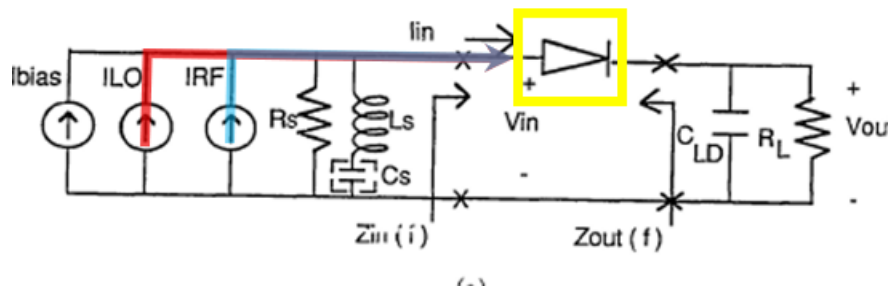
Recognizing this problem, Petitioner asserts that it is the ILO that controls the diode turning “ON” because “only the ILO has sufficient amplitude to activate the diode.” Reply,24. In doing so, the Petitioner acts as if the ILO is some separate

signal. This is a red herring. Once the ILO and IRF are combined, there is no longer a separate ILO signal/voltage. ILO cannot be looked at separately because ILO voltage no longer exists separately. Instead, it is the amplitude (voltage) of the new combined signal that turns the diode "ON."

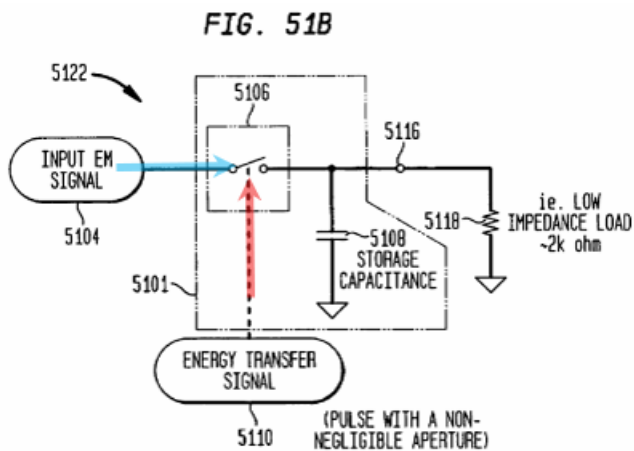
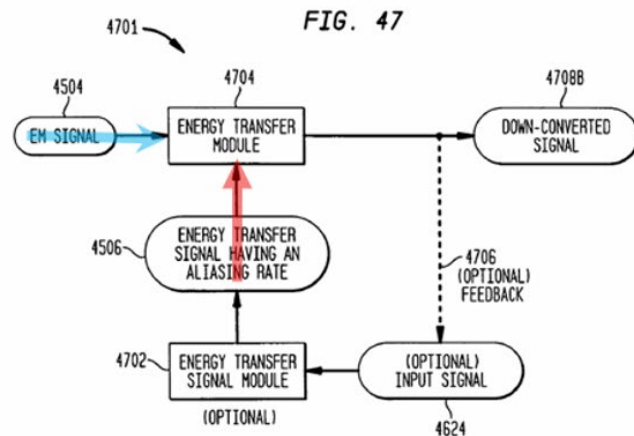
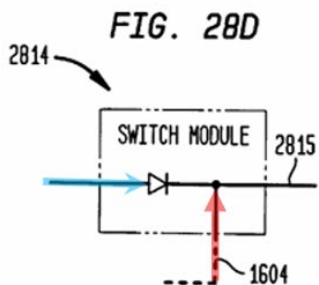
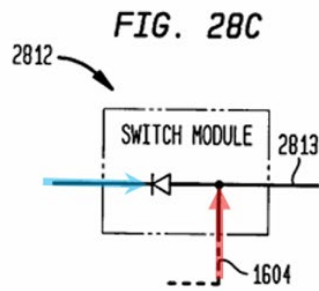
Accordingly, the alleged switch is not operated according to the alleged energy transfer signal.

C. Young/Estabrook does not disclose/teach "a switch configured . . . to sub-sample...a first electromagnetic (EM) signal."

The Petitioner identifies the "switch" as Estabrook's diode and the "first electromagnetic (EM) signal" as IRF (the RF signal). Pet., 74. Estabrook's diode, however, does not sub-sample the IRF.



As shown above, in Estabrook, the IRF and ILO are combined into a completely new signal (purple) and that new signal is what is input into Estabrook's diode. But this is different than the patented technology. Petitioner ignores this critical difference.



As shown above, in the '686 patent, the input electromagnetic signal (blue) is not mixed together with the LO signal (red) before being input into the switch. Instead, the switch receives the EM signal and the LO signal causes the switch to sub-sample the EM signal. Thus, the EM signal is what is actually being sub-sampled unlike Estabrook.

Accordingly, Estabrook does not sub-sample IRF (the alleged EM signal).

Dated: August 5, 2025

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that this Patent Owner's Response complies with the type-volume limitation of 37 C.F.R. § 42.24(b) because it contains 5,535 words, as determined by the word-processing program used to prepare the brief, excluding the parts of the brief exempted by 37 C.F.R. § 42.24(a)(1).

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that the foregoing PATENT OWNER'S
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