IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

FINESSE WIRELESS LLC, *Plaintiff*, v. AT&T MOBILITY LLC,	§ § § § § § §	CIVIL ACTION NO. 2:21-CV-00316-JRG (LEAD CASE)
CELLCO PARTNERSHIP D/B/A VERIZON WIRELESS, *Defendants*.	§ § § §	CIVIL ACTION NO. 2:21-CV-00317-JRG (MEMBER CASE)

CLAIM CONSTRUCTION MEMORANDUM OPINION AND ORDER

In these consolidated patent cases, Finesse Wireless, LLC, alleges infringement by AT&T Mobility, LLC, and Cellco Partnership d/b/a Verizon Wireless (collectively, "Defendants")[1] of U.S. Patent Nos. 7,346,134 and 9,548,775. Each patent relates to reducing signal interference in radio communication systems. (*See* '134 Patent at 1:24–27 ("[T]he invention relates to harmonically compensated radio receivers that demodulate multiple modulations and bandwidth signals and provide interference compensations."); *see also* '775 Patent at 1:20–23 ("[T]he invention relates to the mitigation of non-linear intermodulation product distortions and interference in continuous and real time processes in the transmitter and the co-located receiver(s).").)

The parties present nine[2] disputes regarding claim scope. Having considered their briefing,

[1] After the *Markman* hearing was held on July 20, 2022, Intervenor-Defendant Ericsson Inc. was dismissed from the case. (*See generally* Dkt. No. 101.)

[2] The parties presented argument on ten disputed terms at the *Markman* hearing. On August 12, 2022, the parties informed the Court that the claims containing the term "convolving a composite transmitter signal set with a compression curve function," which was argued before the Court, have been dropped from the case. Accordingly, the Court will not construe the same.

along with arguments of counsel during the July 20, 2022 *Markman* hearing, the Court resolves the disputes as follows.

I. BACKGROUND

A. U.S. Patent 7,346,134

The '134 Patent concerns "radio receivers that . . . provide interference compensation." ('134 Patent at 1:25–27.) The patent explains wireless communications systems are often subject to interfering signals that inhibit the receiver from receiving the intended information signal. (*Id.* at 1:55–60.) Although digital filtering may be used "to eliminate the higher harmonics above a baseband signal," that technique "does not eliminate the interference due to the tails of the harmonic images that extend into the baseband signal." (*Id.* at 1:61–67.)

To address this problem, the patent teaches sampling the entire band in which information signals (also referred to as signals of interest) *and* interfering signals may be received. (*See id.* at 2:5–8.) The resultant bit stream is then processed to isolate the two types of signals, after which the interfering signals are cancelled from the information signals. (*See id.* at 2:8–18.)

Most disputes concerning this patent relate to independent Claims 2 and 3. Claim 2 recites:

> 2. An apparatus comprising:
>
> means for over-sampling, at a desired frequency, a passband of received signals to create a bit stream, wherein the received signals include signals of interest and interference generating signals, the interference generating signals capable of generating intermodulation products inband of the signals of interest;
>
> means for isolating signals of interest in the bit stream using one or more decimating filters;
>
> means for isolating source signals that generate one or more intermodulation products inband of the signal of interest using one or more decimating filters;
>
> means for computing an estimate of each of the one or more

intermodulation products from the source signals that generate the one or more intermodulation products;

means for canceling out one or more inband intermodulation products using the estimate of the intermodulation products; and

means for performing phase and amplitude adjustment on estimations of the intermodulation product interfering signals in a closed loop manner, wherein the means for performing phase and amplitude adjustment of the estimations comprises means for performing sub-sample phase shifts to make a phase adjustment on the estimations of the intermodulation product interfering signals.

('134 Patent at 28:27–52.) The parties dispute the corresponding structure for the first, fourth, fifth and sixth limitations of Claim 2.

Claim 3, which is conceptually similar to Claim 2, recites:

3. An apparatus comprising:

a sampling unit to sample, at a desired frequency, a passband of received signals to create a bit stream, wherein the received signals include signals of interest and interference generating signals, the interference generating signals capable of generating intermodulation products inband of the signals of interest;

one or more filters to isolate signals of interest and interfering signals in the bit stream;

a cancellation unit to cancel out isolated interference generated signals using estimations of the intermodulation products generated by the isolated interfering signals, wherein the estimations of the isolated interfering signals comprise estimations of intermodulation products falling inband of the signals of interest; and

a phase and amplitude adjuster to adjust the phase and amplitude of estimations of the isolated interfering signals in a closed loop manner, wherein the phase and amplitude adjuster performs phase and amplitude adjustment of the estimations by making sub-sample phase shifts to make a phase

> adjustment on the estimations of the isolated interfering signals.

(*Id.* at 28:53–29:7.) The parties dispute whether the "sampling unit," "cancellation unit," and "phase and amplitude adjustor" limitations of this claim are governed by 35 U.S.C. § 112, ¶ 6.

B. U.S. Patent 9,548,775

The '775 Patent relates to problems often encountered by satellite communication systems. Transmitting at a power level outside of the linear operation range can increase the interfering effects of intermodulation products ("IMPs"), which are spurious frequency components generated when two or more signals pass through a non-linear device. ('775 Patent at 2:22–27.) Avoiding IMPs requires transmitter backoff—that is, reducing power to be within the linear operation range—which may negatively affect overall performance of the system. (*See generally id.* at 2:27–54.) The patent, however, purports to teach methods and devices that provide "the capability to operate transmitters in a highly non-linear region while controlling . . . IMPs and thus significantly improving system efficiency and capacity." (*Id.* at 5:55–58.)

The '775 Patent is particularly concerned with minimizing the effect of IMPs on "co-located" devices. To start, it frames the underlying problem as relating to "self-communications terminals" and "self-terminals," which are "[t]he receiver and transmitter of [a] target system." (*Id.* at 5:65–67.) Relative to a self-terminal, there may be "co-located" transmitters and terminals that are located "in the vicinity," but otherwise unrelated. (*Id.* at 6:7–12.) Transmission by the self-terminal may thus cause interfering IMPs for nearby receivers. (*See, e.g.*, *id.* at 6:37–46 (describing sources of IMPs as including those generated by high-power signals in receivers and IMPs generated in co-located high power transmitters).)

Generally, the patent teaches actively cancelling IMPs by digitally copying the IMPs and canceling the system-generated IMPs in real time. ('775 Patent at 6:50–53.) This is accomplished

"by extracting and isolating copies of the signals that create the IMPs and digitally multiplying them together in the time domain to create a copy of the IMPs generated in the transmitters and receivers." (*Id.* at 6:53–57.) Claim 1, which is representative of the asserted claims, recites:

> 1. A method for performing interference cancellation in a receiver, with a transmitter and the receiver being co-located with each other, the method comprising:
>
> generating intermodulation product (IMP) cancellation signals (ICSs) to cancel passive IMPs in the receiver, continuously and near real time, using copies of transmitter signals of the transmitter, wherein the passive IMPs are generated in passive transmitter components of the transmitter and receiver components of the receiver after a high powered amplifier (HPA) and transmitter filter of the transmitter, wherein the transmitter filter is coupled between the HPA and an antenna used by the transmitter, wherein generating the ICSs is based on a power series description of a non-linear process for generating the IMPs, and includes generating an n-th order ICS by, given three signals S1, S2 and S3, digitally multiplying and filtering S1×S1×S2 and S1×S2×S2 and S1×S2×S3 and S1×S1×S3 and S2×S2×S3 and S1×S3×S3 and S2×S3×S3, where n is an integer.

('775 Patent at 16:54–17:6.) Here, S1, S2, and S3 are the signals creating the IMPs.

The parties have two disputes concerning the '775 Patent. First, they dispute the meaning of "co-located" when that term is used to describe the relationship between a receiver and a transmitter (such as in the preamble of Claim 1), as opposed to a transmitter or receiver of a self-terminal. Second, Defendants challenge "compression curve" and "compression curve function" in four dependent claims as indefinite.

II. LEGAL STANDARDS

A. Claim Construction

"'[T]he claims of a patent define the invention to which the patentee is entitled the right to

exclude.'" *Phillips v. AWH Corp.,* 415 F.3d 1303, 1312 (Fed. Cir. 2005) (*en banc*) (quoting *Innova/Pure-Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). As such, if the parties dispute the scope of the claims, the court must determine their meaning. *See, e.g., Verizon Servs. Corp. v. Vonage Holdings Corp.,* 503 F.3d 1295, 1317 (Fed. Cir. 2007); *see also Markman v. Westview Instruments, Inc.,* 517 U.S. 370, 390 (1996), *aff'g,* 52 F.3d 967, 976 (Fed. Cir. 1995) (*en banc*).

Claim construction, however, "is not an obligatory exercise in redundancy." *U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997). Rather, "[c]laim construction is a matter of [resolving] disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims[.]" *Id.* A court need not "repeat or restate every claim term in order to comply with the ruling that claim construction is for the court." *Id.*

When construing claims, "[t]here is a heavy presumption that claim terms are to be given their ordinary and customary meaning." *Aventis Pharm. Inc. v. Amino Chems. Ltd.,* 715 F.3d 1363, 1373 (Fed. Cir. 2013) (citing *Phillips,* 415 F.3d at 1312–13). Courts must therefore "look to the words of the claims themselves . . . to define the scope of the patented invention." *Id.* (citations omitted). "[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, *i.e.,* as of the effective filing date of the patent application." *Phillips,* 415 F.3d at 1313. This "person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification." *Id.*

Intrinsic evidence is the primary resource for claim construction. *See Power-One, Inc. v. Artesyn Techs., Inc.,* 599 F.3d 1343, 1348 (Fed. Cir. 2010) (citing *Phillips,* 415 F.3d at 1312). For

certain claim terms, "the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges, and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words." *Phillips,* 415 F.3d at 1314; *see also Medrad, Inc. v. MRI Devices Corp.,* 401 F.3d 1313, 1319 (Fed. Cir. 2005) ("We cannot look at the ordinary meaning of the term . . . in a vacuum. Rather, we must look at the ordinary meaning in the context of the written description and the prosecution history."). For claim terms with less-apparent meanings, courts consider "those sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean[,] [including] the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art." *Phillips,* 415 F.3d at 1314 (quoting *Innova*, 381 F.3d at 1116).

B. Indefiniteness

"[A] patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus, Inc. v. Biosig Instruments, Inc*., 572 U.S. 898, 901 (2014). "A patent must be precise enough to afford clear notice of what is claimed," but that consideration must be made while accounting for the inherent limitations of language. *Id.* at 908–09. "Indefiniteness must be proven by clear and convincing evidence." *Sonix Tech. Co. v. Publ'ns Int'l, Ltd.*, 844 F.3d 1370, 1377 (Fed. Cir. 2017).

C. Functional Claiming and 35 U.S.C. § 112, ¶ 6

A patent claim may be expressed using functional language. *See* 35 U.S.C. § 112, ¶ 6 (pre-AIA); *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1347–49 & n.3 (Fed. Cir. 2015) (*en*

banc in relevant portion). Section 112, ¶ 6 provides that a structure may be claimed as a "means . . . for performing a specified function" and that an act may be claimed as a "step for performing a specified function." *Masco Corp. v. United States*, 303 F.3d 1316, 1326 (Fed. Cir. 2002). When it applies, § 112, ¶ 6 limits the scope of the functional term "to only the structure, materials, or acts described in the specification as corresponding to the claimed function and equivalents thereof." *Williamson*, 792 F.3d at 1347.

Courts presume that § 112, ¶ 6 applies when the claim language includes "means" or "step for" terms, but not in the absence of those terms. *Masco Corp.*, 303 F.3d at 1326; *Williamson*, 792 F.3d at 1348. Such a presumption stands or falls according to whether one of ordinary skill in the art would understand the claim with the functional language, in the context of the entire specification, to denote sufficiently definite structure or acts for performing the function. *See Media Rights Techs., Inc. v. Capital One Fin. Corp.*, 800 F.3d 1366, 1372 (Fed. Cir. 2015) (noting § 112, ¶ 6 does not apply when "the claim language, read in light of the specification, recites sufficiently definite structure") (quotations omitted); *Williamson*, 792 F.3d at 1349 (noting § 112, ¶ 6 does not apply when "the words of the claim are understood by persons of ordinary skill in the art to have sufficiently definite meaning as the name for structure"); *Masco Corp.*, 303 F.3d at 1326 (noting § 112, ¶ 6 does not apply when the claim includes an "act" corresponding to "how the function is performed"); *Personalized Media Commc'ns, LLC v. I.T.C.*, 161 F.3d 696, 704 (Fed. Cir. 1998) (noting § 112, ¶ 6 does not apply when the claim includes "sufficient structure, material, or acts within the claim itself to perform entirely the recited function . . . even if the claim uses the term 'means'") (citations and quotations omitted).

If § 112, ¶ 6 applies to a term, construing the term involves multiple steps. "The first step . . . is a determination of the function of the means-plus-function limitation." *Medtronic, Inc.*

v. Advanced Cardiovascular Sys., Inc., 248 F.3d 1303, 1311 (Fed. Cir. 2001). "[T]he next step is to determine the corresponding structure disclosed in the specification and equivalents thereof." *Id.* A "structure disclosed in the specification is 'corresponding' structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim." *Id.* The focus of the "corresponding structure" inquiry is not merely whether a structure is capable of performing the recited function, but whether the corresponding structure is "clearly linked or associated with the [recited] function." *Id.* The corresponding structure "must include all structure that actually performs the recited function." *Default Proof Credit Card Sys. v. Home Depot U.S.A., Inc.*, 412 F.3d 1291, 1298 (Fed. Cir. 2005). However, § 112, ¶ 6 does not permit "incorporation of structure from the written description beyond that necessary to perform the claimed function." *Micro Chem., Inc. v. Great Plains Chem. Co.*, 194 F.3d 1250, 1258 (Fed. Cir. 1999).

For § 112, ¶ 6 limitations implemented by a programmed general-purpose computer or microprocessor, the corresponding structure described in the patent specification must include an algorithm for performing the function. *WMS Gaming Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1349 (Fed. Cir. 1999). In that case, the corresponding structure is not a general-purpose computer but rather the special-purpose computer programmed to perform the disclosed algorithm. *Aristocrat Techs. Austl. Pty Ltd. v. Int'l Game Tech.*, 521 F.3d 1328, 1333 (Fed. Cir. 2008).

III. THE LEVEL OF ORDINARY SKILL IN THE ART

The level of ordinary skill in the art is the skill level of a hypothetical person who is presumed to have known the relevant art at the time of the invention. *In re GPAC*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). In resolving the appropriate level of ordinary skill, courts consider the types of and solutions to problems encountered in the art, the speed of innovation, the sophistication of the technology, and the education of workers active in the field. *Id.* Importantly, "[a] person of

ordinary skill in the art is also a person of ordinary creativity, not an automaton." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007).

Here, the parties urge slightly different levels of skill in the art through their respective experts. According to Finesse's expert, a skilled artisan "would have had a bachelor's degree in electrical engineering or some similar field, along with three or more years of experience with the design of wireless communications equipment." (Dkt. No. 83-4 ¶ 30.) According to Defendants, a skilled artisan would have been "a person with a Masters in electrical engineering, computer engineering, or similar fields and at least 2–3 years of work experience in the fields of communications systems design and signal processing." (Dkt. No. 86-4 ¶ 33.) However, none of the parties suggests the differences between these proffered levels of skilled must be resolved to address the issues now before the Court.

IV. THE DISPUTED TERMS

A. "means for over-sampling, at a desired frequency, a passband of received signals to create a bit stream, wherein the received signals include signals of interest and interference generating signals" ('134 Patent, Claim 2)

Plaintiff's Construction	Defendants' Construction
Governed by 35 U.S.C. § 112, ¶ 6: **Function:** over-sampling, at a desired frequency, a passband of received signals to create a bit stream, wherein the received signals include signals of interest and interference generating signals **Structure:** sampling rate multiplier comprising one or more Sigma Delta Modulators or Flash A/D converters in a radio receiver, as well as equivalents thereof	Governed by 35 U.S.C. § 112, ¶ 6: **Function:** over-sampling, at a desired frequency, a passband of received signals to create a bit stream wherein the received signals include signals of interest and interference generating signals **Structure:** one or more sigma delta modulators or flash ADCs that generate low resolution high bit rate digital samples of the passband.

With respect to this term, the parties only dispute what structure corresponds to the recited function. Although they agree the corresponding structure includes "one or more Sigma Delta

Modulators or Flash A/D converters," Defendants further contend those devices must "generate low resolution high bit rate digital samples of the passband." Finesse argues this additional functional language has no place in the structural component of this term, and that such language improperly limits the structure to specifically described embodiments. (Dkt. No. 83 at 6–7.)

Defendants stress that the patent consistently teaches oversampling at a high rate but low resolution. "In fact," say Defendants, "the specification explicitly defines 'Sigma Delta Modulator' as '[a] circuit that generates a low resolution high rate digital sample wave form.'" (Dkt. No. 86 at 3–4 (citing '134 Patent at 6:25–26).) Further, Defendants criticize Finesse's construction as vague, overly broad, and contrary to the express teachings of the patent. (Dkt. No. 86 at 4–5.)

Here, Defendants improperly expand the scope of the recited function, which says nothing about the required resolution. Regarding that function, the specification identifies two structures that perform oversampling: (1) Sigma Delta Modulators, and (2) flash A/D converters. (*See* '134 Patent at 24:59–61 (noting "[t]he Sigma Delta A/D converter has a sufficiently high over sampling ratio (OSR) to provide adequate SNR" for certain wireless standards").) Defendants, however, cite nothing from the intrinsic record that supports limiting the capability of those structures to generating only low-resolution digital samples. Even if the patent defines sigma delta modulators as low-resolution devices, the disclosed flash A/D converters are not limited in that way. Moreover, because "corresponding structure" is limited only to that necessary to perform the recited function, Defendants' inclusion of language stating what the structure does, as opposed to what it is, is improper. The Court therefore construes the corresponding structure as "one or more sigma delta modulators or flash A/D converters."[3]

[3] Finesse argues the proper construction should (1) include "sample rate multiplier," and (2) specify the corresponding structure is "in a radio receiver." As to the former, the patent uses "sampling rate multiplier" as a black-box term for whatever is doing the sampling, which is always either a

B. "means for computing an estimate of each of the one or more intermodulation products from the source signals that generate the one or more intermodulation products" ('134 Patent, Claim 2)

Plaintiff's Construction	Defendants' Construction
Governed by 35 U.S.C. § 112, ¶ 6: **Function:** computing an estimate of each of the one or more intermodulation products from the source signals that generate the one or more intermodulation products **Structure:** a radio receiver with an intermodulation compensator, as well as equivalents thereof	Governed by 35 U.S.C. § 112, ¶ 6: **Function:** computing an estimate of each of the one or more intermodulation products from the source signals that generate the one or more intermodulation products **Structure:** general purpose processor; algorithm: estimating the frequency of each of the one or more intermodulation products with each other in the time domain, and estimating the amplitude of each of the one or more intermodulation products using the IIP3 or IIP2 estimate of the system.

As with the previous term, the parties only dispute what structure corresponds to the identified function. Finesse contends the patent "points directly to a structure intended to perform [the identified function]: a radio receiver with an intermodulation compensator." (Dkt. No. 83 at 8 (citing '134 Patent at 7:17–18).) Defendants counter that, "[i]n every disclosed embodiment, the claimed computation of estimates is performed only in . . . generic processing modules" using a two-step algorithm. (Dkt. No. 86 at 7–8.) Further, Defendants argue that Finesse's corresponding structure of an "intermodulation compensator" is neither a term of art connoting structure nor specifically tied to the identified function. (*Id.* at 8.)

Finesse's corresponding structure is indeed too broad, as evidenced from the excerpts on

sigma delta modulator or a flash A/D converter. Regarding the latter, properly construing this term does not require the Court to specify the operational or spatial relationship to other claim limitations or the invention as a whole. Accordingly, the Court rejects these aspects of Finesse's proposed construction.

which it relies. For example, Finesse urges that FIG. 2A discloses an intermodulation compensator 204 that performs any number of functions, such as "computing the expected in-band interfering signals based on the [input intercept points 2 and 3]," adjusting the amplitude and phase of the estimated signals, and performing signal inversions. (Dkt. No. 83 at 8–9.) These passages, however, merely identify the functions of various clearly identifiable subcomponents of the disclosed embodiments, many of which are at issue with respect to other terms. Consistent with that conclusion, the specification identifies the broad function of the intermodulation compensator as performing the objective of the invention: "compensat[ing] for interference from non-linearities present in the system." ('134 Patent at 7:17–18.) This is not the requisite particularity for clearly linking or associating the intermodulation compensator with the specific function identified by this term.

Defendant' position is more accurate. To start, the specification explains the estimate of intermodulation products is "generated" by processing blocks or units. For example, with reference to FIG. 4, "[t]he output signals from BPF 412 are sent to a *processing block* 416 that generates an estimate of the intermodulation product(s)." ('134 Patent at 15:9–12; *see also id.* at 15:30–35 ("When signals of sufficient energy are detected with the correct relationship to generate in band intermodulation products, the frequencies are passed to BPF 414, which filters the signals of interest and passes them to *processing unit* 420 where an estimate of the intermodulation product(s) is generated.")) (emphasis added). Further, the specification teaches the estimate is generated by multiplying the source signals in the time domain. (*See id.* at 16:35–39 ("In one embodiment, when the transmitter and the 'half way' signal are received by the transmitter feed-through intermodulation products generator 416, the samples are multiplied in the time domain to generate the estimate of the intermodulation product."); *id.* at 18:53–55 ("[T]he samples are multiplied in

the time domain to generate an estimate of the intermodulation product.").)

That said, the second part of Defendants' "corresponding structure" goes a step too far. The patent clearly distinguishes between "estimating the intermodulation products" and estimating *the amplitude* of the intermodulation products. (*See, e.g.*, '134 Patent at 16:48–50 ("The *amplitude* of the intermodulation product is estimated by the knowledge of the estimated IIP3 and sometimes the IIP2.") (emphasis added); *id.* at 18:60–62 (same).) In the specification, however, using the IIP2 and IIP3 estimates is not so clearly linked to the recited function to warrant including that as part of any required algorithm. Accordingly, the Court construes the corresponding structure as "a processor programmed to multiply the source signals in the time domain."

C. "means for cancelling out one or more inband intermodulation products using the estimate of the intermodulation products ('134 Patent, Claim 2)

Plaintiff's Construction	Defendants' Construction
Governed by 35 U.S.C. § 112, ¶ 6: **Function:** canceling out one or more inband intermodulation products using the estimate of the intermodulation products **Structure:** a radio receiver with an intermodulation compensator, as well as equivalents thereof	Governed by 35 U.S.C. § 112, ¶ 6: **Function:** canceling out one or more inband intermodulation products using the estimate of the intermodulation products **Structure:** an inverter and an adder

As with the prior terms, the parties only dispute what structure corresponds to the recited function. According to Defendants, all disclosed embodiments use an inverter and an adder to perform the "cancelling." (Dkt. No. 86 at 11.) Finesse describes Defendants' position as too restrictive, again suggesting the "intermodulation compensator" performs the recited function. (Dkt. No. 83 at 13–14.)

As noted in Part IV.B. *supra*, Finesse's allegedly corresponding structure is too broad and does not clearly link the entire intermodulation compensator to the "canceling" function. Rather,

the specification clearly associates the recited function to adder 226 of FIG. 2A. (*See* '134 Patent at 9:38–44 ("The estimate of the interfering signal is inverted to produce a cancellation signal 224. *An adder 226 adds* the inverted cancellation signal 224 into the original desired signal from FIR filter 206 *to cancel* interference signals within the original Signal of Interest (SOI)."") (emphasis added); *id.* at 22:56–60 ("In processing block 640, the intermodulation compensator inverts the estimate of the interfering signal set (processing block 640) and *adds the inverted interfering signal* set to the original desired signal *to cancel* the interfering signals (processing block 645)."") (emphasis added).[4]

Although Defendants suggest the corresponding structure includes an inverter, these excerpts from specification shows the recited "cancellation" is simply the addition of the already inverted signal. Accordingly, the Court construes the corresponding structure as only "an adder."

D. "means for performing phase and amplitude adjustment on estimations of the intermodulation product interfering signals in a closed loop manner, wherein the means for performing phase and amplitude adjustment of the estimations comprises means for performing subsample phase shifts to make a phase adjustment on the estimations of the intermodulation product interfering signals" ('134 patent, Claim 2)

Plaintiff's Construction	Defendants' Construction
Governed by 35 U.S.C. § 112, ¶ 6: **Function:** performing phase and amplitude adjustment on estimations of the intermodulation product interfering signals in a closed loop manner, wherein the means for performing phase and amplitude adjustment of	Governed by 35 U.S.C. § 112, ¶ 6: **Function:** performing phase and amplitude adjustment on estimations of the intermodulation product interfering signals in a closed loop manner **Structure:** general purpose processor;

[4] The patent suggests a "cancellation summing cell" both inverts and adds the inverted signal. (*See* '134 Patent at 11:58–62 ("A cancellation summing cell 343 inverts and combines both of these signals with the filtered signal of interest to produce a signal-of-interest with the intermodulation interference canceled.").) In the figures, however, cell 343 is denoted with a sigma (Σ), (*id.* at fig.3 (item 343)), which is a mathematical symbol for summation. The specification, however, does not clearly link an inverter of the cell to the recited function of cancelling the IMPs.

the estimations comprises means for performing subsample phase shifts to make a phase adjustment on the estimations of the intermodulation product interfering signals **Structure:** a radio receiver with an intermodulation compensator, and equivalents thereof	algorithm as disclosed in col. 17, lines 4–51

Unlike the prior terms, the parties dispute both the recited function and the corresponding structure for this term. Regarding the function, the issue concerns the "wherein" clause. Characterizing the dispute as "small," Finesse urges the "wherein" clause at the end of the limitation "provides important qualifications and explanations, and so should be included in the recitation of this term's function." (Dkt. No. 83 at 16.) Defendants agree that the "wherein" clause limits the claim but suggests it need not be included in the recited function to arrive at the proper structure. (Dkt. No. 86 at 13.)

Concerning "performing phase and amplitude adjustment on estimations of the intermodulation product interfering signals in a closed loop manner," the specification makes numerous references to "phase and amplitude adjustors" and correlators as performing this function. (*See, e.g.*, '134 Patent at 9:53–57 (explaining, with reference to FIG. 2a, that "correlator 228 adjusts the phase and amplitude of the estimated interference signals with a zero forcing (or other adaptive) algorithm 230 to create control signals that are fed into and control the invert cancellation signal 224"); *id.* at 10:12–19 ("Processor 220A and its associated components 224A and 228A phase adjust, amplitude adjust, and perform signal inversion on the computed transmitter feed through intermodulation products. Processor 220B and its associated components 224B and 228B phase adjust, amplitude adjust, and perform signal inversion on the computed intermodulation product from the source signals."); *id.* at 15:51–52 (identifying "intermodulation product signal generator (phase and amplitude adjuster) 432"); *id.* at 16:41–44 ("The estimate of

the intermodulation product is sent to the intermodulation cancellation signal generator 426 where the signal is adjusted for phase and amplitude by phase/amplitude adjuster[.]"); *id.* at 17:30–51 (describing, with reference to FIG. 11, adjusting phase and amplitude by weighted interpolation and scaling); *id.* at 28:59–60 (noting, with reference to FIG. 13, a "micro delay is done at the sub-sample level in phase and amplitude adjustment block 1121").) Based on these references, Finesse's proposed structure of a "radio receiver with an intermodulation compensator" is too broad and includes unnecessary structure for the reasons set forth *supra*. These references show the specification only associates a general-purpose processor programed to use a zero-forcing, dither, or other algorithm with the recited function.

The second means-plus-function term limits the first and recites the function of "performing subsample phase shifts to make a phase adjustment on the estimations of the intermodulation product interfering signals." ('134 Patent at 28:48–52.) Critically, the only reference to phase and amplitude adjustments using subsample phase shifts in the specification is found in the passage proffered by Defendants relating to FIG. 11:

> In intermodulation cancellation signal generator 426 and 30 intermodulation cancellation signal generator 432, the phase and amplitude of the estimate of the intermodulation product is adjusted with sufficient granularity so as to closely match the phase and amplitude of the intermodulation product generated in the non-linearities. . . . FIG. 11 shows how, in one embodiment, the phase is adjusted by any desired increment, even when the sample rate is low. In this embodiment, the original samples A, B, and C, are converted to samples a, b, c by weighted interpolation. The new samples a, b, and c are mapped into the time slots of A, B, C. In one embodiment, the phase shifting function is performed using a FIR filter with only a few taps. By properly selecting the weighting of values A, B, and C in the interpolation process, any arbitrary phase shift can be achieved. The amplitude may be adjusted by simple scaling.

('134 Patent at 17:30–51.) Thus, in accordance with this passage, the Court finds that the corresponding structure is "a processor programmed to convert original samples to new samples

using weighted interpolation and to map the new samples into the time slots of the original samples, and adjust the amplitude by simple scaling."

E. "a sampling unit to sample, at a desired frequency, a passband of received signals to create a bit stream, wherein the received signals include signals of interest and interference generating signals ('134 Patent, Claim 3)

Plaintiff's Construction	Defendants' Construction
Plain and ordinary meaning. To the extent the Court believes this term is governed by 35 U.S.C. § 112, ¶ 6: **Function:** sample, at a desired frequency, a passband of received signals to create a bit stream, wherein the received signals include signals of interest and interference generating signals **Structure:** sampling rate multiplier comprising one or more Sigma Delta Modulators or Flash A/D converters in a radio receiver, as well as equivalents thereof	Governed by § 112, ¶ 6: **Function:** sample, at a desired frequency, a passband of received signals to create a bit stream **Structure:** one or more sigma delta modulators or flash ADCs that generate low resolution high bit rate digital samples of the passband

The parties first dispute whether this is a means-plus-function term. Finesse argues that, because the patentee clearly knew how to invoke § 112, ¶ 6 in Claim 2, the absence of "means" in this limitation suggests this term should be construed differently. (Dkt. No. 83 at 17.) In contrast, Defendants assert that "a sampling unit" is not the name of a well-known structure. (Dkt. No. 86 at 17 (citing Dkt. No. 86-4 ¶¶ 60–65).) Thus, Defendants argue that any presumption that § 112, ¶ 6 does not apply is overcome.

The Court agrees with Defendants. The presumption that this is not a means-plus-function term stands or falls according to whether a skilled artisan would understand the claim with the functional language, in the context of the entire specification, to denote sufficiently definite structure or acts for performing the function. *See Media Rights Techs., Inc.*, 800 F.3d at 1372. Here, Defendants' expert declares that a "sampling unit" was "not a term of art at the time of the alleged

inventions claimed in the '134 patent or otherwise a term that was used by those skilled in the art to connote any particular structure." (Dkt. No. 86-4 ¶ 61.) Finesse does not counter that assertion in either its opening brief or its reply. Rather, Finesse suggests the claim's description of the sampling unit operation is enough to uphold the presumption, (Dkt. No. at 83 at 17 (citing *Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1300 (Fed. Cir. 2014)), and that the "wherein" clause recites sufficient additional structure to uphold the presumption. (*Id.* at 18.)

Finesse's arguments are unavailing. First, the "wherein" clause does not recite structure, but rather concerns the function of the sampling unit. As to Finesse's comparison of the language of Claims 2 and 3, Finesse cites no authority suggesting the use of "means" in one claim and the failure to use "means" in another is relevant to whether a term is subject to § 112, ¶ 6.[5] Finally, with respect to any description of the element's operation being sufficient to avoid invoking § 112, ¶ 6, there must still be *some* recitation of structure related to the term *somewhere* in the intrinsic record. *See Apple Inc.*, 757 F.3d at 1299 ("Even if a patentee elects to use a 'generic' claim term, such as 'a nonce word or a verbal construct, properly construing that term (in view of the specification, prosecution history, etc.) may still provide sufficient structure such that the presumption against means-plus-function claiming remains intact."). Here, however, neither the claim nor the specification discusses any such structure.

In *Inventio AG v. ThyssenKrupp Elevator Americas Corp.*, 649 F.3d 1350 (Fed. Cir. 2011), which the *Apple* court discussed, the claim recited "at least one *modernizing device* and connecting

[5] Finesse cites *Nystrom v. TREX Co.*, 424 F.3d 1136, 1143 (Fed. Cir. 2005), but *Nystrom* does not concern a means-plus-function term. Finesse also cites *Whitewater W. Indus., Ltd. v. Splashtacular, Inc.*, 2014 WL 121257542 (C.D. Cal. Feb. 12, 2013), which suggests the same "means" term can be governed by § 112, ¶ 6 in some claims but not governed by § 112, ¶ 6 in others. (Dkt. No. 83 at 17.) That is a different proposition than what Finesse advances here.

the at least one *modernizing device* to said floor terminals and said at least one computing unit." *Inventio*, 649 F.3d at 1354. The specification described the modernizing device's input, output, and internal components, and how the internal components were interconnected. *Id.* at 1358–59. The court found that description provided sufficient structure to uphold the presumption against invoking § 112, ¶ 6. Here, however, "sampling unit" appears only once in the patent—in this disputed phrase—and there is no description of any structure in connection with that term. Accordingly, the Court finds that by establishing that "sampling unit" was not a well-known term for structure, Defendants have overcome any presumption this is not a means-plus-function term.

The analysis then turns to whether the recited structure requires some further limitation concerning resolution. The parties agree the dispute is materially the same as that addressed in Part IV.A. Accordingly, for the reasons articulated *supra*, the Court rejects any limitation on bit rate and sample rate and construes the corresponding structure as "one or more sigma delta modulators or flash A/D converters."

F. "a cancellation unit to cancel out isolated interference generated signals using estimations of the intermodulation products generated by the isolated interfering signals, wherein the estimations of the isolated interfering signals comprise estimates of intermodulation products falling inband of the signals of interest" ('134 Patent, Claim 3)

Plaintiff's Construction	Defendants' Construction
Plain and ordinary meaning. To the extent the Court believes this term is governed by 35 U.S.C. § 112, ¶ 6: **Function:** canceling out isolated interference generated signals using estimations of the intermodulation products generated by the isolated interfering signals, wherein the estimations of the isolated interfering signals comprise estimations of intermodulation products falling inband of the signals of interest	Governed by § 112, ¶ 6: **Function:** cancel out isolated interference generated signals using estimations of the intermodulation products generated by the isolated interfering signals **Structure:** an inverter and an adder

Structure: a radio receiver with an intermodulation compensator, as well as equivalents thereof	

The disputes concerning this phrase track those set forth above with respect to "sample unit." Here, too, Defendants offer unrebutted evidence that a skilled artisan "would not have understood 'a cancellation unit . . .' to have a sufficiently definite structural meaning," and that "[i]t was not a term of art at the time of the alleged inventions claimed in the '134 patent or otherwise a term that was used by those skilled in the art to connote any particular structure." (Dkt. No. 86-4 ¶ 63.) Unlike "sample unit," however, "cancellation unit" appears in the specification. (*See* '134 Patent at 14:62–65 ("The output of BPF 410 is sent to cancellation unit 428 (*e.g.*, signal adder, summation unit, etc.) where the interference intermodulation product signals are cancelled."); *id.* at 16:53–55 ("The estimate of the intermodulation product is sent to cancellation unit 428 for cancellation of the intermodulation product(s))."). Regardless, none of these appearances in the specification identify structure that avoids invoking § 112, ¶ 6.

With regard to the corresponding structure, and as it argued for the "means for computing term" in Claim 2, Finesse alleges that the corresponding structure is a radio receiver with an intermodulation compensator. Defendants counter that the corresponding structure is both and adder and an inverter. For the reasons articulated in Part IV.C. *supra*, the Court concludes the corresponding structure is "an adder."

G. "a phase and amplitude adjuster to adjust the phase and amplitude of estimations of the isolated interfering signals in a closed loop manner, wherein the phase and amplitude adjuster performs phase and amplitude adjustment of the estimations by making sub-sample phase shifts to make a phase adjustment on the estimations of the isolated interfering signals ('134 Patent, Claim 3)

Plaintiff's Construction	Defendants' Construction
Plain and ordinary meaning. To the extent the Court believes this term is governed by 35 U.S.C. § 112, ¶ 6: **Function**: performing phase and amplitude adjustment on estimations of the intermodulation product interfering signals in a closed loop manner, wherein the means for performing phase and amplitude adjustment of the estimations comprises means for performing subsample phase shifts to make a phase adjustment on the estimations of the intermodulation product interfering signals **Structure:** a radio receiver with an intermodulation compensator, and equivalents thereof	Governed by 35 U.S.C. § 112, ¶ 6: **Function:** adjust the phase and amplitude of estimations of the isolated interfering signals in a closed loop manner, wherein the phase and amplitude adjuster performs phase and amplitude adjustment of the estimations by making sub-sample phase shifts to make a phase adjustment on the estimations of the isolated interfering signals **Structure:** general purpose processor; algorithm as disclosed in col. 17, lines 4–51

Here, the disputes track those set forth for the two preceding terms. Defendants offer evidence that a "phase and amplitude adjuster" does not have a known structural meaning. (*See* Dkt. No. 86-4 ¶ 65 ("[A] person of ordinary skill in the art would not have understood 'a phase and amplitude adjuster to adjust the phase and amplitude of estimations of the isolated interfering signals" to have a sufficiently definite structural meaning. It was not a term of art at the time of the alleged inventions claimed in the '134 patent or otherwise a term that was used by those skilled in the art to connote any particular structure.").) Finesse again does not address that evidence in its briefing, nor does it cite to descriptions of specific structure from the specification. Thus, Defendants have rebutted any presumption that § 112, ¶ 6 does not apply.

The intrinsic record supports this conclusion. The specification, for example, identifies a "phase and amplitude adjustor 432" in FIG. 4, but neither the written description nor FIG. 4

provide any further structural characteristics for the device. The same holds true for FIG. 2, which shows a component of the intermodulation compensator labeled "Phase and Amplitude Adjust." (*See also* FIG. 7, FIG. 13 (item 1121).) These are simply black-box terms without any structural aspects. As such, this is a means-plus-function term.

Having once again concluded § 112, ¶ 6 applies, Finesse suggests the same corresponding structure as for the previous term: "a radio receiver with an intermodulation compensator." But as noted *supra*, that suggested structure is more than necessary to perform the recited function. Moreover, it is clear from the specification that any phase and amplitude adjustments are done with a general-purpose processor.

The only algorithm for subsample phase shifting relates to FIG. 11, which is described in column 17, lines 30–51 and discussed *supra* in Part IV.D. Based on that reasoning, the Court concludes the corresponding structure is "a processor programmed to convert original samples to new samples using weighted interpolation and to map the new samples into the time slots of the original samples, and adjust the amplitude by simple scaling."

H. "oversampling . . . at a low resolution" ('134 Patent, Claim 20)

Plaintiff's Construction	Defendants' Construction
Plain and ordinary meaning. Alternatively: "oversampling . . . at a resolution that avoids aliasing"	low resolution means "less than or equal to 4 bits"

Claim 20 recites "receiving a signal comprising a signal of interest and one or more source signals" and "generating a sampled data stream by oversampling the received signal over a receiver bandwidth *at a low resolution*[.]" ('134 Patent at 31:9–13) (emphasis added). The parties dispute whether "low resolution" in this claim should be limited to a certain number of bits.

According to Defendants, the specification implicitly defines "low resolution" as having

less than or equal to 4 bits. (Dkt. No. 86 at 19.) Defendants note that "the '134 patent repeatedly describes quantization levels at or below 4 bits as 'low resolution.'" (*Id.* (citing '134 Patent at 3:10–34 (characterizing "very low quantization" as "1 or 2 bits"), 4:34–47 ("In one embodiment, this invention, a low resolution (1 or 2 bits . . .) Sigma Delta A/D converter i[s] used to sample the entire receive pass band . . ."), 8:1–7 (1 bit), 11:32–36 (4 bits), 15:22–36 (4 bits), Claim 13 (4 bits). Twice the patent refers to a medium resolution being approximately 4 bits. *Id.* at 11:12–14 ("The flash A/D cell 320 uses a flash A/D module to sample the receive band to a medium resolution (approximately 4 bits) at a high enough rate to avoid aliasing."), 15:23–27 ("In one embodiment, flash A/D converter 424 is a low to medium resolution A/D converter (around 4 bits) that samples the entire band in which source signals can exist and which have the potential to produce intermodulation products in band of the SOL.").)

According to Finesse, however, a skilled artisan would understand "low resolution" as anything less than the effective number of bits required to fully acquire and resolve the signal of interest. (Dkt. No. 83 at 21–22.) Finesse argues that "low resolution" is a relative term that depends on particular usage. (*Id.* at 22.) Moreover, the patent's identification of 4-bit resolution as "medium" resolution is inconsistent with Defendants' construction, as resolution cannot be simultaneously classified as both "low" and "medium." (Dkt. No. 83 at 22–23; *see also* Dkt. No. 87 at 8.) Instead, "[w]hat makes sampling 'low resolution' or not is context-specific." (*Id.* (citing Dkt. No. 83-4 ¶ 82).)

Although Defendants treat the specification as definitional on this term, the passages on which they rely do not provide the clarity to justify its construction based on implicit lexicography. *See Thorner v. Sony Comput. Entm't. Am. LLC*, 669 F.3d 1362, 1368 (Fed. Cir. 2012) (noting any "'implied' redefinition must be so clear that it equates to an explicit one," so a skilled artisan

"would have to read the specification and conclude that the applicant has clearly . . . acted as its own lexicographer"). Here, although there is no dispute that 1- or 2-bit resolution qualifies as "low," nothing in the specification clearly and unmistakably indicates 5-bit resolution is not.

To the contrary, as Finesse contends, the patent suggests the term is context-specific. For example, the specification explains:

> In the embodiment where in a flash A/D converter is used, the sampling rate required i[s] the same as that of the Sigma Delta A/D only many bits are required for each sample instead of only 1 or 2. . . . The sampling is done to a level of detail (number of bits) so that the signal of interest (SOI) can be distinguished from the interfering signals in the time domain.

('134 Patent at 4:1–9.) This shows the number of bits is at least somewhat dependent on the signal of interest for a given application. Accordingly, the Court rejects Defendants' contention that any higher than 4-bit resolution is excluded from the scope of Claim 20. The Court will give this term its plain and ordinary meaning.

I. "a transmitter and the receiver being co-located with each other" ('775 Patent, Claims 1, 35–37); "a receiver co-located with a transmitter" ('775 Patent, Claims 4, 16–17, 21, 24, 37); "co-located receiver" ('775 Patent, Claims 15, 24, 35–36)

Plaintiff's Construction	Defendants' Construction
Plain and ordinary meaning. Alternatively, to the extent that the Court believes these terms require construction: "co-located receiver" – the definition in the specification applies, and the phrase means "a receiver located in the vicinity of the self communications terminal, but not associated with the self terminal," where "self communications terminal" and "self terminal" mean "the receiver and transmitter of the target system (central system to discussion)" "transmitter and the receiver being co-located	"a receiver located in the vicinity of, but not associated with, the transmitter"

with each other" / "receiver co-located with [a/the] transmitter" – in these instances, "co-located" means "in the vicinity [of]"	

The parties agree that "co-located" means "in the vicinity of," but dispute whether the term precludes "association" between the recited transmitters and receivers. Defendants contend their construction "flows directly from the explicit definitions of co-located receiver and co-located transmitter provided by the patent." (Dkt. No. 86 at 23.) Finesse argues that, to the extent such definitions from the patent apply, they refer to being co-located, but not associated with, the self-communications terminal—that is, a transmitter-receiver pair. (Dkt. No. 83 at 26–27.) Thus, Finesse argues that Defendants' construction improperly narrows claim scope.

The patent defines the following terms:

1. Self communications terminal: The receiver and transmitter of the target system (central system to discussion)(also referred to as the self terminal)
2. Companion transmitter: Transmitter associated with the companion receiver of the self communications terminal
3. Companion receiver: Receiver associated with the companion transmitter of the self communications terminal
4. Co-located receiver: A receiver located in the vicinity of the self communications terminal, but not associated with the self terminal
5. Co-located transmitter: A transmitter located in the vicinity of the self terminal, but not associated with the self terminal
6. Other terminals: Terminals not co-located, but potentially impacted by or impacting the self terminal

The Impacted Receivers are:

1. Companion receiver (receiver associated with the self transmitter)
2. Co-located receiver (co-located receiver that is not associated with the self terminal)

('775 Patent at 5:65–6:19.) The question is whether, and to what extent, such definitions apply to the disputed claim language. From their context, the modifiers "companion" and "co-located" in these definitions explain the relationship of the transmitters and receivers as they relate to the "self communications terminal." Clearly, if the disputed language were referring to the relationship between a receiver co-located with a self terminal, Defendants' inclusion of "but not associated with" in its construction would be correct.

In the claims, however, "co-located" is used to describe the relationship between a transmitter and a receiver. The patent does not so clearly and unmistakably define a universal meaning of co-located that precludes "association" in all instances. (*See, e.g.*, '775 Patent at 6:18–19 (recursively defining a "[c]o-located receiver" as a "co-located receiver that is not associated with the self terminal").) Accordingly, the Court construes "co-located" as "in the vicinity of," which does not preclude the recited transmitters and receivers from being "associated with" one another.

V. CONCLUSION

Term	The Court's Construction
"means for over-sampling, at a desired frequency, a passband of received signals to create a bit stream, wherein the received signals include signals of interest and interference generating signals" ('134 Patent, Claim 2)	Governed by § 112 ¶6. **Function:** over-sampling, at a desired frequency, a passband of received signals to create a bit stream, wherein the received signals include signals of interest and interference generating signals **Structure:** one or more sigma delta modulators or flash A/D converters

"means for computing an estimate of each of the one or more intermodulation products from the source signals that generate the one or more intermodulation products" ('134 Patent, Claim 2)	Governed by § 112, ¶ 6. **Function:** computing an estimate of each of the one or more intermodulation products from the source signals that generate the one or more intermodulation products **Structure:** a processor programmed to multiply the source signals in the time domain
"means for cancelling out one or more inband intermodulation products using the estimate of the intermodulation products" ('134 Patent, Claim 2)	Governed by § 112, ¶ 6. **Function:** canceling out one or more inband intermodulation products using the estimate of the intermodulation products **Structure:** an adder
"means for performing phase and amplitude adjustment on estimations of the intermodulation product interfering signals in a closed loop manner, wherein the means for performing phase and amplitude adjustment of the estimations comprises means for performing subsample phase shifts to make a phase adjustment on the estimations of the intermodulation product interfering signals" ('134 Patent, Claim 2)	Pursuant to 35 U.S.C. § 112, ¶ 6: **Function:** performing phase and amplitude adjustment on estimations of the intermodulation product interfering signals in a closed loop manner, wherein the means for performing phase and amplitude adjustment of the estimations comprises means for performing subsample phase shifts to make a phase adjustment on the estimations of the intermodulation product interfering signals **Structure:** a processor programmed to convert original samples to new samples using weighted interpolation and to map the new samples into the time slots of the original samples, and adjust the amplitude by scaling
"a sampling unit to sample, at a desired frequency, a passband of received signals to create a bit stream, wherein the received signals include signals of interest and interference generating signals ('134 Patent, Claim 3)	Governed by 35 U.S.C. § 112, ¶ 6: **Function:** sample, at a desired frequency, a passband of received signals to create a bit stream, wherein the received signals include signals of interest and interference generating signals **Structure:** one or more sigma delta modulators or flash A/D converters

"a cancellation unit to cancel out isolated interference generated signals using estimations of the intermodulation products generated by the isolated interfering signals, wherein the estimations of the isolated interfering signals comprise estimates of intermodulation products falling inband of the signals of interest" ('134 Patent, Claim 3)	Governed by § 112, ¶ 6: **Function:** cancel out isolated interference generated signals using estimations of the intermodulation products generated by the isolated interfering signals, wherein the estimations of the isolated interfering signals comprise estimations of intermodulation products falling inband of the signals of interest **Structure:** an adder
"a phase and amplitude adjuster to adjust the phase and amplitude of estimations of the isolated interfering signals in a closed loop manner, wherein the phase and amplitude adjuster performs phase and amplitude adjustment of the estimations by making sub-sample phase shifts to make a phase adjustment on the estimations of the isolated interfering signals ('134 Patent, Claim 3)	Governed by 35 U.S.C. § 112, ¶ 6. **Function:** adjust the phase and amplitude of estimations of the isolated interfering signals in a closed loop manner, wherein the phase and amplitude adjuster performs phase and amplitude adjustment of the estimations by making sub-sample phase shifts to make a phase adjustment on the estimations of the isolated interfering signals **Structure:** a processor programmed to convert original samples to new samples using weighted interpolation and to map the new samples into the time slots of the original samples, and adjust the amplitude by scaling
"oversampling . . . at a low resolution" ('134 Patent, Claim 20)	Plain and ordinary meaning.
"a transmitter and the receiver being co-located with each other" ('775 Patent, Claims 1, 35–37) "a receiver co-located with a transmitter" ('775 Patent, Claims 4, 16–17, 21, 24, 37) "co-located receiver" ('775 Patent, Claims 15, 24, 35–36)	"a receiver located in the vicinity of the transmitter"

The Court **ORDERS** each party not to refer, directly or indirectly, to its own or any other party's claim-construction positions in the presence of the jury. Likewise, the Court **ORDERS** the

parties to refrain from mentioning any part of this opinion, other than the actual positions adopted by the Court, in the presence of the jury. Neither party may take a position before the jury that contradicts the Court's reasoning in this opinion. Any reference to claim construction proceedings is limited to informing the jury of the positions adopted by the Court.

So Ordered this

Aug 24, 2022

RODNEY GILSTRAP
UNITED STATES DISTRICT JUDGE