

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

SAINT LAWRENCE  
COMMUNICATIONS LLC,

v.

APPLE INC., et al.

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CASE NO. 2:16-CV-82-JRG

**CLAIM CONSTRUCTION**  
**MEMORANDUM AND ORDER**

Before the Court is Plaintiff Saint Lawrence Communications LLC’s (“Plaintiff’s”) Opening Claim Construction Brief (Dkt. No. 100). Also before the Court are Defendants Apple Inc., AT&T Mobility LLC, and Cellco Partnership d/b/a Verizon Wireless’s (“Defendants”) response (Dkt. No. 109) and Plaintiffs’ reply (Dkt. No. 117).

The Court held a claim construction hearing on March 3, 2017.

## Table of Contents

<b>I. BACKGROUND.....</b>	<b>3</b>
<b>II. LEGAL PRINCIPLES .....</b>	<b>5</b>
<b>III. AGREED TERMS.....</b>	<b>10</b>
<b>IV. DISPUTED TERMS.....</b>	<b>10</b>
A. “[synthesized] [weighted] wideband [speech] signal” .....	10
B. “fixed denominator” .....	16
C. “A [device/method] for enhancing periodicity of an excitation signal produced in relation to a pitch codevector and an innovation codevector for supplying a signal synthesis filter in view of synthesizing a wideband speech signal” .....	18
D. “low frequency portion” .....	21
E. “high frequency content” .....	24
F. “wherein $\gamma_2$ is set equal to $\mu$ ” .....	26
G. “said excitation signal” .....	28
H. “means for comparing an innovative codebook gain $g$ computed during encoding of the wideband signal to a threshold given by the initial modified gain from the past subframe $g-1$ as follows: if $g < g-1$ then $g_0=g \times 1.19$ bounded by $g_0 < g-1$ , and if $g > g-1$ then $g_0=g/1.19$ bounded by $g_0 > g-1$ ” .....	31
I. “means for determining said smoothing gain through the following relation: $g_s = S_m * g_0 + (1 - S_m) * g$ ” .....	33
J. Additional Terms.....	35
<b>V. CONCLUSION.....</b>	<b>39</b>

## I. BACKGROUND

Plaintiff brings suit alleging infringement of United States Patents No. 6,795,805 (“the ’805 Patent”), 6,807,524 (“the ’524 Patent”), 7,151,802 (“the ’802 Patent”), 7,191,123 (“the ’123 Patent”), and 7,260,521 (“the ’521 Patent”) (collectively, the “patents-in-suit”). Plaintiff submits that “[a]ll of the asserted patents in this case relate to the transmission of wideband speech signals,” and “[a]ll five patents have been declared essential to the AMR-WB [(Adaptive Multi-Rate Wideband)] [audio coding] standard . . . .” (Dkt. No. 100, at 1 & 2.)

The ’805 Patent, titled “Periodicity Enhancement in Decoding Wideband Signals,” issued on September 21, 2004, and the Abstract states:

An alternative approach by which periodicity enhancement of an excitation signal is achieved through filtering an innovative codevector by an innovation filter to reduce low frequency content of the innovative codevector and enhance the periodicity at low frequencies more than high frequencies.

The ’524 Patent, titled “Perceptual Weighting Device and Method for Efficient Coding of Wideband Signals,” issued on October 19, 2004, and the Abstract states:

A perceptual weighting device for producing a perceptually weighted signal in response to a wideband signal comprises a signal pre-emphasis filter, a synthesis filter calculator, and a perceptual weighting filter. The signal pre-emphasis filter enhances the high frequency content of the wideband signal to thereby produce a pre-emphasized signal. The signal pre-emphasis filter has a transfer function of the form:  $P(z) = 1 - \mu z^{-1}$ , wherein  $\mu$  is a pre-emphasis factor having a value located between 0 and 1. The synthesis filter calculator is responsive to the pre-emphasized signal for producing synthesis filter coefficients. Finally, the perceptual weighting filter processes the pre-emphasized signal in relation to the synthesis filter coefficients to produce the perceptually weighted signal. The perceptual weighting filter has a transfer function, with fixed denominator, of the form:  $W(z) = A(z/\gamma_1) / (1 - \gamma_2 z^{-1})$  where  $0 < \gamma_2 < \gamma_1 \leq 1$ .

The ’802 Patent, titled “High Frequency Content Recovering Method and Device for Over-Sampled Synthesized Wideband Signal,” issued on December 19, 2006, and the Abstract states:

In a method and device for recovering the high frequency content of a wideband signal previously down-sampled, and for injecting this high frequency content in

an over-sampled synthesized version of the wideband signal to produce a full-spectrum synthesized wideband signal, a random noise generator produces a noise sequence having a given spectrum. A spectral shaping unit spectrally shapes the noise sequence in relation to linear prediction filter coefficients related to the down-sampled wideband signal. A signal injection circuit finally injects the spectrally-shaped noise sequence in the over-sampled synthesized signal version to thereby produce the full-spectrum synthesized wideband signal.

The '123 Patent, titled "Gain-Smoothing in Wideband Speech and Audio Signal Decoder," issued on March 13, 2007, and the Abstract states:

The gain smoothing method and device modify the amplitude of an innovative codevector in relation to background noise present in a previously sampled wideband signal. The gain smoothing device comprises a gain smoothing calculator for calculating a smoothing gain in response to a factor representative of voicing in the sampled wideband signal, a factor representative of the stability of a set of linear prediction filter coefficients, and an innovative codebook gain. The gain smoothing device also comprises an amplifier for amplifying the innovative codevector with the smoothing gain to thereby produce a gain-smoothed innovative codevector. The function of the gain-smoothing device improves the perceived synthesized signal when background noise is present in the sampled wideband signal.

The '521 Patent, titled "Method and Device for Adaptive Bandwidth Pitch Search in Coding Wideband Signals," issued on August 21, 2007, and the Abstract states:

An improved pitch search method and device for digitally encoding a wideband signal, in particular but not exclusively a speech signal, in view of transmitting, or storing, and synthesizing this wideband sound signal. The new method and device which achieve efficient modeling of the harmonic structure of the speech spectrum uses several forms of low pass filters applied to a pitch codevector, the one yielding higher prediction gain (i.e. the lowest pitch prediction error) is selected and the associated pitch codebook parameters are forwarded.

The '805 Patent, the '524 Patent, the '802 Patent, and the '521 Patent all list a foreign priority document dated October 27, 1998, namely Canadian Patent Application No. 2,252,170.

The '123 Patent lists a foreign priority document dated November 18, 1999, namely Canadian Patent Application No. 2,290,037. Defendants submit: "The Asserted Patents generally share the

same figures and specification, with minor differences that relate to the specific claims of each patent.” (Dkt. No. 109, at 2.)

The patents-in-suit were previously construed by this Court in *Saint Lawrence Communications LLC v. ZTE Corp., et al.*, No. 2:15-CV-349, Dkt. No. 236 (E.D. Tex. Oct. 24, 2016) (“*ZTE*”).

## II. LEGAL PRINCIPLES

It is understood that “[a] claim in a patent provides the metes and bounds of the right which the patent confers on the patentee to exclude others from making, using or selling the protected invention.” *Burke, Inc. v. Bruno Indep. Living Aids, Inc.*, 183 F.3d 1334, 1340 (Fed. Cir. 1999). Claim construction is clearly an issue of law for the court to decide. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 970–71 (Fed. Cir. 1995) (en banc), *aff’d*, 517 U.S. 370 (1996).

“In some cases, however, the district court will need to look beyond the patent’s intrinsic evidence and to consult extrinsic evidence in order to understand, for example, the background science or the meaning of a term in the relevant art during the relevant time period.” *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 841 (2015) (citation omitted). “In cases where those subsidiary facts are in dispute, courts will need to make subsidiary factual findings about that extrinsic evidence. These are the ‘evidentiary underpinnings’ of claim construction that we discussed in *Markman*, and this subsidiary factfinding must be reviewed for clear error on appeal.” *Id.* (citing 517 U.S. 370).

To ascertain the meaning of claims, courts look to three primary sources: the claims, the specification, and the prosecution history. *Markman*, 52 F.3d at 979. The specification must contain a written description of the invention that enables one of ordinary skill in the art to make and use the invention. *Id.* A patent’s claims must be read in view of the specification, of which

they are a part. *Id.* For claim construction purposes, the description may act as a sort of dictionary, which explains the invention and may define terms used in the claims. *Id.* “One purpose for examining the specification is to determine if the patentee has limited the scope of the claims.” *Watts v. XL Sys., Inc.*, 232 F.3d 877, 882 (Fed. Cir. 2000).

Nonetheless, it is the function of the claims, not the specification, to set forth the limits of the patentee’s invention. Otherwise, there would be no need for claims. *SRI Int’l v. Matsushita Elec. Corp.*, 775 F.2d 1107, 1121 (Fed. Cir. 1985) (en banc). The patentee is free to be his own lexicographer, but any special definition given to a word must be clearly set forth in the specification. *Intellicall, Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 1388 (Fed. Cir. 1992). Although the specification may indicate that certain embodiments are preferred, particular embodiments appearing in the specification will not be read into the claims when the claim language is broader than the embodiments. *Electro Med. Sys., S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 1054 (Fed. Cir. 1994).

This Court’s claim construction analysis is substantially guided by the Federal Circuit’s decision in *Phillips v. AWH Corporation*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). In *Phillips*, the court set forth several guideposts that courts should follow when construing claims. In particular, the court reiterated that “the claims of a patent define the invention to which the patentee is entitled the right to exclude.” 415 F.3d at 1312 (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). To that end, the words used in a claim are generally given their ordinary and customary meaning. *Id.* The 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.” *Id.* at 1313. This principle of patent law flows naturally from the recognition that

inventors are usually persons who are skilled in the field of the invention and that patents are addressed to, and intended to be read by, others skilled in the particular art. *Id.*

Despite the importance of claim terms, *Phillips* made clear that “the 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.* Although the claims themselves may provide guidance as to the meaning of particular terms, those terms are part of “a fully integrated written instrument.” *Id.* at 1315 (quoting *Markman*, 52 F.3d at 978). Thus, the *Phillips* court emphasized the specification as being the primary basis for construing the claims. *Id.* at 1314–17. As the Supreme Court stated long ago, “in case of doubt or ambiguity it is proper in all cases to refer back to the descriptive portions of the specification to aid in solving the doubt or in ascertaining the true intent and meaning of the language employed in the claims.” *Bates v. Coe*, 98 U.S. 31, 38 (1878). In addressing the role of the specification, the *Phillips* court quoted with approval its earlier observations from *Renishaw PLC v. Marposs Societa’ per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998):

Ultimately, the interpretation to be given a term can only be determined and confirmed with a full understanding of what the inventors actually invented and intended to envelop with the claim. The construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention will be, in the end, the correct construction.

*Phillips*, 415 F.3d at 1316. Consequently, *Phillips* emphasized the important role the specification plays in the claim construction process.

The prosecution history also continues to play an important role in claim interpretation. Like the specification, the prosecution history helps to demonstrate how the inventor and the United States Patent and Trademark Office (“PTO”) understood the patent. *Id.* at 1317. Because the file history, however, “represents an ongoing negotiation between the PTO and the applicant,”

it may lack the clarity of the specification and thus be less useful in claim construction proceedings. *Id.* Nevertheless, the prosecution history is intrinsic evidence that is relevant to the determination of how the inventor understood the invention and whether the inventor limited the invention during prosecution by narrowing the scope of the claims. *Id.*; see *Microsoft Corp. v. Multi-Tech Sys., Inc.*, 357 F.3d 1340, 1350 (Fed. Cir. 2004) (noting that “a patentee’s statements during prosecution, whether relied on by the examiner or not, are relevant to claim interpretation”).

*Phillips* rejected any claim construction approach that sacrificed the intrinsic record in favor of extrinsic evidence, such as dictionary definitions or expert testimony. The *en banc* court condemned the suggestion made by *Texas Digital Systems, Inc. v. Telegenix, Inc.*, 308 F.3d 1193 (Fed. Cir. 2002), that a court should discern the ordinary meaning of the claim terms (through dictionaries or otherwise) before resorting to the specification for certain limited purposes. *Phillips*, 415 F.3d at 1319–24. According to *Phillips*, reliance on dictionary definitions at the expense of the specification had the effect of “focus[ing] the inquiry on the abstract meaning of words rather than on the meaning of claim terms within the context of the patent.” *Id.* at 1321. *Phillips* emphasized that the patent system is based on the proposition that the claims cover only the invented subject matter. *Id.*

*Phillips* does not preclude all uses of dictionaries in claim construction proceedings. Instead, the court assigned dictionaries a role subordinate to the intrinsic record. In doing so, the court emphasized that claim construction issues are not resolved by any magic formula. The court did not impose any particular sequence of steps for a court to follow when it considers disputed claim language. *Id.* at 1323–25. Rather, *Phillips* held that a court must attach the appropriate weight to the intrinsic sources offered in support of a proposed claim construction, bearing in mind the general rule that the claims measure the scope of the patent grant.



The Supreme Court of the United States has “read [35 U.S.C.] § 112, ¶ 2 to require that a patent’s claims, viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable certainty.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2129 (2014). “A determination of claim indefiniteness is a legal conclusion that is drawn from the court’s performance of its duty as the construer of patent claims.” *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1347 (Fed. Cir. 2005) (citations and internal quotation marks omitted), *abrogated on other grounds by Nautilus*, 134 S. Ct. 2120.

In general, prior claim construction proceedings involving the same patents-in-suit are “entitled to reasoned deference under the broad principals of *stare decisis* and the goals articulated by the Supreme Court in *Markman*, even though *stare decisis* may not be applicable *per se*.” *Maurice Mitchell Innovations, LP v. Intel Corp.*, No. 2:04-CV-450, 2006 WL 1751779, at \*4 (E.D. Tex. June 21, 2006) (Davis, J.); *see TQP Development, LLC v. Intuit Inc.*, No. 2:12-CV-180, 2014 WL 2810016, at \*6 (E.D. Tex. June 20, 2014) (Bryson, J.) (“[P]revious claim constructions in cases involving the same patent are entitled to substantial weight, and the Court has determined that it will not depart from those constructions absent a strong reason for doing so.”); *see also Teva*, 135 S. Ct. at 839–40 (“prior cases will sometimes be binding because of issue preclusion and sometimes will serve as persuasive authority”) (citation omitted); *Finisar Corp. v. DirecTV Grp., Inc.*, 523 F.3d 1323, 1329 (Fed. Cir. 2008) (noting “the importance of uniformity in the treatment of a given patent”) (quoting *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 390 (1996)).

### III. AGREED TERMS

In their December 2, 2016 Amended Joint Claim Construction and Prehearing Statement, the parties set forth agreements as to the following terms in the patents-in-suit (Dkt. No. 99, at 2):

<u>Term</u>	<u>Agreement</u>
<p>“means for transmitting the encoded wideband signal”</p> <p>(Claims 53 and 69 of the ’123 Patent)</p>	<p>This term is subject to 35 U.S.C. § 112(6).</p> <p>Function: transmitting an encoded wideband signal</p> <p>Corresponding Structure: transmission circuit; and equivalents thereof</p>
<p>“means for receiving a transmitted encoded wideband signal”</p> <p>(Claims 53 and 69 of the ’123 Patent)</p>	<p>This term is subject to 35 U.S.C. § 112(6).</p> <p>Function: receiving a transmitted encoded wideband signal</p> <p>Corresponding Structure: receiving circuit; and equivalents thereof</p>

The parties have also reached agreements as to the application of the Court’s *ZTE* constructions in the above-captioned case. (See Dkt. No. 93, Joint Motion for Entry of Prior Claim Construction Order as to Certain Specified Terms; see also Dkt. No. 95, Nov. 21, 2016 Order; Dkt. No. 145, Joint Notice Regarding Prior Claim Construction Briefing.)

### IV. DISPUTED TERMS

#### A. “[synthesized] [weighted] wideband [speech] signal”

<b>Plaintiff’s Proposed Construction</b>	<b>Defendants’ Proposed Construction</b>
<p>No construction is necessary.</p> <p>Alternatively:  “a [synthesized] [weighted] [speech] signal that spans a wider bandwidth than traditional telephone signals and that has a frequency range of approximately 50–7000Hz”</p>	<p>“a [synthesized] [weighted] [speech] signal that spans a wider bandwidth than traditional telephone signals and that has a frequency range of 50–7000 Hz sampled at 16000 samples/sec”</p>

(Dkt. No. 99, Ex. A, at 1; *id.*, Ex. B, at 1; Dkt. No. 100, at 4; Dkt. No. 109, at 3; Dkt. No. 117, at 1; Dkt. No. 118, Ex. B, at 1–2.) The parties submit that this term appears throughout the claims of the patents-in-suit. (*See* Dkt. No. 99, Ex. A, at 1; *id.*, Ex. B, at 1; Dkt. No. 118, Ex. B, at 1–2.)

(1) The Parties’ Positions

Plaintiff argues that “[t]he term ‘wideband signal’ has been well-known and commonly-used by those of ordinary skill in the art for years and need not be construed.” (Dkt. No. 100, at 4.) Plaintiff also argues that Defendants’ proposal should be rejected because “[a] wideband signal is not *strictly* limited to the range of 50–7,000 Hz,” and “Defendants’ addition of the phrase ‘sampled at 16000 samples/sec’ is also improper” because “the specification repeatedly refers to down-sampled signals as being ‘wideband’ signals.” (*Id.*, at 6 & 9.)

Defendants respond that the specification expressly defines the disputed term as requiring sampling at 16,000 samples/sec. (Dkt. No. 109, at 4 (citing ’805 Patent at 2:12–14).) Defendants argue that “[t]his explicit definition confirms both (a) the established ordinary meaning requires not only a specific bandwidth, but also a specific sampling rate, and (b) a wideband signal down-sampled to 12,800 samples/sec is no longer a wideband signal.” (Dkt. No. 109, at 5.)

Plaintiff replies, for example, that “signal ‘S’ in Figure 1 . . . is defined in the patent as the ‘wideband signal input speech vector (*after down-sampling*, pre-processing, and preemphasis).” (Dkt. No. 117, at 2 (quoting ’802 Patent at 7:58–59) (emphasis Plaintiff’s).)

At the March 3, 2017 hearing, Plaintiff also noted its alternative proposal in supplemental briefing in the *ZTE* case that “wideband” means “a signal that spans a wider bandwidth than traditional telephone signals and that has a frequency range of approximately 50–7000 Hz, including a signal down-sampled from 16 kHz to 12.8 kHz.” (*ZTE*, Dkt. No. 453.)

Defendants responded that the word “approximately,” which was introduced by the *ZTE* construction, is unclear and lacks support in the specification.

(2) Analysis

In *ZTE*, the Court construed this disputed term to mean “a [synthesized] [weighted] [speech] signal that spans a wider bandwidth than traditional telephone signals and that has a frequency range of approximately 50–7000Hz.”

Here as in *ZTE*, the Court finds construction is appropriate. *See ZTE* at 107–113. The Court thus rejects Plaintiff’s proposal that no construction is necessary.

Also, as in *ZTE*, the Court finds that the disputed term refers to an approximate frequency range, not a precise frequency range. *See id.* Further, although Defendants have argued that the word “approximately” lacks support, the specification discloses that “[a] bandwidth *in the range* 50–7000 Hz was found sufficient for delivering a face-to-face speech quality.” ’802 Patent at 1:25–27 (emphasis added). Because the term “bandwidth” itself refers to a band of frequencies, the phrase “in the range” can be readily interpreted as referring to an approximate range rather than an exact range. The Court hereby expressly rejects Defendants’ proposal of an exact frequency range of 50–7000 Hz.

The remaining issue, namely whether this term requires a sampling rate of 16,000 samples/sec (16 kHz), was not raised in the *ZTE* claim construction proceedings.

The ’805 Patent discloses:

In the telephone band, the sound signal is band-limited to 200–3400 Hz and sampled at 8000 samples/sec. In wideband speech/audio applications, the sound signal is band-limited to 50–7000 Hz and sampled at 16000 samples/sec.

’805 Patent at 2:9–13. This reference to particular “applications,” however, does not rise to the level of a clear definition of the term “wideband signal.” *See CCS Fitness, Inc. v. Brunswick Corp.*,

288 F.3d 1359, 1366 (Fed. Cir. 2002) (“[T]he claim term will not receive its ordinary meaning if the patentee acted as his own lexicographer and *clearly* set forth a definition of the disputed claim term in either the specification or prosecution history.”) (emphasis added); *see also Sinorgchem Co., Shandong v. Int’l Trade Comm’n*, 511 F.3d 1132, 1136 (Fed. Cir. 2007) (“the drafter clearly, deliberately, and precisely defined the term”).

On one hand, the ’802 Patent discloses, for example, that “[a]t the decoder, the high frequency contents of the signal needs to be reintroduced to remove the low pass filtering effect from the decoded synthesized signal and *retrieve the natural sounding quality of wideband signals.*” ’802 Patent at 2:53–61. Defendants’ expert likewise submits that down-sampling results in reduction of signal bandwidth. (Dkt. No. 109, Dec. 21, 2016 Kotzin Decl., at ¶ 46.)

On the other hand, the patents-in-suit refer to down-sampled signals—that is, signals with a sampling rate that is less than 16 kHz—as “wideband” signals. For example, Claim 1 of the ’802 Patent recites “receiving an encoded version of a wideband signal previously down-sampled during encoding,” and the specification discloses down-sampling “from 16 kHz to 12.8 kHz.” ’802 Patent at 8:33–34. Although Defendants argue that this claim recites merely “an encoded version” rather than a wideband signal itself, the same limitation of the claim refers to “said encoded wideband signal version.” A fair reading of this limitation is that this “version” of the signal is nonetheless still recited as a “wideband” signal. Further, the claim also recites “an oversampler responsive to said synthesized wideband signal for producing an over-sampled signal version of the synthesized wideband signal.” Overall, the recital in the claim of a “wideband” signal that has been down-sampled and that is then synthesized and oversampled, coupled with the disclosed example of down-sampling from 16 kHz to 12.8 kHz, weighs against Defendants’ proposal that

the term “wideband” is limited to 16 kHz signals. *See also, e.g., id.* at 1:10–11 (“a wideband signal previously down-sampled”) & 3:5–6 (same).

As to extrinsic evidence, Defendants have cited several technical articles that refer to wideband signals having a sampling rate of 16 kHz. (*See, e.g.,* Dkt. No. 109, Ex. A-2, Richard V. Cox, *Current Methods of Speech Coding*, International Journal of High Speed Electronics and Systems 16 (vol. 8, no. 1, 1997) (“when we refer to wideband speech, we mean speech with a bandwidth of 50–7000 Hz and a sampling rate of 16 kHz”); *id.*, Ex. A-3, U.S. Pat. No. 5,235,669 (“Ordentlich”) at 1:44–47 (“wideband speech is assigned the band 50 to 7000 Hz and is sampled at a rate of 16000 Hz for subsequent digital processing”); *id.*, Ex. A-4, Jürgen Paulus, et al., *Wideband Speech Coding for the GSM Fullrate Channel?* 11 (1996) (“a wideband coding scheme would require a sampling rate of 16 kHz”).)

Similarly, Defendants have cited an article referring to “extract[ing] the 0-6 kHz lower *subband* from the input wideband (7 kHz) signal and reduc[ing] the sampling rate from 16 kHz to 12 kHz . . . .” (*Id.*, Ex. A-8, Jürgen Schnitzler, *A 13.0 kbit/s Wideband Speech Codec Based on SB-ACELP* 157–58 (1998) (emphasis added).)

This extrinsic evidence, however, does not override the above-discussed context provided by the disclosure of down-sampling in the intrinsic evidence. *See Phillips*, 415 F.3d at 1318 (noting that “extrinsic evidence in general [is] less reliable than the patent and its prosecution history in determining how to read claim terms”).

Further, it is noteworthy that the frequency band of the signal is limited by the sampling rate in accordance with what the parties submit is known as the “Sampling Theorem” or “Nyquist Theorem,” which holds that the maximum frequency component of a signal can be no greater than half of the sampling rate. (*See* Dkt. No. 100-14, Dec. 2, 2016 Ogunfunmi Decl., at ¶ 21(c); *see*

also Dkt. No. 109-20, Dec. 21, 2016 Kotzin Decl., at ¶ 36; Dkt. No. 100, Ex. H, U.S. Pat. No. 6,615,169 (“Ojala”) at 2:1–3 (“According to the Nyquist theorem, a speech signal with a sampling rate  $F_s$  can represent a frequency band from 0 to  $0.5 F_s$ .”).) For example, for the bandwidth of a signal to extend up to 7000 Hz, the sampling rate must be at least 14,000 Hz (14,000 samples per second). Thus, whereas Defendants argue that the construction of the disputed term should specify a sampling rate, the *ZTE* construction already inherently includes a sampling rate limitation by way of the Sampling Theorem.

Finally, as noted above, Plaintiff has alternatively proposed construing “wideband” as “including a signal down-sampled from 16 kHz to 12.8 kHz” (*ZTE*, Dkt. No. 453). In some circumstances, “[a] patent claim should be construed to encompass at least one disclosed embodiment in the written description portion of the patent specification.” *Johns Hopkins Univ. v. CellPro, Inc.*, 152 F.3d 1342, 1355 (Fed. Cir. 1998); see *Accent Packaging, Inc. v. Leggett & Platt, Inc.*, 707 F.3d 1318, 1325–26 (Fed. Cir. 2013).

Here, however, Plaintiff’s alternative claim construction proposal would risk improperly invading the province of the finder of fact as to whether a particular accused instrumentality meets the “wideband” limitations. See *Am. Piledriving Equip., Inc. v. Geoquip, Inc.*, 637 F.3d 1324, 1331 (Fed. Cir. 2011) (“It is well settled that the role of a district court in construing claims is not to redefine claim recitations or to read limitations into the claims to obviate factual questions of infringement and validity but rather to give meaning to the limitations actually contained in the claims, informed by the written description, the prosecution history if in evidence, and any relevant extrinsic evidence.”); see also *Wilson Sporting Goods Co. v. Hillerich & Bradsby Co.*, 442 F.3d 1322, 1331 (Fed. Cir. 2006) (noting rule against “tailoring a claim construction to fit the dimensions of the accused product or process and to reach a preconceived judgment of

infringement or noninfringement”); *Markman*, 517 U.S. at 384 (“determining whether infringement occurred \* \* \* is a question of fact, to be submitted to a jury”) (citation and internal quotation marks omitted). Moreover, as discussed above, the construction of the disputed term need not set forth any explicit limitation as to sampling rate because the Court’s construction includes an inherent sampling rate limitation.

The Court therefore hereby construes “[synthesized] [weighted] wideband [speech] signal” to mean “a [synthesized] [weighted] [speech] signal that spans a wider bandwidth than traditional telephone signals and that has a frequency range of approximately 50–7000Hz.”

**B. “fixed denominator”**

Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
<p>No construction is necessary.</p> <p>Alternatively:  “a denominator that does not vary in time with the LP parameters <math>a_i</math>”</p> <p>To the extent the Court is inclined to give the term a specific construction, [Plaintiff] submits that also including the example filter with a fixed denominator recited in the ’524 Patent would be helpful to the Jury in applying the construction. This perceptual weighting filter has the form:  <math>W(z) = A(z/\gamma_1)/(1 - \gamma_2 z^{-1})</math> where <math>0 &lt; \gamma_2 &lt; \gamma_1 \leq 1</math>.</p>	<p>“a denominator that does not vary in time with the LP parameters <math>a_i</math>”</p>

(Dkt. No. 99, Ex. A, at 3; *id.*, Ex. B, at 4; Dkt. No. 100, at 11; Dkt. No. 109, at 11; Dkt. No. 117, at 7; Dkt. No. 118, Ex. B, at 2.) The parties submit that this term appears in Claims 1 and 8 of the ’524 Patent. (Dkt. No. 99, Ex. A, at 3; *id.*, Ex. B, at 4; Dkt. No. 118, Ex. B, at 2.)



(1) The Parties' Positions

Plaintiff argues that “[f]ixing the denominator of the perceptual weighting filter is specifically discussed in the AMR-WB standard, and as such, a person of ordinary skill in the art would readily understand the meaning of the term ‘fixed denominator’ in the context of claims 1 and 8.” (Dkt. No. 100, at 11.)

Defendants respond that they are willing to stipulate to Plaintiff’s alternative proposed construction, “[b]ut [Plaintiff has] declined to stipulate to its own alternative construction.” (Dkt. No. 109, at 12.)

Plaintiff replies that “a specific construction for ‘fixed denominator’ increases the risk of Jury confusion. Instead of evaluating a two-word term that is commonly used in the art, the Jury would be required to evaluate a much longer construction, adding unnecessary layers of analysis to the infringement inquiry.” (Dkt. No. 117, at 7.)

At the March 3, 2017 hearing, Plaintiff stated that it did not dispute the technical accuracy of Defendants’ proposed construction. Plaintiff maintained, however, that including its proposed example would be helpful.

(2) Analysis

Construction of the disputed term will be helpful to the finder of fact to the extent that Defendants have agreed with Plaintiff’s original alternative proposed construction. *See TQP Dev., LLC v. Merrill Lynch & Co., Inc.*, No. 2:08-CV-471, 2012 WL 1940849, at \*2 (E.D. Tex. May 29, 2012) (Bryson, J.) (“some construction of the disputed claim language will assist the jury to understand the claims”). Defendants’ proposal is also consistent with prosecution history cited by Plaintiff. (Dkt. No. 100, at 11 (discussing *id.*, Ex. K., Jan. 23, 2004 Reply Under 37 C.F.R. § 1.111, at 7 (SLFH00001618)).) As to Plaintiff’s proposal of including an example, Plaintiff has

not shown that any potential benefit would outweigh the risk of confusion or the risk that the finder of fact might perceive the example as limiting.

The Court therefore hereby construes “**fixed denominator**” to mean “**a denominator that does not vary in time with the LP parameters  $a_i$ .**”

**C. “A [device/method] for enhancing periodicity of an excitation signal produced in relation to a pitch codevector and an innovation codevector for supplying a signal synthesis filter in view of synthesizing a wideband speech signal”**

<b>Plaintiff’s Proposed Construction</b>	<b>Defendants’ Proposed Construction</b>
This term is the preamble to asserted claims in the ’805 Patent. As such, the term is not limiting.	Preamble is limiting

(Dkt. No. 99, Ex. A, at 1–2; *id.*, Ex. B, at 5; Dkt. No. 100, at 12; Dkt. No. 109, at 13; Dkt. No. 117, at 7; Dkt. No. 118, Ex. B, at 2–3.) The parties submit that this term appears in Claims 1 and 11 of the ’805 Patent. (Dkt. No. 99, Ex. A, at 1–2; *id.*, Ex. B, at 4; Dkt. No. 118, Ex. B, at 2.)

(1) The Parties’ Positions

Plaintiff argues that “claims 1 and 11 of the ’805 Patent contain similar elements and each define a structurally complete invention in the respective claim bodies.” (Dkt. No. 100, at 12.) Plaintiff urges that “the preamble merely states the intended purpose of the invention: namely, enhancing the periodicity of a produced excitation signal in order to supply it to a signal synthesis filter that synthesizes a wideband speech signal.” (*Id.*, at 13.)

Defendants respond: “First, several elements in the body of the claim depend on the preamble for antecedent basis”; “[s]econd, the claim body is not structurally complete without the preamble”; and third, during prosecution the examiner required as a “condition for allowance” that the claims be amended to specify a wideband “speech” signal. (Dkt. No. 109, at 13–15.)

Plaintiff replies that regardless of whether the preamble provides antecedent basis, nonetheless the preamble merely states the intended purpose of the invention. (Dkt. No. 117, at 7–8.)

At the March 3, 2017 hearing, Defendants reiterated that the preamble is limiting because it provides antecedent basis. Plaintiff responded by reiterating that the preamble is not limiting because it merely sets forth an intended use or purpose.

## (2) Analysis

Claims 1 and 11 of the '805 Patent are similar, except that whereas Claim 1 recites a device, Claim 11 recites a method. Claim 1 of the '805 Patent, for example, recites:

1. A device for enhancing periodicity of an excitation signal produced in relation to a pitch codevector and an innovative codevector for supplying a signal synthesis filter in view of synthesizing a wideband speech signal, said periodicity enhancing device comprising:

a) a factor generator for calculating a periodicity factor related to the wideband speech signal; and

b) an innovation filter for filtering the innovative codevector in relation to said periodicity factor to thereby reduce energy of a low frequency portion of the innovative codevector and enhance periodicity of a low frequency portion of the excitation signal.

*ZTE* found that the preamble of Claim 1 of the '805 Patent is not limiting. *See ZTE* at 78–80. There, the *ZTE* defendants had argued that the preamble set forth a means-plus-function limitation governed by 35 U.S.C. § 112, ¶ 6. *See id.* at 78–79. Plaintiff submitted proposed constructions for consideration “[t]o the extent the Court finds that the preamble is limiting and subject to § 112(6).” (*ZTE*, Dkt. No. 171, at 13.) The *ZTE* defendants responded by re-urging their 35 U.S.C. § 112, ¶ 6 argument, but they did not counter Plaintiff’s apparent suggestion that the preamble is not limiting. (*ZTE*, Dkt. No. 206, at 16–17.)

Here, Defendants urge that the body of each claim relies upon the preamble for antecedent basis for “the wideband speech signal,” “the innovative codevector,” and “the excitation signal.”

In particular, Defendants argue that the preamble provides further detail as to “the excitation signal” by reciting “an excitation signal produced in relation to a pitch codevector and an innovative codevector.” See ’805 Patent at 1:46–50 (“An excitation signal is determined in each subframe, which usually consists of two components: one from the past excitation (also called pitch contribution or adaptive code book or pitch codebook) and the other from an innovative codebook (also called fixed code book).”).

Nonetheless, Defendants have not shown that the recital of “enhancing periodicity” is anything other than a statement of purpose as to what is recited in the body of each claim. See *Catalina Mktg. Int’l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002) (“a preamble is not limiting where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention”) (citation and internal quotation marks omitted); see also *Marrin v. Griffin*, 599 F.3d 1290, 1294–95 (Fed. Cir. 2010) (referring to “the presumption against reading a statement of purpose in the preamble as a claim limitation”).

Finally, Defendants have cited an examiner’s amendment during prosecution that replaced “wideband signal” with “wideband speech signal” because the claims were “unclear as to what is being synthesized.” (Dkt. No. 109, Ex. A-16, Apr. 29, 2004 Interview Summary; *id.*, Notice of Allowability, at 2.) Because the body of the claim also recites “the wideband *speech* signal,” this amendment does not affect the analysis as to whether the preamble is limiting.

Thus, in light of the different arguments presented here as compared to *ZTE*, the Court hereby finds that the preambles of Claims 1 and 11 of the ’805 Patent are **limiting only as to “an excitation signal produced in relation to a pitch codevector and an innovative codevector.”**

**D. “low frequency portion”**

<b>Plaintiff’s Proposed Construction</b>	<b>Defendants’ Proposed Construction</b>
No construction necessary and the term should be given its plain and ordinary meaning.	Indefinite

(Dkt. No. 99, Ex. A, at 2; *id.*, Ex. B, at 5; Dkt. No. 100, at 13; Dkt. No. 109, at 18; Dkt. No. 118, Ex. B, at 3.) The parties submit that this term appears in Claims 1 and 11 of the ’805 Patent. (Dkt. No. 99, Ex. A, at 2; *id.*, Ex. B, at 5–6; Dkt. No. 118, Ex. B, at 3.)

(1) The Parties’ Positions

Plaintiff argues that “the term ‘low frequency portion’ is part of a ‘whereby clause’ that does not actually limit the claims in which it appears.” (Dkt. No. 100, at 14.) Alternatively, Plaintiff submits that “application of the innovation filters recited in the ’805 Patent’s specification would define the scope of the ‘low frequency portion’ with reasonable certainty.” (*Id.*, at 15 (citations omitted).)

Defendants respond that “[b]ecause the specification offers inconsistent teachings of what ‘high’ and ‘low’ frequencies mean, a person of skill in the art cannot reasonably ascertain the scope of ‘low frequency portion.’” (Dkt. No. 109, at 18–19.) Defendants also submit that, as the Court found in *ZTE*, what follows the “thereby” clause in the claim is a limitation because it imposes “additional limitations on the manner of [the claimed] filtering.” (*Id.*, at 19 (quoting *ZTE* at 119) (alteration Defendants’).)

Plaintiff replies that Defendants have failed to demonstrate any inconsistency because the terms “low frequency portion” and “high frequency content” appear in different patents, namely the ’805 Patent and the ’524 Patent, respectively. (Dkt. No. 117, at 8.)

At the March 3, 2017 hearing, the parties presented no oral arguments as to this term.

## (2) Analysis

Claim 1 of the '805 Patent, for example, recites (emphasis added):

1. A device for enhancing periodicity of an excitation signal produced in relation to a pitch codevector and an innovative codevector for supplying a signal synthesis filter in view of synthesizing a wideband speech signal, said periodicity enhancing device comprising:

a) a factor generator for calculating a periodicity factor related to the wideband speech signal; and

b) an innovation filter for filtering the innovative codevector in relation to said periodicity factor *to thereby reduce energy of a low frequency portion of the innovative codevector and enhance periodicity of a low frequency portion of the excitation signal.*

*ZTE* rejected Plaintiff's argument that this disputed term appears in a non-limiting portion of the claims, and the Court reaches the same conclusion here. *See ZTE* at 118–20.

Likewise, the Court reaches the same conclusion here as in *ZTE* that the word “low” does not give rise to indefiniteness because the relative bandwidths and the precise manner of filtering are implementation-specific details. *See id.* at 118–21; *see also* '805 Patent at 14:6–30; *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 806 F.2d 1565, 1576 (Fed. Cir. 1986) (regarding a chair leg portion “so dimensioned as to be insertable through the space between the doorframe of an automobile and one of the seats thereof,” finding that “[t]he patent law does not require that all possible lengths corresponding to the spaces in hundreds of different automobiles be listed in the patent, let alone that they be listed in the claims”); *see also Nautilus*, 134 S. Ct. at 2128 (citation and internal quotation marks omitted); *id.* at 2128 n.5 (citing *Eibel Process Co. v. Minn. & Ontario Paper Co.*, 261 U.S. 45, 58, 65-66 (1923) (Taft, J.), as “upholding as definite a patent for an improvement to a paper-making machine, which provided that a wire be placed at a ‘high’ or ‘substantial elevation,’ where ‘readers . . . skilled in the art of paper making and versed in the use of the . . . machine’ would have ‘no difficulty . . . in determining . . . the substantial [elevation] needed’ for the machine to operate as specified”) (ellipses and square bracketed text the Court’s);

*id.* at 2129 (“The definiteness requirement . . . mandates clarity, while recognizing that absolute precision is unattainable.”); *Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1370 (Fed. Cir. 2014) (“We do not understand the Supreme Court to have implied in *Nautilus* . . . that terms of degree are inherently indefinite.”). The opinions of Plaintiff’s expert are also persuasive. (Dkt. No. 100-14, Dec. 2, 2016 Ogunfunmi Decl. at ¶¶ 23–42.) Finally, although Defendants argue that the specification fails to adequately distinguish between “high” and “low,” it is noteworthy that the disputed terms “low frequency portion” and “high frequency content” appear in different claims in different patents.

The Court therefore hereby expressly rejects Defendants’ indefiniteness argument. No further construction is necessary. *See U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997) (“Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement. It is not an obligatory exercise in redundancy.”); *see also O2 Micro Int’l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008) (“[D]istrict courts are not (and should not be) required to construe every limitation present in a patent’s asserted claims.”); *Acumed LLC v. Stryker Corp.*, 483 F.3d 800, 806 (Fed. Cir. 2007) (“The resolution of some line-drawing problems . . . is properly left to the trier of fact.”) (citing *PPG Indus. v. Guardian Indus. Corp.*, 156 F.3d 1351, 1355 (Fed. Cir. 1998) (“after the court has defined the claim with whatever specificity and precision is warranted by the language of the claim and the evidence bearing on the proper construction, the task of determining whether the construed claim reads on the accused product is for the finder of fact”)); *Eon Corp. IP Holdings v. Silver Spring Networks*, 815 F.3d 1314, 1318–19 (Fed. Cir. 2016) (citing *PPG*).

The Court accordingly hereby construes “**low frequency portion**” to have its **plain meaning**.

**E. “high frequency content”**

<b>Plaintiff’s Proposed Construction</b>	<b>Defendants’ Proposed Construction</b>
No construction necessary and the term should be given its plain and ordinary meaning.	Indefinite

(Dkt. No. 99, Ex. A, at 3; *id.*, Ex. B, at 6; Dkt. No. 100, at 15; Dkt. No. 109, at 15; Dkt. No. 118, Ex. B, at 3.) The parties submit that this term appears in Claims 1 and 8 of the ’524 Patent. (Dkt. No. 99, Ex. A, at 3; *id.*, Ex. B, at 6; Dkt. No. 118, Ex. B, at 3.)

(1) The Parties’ Positions

Plaintiff argues that “the term ‘high frequency content’ does not impose any structural limitations on the preemphasis filter, and instead recites its intended use,” and therefore “the term ‘high frequency content’ is not a limitation.” (Dkt. No. 100, at 15–16.) Alternatively, Plaintiff submits that “[t]he ‘high frequency content’ term refers to the output of the preemphasis filter, and the application of the preemphasis filter disclosed in the ’524 Patent would define the scope of the ‘high frequency portion’ with reasonable certainty.” (*Id.*, at 16 (citation omitted).)

Defendants respond that “the specification contains conflicting teachings that were not presented to the Court in the prior cases, leaving uncertainty about the scope of the ‘high’ and ‘low’ frequency claim terms.” (Dkt. No. 109, at 16.) Defendants also submit that, for the reasons set forth in *ZTE*, “for enhancing a high frequency content” is a limitation. (*Id.*, at 18.)

Plaintiff replies as to this term together with “low frequency portion,” which is addressed separately above. (*See* Dkt. No. 117, at 8–9.)

At the March 3, 2017 hearing, the parties presented no oral arguments as to this term.



## (2) Analysis

Claim 1 of the '524 Patent, for example, recites (emphasis added):

1. A perceptual weighting device for producing a perceptually weighted signal in response to a wideband speech signal in order to reduce a difference between the wideband speech signal and a subsequently synthesized wideband speech signal, said perceptual weighting device comprising:

a) a signal preemphasis filter responsive to the wideband speech signal for *enhancing a high frequency content* of the wideband speech signal to thereby produce a preemphasised signal;

b) a synthesis filter calculator responsive to said preemphasised signal for producing synthesis filter coefficients; and

c) a perceptual weighting filter, responsive to said preemphasised signal and said synthesis filter coefficients, for filtering said preemphasised signal in relation to said synthesis filter coefficients to thereby produce said perceptually weighted signal, said perceptual weighting filter having a transfer function with fixed denominator whereby weighting of said wideband speech signal in a formant region is substantially decoupled from a spectral tilt of said wideband speech signal.

*ZTE* rejected Plaintiff's argument that this disputed term appears in a non-limiting portion of the claims, and the Court reaches the same conclusion here. *See ZTE* at 122–23.

The Court hereby expressly rejects Defendants' indefiniteness argument for substantially the same reasons set forth in *ZTE*. *See ZTE* at 117–23. The opinions of Plaintiff's expert are also persuasive. (*See* Dkt. No. 100-14, Dec. 2, 2016 Ogunfunmi Decl., at ¶¶ 43–49.) Finally, although Defendants argue that the specification fails to adequately distinguish between “high” and “low,” it is noteworthy that the disputed terms “low frequency portion” and “high frequency content” appear in different claims in different patents.

No further construction is necessary. *See U.S. Surgical*, 103 F.3d at 1568; *see also O2 Micro*, 521 F.3d at 1362; *Acumed*, 483 F.3d at 806; *Eon*, 815 F.3d at 1318–19.

The Court accordingly hereby construes “[**enhanced**] / [**enhancing a**] **high frequency content**” to have its **plain meaning**.

**F. “wherein  $\gamma_2$  is set equal to  $\mu$ ”**

Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
No construction necessary and the term should be given its plain and ordinary meaning.	Indefinite

(Dkt. No. 99, Ex. A, at 3; *id.*, Ex. B, at 7; Dkt. No. 100, at 17; Dkt. No. 109, at 19; Dkt. No. 117, at 9; Dkt. No. 118, Ex. B, at 3–4.) The parties submit that this term appears in Claims 7, 14, 21, 35, and 42 of the ’524 Patent. (Dkt. No. 99, Ex. A, at 3; *id.*, Ex. B, at 7; Dkt. No. 118, Ex. B, at 3–4.)

(1) The Parties’ Positions

Plaintiff submits that “Defendants do not allege that all instances of the term ‘wherein  $\gamma_2$  is set equal to  $\mu$ ’ in the ’524 Patent are indefinite.” (Dkt. No. 100, at 17.) “Additionally, the specification adequately defines what ‘ $\mu$ ’ means in the term ‘wherein  $\gamma_2$  is set equal to  $\mu$ .” (*Id.*, at 18.)

Defendants argue that “[t]he term ‘ $\mu$ ’ has no antecedent basis within the phrase ‘wherein  $\gamma_2$  is set equal to  $\mu$ ’ in dependent Claims 7, 14, 21, 35, and 42 of the ’524 Patent (the ‘challenged claims’), rendering those claims indefinite.” (Dkt. No. 109, at 20.)

Plaintiff replies that because the specification explains the meaning of “ $\mu$ ,” the Court should reject Defendants’ argument that each claim *itself* must define “ $\mu$ .” (Dkt. No. 117, at 9.)

At the March 3, 2017 hearing, the parties presented no oral arguments as to this term.

(2) Analysis

Claim 7 of the ’524 Patent, for example, depends from Claim 6, which in turn depends from Claim 1. Claims 6 and 7 of the ’524 Patent recite (emphasis added):

6. A perceptual weighting device as defined in claim 1, wherein said perceptual weighting filter has a transfer function of the form:

$$W(z) = A(z/\gamma_1)/(1 - \gamma_2 z^{-1})$$

where  $0 < \gamma_2 < \gamma_1 \leq 1$  and  $\gamma_2$  and  $\gamma_1$  are weighting control values.

7. A perceptual weighting device as defined in claim 6, wherein  $\gamma_2$  is set equal to  $\mu$ .

Claim 7 thus recites  $\mu$  without reciting any definition or antecedent basis. By contrast, Claim 5 of the '524 Patent depends from Claim 4, which in turn depends from Claim 2, and Claim 2 recites that " $\mu$  is a preemphasis factor":

2. A perceptual weighting device as defined in claim 1, wherein said signal preemphasis filter has a transfer function of the form:

$$P(z) = 1 - \mu z^{-1}$$

wherein  $\mu$  is a preemphasis factor having a value located between 0 and 1.

The specification discloses:

In a preferred embodiment of the preemphasis filter 103, the signal  $s_p(n)$  is preemphasized using a filter having the following transfer function:

$$P(z) = 1 - \mu z^{-1}$$

where  $\mu$  is a preemphasis factor with a value located between 0 and 1 (a typical value is  $\mu=0.7$ ). A higher-order filter could also be used.

'524 Patent at 7:66–8:6.

Plaintiff has not shown that this disclosure in the specification amounts to a lexicography. *See, e.g., CCS Fitness*, 288 F.3d at 1366 (“the claim term will not receive its ordinary meaning if the patentee acted as his own lexicographer and *clearly* set forth a definition of the disputed claim term in either the specification or prosecution history”) (emphasis added). On the contrary, the above-quoted disclosure explicitly refers to “a preferred embodiment.” Further, Defendants’ expert has opined that  $\mu$  “is not a term of art in the relevant technology” (*see* Dkt. No. 109-20, Dec. 21, 2016 Kotzin Decl., at ¶ 98; *see also id.*, at ¶¶ 101–03), and Plaintiff has not presented any evidence to the contrary.

On balance, because no antecedent basis is present for  $\mu$  in Claims 7, 14, 21, 35, and 42 of the '524 Patent—and because no lexicography or reasonably ascertainable meaning is present for  $\mu$  in the instances in which no antecedent basis is present—those claims “fail to inform those

skilled in the art about the scope of the invention with reasonable certainty.” *Nautilus*, 134 S. Ct. at 2129.

The Court therefore finds that “wherein  $\gamma_2$  is set equal to  $\mu$ ,” as used in Claims 7, 14, 21, 35, and 42 of the ’524 Patent, is indefinite.

**G. “said excitation signal”**

Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
No construction necessary and the term should be given its plain and ordinary meaning.	“the excitation signal produced by combining said pitch codevector and said innovative codevector in step (d)/[step (iv)]”  -or-  “the excitation signal produced by combining said pitch codevector and said innovative codevector in element (d)/[element (iv)]”

(Dkt. No. 99, Ex. A, at 4; *id.*, Ex. B, at 8; Dkt. No. 100, at 18; Dkt. No. 109, at 22; Dkt. No. 117, at 9; Dkt. No. 118, Ex. B, at 4.) The parties submit that this term appears in Claims 1, 9, and 25 of the ’802 Patent. (Dkt. No. 99, Ex. A, at 4; *id.*, Ex. B, at 8; Dkt. No. 118, Ex. B, at 4.)

(1) The Parties’ Positions

Plaintiff argues that whereas “Defendants’ construction appears to construe the term ‘said’ from this larger phrase,” “Defendants’ construction is unnecessary in light of the existing claim language and fails to provide any meaningful guidance to the Jury.” (Dkt. No. 100, at 18.)

Defendants respond that “each claim first recites ‘an excitation signal’ followed by ‘said excitation signal,’ and Defendants seek to confirm that they are both referring to the same ‘excitation signal.’” (Dkt. No. 109, at 22.)

Plaintiff replies that Defendants “merely rearrange[] the existing words of the claim without providing any clarification of its meaning or articulating the substance of [Defendants’] alleged dispute.” (Dkt. No. 117, at 9.)

At the March 3, 2017 hearing, Defendants submitted that the specification discloses an enhanced excitation signal as distinct from a mere excitation signal. Plaintiff responded that although the claims at issue do not require enhancement, for example by filtering and amplifying, the claims do not *preclude* such enhancement.

## (2) Analysis

Claim 1 of the ’802 Patent, for example, recites (emphasis added):

1. A decoder for producing a synthesized wideband signal, comprising:
  - a) a signal fragmenting device for receiving an encoded version of a wideband signal previously down-sampled during encoding and extracting from said encoded wideband signal version at least pitch codebook parameters, innovative codebook parameters, and linear prediction filter coefficients;
  - b) a pitch codebook responsive to said pitch codebook parameters for producing a pitch codevector;
  - c) an innovative codebook responsive to said innovative codebook parameters for producing an innovative codevector;
  - d) a combiner circuit for combining said pitch codevector and said innovative codevector to thereby produce *an excitation signal*;
  - e) a signal synthesis device including a linear prediction filter for filtering *said excitation signal* in relation to said linear prediction filter coefficients to thereby produce a synthesized wideband signal, and an oversampler responsive to said synthesized wideband signal for producing an over-sampled signal version of the synthesized wideband signal; and
  - f) a high-frequency content recovering device comprising:
    - i) a random noise generator for producing a noise sequence having a given spectrum;
    - ii) a spectral shaping unit for shaping the spectrum of the noise sequence in relation to linear prediction filter coefficients related to said down-sampled wideband signal; and
    - iii) a signal injection circuit for injecting said spectrally-shaped noise sequence in said over-sampled synthesized signal version to thereby produce said full-spectrum synthesized wideband signal.

On its face, the antecedent basis for “said excitation signal” in element (e) is “an excitation signal” recited in element (d). *See, e.g., Summit 6, LLC v. Samsung Elecs. Co., Ltd.*, 802 F.3d 1283, 1291 (Fed. Cir. 2015) (as to “said one or more preprocessing parameters,” finding that “use of the term ‘said’ indicates that this portion of the claim limitation is a reference back to the previously claimed ‘pre-processing parameters’”).

Defendants have expressed concern that Plaintiff may attempt to “put forth at trial an infringement case that maps ‘an excitation signal’ and ‘said excitation signal’ to two different excitation signals respectively.” (Dkt. No. 109, at 23.)

In the context here at issue as to “excitation signal” and “said excitation signal,” whether a modified “excitation signal” is nonetheless the same “excitation signal” presents questions of fact as to particular implementation details. To the extent that Defendants are arguing that “said excitation signal” cannot have undergone any modifications or enhancements, Defendants have not identified any claim language or legal precedent that would support such a rigid interpretation. *See Microprocessor Enhancement Corp. v. Tex. Instruments Inc.*, 520 F.3d 1367, 1375 (Fed. Cir. 2008) (“the patentee’s mere use of a term with an antecedent does not require that both terms have the same meaning”).

On balance, Defendants’ concern relates not to any issue of claim construction but rather to how Plaintiff purportedly may apply the claims to the accused instrumentalities. *See PPG*, 156 F.3d at 1355 (“[A]fter the court has defined the claim with whatever specificity and precision is warranted by the language of the claim and the evidence bearing on the proper construction, the task of determining whether the construed claim reads on the accused product is for the finder of fact.”); *see also Eon*, 815 F.3d at 1318–19 (citing *PPG*).

Based on the foregoing, no construction of “said excitation signal” is necessary. *See U.S. Surgical*, 103 F.3d at 1568 (“Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement. It is not an obligatory exercise in redundancy.”); *see also O2 Micro*, 521 F.3d at 1362.

The Court therefore hereby construes “said excitation signal” to have its **plain meaning**.

**H. “means for comparing an innovative codebook gain  $g$  computed during encoding of the wideband signal to a threshold given by the initial modified gain from the past subframe  $g-1$  as follows: if  $g < g-1$  then  $g_0 = g \times 1.19$  bounded by  $g_0 \leq g-1$ , and if  $g \geq g-1$  then  $g_0 = g/1.19$  bounded by  $g_0 \geq g-1$ ”**

Plaintiff submits that this term appears in Claims 35, 67, and 83 of the ’123 Patent. (Dkt. No. 100, at 19.)

(1) The Parties’ Positions

Plaintiff argues that “the claim itself recites the specific algorithm used to perform the recited function, and thus recites sufficient structure.” (Dkt. No. 100, at 20.) Plaintiff concludes that “[b]ecause th[is] . . . term[] recite[s] sufficient structure in the claim itself in the form of the disclosed algorithm[], [Plaintiff] respectfully submits that [this term is] not subject to § 112(6).” (*Id.*)

Defendants respond: “Defendants take no position on th[is] term[] beyond what was already briefed and incorporated by reference pursuant to [Dkt. No.] 93, Order Granting the Parties’ Joint Motion for Entry of Prior Claim Construction Order as to Certain Specified Terms.” (Dkt. No. 109, at 24.)

At the March 3, 2017 hearing, the parties presented no oral arguments as to this term. (*See* Dkt. No. 145, at 1-2; *see also id.*, at App’x 2.)

(2) Analysis

The present disputed term was not at issue in *ZTE*. (See Dkt. No. 93, at 4 (“the parties identify eight ‘means for’ terms in Appendix C not addressed in the Prior Claim Construction Order”) & App’x C; see also *ZTE*, Dkt. No. 67, Nov. 25, 2016 Amended Joint Claim Construction and Prehearing Statement; *id.*, Dkt. No. 74, Defs.’ Responsive Claim Construction Brief Pursuant to P.R. 4-5(b); *id.*, Dkt. No. 80, Dec. 23, 2016 Joint Claim Construction Chart Pursuant to P.R. 4-5(d).)

Defendants’ above-noted reference to the *ZTE* briefing (Dkt. No. 109, at 24) thus appears to be a general reference to the *ZTE* defendants’ arguments regarding purported lack of disclosure of a computer or processor. Yet, the parties here have agreed that the *ZTE* findings as to disclosure of a computer or processor will apply in the present case. (See Dkt. No. 93, at 4; see also Dkt. No. 95, at 3.)

“[T]he word ‘means’ in a claim element creates a rebuttable presumption that § 112, para. 6 applies,” and Plaintiff has not overcome the presumption. *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1348 (Fed. Cir. 2015). Although the disputed term sets forth a mathematical relationship, the claims do not themselves recite a processor.

The parties have agreed as follows:

To the extent the Court finds that the term is subject to 35 U.S.C. 112(6), the parties agree that the claimed function is “comparing an innovative codebook gain  $g$  computed during encoding of the wideband signal to a threshold given by the initial modified gain from the past subframe  $g_{-1}$ ,” and that the specification links this function to the following disclosure: “if  $g < g_{-1}$  then  $g_0 = g * 1.19$  bounded by  $g_0 < g_{-1}$ , and wherein if  $g > g_{-1}$  then  $g_0 = g / 1.19$  bounded by  $g_0 > g_{-1}$ .”

(Dkt. No. 93, App’x C, at p. 3 of 5.)

The Court therefore hereby construes this disputed term as set forth in the following chart:



<u>Term</u>	<u>Construction</u>
<p><b>“means for comparing an innovative codebook gain <math>g</math> computed during encoding of the wideband signal to a threshold given by the initial modified gain from the past subframe <math>g-1</math> as follows: if <math>g &lt; g-1</math> then <math>g_0 = g \times 1.19</math> bounded by <math>g_0 \leq g-1</math>, and if <math>g \geq g-1</math> then <math>g_0 = g/1.19</math> bounded by <math>g_0 \geq g-1</math>”</b></p>	<p><b>35 U.S.C. § 112, ¶ 6 applies.</b></p> <p>Function:  <b>“comparing an innovative codebook gain <math>g</math> computed during encoding of the wideband signal to a threshold given by the initial modified gain from the past subframe <math>g-1</math>”</b></p> <p>Corresponding Structure:  <b>“a processor configured such that if <math>g &lt; g-1</math> then <math>g_0 = g \times 1.19</math> bounded by <math>g_0 &lt; g-1</math>, and wherein if <math>g &gt; g-1</math> then <math>g_0 = g/1.19</math> bounded by <math>g_0 &gt; g-1</math>”</b></p>

**I. “means for determining said smoothing gain through the following relation:  $g_s = S_m \cdot g_0 + (1 - S_m) \cdot g$ ”**

Plaintiff submits that this term appears in Claims 36, 68, and 84 of the '123 Patent. (Dkt. No. 100, at 19.)

(1) The Parties' Positions

Plaintiff argues that “the claim itself recites the specific algorithm used to perform the recited function, and thus recites sufficient structure.” (Dkt. No. 100, at 20.)

Defendants respond: “Defendants take no position on th[is] term[] beyond what was already briefed and incorporated by reference pursuant to [Dkt. No.] 93, Order Granting the Parties' Joint Motion for Entry of Prior Claim Construction Order as to Certain Specified Terms.” (Dkt. No. 109, at 24.)

At the March 3, 2017 hearing, the parties presented no oral arguments as to this term. (See Dkt. No. 145, at 1-2; *see also id.*, at App'x 2.)

(2) Analysis

The present disputed term was not at issue in *ZTE*. (See Dkt. No. 93, at 4 (“the parties identify eight ‘means for’ terms in Appendix C not addressed in the Prior Claim Construction Order”) & App’x C; see also *ZTE*, Dkt. No. 67, Nov. 25, 2016 Amended Joint Claim Construction and Prehearing Statement; *id.*, Dkt. No. 74, Defs.’ Responsive Claim Construction Brief Pursuant to P.R. 4-5(b); *id.*, Dkt. No. 80, Dec. 23, 2016 Joint Claim Construction Chart Pursuant to P.R. 4-5(d).)

Defendants’ above-noted reference to the *ZTE* briefing (Dkt. No. 109, at 24) thus appears to be a general reference to the *ZTE* defendants’ arguments regarding purported lack of disclosure of a computer or processor. Yet, the parties here have agreed that the *ZTE* findings as to disclosure of a computer or processor will apply in the present case. (See Dkt. No. 93, at 4; see also Dkt. No. 95, at 3.)

“[T]he word ‘means’ in a claim element creates a rebuttable presumption that § 112, para. 6 applies,” and Plaintiff has not overcome the presumption. *Williamson*, 792 F.3d at 1348. Although the disputed term sets forth a mathematical relationship, the claims do not themselves recite a processor.

The parties have agreed as follows:

To the extent the Court finds that the term is subject to 35 U.S.C. 112(6), the parties agree that the claimed function is “determining said smoothing gain,” and that the specification links this function to the following disclosure: “ $gs = Sm * g0 + (1 - Sm) * g$ .”

(Dkt. No. 93, App’x C, at p. 4 of 5.)

The Court therefore hereby construes this disputed term as set forth in the following chart:

<u>Term</u>	<u>Construction</u>
<p><b>“means for determining said smoothing gain through the following relation: <math>g_s = S_m * g_0 + (1 - S_m) * g</math>”</b></p>	<p><b>35 U.S.C. § 112, ¶ 6 applies.</b></p> <p>Function:  <b>“determining said smoothing gain”</b></p> <p>Corresponding Structure:  <b>“a processor configured such that <math>g_s = S_m * g_0 + (1 - S_m) * g</math>”</b></p>

## J. Additional Terms

Plaintiff’s opening brief also addresses the following six terms:

<b>Term</b>	<b>Plaintiff’s Position</b>
<p>“spectral shaping unit for shaping the spectrum of the noise sequence in relation to linear prediction filter coefficients related to said down-sampled wideband signal”</p> <p>(’802 Patent, Claims 1, 9, 25)</p>	<p>Plaintiff submits that this term appears in Claims 1, 9, and 25 of the ’802 Patent. (Dkt. No. 100, at 21.)</p> <p>Plaintiff argues that “Defendants fail to rebut the presumption that the terms are <i>not</i> subject to § 112(6)” because this term “include[s] substantial additional language that describe[s] [its] operation and [its] interaction with other elements.” (<i>Id.</i>, at 20 &amp; 21.)</p>
<p>“gain adjustment module, responsive to said white noise sequence and a set of gain adjusting parameters, for producing a scaled white noise sequence”</p> <p>(’802 Patent, Claims 3, 11, 27, 35)</p>	<p>Plaintiff submits that this term appears in Claims 3, 11, 27, and 35 of the ’802 Patent. (Dkt. No. 100, at 21.)</p> <p>Plaintiff argues that “Defendants fail to rebut the presumption that the terms are <i>not</i> subject to § 112(6)” because this term “include[s] substantial additional language that describe[s] [its] operation and [its] interaction with other elements.” (<i>Id.</i>, at 20 &amp; 21.)</p>

<p>“convolution unit for convolving the pitch codevector with a weighted synthesis filter impulse response signal”</p> <p>(’521 Patent, Claims 5, 14, 32, 41)</p>	<p>Plaintiff submits that this term appears in Claims 5, 14, 32, and 41 of the ’521 Patent. (Dkt. No. 100, at 21.)</p> <p>Plaintiff argues that “Defendants fail to rebut the presumption that the terms are <i>not</i> subject to § 112(6)” because this term “include[s] substantial additional language that describe[s] [its] operation and [its] interaction with other elements.” (<i>Id.</i>, at 20 &amp; 21.)</p>
<p>“signal fragmenting device for receiving an encoded wideband speech signal and extracting from said encoded wideband speech signal at least pitch codebook parameters, innovative codebook parameters, and synthesis filter coefficients”</p> <p>(’805 Patent, Claims 21, 31)</p>	<p>Plaintiff submits that this term appears in Claims 21 and 31 of the ’805 Patent. (Dkt. No. 100, at 22.)</p> <p>Plaintiff argues that “Defendants fail to rebut the presumption that the terms are <i>not</i> subject to § 112(6).” (<i>Id.</i>, at 20.)</p>
<p>“signal fragmenting device for receiving an encoded version of a wideband signal previously down-sampled during encoding and extracting from said encoded wideband signal version at least pitch codebook parameters, innovative codebook parameters, and linear prediction filter coefficients”</p> <p>(’802 Patent, Claims 1, 9, 25)</p>	<p>Plaintiff submits that this term appears in Claims 21 and 31 of the ’805 Patent. (Dkt. No. 100, at 22.)</p> <p>Plaintiff argues that “Defendants fail to rebut the presumption that the terms are <i>not</i> subject to § 112(6).” (<i>Id.</i>, at 20.)</p>
<p>“pitch analysis device responsive to the pitch codevector for selecting, from said sets of pitch codebook parameters, the set of pitch codebook parameters associated to the signal path having the lowest calculated pitch prediction error”</p> <p>(’521 Patent, Claim 10)</p>	<p>Plaintiff submits that this term appears in Claim 10 of the ’521 Patent. (Dkt. No. 100, at 23.)</p> <p>Plaintiff argues that “Defendants fail to rebut the presumption that the terms are <i>not</i> subject to § 112(6)” because this term “includes substantial additional language describing the operation of the components at issue and their interaction with other components.” (<i>Id.</i>, at 23.)</p>

“Defendants take no position on these terms beyond what was already briefed and incorporated by reference pursuant to [Dkt. No.] 93, Order Granting the Parties’ Joint Motion for

Entry of Prior Claim Construction Order as to Certain Specified Terms.” (Dkt. No. 109, at 24.) Plaintiff’s reply brief does not address these terms. (See Dkt. No. 117.) At the March 3, 2017 hearing, the parties presented no oral arguments as to these terms. (See Dkt. No. 145, at 1-2; see also *id.*, at App’x 2.)

These six additional terms were construed by the Court in *ZTE*. See *ZTE* at 44, 47–48, 49, 54–55, 64 & 76. The parties have not shown any reason for the Court to depart from the *ZTE* constructions. See, e.g., *id.* at 42–44. The Court therefore hereby construes these disputed terms as set forth in the following chart:

<u>Term</u>	<u>Construction</u>
<p><b>“spectral shaping unit for shaping the spectrum of the noise sequence in relation to linear prediction filter coefficients related to said down-sampled wideband signal”</b></p>	<p><b>35 U.S.C. § 112, ¶ 6 applies.</b></p> <p>Function:  <b>“shaping the spectrum of the noise sequence in relation to linear prediction filter coefficients related to said down-sampled wideband signal”</b></p> <p>Corresponding Structure:  <b>“a processor configured to filter the noise <math>w_g</math> through a bandwidth expanded version of the same LP synthesis filter used in the down-sampled domain (<math>1/\hat{A}(z/0.8)</math>), and equivalents thereof”</b></p>
<p><b>“gain adjustment module, responsive to said white noise sequence and a set of gain adjusting parameters, for producing a scaled white noise sequence”</b></p>	<p><b>35 U.S.C. § 112, ¶ 6 applies.</b></p> <p>Function:  <b>“producing a scaled white noise sequence”</b></p> <p>Corresponding Structure:  <b>“a processor configured such that <math>w_g = g_t w</math> and equivalents thereof”</b></p>

<p><b>“convolution unit for convolving the pitch codevector with a weighted synthesis filter impulse response signal”</b></p>	<p><b>35 U.S.C. § 112, ¶ 6 applies.</b></p> <p>Function:  <b>“convolving the pitch codevector with a weighted synthesis filter impulse response signal”</b></p> <p>Corresponding Structure:  <b>“a processor configured to convolve the vectors <math>v_f^{(j)}</math> with the impulse response <math>h</math> to obtain the vectors <math>y^{(j)}</math>, where <math>j = 0, 1, 2, \dots, K</math>, and equivalents thereof”</b></p>
<p><b>“signal fragmenting device for receiving an encoded wideband speech signal and extracting from said encoded wideband speech signal at least pitch codebook parameters, innovative codebook parameters, and synthesis filter coefficients”</b></p>	<p><b>35 U.S.C. § 112, ¶ 6 applies.</b></p> <p>Function:  <b>“receiving an encoded wideband speech signal and extracting from said encoded wideband speech signal at least pitch codebook parameters, innovative codebook parameters, and synthesis filter coefficients”</b></p> <p>Corresponding Structure:  <b>“a processor configured to demultiplex the long-term prediction (LTP) parameters <math>T</math>, <math>b</math>, and <math>j</math> per subframe, the innovation codebook index <math>k</math> and gain <math>g</math> per subframe, and the short-term prediction parameters (STP) <math>\hat{A}(z)</math> per frame; and equivalents thereof”</b></p>

<p><b>“signal fragmenting device for receiving an encoded version of a wideband signal previously down-sampled during encoding and extracting from said encoded wideband signal version at least pitch codebook parameters, innovative codebook parameters, and linear prediction filter coefficients”</b></p>	<p><b>35 U.S.C. § 112, ¶ 6 applies.</b></p> <p>Function:  <b>“receiving an encoded version of a wideband signal previously down-sampled during encoding and extracting from said encoded wideband signal version at least pitch codebook parameters, innovative codebook parameters, and linear prediction filter coefficients”</b></p> <p>Corresponding Structure:  <b>“a processor configured to demultiplex the long-term prediction (LTP) parameters T, b, and j per subframe, the innovation codebook index k and gain g per subframe, and the short-term prediction parameters (STP) <math>\hat{A}(z)</math> per frame; and equivalents thereof”</b></p>
<p><b>“pitch analysis device responsive to the pitch codevector for selecting, from said sets of pitch codebook parameters, the set of pitch codebook parameters associated to the signal path having the lowest calculated pitch prediction error”</b></p>	<p><b>35 U.S.C. § 112, ¶ 6 applies.</b></p> <p>Function:  <b>“selecting, from said sets of pitch codebook parameters, the set of pitch codebook parameters associated to the signal path having the lowest calculated pitch prediction error”</b></p> <p>Corresponding Structure:  <b>“a processor configured to select the parameters b, T, and j, corresponding to the <math>v_T</math> or <math>v_f^{(i)}</math> which minimizes the mean squared pitch prediction error, and equivalents thereof”</b></p>

## V. CONCLUSION

The Court adopts the constructions set forth in this opinion for the disputed terms of the patent-in-suit, and in reaching conclusions the Court has considered and relied upon extrinsic evidence. The Court’s constructions thus include subsidiary findings of fact based upon the

extrinsic evidence presented by the parties in these claim construction proceedings. *See Teva*, 135 S. Ct. at 841.

The parties are ordered that they may not refer, directly or indirectly, to each other's claim construction positions in the presence of the jury. Likewise, the parties are ordered to refrain from mentioning any portion of this opinion, other than the actual definitions adopted by the Court, in the presence of the jury. Any reference to claim construction proceedings is limited to informing the jury of the definitions adopted by the Court.

Within thirty (30) days of the issuance of this Memorandum Opinion and Order, the parties are hereby ORDERED, in good faith, to mediate this case with the mediator appointed herein. As a part of such mediation, each party shall personally appear by counsel and by at least one corporate officer possessing sufficient authority and control to unilaterally make binding decisions for the corporation adequate to address any good faith offer or counteroffer of settlement that might arise during such mediation. Failure to do so shall be deemed by the Court as a failure to mediate in good faith and may subject that party to such sanctions as the Court deems appropriate. No participant shall leave the mediation without the approval of the mediator.

**So ORDERED and SIGNED this 5th day of July, 2017.**

  
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RODNEY GILSTRAP  
UNITED STATES DISTRICT JUDGE