

United States District Court,
S.D. New York.

AT & T CORP,
Plaintiff.

v.

MICROSOFT CORPORATION,
Defendant.

No. 01 Civ. 4872(WHP)

June 24, 2003.

In construing claims for reissue patent for digital speech coder, the District Court, Pauley, J., held that: (1) limitation for "spectral representative signals," meant signals representing the frequency spectrum; (2) phrase "speech pattern," meant an audible speech message configuration; and (3) "third signal," as used in means-plus-function phrase "means... for producing a third signal" meant a signal other than a first signal or a second signal.

Claims construed.

32,580. Construed.

Robert D. Kaplan, Friedman Kaplan Seiler & Adelman LLP, New York, NY, for Plaintiff.

Frank V. Pietrantonio, Jonathan G. Graves, Cooley Godward, LLP, Reston, VA, for Plaintiff.

Stephen C. Neal, Cooley Godward, LLP, Palo Alto, CA, for Plaintiff.

James H. Carter, Sullivan & Cromwell, New York, NY, for Defendant.

Dale M. Heist, David R. Bailey, Woodcock Washburn LLP, Philadelphia, Pennsylvania, for Defendant.

MEMORANDUM AND ORDER

PAULEY, J.

On January 19, 1988, the United States Patent and Trademark Office issued United States Reissue Patent No. 32,580 (the " '580 patent"), titled "Digital Speech Coder" to Dr. Bishnu S. Atal and Joel R. Remde. AT & T Corporation ("AT & T") is the assignee of the '580 patent, which expired in December 2001. The '580 patent contains 43 claims and 7 figures, including, without modification, claims 1-39 of United States Patent No. 4,472,832 (the " '832 patent"). The '580 patent added claims 40-43 as a reissue of the '832 patent, which

issued on September 18, 1984. AT & T alleges that certain Microsoft Corporation ("Microsoft") products containing speech codecs infringe the '580 patent, and both parties seek construction of certain disputed terms in the '580 patent. This Court conducted a *Markman* hearing to construe the disputed claim terms in the '580 patent. After consideration of the parties' claim construction briefs and their *Markman* hearing presentations, the Court construes the thirteen disputed claims as set forth below.

Procedural History

On June 4, 2001, AT & T filed a complaint alleging that Microsoft directly, contributorily and willfully infringed, and induced others to infringe, one or more claims of the '580 patent, by making, using, offering to sell and/or selling within the United States various multipulse speech coding products. (Am.Compl.para. 44-45.) The claimed invention "relates to speech processing and more particularly to digital speech coding arrangements." ('580 patent, Col. 1:9-10.) In essence, the invention provides a faster way to send speech over a telephone or Internet network, for example, by using fewer digital signals and less storage while enhancing the perceived sound quality of the synthesized speech. This technology can be used in devices such as certain computer software, digital cellular telephones, audio-video conferencing, voice messaging and Internet voice communications. (Am.Compl.para. 10.)

On February 26, 2002, AT & T filed an amended complaint, which alleges additionally that numerous Microsoft products contain speech codecs that infringe the '580 patent. "A speech codec is a software program that is capable of coding-converting a speech signal into a more compact code-and decoding-converting the more compact code back into a signal that sounds like the original speech signal." (Am.Compl.para. 14.) Such products include Microsoft's NetMeeting video conferencing software, which is available in certain editions of Microsoft's Windows operating systems, its Sound Recorder application available in Windows 95 products containing the TrueSpeech software codec, FN1 and the Microsoft G.723.1 codec. (Am.Compl.para.para. 15-18.)

FN1. According to AT & T, the TrueSpeech codec is incorporated into or supported by Windows 95, Windows 98, Windows 98 Second Edition, Windows 2000, Windows NT, Windows Me, Windows XP Home Edition, Windows XP Professional operating systems, NetShow, DirectX, and the Cordless Phone System. (Am.Comp.para. 25.)

AT & T further alleges that the International Telecommunications Union ("ITU"), an organization that establishes and administers technical standards in the communications technologies field, adopted ITU Recommendations G.723, G.723.1, G.728, and G.729, and that the '580 patent is necessary to practice those ITU Recommendations. (Am.Comp.para.para. 12, 27-28.) AT & T alleges that Microsoft failed to obtain a license to use the '580 patent technology in various Microsoft products, including Windows Operating System Products, NetMeeting software, Windows XP Professional, Microsoft Windows Media Player for Windows XP Home Edition, Microsoft Windows Media Player for Windows XP Professional, Windows Media Player for Mac, NetShow 2.0 and NetMeeting 2.0. (Am.Comp.para.para. 20, 30-34.) Further, AT & T asserts that certain additional ITU standard compliant products sold by Microsoft infringe the '580 patent, including the Microsoft Exchange 2000 Conferencing Server, Microsoft Internet Security and Acceleration Server 2000, Telephony Application Programming Interface of Windows 2000 Professional, Windows Messenger, and Windows Real-Time Communication client of Windows XP. (Am.Comp.para.para. 35-40.)

In its second amended answer and counterclaim to the amended complaint, Microsoft denies infringement of

the '580 patent, and seeks dismissal of the amended complaint together with a declaratory judgment of noninfringement, invalidity and unenforceability of the '580 patent.

The parties submitted their respective opening claim construction briefs on May 6, 2002. Microsoft asserted that over 40 claim terms and phrases required construction, while AT & T requested construction of just three terms. In an effort to crystalize the parties' positions and narrow the terms for definition, the Court requested the parties submit a Joint Claim Construction Statement (the "JCCS"). Shortly after the parties submitted the JCCS on June 27, 2002, they submitted supplemental claim construction briefs.

A technology tutorial was held on July 10, 2002, after which the parties submitted their second amended claim construction briefs in September 2002. On October 1 and 2, 2002, this Court conducted a *Markman* hearing to construe fourteen disputed claim terms in the '580 patent. Subsequently, the parties submitted post-hearing briefs. Additionally, the parties submitted a joint letter on October 22, 2002 (the "Joint Letter") outlining their post-hearing claim construction positions and notifying the Court of their agreement to reduce the number of claim terms and phrases for construction to thirteen. (Joint Letter, Exs. A & B.) FN2

FN2. The parties' Joint Letter reflects their most recent proposed constructions of the disputed claim terms.

DISCUSSION

I. Claim Construction Standards

Claim interpretation is a question of law for the court to determine. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed.Cir.1995) *aff'd*, 517 U.S. 370, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996). This Court must construe "only those [claim] terms ... that are in controversy, and only to the extent necessary to resolve the controversy." *Vivid Techs., Inc. v. Am. Science & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed.Cir.1999). Accordingly, to the extent claim terms are genuinely in dispute, this Court construes the thirteen claim terms and phrases identified in the Joint Letter and addressed at the claim construction hearing.

A. Plain Meaning

In construing the claims at issue, a court must initially examine the intrinsic evidence, which includes the claims themselves, portions of the specification, drawings, and the prosecution history, if any. *Brookhill-Wilk 1, LLC v. Intuitive Surgical, Inc.*, 326 F.3d 1215, 1220 (Fed.Cir.2003) (citing cases); *Altris v. Symantec Corp.*, 318 F.3d 1363, 1369 (Fed.Cir.2003) (citing *Gart v. Logitech, Inc.*, 254 F.3d 1334, 1339 (Fed.Cir.2001)); *Teleflex, Inc. v. Ficosa North Am. Corp.*, 299 F.3d 1313, 1324-25 (Fed.Cir.2002); *Bell & Howell Document Mgmt. Prods. Co. v. Altek Sys.*, 132 F.3d 701, 705 (Fed.Cir.1997). In construing a claim, the analysis "begins and ends in all cases with the actual words of the claim." *Renishaw P.L.C. v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1248 (Fed.Cir.1998); *accord Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed.Cir.1996). After examining the claims themselves, the Court must examine the rest of the intrinsic evidence "beginning with the specification and concluding with the prosecution history...." *Interactive Gift Express, Inc. v. Compuserve, Inc.*, 256 F.3d 1323, 1331 (Fed.Cir.2001). "[A] court must presume that the terms in the claim mean what they say, and, unless otherwise compelled, give full effect to the ordinary and accustomed meaning of claim terms." *Johnson Worldwide Assocs., Inc. v. Zebco Corp.*, 175 F.3d 985, 989 (Fed.Cir.1999) (quoting *Tate Access Floors, Inc. v. Interface Architectural Resources, Inc.*, 279 F.3d 1370 (Fed Cir.2002)); *accord Teleflex*, 299 F.3d at 1324.

In analyzing the intrinsic evidence, courts engage in a " 'heavy presumption' that claim terms carry their ordinary meaning as viewed by one of ordinary skill in the art." *Altris*, 318 F.3d at 1369 (quoting *CCS Fitness Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed.Cir.2002)); *accord* *Texas Digital Sys., Inc. v. Telegenix, Inc.*, 308 F.3d 1193, 1202 (Fed.Cir.2002). Here, the parties agree that "one of ordinary skill in the art" is a person with a master's degree in electrical engineering or its equivalent, with two to four years of experience in the field of speech compression, or a Ph.D. in electrical engineering or its equivalent with a focus on speech compression. (*See* Declaration of Dr. Nikil S. Jayant, dated June 3, 2002 ("Jayant Decl.") at para. 5; Declaration of Dr. Allen Gersho, dated June 25, 2002 ("Gersho Decl.") at para. 9.)

It is axiomatic that claims must be interpreted in light of the specification, but that "limitations from the specification are not to be read into the claims." *Teleflex*, 299 F.3d at 1326; *accord* *Renishaw PLC*, 158 F.3d at 1248-50. While there is a "fine line" between reading a claim in light of the specification and reading a limitation into the claim from the specification, the Federal Circuit has advised courts to "look to the specification to ascertain the meaning of the claim term as it is used by the inventor in the context of the entirety of his invention." *Interactive Gift Express*, 256 F.3d at 1331 (quotation omitted). Additionally, "the number of embodiments disclosed in the specification is not determinative of the meaning of disputed claim terms," and consequently should not be construed as a limitation on those terms. *Teleflex*, 229 F.3d at 1327; *accord* *CCS Fitness*, 288 F.3d at 1366 (Fed.Cir.2002).

Although not technically intrinsic evidence, dictionary, encyclopedia and treatise definitions may be consulted in establishing a claim term's ordinary meaning. *Altris*, 318 F.3d at 1369; *Texas Digital Sys.*, 308 F.3d at 1202; *Vanguard Prods. Corp. v. Parker Hannifin Corp.*, 234 F.3d 1370, 1372 (Fed.Cir.2000). Dictionary definitions may only establish a claim term's ordinary meaning if they do "not contradict any definition found in or ascertained by the reading of the patent documents." *Union Carbide Chem. & Plastics Tech. Corp. v. Shell Oil Co.*, 308 F.3d 1167, 1178 n. 4 (Fed.Cir.2002); *Texas Digital Sys.*, 308 F.3d at 1202; *CCS Fitness*, 288 F.3d at 1366. Additionally, "the intrinsic record must always be consulted to identify which of the different possible dictionary meanings is most consistent with the use of the words by the inventor." *Brookhill-Wilk 1*, 326 F.3d at 1221-22 (examining intrinsic record where multiple, potentially consistent dictionary definitions existed for claim term at issue). If multiple dictionary definitions are consistent with the use of the terms in the intrinsic record, the Court may construe those claim terms to encompass all consistent meanings. *Texas Digital Sys.*, 308 F.3d at 1202.

B. Rebutting the Presumption of Plain Meaning

The "heavy presumption" in favor of assigning the ordinary meaning to a claim's terms "is overcome, however, if a different meaning is clearly and deliberately set forth in the intrinsic evidence." *Union Carbide Chem. & Plastics Tech*, 308 F.3d at 1177; *accord* *Multiform Desiccants, Inc. v. Medzam, Ltd.*, 133 F.3d 1473, 1478 (Fed.Cir.1998).

A "patentee demonstrate[s] an intent to deviate from the ordinary and accustomed meaning of a claim term by redefining the term or by characterizing the invention in the intrinsic record using words or expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope." *Teleflex*, 299 F.3d at 1327; *accord* *Brookhill-Wilk 1*, 326 F.3d at 1220 (noting that the context of the claim terms must be considered in determining their ordinary and customary meaning); *Renishaw PLC*, 158 F.3d at 1248 (noting that "there is no legitimate way to narrow the property right" besides pointing to claim terms which confine or affect a patent's scope).

The presumption of plain meaning is rebutted where (1) the patentee acting as his own lexicographer clearly established a definition of the term different from its customary meaning, *Hoechst Celanese Corp. v. BP Chem. Ltd.*, 78 F.3d 1575, 1578 (Fed.Cir.1996); *Brookhill-Wilk 1*, 326 F.3d at 1220; (2) the meaning of a claim term is so unclear from the intrinsic evidence "that there is 'no means by which the scope of the claim may be ascertained from the language used,'" *Bell Atlantic Network Servs., Inc. v. Covad Comm. Group, Inc.*, 262 F.3d 1258, 1268 (Fed.Cir.2001) (quoting *Johnson Worldwide*, 175 F.3d at 990); or (3) the patentee disavowed an interpretation of a claim during prosecution, *Texas Digital Sys.*, 308 F.3d at 1204 (citing *Teleflex*, 299 F.3d at 1324).

A patent applicant acting as his own lexicographer must clearly state a special definition of the term in the patent specification or prosecution history. *Vitronics*, 90 F.3d at 1582 (citing *Hoescht Celanese Corp.*, 78 F.3d at 1578); *Pourchez v. Diatek, Inc.*, 03 CV 972(WHP), 2003 WL 21220791, at (S.D.N.Y. May 8, 2003). In those instances where the patentee acts as his own lexicographer, the plain meaning of the claim is preempted by the terms used by the patentee. *Brookhill-Wilk 1*, 326 F.3d at 1220. This exception is applicable where the patentee defined the term "with reasonable clarity, deliberateness, and precision" in the written description or the prosecution history. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed.Cir.1994); *accord Teleflex*, 299 F.3d at 1326. Additionally, "[t]he specification acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication." *Vitronics*, 90 F.3d at 1582; *accord Markman*, 52 F.3d at 979.

Similarly, the ordinary meaning of a term will not apply if the claim "term 'chosen by the patentee so deprive[s] the claim of clarity' as to require resort to the other intrinsic evidence for a definite meaning." *CCS Fitness*, 288 F.3d at 1367 (quoting *Johnson Worldwide*, 175 F.3d at 990) (alteration in original).

Finally, the Court must consider the prosecution history of the patent "to determine whether the applicant clearly and unambiguously 'disclaimed or disavowed [any interpretation] during prosecution in order to obtain a claim allowance.'" *Middleton, Inc. v. Minnesota Mining & Mfg. Co.*, 311 F.3d 1384, 1388 (Fed.Cir.2002) (quoting *Standard Oil Co. v. Am. Cyanamid Co.*, 774 F.2d 448, 452 (Fed.Cir.1985)) (alteration in original); *accord Interactive Gift Express*, 256 F.3d at 1331. Disclaimer during prosecution of the patent may include instances where "the patentee distinguished [a] term from prior art on the basis of a particular embodiment, expressly disclaimed subject matter, or described a particular embodiment as important to the invention." *CCS Fitness*, 288 F.3d at 1366-67 (citations omitted). Thus, once a patent applicant disclaims an interpretation during patent prosecution, he cannot reclaim that interpretation during subsequent claim construction. *Teleflex*, 299 F.3d at 1326 (citing *Standard Oil*, 774 F.2d at 452); *Southwall Techs., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1576 (Fed.Cir.1995).

C. Extrinsic Evidence

Extrinsic evidence includes evidence such as expert testimony, articles and inventor testimony. *Bell Atlantic Network Servs.*, 262 F.3d at 1269. "[I]f the meaning of the claim limitation is apparent from the intrinsic evidence alone, it is improper to rely on extrinsic evidence other than that used to ascertain the ordinary meaning of the claim limitation." *Bell Atlantic Network Servs.*, 262 F.3d at 1268-69; *accord Vitronics*, 90 F.3d at 1582. Courts may rely on, as opposed to merely examine, extrinsic evidence only in "instances in which intrinsic evidence is insufficient to enable the court to determine the meaning of the asserted claims." *Vitronics*, 90 F.3d at 1584; *accord Interactive Gift Express*, 256 F.3d at 1332 (stating extrinsic evidence may only be relied on where a claim term is "genuinely ambiguous after consideration of the intrinsic

evidence"). Extrinsic evidence may be consulted, as opposed to relied upon, to assist the court in understanding the underlying technology. *Interactive Gift Express*, 256 F.3d at 1332; *accord* *Intellectual Prop. Dev., Inc. v. UA-Columbia Cablevision of Westchester, Inc.*, 94 Civ. 6296 (WHP), 2002 WL 10479, at (S.D.N.Y. Jan. 3, 2002) (citing *Pitney Bowes*, 182 F.2d at 1308). In either case, however, "extrinsic evidence may be used only to assist in the proper understanding of the disputed limitation; it may not be used to vary, contradict, expand or limit the claim language from how it is defined, even by implication, in the specification or the file history." *Bell Atlantic Network Servs.*, 262 F.3d at 1269; *accord* *Vitronics*, 90 F.3d at 1584-85.

II. *Disputed Terms of the '580 Patent*

The parties dispute thirteen claim terms and phrases in the '580 patent: FN3 (1) "spectral representative signals"; (2) "plurality of pulse amplitude and location coded signals"; (3) "representative"; (4) "converting"; (5) "excitation"; (6) "speech pattern"; (7) "means ... for generating a speech pattern"; (8) "signal representative of the differences between said interval speech pattern and the interval representative signal set"; (9) "means ... for forming a first signal corresponding to the interval speech pattern"; (10) "means for forming a second interval corresponding signal"; (11) "signal corresponding to the differences between said first and second interval corresponding signals"; (12) "means for producing a third signal"; and (13) "means for producing a predictive residual signal." (Joint Letter, Ex. B.)

FN3. A copy of the '580 patent is attached to this Memorandum and Order as Appendix A.

A. *Spectral Representative Signals*

[1] The limitation "spectral representative signals" is found in claims 34, 36, 37, 39, 40 and 42. Those claims describe a process or apparatus to decode information to form a speech message. The phrase does not appear in the specification, and both parties argue that this term requires construction. AT & T proposes the definition "signals that relate to, represent, or describe the frequency characteristics of speech for a time interval." (Joint Letter, Ex. B.) Microsoft counters that the term's definition should be "speech parameters needed to form predicted speech and reflecting the frequency spectrum (*i.e.*, the whole range of frequencies) of speech for a time interval." (Joint Letter, Ex. B.) At the *Markman* hearing, Microsoft also agreed to the definition, "speech parameter constants needed to form predicted speech and that reflect the frequency spectrum, that is the whole range of frequencies of speech." (Tr. at 81.)

This Court construes "spectral representative signals" to mean "signals representing the frequency spectrum (*i.e.*, the whole range of frequencies) of speech for a time interval."

1. *Frequency Spectrum*

First, this Court agrees with Microsoft that "frequency spectrum (*i.e.*, the whole range of frequencies)" should be used to describe "spectral representative signals" rather than AT & T's proposed "frequency characteristics." The word "spectral" is derived from "spectrum," which the parties have agreed to define as "the range of frequencies of a particular sound (as a noise or speech sound)." (JCCS Tab A at 1-3; *Webster's Third New Int'l Dictionary* at 2188 (G. & C. Merriam Co.1981).) Similarly, the parties agree that "signals" refers to "sequences of numbers or values." (*See, e.g.*, JCCS Tab B at 34-36.) In contrast, AT & T's suggested phrase "frequency characteristics" reads the term "spectral" out of the phrase completely. *See* *Ethicon Endo-Surgery, Inc. v. United States Surgical Corp.*, 93 F.3d 1572, 1582-83 (Fed.Cir.1996)

(declining to read a limitation out of a claim).

The specification and prosecution history also confirm the inclusion of "frequency spectrum" as opposed to "frequency characteristics" in the definition. The specification states that the spectral representative signals reflect a "short time spectrum" of speech. ('580 patent, Col. 3:33-39; Col. 3:55-56 ("speech spectrum").) Further, the prosecution history supports use of the term "spectrum" rather than AT & T's broader proposed definition "frequency characteristics of speech." ('580 Pros. Hist. at 51; Tr. at 83-86).

Second, this Court rejects AT & T's assertion that the word "whole" is improper in the definition. The word "whole" does not change the scope of the claim, but merely aids the fact finder in understanding the claim's language. While AT & T argues that the encoder removes speech frequencies above 4.0 KHz, as shown in an embodiment in the specification ('580 patent, Col. 3:25-27), the phrase "spectral representative signals" only appears in the decoder claims of the '580 patent. (*See* Claims 34-43.) The decoder generates speech from the "spectral representative signals" without adding back the speech frequencies above KHz that were removed at the encoder. ('580 patent, Col. 7:3-10.) Thus, the "spectral representative signals" necessarily reflect the whole range of speech frequencies generated by the decoder.

2. Intrinsic Record

The Court declines to read into the claim Microsoft's narrow proposed language "speech parameters needed to form predicted speech," (Joint Letter, Ex. B), and instead adopts AT & T's broader proposed word "signals," which most reflects the plain meaning of the phrase. *See* RF Delaware, Inc. v. Pacific Keystone Techs., Inc., 326 F.3d 1255, 1263 (Fed.Cir.2003). Specifically, the adoption of Microsoft's proposed phrase (1) would not harmonize with the evidence in the intrinsic record, and (2) would violate the doctrine of claim differentiation, as that interpretation renders claims 37 and 39 identical. *See* Wegner Mfg., Inc. v. Coating Machinery Sys., Inc., 239 F.3d 1225, 1233-35 (Fed.Cir.2001) (declining to limit independent claim with language recited in dependent claim).

First, Microsoft's claim that the intrinsic record demonstrates that the patentees disavowed a broader meaning of the claim phrase is misplaced. Microsoft cites to part of the prosecution history in support of its proposed, narrower construction: "The object of the instant invention is to provide high quality speech.... This is accomplished in the instant application by analyzing each successive interval of a speech pattern ... to generate a set of predictive parameter signals...." (Prosecution History for U.S. Patent No. 4,472,832 ("Pros.Hist.") at 111-12.) FN4 However, this general statement does not evince an intent by the patentee to "clearly and unambiguously" disclaim or disavow a broader reading of the claim term as "signals." *Middleton, Inc. v. Minnesota Mining & Mfg. Co. .*, 311 F.3d 1384, 1388 (Fed.Cir.2002) (finding statements made during prosecution were not a clear and unambiguous waiver of claim scope); *accord* *Inverness Med. Switzerland GmbH v. Princeton Biomeditech Corp.*, 309 F.3d 1365, 1372 (Fed.Cir.2002) (same). Accordingly, the Court declines to include the narrowing phrase "needed to form predicted speech."

FN4. Unless otherwise indicated, all references to "Pros. Hist." relate to the prosecution of the underlying '832 patent.

Second, although the written description and embodiments ('580 patent, Col. 3:33-39; Col. 3:54-55; Col. 10:47-49; Figure 1) convey a parameterized nature of the values used to represent the frequency range of speech for a time interval, Microsoft's proposed language "speech parameters needed to form predicted

speech" would violate the doctrine of claim differentiation. FN5 "Under the doctrine of claim differentiation, 'each claim in a patent is presumptively different in scope.'" *Ecolab Inc. v. Paraclipse, Inc.*, 285 F.3d 1362, 1376 (Fed.Cir.2002) (quoting *Intermatic Inc. v. Lamson & Sessions Co.*, 273 F.3d 1355, 1364 (Fed.Cir.2001)); *accord* Donald S. Chisum, *5A Chisum on Patents*, s. 18.03[6] (Matthew Bender 2002) ("[O]rdinarily language of one claim should not be so interpreted as to make another claim, such as a claim dependent on the first claim, identical in scope."). "This presumption is especially strong where there is a dispute over whether a limitation found in a dependent claim should be read into an independent claim...." *Ecolab*, 285 F.3d at 1376. Although "[t]he doctrine of claim differentiation creates only a presumption that each claim in a patent has a different scope that 'can not broaden claims beyond their correct scope,'" that presumption is usually only overcome when the patentee has expressly disclaimed the subject matter in the prosecution history. *Fantasy Sports Properties, Inc. v. Sportsline .com, Inc.*, 287 F.3d 1108, 1115-16 (Fed.Cir.2002) (quotation omitted).

FN5. Microsoft's proposed construction would also have the phrase "spectral representative signals" equate to "predictive parameters." While the specification refers to predictive parameters in discussing the embodiments, predictive parameters are merely one type of spectral representative signal. Indeed, the specification expressly states that other spectral representative signals may be used such as "formant parameters or other speech parameters well known in the art." (580 patent, Col. 10:47-48.) Thus, any restriction to "predictive" parameters would be misplaced. *See ATD Corp. v. Lydall, Inc.*, 159 F.3d 534, 540 (Fed.Cir.1998) (claim terms must be read in light of the specification).

Here, the doctrine of claim differentiation mandates that "predictive parameters" should not be construed as part of "spectral representative signals" in the '580 patent. First, the patentee has made no express disclaimer of the subject matter in the prosecution history. *See Fantasy Sports Properties*, 287 F.3d at 1115-16. (finding presumption of claim differentiation overcome by express disclaimer of subject matter in the prosecution history). In examining the claims, the only difference between claims 37 and 39 is that independent claim 37 recites the broad phrase "spectral representative signals," (580 patent, Col. 22:50-23:4), while dependent claim 39 more narrowly asserts that the "spectral representative signals are speech interval predictive parameter signals." (580 patent, Col. 23:21-24.) The only meaningful difference between the two claims is the limiting term "predictive parameters." Without that limiting term, the claims would be redundant. Thus, this Court declines to read such limiting language from the dependent claim into the independent claim. *Dow Chem. Co. v. United States*, 226 F.3d 1334, 1341-42 (Fed.Cir.2000) (applying doctrine of claim differentiation, finding independent claim should be given broader scope than dependent claim to avoid rendering dependent claim redundant).

Microsoft argues that while claim 37 refers to "signals," the meaning of that word in the claim is unclear in that neither the claim nor the specification provide any further explication of "signals" separate and apart from parameters. Thus, Microsoft asserts that the claims bear only one interpretation, and the presumption of claim differentiation does not apply. In this vein, Microsoft's citation to *Laitram Corp. v. Rexnord, Inc.*, 939 F.2d 1533, 1538 (Fed.Cir.1991), for the proposition that if the claims "will bear only one interpretation similarity will have to be tolerated" (Tr. at 75), is inapplicable to the phrase at issue. In *Laitram*, the Federal Circuit found that pursuant to 35 U.S.C. s. 112, para. 6, the usual prohibition on reading a limitation from a dependent claim into the independent claim was inapplicable to the means-plus-function claim at issue. 939 F.2d at 1538; *accord* *Wegner Mfg.*, 239 F.3d at 1233. As *Laitram*'s holding is limited in application to means-plus-function claims, this Court declines to apply Microsoft's proposed exception to the phrase at issue, and instead applies the customary presumption of claim differentiation, namely that an independent

claim should be given a broader scope than a dependent claim to avoid rendering the latter redundant. RF Delaware, Inc. v. Pacific Keystone Techs., Inc., BCA, 326 F.3d 1255, 1263-64 (Fed.Cir.2003).

3. Representative

Finally, the Court declines to construe the term "spectral representative signals" to incorporate the word "reflecting," as Microsoft proposes, and instead adopts AT & T's view that "representing," the plain meaning of a term in the disputed phrase, should be used here. (Tr. at 60.) Webster's Dictionary defines "representative," as "serving to represent, portray or typify." *Webster's Third New Int'l Dictionary on the English Language Unabridged* at 1926 (G. & C. Merriam Co.1981); see *Inverness Med. Switzerland GmbH v. Princeton Biomeditech Corp.*, 309 F.3d 1365, 1369 (Fed.Cir.2002) ("It is well settled that dictionaries provide evidence of a claim term's ordinary meaning"). Additionally, the word "representing" is the present participle of "represent." *Webster's Third New Int'l Dictionary* at 1927. Accordingly, this Court adopts the term "representing" rather than "reflecting," which is not found within the language of the claim here. See *Altris, Inc. v. Symantec Corp.*, 318 F.3d 1363, 1369-71 (Fed.Cir.2003).

In conclusion, the Court construes the term "spectral representative signals" to mean "signals representing the frequency spectrum (*i.e.*, the whole range of frequencies) of speech for a time interval."

B. Plurality of Pulse Amplitude and Location Coded Signals

[2] The phrase "plurality of pulse amplitude and location coded signals" appears in claims 40 and 42. Claim 40 states in relevant part:

Apparatus for producing a speech message comprising: means for receiving a sequence of speech message signals for the successive time intervals of the speech message, each time interval speech message signal including a set of coded spectral representative signals for the time interval portion of said speech message and a *plurality of pulse amplitude and location coded signals* representative of the differences between the time interval portion of the speech message and the time interval proportion of the speech message formed from said spectral representative signals.

(emphasis added.) Claim 42 states in relevant part:

A method for producing a speech message comprising the steps of: receiving a sequence of speech message signals for the successive time interval portions of the speech message, each time interval speech message signal including a set of coded spectral representative signals for the time interval portion of said speech message and a *plurality of pulse amplitude and location coded signals* representative of the differences between the time interval portion of the speech message and the time interval portion of the speech message formed from said spectral representative signals.

(emphasis added.)

Microsoft's proposed definition for this disputed claim term is "two or more pairs of amplitude and location values having a prescribed format (b(i), m(i)), where b(i) is the amplitude and m(i) is a location of that amplitude." (Joint Letter, Ex. B.) AT & T counters with the definition "two or more pulse amplitude values having a formatted representation and two or more pulse location values having a formatted representation." (Joint Letter, Ex. B.) The parties agree that the plain meaning of the word "signal" is "a sequence of values" (JCCS at 34-36), and that the plain meaning of the word "coded" is "a formatted representation of." (Tr. at

87.) Additionally, both parties agree that the word "plurality" means two or more. (Microsoft Post Hearing Brief ("PHB") at 9; AT & T Post Hearing Reply Brief ("PHRB") at 4.) Thus, the main issue is whether the coded signals are restricted to the particular prescribed format Bi followed by Mi.

1. Plain Meaning of "Pulse"

Microsoft contends that "pulse" means "an amplitude and location pair [Bi, Mi]," while AT & T argues that pulses are not always defined by amplitude and location, and may be reflected by a number of different formats. The *McGraw-Hill Dictionary of Scientific and Technical Terms*, 1293 (3d ed.1984), defines "pulse" as "a variation in a quantity which is normally constant; has a finite duration and is usually brief compared to the time scale of interest." Microsoft cites to a treatise which describes the concept of "pulse" to support its assertion that the term at issue mandates a prescribed format (Bi, Mi). See Clare D. McGillem & George R. Cooper, *Continuous and Discrete Signal and System Analysis*, 275-76 (Holt, Rinehart and Winston, Inc.1974)) ("McGillem Text"). The McGillem Text, however, notes that pulses can be represented mathematically or visually, and does not state that such representations must follow any particular format such as Bi, Mi. See McGillem Text at 275-76. For example, the pulses illustrated in the McGillem Text are in an evenly spaced series and could be described as a series of amplitudes (B1, B2, B3). In contrast, unevenly spaced pulses may be reflected either by Microsoft's proposed (Bi, Mi) format or by alternative formats such as sending the amplitudes first (B1, B2, B3), sending the locations second (M1, M2, M3), and reinterpreting the codes to build multiple pulses. Accordingly, the dictionary and treatise definitions support AT & T's position that one skilled in the art would know from the plain meaning of the claim that a "pulse" is not restricted to a prescribed, paired format (Bi, Mi), but rather may be reflected by several different formats.

2. Prosecution History

Microsoft argues that the patentees clearly disavowed AT & T's broader definition during prosecution and that the '580 patent specification defines "pulse" in terms of Bi, Mi. (See Microsoft PHB at 12; Microsoft PHRB at 9-10 *discussing* Pros. Hist. at 116.) In examining the prosecution history, one of the passages distinguishes the patentees' invention from United States Patent No. 4,130,729 (the "'729 patent") on the grounds that the '729 patent does not claim the "formation of a coded excitation signal," and "requires high bit rate transmission." (Pros. Hist. at 116). The prosecution history further distinguishes the '729 patent by noting that the patentees' invention provides "a prescribed format coded signal (B, M) that can be transmitted at a substantially lower bit rate...." (Pros. Hist. at 116.) However, that passage addresses the patentees' proposed claims 1-39 in the underlying '832 patent, which do not contain the phrase "plurality of pulse amplitude and location coded signals." As the term at issue here only appears in re-issue claims 40 and 42, the cited prosecution history is not applicable to that term. See *Laitram Corp. v. Morehouse Indus., Inc.*, 143 F.3d 1456, 1460 (Fed.Cir.1998) (declining to rely on statements made during prosecution that are relevant to claim language different from, albeit related to, the term at issue).

Additionally, the prosecution history does not include a manifest disavowal of the plain meaning of the phrase, as contemplated in *Teleflex*. A manifest disavowal cannot derive from statements made to the examining attorney concerning other claims. *Teleflex*, 299 F.3d at 1328. The prosecution history cited by Microsoft does not contain an expression of manifest exclusion. Accordingly, those portions of the prosecution history on which Microsoft relies do not support its narrow, limiting interpretation of the claim term. See *Teleflex*, 299 F.3d at 1328; *Laitram*, 143 F.3d at 1460.

3. Specification

AT & T asserts that Microsoft's use of the words "prescribed format b(i), m(i)" to describe a "pulse" improperly imports a limitation into the claim from the preferred embodiment shown in the specification. (Tr. at 87-91.) Microsoft counters that the phrase is defined by implication because every time the word "pulse" appears in the specification's preferred embodiment, it is listed as an amplitude and location pair, and that "when a patentee uses a claim term throughout the entire patent specification, in a manner consistent with only a single meaning, he has defined that term by implication." (Microsoft PHRB at 7-8 citing *Bell Atlantic Network Serv., Inc. v. Covad Communications Group, Inc.*, 262 F.3d 1258, 1271 (Fed.Cir.2001).) However, the Federal Circuit has instructed that a preferred embodiment should not be read into a claim as a limitation, even if there is only one embodiment in the specification. *See Teleflex*, 299 F.3d at 1328.

In support of its more limited construction, Microsoft also cites to the specification's "Summary of Invention," which "sets forth in clear and concise terms an embodiment of the invention." (Pros. Hist. at 106.) However, that Summary merely describes how a problem "may be solved," does not refer to the proposed Bi, Mi format, and makes no overarching statements to limit the invention. ('580 patent, Col. 1:63-2:7.) Although several references to the pulse signals in the specification's description of the preferred embodiment describe a prescribed format of Bi, Mi, there are no statements in the prosecution history or in the claims themselves to the effect that all the contemplated embodiments must use pulse codes formatted in the Bi, Mi order. Because those limitations are absent in the claims themselves and the descriptions leave open the possibility of other embodiments, they do not negate the claim term's plain meaning. *See Teleflex*, 299 F.3d at 1327.

Microsoft's citation to *Toro Co. v. White Consol. Indus., Inc.*, 199 F.3d 1295, 1301 (Fed.Cir.1999), to support its proposition that the Bi, Mi format depicted by one embodiment limits the claim itself, is misplaced. The Federal Circuit specifically rejected Microsoft's position in *Teleflex*, and stated that "the number of embodiments disclosed in the specification is not determinative of the meaning of the disputed claim terms." 299 F.3d at 1327. Claim terms take on their ordinary and accustomed meanings unless the patentee demonstrated an intent to deviate by redefining the claim term or used "words or expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope." *Teleflex*, 299 F.3d at 1327; *accord Altris*, 318 F.3d at 1370-71 ("Nor are claims ordinarily limited in scope to the preferred embodiment."). Even where the specification describes only one embodiment of the structure, courts are still "constrained to follow the language of the claims, rather than that of the written description." *Teleflex*, 299 F.3d at 1328. "[A]n accused infringer cannot overcome the 'heavy presumption' that a claim term takes on its ordinary meaning simply by pointing to the preferred embodiment or other structures or steps disclosed in the specification or prosecution history." *Teleflex*, 299 F.3d at 1327; *accord Texas Digital Sys.*, 308 F.3d at 1204-05.

Accordingly, this Court will not read those limitations into the plain meaning of the claim itself. *See Teleflex*, 299 F.3d at 1326-27 (finding claim terms not limited to depiction of one embodiment in specification); *SRI Int'l v. Matsushita Elec. Corp.*, 775 F.2d 1107, 1121 (Fed.Cir.1985) (en banc) (same).

In conclusion, this Court construes the phrase "plurality of pulse amplitude and location coded signals" to mean "two or more pulse amplitude values having a formatted representation and two or more pulse location values having a formatted representation." This definition is based on the plain meaning of the phrase as would be understood by one skilled in the art.

C. Representative

[3] The term "representative" appears in claims 34, 37, 40 and 42 of the '580 patent. Microsoft's proposed definition of the term is "that replaces (without loss of meaning) or is equivalent to." AT & T's proposed definition of "relates to, represents, or describes ." (Joint Letter, Ex. B.; Tr. 108-09, 117.) AT & T also stated at the *Markman* hearing that it "would be fine with something like represents, typifies or describes." (Tr. 118-19.)

"Dictionary definitions may establish a claim term's ordinary meaning" that "would have been attributed by those of skill in the relevant art." *Texas Digital Sys.*, 308 F.3d at 1202 (quoting *CCS Fitness*, 288 F.3d at 1366); *accord Vitronics*, 90 F.3d at 1584 n. 6. In doing so, "the intrinsic record must always be consulted to identify which of the different possible dictionary meanings of the claim terms in issue is most consistent with the use of the words by the inventor." *Texas Digital Sys.*, 308 F.3d at 1203. Moreover, "[i]f more than one dictionary definition is consistent with the use of the words in the intrinsic record, the claim terms may be construed to encompass all such consistent meanings." *Texas Digital Sys.*, 308 F.3d at 1203 (citations omitted).

Webster's Dictionary defines "representative" as "one that in some way corresponds to, replaces, or is equivalent to someone or something else," and as "serving to represent, portray, or typify." *Webster's Third New Int'l Dictionary of the English Language Unabridged* at 1926 (G. & C. Merriam Co.1981). The American Heritage Dictionary defines "represent" as "to stand for; symbolize." *Am. Heritage Dictionary* at 1104 (Am. Heritage Pub. Co., Inc.1973). AT & T also presented additional definitions from Webster's dictionaries: "serving to represent, portray or typify; serving as a characteristic example; illustrative of the class; serving as a typical or characteristic example." (Tr. at 109.)

The specification and the prosecution history do not indicate any intent by the patentees to deviate from the plain meaning of the term. *See Altris*, 318 F.3d at 1370-71 (citing *Teleflex*, 299 F.3d at 1327). Reading the term in light of the specification, several dictionary definitions are consistent with the use of the claim terms. *Altris*, 318 F.3d at 1369 (citing *Texas Digital Sys.*, 308 F.3d at 1203). Accordingly, this Court incorporates those consistent terms and construes "representative" as "one that in some way symbolizes, represents, replaces, or is equivalent to something else." *See Texas Digital Sys.*, 308 F.3d at 1203.

D. Converting

[4] The term "converting" appears in claims 40 and 42. The use of the term in both claims is similar. Claim 40 reads: "Apparatus for producing a speech message comprising: ... means for *converting* the plurality of pulse amplitude and location codes of said time interval into a signal representative of the excitation of the time interval portion of said speech message." ('580 patent, Col. 23:25-26, 23:37-24:2) (emphasis added.) Claim 42 reads: "A method for producing a speech message comprising the steps of: ... *converting* the plurality of pulse amplitude and location codes of said time interval into a signal representative of the excitation of the time interval portion of said speech message." ('580 patent, Col. 24:13-15, 24:25-28) (emphasis added.) Microsoft proposes the definition "changing without the use of other values (such as 'pitch period' signals)," while AT & T argues the definition should read "changing or turning one thing into another." (Joint Letter, Ex. B.) In its Post-Hearing Brief, Microsoft also accepts the definition, "changing one thing into another without the use of other values (such as 'pitch period signals')." (Microsoft PHB at 15; Tr. at 127.)

The parties generally agree on the plain meaning of "converting," (Tr. at 123, 127; AT & T PHB at 14), but

differ as to whether the term should include the limiting language "without the use of other values," as further elucidation of the word "changing ." (Tr. at 128.) The parties agree that the plain meaning of "converting" to a lay person is "changing or turning one thing into another." (Tr. at 127-128.)

Webster's Dictionary defines "convert" as "to change or turn from one state to another; alter in form, substance, or quality." *Webster's Third New Int'l Dictionary of the English Language Unabridged* at 499 (G. & C. Merriam Co.1981). Microsoft also cites to the technical dictionary definition of "convert"-"to transform the representation of data," and "converter" to mean one that "changes numerical formation from one form to another, as from decimal to binary...." *McGraw-Hill Dictionary of Scientific and Technical Terms* at 360, 364 (3rd ed. McGraw-Hill, Inc.1984).

This Court construes "converting" to mean "changing one thing into another." This definition to one skilled in the art is consistent with that term's use in claims 40 and 42, as well as in the specification, and coincides with both the technical and lay dictionary definitions. First, in one embodiment the specification describes that the speech signal from the microphone is "converted into a sequence of pulse samples in filter and sampler circuit 113." ('580 patent, Col. 3:23-3:25.) *See SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1340-41 (Fed.Cir.2001) (claims must be read in light of the specification); *ATD Corp. v. Lydall, Inc.*, 159 F.3d 534, 540 (Fed.Cir.1990) (same). "Varied use of a disputed term in the written description demonstrates the breadth of the term rather than providing a limited definition." *Johnson Worldwide*, 175 F.3d at 991 (citing *Enercon GmbH v. Int'l Trade Comm'n*, 151 F.3d 1376, 1385 (Fed.Cir.1998)). The specification's use of "converted" relates to converting speech signals into speech samples, which is varied from the use of "converting" in claims 40 and 42. Accordingly, the Court declines to apply a narrow scope to the claim term. *Johnson Worldwide*, 175 F.3d at 991.

Second, both dictionary definitions are consistent with each other and the plain language of the claims. *See Texas Digital Sys.*, 308 F.3d 1203. The technical and lay definitions both contemplate "converting" as a change from one form into another, thus the Court's definition incorporates the plain meaning of the word as one skilled in the art would understand it as well.

Third, this Court recognizes the heavy presumption that the ordinary meaning of claim terms must apply. *Pourchez*, 2003 WL 21220791, at *2 (citing cases); *see also Inverness Med. Switzerland*, 309 F.3d at 1369 ("It is well settled that dictionaries provide evidence of a claim term's 'ordinary meaning'."). (citations omitted). Microsoft's proposed language appears nowhere in the claims or in the specification, and thus will not be incorporated into the construction of the claim term. *See Altris*, 318 F.3d at 1369-71; *see also Pourchez*, 2003 WL 21220791, at *9 (declining to import party's limiting language that was unsupported by intrinsic evidence). Additionally, there are neither: (1) expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope, in the intrinsic evidence; nor (2) any evidence that the patentees acted as their own lexicographers and used this claim term in a manner other than its ordinary meaning. *See Inverness Med. Switzerland*, 309 F.3d at 1372.

The Court declines to further limit the construction of the term with Microsoft's proposed parenthetical "such as 'pitch period' signals." Microsoft argues that this limitation is derived from the prosecution history (Pros Hist. at 110-11), which provides a disclaimer of the claim's scope. The cited prosecution history, however, does not address the term "converting" or any converting steps. *See Inverness Med. Switzerland*, 309 F.3d at 1372 (finding no clear and ambiguous disclaimer of broader definition of claim term). Even assuming *arguendo* that the prosecution history contains a disavowal by the patentees, the patentee's Office Action response concerning original claims 1-39 cannot rise to the level of a disavowal of claim scope with

respect to the term "converting," which only appears in reissue claims 40 and 42. *See* Laitram, 143 F.3d at 1460 n. 3.

E. *Excitation*

[5] The term "excitation" appears throughout the claims of the '580 patent, including in claims 29-31, 34, 37, and 40-43. AT & T proposes two separate definitions: "(noun) an input signal of a system or apparatus; (adjective) relating to an input of a system or an apparatus." (Joint Letter, Ex. B.) Microsoft asserts the definition should be "values that by themselves without other values (such as "pitch period signals" or "voiced and unvoiced amplitudes") replace the difference between actual and predicted speech values." (Joint Letter, Ex. B.) The main difference between the parties is whether an excitation is limited to a single, particular signal.

The plain meaning of "excitation" is defined in a treatise that both parties offer:

A digital processing system acts on a digital input signal and produces a digital output signal. In other words, it establishes a cause-and-effect relationship. The input signal is called the excitation signal or simply excitation. The output signal is called the response of the system to the considered excitation.

(Murat Kunt, *Digital Signal Processing* at 22 (Artech House, Inc.1980) (emphasis in original.) Accordingly, an "excitation signal," as contemplated by the treatise is "an input signal." There is nothing in the language of the '580 patent claims to indicate that the plain meaning of "excitation" should not apply.

The claim must also be read in light of the specification and prosecution history to determine whether the patentees chose to assign to the term "excitation" a definition or scope other than its plain meaning. *See* Union Carbide Chem. & Plastics Tech., 308 F.3d at 1177. The specification does not define "excitation." Although the parties agree that the Figure 1 embodiment does not disclose more than one excitation signal being used in a single frame (Tr. at 162), there is nothing in the language of the claims themselves to support a reading that more than one value cannot be associated with the excitation. It is inappropriate to import any limitation from that embodiment into the claims. *Teleflex*, 299 F.3d at 1325; *Brookhill-Wilk* 1, 326 F.3d at 1223. Thus, the specification's use of the term "excitation" does not rebut the presumption of plain meaning.

Microsoft asserts that the patentees disavowed the use of "other values" such as "pitch period signals" or "voiced and unvoiced amplitudes" during prosecution:

[In the Atal '302 patent] [v]oiced/unvoiced signals are required to define the type of excitation to be applied to the decoding filter and a noise generator is needed to substitute for unvoiced excitation. All these signals are coded and utilized to construct a replica of the speech pattern. The excitation signal of the instant application is completely distinguished from the multitude of signals required in Atal '302 to perform the same function and advantageously provides improved operation in which voiced, unvoiced and partially voiced intervals may be accurately constructed using a single excitation signal.

(Pros. Hist. at 110-11.)

The cited prosecution history shows that AT & T disavowed any definition of "excitation" requiring the use of multiple signals. The prosecution history states that "the excitation signal of the instant application is

completely distinguished from the multitude of signals required in Atal '302." (Pros. Hist. at 111 (emphasis added).) When read in context, that phrase strongly supports limiting the definition of "excitation" to a single input signal, without additional values. That passage also uses equivocal language: "voiced, unvoiced and partially voiced intervals *may* be accurately constructed using a single excitation signal [in the claimed invention]." (Pros. Hist. at 111 (emphasis added).) Reading the prosecution history as a whole, however, this Court finds that the patentees represented to the examining attorney that the '580 patent's use of "a single excitation signal," rather than voiced/unvoiced signals and a noise generator, distinguished it from the prior art. Other sections of the prosecution history support this conclusion. The patentees represented to the examining attorney that "the voiced/unvoiced coded signal and noise generator are eliminated and more exact replicas can be synthesized at bit rates lower than required for residual signal encoding," (Pros. Hist. at 112), and that the creation of the excitation signal in the invention under review is, again, "completely distinguished from Atal '302." (Pros. Hist. at 113.)

AT & T asserts that the prosecution history does not limit the claim to merely a single excitation signal (Tr. at 147-48), but instead contemplates an invention which may optionally use multiple or a single excitation signal. (Tr. at 150.) However, as noted, AT & T's proposed construction does not comport with the prosecution history's use of unequivocal language to distinguish and disavow the multiple signals feature of the prior art. (Pros. Hist. at 110-11.)

Accordingly, based on the plain meaning of the term "excitation," the specification's written descriptions, and the prosecution history, this Court defines "excitation" as a noun to mean "an input signal of a system or apparatus without additional values," and as an adjective to mean "relating to an input signal of a system or an apparatus without additional values."

F. *Speech Pattern*

[6] The phrase "speech pattern" appears in several '580 claims, including claims 2, 11, 40 and 42. Microsoft proposes the definition "an audible speech message formed from or into a sequence of time varying values." AT & T asserts the definition should be "a configuration (*e.g.*, a waveform) of information that is based on audible speech." (Joint Letter, Ex. B.) The crux of the dispute is whether "speech pattern" must be audible, as Microsoft contends, or whether it can be merely based on audible speech, as AT & T asserts.

As the term "speech pattern" is not defined in the specification, the dictionary meaning of the phrase sheds light on its ordinary meaning. *Texas Digital Sys.*, 308 F.3d at 1202; *Vitronics Corp.*, 90 F.3d at 1584 n. 6. Webster's Dictionary defines "speech" as "something that is spoken: an uttered word: statement", and "pattern" as "a natural or chance configuration (as of markings or of events)." *Webster's Third New Int'l Dictionary* at 2189, 1657 (G. & C. Merriam Co.1981). Additionally, a technical treatise defines "speech" as an "audible set of sounds." *McGraw Hill Dictionary of Scientific and Technical Terms*, 21. Both dictionaries contemplate speech as audible.

Neither the claims nor the specification explicitly define "speech pattern" or its component words. However, the use of the phrase in the specification is instructive. *ZMI Corp. v. Cardiac Resuscitator Corp.*, 844 F.2d 1576, 1580 (Fed.Cir.1988) ("The specification aids in ascertaining the scope and meaning of the language employed in the claims."). The specification contemplates "speech pattern" as audible speech. In describing Figure 1, the specification states "a speech pattern such as a spoken message is received by [a] microphone" on the speaking end. ('580 patent, Col. 3:20-22.) In describing the output of the claimed invention on the listening end, the specification states that in Figure 1, "an analog signal [is] ... transformed into a speech

pattern by transducer [speaker] 160." ('580 patent, Col. 7:8-10.) AT & T points to Figure 7, the depiction of a "waveform" to justify its position that a "speech pattern" is "a configuration ... of information that is based on audible speech," because "one doesn't hear anything from the speech pattern [illustrated by the waveforms] coming off this page." (Tr. at 180; Joint Letter, Ex. B.) Figure 7, however, does not suggest that a "speech pattern" refers to anything other than audible speech; rather, it merely depicts waveforms that "illustrate[] a typical speech pattern." ('580 patent, Col. 3:15-16, 61-62.) Indeed, even considering the waveform of Figure 7 as an analog electrical signal, the specification teaches that such signals merely "correspond[]" to a "speech pattern, such as a spoken message," and are not themselves speech patterns. ('580 patent, Col. 3:20-23.)

The Court declines to adopt Microsoft's proposed phrase "formed from or into a sequence of time varying values." Such a phrase is not within the plain meaning of "speech pattern." *See* Texas Digital Sys., 308 F.3d at 1201-02 (recognizing the "heavy presumption" that the terms in the claims have their ordinary meaning).

Accordingly, this Court construes the ordinary meaning of "speech pattern" as "an audible speech message configuration."

G. Means ... For Generating a Speech Pattern

[7] The parties dispute the corresponding structure for the "means ... for generating a speech pattern." AT & T argues that the speech synthesizer filter 154 (as described at '580 patent, Col. 7:4-7) is the sole corresponding structure, while Microsoft counters that the structure should be speech synthesizer filter 154, D/A converter 156, low pass filter 158, and transducer 160 of Figure 1 (as described at '580 patent, Col. 7:4-11). Both parties agree that there is only one embodiment for purposes of this s. 112, para. 6 analysis. (Joint Letter, Ex. B.)

The Patent Act allows means-plus-function claims:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material or acts described in the specification and equivalents thereof.

35 U.S.C. s. 112, para. 6. When a court construes a means-plus-function term, it must first identify the claimed function and then determine "what structure, if any, disclosed in the specification corresponds to the claimed function." *Cardiac Pacemakers*, 296 F.3d at 1113; *accord* *IMS Tech., Inc. v. Haas Automation, Inc.*, 206 F.3d 1422, 1430 (Fed.Cir.2000). "In order to qualify as corresponding, the structure must not only perform the claimed function, but the specification must clearly associate the structure with performance of the function." *Cardiac Pacemakers*, 296 F.3d at 1113 (citations omitted). The specification or prosecution history must "clearly link[] or associate[][the] structure to the function recited in the claim." *B. Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1424 (Fed.Cir.1997). "A court may not import into the claim features that are unnecessary to perform the claimed function." *Northrop Grumman Corp. v. Intel Corp.*, 325 F.3d 1346, 1352 (Fed.Cir.2003) (citing *Acromed Corp. v. Sofamor Danek Group Inc.*, 253 F.3d 1371, 1382 (Fed.Cir.2001)). "Features that do not perform the recited function do not constitute corresponding structure and thus do not serve as claim limitations." *Northrop Grumman*, 325 F.3d at 1352 (citations omitted). "It is equally improper to broaden the scope of the claimed function by ignoring clear limitations in the claim language." *Cardiac Pacemakers*, 296 F.3d at 1113. As with ordinary claim construction, this analysis is

performed from the perspective of one of ordinary skill in the art.

The disputed phrase reads:

means jointly responsive to said interval spectral representative signals and said interval excitation representative signal *for generating a speech pattern* corresponding to the speech message of said time interval.

('580 patent, Col. 24:3-6) (emphasis added.)

As noted, the parties agree that the function of this means-plus-function phrase is to generate a speech pattern and that there is only one applicable corresponding structure disclosed in the specification, but disagree as to which elements of Figure 1 constitute the corresponding structure. *See* Telemac Cellular Corp. v. Topp Telecom, Inc., 247 F.3d 1316, 1324 (Fed.Cir.2001) (stating that the court must first identify the claimed function). The specification states in pertinent part:

The excitation code, after being decoded into an excitation pulse sequence in decoder 153, is applied to the excitation input of speech synthesizer filter 154. The a(k) codes are supplied to the parameter inputs of filter 154. Filter 154 is operative in response to the excitation and predictive parameter signals to form a coded replica of the frame speech signal as is well known in the art. D/A converter 156 is adapted to transform the coded replica into an analog signal which is passed through low-pass filter 158 and transformed into a speech pattern by transducer 160.

('580 patent, Col. 6:68-7:10.) While the speech synthesizer filter 154 is jointly responsive to both the interval spectral representative signals and the interval excitation representative signal, it does not form a speech pattern alone. The specification clearly links additional elements 156, 158 and 160 as necessary to perform the function of generating a speech pattern. ('580 patent, Col. 7:4-11.) For example, the specification states explicitly that after passing through the D/A converter and low-pass filter 158, the resultant signal is "transformed into a speech pattern." ('580 patent, Col. 7:7-10.) Accordingly, the structure corresponding to the "means ... for generating a speech pattern" function consists of the speech synthesizer filter 154, D/A converter 156, low-pass filter 158, and transducer 160 (as described at '580 patent, Col. 7:4-11).

H. Signal Representative of the Differences Between Said Interval Speech Pattern and the Interval Representative Set

[8] The parties also dispute the meaning of the phrase "signal representative of the differences between said interval speech pattern and the interval representative set" (the "Differences Phrase"). ('580 patent, Col. 19:10-12.) Both parties maintain that this phrase requires construction.

AT & T urges the Court to adopt its proposed construction: "a sequence of values representative of the differences between the interval speech pattern and the predicted speech pattern based on the set of signals representative of the speech pattern of said time interval." (Joint Letter, Ex. B.) Microsoft's proposed definition is: "a sequence of values representing the subtraction between the speech pattern for an entire time segment and the representative signal set for that entire time segment." (Joint Letter, Ex. B.) The two main points of contention between the parties' positions are: (1) the construction of the Differences Phrase as a whole; and (2) whether the term "differences" encompasses the concept of the degree or amount things

differ or, in contrast, a mathematical subtraction.

1. The "Differences Phrase"

The parties both acknowledge that the Differences Phrase, as written, is unclear in that it describes a comparison of unlike items: a speech pattern with an interval representative set. AT & T, however, asserts that the specification teaches that the "difference" between the two values may be formed in the predictor residual generator 118. More specifically, AT & T urges the Court to consider the specification's description of the operation of the Differences Phrase:

The delayed samples are supplied to the input of prediction residual generator 118. The prediction residual generator, as is well known in the art, is responsive to the delayed speech samples and the prediction parameters $a(k)$ to form a signal corresponding to the difference therebetween. The formation of the predictive parameters and the prediction residual signal for each frame shown in predictive analyzer 110 may be performed according to the arrangement disclosed in U.S. Pat. No. 3,740,476 issued to B.S. Atal June 19, 1973 and assigned to the same assignee or in other arrangements well known in the art.

(580 patent, Col. 3:41-53.) AT & T also points to Figure 7 to demonstrate the specification's illustration of the Differences Phrase.

Microsoft argues that the Court should not impermissibly re-draft the claim phrase to accommodate AT & T's proposed construction, and acknowledges that its proposed construction would render claims incorporating the Differences Phrase invalid.

As a preliminary matter, "[a] patent claim shall be presumed valid" unless the party challenging the claim can prove invalidity by clear and convincing evidence. 35 U.S.C. s. 282 (2003); *see* Atlas Powder Co. v. E.I. du Pont De Nemours & Co., 750 F.2d 1569, 1573 (Fed.Cir.1984); Minnesota Mining & Mfg. Co. v. Chemque, Inc., 303 F.3d 1294, 1301 (Fed.Cir.2002). Approaches to claim construction that render the claimed invention inoperable should be viewed with skepticism. *See* Modine Mfg. Co. v. United States Int'l Trade Comm'n, 75 F.3d 1545, 1557 (Fed.Cir.1996) *overruled on other grounds*, 535 U.S. 722, 122 S.Ct. 1831, 152 L.Ed.2d 944 (2002); ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577 (Fed.Cir.1984). "When claims are amenable to more than one construction, they should when reasonably possible be interpreted so as to preserve their validity." *Modine Mfg. Co.*, 75 F.3d at 1556; *accord* Rhine v. Casio Inc., 183 F.3d 1342, 1345 (Fed.Cir.1999); *Whittaker Corp. v. UNR Indus., Inc.*, 911 F.2d 709, 712 (Fed.Cir.1990).

Although the claim language itself is unclear, the '580 patent's written description clarifies the meaning of the Differences Phrase by describing how the comparison operates. *See* Teleflex, 299 F.3d at 1325 ("The intrinsic evidence may provide context and clarification about the meaning of claim terms.") The passage describing Element 118, the residual generator signal, makes clear that the proposed comparison is performed on interval speech pattern and the predicted speech pattern based on the set of signals representative of the speech pattern. (*See* '580 patent, Col. 3:40-53.) *See* Teleflex, 299 F.3d at 1325 ("The specification may assist in resolving ambiguity where the ordinary and accustomed meaning of the words used in the claims lack sufficient clarity to permit the scope of the claim to be ascertained from the words alone.") (citing *Eastman Kodak Co. v. Goodyear Tire & Rubber Co.*, 114 F.3d 1547, 1554 (Fed.Cir.1997)). Analyzing the prosecution history, it is silent concerning the Differences Phrase despite the fact that the PTO examined the reissue patent twice. *See* Interconnect Planning Corp. v. Feil, 774 F.2d 1132, 1139

(Fed.Cir.1985) (the "burden of proving invalidity [is] made heavier" with respect to a reissue patent).

AT & T urges the Court to consult certain expert testimony to confirm the meaning of the Differences Phrase as understood by one of ordinary skill in the art. Microsoft counters by emphasizing that "[e]xpert testimony is often useful to clarify the patented technology and to explain its meaning through the eyes of experience, but it may not correct errors or erase limitations or otherwise diverge from the description of the invention as contained in the patent documents." *Aqua-Aerobic Sys. v. Aerators Inc.*, 211 F.3d 1241, 1245 (Fed.Cir.2000). Expert testimony "may be used only to help the court come to the proper understanding of the claims; it may not be used to vary or contradict the claim language." *Vitronics*, 90 F.3d at 1584 (citing *Markman*, 52 F.3d at 967); *accord Pitney Bowes*, 182 F.3d at 1308; *Pall Corp. v. Micron Separations, Inc.*, 66 F.3d 1211, 1216 (Fed.Cir.1995); *see also Teleflex*, 299 F.3d at 1328 (referring to expert witnesses' testimony concerning the ordinary meaning of a claim term); *Budde v. Harley-Davidson, Inc.*, 250 F.3d 1369, 1382 (Fed.Cir.2001) (considering expert testimony concerning the view of one skilled in the art). "[I]t is entirely appropriate, perhaps even preferable, for a court to consult trustworthy extrinsic evidence to ensure that the claim construction it is tending to from the patent file is not inconsistent with clearly expressed, plainly apposite, and widely held understandings in the pertinent technical field." *Pitney Bowes*, 182 F.3d at 1309.

In this case, both parties submitted expert testimony concerning the interpretation one skilled in the art would attribute to the Differences Phrase: AT & T presented Dr. Nikil S. Jayant and Microsoft presented Dr. Allen Gersho, both accomplished engineers. In paragraph 7 of his declaration, Dr. Jayant states that one of ordinary skill in the art of speech compression in 1981 would have understood that the Differences Phrase

refers to the difference between an original speech signal a prediction or estimate of the original speech signal. The person of ordinary skill in the art would have understood that a residual signal, or a prediction error, would be consistent with such a difference between [the] original speech signal and the prediction or estimate of the original speech signal.

(Jayant Decl. at para. 7.)

Microsoft's expert, Dr. Gersho averred in his declaration:

I agree that persons skilled in the art of speech compression in 1981 would have understood that the inventors intended the 'differences' phrase to refer to the difference between (1) 'an original speech signal' and (2) 'a prediction or estimate of the original speech signal,' but I disagree that the differences phrase, as written by the claim drafter so states.

(Gersho Decl. at para. 12.) Microsoft conceded, however, at the *Markman* hearing that its own expert, Dr. Gersho, supports Dr. Jayant's position in his declaration, (Tr. at 239-40), and similarly acknowledged that the Court should consider the experts' declarations in analyzing the disputed phrase. (Tr. at 228.) *See Teleflex*, 299 F.3d at 1328; *Budde*, 250 F.3d at 1382; *Vitronics*, 90 F.3d at 1584; *Pitney Bowes*, 182 F.3d at 1309. Thus, the Court's consultation of the experts' determinations confirm the teachings of the specification that one of ordinary skill in the art of speech compression in 1981 would have understood the Differences Phrase to refer to the difference between an original speech signal and a prediction or an estimate of the original speech signal. *See Renishaw*, 158 F.3d at 1250 ("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."); *accord Vitronics*, 90 F.3d at 1584; *Pitney Bowes*, 182 F.3d at 1309.

The instant situation is distinguishable from the decisions upon which Microsoft relies. For example, in *Aqua-Aerobic Sys., Inc. v. Aerators Inc.*, 211 F.3d 1241, 1245 (Fed.Cir.2000), the Federal Circuit declined to rely on expert testimony to vary or contradict the terms of the claims stating: "[the expert's testimony] is directly contrary to the limitations in the claims and the description in the specification." *Aqua-Aerobics Sys.*, 211 F.3d at 1245; *see also* *Process Control Corp. v. HydReClaim Corp.*, 190 F.3d 1350, 1357 (Fed.Cir.1999) (declining to apply contrary written description where one skilled in the art would understand that the "claim was susceptible to only one reasonable construction"); *Allen Eng'g Corp. v. Bartell Indus.*, 299 F.3d 1336, 1349 (Fed.Cir.2002) (finding claim invalid where specification described a claim structure in "contrary terms" to the claim language). Here, however, a review of both experts' testimony confirms that the specification describes the Differences Phrase consistent with, not contrary to, the understanding of one skilled in the art. *See* *Vitronics*, 90 F.3d at 1583-84 (stating a court may consider expert testimony to aid it in "com[ing] to the proper understanding of the claims"); *accord Pitney Bowes*, 182 F.3d at 1308. Thus, the construction of this claim term is appropriately based on the intrinsic evidence, as confirmed by the experts' testimony.

2. Differences v. Subtraction

The parties also disagree as to whether the proper construction of the Differences Phrase should retain the term "differences" or instead use the term "subtraction." To restate, AT & T's proposed definition is: "a sequence of values representative of the *differences* between the interval speech pattern and the predicted speech pattern based on the set of signals representative of the speech pattern of said time interval." (emphasis added.) Microsoft's proposal is: "a sequence of values representing the *subtraction* between the speech pattern for an entire time segment and the representative signal set for that entire time segment." (Joint Letter, Ex. B) (emphasis added.)

AT & T argues that the term "differences" should retain its plain meaning, since infusing the term "subtraction" into the phrase would render the encompassing claims inoperable. *See* *ACS Hosp. Sys.*, 732 F.2d at 1577 ("claims should be ... construed, if possible, as to sustain their validity"). AT & T further asserts that the patentees did not manifest a clear disavowal of the plain meaning of "differences."

Microsoft counters that its version of the plain meaning of "differences" should apply: "the result of subtracting one number from another." (*See* Microsoft PHB at 24-25; *citing McGraw-Hill Dictionary of Scientific and Technical Terms* at 448 (3rd ed. McGraw-Hill 1984).) Microsoft argues that the written description supports the use of the word "subtraction," in that the correlation processor 125 generates "a signal corresponding to the weighted difference" between "signals Y and [YHAT]," ('580 patent, Col. 4:60-64), and that this difference is the result of subtractions, as illustrated by the source code in Appendix A, line 201, depicting a subtraction between the "Y" signal and the "YHAT" signal.

Starting with the words of the claim, Microsoft cites to the mathematical definition "the result of subtracting one number from another" in support of its proposed "subtraction" claim language. *See McGraw-Hill Dictionary of Scientific and Technical Terms* at 364. AT & T offers two dictionary definitions of "difference" in support of its broader proposed language: "the amount by which one quantity is greater or less than another," *Am. Heritage Dictionary of the English Language* at 367 (Am. Heritage Publishing Co., Inc.1973), and "the degree or amount by which things differ in quantity or measure," *Webster's New Collegiate Dictionary*, at 315 (G. & C. Merriam Co.1981). AT & T also submits a definition for "differ": "to be unlike or distinct in nature, form, or characteristics." *Webster's New Collegiate Dictionary* at 315 (G. &

C. Merriam Co.1981). Where terms have multiple dictionary definitions "the intrinsic record must always be consulted to identify which of the different possible dictionary meanings of the claim terms in issue is most consistent with the use of the words by the inventor." Texas Digital Sys., 308 F.3d at 1203 (citing cases). Here, the specification's description of the operation of the Differences Phrase (580 patent, Col. 3:41-53) confirms a broader definition of the term "differences," as it depicts a comparison rather than a mathematical subtraction between the interval speech pattern and the predicted speech pattern.

Further, the patentees did not clearly disavow the broader, comparative definition of "differences" in the specification or the prosecution history. The specification source code in Appendix A, to which Microsoft cites in support of its proposed term, is merely one embodiment of the mathematical operation in Element 118, which itself is one part of the embodiment described in Figure 1. To narrow the claim term as Microsoft suggests would be to impermissibly import a limitation from the specification. *See Teleflex*, 299 F.3d at 1325. Accordingly, the intrinsic evidence does not support the infusion of the word "subtractions" into the Differences Phrase.

In conclusion, this Court construes the claim phrase "signal representative of the differences between said interval speech pattern and the interval representative set" as "a sequence of values representative of the differences between the interval speech pattern and the predicted speech pattern based on the set of signals representative of the speech pattern of said time interval."

I. Means ... for Forming a First Signal Corresponding to the Interval Speech Pattern

[9] This means-plus-function phrase in claim 11 reads: "means responsive to said speech interval signals and said interval differences representative signal for forming a first signal corresponding to the interval speech pattern." (580 patent, Col. 19:12-15.) The disputed part of the phrase is "means ... for forming a first signal corresponding to the interval speech pattern." (Joint Letter, Ex. B.)

While the parties agree that the disputed phrase is subject to 35 U.S.C. s. 112, para. 6 because it is a means-plus-function phrase, they differ as to the corresponding structure described in the patent specification. AT & T argues that this means-plus-function phrase has three corresponding structures for purposes of a s. 112, para. 6 analysis, while Microsoft asserts only one. The parties also dispute the meaning of part of the recited function "first signal corresponding to the interval speech pattern." (Joint Letter, Ex. B .)

1. "First Signal Corresponding to the Interval Speech Pattern"

Microsoft argues that the definition of the "first signal corresponding to the interval speech pattern" should be "a first sequence of values that equal or closely approximate the speech pattern in the time segment." (Joint Letter, Ex. B.) AT & T's proposed definition is "a first sequence of values corresponding to (*i.e.*, that relates either loosely or tightly) the interval speech pattern." Thus, the parties' central disagreement lies in the definition of the term "corresponding to."

Microsoft argues that the patentees ascribed a special meaning to the term "corresponding" during prosecution, and therefore AT & T's proposed definition is misplaced. According to Microsoft, the patentees distinguished their claims from the prior art by asserting that the "first interval corresponding signal" is one "that closely approximates the interval speech pattern." (Pros. Hist. at 112.) AT & T argues that the patentees' statement to the examining attorney did not rise to the level of a "clear disavowal" of plain meaning, and instead characterizes the statement as a "general comparison" of the invention with prior art.

The plain meaning of "corresponding" is "agreeing in kind, degree, position, function or other respects; related, derived, accompanying." *Webster's Third New Int'l Dictionary on the English Language Unabridged* at 512 (G. & C. Merriam Co.1981).) The specification does not define "corresponding." However, the patentees disavowed the plain meaning of "corresponding" in their statements to the examining attorney. The relevant remarks from the prosecution history were presented to the PTO in response to an Office Action that rejected the original patent application on the grounds that, among other reasons, (1) the written description was inadequate; and (2) the claims were obvious in light of the Atal '302 and '976 patents. (Pros. Hist. at 79-84.) Thus, AT & T's characterization of the patentees' response as a "general comparison" of the prior art with their invention is unpersuasive, since the patentees' goal was to distinguish their invention from that prior art. *See Spectrum Int'l, Inc. v. Sterilite Corp.*, 164 F.3d 1372, 1378 (Fed.Cir.1998) (explicit meanings given to claim terms in order to overcome prior art will limit those terms accordingly); *Pall Corp. v. PTI Techs. Inc.*, 259 F.3d 1383, 1392 (Fed.Cir.2001) (same); *Southwall Techs.*, 54 F.3d at 1576 (same); *Standard Oil*, 774 F.2d at 452 (same).

The patentees stated: "The instant application provides a first interval corresponding signal that closely approximates the interval speech pattern produced from the interval representative signals." (Pros. Hist. at 112.) Read in context with the prosecution history, the term, "corresponding" is replaced by the term "closely approximat[ing]." The patentees' clearly disavowed the plain meaning of "corresponding," and provided to the examiner a more specific comparison with the prior art.

The Court declines to adopt Microsoft's proposed "equal to" language, however, as that term is unsupported by the intrinsic record and is similarly absent from the cited prosecution history. (Pros. Hist. at 112.) Indeed, the plain meaning of "closely approximating" excludes the term "equal to".FN6

FN6. The definition of "approximation" is "a mathematical quantity that is close in value to but not the same as a desired quantity." *Webster's New Collegiate Dictionary* at 56 (G. & C. Merriam Co.1981).

Accordingly, this Court defines "first signal corresponding to the interval speech pattern" as "a first sequence of values closely approximating the interval speech pattern."

2. Corresponding Structure

The parties agree that Element 121 of Figure 1, titled "predictive filter," described in the specification at Column 4, lines 45-60 concerning structure 121, is a structure corresponding to the means phrase. (Joint Letter, Ex. B; Tr. at 258.) Microsoft, however, disagrees with AT & T's assertion that two additional embodiments exist, one in processor 210 of Figure 2, operating on the instructions in Appendix D, and another as described at Column 10, lines 40-55. (Joint Letter, Ex. B.) As noted, the function of the means-plus-function phrase at issue here is to form a first sequence of values closely approximating the interval speech pattern.

Means-plus-function claims are "construed to cover the corresponding structure ... described in the specification." 35 U.S.C. s. 112, para. 6. "[P]ursuant to this provision, 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. This duty to link or associate structure to function is the *quid pro quo* for the convenience of employing s. 112, para. 6." *B. Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1424 (Fed.Cir.1997) (citing *O.I Corp. v. Tekamar Co.*, 115 F.3d 1576, 1583

(Fed.Cir.1997)).

The parties agree that Element 121 of Figure 1, as described in portions of Column 4, lines 45-60 concerning Filter 121, is a corresponding structure to the function "means for forming a first sequence of values...." (Tr. at 266.) Examining the prosecution history, the examining attorney, after concluding that the original '832 patent application's "disclosure fail[ed] to provide adequate description," FN7 stated: "APPLICANT IS REQUIRED TO READ THE CLAIMS ON THE DRAWINGS BY SUBMITTING A COPY OF THE CLAIMS WITH PARENTHETICAL INSERTIONS IDENTIFYING BY ITEM NUMBER EACH FUNCTIONAL ELEMENT." (Pros. Hist. at 81 (emphasis original).) In response to the PTO's Action Letter, the applicants linked the phrase at issue here explicitly with only one structure: Element 121 of Figure 1. The prosecution history states that "a first signal corresponding to the frame interval speech pattern is generated in a predictive filter (121)." (Pros. Hist. at 112, 121-22, para. 11 ("means (121) for forming a first signal corresponding to the interval speech pattern"); *see also* Pros. Hist. at 125, para. 24, 127, para. 29 (same).)

FN7. The Examiner initially rejected claims 1-31 of the original '832 patent under 35 U.S.C. s. 112, para. 1, *inter alia*, as failing to provide an adequate description. Specifically, the Examiner reasoned that the "gist of the invention is not clear as required in the Abstract and Summary of the Invention," "the drawings appear incomplete," and the "adaptation of the prior art as cited and needed is not clearly disclosed and related to the present invention as disclosed." (Pros. Hist at 81.)

Microsoft argues that AT & T's proposed second additional corresponding structure is not clearly linked to the claimed function, either in the specification or the prosecution history. *See Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, 296 F.3d 1106, 1114 (Fed.Cir.2002) (declining to accept proposed structure where the specification disclosed no structure that corresponded to the claimed function). AT & T's second proposed corresponding structure is Processor 210 of Figure 2, operating on instructions in Appendix D. (Joint Letter, Ex. B.) AT & T argues that Processor 210 is actually linked with the predictive filter in Element 121 of Figure 1 through a multi-link analysis of the specification. (Tr. at 258-263.) AT & T notes that the patentees indicated in the specification that they anticipated that the Processor 210, and the operations performed by the Processor in Figure 2, could be substituted for Box 120 in Figure 1, the excitation signal generator circuit. (Tr. at 261; '580 patent, Col. 8:18-20.) AT & T further elaborates that an equation in the specification at Column 8, lines 1-5, "corresponds to the speech representative signal of the frame at the output of predictive filter 121." ('580 patent, Col. 8:6-7.) Consequently, AT & T argues that this particular equation is generated by the embodiment in Figure 2 because the equation appears in Figure 5 ('580 patent, Sheet 4 of 6), and Figure 5's operations are allegedly performed by the Processor 210 in Figure 2, operating on software code contained in Appendix D. ('580 patent, Col. 8:60-64.)

The Court does not accept AT & T's multi-step proposal to clearly link the proposed embodiment with the function at hand. First, when the examiner invited the patentees to "read the claims onto the drawings," the patentees only noted one corresponding structure, Element 121 of Figure 1. Second, while AT & T's proposed path to this second corresponding structure may possibly link Figure 2 with Element 121 of Figure 1, it does not clearly link the cited function-"forming a first signal corresponding to [closely approximating] the interval speech pattern"-with Processor 210 of Figure 2. In light of the entire intrinsic record, the Court declines to adopt AT & T's second proposed embodiment for this means-plus-function phrase.

The description of the third embodiment that AT & T proposes consists of Column 10, lines 40-55:

The invention has been described with reference to particular illustrative embodiments. It is apparent to those skilled in the art with various modifications may be made without departing from the scope and the spirit of the invention. For example, the embodiments described herein have utilized linear predictive parameters and a predictive residual. The linear predictive parameters may be replaced by formant parameters or other speech parameters well known in the art. The predictive filters are then arranged to be responsive to the speech parameters that are utilized and to the speech signal so that the excitation signal formed in circuit 120 of FIG. 1 is used in combination with the speech parameter signals to construct a replica of the speech pattern of the frame in accordance with the invention.

An alternative corresponding structure set forth in a means-plus-function limitation must actually perform the recited function. *Fonar Corp. v. General Elec. Co.*, 107 F.3d 1543, 1551-52 (Fed.Cir.1997); *Medtronic, Inc. v. Advanced Cardiovascular Sys., Inc.*, 248 F.3d 1303, 1311-13 (Fed.Cir.2001); Donald S. Chisum, 5A *Chisum on Patents*, s. 18.03[5][d][i] (Matthew Bender & Co 2003). Here, the proposed claim is too general to qualify as an additional corresponding structure, and thus the s. 112, para. 6 claim is limited to the corresponding structure actually disclosed. *See Fonar*, 107 F.3d at 1551-52; *B. Braun Med.*, 124 F.3d at 1425; *Cardiac Pacemakers*, 296 F.3d at 1114. Accordingly, Column 10, lines 40-48 do not encompass a third alternative corresponding structure for the phrase at issue.

Since the second and third embodiments proposed by AT & T are not clearly linked with the means-plus-function phrase at issue here, the Court identifies Element 121 of Figure 1, as described in portions of Column 4:45-60 concerning Filter 121, as the corresponding structure to the function of the phrase "means ... for forming a first signal corresponding to the interval speech pattern."

J. Means ...for Forming a Second Interval Corresponding Signal

[10] This means-plus-function phrase reads: "means responsive to said interval speech pattern representative signals for forming a second interval corresponding signal." (580 patent, Col. 19:16-18.) Similar to the "means ... for forming a first signal" phrase, the parties dispute the meaning of the phrase "a second interval corresponding signal." With respect to the corresponding structures, the parties agree that Filter 123 of Figure 1, as described in portions of Column 4, lines 45-60 concerning Filter 123, performs the phrase's function. (Joint Letter, Ex. B.) AT & T, however, asserts two additional embodiments that Microsoft disputes.

1. A Second Interval Corresponding Signal

AT & T's proposed definition of "a second interval corresponding signal" is: "a second sequence of values corresponding to (*i.e.*, that relates to either loosely or tightly) the time segment or frame." Microsoft contends the definition should be: "a second sequence of values that approximate the speech pattern in the time segment." (Joint Letter, Ex. B.)

Unlike the prosecution history addressing the "first interval corresponding signal," the prosecution history relating to "a second interval corresponding signal" does not suggest that the term "corresponding" means "closely approximating." (Pros. Hist. at 112.) FN8 The term "corresponding," however, "cannot be interpreted differently in different claims because claim terms must be interpreted consistently." *Southwall Techs., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1579 (Fed.Cir.1995). Claim construction requires reference to other claims, in addition to the written description and prosecution history. *Southwall Techs.*, 54 F.3d at 1579.

FN8. That portion of the prosecution history reads: "The instant application provides a first interval corresponding signal that closely approximates the interval speech pattern produced from the interval representative signals and a differences representative signal and a second interval corresponding signal produced from the interval representative signals." (Pros Hist. at 112.)

Thus, the patentees' statement to the PTO examiner concerning the "first signal phrase" discussed above is also relevant to interpreting the meaning of "corresponding" in the "second interval corresponding signal" phrase. (Pros. Hist. at 112); *see* Southwall Techs., 54 F.3d at 1579. There is no clear indication in the intrinsic evidence that the meaning of "corresponding" in the first signal phrase is inapplicable here. Moreover, further statements during prosecution comport with the above definition of "corresponding" here. During prosecution, the patentees stated: "An excitation signal [is] formed for altering the second signal to reduce the differences between the first and second interval corresponding signals. The alteration of the second signal results in a controlled approximation to the interval pattern ." (Pros. Hist. at 112.)

Thus, the phrase "second interval corresponding signal" is defined as "a second sequence of values that closely approximate the time segment or frame." The Court declines to insert the term "speech pattern" into the construction, as that term does not appear in the phrase and is unsupported by the specification or the prosecution history. *See* Texas Digital Sys., 308 F.3d at 1212 (holding term inserted into recited function inappropriate where reference to term had no basis in claim language) (citing cases).

2. Corresponding Structures

The parties agree that Filter 123 of Figure 1 is a corresponding structure. AT & T asserts two additional embodiments: Processor 210 of Figure 2 operating on instructions in Appendix D, and a structure described in Column 10 lines 40 to 55. (Joint Letter, Ex. B.) In response to the examining attorney's direction to read the limitations on the written description, the patentees only identified Filter 123 as the structure corresponding to the means-plus-function claim. (Pros. Hist. at 122, para. 11 ("means (123) ... for forming a second interval corresponding signal"); *see also* Pros. Hist. at 125-26, para. 24; Pros. Hist. at 127, para. 29 (same).) Neither the prosecution history nor the written description "clearly identify" any additional corresponding structures. Accordingly, as noted in the analysis in Section I above, AT & T's proposed second and third corresponding structures cannot survive. Thus, Filter 123 of Figure 1 is the sole structure corresponding to the "means ... for forming a second corresponding signal" limitation. *See* B. Braun Med., 124 F.3d at 1424 (declining to accept additional structure inadequately disclosed in the specification); Cardiac Pacemakers, 296 F.3d at 1114 (same).

K. Signal Corresponding to the Differences Between Said First and Second Interval Corresponding Signals

[11] This phrase "signal corresponding to the differences between said first and second interval corresponding signals" appears in claims 2, 11, 24, 29, 34, and 37. Microsoft asserts that the definition should be "values closely approximating or equal to the result of subtractions between the first and second interval corresponding signals." (Joint Letter, Ex. B.) AT & T's proposed definition is "values corresponding to (*i.e.* that relate to, either loosely or tightly) the differences between the first and second interval corresponding signal." (Joint Letter, Ex. B.) Here again, the parties disagree with respect to the meaning of "corresponding to" and whether the phrase should be defined to include the term "subtractions" or "differences."

As noted above, absent a clear indication to the contrary, terms appearing in multiple claims should be construed consistently. *Southwall Techs.*, 54 F.3d at 1579. There is no indication here that the term takes on a different meaning in the disputed phrase than in other claim phrases. Thus, the Court similarly construes "corresponding" as "closely approximating."

As with the interpretation of the Differences Phrase above, the Court finds no clear disavowal of the plain meaning of "differences" in this term. Accordingly, the Court again declines to infuse Microsoft's proposed "subtractions" terminology into the claim language, and instead uses the word "differences" in the disputed claim phrase, as claim terms must be construed in concert throughout the patent. *Southwall Techs.*, 54 F.3d at 1579.

Accordingly, the Court interprets "signal corresponding to the differences between said first and second interval corresponding signals" as "a signal closely approximating the differences between said first and second interval corresponding signals."

L. Means ... for Producing a Third Signal

[12] This means-plus-function limitation appears in claim 11: "means responsive to said interval differences corresponding signal for producing a third signal for altering said second interval corresponding signal to reduce the interval differences corresponding signal." ('580 patent, Col. 19:20-24.) A similar limitation appears in claim 2 ('580 patent, Col. 17:52-55.) The parties now agree that one portion of this phrase, "for altering said second interval corresponding signal to reduce the interval differences corresponding signal" does not require construction. (Joint Letter, Ex. A.) The parties similarly agree with respect to the two corresponding structures: (1) Element 127 of Figure 1, as described in Column 4:63-68, Column 5:62 through Column 6:9, and Appendix B; and (2) Processor 210 of Figure 2, operating on instructions in Appendix D. (Joint Letter, Ex. B.) The remaining dispute solely concerns the meaning of the term "third signal." (Joint Letter, Ex. B.)

Microsoft's proposed definition is "third values that, by themselves, without any other values (such as "pitch period" values) replace the signal representative of the differences between said interval speech pattern and the interval representative signal set." AT & T counters with the broader definition "a signal that is different than a first signal and a second signal." (Joint Letter, Ex. B.) At the *Markman* hearing, AT & T also asserted that it "would be happy with just third signal." (Tr. at 295.) The terms "third" and "signal" are not defined in the specification.

In support of its narrower definition, Microsoft asserts that the patentees disavowed the plain meaning in statements made to the patent examiner concerning the excitation signal:

The excitation signal of the instant application is completely distinguished from the multitude of signals required in Atal '302 to perform the same function and advantageously provides improved operation in which voiced, unvoiced and partially voiced intervals may be accurately constructed using a single excitation signal.

(Pros. Hist. at 111.)

According to Microsoft, the intrinsic record reveals that the "third signal" corresponds to the excitation

signal, and consequently certain prosecution history concerning the excitation signal equally applies to interpretation of the term "third signal." (Microsoft PHB at 34; Tr. at 307-08.) Specifically, Microsoft points to a portion of the specification to support its argument that a "third signal" from Element 127 of Figure 1 is associated with the term "excitation signal" or "excitation code." (Tr. at 307). In addition to noting that the specification posits processor 127 producing an excitation signal ('580 patent, Col. 4:60), the cited portion of the specification reads: "Signal E is applied to a signal processor 127 to adjust the excitation signal EC so that the differences between the weighed speech representative signal from filter 121 and the weighed artificial speech representative signal from filter 123 are reduced." ('580 patent, Col. 4:63-68.) Microsoft notes that claim 11 recites the phrase "means responsive to said interval differences corresponding signal for producing a third signal for altering said second interval corresponding signal to reduce the interval differences corresponding signal," ('580 patent, Col. 19:22-23), and that the prosecution history states that "[a]n excitation signal [is] formed for altering the second signal to reduce the differences between the first and second interval corresponding signals." (Pros. Hist. at 112.) It is unclear, however, whether the written description of the embodiments restrict the term "third signal" as solely equivalent to an excitation signal (depicted as EC). *See Johnson Worldwide*, 175 F.3d at 990-91 (citing *Comark Communications, Inc. v. Harris Corp.*, 156 F.3d 1182, 1187 (Fed.Cir.1998)).

An examination of the prosecution history provides no further clarification or clear link between the patentees' statements regarding the excitation signal and the term "third signal." While the cited prosecution history directly relates to the "excitation" signals, it neither recites nor describes the "third signal." So to, this Court cannot glean from the prosecution history any clear disavowal of the plain meaning of the term. Accordingly, that portion of the prosecution history does not affect a plain meaning definition of "third signal." *See Laitram*, 143 F.3d at 160 (arguments relating to language different from the claim language are not relevant to claim construction). Consequently, after reviewing the intrinsic evidence in total, the Court declines to adopt Microsoft's proposed link between "third signal" and "excitation."

Webster's Dictionary definitions of "third" include, *inter alia*: "being number three in a countable series"; "other than the two known, mentioned, or participating." *Webster's Third New Int'l Dictionary of the English Language Unabridged*, at 2377-78 (G. & C. Merriam Co.1981). As the patentees did not define the term "third signal" in the specification or provide a clear disavowal of claim scope concerning this term in the prosecution history, the Court adopts the ordinary meaning of "third signal," as "a signal other than a first signal or a second signal."

M. Means ... For Producing A ... Predictive Residual Signal

[13] This means-plus-function phrase occurs in claim 29, and reads: "means responsive to the speech pattern of each frame for producing a set of predictive parameter signals and a predictive residual signal." ('580 patent, Col. 21:39-41.) The parties dispute the meaning of the phrase "predictive residual signal," as well as the applicable corresponding structures.

1. "Predictive Residual Signal"

Microsoft asserts that the definition of "predictive residual signal" is "a sequence of values resulting from the subtraction of predicted speech from the speech pattern." (Joint Letter, Ex. B.) AT & T's proposed definition is "a sequence of values representing the difference between predicted speech and the speech pattern." (Joint Letter, Ex. B.) The heart of the difference in the parties' opinions is whether, like the Differences Phrase, a mathematical subtraction must occur or whether a "predictive residual signal" merely represents the difference between predicted speech and the speech pattern. (Tr. at 210, 332.)

For the reasons set forth above in the discussion of the Differences Phrase, (*see supra* Section H), the Court declines to inject the word "subtraction" into the claim, and therefore adopts AT & T's proposed definition "a sequence of values representing the difference between the predicted speech and the speech pattern."

2. *Corresponding Structures*

AT & T asserts that two embodiments correspond to the function of the phrase, while Microsoft proposes only one corresponding structure. (Joint Letter, Ex. B.) Both parties agree that Element 118 of Figure 1, the residual signal generator, forms one of the structures. AT & T asserts that the Element and its functionality are described at Column 3, lines 33-39, and Column 3, lines 43-53, while Microsoft only designates Column 3, lines 33-39.FN9 AT & T also asserts that a second embodiment is described at Column 10, lines 40 to 48. (Joint Letter, Ex. B.)

FN9. Column 3, lines 33-39 relate to first part of the means-plus-function phrase, "predictive parameter signals," which is not in dispute. (Joint Letter, Exs. A & B; Tr. at 330-31.)

With respect to the structure of the first proposed embodiment, the disputed specification passage, Column 3, lines 43 to 53, reads:

The prediction residual generator, as is well known in the art, is responsive to the delayed speech samples and the prediction parameters *ak* to form a signal corresponding to the difference therebetween. The formation of the predictive parameters and the prediction residual signal for each frame shown in predictive analyzer 110 may be performed according to the arrangement disclosed in U.S. Pat. No. 3,740,476 issued to B.S. Atal June 19, 1973 and assigned to the same assignee or in other arrangements well known in the art.

Microsoft's argument that "the disclosed residual signal generator 118 is ... incapable of performing the recited function of "producing a predictive residual signal" is unpersuasive. (Microsoft PHB at 23; Tr. at 331-333.) Microsoft failed to prove "by clear and convincing evidence, that the specification lacks adequate disclosure of structure to be understood by one skilled in the art as able to perform the recited functions." *Intel Corp. v. VIA Techs., Inc.*, 319 F.3d 1357, 1366 (Fed.Cir.2003); *accord* *Budde v. Harley-Davidson, Inc.*, 250 F.3d 1369, 1376-77 (Fed.Cir.2001). The cited passage specifically describes a function of the prediction residual generator, Element 118 of Figure 1, and the creation of predictive parameters and prediction residual signals. ('580 patent, Col. 3:43-53.) The specification references "[t]he formation of ... the prediction residual signal" immediately after introducing Element 118, ('580 patent, Col. 3:43-48), and is necessary to describe the structure linked with the phrase at issue. Thus, the Court finds that Column 3, lines 43-48 additionally describe a corresponding structure for the function of producing a predictive residual signal.

The description of the second embodiment that AT & T proposes consists of Column 10, lines 40-48:

The invention has been described with reference to particular illustrative embodiments. It is apparent to those skilled in the art with various modifications may be made without departing from the scope and the spirit of the invention. For example, the embodiments described herein have utilized linear predictive parameters and a predictive residual. The linear predictive parameters may be replaced by formant parameters or other speech parameters well known in the art.

As noted above, the cited passage refers to alternate embodiments for Figures in the '580 patent. The specification generally states that such embodiments can be modified, and states as an example that, "[t]he linear predictive parameters may be replaced by formant parameters or other speech parameters well known in the art." ('580 patent, Col. 10:47-49.) An alternative corresponding structure set forth in a means-plus-function limitation must actually perform the recited function. *Fonar Corp. v. General Elec. Co.*, 107 F.3d 1543, 1551-52 (Fed.Cir.1997); *Medtronic, Inc. v. Advanced Cardiovascular Sys., Inc.*, 248 F.3d 1303 (Fed.Cir.2001); *see also* Donald S. Chisum, *5A Chisum on Patents*, s. 18.03[5][d][i] (Matthew Bender & Co 2003). Here, the proposed claim is too general to qualify as a second corresponding structure, and thus the s. 112, para. 6 claim is limited to the corresponding structure actually disclosed. *See* *Fonar*, 107 F.3d at 1551-52 (limiting corresponding structure to "a generic gradient wave form" despite specification's recognition that "other wave forms may be used"); *B. Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1425 (Fed.Cir.1997) (declining to accept additional structure inadequately disclosed in the specification). Accordingly, Column 10, lines 40-48 do not encompass an alternative corresponding structure for the phrase at issue.

CONCLUSION

For the reasons set forth in this Memorandum and Order, this Court construes the thirteen disputed claim terms and phrases in the '580 patent as follows:

- (a) "spectral representative signals" means "signals representing the frequency spectrum (*i.e.*, the whole range of frequencies) of speech for a time interval";
- (b) "plurality of pulse amplitude and location coded signals" means "two or more pulse amplitude values having a formatted representation and two or more pulse location values having a formatted representation";
- (c) "representative" means "one that in some way symbolizes, represents, replaces, or is equivalent to something else";
- (d) "converting" means "changing one thing into another";
- (e) "excitation" means as a noun "an input signal of a system or apparatus without additional values," and as an adjective "relating to an input signal of a system or an apparatus without additional values";
- (f) "speech pattern" means "an audible speech message configuration";
- (g) the structure corresponding to the function in the phrase "means ... for generating a speech pattern" are the speech synthesizer filter 154, D/A converter 156, low-pass filter 158, and transducer 160 (as described at '580 patent, Col. 7:4-11);
- (h) "signal representative of the differences between said interval speech pattern and the interval representative signal set" means "a sequence of values representative of the differences between the interval speech pattern and the predicted speech pattern based on the set of signals representative of the speech pattern of said time interval";
- (i) "means ... for forming a first signal corresponding to the interval speech pattern" is construed as "means

... for forming a first sequence of values closely approximating the interval speech pattern," with a corresponding structure at Element 121 of Figure 1 (as described in portions of '580 patent, Col. 4:45-60 concerning Filter 121);

(j) "means ... for forming a second interval corresponding signal" is construed as "means ... for forming a second sequence of values that closely approximate the time segment or frame," with a corresponding structure at Element 123 of Figure 1 (as described in portions of '580 patent, Col. 4:45-60, concerning Filter 123);

(k) "signal corresponding to the differences between said first and second interval corresponding signals" means "a signal closely approximating the differences between said first and second interval corresponding signals";

(l) "means ... for producing a third signal" is construed as "means ... for producing a signal other than a first signal or a second signal," with corresponding structure at Element 127 of Figure 1 (as described in '580 patent, Col. 4:63-68, 5:62-6:9, Appendix B), and Processor 210 of Figure 2 operating on instructions in Appendix D; and

(m) "means ... for producing a ... predictive residual signal" is construed as "means ... for producing a ... sequence of values representing the difference between the predicted speech and the speech pattern," with a corresponding structure at Element 118 of Figure 1 (as described in '580 patent, Col. 3:33-39, 3:43-53).

This Memorandum and Order constitutes the decision of this Court concerning claim construction.

TABULAR OR GRAPHIC MATERIAL SET AT THIS POINT IS NOT DISPLAYABLE

Produced by Sans Paper, LLC.