

**UNITED STATES DISTRICT COURT
MIDDLE DISTRICT OF FLORIDA
JACKSONVILLE DIVISION**

PARKERVISION, INC.,

Plaintiff,

v.

QUALCOMM INCORPORATED,

Defendant.

QUALCOMM INCORPORATED,

Case No. 3:11-cv-719-J-37TEM

Counterclaim Plaintiff,

v.

**PARKERVISION, INC., AND STERNE,
KESSLER, GOLDSTEIN, & FOX PLLC,**

Counterclaim Defendants.

**PLAINTIFF PARKERVISION, INC.'S
REBUTTAL CLAIM CONSTRUCTION BRIEF**

TABLE OF CONTENTS

I. INTRODUCTION1

II. PRINCIPLES OF CLAIM CONSTRUCTION1

A. The Roles of Intrinsic and Extrinsic Evidence in Claim Construction1

B. Courts Need Not Construe Every Disputed Claim Term.....3

III. DISPUTED CLAIM CONSTRUCTIONS3

A. Qualcomm Ignores The Basic Principles Of Claim Construction3

1. Sampling of Energy3

2. Transferring Non-negligible Amounts of Energy7

3. Lower Frequency Signal9

4. Harmonic or Subharmonic of the Carrier Signal10

5. Integrating the Energy11

6. Finite Time Integrating Operation/Module12

7. Impedance Matching13

8. Differential Down-Conversion Terms14

9. Interpolation Filter15

10. Asynchronous Energy Transfer Signal16

11. Universal Frequency Down-Converter17

B. Claims That Require No Construction.....17

1. Generating a Lower Frequency Signal from the Transferred Energy.18

2. Controlling a Charging and Discharging Cycle of the First and Second Capacitors with First and Second Switching Devices.....19

C. Means-Plus-Function Claim Terms.20

IV. CONCLUSION.....20

TABLE OF AUTHORITIES

	Page(s)
CASES	
<i>AIA Eng’g Ltd. v. Magotteaux Int’l S/A</i> , 657 F.3d 1264 (Fed. Cir. 2011).....	14
<i>Aventis Pharma S.A. v. Hospira, Inc.</i> , 675 F.3d 1324 (Fed. Cir. 2012).....	2, 5
<i>Digital-Vending Servs. Int’l, LLC v. Univ. of Phoenix, Inc.</i> , 672 F.3d 1270 (Fed. Cir. 2012).....	15, 17
<i>Edisync Sys. v. Centra Software, Inc.</i> , No. 03-cv-1587-WYD-MEH, 2012 U.S. Dist. LEXIS 83169 (D. Colo. June 15, 2012)	18
<i>EON Corp. IP Holdings, LLC v. Sensus USA Inc.</i> , No. 6:09-CV-116-JDL, 2010 U.S. Dist. LEXIS 83442 (E.D. Tex. Aug. 11, 2010).....	18
<i>Finjan, Inc. v. Secure Computing Corp.</i> , 626 F.3d 1197 (Fed. Cir. 2010).....	3, 18
<i>High Point Sarl v. Sprint Nextel Corp.</i> , No. 09-2269-CM-DJW, 2010 U.S. Dist. LEXIS 85497 (D. Kan. Aug. 18, 2010).....	18
<i>HTC Corp. v. IPCom GmbH & Co.</i> , 667 F.3d 1270 (Fed. Cir. 2012).....	2, 8, 14
<i>i4i Ltd. P’ship v. Microsoft Corp.</i> , 598 F.3d 831 (Fed. Cir. 2010).....	18
<i>K-2 Corp. v. Salomon S.A.</i> , 191 F.3d 1356 (Fed. Cir. 1999).....	18, 20
<i>Markman v. Westview Instruments, Inc.</i> , 517 U.S. 370 (1996).....	17
<i>Metabolite Labs., Inc. v. Lab. Corp. of Am. Holdings</i> , 370 F.3d 1354 (Fed. Cir. 2004).....	11
<i>Mirror Worlds, LLC v. Apple, Inc.</i> , No. 6:08-CV-88-LED, 2010 U.S. Dist. LEXIS 82070 (E.D. Tex. Aug. 11, 2010)	3, 17
<i>O2 Micro Int’l Ltd. v. Beyond Innovation Tech. Co., Ltd.</i> , 521 F.3d 1351 (Fed. Cir. 2008).....	3
<i>Oatey Co. v. IPS Corp.</i> , 514 F.3d 1271 (Fed. Cir. 2008).....	5

On-Line Techs., Inc. v. Bodenseewerk Perkin-Elmer GmbH,
386 F.3d 1133 (Fed. Cir. 2004)..... 9

Phillips v. AWH Corp.,
415 F.3d 1303 (Fed. Cir. 2005) (en banc).....1, 2, 3, 9

Thorner v. Sony Comp. Entm't Am. L.L.C.,
669 F.3d 1362 (Fed. Cir. 2012).....2, 4, 20

U.S. Surgical Corp. v. Ethicon, Inc.,
103 F.3d 1554 (Fed. Cir. 1997).....3, 19

Verizon Servs. Corp. v. Vonage Holdings Corp.,
503 F.3d 1295 (Fed. Cir. 2007).....5

Vitronics Corp v. Conceptoronic, Inc.,
90 F.3d 1576 (Fed. Cir. 1996).....1, 2, 4, 16

OTHER AUTHORITIES

Authoritative Dictionary of IEEE Standards Terms (7th Ed. 2000).....13

I. INTRODUCTION

Despite acknowledging that in claim construction the Court must look first to the intrinsic evidence—specifically the claims, specification, and prosecution history—Qualcomm nonetheless repeatedly avoids analyzing intrinsic evidence in favor of its selective application of extrinsic evidence. In contrast to Qualcomm’s extrinsic evidence based approach, ParkerVision construes the disputed terms according to the intrinsic evidence and the ordinary meaning of the terms. For the reasons set forth herein, and in ParkerVision’s opening brief, dkt. 122, the Court should adopt ParkerVision’s proposed claim construction for each disputed term.

II. PRINCIPLES OF CLAIM CONSTRUCTION

A. The Roles of Intrinsic and Extrinsic Evidence in Claim Construction

In *Vitronics Corp. v. Conceptronic, Inc.* and *Phillips v. AWH Corp.*, the Federal Circuit identified a hierarchy of sources for conducting a claim construction analysis. *Vitronics Corp v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996); *Phillips v. AWH Corp.*, 415 F.3d 1303, 1324 (Fed. Cir. 2005) (en banc) (“In *Vitronics*, this court . . . set forth guidelines for reaching the correct claim construction . . . [t]oday, we adhere to that approach and reaffirm the approach to claim construction outlined in that case . . .”). Specifically, the Federal Circuit held that “intrinsic evidence is the most significant source of the legally operative meaning of disputed claim language.” *Vitronics*, 90 F.3d at 1582. Indeed, where the intrinsic evidence unambiguously describes the scope of the patented invention, reliance on extrinsic evidence is improper. *Id.* at 1583. Intrinsic evidence includes: the claims themselves; the specification; and the prosecution history. *Id.* at 1582.

First, courts “look to the words of the claims themselves, both asserted and nonasserted, to define the scope of the patented invention.” *Id.* The claims are “of primary importance, in the effort to ascertain precisely what it is that is patented.” *Phillips*, 415 F.3d at 1312 (quoting

Merrill v. Yeomans, 94 U.S. 568, 570 (1876)). “[T]he words of a claim ‘are generally given their ordinary and customary meaning.’” *Id.* at 1312 (quoting *Vitronics*, 90 F.3d at 1582).

Second, “the specification is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.” *Id.* at 1315. “The specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess.” *Id.* at 1316. Courts may “only interpret a claim term more narrowly than its ordinary meaning under two circumstances: ‘1) when a patentee sets out a definition and acts as [its] own lexicographer, or 2) when the patentee disavows the full scope of a claim term either in the specification or during prosecution.’” *Aventis Pharma S.A. v. Hospira, Inc.*, 675 F.3d 1324, 1331 (Fed. Cir. 2012) (quoting *Thorner v. Sony Computer Entm’t Am. L.L.C.*, 669 F.3d 1362, 1365 (Fed. Cir. 2012)).¹

Third, a court may consider the prosecution history of the patent. *Phillips*, 415 F.3d at 1317. But while the prosecution history can offer insight into the meaning of a particular claim term, the “[c]laim language and the specification generally carry greater weight.” *HTC Corp. v. IPCOM GmbH & Co.*, 667 F.3d 1270, 1276 (Fed. Cir. 2012).

Finally, where the intrinsic sources of meaning are unclear, a court may turn to extrinsic sources of meaning. *See Phillips*, 415 F.3d at 1317 (internal quotations and citations omitted) (extrinsic evidence “is less significant than the intrinsic record . . .”). Extrinsic evidence is any evidence which is external to the patent and file history. *Vitronics*, 90 F.3d at 1578.²

¹ “To act as its own lexicographer, a patentee must clearly set forth a definition of the disputed claim term other than its plain and ordinary meaning.” *Thorner*, 669 F.3d at 1365 (internal quotations omitted). Similarly, to disavow claim scope, “[t]he patentee may demonstrate intent to deviate from the ordinary and accustomed meaning of a claim term by including in the specification expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope.” *Id.* at 1366 (internal quotations omitted).

² Extrinsic evidence is often found in the form of technical dictionaries, which may help a court “‘to better understand the underlying technology’ and the way in which one of skill in the art might use the claim terms.” *Phillips*, 415 F.3d at 1318 (quoting *Vitronics*, 90 F.3d at 1584 n.6). Extrinsic evidence may also be found in the form of expert testimony that may be useful “to provide background on the technology at issue, to explain how an

B. Courts Need Not Construe Every Disputed Claim Term

Claim construction “is not an obligatory exercise in redundancy,” *U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997), and district courts “are not (and should not be) required to construe every limitation present in a patent’s asserted claims.” *O2 Micro Int’l Ltd. v. Beyond Innovation Tech. Co., Ltd.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008). In particular, when the “claim language is clear to a lay jury who will understand the term,” the Court may properly resolve the parties’ dispute simply by rejecting the unnecessary and unhelpful construction proposed by defendants and holding that the term will have its plain and ordinary meaning. *Mirror Worlds, LLC v. Apple, Inc.*, No. 6:08-CV-88-LED, 2010 U.S. Dist. LEXIS 82070, at *20 (E.D. Tex. Aug. 11, 2010); *see also Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1207 (Fed. Cir. 2010).

III. DISPUTED CLAIM CONSTRUCTIONS

A. Qualcomm Ignores The Basic Principles Of Claim Construction

In contrast to ParkerVision’s focus on the intrinsic record of the Patents-in-Suit, Qualcomm overwhelmingly advocates for constructions based on extrinsic evidence. But the approach to claim construction mandated by the Federal Circuit in *Phillips* makes clear that a claim construction based on intrinsic evidence trumps a construction based on extrinsic evidence.

1. Sampling of Energy

a) *Sampling*

Qualcomm relies exclusively on extrinsic dictionary and treatise definitions of the term “sampling” with no consideration of the claims or specification—in direct contravention of the Federal Circuit’s *en banc* holding in *Phillips*. Dkt. 119 at 4. Qualcomm starts and ends its

invention works, to ensure that the court’s understanding of the technical aspects of the patent is consistent with that of a person of skill in the art, or to establish that a particular term in the patent or the prior art has a particular meaning in the pertinent field.” *Id.* (citations omitted). “However, conclusory, unsupported assertions by experts as to the definition of a claim term are not useful to a court. Similarly, a court should discount any expert testimony that is clearly at odds . . . with the written record of the patent.” *Id.* (internal quotations omitted).

analysis with extrinsic evidence in the form of dictionary definitions, arguing that “[n]othing in the Patents warrants ParkerVision’s departure” from the dictionary definitions. *Id.*

But Qualcomm is mistaken—the intrinsic record of the Patents-in-Suit makes clear that the claimed “sampling” is not the same as the “sampling” described in the dictionaries cited by Qualcomm. ParkerVision’s patented technology represents a paradigm shift with respect to the state of the art that existed at the time the patents were filed (and at the time the dictionaries cited by Qualcomm were published). In contrast to the prior art, ParkerVision’s patents define the claimed “sampling” as “capturing energy of a signal at discrete times.” *Compare* ’518 at 32:34-36 (describing prior art as “captur[ing] various amplitudes of the AM signal . . .”) with ’518 at 73:54-56 (describing the invention as “*captur[ing] varying amounts of energy from the analog AM carrier signal . . .*”) (emphasis added). *See also* Prucnal Decl. at ¶18. In using the term “sampling,” ParkerVision acted as its own lexicographer and expressly defined this term in a manner different than the then-existing dictionaries cited by Qualcomm. *Thorner*, 669 F.3d at 1365 (a patentee acts as its own lexicographer when it “set[s] forth a definition of the disputed claim term other than its plain and ordinary meaning”).³ ParkerVision’s proposed construction should be adopted because it is consistent with both the intrinsic record and the understanding one of ordinary skill in the art would obtain after reading the Patents-in-Suit.

b) *Under-Samples, Sub-Sample, and Sub-Sampling*

These terms are synonymous. *See* Dkt. 122 at 10-11; Prucnal Decl. ¶¶20-25. Specifically, the ’734 patent uses the term “under-samples,” the ’518 patent uses the term “sub-sampling,” and the ’371 patent uses the term “sub-sample.” Each of these patents uses these terms to mean “sampling at an aliasing rate”—ParkerVision’s proposed construction. *See id.*

³ Qualcomm asserts that ParkerVision should be bound by a definition of “sampling” referenced in its infringement contentions. Dkt. 119 at 4. ParkerVision’s infringement contentions, like the referenced dictionary definition therein, are extrinsic evidence. *Vitronics*, 90 F.3d at 1578.

With respect to the '734 patent's use of the term "under-sampling," Qualcomm and its expert acknowledge that the Patents-in-Suit disclose "under-sampling" as synonymous with sampling an "aliasing rate." Dkt. 119 at 4; Fox Decl. ¶29. Nonetheless, Qualcomm improperly attempts to limit the definition of this term to sampling "at an aliasing rate *using negligible apertures*." See Dkt. 119 at 4. Specifically, Qualcomm attempts to read-in the "negligible aperture" limitation based upon a reference in the specification of the '551 patent to "the under sampling signal includ[ing] a train of pulses having negligible apertures . . ." and the Venn diagram shown in Figure 45 of the '551 patent. *Id.* at 4-5. However, these references hardly constitute lexicographic limitations or clear disavowals of claim scope sufficient to support the narrowing amendment Qualcomm proposes. *Aventis*, 675 F.3d at 1331. In fact, another embodiment detailed in the specification of the '551 patent "illustrates an example under-sampling signal 8304, including energy transfer pulses 8306 *having non-negligible apertures* that tend away from zero time in duration." '551 at 67:50-54 (emphasis added). This example embodiment is directly at-odds with Qualcomm's proposed construction.⁴ The patents describe under-sampling with both negligible and non-negligible apertures; thus, the construction of "under-sampling" should not include an aperture limitation.

Consistent with ParkerVision's proposed construction, the specification of '551 patent specifically and repeatedly equates the "under-samples" term with "sampling at an aliasing rate" (not "sampling at an aliasing rate *using negligible apertures*" as Qualcomm proposes):

- "When a signal is sampled at less than or equal to twice the frequency of the signal, the signal is said to be under-sampled, or aliased." '551 at 19:49-51.
- "In an embodiment, an EM signal is under-sampled at an aliasing rate to down-convert the EM signal to a lower, or intermediate frequency (IF) signal." '551 at 21:22-24.

⁴ See *Oatey Co. v. IPS Corp.*, 514 F.3d 1271, 1276 (Fed. Cir. 2008) ("We normally do not interpret claim terms in a way that excludes embodiments disclosed in the specification."); *Verizon Servs. Corp. v. Vonage Holdings Corp.*, 503 F.3d 1295, 1305 (Fed. Cir. 2007) (rejecting proposed interpretation that would exclude disclosed embodiments).

- “Step 1412 includes under-sampling the EM signal at the aliasing rate to down-convert the EM signal to the intermediate signal F_{IF} . Step 1412 is illustrated in FIG. 19B by under-sample points 1905.” ’551 at 32:40-43.

Accordingly, the intrinsic record of the Patents-in-Suit shows that the claimed “under-sampling” means “sampling at an aliasing rate,” without further limitation. *See* Prucnal Decl. ¶¶21-23.

With respect to the “sub-sampling” term of the ’518 patent and the “sub-sample” term of the ’371 patent, ParkerVision proposes that these terms be read as synonymous with the “under-sampling” claim term of the ’734 patent and consistently with the repeated use of the terms “under-sampling” and “under-sample” in the specifications of the ’518, ’371 and ’551 patents. *See* Dkt. 122 at 10-11. While the claims of the ’518 patent make use of the term “sub-sampling,” the Abstract of the ’518 patent explains that it claims “[m]ethods, systems, and apparatuses for down-converting an electromagnetic (EM) signal *by aliasing* the EM signal . . .” ’518 at Abstract (emphasis added). The Abstract further explains that “[t]he term aliasing, as used herein, refers to both down-converting an EM signal by *under-sampling the EM signal at an aliasing rate*, and down-converting an EM signal by transferring energy from the EM signal at the aliasing rate.” *Id.* (emphasis added). A similar discussion of “under-sampling” is present in the specification of the ’518 patent. *See* ’518 at 18:15-23; *see also* Prucnal Decl. ¶24. Thus, consistent with ParkerVision’s proposed construction, the term “sub-sampling” in the claims of the ’518 patent has the same meaning as the term “under-sampling” as used in the specification of the ’518 patent—“sub-sampling” means “sampling at an aliasing rate.”

Rather than read the “sub-sampling” and “sub-sample” terms consistently with the available intrinsic sources of meaning, Qualcomm instead bases its proposed construction solely on extrinsic evidence in the form of its expert’s declaration. Dkt. 119 at 5-6; Fox Decl. ¶¶31-32. Qualcomm leverages its expert’s declaration in an attempt to improperly limit these terms to

“sampling at a sub-harmonic rate”—expressly excluding sampling at a harmonic rate (*i.e.* sampling at a rate equal to an integer multiple of f , where f is the frequency of the signal being sampled). The intrinsic record of the Patents-in-Suit makes clear that Qualcomm’s proposed limitation is incorrect. *First*, the specification of the ’551 patent discloses sampling at an aliasing rate where “*the aliasing rate is substantially equal to a harmonic or, more typically, a subharmonic of a frequency.*” ’551 at 94:23-24. (emphasis added). *Second*, in contrast to the prior art, the invention disclosed by the Patents-in-Suit disregards the Nyquist sampling theorem and works instead by sampling a signal “at less than or equal to twice the frequency of the signal.” ’518 at 18:19-23. Where f represents the frequency being sampled, sampling at less than twice the frequency of the signal—*i.e.* sampling at a rate less than or equal to $2f$ —expressly includes sampling at the rates of f and $2f$, both harmonics. *See also* Prucnal Decl. ¶23.

Accordingly, Qualcomm’s proposed construction is incorrect as it excludes the express teachings of the patent. Based upon the intrinsic record, one of ordinary skill in the art would understand that the “sub-sample” and “sub-sampling” terms are synonyms of the “under-sampling” term and mean “sampling at an aliasing rate.”

2. Transferring Non-negligible Amounts of Energy

Qualcomm asks the Court to construe the term “transferring non-negligible amounts of energy” to require “caus[ing] substantial distortion of the carrier signal.” Dkt. 119 at 6. Qualcomm’s proposed construction fails for many reasons: *First*, unlike ParkerVision’s proposed construction, Qualcomm’s proposed construction does not come from the specification of the ’551 patent, in which this term appears. As ParkerVision explained in its opening brief, dkt. 122 at 4, it lifted its proposed construction directly from the ’551 patent: “In accordance with an aspect of the invention, methods and systems are disclosed below for down-converting EM signals by transferring non-negligible amounts of energy from the EM signals. The resultant

down-converted signals have sufficient energy to allow the down-converted signals *to be distinguishable from noise.*” ’551 at 63:27-34 (emphasis added). In contrast, to the extent that Qualcomm addresses the specification, it cites to Figures 82 and 83. The specification’s description of those figures states that they illustrate the effect on a signal when “non-negligible amounts of energy are transfer[ed] from it.” ’551 at 67:55-57. The word “substantial” is never used.

Second, Qualcomm’s proposed construction relies on far-flung evidence: the prosecution history of a different patent that post-dates the ’551 patent, the prosecution history of a foreign patent that post-dates the ’551 patent, a white paper that is extrinsic evidence not part of the ’551 prosecution history, and a conclusory statement by an expert that is also extrinsic evidence. *See* Dkt. 119 at 6-9. As to the prosecution histories of the later-filed patents, the “[c]laim language and the specification” that ParkerVision relies upon “generally carry greater weight.” *HTC*, 667 F.3d at 1276. And, as to the extrinsic evidence Qualcomm cites, *Phillips* teaches that such evidence may not trump intrinsic sources of meaning that ParkerVision bases its construction on.

Third, and as ParkerVision explained in its opening brief, Qualcomm’s proposed construction is a *non-sequitur*. Dkt. 122 at 5. While the patents-in-suit describe the prior art as transferring negligible amounts of energy in order to protect a signal from distortion, *see e.g.* ’551 at 63:5-10, it does not follow that the disclosed invention—because it involves the transfer of non-negligible amounts of energy—requires that transfer “cause substantial distortion of the carrier signal.” *See* Prucnal Decl. ¶26.

Fourth, although Qualcomm asks the Court to inject the term “substantial” into its construction of “transferring non-negligible amounts of energy,” with respect to other claims at issue Qualcomm argues that the term “substantial” constitutes an “inherently imprecise” term

which may render a claim indefinite. Dkt. 119 at 25. Qualcomm cannot have it both ways.

In light of the foregoing, and based upon the most apt intrinsic sources of meaning, “transferring non-negligible amounts of energy from the carrier signal” means “transferring energy (*i.e.*, voltage and current over time) in amounts that are distinguishable from noise.”

3. Lower Frequency Signal

In its proposed construction of the term “lower frequency signal,” Qualcomm relies on an incomplete reading of the specification in order to assert that the term refers to a “signal with frequency below the carrier signal frequency *and above the baseband frequency.*” Dkt. 119 at 9-11. This is error, for a number of reasons. *First*, and most fundamentally, the plain meaning of “lower” is “below” as ParkerVision proposes—not “lower than X but greater than Y” as Qualcomm proposes. There is no intrinsic justification for Qualcomm’s radical departure from the well-known meaning of such a simple term.

Second, Qualcomm ignores a key section of the specification that makes it clear that lower frequency signal may encompass a baseband signal. *See* ’551 at 23:28-67; Dkt. 122 at 8. According to the specification of the ’551 patent, the invention can down-convert a carrier to lower frequencies, such as “a demodulated baseband signal.” ’551 at 23:28-67. Qualcomm’s construction impermissibly excludes an embodiment that the patent specifically describes.⁵

Third, Qualcomm’s proposed construction is at-odds with the words of the claims. As *Phillips* explains, the words of the asserted and non-asserted claims are of primary importance in claim construction. 415 F.3d at 1312. Claim 192 of the ’551 patent teaches: “The apparatus according to claim 23, wherein the aliasing rate is substantially equal to frequency of the carrier signal divided by n *and the lower frequency signal is a baseband signal.*” ’551 at 126:64-127:2.

⁵ *See On-Line Techs., Inc. v. Bodenseewerk Perkin-Elmer GmbH*, 386 F.3d 1133, 1138 (Fed. Cir. 2004) (“[A] claim interpretation that excludes a preferred embodiment from the scope of the claim is rarely, if ever, correct.”) (internal quotations omitted).

Thus, in contrast to Qualcomm's proposal, the "lower frequency" may be "a baseband signal." See Prucnal Decl. ¶27.

Fourth, in support of its erroneous construction, Qualcomm also relies on the declaration of its expert. Tellingly however, Qualcomm's expert *does not opine* that one of ordinary skill in the art would understand "lower frequency signal" to be limited to "above the baseband signal" as Qualcomm proposes. Fox Decl. ¶21. Indeed, Qualcomm's own expert admits that "[t]he Patents-in-Suit relate to both down-conversion using an intermediate frequency and direct down-conversion to baseband frequency." *Id.* This omission makes sense because one of ordinary skill in the art would not understand the term "lower frequency" to exclude the baseband signal as Qualcomm's construction implies. Prucnal Decl. ¶27.

The intrinsic sources of meaning confirm that the plain and ordinary meaning of "lower frequency signal" is "a signal with frequency below the carrier signal."

4. Harmonic or Subharmonic of the Carrier Signal

Citing no supporting evidence—not even extrinsic evidence—Qualcomm argues that n cannot equal 1 because it would result in the "fundamental frequency," and not a harmonic or subharmonic. See Dkt. 119 at 13. Qualcomm's argument is simply incorrect—implicitly confirmed by the fact that its own expert was unwilling to offer an opinion in support of Qualcomm's proposed construction. In addition to being a fundamental mathematical principle, the plain language of the '551 patent states: " $n=0.5, 1, 2, 3, 4, 5, \text{ and } 6$," where " n " is the carrier signal. '551 at 71:31-33 (emphasis added); *see also* Prucnal Decl. ¶19 ("It is well settled and understood by all persons skilled in the art that in the scenario where n is equal to 1 the corresponding aliasing rate can be called *either* the 'fundamental frequency' or the 'first harmonic.'"). As demonstrated by the intrinsic evidence, the term " n represents/indicates a

harmonic or subharmonic of the carrier signal,” as used in the Patents-in-Suit, means “ n is 0.5 or an integer greater than or equal to 1”—it does not exclude “1” as Qualcomm asserts.

5. Integrating the Energy

In construing this term, Qualcomm again attempts to avoid the clear intrinsic evidence in favor of extrinsic evidence—namely its expert’s affidavit. Qualcomm and Dr. Fox argue that “integrating . . . energy” would not be understood by a person skilled in the art and would be “nonsensical.” Dkt. 119 at 14. But the mathematical operation “integration” is easily understood by a person skilled in the art, as is the term “energy.” Prucnal Decl. ¶28. This term is not “insolubly ambiguous and without a discernible meaning” such that a person of ordinary skill in the art could not understand it after making “all reasonable attempts at construction.” *Metabolite Labs., Inc. v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354, 1366 (Fed. Cir. 2004).

As it has done consistently in construing terms, Qualcomm turns a blind eye to the relevant portion of the specification. Qualcomm’s proposed construction incorrectly frames the inventions of the Patents-in-Suit as requiring energy “storage” for some fixed amount of time. However, the specifications of the Patents-in-Suit make clear that the invention’s capacitor devices, in order to generate a lower frequency signal, continuously accumulate and discharge energy—they are not required to “store” the energy for some fixed amount of time. *See, e.g.* ’551 63:63-64:3, 103:45-51; ’551 at Figs. 60E, 6010A, and 6010B; *see also* Dkt. 122 at 12; Prucnal Decl. ¶28. Because the ’551 and ’518 specifications do not teach that the energy is held in a stored state for some amount of time for later use, “accumulating the energy” is a more accurate construction than storing the energy. *See* Prucnal Decl. ¶28.⁶ Accordingly, based on the intrinsic record, “integrating the energy” means “accumulating the energy.”

⁶ The teachings of the ’551 specification are consistent with the ’518 patent’s description (in Fig. 101 and its textual description) of an “RF Switch/Integrator.” ’518 at Fig. 101, 12:111:46-112:36. The ’518’s figure and description of

6. Finite Time Integrating Operation/Module

The parties agree that the two terms involving “finite time integrating” are terms coined by ParkerVision, for which it acted as its own lexicographer. *See* Dkt. 122 at 13; Dkt. 119 at 16. Subsection 1.2 of the ’845 patent, titled “High Level Description of a Finite Time Integrating Characterization/Embodiment of the Invention,” provides a clear explanation of these terms. ’845 at 130:21-131:44. However, Qualcomm ignores the specific teachings of the ’845 patent.

These terms appear only in the ’845 patent. As used in the ’845 patent, the claimed “integrating operation” is an approximation to “a matched filter/correlation process.” ’845 at 129:41-43. Furthermore, as the specification of the ’845 patent teaches, after the energy sampling occurs, an additional step comprising “convolving an approximate half cycle of the carrier signal [which was obtained by energy sampling] with a representation of itself in order to efficiently acquire the energy of the approximate half cycle of the carrier signal” occurs. *Id.* at 131:1-5. Qualcomm’s proposed constructions of these terms fail to take into account the additional “convolution” step required by the ’845 patent, as compared to the inventions claimed in the other Patents-in-Suit. *See* Prucnal Decl. ¶29. Failing to convey the very essence of the ’845 patent’s finite time integrating module, Qualcomm’s construction cannot be correct.

In ignoring the ’845 patent, Qualcomm again attempts to read in the requirement that the “operation distorts the carrier signal” and that there be “storage” of energy for some predefined period of time. Dkt. 119 at 16-17. For the reasons explained with respect to the “transferring non-negligible amounts of energy” term *supra*, Qualcomm’s attempt to read in the “distortion” limitation is incorrect. *See* Prucnal Decl. ¶30. Likewise, and for the reasons explained with

the Integrator illustrates that it samples the RF signal, quickly charges, holds the sample RF signal under certain conditions, and then discharges at a controlled rate. *Id.* at 112:23-32. This process is continuous; the Integrator does not persistently store a signal or charge. *See id.*

respect to the “integrating energy” term *supra* (notably, that the patents describe the *continuous* accumulation-and-release of energy), Qualcomm’s attempt to read in a requirement that there be “storage” of energy for some predefined period of time is incorrect. *See id.* at ¶31. There is no basis in the intrinsic record that warrants reading in these extraneous limitations.

Accordingly, one of ordinary skill in the art would understand that “finite time integrating operation” as used in the ’845 patent means “convolving a portion of the carrier signal with an approximate representation of itself” and the term “finite time integrating module” as used in the ’845 patent means “circuitry that can perform a finite time integrating operation.”

7. Impedance Matching

Ignoring the language of the patents, Qualcomm endeavors to construe the term “impedance matching” with reference to extrinsic expert testimony and a prior art reference cited in the prosecution history of the ’551 patent. Dkt. 119 at 18-19. Qualcomm’s expert opines that a person of ordinary skill in the art would understand “impedance matching” to mean “maximizing power through a signal path.” Dkt. 119 at 17-18; Fox Decl. ¶23. This proposed construction is at-odds with both the intrinsic evidence and the ordinary meaning of this term.

As a threshold matter, “impedance matching” is a term of art in circuit design that does not include the requirement that power be “maximized . . . through a signal path.” Prucnal Decl. ¶36.⁷ The specifications of the patents make clear that “[i]n an embodiment . . . [a]n impedance matching circuit can be utilized to efficiently couple the down-converted signal with an output impedance.” ’518 at 108:1-8. The ’518 patent continues to explain, with respect to the impedance matching circuits, that “[i]n some situations, the initial designs may be suitable without further optimization. In other situations, the initial designs can be optimized in

⁷ *See also* Ex. A, *Authoritative Dictionary of IEEE Standards Terms* 632 (7th Ed. 2000) (“Impedance matching” is “[t]he technique of either adjusting the load-circuit impedance or inserting a network between two parts of a system to produce the desired power transfer or signal transmission.”)

accordance with other various design criteria and considerations.” ’518 at 105:53-58. Thus, the intrinsic sources of meaning show that the impedance matching circuitry need only be as efficient or optimized as a particular design or application requires—it need not “maximize” the power “through a signal path” in all instances, as Qualcomm proposes.

Qualcomm’s proposed construction is further deficient because it requires that the “impedance matching” maximize power transfer “throughout a [signal] path.” Impedance matching, as understood by one of ordinary skill, involves matching impedances in relation to the desired power transfer only at specific points in a circuit (generally, the input or output points). Prucnal Decl. ¶38. Qualcomm’s proposed construction is incorrect in that it suggests that “impedance matching” results in the desired power transfer along every point of a circuit.⁸

Finally, as evidenced by the specification’s provisions for further optimizing the invention’s power transference, Qualcomm’s proposed construction must be rejected because a circuit’s source and load impedances could never, in reality, be made perfectly equal. Therefore, the amount of power transferred in impedance matching could never be truly, demonstrably “maximized . . . throughout the signal path.” Dkt. 122 at 17-18; Prucnal Decl. ¶35; *see AIA Eng’g Ltd. v. Magotteaux Int’l S/A*, 657 F.3d 1264, 1278-79 (Fed. Cir. 2011) (“a construction that renders the claimed invention inoperable should be viewed with extreme skepticism.”).

In light of the intrinsic sources of meaning, and the commonly understood meaning, “impedance matching” as used by the Patents-in-Suit means “transferring the desired power.”

8. Differential Down-Conversion Terms

Qualcomm seeks to improperly read a limitation from the specification of the ’734 patent into the “differential down conversion claim” based on the embodiment depicted in Figure 95.

⁸ Qualcomm also attempts to rely on the definition of impedance matching from another patent, which was cited by the Examiner during the patent prosecution. Dkt. 119 at 19. But the claim language and the specification of the ’551 patent carry greater weight than art cited by the Examiner during patent prosecution. *See HTC*, 667 F.3d at 1276.

See Dkt. 119 at 20; Fox Decl. ¶67. The claims and specification, however, do not support such a construction. Claim 12 states: “differentially down-converting the received input signal to a differential down-converted output signal.” ’734 at 86:1-12. And Figure 76C and D specifically teach differential down-conversion modules that have neither differential input signals nor differential output signals. See ’551 at Fig. 76C (showing single input to differential output) and D (showing differential input to single output); see also Prucnal Decl. ¶41.

Qualcomm nonetheless attempts to narrow the scope of the claim by adding the limitation that “differentially down-converting” means differentially down-converting to a “replica of the input signal.” Dkt. 119 at 19. This construction would exclude preferred embodiments; it would limit the patent to covering only the preferred embodiment shown in Figure 95⁹, which has both a differential input signal and a differential output signal. ’734 at 86:1-12. Moreover, it would be redundant to include a definition of the type of output in the construction of the term, where the claim itself defines the type of output from the claim term (“a differential down-converted output signal”), separate and distinct from the term itself (“differentially down converting”). ’734 at 86:11-12; see *Digital-Vending Servs. Int’l, LLC v. Univ. of Phoenix, Inc.*, 672 F.3d 1270, 1275 (Fed. Cir. 2012). For these reasons, ParkerVision’s proposed constructions for the “differential down conversion” terms should be adopted.

9. Interpolation Filter

In yet another instance of Qualcomm seeking to dodge the construction dictated by the intrinsic evidence, Qualcomm misstates in conclusory fashion that “[t]here is nothing in the intrinsic evidence of the ’845 Patent that provides insight into the term ‘interpolation filter.’” Dkt. 119 at 22. Qualcomm then relies solely on extrinsic evidence for its proposed claim

⁹ In its opening brief at page 15, ParkerVision mistakenly cited to Figure 93 of the ’734 patent; the citation should be to Figure 95. See Dkt. 122 at 15.

construction. But the '845 patent identifies ZODH as an example “filter or sample interpolator which provides a memory in between acquisitions.” '845 at 160:19-21, 164:25-29. And the specification’s discussion of ZODH does not provide for the “additional values” with which Qualcomm would burden the claim term. *See id.*; *see also* Prucnal Decl. ¶43 (“‘Interpolation filter’ is a term of art used to describe a filter that smoothes a signal by means of the interpolation of input values.”). Notably, suggesting that Qualcomm’s construction is inconsistent with the ordinary meaning, Qualcomm’s expert has not endorsed Qualcomm’s construction of the term. Qualcomm may not rely on extrinsic evidence to insert a limitation into claim—particularly where nothing in the intrinsic record supports reading in the proposed limitation and where the proposed limitation is inconsistent with the ordinary meaning of the term.¹⁰ Thus, “interpolation filter,” as used by the Patents-in-Suit, means “circuitry that outputs a smoothed signal between the input sampled values.”

10. Asynchronous Energy Transfer Signal

Qualcomm offers no evidence in support of its contention that the term is indefinite or in support of its proposed claim construction, not even the required examination of the patent claims and specification. Nor could it—“asynchronous” is a commonly understood term of art used to describe signals whose phases do not align. Prucnal Decl. ¶42. Again, Qualcomm’s expert has not endorsed Qualcomm’s construction of the term, suggesting that Qualcomm’s construction is inconsistent with the ordinary meaning. Moreover, the specification of the '551 patent, specifically Figures 83A-83F, illustrate how the carrier signals described in the invention are asynchronous. Each of these Figures shows signals with phases that do not align. A person of

¹⁰ *See Vitronics*, 90 F.3d at 1583 (“In those cases where the public record unambiguously describes the scope of the patented invention, reliance on any extrinsic evidence is improper.”).

ordinary skill in the art would understand the term to mean “an energy transfer signal with a phase that varies with respect to the phase of the carrier signal.”

11. Universal Frequency Down-Converter

The parties agree that this is not a term of art. Dkt. 119 at 23; Dkt. 122 at 16. In attempting to define this patent-specific term, Qualcomm ignores the patent’s specification and relies solely on Claim 1 of the ’371 patent and expert testimony. The resulting construction is technically accurate, but incomplete and redundant. Prucnal Decl. ¶40. The fundamental flaw with Qualcomm’s construction is that it reads Claim 1 of the ’371 patent in total isolation from the remainder of the patent. *See Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 389 (1996) (“[A claim] term can be defined only in a way that comports with the instrument as a whole.”). Additionally, Qualcomm’s construction merely reiterates Claim 1—it would be redundant for the Court to so construe the disputed claim term. *See Digital-Vending Servs. Int’l, LLC*, 672 F.3d at 1275.

ParkerVision, by contrast, relies on the specification of the ’371 patent. There, the term is defined by the patent’s own lexicography. ’371 at 4:60-5:6, 4:40-43. The patent describes a “universal frequency translation” (UFT) module that can be used in either a “universal frequency down-conversion module (UFD)” to down-convert “an input signal to an output signal” or a “universal frequency up-conversion (UFU) module” to up-convert “an input signal to an output signal.” *See id.* at 4:60-5:6. Considering this explanation, a person with ordinary skill in the art would understand that a UFD is an implementation of a UFT that consists of “circuitry that generates a down converted output signal from an input signal.” Prucnal Decl. ¶40.

B. Claims That Require No Construction

The language of each of these claim terms is “clear in the context of the claims and will be readily understandable to the jury.” *Mirror Worlds, LLC*, 2010 U.S. Dist. LEXIS 82070, at

*20. This conclusion is reinforced by the observation that the “generating” and “controlling a charging and discharging cycle of the first and second capacitors. . .” language appears only in the claims of the Patents-in-Suit, and thus was given no special meaning either in the specification or in the prosecution history of the Patents-in-Suit. The controlling case law confirms that this Court can resolve the dispute by rejecting Defendants’ improper constructions and holding that the term will have its plain meaning. *Finjan*, 626 F.3d at 1207.¹¹

Ultimately, Qualcomm’s efforts to assign different language to these self-explanatory, plain language terms amounts to an attempt to rewrite the claims of the Patents-in-Suit, and should therefore be rejected. *See K-2 Corp. v. Salomon S.A.*, 191 F.3d 1356, 1364 (Fed. Cir. 1999) (“Courts do not rewrite claims; instead, we give effect to the terms chosen by the patentee.”); *i4i Ltd. P’ship v. Microsoft Corp.*, 598 F.3d 831, 843 (Fed. Cir. 2010) (“Had the inventors intended this limitation, they could have drafted the claims to expressly include it.”).

1. Generating a Lower Frequency Signal from the Transferred Energy.

Qualcomm avers that its proposed construction of this term is based on the “plain language” of the claims. Dkt. 119 at 12. But the plain language of the claim stands on its own; the common meaning of these words may be readily understood by laypeople—this claim term is not a term of art, and the patents assign it no special lexicography. Prucnal Decl. ¶27. Accordingly, no claim construction of these terms is necessary or appropriate.

In support of its construction, Qualcomm relies solely on the conclusory opinion of Dr. Fox. Dkt. 119 at 12. Qualcomm can provide no other intrinsic or extrinsic support to demonstrate

¹¹ *See also Edisync Sys. v. Centra Software, Inc.*, No. 03-cv-1587-WYD-MEH, 2012 U.S. Dist. LEXIS 83169, at *41 (D. Colo. June 15, 2012) (“[T]he phrase ‘given computer file’ is comprised of easily understood terms . . . Therefore, I find the term requires no additional construction.”); *High Point Sarl v. Sprint Nextel Corp.*, No. 09-2269-CM-DJW, 2010 U.S. Dist. LEXIS 85497, at *12-*13 (D. Kan. Aug. 18, 2010) (observing that “not every word requires a construction” and the terms requiring construction “will likely be terms that would be unfamiliar or confusing to a jury”); *EON Corp. IP Holdings, LLC v. Sensus USA Inc.*, No. 6:09-CV-116-JDL, 2010 U.S. Dist. LEXIS 83442, at *71-72 (E.D. Tex. Aug. 11, 2010) (“The Court also finds the terms do not require construction because their meanings are clear in the context of the claims and will be readily understandable to the jury.”).

either the necessity of a construction or that the construction it proposes is appropriate. “Generating” is a term used for its common meaning. Moreover, the specification of the ’551 patent explains that the down-converted signal is not “created . . . from the previously transferred energy.” Rather, in order to generate a lower frequency signal, the invention continuously accumulates and discharges energy. *See, e.g.* ’551 63:63-64:3, 103:45-51, Figs. 60E, 6010A, and 6010B; Prucnal Decl. ¶33.

2. Controlling a Charging and Discharging Cycle of the First and Second Capacitors with First and Second Switching Devices.

This claim term likewise does not warrant claim construction. “Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement.” *U.S. Surgical Corp.*, 103 F.3d at 1568. The Court should decline to construe the term for a number of reasons: *First*, Qualcomm points to no ambiguity in the claim language and does not dispute ParkerVision’s understanding of the claim. *See* Dkt. 119 at 21 (acknowledging that the parties’ proposed constructions “appear similar”). The parties agree that the claim describes a switch device A that controls the charging of capacitor B and the discharging of capacitor B, and a switch device C that controls the charging of capacitor D and the discharging of capacitor D.

Second, inserting the term “separately” results in an unclear and confusing claim construction. In Qualcomm’s proposed construction, it is unclear what exactly the switching devices are meant to control “separately.” Qualcomm states that it intends to communicate that “switching devices must in one position (*e.g.*, open) control one cycle (charging or discharging) and in another position (*e.g.*, closed) control the other cycle. *See id.* But adding the term “separately” entirely fails to communicate that distinction—nor does such a distinction even

exist in the patent. Inserting the term “separately” would only add ambiguity and confusion to the claim, rather than clarify its meaning.

And *third*, Qualcomm may not elect to simply rewrite the claim according to its preference. The ’342 patent does not use the term “separately,” nor does the intrinsic evidence reflect any intent by the inventors to require that the claimed switching devices must control “separately” the cycles of the respective capacitors, or what such separate control even entails. It may be that some embodiments involve “separate” control and some do not. In any event, Qualcomm finds no justification in the patents for unilaterally imposing a separateness limitation on the claim.¹² Thus, the Court should decline to construe the claim, or, alternatively, reject Qualcomm’s proposed construction in favor of ParkerVision’s proposed construction.

C. Means-Plus-Function Claim Terms.

Despite insisting that the parties and Court brief and consider a multitude of means-plus-function claim terms, Qualcomm spends less than a page discussing the proper construction of these terms. Dkt. 119 at 23-24. Accordingly, and because Qualcomm makes no substantive arguments regarding these terms, ParkerVision relies upon the arguments made in its opening brief with respect to the correct construction of these terms. Dkt. 122 at 20-24; *see also* Prucnal Decl. ¶13.

IV. CONCLUSION

For the foregoing reasons, ParkerVision respectfully requests that the Court adopt its proposed constructions of the disputed claim terms, which are the product of a correct application of the principles of claim construction.

¹² *See Thorer*, 669 F.3d at 1366-67 (“It is [] not enough that the only embodiments, or all of the embodiments, contain a particular limitation. We do not read limitations from the specification into claims; we do not redefine words. Only the patentee can do that. To constitute disclaimer, there must be a clear and unmistakable disclaimer.”); *K-2 Corp.*, 191 F.3d at 1364 (“Courts do not rewrite claims ... [they] give effect to the terms chosen by the patentee.”).

July 27, 2012

Respectfully submitted,

McKool Smith, P.C.

/s/ Douglas A. Cawley
Douglas A. Cawley, Lead Attorney
Texas State Bar No. 04035500
E-mail: dcawley@mckoolsmith.com
John Austin Curry
Texas State Bar No. 24059636
E-mail: acurry@mckoolsmith.com
McKool Smith P.C.
300 Crescent Court, Suite 1500
Dallas, Texas 75201
Telephone: (214) 978-4000
Telecopier: (214) 978-4044

T. Gordon White
Texas State Bar No. 21333000
gwhite@mckoolsmith.com
Kevin L. Burgess
Texas State Bar No. 24006927
kburgess@mckoolsmith.com
Josh W. Budwin
Texas State Bar No. 24050347
jbudwin@mckoolsmith.com
McKool Smith P.C.
300 West Sixth Street, Suite 1700
Austin, Texas 78701
Telephone: (512) 692-8700
Telecopier: (512) 692-8744

SMITH HULSEY & BUSEY

/s/ James A. Bolling
Stephen D. Busey
Florida Bar Number 117790
sbusey@smithhulsey.com
James A. Bolling
Florida Bar Number 901253
jbolling@smithhulsey.com
225 Water Street, Suite 1800
Jacksonville, Florida 32202
(904) 359-7700
(904) 359-7708 (facsimile)

*ATTORNEYS FOR PLAINTIFF
PARKERVISION, INC.*

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on this day, July 27, 2012, I electronically filed the foregoing with the Clerk of the Court by using the CM/ECF system which will send a notice of electronic filing to all counsel of record.

/s/ Austin Curry

John Austin Curry