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Paper No. 42
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.
Petitioner,

v.

PERSONALIZED MEDIA COMMUNICATIONS, LLC,
Patent Owner.

Case IPR2016-00755
Patent 8,191,091 B1

Before KARL D. EASTHOM, KEVIN F. TURNER, and GEORGIANNA W. BRADEN, *Administrative Patent Judges*.

EASTHOM, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

A. Background

Petitioner, Apple Inc., filed a Petition requesting an *inter partes* review of claims 13–16, 18, 20, 21, 23, 24, 26, 27, and 30 ("the challenged claims") of U.S. Patent No. 8,191,091 B1 (Ex. 1003, the "'091 patent"). Paper 1 ("Pet."). After Patent Owner, Personalized Media Communications, LLC, filed a Preliminary Response (Paper 7, "Prelim. Resp."), we instituted an *inter partes* review of the challenged claims (Paper 14, "Institution Decision" or "Inst. Dec.").

The '091 patent, filed in 1987, claims continuation-in-part (CIP) status to U.S. Pat. No. 4,696,490 (Ex. 1009) (the "'490 patent" (filed Nov. 3, 1981)); Ex. 1006 (Related U.S. Application Data). Addressing a priority date issue involving the challenged claims of the '490 patent raised during a teleconference with the panel, Petitioner filed a Preliminary Reply to Patent Owner's Preliminary Response (Paper 10 ("Pet. Prelim. Reply")) and Patent Owner filed a Sur-Reply in Response to Petitioner's Preliminary Reply on Priority Date (Paper 12 ("PO Sur-Reply")). *See* Paper 8 (Order Authorizing Pet. Prelim. Rep. and PO Sur-Reply); Ex. 1041 (Transcript).

Subsequent to institution, Patent Owner filed a Patent Owner Response (Paper 20, "PO Resp.") and a Contingent Motion to Amend the Claims (Paper 21, "Motion to Amend"); Petitioner filed a Reply (Paper 28, "Pet. Reply") and an Opposition to Patent Owner's Contingent Motion to Amend the Claims (Paper 29); and Patent Owner filed a Reply in Support of Motion to Amend (Paper 33).

Petitioner relies on, *inter alia*, Declarations by Anthony J. Wechselberger. Ex. 1001; Ex. 1055. Patent Owner relies on, *inter alia*, Declarations by Alfred C. Weaver, Ph.D. (Ex. 2001; Ex. 2022), Thomas J. Scott, Jr. (Ex. 2024), and Timothy D. Dorney, Ph.D. (Ex. 2130).

The Board filed a transcription of the Oral Hearing held on June 6, 2017. (Paper 41, "Tr.").[1] During the Oral Hearing, Patent Owner opted not to present arguments in support of its Motion to Amend.

The Board has jurisdiction under 35 U.S.C. § 6. This Final Written Decision issues pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that the challenged claims are unpatentable and that Patent Owner has not met its burden on its Motion to Amend.

B. Related Proceedings

Petitioner states that the '091 patent is involved in Case No. 2:15-cv-01366-JRG-RSP (E.D. Tex. filed July 30, 2015). Pet. 58. In addition to related Case IPR2016-00754 (*see* note 1), Petitioner lists a number of related

[1] An oral hearing in related Case IPR2016-00754 ("'754 IPR") occurred on the same day, with similar issues presented and argued. For example, the parties discussed the common issue of decrypting and scrambling, as it relates to the alleged continuity of the '490 patent in both cases. *See Apple Inc. v. Personalized Media Comm's, LLC*, IPR2016-00754, Paper 40, 57:27–60, 34:1–38:23) (PTAB August 11, 2017) (hearing transcript) ("'754 Tr.") (Discussing "both cases"). Also, the '091 patent challenged here and the patent challenged in the '754 proceeding (U.S. Patent No. 8,559,635) share the same application and continuation chains, and both were filed in 1987 as CIP applications to the '490 patent.

patents involved in district court cases and other related patents involved in *inter partes* reviews. *Id.* at 58–59.

C. The '091 Patent (Ex. 1007)

The '091 patent describes using a conventional scrambled broadcast program containing digital signal information to, among other things, "identif[y] the particular apparatus to which [the digital] signals are addressed." Ex. 1003, 18:41–62. The described system uses "a standard amplitude demodulator, 32, which uses standard demodulator techniques, well known in the art, to define the television based band signal. This base band signal is then transferred through separate paths to three separate detector devices." *Id.* at 18:43–48 (referring to Figure 2A). Similarly, "[t]he present invention employs signals embedded in programming." *Id.* at 7:50–51. The invention seeks to overcome alleged deficiencies in the prior art: "The prior art . . . has no capacity for . . . controlling the decryption of said programming, let alone doing so on the basis of signals that are embedded in said programming that contain keys for the decryption of said programming." *Id.* at 5:15–23. "It has no capacity *for decrypting combined media programming*." *Id.* at 5:38–39 (emphasis added).

The '091 patent describes "programming" broadly: "The term 'programming' *refers to everything that is transmitted electronically* to entertain, instruct or inform, including television, radio, broadcast print, and computer programming was well as combined medium programming." *Id.* at 6:31–34 (emphasis added).

Figure 2A of the ’091 patent follows:

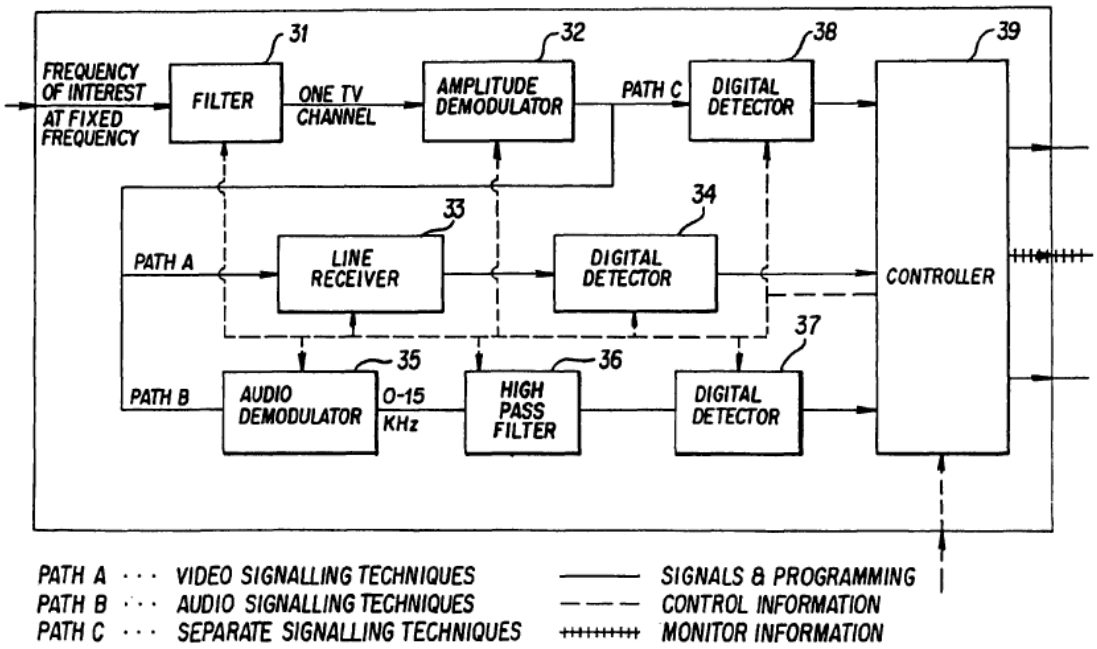

FIG. 2A

Figure 2A depicts conventional amplitude demodulator 32 for receiving standard television signals having embedded digital information therein:

> In FIG. 2A, . . . [t]he television channel signal . . . passes to a standard amplitude demodulator, . . . which uses standard demodulator techniques, well known in the art, to define the television base band signal. . . . [A] digital detector, 34, . . . acts to detect the digital signal information embedded in said [video] information, using standard detection techniques well known in the art, and inputs detected signal information to controller, 39, ...

Ex. 1003, 18:41–62; *see also id.* at 159:54–61 (describing “conventional analog television” receivers using descramblers “that descramble analog television transmissions and are actuated by receiving digital key information”).

D. Illustrative Claim

Petitioner challenges independent claims 13, 20, and 26. Petitioner also challenges claims 14, 15, 18, 23, 24, 27, and 30, which depend directly or indirectly from claims 13, 20, or 26. Claim 13 follows:

> 13. A method of decrypting programming at a receiver station, said method comprising the steps of:
>
> [a] receiving an encrypted digital information transmission including encrypted information;
>
> [b] detecting in said encrypted digital information transmission the presence of an instruct-to-enable signal;
>
> [c] passing said instruct-to-enable signal to a processor; determining a fashion in which said receiver station locates a first decryption key by processing said instruct-to-enable signal;
>
> [d] locating said first decryption key based on said step of determining;
>
> [e] decrypting said encrypted information using said first decryption key; and
>
> [f] outputting said programming based on said step of decrypting.

Ex. 1003, 285:61–286:9 ([a]–[f] nomenclature added).

E. Instituted Grounds of Unpatentability

We instituted grounds of unpatentability of the challenged claims under the following sections of 35 U.S.C.:

Claim(s) Challenged	Basis	Reference(s)
13–15, 18, 20, 23, and 24	§ 102(a)	Gilhousen (Ex. 1004)[2]
13–15, 18, 20, 23, and 24	§ 102(e)	Mason (Ex. 1005)[3]

[2] Gilhousen et al., U.S. Patent No. 4,613,901 (filed May 27, 1983, issued September 23, 1986).
[3] Mason, U.S. Patent No. 4,736,422 (filed July 2, 1984, issued April 5, 1988).

26 and 30	§ 102(e)	Frezza (Ex. 1006)[4]
16 and 21	§ 103(a)	Mason and Block (Ex. 1008)[5]
16 and 21	§ 103(a)	Gilhousen and Block
27	§ 103(a)	Frezza and Block

See Inst. Dec. 5–6, 49–50 (also denying grounds based on a prior art reference to "Kelly").

II. ANALYSIS

A. Claim Construction

In an *inter partes* review, the Board construes claims by applying the broadest reasonable interpretation in light of the specification. 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2142 (2016). Under this standard, absent any special definitions, claim terms and phrases carry their ordinary and customary meaning, as would be understood by one of ordinary skill in the art, in the context of the entire disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

Petitioner and Patent Owner dispute several claim terms that require construction. Other terms are not in controversy and do not require express construction. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (only those terms which are in controversy need to be construed and only to the extent necessary to resolve the controversy).

[4] Frezza et al., U.S. Patent No. 4,712,239 (filed June 16, 1986, issued Dec. 8, 1987).
[5] Block et al., U.S. Patent No. 4,484,217 (filed May 11, 1982, issued Nov. 20, 1984).

1. Claims 13 and 20, "an encrypted digital information transmission including encrypted information," Claim 26, "receiving an information transmission including encrypted information"

Petitioner contends that the phrase noted above, recited in claims 13 and 20, means "an information transmission that is partially or entirely digital, at least a portion of which is encrypted." Pet. 5. For purposes of institution, we construed the phrase to "include[] at least some encrypted digital information, and does not preclude, with that transmission, non-encrypted information or scrambled analog information." Inst. Dec. 12.

Petitioner agrees with our construction. Pet. Reply 6. Patent Owner does not. PO Resp. 4–5. According to Patent Owner, "[t]he broadest reasonable interpretation of the term 'an encrypted digital information transmission including encrypted information' should be 'an information transmission carrying *entirely digital* content at least a portion of which is encrypted.'" *Id.* (citing Ex. 2022 ¶ 42).

Petitioner contends "the plain language" of the phrase "encrypted digital information transmission ***including*** encrypted information" includes not only encrypted digital information, it may additionally include "information that is not encrypted or digital." *See* Pet. 5–6 (emphasis by Petitioner). Petitioner further contends that "[w]hen the patentee wanted to specify that 'an encrypted digital information transmission' included only digital information (in a related patent having the same specification as the '091 patent), it added language expressly excluding non-digital information from the transmission in certain claims." *Id.* at 7 (citing Ex. 1030, claim 18). Claim 18 of the related patent, U.S. Patent No. 8,559,635 (the "'635 patent"), which shares a common specification with the '091 patent

challenged in the companion ’754 IPR (*see* note 1), supports Petitioner. Claim 18 of the ’635 patent recites “receiving at least one encrypted digital information transmission, *wherein the at least one encrypted digital information transmission is unaccompanied by any non-digital information transmission*.” Ex. 1030, 288:13–16 (emphasis added).

In response, Patent Owner explains digital cannot be partially digital, as “[n]o POSITA would ever refer to a mixture of analog and digital data simply as ‘digital data’ without saying anything more.” PO Resp. 5. In contrast, Patent Owner contends “the inventors explicitly expanded the scope of ‘encrypted’ to cover partially encrypted information transmissions.” *Id.* Patent Owner relies on the earlier ’490 patent to support its argument that encrypted means at least “partially encrypted.” *Id.* (citing Ex. 1009, 13:68–14:2 (“Encrypted transmissions may be only partially encrypted)).

Patent Owner’s argument improperly characterizes Petitioner’s proffered claim construction to require a construction of “digital” to “convey a sense of varying degree” or to mean “partially digital.” *See* PO Resp. 4–5. It does not. Rather, the construction requires the *transmission* to be partially digital and the *transmission* may include analog information. Patent Owner does not dispute that disclosed TV transmissions in both the ’490 and ’091 patents include analog and embedded digital information, including analog carrier waves, with some information encrypted. *See id.* at 8 (arguing some claims do not cover “*all* the disclosed embodiments” and “[t]hose mixed analog/digital embodiments support the broader ‘information transmission’ (claim 26) instead”); Pet. Reply 8 (“The specification describes numerous transmissions that include both analog and digital data”) (citing Inst. Dec. 10–11)); *supra* Section I.A (Introduction); Ex. 1003, Fig. 2A, 11:23–61,

12:1–12, 18:41–62, 159:57–61 (describing Wall Street television embodiment and analog-digital mixed television signals).

Simply put, the phrase "encrypted digital information *transmission* including encrypted information" (as recited in independent claims 13 and 20 (emphasis added)) means the *transmission* includes "encrypted digital information" *and* "encrypted information." The claim phrase itself shows that "encrypted information" need not be "encrypted digital information."

Patent Owner's contention that the term includes non-encrypted information but excludes non-digital information (e.g., analog information) renders the plain meaning of the last part of the phrase superfluous. In other words, if "an encrypted digital information transmission, including encrypted information," only includes encrypted digital information, then it renders superfluous "including encrypted information." During Oral Hearing arguments about the disputed phrase, Patent Owner acknowledged that the latter phrase "may be" superfluous. *See* Tr. 43:8–45:7, 41:13.

Patent Owner's Response similarly concedes that its construction renders "including encrypted information" superfluous. In other words, Patent Owner argues "once the 'transmission' is construed, as PMC proposes, to carry all-digital information, the 'encrypted information' is also limited to 'encrypted digital information' only." PO Resp. 8. Precedent disfavors such a construction. *See Innova/Pure Water, Inc. v. Safari Water Filtration Sys.*, 381 F.3d 1111, 1119–20 (Fed. Cir. 2004) ("While not an absolute rule, all claim terms are presumed to have meaning in a claim."); *Merck & Co. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 1372 (Fed. Cir. 2005) ("A claim construction that gives meaning to all the terms of the claim is preferred over one that does not do so."); *Power Mosfet Techs., L.L.C. v.*

Siemens AG, 378 F.3d 1396, 1410 (Fed. Cir. 2004) ("[I]nterpretations that render some portion of the claim language superfluous are disfavored.").

This argument also incorrectly assumes "'transmission' is construed, as . . . to carry all-digital information." PO Resp. 8. To the contrary, none of the challenged claims require the transmission to be all-digital, and nothing in claims 13 or 20 transforms "encrypted information" as recited in the last part of the phrase into "encrypted digital information."

Turning to claim 18 of the related '635 patent, it recites "receiving at least one encrypted digital information transmission, *wherein the at least one encrypted digital information transmission is unaccompanied by any non-digital information transmission*." Ex. 1030, 288:13–16 (emphasis added). This shows that Patent Owner informs the meaning of encrypted digital information transmission as including analog (i.e., non-digital) information, else there would have been no need to specify the exclusion of such information. Patent Owner, however, argues

> the claim clause—"wherein the at least one encrypted digital information transmission is unaccompanied by any non-digital information transmission"—merely specifies what *other* transmission accompanies the "encrypted digital information transmission"; the "wherein" clause does not affect the intrinsic characteristics of the "*encrypted digital* information transmission" itself such as whether it is fully or partially encrypted or digital.

PO Resp. 7.

Contrary to Patent Owner's arguments, as Petitioner argues, Patent Owner's attempt to distinguish "unaccompanied by" does not account for opposite arguments it made during "PMC's proposed constructions of the term" in related IPR proceedings. *See* Pet. Reply 8 (citing Ex. 1056, 21–22; 1061, 13; Ex. 1062, 9–10). Each of the cited Exhibits supports Petitioner,

because each one shows that Patent Owner equated "unaccompanied for" with "does not include" in its proposed construction. Ex. 1061, 13 ("Patent Owner submits that a person of ordinary skill in the art would understand this to mean 'a digital information transmission that *does not include* non-digital information such as analog information.'") (emphasis added); Ex. 1056, 21–22 (similar statement by Patent Owner); Ex. 1062, 9–10 (similar statement by Patent Owner). Also, Patent Owner's arguments here, and throughout, effectively concede that the challenged claims cover a mixed analog television signal—i.e., analog television transmissions "accompanied with" embedded digital information at some time during a given transmission.

To support their respective positions, both parties cite to the '091 patent (which contains 288 columns, Ex. 1003) and is a CIP of the earlier-filed ancestor '490 patent (which contains only 24 columns). As noted above, Patent Owner agrees with our initial finding that both of "the patent[s] disclose[] . . . 'embodiments that involve mixtures of digital and analog information.'" *See* PO Resp. 8 (quoting Inst. Dec. 10) (Patent Owner refers to "the patent" whereas our finding refers to the '091 and the '490 patents). Nevertheless, Patent Owner contends "[t]hose mixed analog/digital embodiments support the broader 'information transmission' (claim 26) instead." *Id.* According to Patent Owner, the "French Chef" example (disclosed in the earlier-filed '490 patent as part of the "Julia Child" television show) includes "two alternative embodiments," and "[h]ere, the separate transmission of the encrypted recipe in encoded digital form constitutes an (all-digital) 'encrypted digital information transmission.'" *Id.*

at 8–9 (citing Ex. 2022 ¶ 55; *comparing* Ex. 1009, 20:28–37, *with id.* at 20:60–68).

Neither of the French Chef embodiments in the earlier-filed '490 patent clearly supports an all-digital modulation technique. For example, in the "alternate method," the recipe is "in encoded digital form *in the programming transmission received by the TV set*." Ex. 1009, 20:60–63 (emphasis added). Similarly, in the other embodiment, the TV tunes "*to the appropriate channel* to receive the recipe in encoded digital form." *Id.* at 20:35–37 (emphasis added). These '490 patent passages do not describe the transmissions as all-digital; rather the digital signals are embedded as an encoded recipe (similar to other embedded control signals, program, or network identifiers, or other signals) in analog television channels. *See id.* at 15:7–11, 56–63, 20:60–68; *supra* note 6; *infra* note 7. Also, the latter disclosed digital recipe of another channel does not include any control signal in the transmission, which the claims require (e.g., an instruct-to-enable signal).[6] Moreover, even if somehow the encrypted recipe of one of the French Chef embodiments does support an all-digital interpretation (they do not), this does not limit claims 13 and 20 to a single embodiment according to the plain language of the claims (which include a broad array of programming, as explained further below).

[6] In this other channel embodiment, the recipe appears to be digital textual information that the system transmits to a viewer user on a different television channel than the channel transmitting the "The French Chef" television program. *See* Ex. 1009, 20:18–19, 32–37. In the same channel embodiment, the system embeds the encrypted digital recipe in "The French Chef" program. *See id.* at 20:6–63.

Contrary to Patent Owner's argument that an embodiment in the '091 patent limits the claims to all-digital (*see* PO Resp. 11–12 (citing Ex. 1003, 159:46–61 describing an Example # 7 embodiment)), during prosecution of the '091 patent, Patent Owner described "**example # 6** and especially **example # 7**," of the '091 patent as "includ[ing] both digital and analog television signals . . . relat[ing] to the 'Wall Street Week program.'" *See* Ex. 1043, 12; Ex. 1003, 148:5–160:28 (describing the Example # 7 embodiment).

As shown above, the record does not support Patent Owner's arguments that seek to limit any of the challenged claims to all-digital. In addition, Patent Owner's current substitute amendments acknowledge that even the later-filed '091 patent includes digital control messages "as part of an ***analog*** television transmission." Paper 33, 6.

As explained above, the phrase "receiving an encrypted digital information transmission including encrypted information" specifically requires the "information transmission" to include "encrypted information," which includes non-digital (analog) and/or digital information, because the claim specifically distinguishes between "encrypted digital information" and "encrypted information." Similarly, as noted in the Institution Decision, reciting "encrypted information" in claim 26, and reciting "encrypted *digital* information" in claim 13 (emphasis added), shows further that encrypted information need not be digital information. Inst. Dec. 8–9. Patent Owner does not address this reasoning in its Response, but instead concedes that "information transmission (claim 26)" supports the broader interpretation. PO Resp. 8 (arguing "[t]hose mixed analog/digital embodiments [in the '091 patent] support the broader 'information transmission' (claim 26) instead.")

Nothing in the plain language of claim 13 implies an "entire" digital or "entire" encrypted transmission. Patent Owner does not rely on a lexicographic definition to support its claim construction in its Patent Owner Response. *See id.* at 5. The earlier-filed '490 patent states "[a] decrypter does not *necessarily decrypt the entire transmission*. Encrypted transmissions may be only partially encrypted. For example, only the video portion . . . may be encrypted." Ex. 1009, 13:68–14:2; *see* PO Resp. 5 (citing and partially quoting Ex. 1009, 13:68–14:2); Prelim. Resp. 25 (citing same passage, arguing the inventors "act[ed] as their own lexicographer"). This passage implies the whole transmission may be encrypted and decrypted. During the Oral Hearing in the related '754 IPR, Patent Owner confirmed that the '490 patent largely described protecting mixed analog and digital television signals with encryption. *See* note 1; '754 Tr. 39:8–24 (Patent Owner agreeing "the thrust of the whole patent [is] to protect all manner of transmissions").

Also, the '490 patent and '091 patent do not specify the parameters of the claim phrase, "encrypted digital information transmission including encrypted information." The quoted disclosure (PO Resp. 5) and other parts of the '490 and '091 patents merely describe what appears to be a typical situation in which part of a transmission may be encrypted as embedded data in an analog television signal. *See* Ex. 1009, 14:1–3; Ex. 1001 ¶¶ 41–49 (describing known digital systems that were only partly digital); Ex. 1003, 155:43–45 (the "studio commences transmitting analog television information on its transmission frequency and embeds and transmits

particular SPAM message information on lines 20, 21, 22, 23, 24, 254, 26, and 27").[7]

Patent Owner also does not argue specifically that the prosecution history supports its position with respect to the transmission term. In any event, as noted in the Institution Decision, Patent Owner did not argue during prosecution that challenged claims 13 and 20 exclude the "Wall Street Week" embodiment highlighted in the '091 patent in several places. *See*, *e.g.*, Ex. 1003, 11:23–61, 12:1–12, 159:57–61. In addition, in its Preliminary Response, as noted in the Institution Decision,

[7] As discussed further below, the two patents contain overlapping portions, and in particular, the earlier-filed '490 patent indicates *throughout* that the referenced video portion refers to embedding digital signals into a normal analog television transmission. *See* Ex. 1009, 9:31–33 ("A digital signal is embedded by conventional generating and encoding means and transmitted in a television, radio or other transmission."); *see also* 7:23–49 (describing reception of standard TV and decryption); 4:5–6 (embedding signals in programs); *accord* Ex. 1001 ¶ 46 ("[A] person of ordinary skill in 1981 or 1987 would have considered 'digital television,' 'digital video,' or 'digital programming' to be fundamentally comprised of an analog video signal that contained embedded digital content such as teletext or videotex."). Figure 4B of the '091 patent describes what appears to be decrypting examples: 1) decrypting via the "PROGRAMMING DECRYPTER OR INTERRUPT MEANS" 104 signifying (descrambling)—especially where this was "well known in the art" (Ex. 1009, 13:5–8); and 2) decrypting by signal processor 100 of encoded digital signals embedded in the video or audio. The '490 patent explains that signal processor 100 "possibly decrypts" signals to decrypter/interrupter 101, to inform the latter "how to decrypt or interrupt the programming." *Id.* at 13:27–32 ("The signal or signals may transmit a code or codes necessary for the decryption of the transmission."). Further, Mr. Wechselberger testifies that before the mid-1980s (i.e., after the filing of the '490 patent), skilled artisans interchanged the terms "encrypted" and "scramble[ed]." *See* Ex. 1001 ¶¶ 62–65.

> Patent Owner argues . . . that an analog television embodiment (which includes digital information) is within the scope of the claims. For example, in a related argument alleging support in the '490 patent for "receiving an encrypted digital information transmission including encrypted information," Patent Owner relies on "the incoming programming" of "'The French Chef' TV program." *See* Prelim. Resp. 9–10 (citing Ex. 1009, 20:12–50; 20:60–68). This conventional TV program includes analog information, which includes an encrypted recipe "in encoded digital form in the programing transmission received by TV set, 202," which processor 200 eventually decrypts. Ex. 1009, 20:60–68. In addition, claim 26 specifically recites "wherein said encrypted information includes television programming," further indicating that encrypted information may include analog information, because programming, as discussed further below, and as noted above, is a broad term. Ex. 1003, 6:31–34; *supra* Section I.B. For example, programming covers embodiments exemplified by the "Wall Street Week" and "The French Chef" analog television shows.

Inst. Dec. 11.

Patent Owner now argues that it disclaimed the scope of the related term "decrypting" (discussed below) during prosecution of the '091 patent. *See* PO Resp. 15–16. To the extent this argument applies to the encrypting phrase at issue here, we adopt and incorporate the remaining findings and discussion from the Institution Decision and our discussion of decrypting below. *See* Inst. Dec. 10–12. In short, the '091 patent refers to "*decrypting* combined media *programming*." Ex. 1003, 5:38–39 (emphasis added).

As discussed above and below, programming is a broad term, not limited to digital data, indicating decrypting and encrypting encompass all manner of data and signals. Challenged claims 18, 24, and 30, which depend respectively from claims 13, 20, and 26, specifically recite "said encrypted information includes television programming," and Patent Owner

concedes, as noted above, that claim 26 covers mixed analog/digital embodiments. *See* PO Resp. 8 (arguing "[t]hose mixed analog/digital embodiments [in the '091 patent] support the broader 'information transmission' (claim 26) instead.").

The earlier-flied '490 patent shows that the disclosure broadly contemplates decrypting programming *and the signals within programming*: "The signals that enable the decrypter/interrupter, 101, to *decrypt* and/or transfer *program[m]ing* uninterrupted may be embedded in the program[m]ing or may be elsewhere." Ex. 1009, 13:17–20 (emphasis added). "These techniques employ signals embedded in programming." *Id.* at 4:5–6. "The present invention provides a method for obscuring the meaning of the signals *to prevent unauthorized use of the signals and their associated programming*. Their meanings may be obscured through encryption." *Id.* at 4:31–34 (emphasis added). Each of the challenged claims recite "*decrypting programming*" and "outputting said programming based on said step of decrypting." The '490 patent explains that signal processor 100 "possibly decrypts" signals to decrypter/interrupter 101, to inform the latter "*how to decrypt or interrupt the programming*." *Id.* at 13:27–32 (emphasis added) ("The signal or signals may transmit a code or codes *necessary for the decryption of the transmission*."). The '490 patent also describes "*convert[ing]* the encoded signals [of received transmissions] *into digital information*." Ex. 1009, 4:64–65 (emphasis added). Therefore, given analog television programming and the desire to protect its unauthorized viewing that the '490 and '091 patents teach, decrypting *programming and the signals within it* must reasonably encompass

descrambling the programming by virtue of decrypting encrypted digital signal keys.

Patent Owner obscures the construction and consequent scope of the claim terms at issue here by contending that "PMC has not contended that they [(claims 13, 20, and 26)] must cover 'digital television programming.'" PO Resp. 33. Patent Owner also obscures the construction and scope of the claims by arguing "whether the Board construes 'digital television programming' to be analog video containing embedded digital content (as Petitioner proposes) or entirely digital TV content, the '490 Patent provides written support for both cases." *Id.* Patent Owner cites to examples that provide mixed analog television with embedded content and alleges one example provides "all-digital TV." *See id.* (citing Ex. 1009, 20:32–38, 20:60–68 (French Chef examples discussed above), Fig. 2A, 6:6:67–7:1) (alleging Path C constitutes "all-digital TV").

These examples, including the latter example, do not support "digital television programming," because in the latter example, the signal first passes through "AMPLITUDE DEMODULATOR" 32 of "ONE TV CHANNEL" in a "TV SIGNAL DECODER," just like paths A and B, which Patent Owner does not describe as all-digital and which constitute typical mixed analog/digital television signals. *See* Ex. 1009, Fig. 2A; *infra* Section II.B.1 (discussing programming and Figure 2A). Given Patent Owner's agreement that the earlier-filed (1981) '490 patent "provides written support" for "analog video containing embedded digital content" (PO Resp. 33), Patent Owner's argument that "the 1981 ['490] specification is completely devoid of any discussion of scrambling/descrambling" (*id.* at 62) shows that the term encrypting and decrypting in the '490 patent must

have embraced the terms scrambling and descrambling. Otherwise, as indicated above, the '490 patent could not have described the protection of analog television programming (i.e., by scrambling and descrambling it using an embedded digital key).

Furthermore, in related litigation, Patent Owner proposed construing "encrypted digital information transmission" more broadly, and as meaning "[s]ignals sent or passed from one location to another location to convey digital information which is in encrypted form." *See* Pet. 18 (citing (Ex. 1015, 1). Patent Owner contends that its

> proposed definition [of 'encrypted digital information transmission'] in the district court— 'signals sent or passed from one location to another location ***to convey digital information*** which is in encrypted form' (Ex. 1015, 1)—only covers signals that 'convey digital information' and therefore is no broader than the all-digital construction here. (Ex. 2022, ¶56.)

PO Resp. 9.

This citation and argument is not persuasive. First, the cited page of Exhibit 1015 (Ex. 1015, 1) does not include a construction for the remaining part of the phrase (in claims 13, 20, and 26) at the heart of the issue here: "transmission including encrypted information." *See* Ex. 1015, 1. Furthermore, Patent Owner's characterization of its proffered "definition" of what the phrase "covers" does not address the issue of whether the transmission also may include (i.e., cover) encrypted *analog and digital* information. That the transmission may "convey digital information . . . in encrypted form" (as Patent Owner argues) does not preclude the transmission from also conveying encrypted analog information with that encrypted digital information. Moreover, the '091 and '490 patents do not

describe a single specific digital modulation technique, and the claims do not recite digital modulation.

In summary, the plain meaning of the challenged claim phrases in context of the claims as a whole in view of the ’091 patent disclosure, the ’490 patent disclosure, the prosecution history (discussed further below), claim 18 of the related ’635 patent, and Patent Owner’s proposed District Court construction, indicates that the disputed transmission phrase, in particular the more generic “encrypted information” portion of the transmission, may include encrypted non-digital or digital information. In addition, as noted, in addressing its contingent substitute claims, which further limit the challenged claims, Patent Owner *concedes* that its substitute claims (which include a new narrowing negative limitation), “*do not require the encrypted and unencrypted digital information to be exclusive of analog signals.*” Paper 33, 6 (emphasis added). Patent Owner states its substitute “claims echo the Board’s own construction,” but Patent Owner argues that its claims may include analog signals in order to show original support for them in the ’091 patent. *Id.*

Accordingly, we maintain, our initial construction set forth in the Institution Decision. Therefore, an “encrypted digital information transmission including encrypted information” includes at least some encrypted digital information, and does not preclude, with that transmission, non-encrypted information or scrambled analog information. *See* Inst. Dec. 12. In other words, the “transmission” requires some encrypted digital information, but does not preclude other information such as non-encrypted information or analog information, and “encrypted information” does not preclude scrambled analog information.

2. "decrypting said encrypted information"

Claims 13, 20, and 26 recite the phrase decrypting said encrypted information." As noted above, dependent challenged claims 18, 24, and 30 recite "wherein said encrypted information includes television programming," which signifies analog television programming—especially where Patent Owner concedes that "encrypted information" includes analog information in claim 26. *See* PO Resp. 8. Citing passages from the '091 patent, a related IPR decision, its Declarant, and a related district court case, Petitioner contends that decryption and encryption are not limited to operations on digital information, but include descrambling and scrambling operations on analog information (i.e., including analog television programming as claim 18 recites). *See* Pet. 4–5 (citing Ex. 1003, 159:46–61; Ex. 1001 ¶¶ 63–65; Ex. 1011, 7–11; Ex. 1012, 2–5; Ex. 1013, 25–26; Ex. 1014, 2–4; Ex. 1017, 29). This issue closely ties with the construction of the "transmission" phrase above, which does not preclude "encrypted information" that includes analog information.

Patent Owner, citing the CIP '091 patent, the earlier-filed '490 patent, related patent reexaminations, a District Court case, and other evidence, contends that in line with convention, the '091 patent makes a distinction between encryption and scrambling, with the former limited to digital data and the latter limited to analog data. *See* PO Resp. 9–20 (citing Ex. 1003, 147:21–26, 148:13–20; 159:46–61; Ex. 1009, 4:61–5:2, 24:17–19, 73:34–36, 77:10–38, 101:51–58; Ex. 1027, 4–5, Ex. 1035, 10–11, Ex. 1037, 10–11, Ex. 1039, 10; Ex. 2001 ¶¶ 46–47; Ex. 2004, 30; Ex. 2005, 41; Ex. 2006, 77; Ex. 2007, 68–69; Ex. 2008, 2, n.1; Ex. 2010 ¶¶ 18–20, 24; Ex. 2022 ¶¶ 92–94; Ex. 2023, 16–17).

Regarding citations to the earlier-filed '490 patent, Patent Owner provides the following:

> *See also* Ex. 1009, 4:61–5:2 (decryptors convert the received information . . . to other ***digital information***); Ex. 1003, 148:13–20 ("the program originating studio . . . transmits a television signal that consists of so-called '***digital video***' and '***digital audio***'" in which "the ***digital video information*** is doubly ***encrypted*** . . ."); *id.*, 24:17–19 (describing the decryption of the execution segment of a ***digital message***); *id.*, 73:34-36; 101:51-58 (describing techniques to ***encrypt "binary information"*** – *i.e.*, digital information); *id.*, 77:10–38 (describing a decryptor 10 that receives digital data and decrypting it into "**binary information**").

PO Resp. 10 (emphasis by Patent Owner).

Patent Owner's arguments are not persuasive, because the cited passages do not support Patent Owner's position in light of other passages described above. Specifically, passages in the '490 and '091 patents, as explained above and further below, support using control signals, some of which may be digital, embedded in analog television, and "convert[ing]" them into "digital information." *See* Ex. 1009, 4:61–5:2.

With respect to the '091 patent, Patent Owner cites to the phrase "so-called 'digital video' and 'digital audio.'" PO Resp. 10 (citing Ex. 1003, 148:13–20). That citation relates to an Example #7 embodiment (relied upon by Patent Owner also to support substitute claims as discussed below). The embodiment simply does not describe what type of modulation "so-called" digital audio and video embraces. At several passages, the cited embodiment describes embedding control and other data signals within the video or audio frame portions of the NTSV signal as digital data. *See* Ex. 1003, 148:13–20, 156:35–157:2 (describing inserting and stripping "SPAM" or other control information from the Wall Street Week video program,

wherein "[s]aid stripped information . . . would cause disabling chips, well known in the art" to prevent further processing via a microprocessor, and only allowing video to be displayed if said information is stripped).

Example #7 also refers to sending "in due course" "*analog television information*" with embedded SPAM signals. *Id.* at 155:44–46. Another passage similarly describes how control signals cause the cessation of receiving digital video and audio of "cable channel 13 . . . to commence receiving said television information as conventional analog television." *Id.* at 154:57–64. The passages in some instances seem to imply sending of digital information and at other instances sending digital mixed with analog information, all presumably sent to the same viewer, with little or no clear description what the process at the television receiver involves. *See* Ex. 1003, 148:5–160:28. Therefore, Example #7 appears to constitute a description of what Mr. Wechselberger describes as "full-channel" or "full-field" transmission, like some teletext, videotext, or other systems, albeit including other control signals (e.g., SPAM signals). *See* Ex. 1001 ¶¶ 44, 34–51.

In any event, more importantly, Patent Owner's arguments and evidence fail to address adequately what claims 13, 20, and 26 recite: "[a] method of *decrypting programming*" and "outputting said *programming based on said step of decrypting*." Ex. 1003, 285:70, 286:8–9, 29, 46–47, 63 (emphasis added). As noted above, the '091 patent discloses that programming includes all manner of programming, including conventional analog television signals. *See* Sections I.C, II.B.1. "The term 'programming' refers to everything that is transmitted electronically to entertain, instruct or inform, including television, radio, broadcast print, and

computer programming was well as combined medium programming." Ex. 1003, 6:31–34.

Similar to the challenged claims, and as the cited passages by Patent Owner show, the '490 patent and the '091 patent describe decryptors as applying to *programming*. For example, "as regards decoders and decryptors, many different systems exist, at present, that enable programming suppliers to restrict the use of transmitted programming to only duly authorized subscribers." Ex. 1003, 5:28–31. Similarly, "this prior art, too, is limited. It has no capacity for *decrypting combined media programming*." *Id.* at 5:38–39 (emphasis added). And as noted above and similar to the passages Patent Owner cites (*supra* notes 6–7; PO Resp. 10 (quoted *supra*)), "[t]he *signals that enable the decrypt[o]r/interrupter*, 101, to *decrypt* and/or transfer *program[m]ing* uninterrupted *may be embedded in the program[m]ing* or may be elsewhere." Ex. 1009, 13:17–20 (emphasis added).

These passages (and others) explicitly show that decrypting programming includes decrypting the programming itself (i.e., including analog signals) *and* the digital keys "embedded in the program[m]ing." *See id.* During the Oral Hearing in the related '754 IPR, Patent Owner acknowledged that the '490 patent deals with protecting all types of programming (after arguing that the "Julia Child's" "The French Chef" television show example involves "decryption" of a digital recipe):

> JUDGE EASTHOM: I understand there are digital --
>
> MR. KLINE: Right.
>
> JUDGE EASTHOM: -- the recipe [in the earlier-filed '490 patent] was digitally encrypted, I understand that. So my question is, wasn't the thrust of the whole patent to protect all

> manner of transmissions?
>
> MR. KLINE: I certainly -- in a variety of ways, and it's very -- even -- you know, relative to the ['091 patent] '87 specification, the '490 specification, it certainly is not as voluminous, but it is still quite thorough on its own, longer than most applications. *So it certainly describes a wide variety of transmissions and a wide variety of programming*.
>
> This will come up again quite a bit when we talk about priority, which is in the next IPR proceeding that we are going to move on to. *So the '490 specification certainly describes a variety of programming as a subject of its disclosure, absolutely*.

'754 Tr. 39:5–18 (emphases added) (*see* note 1).

Patent Owner also argued that "we don't even use the word 'scrambling' in the 1981 application." *Id.* at 38:1–2; *accord* PO Resp. 62 ("the 1981 specification is completely devoid of any discussion of scrambling/descrambling."). But, as the panel pointed out during the Oral Hearing of the related '754 IPR (discussing common issues at hand here (*see* note 1)), if the earlier-filed '490 patent does not mention scrambling (or descrambling) anywhere, and it protects analog programming, then decrypting and encrypting must mean the same thing as descrambling and scrambling, i.e., they apply to analog programming in the context of the '490 patent. *See id.* at 38:15–18 ("if you say you don't have anything about descrambling in there, then you must be talking about protecting [programs] with decrypting, which is the same thing as descrambling because [the programs include] analog").

In other words, notwithstanding Patent Owner's evidence and arguments, the earlier-filed '490 patent and the CIP '091 patent describe encrypting and decrypting analog data, because both encompass decrypting general or conventional television programming, as also discussed above.

Supra Sections I.C, IIA.1. Furthermore, by reciting "encrypted digital information transmission" as "including encrypted information" in claims 13 and 20, this implies further that not all encrypted information must be digital. It follows that because not all encrypted information must be digital, encrypted information must include scrambled analog information and decrypting that information must include descrambling it.

The '091 patent states that "the invention is not to be unduly restricted" and lists "for example, the 'Wall Street Week' transmission may be of conventional analog television, and the decrypters, 107, 224, and 231, may be conventional descramblers, well known in the art, that descramble analog television transmissions and are actuated by receiving *digital* key information." Ex. 1003, 159:47–61 (emphasis added). This passage further supports Petitioner's view by equating decryption and descrambling with respect to certain embodiments, using "digital key information." *See* Pet. 4 (citing Ex. 1013, 25–26; Ex. 1003, 159:46–61); Pet Reply 10–11 (discussing the "controversial" or passage).

In response to Petitioner regarding this "controversial" passage, Patent Owner contends the passage supports its view. Patent Owner explains that Petitioner, a prior Board decision, one District Court (*see* Ex. 1017, 29), and this panel, all interpret this particular disclosure out of context, because the passage refers to alternative embodiments, and "contrasts, rather than conflates, digital decryption with analog descrambling since it confirms a conventional analog television transmission requires conventional (analog) descramblers instead of digital decryptors." PO Resp. 11–12 (citing Pet. 4–5; Ex. 1003, 159:46–61), 12–13 (citing Ex. 2022 ¶ 63); *but see* Ex. 1017, 29

("The court rejects PMC's attempt to limit the encrypt/decrypt terms to digital data.").

Contrary to Patent Owner's view, the disputed passage in the '091 patent specifically lists descramblers as one example of a type of decryptor "without . . . departing from the spirit of the invention." Ex. 1003, 159:50–51. The "controversial" sentence states "the decryptors, 107, 224, and 231, *may be* conventional descramblers." Ex. 1003, 159:46–61 (emphasis added). It does not say "decryptors . . . *may be replaced by* . . . descramblers," which is what Patent Owner urges. PO Resp. 12 (arguing the sentence actually means "'conventional (analog) descramblers' would be *used in place of*, or *as an alternative to*, the 'decryptors, 107, 224, and 231' if and when "the 'Wall Street Week' transmission [is] of conventional analog television" instead of digital television programming"). As Patent Owner recognizes, the passage lists the "Wall Street Week" conventional analog television example as using descramblers. *See* Ex. 1003, 159:57–61; PO Resp. 11–13.

In its Response, Patent Owner contends "[u]nder PMC's construction of 'decrypting,' 'decrypting programming' is necessarily limited to the decryption of *digital* programming." PO Resp. 15. Patent Owner's argument presumes incorrectly that the challenged claims limit "programming" to "*digital* programming." Having defined "programming" broadly (as discussed further below in Section II.B.1 and as noted above in Section II.A.1), Patent Owner does not clearly narrow it to "digital programming" by lexicography, prosecution history, or otherwise. As noted above, according to the '091 patent, "[t]he term 'programming' refers to everything that is transmitted electronically to entertain, instruct or inform,

including television, radio, broadcast print, and computer programming was well as combined medium programming." Ex. 1003, 6:31–34. Of course, "embedded signals contain digital information," according to the '091 patent. *Id.* at 7:58–59. But Patent Owner does not dispute that "programming" includes "everything that is transmitted electronically." As discussed above, the '091 patent describes decrypting *programming* that merely contains *signals in that programming*—thereby showing that encrypting or decrypting programming does not transform the programming into digital programming. An example follows: "The *signals that enable the decrypt[o]r/interrupter*, 101, to *decrypt* and/or transfer *program[m]ing* uninterrupted *may be embedded in the program[m]ing* or may be elsewhere." Ex. 1009, 13:17–20 (emphasis added).

Similarly, in the context of the challenged claims, the "programming" output overlaps with the encrypted received "transmission," which need not be entirely digital, especially where claim 13 specifically distinguishes "encrypted digital information" from "encrypted information," as discussed above. *See* Pet. Reply 10 ("PMC's argument that the 'controversial' sentence reflects an alternative embodiment is inconsistent with the text and presumes that an information transmission ***must*** include solely digital information."). In context, Petitioner persuasively points out "[t]he 'controversial' sentence is consistent with [mixed analog/digital signal embodiments], as it states that the decryptors may be conventional descramblers 'that descramble analog television transmissions and *are actuated by receiving digital key information*.'" *Id.* at 11 (quoting Ex. 1003 at 159:57–61) (emphasis added). As Petitioner also persuasively points out, "[t]he specification lists changes that could be made to the example that

would still fall within the spirit of the invention—such as descrambling where a device is labeled 'decryptor.'" *Id.* at 10 (citing Ex. 1003, 159:46–160:27).

Similarly, Patent Owner's reliance on the Julia Child example does not support Patent Owner's claim construction, for reasons discussed above. In other words, Patent Owner contends "the decryption of a ***digitally encoded recipe provided on its own channel*** separate from a television program" (PO Resp. 14–15 (citing Ex. 1009, 20:32–43)) supports its claim construction. To the contrary, the cited disclosure describes a signal that instructs "tuner, 223, *to tune* cable converter box, 222, *to the appropriate channel* to receive *the recipe* in encoded digital form." Ex. 1009, 20:34–37 (emphases added). This passage does not convey that the tuning to the "appropriate channel" involves an all-digital channel, rather, it conveys the opposite—i.e., that the tuner *tunes* as it normally does to a mixed analog/digital *appropriate channel*. As explained above, this different channel method differs from the same channel method only because the system encodes the recipe in the current channel instead of another "appropriate" channel. *See supra* note 6; Ex. 1009, 20:60–63 (describing sending the French Chef recipe "in encoded digital form in the programming transmission [of the French Chef show] received by TV set, 202")).

3. Past Statements by Mr. Wechselberger

Patent Owner's contentions that Petitioner's expert, Mr. Wechselberger, supports Patent Owner's claim construction based on an article Mr. Wechselberger wrote (Ex. 1027), and according to his prior testimony (Ex. 2010), fail to account for the fact that the '091 patent and earlier-filed '490 patent conflate the meaning of terms as discussed above.

See PO Resp. 18–20 (citing Ex. 2003, 135:2–8; Ex. 2010 ¶¶ 18–20, Ex. 1027, 4–5). Furthermore, contrary to Patent Owner's characterizations, Mr. Wechselberger's article and prior testimony do not contradict his declaration testimony describing how his earlier article attempted to clarify confusion between use of the terms scrambling and encryption during the mid-1980s—the period between the filing of the 1981 '490 patent and the 1987 '091 patent. *See* Ex. 1001 ¶¶ 62–63 (describing confusion over the terms encryption and scrambling and addressing his 1983 article (Ex. 1027)); Ex. 2010 ¶ 18 & n.2 (noting that in 1987, "due to the evolution of the technology," he would not be "surpris[ed]" to find scrambling used "incorrectly" in some references to refer to "hard encryption processes performed on digital signals"); Ex. 1027, 1 ("One major area of confusion lies in the technical differences between encryption and scrambling."); Ex. 2003, 35:2–8 (responding to a question regarding a distinction *he drew* between the terms in the mid-1980s).

Patent Owner responds to these preliminary findings in the Institution Decision by focusing on a statement by Mr. Wechselberger about a convention "in the mid-1980s" (citing Ex. 2010 ¶ 18), and also about an understanding of scrambling in February 1987, but Patent Owner does not address the evidence above (Ex. 2010 ¶ 18 & n.2), which puts the testimony in context. *See* PO Resp. 19; Inst. Dec. 15–16 (citing Ex. 1001 ¶¶ 62–63; Ex. 2010 ¶ 18 & n.2; Ex. 1027, 1). In the cited footnote, Mr. Wechselberger notes the incorrect use of the terms at issue and also cogently predicts the situation involved here: "However, the specific system described would typically indicate to one of skill in the art which meaning was intended." Ex. 2010 ¶ 18 n.2.

The evidence shows the meaning of the terms to be in flux, with no established convention in 1981 existing at the time of filing of the '490 patent, and with the "incorrect" use of "scrambling" and "encrypting" continuing up to 1987. The fact that the '091 patent claims CIP status back to the earlier-filed '490 patent further obscures what interpretations of various claim terms carry over to the 1987 filing of the '091 patent.

Contrary to Patent Owner's arguments, the cited '091 patent passages and other cited passages in the '490 patent support Mr. Wechselberger's testimony, because they refer to the Wall Street Week television program and decrypting programming, each of which includes analog and digital information, and the Wall Street Week example specifically refers to decryptors as being descramblers activated via embedded digital keys (as discussed above). In other words, the two patents (and prior art of record) indicate that with respect to mixed analog and digital systems, the terms encryption and scrambling, or decryption and descrambling, were being used interchangeably, just as Mr. Wechselberger testifies in describing the industry during and/or prior to the mid-1980s.[8] *See* Ex. 1001 ¶¶ 62–63; Ex. 1003, 159:46–61; Reply Br. 11–12. None of Mr. Wechselberger's cited prior statements selected by Patent Owner relate to the context of the claims and disclosures at issue here, especially in light of the fact that the challenged claims, including claim 13, specifically distinguish between "encrypted digital information" and "encrypted information" and also recite

[8] Mason, prior art employed in this trial (and filed in 1984) describes "session key S . . . used in a third decryption circuit 23 ***for decrypting*** the information signal A." *See* Pet. Reply 20 (citing Ex. 1005, 3:17–22) (emphasis by Petitioner).

"decrypting programming."

Accordingly, and considering the discussion above in Section 1 (regarding "encrypting information") and below in Section 4 ("Prior Proceedings") and Section 5 ("Prosecution History"), "decrypting said encrypted information" means "performing a process to decipher, decode, or descramble information that is either ciphered, encoded, or scrambled, using a key, algorithm, or some type of digital information." *See* Ex. 1003, 159:46–61.

4. Prior Proceedings

Patent Owner's arguments that rely on past Board decisions and other court decisions fail to acknowledge that those prior decisions did not have the benefit of this record evidence and specifically did not consider the cited passage in the '091 patent stating that decryptors *may be* descramblers, the specific claim language that includes "decrypting programming" and "encrypted *digital* information transmission including encrypted [*general*] information," or the cited passages in the CIP '091 patent and earlier-filed '490 patent that specifically describe decrypting signals and signals within programming—the latter a generic term that includes, according to the '091 patent, "everything that is transmitted electronically" (Ex. 1003, 6:31–34). *See* PO Resp. 16–17 (citing Ex. 2007, 68–69; Ex. 2008, 2, n.1; Ex. 2009, 53–54; Ex. 2023, 16).

Furthermore, in at least one cited relied-upon reexamination proceeding (Reexam. Cont. No. 90/006,536, the "'536 reexamination," *infra* note 9) of a related patent (U.S. Patent No. 4,965,825), Patent Owner contended (in a reply brief to the Board) that the inventor acted as a "*lexicographer*" so that "the inventor expressly advised the reader that by

the terms encryption and decryption he means something *beyond the conventional* scrambling/descrambling relied upon by the Examiner, *such as the use of a decryption key*, which is not disclosed or suggested in any of the references relied upon by the Examiner." Ex. 2005, 41 (emphases added).[9] This '536 reexamination argument contradicts Patent Owner's arguments here that its construction tracks the plain meaning of encrypting and decrypting programming, because a lexicographer's definition necessarily departs from the plain meaning of a term, indicating that skilled artisans

[9] In this *ex parte* '536 reexamination proceeding (Patent Owner cites to Ex. 2009, 53–54 and also a Delaware District Court proceeding (PO Resp. 16–17 (citing Ex. 2008, 2, n.1)) that itself relies upon the '536 reexamination proceeding as evidencing a prosecution history disclaimer), the Board's decision notes that "[i]n any case, the *embedded digital signals* in Aminetzah *are not scrambled or encrypted*." Ex. 2009, 54 (emphasis added). In other words, any statements by the prior Board panel that scrambling does not include encryption relate to different claim terms and also amount to dicta. Also, in contrast to Aminetzah, as discussed below, Mason and Gilhousen disclose encrypted digital signals, which our claim construction of an "encrypted digital information transmission including encrypted information" requires. *See also* Ex. 2008, 2 n.1 (District Court discussing the '536 reexamination at 53–54 (i.e., Ex. 2009, 53–54) and noting that "the BPAI appears to have relied upon that disclaimer" and that "the defendants' failure to directly address the . . . disclaimer argument is telling"). In other words, the defendants in that Delaware District Court case may have had a reason not to contest the disclaimer argument (e.g., to defeat an infringement contention). *See Tempo Lighting, Inc. v. Tivoli, LLC*, 742 F.3d 973, 978 (Fed. Cir. 2014) ("the PTO is under no obligation to accept a claim construction proffered as a prosecution history disclaimer"). Also, notwithstanding part of the District Court's rationale that relies partly on the BPAI allegedly relying on a disclaimer allegedly *created during an ongoing case before the BPAI*, the PTAB typically does not rely on arguments before it in an ongoing case as a disclaimer—as opposed to relying on a disclaimer that occurred in an earlier completed case.

normally interchanged scrambling and encrypting (at least when scrambling employs some type of a decryption key). Patent Owner does not argue here that the '091 patent or the '490 patent sets forth a lexicographic definition of a decryption or encryption. Furthermore, Patent Owner's reexamination argument in its reply brief shows that Patent Owner attempted to capture "conventional scrambling/descrambling" that includes "*the use of a decryption key, which is not disclosed or suggested in any of the references relied upon by the Examiner*." *See* Ex. 2005, 41 (emphasis added).

Patent Owner also points to another BPAI reexamination proceeding (Ex. 2007, 68–69, Reexam. Control No. 90/006,563 ("'563 reexamination") and an Eastern District of Texas District Court proceeding (Ex. 2023, 16). PO Resp. 16–17. Patent Owner cites to the BPAI's finding in the '563 reexamination, *inter alia*, that encryption is "distinct from scrambling." *See* PO Resp. 16 (citing Ex. 2007, 68 (BPAI "interpreting a decryptor . . . more generically as a decoder is an improper broadening of the claim term")).

In short, in the cited prior proceedings, neither the Board nor the Texas District Court discussed the term "decrypting programming," nor the related distinction between "encrypting digital information" versus "encrypting information." No pertinent discussion in those proceedings exists concerning how the '490 and '091 patents describe both decrypting of programming and decrypting signals embedded in programming, which implies that decrypting programming relates to analog information. In the cited Texas District Court case, the court relies on the above-discussed '536 reexamination reply brief disclaimer and reasons, in part, "[i]n essence, the inventor expressly advised the reader that terms 'encryption' and 'decryption' in the patent meant something beyond conventional

scrambling/descrambling." Ex. 2023, 16. But Patent Owner itself characterized what "beyond conventional scrambling/descrambling" meant to the inventor: "he meant something beyond the conventional scrambling/descrambling relied upon by the Examiner, *such as the use of a decryption key, which is not disclosed or suggested in any of the references relied upon by the Examiner*." Ex. 2005, 41 (emphasis added).

In other words, the use of the decryption key goes beyond conventional scrambling, according to Patent Owner's prior reply brief arguments. *Id.* It is not clear if the Texas District Court considered the proper context of that reexamination argument, as argued here by Petitioner, in finding a disclaimer. *See* Ex. 2023, 12–18. Furthermore, the claim charts submitted to the Texas District Court with respect to the '091 patent proffers constructions of "encrypted," "decryption key," and decrypting/decryption" in isolation of the surrounding claim language (i.e., "decrypting programming," "encrypted digital information transmission including encrypted information") at the heart of the claim construction. *See* Ex. 2023, 12.

Again, although some of the evidence here overlaps with the Texas District Court proceeding (Ex. 2023), in addition to a different claim construction standard, that court had before it different evidence and argument that does not take into account the broad nature of "programming," the superfluous nature of "encrypting information" under Patent Owner's construction, and broad disclosures describing decrypting programming that include analog television with further disclosures separately describing decrypting digital information embedded in the (analog) programming (which itself is described as decrypted).

In yet another Eastern District Texas District Court case, the court, relying on similar evidence, reached the same conclusion as this Board panel that encryption and decryption are not limited to digital data. *See* Ex. 1017, 29 ("The court rejects PMC's attempt to limit the encrypt/decrypt terms to digital data.").

Given the various arguments, evidence, prosecution histories (discussed further below), and District Court and Board proceedings and determinations, a clear disclaimer does not emerge for the distinct claim terms at issue here. In other words, the various previous arguments by Patent Owner show that any purported disclaimer does not satisfy the legal requirement that a disclaimer must be clear and unequivocal, as discussed in further detail below. *See GE Lighting Sols., LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014) ("The standards for finding lexicography and disavowal are exacting."); *Omega Eng'g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1325–26 (Fed. Cir. 2003) ("[F]or prosecution disclaimer to attach, our precedent requires that the alleged disavowing actions or statements made during prosecution be both clear and unmistakable.").

5. Prosecution History

Although a brief discussion of the prosecution history occurs above in discussing claim construction based on Patent Owner's arguments, in related arguments, Patent Owner maintains in a separate section of its Response that it "repeatedly and consistently confirmed, during all prosecution, reexamination, and litigation proceedings, that the 'decrypting' terms are limited to a digital context." PO Resp. 15–16 (citing Ex. 1035, 10–11; Ex. 1037, 10–11; Ex. 1039, 10; Ex. 2004, 30; Ex. 2006, 77). Mr. Wechselberger provides a brief summary of the prosecution history. *See* Ex. 1001 ¶¶ 73–

86.

During prosecution of the ’091 patent (Ex. 1035, Ex. 1037, Ex. 1039), in one of its later arguments (i.e., after a final office action and advisory action), Patent Owner argued “[w]ithout abandoning their previous argument, Applicants acknowledge that *it can be argued that Mason teaches encrypted elements as part of its analog information transmission*. But it does not teach *the encryption of an entire digital signal transmission*.” Ex. 1039, 10 (emphasis added). Patent Owner also argued “[t]his amendment in no way affects Applicants’ position that encryption requires a digital signal.” *Id.*

Therefore, Patent Owner presented multiple arguments during prosecution of the ’091 patent, and also an argument that differs as compared to the instant proceeding. The argument that Mason does not teach “*the encryption of an entire digital signal transmission*” (Ex. 1039, 10), explicitly contradicts its reasoning to support its “all-digital” argument in the instant proceeding, the reasoning that “the inventors explicitly expanded the scope of ‘encrypted’ to cover *partially encrypted information transmissions*.” PO Resp. 5 (emphasis added). Also, the arguments do not clearly disavow mixed analog and digital information transmissions—i.e., they reasonably appear to allege that Mason does not teach encrypting *all of the digital information* sent during a given transmission (i.e., which may or may not include analog information). *See* Ex. 1039, 10 (emphasis added).

Such contradictory and unclear positions do not support the requirements for a disclaimer. The other prosecution history argument, that “encryption requires a digital signal” does not address clearly the issue of the difference between “encrypted information” and “encrypted digital

information" that lies at the heart of the claim constructions at issue here with respect to the following inter-related phrases: "receiving an encrypted digital information transmission including encrypted information" (claims 13 and 20); "receiving an information transmission including encrypted information" (claim 26); "decrypting said encrypted information" (claims 13, 20, and 26); and "outputting said programming based on said step of decrypting" (claims 13, 20, and 26).

Patent Owner's citations to general statements allegedly disavowing the scope of encryption and decryption (as not including scrambling and descrambling) during prosecution of other patents similarly do not account for the specific claim terms being construed in this proceeding. *See* PO Resp. 15–16 (citing Ex. 2004, 30; Ex. 2005, 41; Ex. 2006, 77). Some of these prosecution histories were discussed above. For example, one cited prior prosecution (the '536 reexamination), involved the claim phrase "decrypting encrypted *embedded* signals" (Ex. 2004, 29–30 (emphasis added)), which is narrower than "decrypting . . . encrypted information," recited in claims 13, 20, and 26, especially claims 13 and 20, which distinguish between "encrypted digital information" and "encrypted information." Arguments Patent Owner made in another cited prior prosecution, the '563 reexamination, agrees with our construction here as discussed above, because Patent Owner argued "*[i]n essence* . . . the terms 'encryption' and 'decryption'" differ "beyond . . . conventional scrambling/descrambling" because of "the use of a decryption key." *See* Ex. 2005, 41 (Patent Owner's reply brief in the '563 reexamination proceeding) (emphasis added). The cited statement in Patent Owner's '563 appeal brief that "decryption . . . is a digital operation," (Ex. 2006, 77), does not

overcome the statement in its reply brief just described that bases any distinction between decryption and descrambling upon "use of a decryption key," especially in context—i.e., where another statement (Ex. 2006, 80) in the appeal brief alludes to same fuller statement made in the reply brief statement. *See* PO Resp. 16 (citing Ex. 2006, 77, 80 (stating "the ['']277 patent specification requires more than the scrambling/descrambling relied upon by the Examiner"); Ex. 2005, 41 (reply brief argument quoted above). In context to this essential distinction (i.e., use of a decryption key that would be decrypted), other prior prosecution history statements do not present the sharp distinction Patent Owner contends they make in isolation. **See** PO Resp. 16 (citations omitted).

As indicated above, if all "encrypted information" must be digital, then claims 13 and 20, which recite "encrypted *digital* information," would include superfluous language. Also, the claims would be narrowed improperly to preclude decrypting mixed analog and digital information encompassed by the broad description of decrypting programming in the '490 and '091 patents.

In addition, with respect to prosecution of the '091 patent, the Examiner's reasons for allowance do not state that encryption must be digital or that encryption precludes analog and digital information. Rather, the Examiner stated he

> agrees with Applicant that Mason (U.S. 4,736,422) fails to teach or suggest "detecting <u>in said encrypted digital information transmission</u> the presence of an instruct-to-enable signal" and "determining a fashion in which said receiver locates a first decryption key by processing <u>said instruct-to-enable signal</u>" in <u>combination</u> with the other limitations of claim 45.

Ex. 1040, 7–8.

Although, generally, an Examiner need not agree to prosecution arguments in order for a district court subsequently to bind a patent owner to those arguments (as clear disclaimer arguments), the lack of any agreement here, and/or the lack of clear arguments, signifies the lack of a meaningful understanding that otherwise would serve the public notice function of a disclaimer. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1317 (Fed. Cir. 2005) (en banc) ("Like the specification, *the prosecution history provides evidence of how the PTO and the inventor understood the patent*. . . . Yet because the prosecution history represents an ongoing negotiation between the PTO and the applicant, rather than the final product of that negotiation, it often lacks the clarity of the specification and thus is less useful for claim construction purposes." (Emphasis added)).

The "doctrine [of prosecution history (file wrapper) estoppel] is an equitable tool for determining the permissible scope of patent claims." *Builders Concrete, Inc. v. Bremerton Concrete Prods. Co.*, 757 F.2d 255, 258 (Fed. Cir. 1985). Because the prosecution history does not reveal a clear disavowal of claim scope in context of the disputed phrases in the challenged claims as a whole, under a broadest reasonable construction, the public should not be bound via a doctrine of equity to a construction that would render the claims superfluous and contradict the meaning of decrypting and programming as described in the patents by stripping their breadth to all-digital applications. *See Tempo Lighting, Inc. v. Tivoli, LLC*, 742 F.3d 973 (Fed. Cir. 2014) (The court "observes that *the PTO is under no obligation* to accept a claim construction proffered as a prosecution history disclaimer." (Emphasis added)). Accordingly, contrary to Patent Owner's arguments, no disclaimer attaches to support Patent Owner's claim

construction.

6. "processor" and "processor instructions"

Claim 13 recites a processor and claim 20 recites processor instructions. In the Institution Decision, we preliminarily determined "a processor means 'a device that operates on data' and 'processor instructions' means 'instructions, including control or informational signals, to a device that operates on data.'" Inst. Dec. 19.

Petitioner agrees with the preliminary construction. *See* Pet. Reply 13–14. Patent Owner disputes the construction of "processor." PO Resp. 21–22. According to Patent Owner, "processor" should be construed according to its plain ordinary meaning as "a device that performs operations *according to instructions*." *Id*. at 21. Patent Owner contends the "specifications consistently describe processors as devices that execute instructions or process data according to instructions." *Id.* at 22 (citing Ex. 1003, 8:32–39, 118:10–13; Ex. 2022 ¶ 100).

Petitioner contends that the '091 patent describes a variety of processors, including hardwired devices that process data. Pet. 7–8 (citing Ex. 1003, 134:27–31 (decoders 30 and 40 process information), 75:21–27 (buffer/comparator 8 processes data). The '490 patent describes "pass[ing] a signal word to signal processor, 200, which in a predetermined fashion, signal processor, 200, decrypts and transfers to decrypt[o]r, 224, to serve as the code upon which decrypt[o]r, 224, will decrypt the incoming encrypted recipe." Ex. 1009, 20:39–43. With respect to processor instructions, Petitioner notes "the specification discloses that an 'interrupt signal' informs a control processor and causes the control processor to act in a 'predetermined fashion.'" Pet. Reply 14 (citing Ex. 1003, 110:44–54).

The quoted disclosure implies that a mere word signal or input constitutes a type of instruction because a signal processor responds to it in a predetermined fashion. Circuits also respond to inputs in a predetermined fashion. Also, an "instruction" may merely "inform[]" a processor. For example, the '091 patent describes transferring an "instruction . . . that informs said processor, 39J, [that] cable channel 2 is inputted to decoder, 30." Ex. 1003, 134:23–27. Processor operations also include decryption, thereby suggesting a decryptor may be a processor. *See id.* at 20:30–39, 66–67; Ex. 83:9–11 ("Said decryptor, 39K, is a conventional decryptor that is identical to decryptor, 10, of signal processor, 200."). In addition, the earlier-filed '490 patent refers to "one or more processor[s]/monitors and/or buffer/comparators that organize and transfer the information stream." *Id.* at 8:52–5:2. This latter disclosure shows that the disclosed processors simply organize and transfer information and may be as simple as a comparator, buffer, monitor, or other circuit type or device.

Moreover, the '091 patent states"[t]he processors and buffers can have inputs from each of the receiver/detector lines and evaluate information continuously. From the processors and buffers, the signals may be transferred . . . ." Ex. 1003, 8:54–58. This passage shows that processors often merely "evaluate information" and/or "transfer[]" signals, tracking our preliminary claim construction. In contrast, the '091 patent also describes "[i]n the present invention, particular signal processing apparatus (*hereinafter called the 'signal processor'*) detect signals, and, in accordance with instructions in the signals and pre-programming in the signal processor, decrypt and/record and/or control station apparatus." *Id.* at 8:34–36 (emphasis added). None of the challenged claims recite a "signal processor"

that the ’091 patent appears to define (by using “hereinafter”) in more narrow terms relative to a more general processor.

Notwithstanding the broad disclosure of processor functions in the ’091 patent and the ’490 patent, Patent Owner argues that Petitioner mischaracterizes the two disclosures using “circular” arguments, contending none of its disclosed processors are hardwired, because a controller “*can* instruct” the disclosed processors and others are programmed. *See* PO Resp. 22–23 (emphasis added). Patent Owner also contends “[n]either Petitioner nor the Board actually address what a POSITA would understand to be a ‘processor.’” *Id.* at 24. Patent Owner “agrees that ‘processor instructions’ are ‘instructions to a processor’,” but contends “Petitioner’s definition of ‘processor instructions’ as ‘instructions to a device that operates on data’ is incorrect for incorporating the incorrect definition of ‘processor.’” PO Resp. 24.

Although Patent Owner urges a “plain and ordinary meaning,” Patent Owner agrees “it is true that a processor can be a ‘part of a computer system that operates on data.’” *See id.* at 23–24 (citing Ex. 1013, 7; Ex. 2022 ¶¶ 99–104). Patent Owner does not provide evidence of a plain and ordinary meaning that undermines the passages in the ’091 patent and ’490 patents and extrinsic evidence indicating a processor operates on data. *See id.* Dr. Weaver’s declaration testimony, cited by Patent Owner, does not provide corroborating citations to support Patent Owner’s more restrictive view of a processor. *See id.* (citing Ex. 2022 ¶¶ 99–104). In addition, Dr. Weaver and Patent Owner rely on the notion that decoder devices “can” be instructed to show that those devices must be programmed (thereby allegedly showing

them to be processors), but the word "can" is not limiting. PO Resp. 22: Ex. 2022 ¶ 103.

Petitioner demonstrates that its construction follows

> [t]he plain meaning of "processor," as reflected in contemporaneous dictionary definitions, is "the part of a computer system that operates on data." Ex. 1057 at 11 (citing Exs. 1058, 1059); Ex. 2023 at 59–61. All of the "processors" described in the specification identified by Apple, PMC, or the Board are devices that operate on data. That some of those processors may also operate in response to instructions is not sufficient for importing this narrowing limitation into a broad claim term.

Pet. Reply 13.

Petitioner also points out that in related District Court litigation, Patent Owner previously proposed construing the term "processor" as "any device capable of performing operations on data." Pet. 8 (citing Ex. 1016, 12; Ex. 1018, 7–8). Patent Owner responds it "did not propose a more precise construction in prior litigation merely because the opposing parties did not attempt to overstretch 'processor' beyond its common-sense meaning." PO Resp. 24. Patent Owner's response implies its prior District Court construction of "any device capable of performing operations on data" constitutes a "common-sense meaning," tracking the plain meaning Petitioner proposes. *See* Ex. 1016, 12; Ex. 1018, 7–8. As Petitioner notes, Patent Owner does not address, let alone dispute, our preliminary claim construction that relies upon the preliminary record to show processor instructions include control or informational signals. *See* Pet. Reply 14–15; PO Resp. 24–25.

The '091 and '490 patent disclosures and extrinsic evidence of record, including Patent Owner's District Court construction, support our

preliminary construction in the Institution Decision. We also incorporate-by-reference a Board panel's analysis of the construction of processor in related IPR2014-01532, which relies on the same 1987 specification in a related patent. *See* Ex. 1013, 6–8.

Accordingly, the record supports our preliminary claim construction of "processor" and "processor instructions" as set forth above. *See* Inst. Dec. 19. Accordingly, we maintain that construction.

7. "locating" and "locate"

Claim 13 recites step [e] "locating said first decryption key based on said step of determining." Claim 13 also recites related step [d] "determining a fashion in which said receiver station locates a first decryption key by processing said instruct-to-enable signal." In his initial Declaration, Patent Owner's declarant, Dr. Weaver, testifies that both steps can be found at the same cited portions in the '490 patent. *See* Ex. 2001 ¶ 44 (informing the reader with respect to step 13[e] to "*[s]ee* citations above for Element 13[d]"). Dr. Weaver relies on the plain meaning of "locate" or "locating" in the '091 patent in his second Declaration. *See* Ex. 2022 ¶¶ 92–97. Tracking the latter testimony and citing a dictionary, Patent Owner contends "[u]nder the broadest reasonable interpretation, the words 'locate' and 'locating' mean 'to determine the place or position of something already in existence.'" PO Resp. 20 (citing Ex. 2013, 4). According to Patent Owner, the verb "locate" means "to determine or indicate the place, site, or limits of" or "to seek out and determine the location of." *Id*. (citing Ex. 2013, 4; Ex. 2022 ¶¶ 92–94).

Contrary to Patent Owner's arguments, the cited dictionary definition that Patent Owner relies upon for a plain meaning does not require

"locating" to be with respect to "something already in existence." *See* Pet. Reply 13; Ex. 2013, 4. Claim 13 also does not require the decryption key to be "already in existence" in order to be located. In other words, as Petitioner persuasively explains, "the dictionary PMC cites states[] 'locate' means 'to determine or indicate the place, site, or limits of.' Ex. 2013 at 4. Whether the object 'located' is stored, created, or recreated at that place does not matter—that place is where the object can be found." *Id*. Even if this latter meaning refers to a slightly different context than the claims at issue, it implies further that "locate" under any definition is not restricted to being in existence. For example, one may "locate" a completely new structure or business at a particular spot, just as the claimed method may locate a key or signal in a transmission or elsewhere.

As noted in the Institution Decision, consistent with the plain meaning, "Patent Owner also contends that 'locating may involve decrypting the "instruct-to-enable signal"' or may involve decrypting a signal on a different channel." Inst. Dec. 34 (citing Prelim. Resp. 12; Ex. 1009, 15:20–25, 21:35–43) (indicating that "located" means "identified and decrypted"). In its Patent Owner Response, Patent Owner states a signal "has to be located (i.e., identified and decrypted) first." PO Resp. 28 (citing Ex. 1009, 15:8–19). Dr. Weaver points to a citation for steps [d] and [e] and notes it states a signal processor "identifies one or more signal words . . . [and] decrypts the signal word or words." Ex. 2001, 25–26 (quoting Ex. 1009, 21:35–43). This implies "determining a fashion" of locating and "locating" as claim 13 recites involve identifying and decrypting a signal.

In addition, the record does not require an encrypted signal to constitute the same signal as a decrypted signal and, therefore, already be in

existence in its decrypted form. Similarly, Patent Owner contends "[y]et another example of 'locating said first decryption key' [as claim 13 recites] is to 'telephone a remote site to get an additional signal or signals necessary for the proper decryption and/or transfer of incoming programing transmissions.'" PO Resp. 28 (respectively quoting claim 13 and Ex. 1009, 15:20–25). This disclosed example of telephoning in the '490 patent does not require the necessary "signal or signals," let alone the decryption key, to be in existence prior to being located (e.g., a key or signal could be created from other signals). *See* Ex. 2001, 24–25 (quoting other examples including a telephone example within a large string citation to Ex. 1009, 14:33–15:25 without clearly specifying what "locate" or any portion of the two clauses means).

Although Patent Owner contends claim 13 recites decrypting and locating as separate steps, claim 13 does not preclude decrypting a signal to locate the decryption key, rather, it recites "decrypting said information using said . . . decryption key." *See* PO Resp. 20–21. In summary, the '490 patent does not preclude processing signals in order to locate a decryption key and otherwise does not require the key to exist before it is located. *See id.*; Ex. 1009, 15:20–25 (telephoning a remote site for "signals necessary for the proper decryption"), 21:35–43 (decrypting words and transferring them to a decryptor "to serve as the code for the first stage of decryption").

Accordingly, based on the foregoing discussion, the broadest reasonable construction of locate or locating tracks their ordinary meaning: "to determine or indicate the place, site, or limits of." Ex. 2013 at 4.

8. "designated"

Patent Owner contends "designated" in claim 26 "requires some clarification." PO Resp. 21. Patent Owner contends a "'designated' channel "is a particular channel that has been specified or identified, for example, with its channel number or other identifier." *Id.* Petitioner "does not dispute that 'designated' means 'specified,' but disputes PMC's application of this construction in the context of claim 26." Pet. Reply 13. Accordingly, on this record, "designated" means "specified" or "identified."

B. Priority

The prior art status of all the asserted references in this trial hinges on the effective filing date for the '091 patent with respect to support for the challenged claims. Petitioner contends that the earliest effective filing date for challenged claims of the '091 patent is September 11, 1987 (through a series of continuation patents). *See* Pet. 2–3. The '091 patent effectively claims CIP status from September 11, 1987 to a chain of continuing applications purportedly having an effective filing date of November 3, 1981—the filing date of the earliest-filed ancestor patent in the chain, the '490 patent. *See* Ex. 1003, [63]. Patent Owner contends that the effective filing date of the '091 patent is November 3, 1981, the filing date of the '490 patent. Prelim. Resp. 8; PO Resp. 25.

After a teleconference requested by Petitioner prior to institution, the panel authorized the parties to file supplemental briefing on this issue. *See* Ex. 1041 (Teleconference Transcript); Pet. Prelim. Reply; PO Sur-Reply. Citing *Bradford Co. v. Conteyor N. Am., Inc.*, 603 F.3d 1262 (Fed. Cir. 2010), Petitioner relies on estoppel, contending that Patent Owner disclaimed priority to the filing date of the '490 patent during prosecution

after a double patenting rejection by the Examiner.[10] *See* Pet. Prelim. Reply 6–7. Petitioner also relies on *PowerOasis, Inc. v. T-Mobile USA, Inc.*, 522 F.3d 1299, 1306, 1311 (Fed. Cir. 2008), contending that Patent Owner broadened the scope of the claim term "programming" in the 1987 application that led to the '091 patent, relative to the scope of the term as disclosed in the ancestor 1981 '490 patent specification.[11] *Id.* In addition, Petitioner contends that the 1981 '490 patent specification does not provide sufficient disclosure to support specific claim elements as recited in challenged claims of the '091 patent. *Id.* at 7. Patent Owner disagrees with each of these theories, as discussed further below.

As an initial matter, Patent Owner initially argues (in its PO Sur-Reply) that the Petition fails to make "a prima facie case" that the '490 patent does not support the challenged claims that issued in the CIP '091 patent. PO Sur-Reply 1 (emphasis omitted). Patent Owner does not make this argument in its Response. Rather, in its Response, Patent Owner only argues that "[a]t least claims 13–16, and 18 ('the 1981 Claims') are entitled to the priority date of November 3, 1981." PO Resp. 25. Accordingly, Patent Owner waives any argument 1) that the Petition fails to shift the burden of production to Patent Owner on the issue of priority with respect to "the 1981 Claims" (i.e., claims 13–16 and 18; PO Resp. 25) and 2) that

[10] The Examiner rejected the claims based on *In re Schneller*, 397 F.2d 350 (CCPA 1968), asserting the claims could have been claimed in the earlier filed '490 patent because "they were fully disclosed" therein. Ex. 1047, 9, 11; Pet. Prelim. Reply 2 (citing Ex. 1047, 11).

[11] Reference to the (effectively-filed 1987) '091 patent Specification signifies the '091 patent under challenge in an effort to distinguish the challenged patent Specification further from the (1981) '490 patent specification.

challenged claims 20, 21, 23, 24, 26, 27, and 30 are entitled to the benefit of the filing date of the '490 patent.

As background, in the Institution Decision, citing the Order Granting Authorization to File a Reply and Sur-Reply (Paper 8), we noted the following:

> [T]he Petition notes, among other things, that the '019 patent "involved a large expansion of material in the later-filed 1987 CIP application (300 columns) relative to the original 1981 application (22 columns)," and Patent Owner made prior assertions of priority [only] to the 1987 CIP date, including in related district court litigation. *See id.* at 4–5; Pet. 1. The Petition also explains that Patentee
>
> > filed 328 virtually identical continuations from that 1987 application, with an estimated 10,000 to 20,000 claims. Ex. 1010; Ex. 1033 at 2 (stating applicants had "hundred[s] of applications, containing over ten thousand claims"). The '091 patent is just one of the patents that issued from that flurry of activity.
>
> Pet. 1.
>
> The Petition also reasonably conveys the fact that the prosecution history includes rejections based on prior art that post-dated the 1981 date. *See* Pet. 2 (showing the effective priority dates for Gilhousen and Mason as post-dating 1981), 10 (citing Gilhousen and Mason as applied during prosecution). Under these circumstances, Petitioner sufficiently shows that the 1981 '490 patent does not support all the claims of all the CIP patent applications filed on or after 1987, including the challenged claims in the '091 patent.
>
> Furthermore, the Board considered a substantially similar CIP priority issue based on disclaimer and the breath of the term "mass medium program" with respect to related patents of Patent Owner involving the same 1981 specification and 1987 [s]pecifications as involved here, and determined that the 1981 specification did not support the CIP claims. *See Amazon.com v. Personalized Media Commc'ns, LLC*, IPR2013-01527, slip. op.

> at 33 (PTAB Mar. 23, 2016) ("'1527 final written decision") (Ex. 1048). *See also id.*, slip op. at 14–21 (PTAB Aug. 31, 2016) ("'1527 rehearing decision") (Ex. 3001). We herein adopt and incorporate by reference the findings and reasoning in the '1527 final written decision and '1527 rehearing decision pertaining to the disclaimer and programming issue. *See* Ex. 1048, 29–34; Ex. 3001, 14–21, 26–41.

Inst. Dec. 21–22.

In other words, even if Patent Owner has not waived the argument regarding Petitioner's burden of production, the Petition satisfies the initial burden of going forward to show that the challenged claims are not entitled to priority to the November 3, 1981 filing date of the '490 patent. Nonetheless, Petitioner carries the ultimate burden of showing a lack of support.

1. Programming

As indicated above, in a final judgment, the Board previously considered whether Patent Owner broadened the scope of the related term "mass medium program" in a related 1987 CIP patent in the '1527 final written.[12] In that case, a Board panel noted that an examiner in a related 2010 reexamination decision found that the term "programming" had been broadened in that related 1987 CIP patent relative to the same earlier 1981 '490 patent at issue in the instant case, and that a prior Board panel that also considered the issue in a reexamination proceeding did not address the *PowerOasis* holding.[13] *See* Ex. 3001, 20 ("The Board in that prior

[12] Our reviewing court granted Patent Owner's motion to terminate its appeal of the '1527 final written decision (which includes a rehearing decision) rendering it now a final judgment. *See Personalized Media Commc'ns, LLC v. Amazon.com,* No. 17-1155 (Fed. Cir. Apr. 13, 2017).
[13] *See* Ex. 2007, 43–45 (*Ex Parte Personalized Media Commc'ns, LLC*, App.

reexamination decision did not disagree with the [E]xaminer's finding in its 2010 reexamination decision, it only disagreed 'with the Examiner's reasoning.'"); *see also PowerOasis*, 522 F.3d at 1306–11 (an original specification does not support a claim that receives a broader interpretation of a claim term based on later-filed new matter filed in a CIP specification).

As noted above, the challenged claims here require "outputting said programming." The '490 patent discloses "provid[ing] techniques whereby automatically, single channel, single medium presentations, be they television, radio, or other electronic transmissions, may be recorded, [and] co-ordinated in time with other programing previously transmitted and recorded." Ex. 1009, 3:51–56. The '490 patent also states "'[p]rogramming' here means everything transmitted over *television or radio* intended for communication of entertainment or to instruct or inform." *Id.* at Abstract (emphasis added).

On the other hand, the later-filed '091 patent states that "[t]he term 'programming' refers to *everything* that is transmitted electronically to entertain, instruct or inform, including television, radio, broadcast print, and computer programming was well as combined medium programming." Ex. 1003, 6:31–34 (emphasis added). Therefore, the broad disclosure in the '091 patent potentially includes not only "combined medium programming" and "computer programming," it also includes "*everything* . . . electronically transmitted" (subject to the quoted qualifiers) at the time of filing of the '091 patent (i.e., assuming for the sake of argument written description exists for

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No. 2009-006825 (BPAI Jan. 19, 2010) (Reexam. Control Nos. 90/006,563 & 90/006,698, U.S. Pat. No. 5,335,277)).

"everything" so transmitted). *Id.* (emphasis added). In comparison, the disclosure in the '490 patent only includes "other electronic transmissions"––i.e., in context, those "other" transmissions that were similar to conventional mixed analog and digital "single channel, single medium," "television" or "radio" transmissions at the time of filing of the '490 patent (i.e., 1981). *Compare* Ex. 1003, 6:31–34, *with* Ex. 1009, 3:51–56, 10:48–49.

In the Institution Decision, we cited one prominent example relative to the 1987 filing date, wherein Patent Owner argues that the '091 patent discloses "digital television programming." Inst. Dec. 24 (citing Prelim. Resp. 20). We noted "[t]he record, however, does not show how the '490 patent supports digital television programming, much less all types of digital television programming existing in 1987." *Id.* (citing Ex. 1001 ¶¶ 42–47).

In response to these preliminary findings in the Institution Decision, Patent Owner now argues as follows:

> The Board uses "digital television programming" as an example of what is disclosed in the 1987 specification but not in the 1981 specification. (Dec., 24.) However, with respect to claims 13, 20 and 26 (which recite "decrypting programming"), PMC has not contended that they must cover "digital television programming." Furthermore, whether the Board construes "digital television programming" to be analog video containing embedded digital content (as Petitioner proposes) or entirely digital TV content, the '490 Patent provides written support for both cases. (*See* Ex. 1009, FIG. 2A (Path C), 6:67-7:1 ("Path C inputs the *separately defined* [all-digital TV] transmission to a digital detector, 38."), 20:32-38 (receiving an encrypted transmission of a recipe "in encoded digital form"), 20:60-68 (receiving the digitally encoded recipe "in the programming transmission received by TV set, 202").).

PO Resp. 33 (bracketed information by Patent Owner). Patent Owner's position is not clear and is inconsistent. On one hand, it "has not contended" claims 13, 20, and 26 "must cover 'digital television programming'," and at the same time, argues support for "entirely digital TV content," "digital video," and also for "analog video containing embedded digital content." *Id.* Later, in the same section, Patent Owner cites a 1976 article to allege that its disclosure "fully enables transmission of digital TV programming." PO Resp. 36 (citing "Ex. 1026 in Case No. IPR2016-00753"; Ex. 2022 ¶ 130).

In the context of myriad statements throughout the trial and briefing, Patent Owner fails to specify clearly what its claims cover, as noted above. Patent Owner states that the '490 patent discloses a recipe "in encoded digital form" and digital encryption of "only the video portion of the transmission," but these portions refer to mixed analog and embedded digital content in a TV channel, as explained above. *See id.* at 33 (citing Ex. 1009, 20:16–59, 13:68–14:9). Patent Owner's arguments support this latter finding, by characterizing the '490 patent as describing "decrypting [the] program[m]ing transmission on one channel in order to identify and process correctly the program[m]ing transmitted on another channel." *Id.* at 34 (citing Ex. 1009, 20:60–63).

Even if Patent Owner somehow contends the '490 patent supports, and the challenged claims cover, "digital television programming," its meaning evolved through the 1980s. *See* Ex. 1001 ¶¶ 46–47. According to Mr. Wechselberger, Petitioner's declarant, the term meant a signal "fundamentally comprised of an analog video signal that contained embedded digital content such as teletext or videotex." *Id.* ¶ 46. Although Patent Owner's declarant, Dr. Weaver, contends that the 1981 and 1987

patents both support digital transmissions, Dr. Weaver's testimony supports the finding that the 1987 specification discloses more than the 1981 specification, stating the latter "*further* supports embedding digital signals in digital transmissions." Ex. 2022 ¶ 127 (emphasis added).

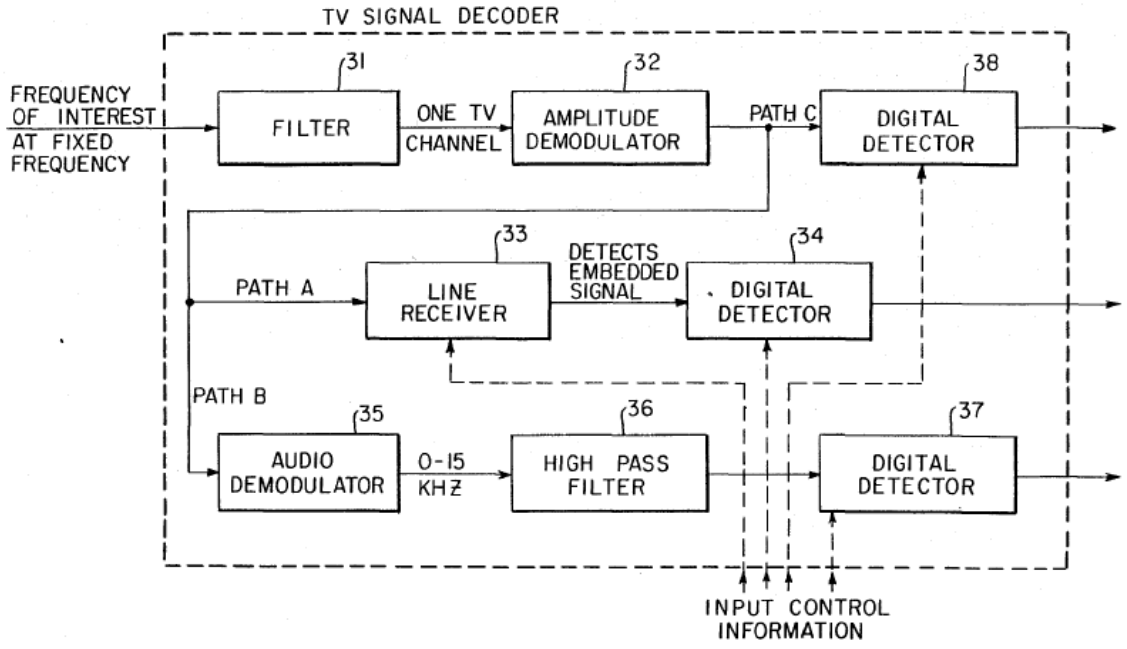
Dr. Weaver also states that "the 1987 specification provides *an even more detailed description of [digital] packetization*, including a discussion of headers and footers." *Id.* ¶ 125 (emphasis added). Although the previous paragraph of Dr. Weaver's testimony (¶ 124) describes signal units in the 1981 specification as disclosed "on a single line of video or sequentially in audio," Dr. Weaver does not provide sufficient evidence to support his related declaration testimony that the 1981 specification describes such signals as packets, including packets having header and footer addresses. *See id.* ¶ 124 (citing Ex. 1009, 3:3–12). Toward that end, he testifies "[t]he 1987 specification also describes addressing, another important element of packetized networks." *Id.* ¶ 126. Dr. Weaver does not provide citations that show addressing or packets in the 1981 specification, and the cited passage does not describe either one. *See id.* ¶ 124 (citing Ex. 1009, 3:3–12). Dr. Weaver also testifies that "digital television may have been in its infancy in 1981 and 1987" (Ex. 2022 ¶ 135) and was "a nascent technology" (*id.* ¶ 141). Of course, given the testimony and other indicators, "infancy" in 1981 cannot be the same stage of "infancy" in 1987.

Nevertheless, to buttress its position, Patent Owner contends Path C of Figure 2A in the '490 patent "is reserved for all-digital data associated with other (non-conventional) television signals (*i.e.*, digital television) instead of the conventional analog television signals on Paths A and B." PO Resp. 35, 34–36 (citing Ex. 2022 ¶¶ 116–141; Ex. 2025; Ex. 2026; Ex. 2034–46)

(generally citing the references to assert "digital television and digital video were nothing new to a PHOSITA"). Again, it also is not clear what Patent Owner means by "digital television." In any event, whatever the '490 patent via Figure 2A describes, the patent does not use the term "digital television," and it merely describes embedded digital signals within conventional analog television, so it is not "digital television" in the context of 1987. Dr. Weaver's testimony does not refute this particular statement regarding 1987. *See* Ex. 2022 ¶ 121 (addressing Ex. 1009, Figure 2A—note, Figure 2A of Ex. 1003 materially tracks the same Figure 2A of Ex. 1009).

As indicated above, Paths A, B, and C all exit "AMPLITUDE DEMODULATOR" 32 and arrive at the same terminal point, as seen in Figure 2A of the '490 patent below:

FIG. 2A



As Figure 2A of the '490 reproduced above shows, Paths A, B, and C of the depicted circuit block diagram first originate by entering the TV signal decoder as "ONE TV CHANNEL," enter an "AMPLITUDE

DEMODULATOR," and then exit it to begin at the same terminal point. Therefore, whatever Patent Owner means by asserting Path C represents "digital television," Paths A, B, and C represent signals or data embedded in the conventional "ONE TV CHANNEL" as mixed analog/digital signals, and each path ultimately represents digital data that enters one of digital detectors 34, 37, and 38. Dr. Weaver tracks Patent Owner's argument and contends "Path C flows straight to a digital detector" and "is reserved for digital data associated with other (*non-conventional*) television signals (e.g., digital television) instead of the conventional analog signals on paths A and B." Ex. 2022 ¶ 121 (emphasis added).

> The '490 patent contradicts Dr. Weaver by stating
>
> > [a] *digital signal is embedded by conventional* generating and encoding *means and transmitted in a television, radio or other transmission. . . . Each of the paths* described in FIGS. 2A, 2B, and 2C can identify and process *only signals embedded in the particular transmission channel inputted to said paths*.

Ex. 1009, 9:31–40 (describing paths in each of Figures 2A, 2B, and 2C) (emphasis added). In other words, the '091 patent explicitly characterizes all the paths as "conventional" "embedded signals"—i.e., not "non-conventional" as Dr. Weaver testifies. *See* Ex. 2022 ¶ 121. Conceivably, each transmission path represents reception of "signals embedded in the particular transmission channel." *Id.* As explained, Figure 2A shows signals on each path must be amplitude demodulated in AMPLITUDE DEMODULATOR 32, evidencing that the signals represent the same modulation technique. Each of the paths start at the same exit point of amplitude demodulator 32 and eventually go to a separate "digital detector" 34, 37, or 38. Ex. 1009, 6:53–7:5. The disclosure describes Path A as representing video embedded digital information from a normal television

signal. *Id.* at 6:53–56. Path B represents audio, and Path C simply represents other embedded signals acting on "particular frequency ranges in which the encoded information may be found." *Id.* at 6:50–52. If anything, the disclosure appears to represent, at most, to those of skill at the time of the invention, different embedded signal portions of a normal NTSV television signal (for example, the HBI or VBI) that may or may not be transmitted on different television frequencies (i.e., channels). *See* Ex. 1009, 6:42–7:5; Ex. 1001 ¶¶ 34–51 (describing history and convention of embedding signals). After all, "Fig. 2A is a block diagram of a TV signal decoder apparatus." Ex. 1009, 5:32–33.

Furthermore, as stated above, whatever "digital television" meant in 1981 (the term does not appear in the '490 patent), it meant something different in 1987, because the term grew to encompass many different types of known analog and digital programming (including digital modulation techniques) not contemplated in 1981. *See* Ex. 1001 ¶¶ 41–47; Ex. 2022 ¶ 62 (Dr. Weaver contending the '091 patent supports "digital video and audio" (citing Ex. 1003, 143:20–30)); Ex. 2043, 102 (1985 IEEE article cited by Patent Owner concluding "considerable circuitry is needed" to optimize results and "maintain the degradations of distortions" for digital 16 and 64 QAM (quadrature amplitude modulation)). The '490 patent attempts to capture the broadened meaning of programming (including digital modulation techniques) as it stood in 1987 to encompass "*everything* that is transmitted electronically to entertain, instruct or inform, including television, radio, broadcast print, and computer programming was well as combined medium programming." Ex. 1003, 6:31–34 (emphasis added).

Moreover, as noted in the Institution Decision, Patent Owner does not dispute in its Sur-Reply that the 1987 '091 patent specification broadened the meaning of the term "programming." *See* Inst. Dec. 25 (citing PO Sur-Reply 7 (arguing that *Power Oasis* "does [not] . . . support the proposition that a claim loses its support in an earlier application (and hence its priority date) *simply because a claim term is described more broadly in a CIP*") (emphasis added)). Patent Owner now obfuscates the issue further and argues that "*it is highly debatable* 'other electronic transmissions'" as set forth in the 1981 '091 patent specification is "narrower than 'everything that is transmitted electronically'" as set forth in the 1987 '490 patent Specification. PO Resp. 32 (emphasis added) (citing Ex. 1009, 3:48–56; Inst. Dec. 24). This recent "debatable" characterization of the issue fails to even allege that the earlier 1981 disclosure is not narrower relevant to the scope of programming than the 1987 disclosure. In any event, by *changing* the meaning of programming in 1987 to mean "everything that is transmitted electronically" in 1987, Patent Owner signaled that it means something different than "other electronic transmissions," especially in context, where, as discussed above, the 1981 '490 patent only discloses conventionally embedded signals in analog television, radio, and other transmissions.

Moreover, Patent Owner argues "**Broadening of A 1981-Supported Term Is Irrelevant**," which incorrectly fails to address the clear holding of *PowerOasis*. *See* PO Resp. 36–37. *PowerOasis* holds that an original specification does not support a claim that receives a broader interpretation of a claim term based on new matter added in a later-filed CIP specification. *PowerOasis*, 522 F.3d at 1311 ("That the Original Application may support a narrower construction of 'customer interface' as a display on the vending

machine does not mean that the Original Application supports the broader construction of a 'customer interface' as an interface located on the customer's laptop (remote from the vending machine)."). Under *PowerOasis*, Patent Owner impermissibly added new matter in order to broaden the scope of the claim term "programming" to include "*everything* that is transmitted electronically to entertain, instruct or inform, including television, radio, broadcast print, and computer programming was well as combined medium programming," as of 1987 in the '091 patent, relative to the disclosure of the term "programming" in the ancestor 1981 '490 patent. *Compare* Ex. 1003, 6:31–34, *with* Ex. 1009, 3:48–56.

Accordingly, we determine that a preponderance of evidence supports Petitioner's contention that the '490 patent does not support the scope of challenged claims of the CIP '091 patent.

2. Disclaimer/Estoppel

As noted above, the Examiner issued a *Schneller*-type double patenting rejection during prosecution of the '091 patent. *Supra* note 10; Ex. Ex. 1047, 9–11; Ex. 1043, 21 (Patent Owner addressing, during prosecution, the "twice rejected" claims for double patenting "under the Schneller doctrine"). Citing and quoting Exhibits containing relevant prosecution history, Petitioner shows persuasively that Patent Owner disclaimed priority to its 1981 '490 specification by arguing "that the [E]xaminer's double patenting rejection based on patents having the 1981 specification 'is improper because *the present application does not claim the benefit of those applications under 35 U.S.C. § 120*.' Ex. 1043 at 21. PMC successfully argued that '*there could never have been a basis for claiming the present subject matter in* [*the 1981*] *applications*.' *Id.*; *see* Ex. 1031." Pet. Prelim.

Reply 2, 1–6 (quoting statements made by Patent Owner during prosecution) (emphasis by Petitioner) (describing other factors involved during prosecution, including that Patent Owner asserted priority to applications that Patent Owner labeled as "DECR 87 group" while separating large groups of then-pending applications based on whether or not priority to 1981 or 1987 was being asserted); Ex. 1044–47 (information disclosure statements citing numerous references pre-dating the 1987 filing date—i.e., back to 1950).

Patent Owner responds that its prosecution disclaimer of priority to 1981 was unclear, and that the statements Petitioner characterizes as a prosecution disclaimer applied only to then pending claims that Patent Owner subsequently cancelled and replaced with amended claims that issued, including the challenged claims. *See* PO Resp. 29–31; PO Sur-Reply 4 ("The early statements made by PMC were directed to claims 3–32 which each recited '*modifying a fashion* in which said receiver station locates [/ receives / identifies] said enabling information . . . [.]' That feature was not disclosed in the 1981 specification, which is why priority was asserted by PMC to 1987, not 1981."). Patent Owner explains "new claims 33–63" that led to the challenged claims were "introduced in 2011" after its alleged disclaimer. *See* PO Sur-Reply 4 (not citing prosecution history); *see* Ex. 1035 (2011 amendments). Patent Owner also acknowledges that the application culminating in the '091 patent "was initially labeled, for administrative docketing convenience, as 'DECR 87B.'" *Id.* at 5; *see* Ex. 1035 (introducing the 2011 amendments without any mention of alleged support to 1981 or the prior double patenting rejection).

Patent Owner's arguments attempting to distinguish *Bradford*, *Springs Window Fashions LP v. Novo Industries, L.P.*, 323 F.3d 989, 993–94 (Fed. Cir. 2003), and *Hakim v. Cannon Avent Group PLC*, 479 F.3d 1313, 1315–16 (Fed. Cir. 2007), on the basis that the disclaimers in those cases were directed to patented claims or "involved clear and unmistakable disclaimers by the patentees," are not persuasive. *See* PO Sur-Reply 3; PO Resp. 29–31. As we explained in the '1527 final (Ex. 1048) and rehearing (Ex. 3001) decisions, similar to the prosecution history here, Patent Owner clearly disclaimed priority with respect to the claims then pending and rejected under the *Schneller* doctrine at the time of the disclaimer. *See* Ex. 1048, 29–34; Ex. 3001, 26–41; Ex. 1043, 11 (informing the Examiner during prosecution "[t]he present application asserts priority based on the 1987 disclosure"), 21 (informing the Examiner asserting during prosecution "the Schneller double patenting theory based on Harvey U.S. Patents 4,694,490 and 4,704,725 is improper because the present application does not claim the benefit of those applications under 35 U.S.C. 120. *Thus, there never could have been a basis for claiming the present subject matter in those applications*.") (emphasis added)."); *supra* note 12 (similar issue in '1527 final decision).[14]

[14] Patent Owner also contends that the disclaimer involved in *Bradford* benefitted the patentee in that case and "[this] is not the case here." PO Sur-Reply 3. Patent Owner fails to cite precedent supporting the notion that such a benefit makes a difference. *See id.* Furthermore, the claims eventually were allowed in the instant case, so that given the disclaimer of priority, Patentee benefitted because the Examiner ultimately did not maintain the *Schneller*-based double patenting rejection. *See* Ex. 1043, 11, 21 (discussed herein).

With regard to Patent Owner's argument that Patentee did not disclaim the issued claims that were not pending at the time of the alleged disclaimer, Petitioner compares "prosecution [of cancelled] claim 3 and issued claim 13," explains that the two sets of claims overlap, and maintains that "[a]ny argument that the 1981 specification did not support the then-pending claims but supports the issued claims would not be credible." Pet. Prelim. Reply 4. In other words, notwithstanding Patent Owner's arguments, Petitioner contends that the disclaimer reasonably corresponds to the issued claims because they are similar to the canceled claims that Patent Owner concedes only have priority to 1987.

As Petitioner contends, the different sets of claims appear to be reasonably commensurate in scope such that a reasonable competitor or examiner would have deemed the disclaimer to apply to the issued claims. For example, Patent Owner contends that the '490 patent does not support "modifying a fashion," which cancelled claims 3–32 recited, but it does support "determining a fashion," which the challenged claims recite. *See* PO Sur-Reply 4–5; PO Resp. 30. Patent Owner asserts this distinction (i.e., the alleged lack of a disclosure in the 1981 specification of "modifying a fashion" versus the claim amendments to "determining a fashion" in the 1987 Specification) "is why priority was initially defaulted to 1987." PO Resp. 30. Nevertheless, we initially found in the Institution Decision "Patent Owner does not argue that 'determining a fashion' is not broader than 'modifying a fashion.'" Inst. Dec. 27. Patent Owner characterizes that initial finding as "[c]urious[]," and responds as follows: "[B]y showing the 1981 support of the 'determining' step as well as the lack of support for the 'modifying' step, PMC has indeed established, logically, 'determining a

fashion' is not broader than 'modifying a fashion.'" PO Resp. 30–31 (citing Inst. Dec. 27).

The scope of challenged claim 13 reasonably includes in its broad scope what Patent Owner contends the '490 patent does not support—the claim 13 method recites determining a fashion so it includes modifying that fashion. *Cf.* PO Sur-Reply 5 (arguing that "Petitioner has failed to demonstrate that the subject matter of then-pending claims 3–32 is substantively the same as or equivalent to that of the issued claims"). Simply put, modifying a fashion necessarily results in determining that fashion. Patent Owner otherwise conflates "modifying" and "determining" in arguing that Gilhousen does not disclose the claimed invention, as discussed in Section II.D.1 below. *See* PO Resp. 49–50 (arguing "determining a fashion" requires "altering . . . the behavior" of a receiving system). Faced with the clear disclaimer that pertains to modifying a method of locating a decryption key according to Patent Owner's arguments, a reasonable competitor or examiner would have interpreted the clear disclaimer also to apply to broader claimed subject matter that embraces what Patent Owner admits is disclaimed subject matter. *See* Pet. Reply 4–5 (maintaining Patent Owner "incorrectly" argues "that the issued claims are significantly different than those pending at the time the disclaimer was made, [which] is not sufficient") (citing *Hakim v. Cannon Avent Grp., PLC*, 479 F.3d 1313, 1318 (Fed. Cir. 2007)).[15]

[15] As discussed above, the '490 patent does not support the broad scope of programming that Patentee enhanced in the later-filed '091 patent Specification, such that a reasonable competitor could have interpreted the disclaimer as applying on that basis too.

In *Hakim*, the court determined that even though the patent owner amended and broadened claims, and then argued to a District Court and our reviewing court that a previous disclaimer made to the examiner with respect to a set of earlier claims no longer applied, the patent owner was bound by the disclaimer with respect to the amended broadened claims. *See Hakim*, 479 F.3d at 1318. By analogy, Patent Owner here argues its disclaimer should be ignored because it changed its claims (to be broader or otherwise). Under *Hakim*, even if the amendments broaden (or otherwise slightly alter) the scope of the original claims, Patent Owner still had the duty to inform the Examiner in a sufficiently clear fashion of its intent to recapture priority in order to erase the effect of its disclaimer. *See id.* ("Although a disclaimer made during prosecution can be rescinded, permitting recapture of the disclaimed scope, the prosecution history must be sufficiently clear to inform the examiner that the previous disclaimer, and the prior art that it was made to avoid, may need to be re-visited."); Pet. Reply 4–5 (citing *Hakim*, 479 F.3d at 1318).

Petitioner shows persuasively that Patent Owner did not meet its duty under the reasoning of *Hakim* or otherwise. That is, Patent Owner did not rescind the disclaimer during prosecution by informing the Examiner in a sufficiently clear manner that the '490 patent supports the newly amended claims that eventually issued in part as the challenged claims. *See* Pet. Prelim. Reply 5–6; Pet. Reply 4–5; Ex. 1001 ¶¶ 73–86 (brief summary of the prosecution history). By way of example of keeping its position unclear, Petitioner notes persuasively that throughout prosecution, the Examiner continued to reject the claims with references that post-dated 1981, but Patent Owner did not assert the references were not prior art, and repeatedly

asserted priority to 1987 (including in District Court litigation). *See id.* at 6 (citing Ex. 1019, 6; Ex. 1050, 7; Ex. 1051, 6–7).

In addition, contrary to Patent Owner's allegation that the reason for the disclaimer hinged on "determining a fashion," Patent Owner did not even discuss the *Schneller*-based double patenting rejection when it introduced its amendments on April 11, 2011 (cancelling claims 1–32 and adding claims 33–63). *See* Ex. 1001 ¶ 77 (citing Ex. 1035, 4–9); Ex. 1035, 2–3 and 10–11 (arguing prior art post-dating 1981, including Gilhousen and Mason, does not meet the newly amended claims, and explaining that Patent Owner divided its applications based on filing date priority, designating the '091 patent application as part of the "DECR 87" group, and arguing that claims 33–63 "are fully supported by the specification"—a specification within the DECR 87" group). In introducing claims 33–63, Patent Owner informed the Examiner that "[c]laims 33–63 *correspond* to various claims of the 'A' application," and that "Applicants now wish to pursue the subject matter *within the scope* of the 'A' claims of the DECR 87 group 'A' (U.S. Patent Application Serial No. 08/474,145"—which corresponds to U.S. Patent No. 7,992,169 B1 (Harvey et al.) *filed in 1995* (claiming continuation status back to 1987 and CIP status back to 1981, just like the '091 patent). Ex. 1035, 4.

Prior to the latest amendments (i.e., claims 33–63), introducing claims 1–32, Patent Owner specifically stated "[t]he present application asserts priority based on the 1987 disclosure" (Ex. 1043, 11), and argued on that basis the *Schneller*-type double patenting rejection based on the '490 patent (and another patent) was improper as noted above (*id.* at 21). In the next Office Action, a final office action, the Examiner dropped the particular

Schneller-type double patenting rejections noted above. *See* Ex. 1031, 3–11 (rejecting claims based on double-patenting over a long list of applications and based on a lack of written description for "the steps of receiving, detecting, passing, modifying, locating, enabling and outputting").

In other words, Patent Owner's actions and statements clarified and signaled absolutely nothing relative to the *Schneller*-type double patenting rejection withdrawn by the Examiner. Accordingly, Patent Owner does not rebut Petitioner's showing that Patent Owner failed to correct its disclaimer. *See* PO Resp. 30–31 (arguing it need not correct a disclaimer that was unclear). Put another way, Patent Owner does not show that it notified the Examiner that it retracted or clarified the disclaimer by explaining that its newly amended claims had a different scope, or by seeking continuation priority to the '490 patent for the challenged claims (or any claims) that issued in the '091 patent. *See* PO Sur-Reply 5–6; PO Resp. 30. Patent Owner's argument that it "made clear" that its priority extended back to 1981 "*throughout* prosecution" contradicts its argument that it disclaimed priority with respect to the original claims that it cancelled. *See* PO Sur-Reply 2–3 (emphasis added); PO Resp. 30. It also contradicts the record that shows it claimed priority to 1987 in arguing against the *Schnelle*r-type double patenting rejection and in introducing claims 33–63. Ex. 1035, 4; Ex. 1043, 11, 21.

Furthermore, Patent Owner's argument that it claimed priority to 1981 further attempts to obscure the fact that it only asserted priority on a CIP basis, according to the face of the '091 patent and otherwise, which fails to clarify its priority status on a claim-by-claim basis. *See* PO Sur-Reply 3 (citing Ex. 2015, 1–2; Ex. 2016, 1–2). Even in this trial, Patent Owner only

alleges "[a]t least claims 13–16, and 18 ('the 1981 Claims') are entitled to the priority date of November 3, 1981." PO Resp. 25.

Accordingly, we determine that Petitioner has shown by a preponderance of evidence that Patent Owner disclaimed priority to the '490 patent so that the '091 patent does not have priority with respect to the challenged claims based on the '490 patent filing date.

3. Independent Claims 13, 20, and 26, Additional Phrases

Petitioner contends that the '490 patent does not provide written description support for the following two claim 13 terms: "detecting in said encrypted digital information transmission the presence of an instruct-to-enable signal" and "determining a fashion in which said receiver station locates a first decryption key by processing said instruct-to-enable signal." Pet. Prelim. Reply 7. Petitioner explains that the '490 patent only discloses "preinformed" receivers. *Id.* (citing Ex. 1009, 4:31–40). Petitioner also contends that the terms "'decryption key' (claims 13, 20) and 'instruct-to-enable signal' (claims 13, 20, 26) are never used in the '490 patent." *Id.*

Petitioner's challenge shifts the burden of production to Patent Owner with respect to the challenged claims. Patent Owner responds by attempting to show that the '490 patent only supports claim 13–16 and 18 ("the 1981 Claims," Ex. 2022 ¶ 112 p. 48 (addressing claims 13–16 and 18 only)). Patent Owner does not address independent claims 20 and 26, and claims 21, 23, 24, 26, 27, and 30, which depend from claims 20 or 26. *See* PO Resp. 25–29 (citing Ex. 2022 ¶ 112).

Patent Owner's showing with respect to claim 13 includes a multitude of citations to the '490 patent that discuss different embodiments and teachings. The showing fails to show explicitly and with requisite clarity

how the inventors possessed the claimed invention. Specifically, Patent Owner fails to show support sufficiently for the claim 13 "instruct-to-enable signal," which must be "detect[ed] in said encrypted digital information transmission" and "pass[ed] to a processor," and the claimed "decryption key," wherein that embodiment "*determin[es] a fashion* in which said receiver station *locates a first decryption* key by processing said instruct-to-enable signal," as set forth in claim 13. *See* PO Resp. 25–28; Ex. 2022 ¶ 112 (providing claim chart for claims 13–16 and 18 with blank citations quoting the '490 patent devoid of any explanation).

With respect to claim 13, Patent Owner points to the "French Chef" TV program in the '490 patent to support steps [a] and [b] above, "receiving an encrypted digital information transmission including encrypted information," and "detecting in said encrypted digital information transmission the presence of an instruct-to-enable signal." PO Resp. 26 (citing Ex. 20:12–50; 20:60–68). For example, Dr. Weaver puts emphasis on "**a television program on cooking techniques that is received on TV set, 202, via box 201,**" and ties it to "Julia Child's 'The French Chef'" program, listing it as meeting step [a]. But Patent Owner fails to point out which part of the television program, if any, constitutes an "encrypted digital information transmission" and which part corresponds to "encrypted information." *See* Ex. 2022 ¶ 212 (p. 49).

As discussed above in the Claim Construction section, the French Chef TV program, as a programming transmission, constitutes mixed analog and digital information. Therefore, the "encrypted information" in theory may be a scrambled Julia Child program, but the cited embodiment does not describe it specifically as such, and it does not describe decrypting or

descrambling that programming as claim 13 also requires. Patent Owner does not contend that skilled artisans would have gleaned that the specific Julia Child program would be scrambled or that a more generic scrambling/descrambling teaching applies to that specific embodiment (which relates to digital encryption of the recipe as noted).

In any event, as step [b] shows, the instruct-to-enable signal must be detected in the "encrypted digital information transmission." Also, as discussed above, and as Patent Owner contends, the cited Julia Child program includes two separate embodiments—receiving an encrypted recipe either "in the TV 'programming transmission' or on another channel." PO Resp. 26. The "another channel" embodiment lacks any relevant description of the claimed "instruct-to-enable" signal that must be detected within the same "encrypted digital information transmission" according to claim 13. In other words, the newly tuned-in channel that receives the encrypted recipe constitutes a separate transmission from the encrypted digital information transmission that allegedly contains an instruct-to-enable signal. The cited passage also does not set forth a clear description of whether or not Patent Owner relies upon the encrypted recipe for the "encrypted digital information transmission," but if so, the passage refers to "when the transmission of the recipe is received" without describing the encrypted recipe as being part of the "encrypted digital information transmission" that contains the "instruct-to-enable" signal. *See* Ex. 1009, 20:32–37. It follows that the Julia Child embodiments also fail to describe "determining a fashion" of locating a first decryption key by processing said instruct-to-enable key with respect to either embodiment. *See* Ex. 1009, 20:47–50.

The cited Julia Child embodiments also do not indicate how any earlier generic "signal" teachings listed by Patent Owner's string citations modify one of the other of the Julia Child's embodiments. *See* PO Resp. 27–28 (discussed further below). In other words, Patent Owner cites to a variety of passages that may or may not pertain to the French Chef TV program. *See* PO Resp. 27–28 (citing Ex. 1009, 4:55–67, 8:32–39, 9:27–40, 18:44–67).

As an example of a generic citation, with respect to the "instruct-to-enable signal," Patent Owner cites to "signals that enable" or "inform" decryptor 101 to decrypt programming, signals that "may be embedded in the program[m]ing." *Id.* at 27 (citing Ex. 1009, 13:17–20). Patent Owner also provides another quotation: "The signal or signals may transmit a code or codes necessary for the decryption of the transmission." PO Resp. 27 (quoting 13:24–32). These string citations not only conflate the claimed instruct-to-enable signal with the claimed decryption key, Patent Owner fails to even allege that the cited instruct-to-enable key is "detected in said encrypted digital information transmission"—let alone identify the latter transmission. *See* PO Resp. 27.

Next, according to Patent Owner, with respect to

> the steps of "*determining a fashion* in which said receiver station *locates a first decryption key* by processing said instruct-to-enable signal" and "*locating said first decryption key* based on said step of determining," as recited in independent claim 13, the '490 Patent describes that "[b]oth the arrangement of signal units in signal words and the locations, timings, and lengths of signal words in individual transmissions or groups of transmissions may vary in fashions that can only be interpreted accurately by apparatus that are preprogramed with the keys to such variations" (*id.*, 4:31–46) and that "[t]he signals that enable the

> decrypter/interrupter, 101, to decrypt . . . programing . . . may be embedded in the programing or may be elsewhere" such as "in a channel other than the channel being transferred" (*id.*, 13:13–32; 14:46–54). A "signal processor, 112" may be "informed of the predetermined fashion for identifying and processing the [] needed signal or signals in the incoming transmission . . . for example, where to look for the signals and when and how" and "can transfer the [located] signal to decryptor/interruptor, 115." (*Id.*, 14:54–61.) A "controller, 20" in a signal processor (FIG. 1) "can tell decrypter, 10, when and how to change decryption patterns, fashions, and techniques." (*Id.*, 8:39–40.) "FIG. 4E also illustrates how it may be necessary to decrypt a programing transmission on one channel in order to identify and process correctly the programing transmitted on another"; for example, "the signal or signals needed to operate decryptor/interruptor, 115, correctly may be on a separate channel of programing that is, itself, encrypted in transmission" and has to be located (*i.e.*, identified and decrypted) first. (*Id.*, 15:8–19.) Yet another example of "locating said first decryption key" is to "telephone a remote site to get an additional signal or signals necessary for the proper decryption and/or transfer of incoming programing transmissions." (*Id.*, 15:20–25.)

PO Resp. 27–28 (citing Ex. 1009).

This long citation, even coupled with reliance on the two Julia Child's embodiments, fails to present a coherent explanation of how the disclosure provides written description support for the interrelated "instruct-to-enable" signal, the "first decryption key," and "determining a fashion in which said receiver station locates a first decryption key by processing said instruct-to-enable key," as recited in claim 13. Patent Owner essentially invites the panel to sort through all of its string citations that involve general statements and determine for itself how to apply them separately to find support for the claims or to apply some or all of the cited strings to one or more of the French Chef embodiments in order to find the requisite support.

As another example of alleged written descriptive support for "locating said first decryption key," Patent Owner, in the above quotation from pages 27–28 of the Patent Owner Response, cites to disclosure in the '490 patent regarding telephoning to a remote site. *See id.* That explanation by Patent Owner fails even to allege how telephoning occurs in relation to the requirement of locating "by processing said instruct-to-enable signal" and "locating" based on a step of "determining."

Similar to claim 13, independent claim 20 recites detecting first and second instruct-to-enable signals in an encrypted digital information transmission, and other related phrases, including executing first and second processor instructions to provide first and second decryption keys. Patent Owner does not direct attention to any support for claims 20 or 26, but generally refers the panel to Dr. Weaver's testimony with respect to claims 13–16 and 18. *Id.* at 25–28 (citing Ex. 2022 ¶ 112).

With further respect to claims 13–16 and 18, citing to the expert declaration, without more, normally constitutes improper incorporation by reference and fails to provide proper context or meaningful analysis. *See* 37 C.F.R. 42.6 (a) (3) ("Arguments must not be incorporated by reference from one document to the other."); PO Resp. 28 (citing Ex. 2022 ¶ 112). Even assuming it is proper with respect to dependent claims 14–16 and 18, Dr. Weaver's testimony lacks coherent or specific explanations and amounts to providing string cites in a similar fashion to that of Patent Owner. *See* Ex. 2022 ¶ 112 (providing string cites only for claims 13 and 16–18). In any case, by showing claim 13 lacks support in the '490 patent, Petitioner also shifts the burden to Patent Owner to demonstrate dependent (narrower) claims 16–18 (which depend on claim 13) do not lack written description

support. As indicated above, Patent Owner only argues "[a]t least claims 13–16, and 18 ('the 1981 Claims') are entitled to the priority date of November 3, 1981." PO Resp. 25. Patent Owner does not rebut or address Petitioner's allegation and preliminary showing that independent claims 20 and 26 lack priority.

Based on the foregoing discussion, Petitioner shows, by a preponderance of evidence, that the '490 patent does not support challenged independent claims 13, 20, and 26, and dependent claims 15, 18, 23, 24, 27, and 30 in the '490 patent. Accordingly, for the reasons and findings discussed above, the challenged claims have an earliest effective filing date of September 11, 1987, the effective filing date of the '091 patent.

C. Alleged Unfairness

Patent Owner contends "it would be unfair for the Board to broadly interpret the Challenged Claims and apply an expansive read of the references to the claims while still rejecting PMC's 1981 priority assertion." PO Resp. 44. Contrary to this characterization, Patent Owner itself provides dual citations to the two patents and to the plain meaning of terms in various places to support its claim construction (as outlined above). This implies that the plain meaning and overlapping subject matter in the two patents inform a common understanding of the construction of some of the inter-related claim phrases, even if Petitioner shows, by a preponderance of evidence (after shifting the burden of production to Patent Owner), that the '490 patent does not provide written descriptive support for certain claim phrases. Tracking Patent Owner's claim construction arguments, in addition to providing specific citations to the '490 patent to allege written description support for claims 13–16 and 18, Dr. Weaver also cites to both patents to

support his view of the meaning of terms and the background of the invention within the two patents. *See* Ex. 2022 ¶¶ 36–67, 112.

Setting aside the varying breadth of the term "programming," Patent Owner advances neither a specific nor a generic argument that shows the '091 patent dictates that the construction of any claim term at issue here must be narrower by ignoring guidance from the '490 patent. No dispute exists over the fact that the two patents share some overlapping subject matter such that the earlier-filed '490 patent sheds light and insight into the claim construction for the later-filed challenged claims in the CIP '091 patent. Based on the cited disclosures by the parties to the '091 and '490 patents and according to the discussion above, the construction of an above-listed term in each of Sections II.A.1, 2, and 6–8 (*supra*), as it the relates to a prior art issue here, does not turn on the question of priority, with the plain meaning and at least the later-filed '091 patent (i.e., with or without insight from the earlier-filed '490 patent) supporting the claim constructions listed in those sections above. *See PowerOasis*, 522 F.3d at 1309, 1306–11 (the meaning of a claim term in a later-filed CIP patent may be informed by an earlier-filed ancestor patent application, even though the term does not have written description support in the ancestor application—citing the original ancestor application as describing a user interface with "any number of forms"—but finding no original specific written description support in the ancestor application for the later-filed new matter describing a user interface form of a "laptop separate from the vending machine itself").

"Since CIPs generally add new matter, the claims may be fully supported by the parent application or they may rely on the new matter for support." *Id.* at 1305, n.4. The parties do not assert, and we do not find, that

the ’091 patent adds new matter to the ’490 patent that serves to narrow the claim construction of a term at issue here. Accordingly, we based our claim construction determinations and interpretations on the record before us and on the law as interpreted by our reviewing court.

D. Alleged Anticipation, Claims 13–15, 18, 20, 23, 24, 26, and 30

Petitioner alleges that Gilhousen (Ex. 1004) and Mason (Ex. 1005) each separately anticipate claims 13–15, 18, 20, 23, and 24, and that Frezza (Ex. 1006) anticipates claims 26 and 30. Pet. 3.

1. Alleged Anticipation Based on Gilhousen

i. Gilhousen (Ex. 1004)

Gilhousen discloses a system for scrambling and selectively descrambling television signals in a subscription television system. Ex. 1004, Abstract. Gilhousen teaches that a transmitter sends an “encrypted category key signal[]” with scrambled video and audio television signals and other control information, to a subscriber station. *Id.* at Abstract, Fig. 3. The system scrambles the television signal using a unique encryption keystream. *Id.* at Abstract. By digitizing the scrambled television signal in analog to digital (A/D) converter 205, a receiver descrambles the video and audio signals using decryption keys and Data Encryption Standard (DES) algorithms, and then outputs the television programming. *See id.* at Abstract, Fig. 7, 1:23–32, 16:26–64.

ii. Claims 13–15, 18, 20, 23, 24, 26, and 30

Addressing the preamble of claim 13, “a method of decrypting programming at a receiver station,” Petitioner contends that Gilhousen discloses a receiver with descrambler signal processor 150 that descrambles video in accordance with a unique keystream. Pet. 16 (citing Ex. 1004,

12:36–40, 22:24–28; Ex. 1001 ¶¶ 112–16). According to Petitioner, "'decrypt' as used in the '091 patent encompasses descrambling analog data." *Id.* Petitioner alternatively contends that "[e]ven if 'decrypting' were limited to digital data," Gilhousen "discloses the scrambling and unscrambling of digital video and audio components of a television signal." *Id.* (citing Ex. 1001 ¶¶ 114–116). Petitioner explains that Gilhousen's scrambling and descrambling systems operate on analog data that have been converted to digital data using D/A and A/D converters respectively on the transmitter and receiver ends. *See id.* at 17 (citing Ex. 1004, 6:62–7:6, 8:2–4, 8:46–50, 11:66–12:2, 16:26–29, 16:33–64, 17:42–46; Ex. 1001 ¶ 116).

Addressing step [a], "receiving an encrypted digital information transmission including encrypted information," Petitioner contends that Figure 5 of Gilhousen depicts scrambled television signal on line 152, which includes encrypted digital information, such as an encrypted channel key on line 154 and an encrypted category key on line 156. *See id.* at 18 (citing Ex. 1004, 5:36–55, 6:62–7:6; 8:2–4, 8:46–50, Figs. 3, 5, 11:52–65, 12:17–35, 15:50–16:4; Ex. 1001 ¶¶ 117–119). Petitioner also contends that scrambled digital control signals embedded in the audio and video transmission based on encryption keys constitute encrypted digital information. *See id.* at 18–19.

Addressing step [b], "detecting in said encrypted digital information transmission the presence of an instruct-to-enable signal," Petitioner contends that Gilhousen's IV frame count signal on line 153 constitutes the claimed instruct-to-enable signal because it instructs "'working key generator 176'" to generate "'a 64-bit working key signal on line 192.'" Pet. 19 (quoting Ex. 1004, 14:6–21, 12:17–28, Fig. 5; Ex. 1001 ¶ 121).

Addressing step [c], "passing said instruct-to-enable signal to a processor," Petitioner contends that Gilhousen teaches passing the IV frame count signal to working key generator 176, which constitutes a processor, because it operates on data, the IV frame count signal. *Id.* at 20 (citing Ex. 1004, 14:14–19, Fig. 6; Ex. 1001 ¶¶ 123–124).

Addressing step [c], "determining a fashion in which said receiver station locates a first decryption key [(i.e., keystream)] by processing said instruct-to-enable signal," Petitioner relies on Gilhousen's 64-bit unique keystream on line 159 as a first decryption key. *Id.* at 25–28.

Petitioner explains that working key generator 176 generates a 64-bit working key signal on line 192 by processing the IV frame count signal on line 191. *See id.* at 20 (citing Ex. 1004, 12:36–40); Ex. 1004, Fig. 6. Petitioner adds that keystream generator 178 also processes the IV frame count and processes the 64-bit working key signal ultimately to generate the 64-bit unique keystream on line 159. Pet. 20–21 (citing Ex. 1004:14–19, 22–35; Ex. 1001 ¶ 126).

Addressing remaining steps [d], [e], [f], and [g] of claim 13, Petitioner persuasively provides a detailed showing that reads the steps onto Gilhousen's disclosure. Pet. 20–22 (citing Ex. 1004, 12:36–40, 14:27–32, Fig. 5; Ex. 1001 ¶¶ 127–29).

Addressing step [b] of claim 20, "detecting in said encrypted digital information transmission the presence of a first instruct-to-enable signal including first processor instructions," Petitioner contends that the IV frame count signal "includes 'processor instructions' to the keystream generator," because the keystream generator 178 processes an expanded version of the IV frame count signal. Pet. 25 (citing Ex. 1004, 14:6–11, 14:27–35).

Addressing step [d] of claim 20, "detecting in said encrypted digital information transmission the presence of a second instruct-to-enable signal including second processor instructions," Petitioner contends that "[b]ecause subscriber key generator 165 acts to produce subscriber key 181 in response to the subscriber key generation number 157, . . . subscriber key generation number [on line 157 constitutes an instruct-to-enable signal that] includes processor instructions to the subscriber key generator." *See* Pet. 27 (citing Ex. 1004, 12:59–68; Ex. 1001 ¶¶ 149–151); Ex. 1004, 12:59–68 (The "unique 64-bit subscriber key generation signal on line 181" is generated "by processing the subscriber key generation signal on line 180 in accordance with the DES encryption algorithm.").

Regarding executing steps [d] and [e], which collectively require "executing said first [and second] processor instructions of said first [and second] instruct-to-enable signal[s respectively] to provide a first [and second] decryption key[s]," Petitioner contends the "'64-bit unique keystream on line 159'" constitutes a first decryption key provided by keystream generator 178 (a processor) "executing" the IV Frame signal on line 191 (i.e., the first instruct-to-enable signal including processor instructions). Pet. 25–26 (annotating Figure 6 of Gilhousen). Keystream generator 178 is "embodied in a[ ] . . . processor chip." Ex. 1004, 22:66–68. Petitioner contends a truncated (56-bit) subscriber key on line 182 constitutes the second decryption key provided by subscriber key generator 165 (a processor) executing the subscriber key generation signal on line 180 (i.e., the first instruct-to-enable signal including processor instructions). *See* Pet. 28 (annotating Ex. 1004, Fig. 6 (citing Ex. 1004, 12:63–13:3, 13:20–28; Ex. 1001 ¶¶ 152–154)).

Petitioner also reads the remaining steps of claim 20 and recited steps of claims 14, 15, 18, 23, and 24 onto Gilhousen's disclosure, supported by its expert declarant. *Id.* at 22–31 (citing Ex. 1001; Ex. 1004).

In response, Patent Owner contends that Gilhousen's transmitter does not supply the 64-bit unique keystream (the "decryption key" in claim 13) to "to the subscriber stations," rather each subscriber keystream generator 178 only "***reproduces*** the 64-bit unique keystream on line 159." *See* PO Resp. 47 (quoting Ex. 1004, 14:27–35 (emphasis by Patent Owner), citing Ex. 2022 ¶¶ 161–162). According further to Patent Owner, Gilhousen's descramblers do not "locate" the keystream, which must be "something *already in existence*" in order to be located. *Id.* at 48. Patent Owner also argues Working Key Generator 176 does not perform determining a fashion of locating a first decryption key, because it merely supplies a working key as an input "for Keystream Generator 178, which keeps 'processing the 64-bit initialization vector signal on line 191 in accordance with the DES algorithm' in the same fashion. . . . Nothing indicates Working Key Generator 176 is *capable of altering* in any way the behavior of Keystream Generator 178." PO Resp. 49–50 (citing Ex. 1004, 14:27–32; Ex. 2022 ¶ 168) (emphasis added). "Therefore," according to Patent Owner, "Gilhousen does not disclose the 'determining' or 'locating' steps." *Id.* at 50.

Patent Owner's arguments are not persuasive for several reasons. First, "locating" the first decryption key does not require it to preexist, according to the claim construction set forth above. *See* Section II.A.6. Second, even if it does (per Patent Owner's proffered narrow claim construction), *reproducing* the keystream, which Patent Owner cites as

occurring in Gilhousen's system, shows that the keystream values previously existed at least at the transmitter side. *See* Ex. 1004, Fig. 1 (keystream 44), Fig. 3 (same); Inst. Dec. 33 (citing Ex. 1004, Abstract, 14:27–35 (explaining that "reproducing" in Gilhousen shows the keystream already exists before being reproduced)); PO Resp. 48 (contending no citation shows reproducing means a pre-existing keystream). In other words, even under Patent Owner's narrow claim construction, Petitioner points out persuasively that Gilhousen shows "the keystream previously existed, as keystream 44 exists in the scrambler signal processor that generates the transmission to the subscriber station." Pet. Reply 16 (citing Ex. 1004, Abstract, 6:25–27, Fig. 3). Stated differently, keystream 44 pre-exists at least on the transmitter side before being *reproduced* on the receiver side. *See* Ex. 1004, Fig. 1 (keystream 44), Fig. 3 (same).

Third, contrary to Patent Owner's related arguments, the determining and locating steps do not require altering. *See* Pet. Reply. 17 (responding to PO Resp. 49–50). Patent Owner's argument about altering with respect to Gilhousen contradicts its argument addressed above (Section II.B.3) that the '490 patent does not support "modifying" (i.e., altering), but it does support "determining," because the argument by Patent Owner here essentially equates modifying/altering with determining (or locating). Patent Owner equivocates about the meaning of "locating" further by arguing "[e]ven if 'locating' might involve 'processing' as one of the steps, it does not mean general 'processing' (such as Gilhousen's handling of IV frame count) can be considered 'locating.'" PO Resp. 49 (citing Ex. 2022 ¶ 166); *see supra* Claim Construction Section II.A.

The record also supports Petitioner's other responses to Patent Owner's arguments. The challenged claims do not require "supply[ing] the keystream to the subscriber station. . . . A plurality of signals are transmitted to and processed by the receiver to determine the fashion in which the keystream will be located at the receiver, and the keystream is located at Keystream Generator." Pet. Reply 16–17 (citing Ex. 1004, Abstract, 14:14–35, Fig. 6; Pet. 20–21; Ex. 1001 ¶¶ 125–28).

For context regarding the issues at hand, Patent Owner's annotated Figure 6 from Gilhousen follows:

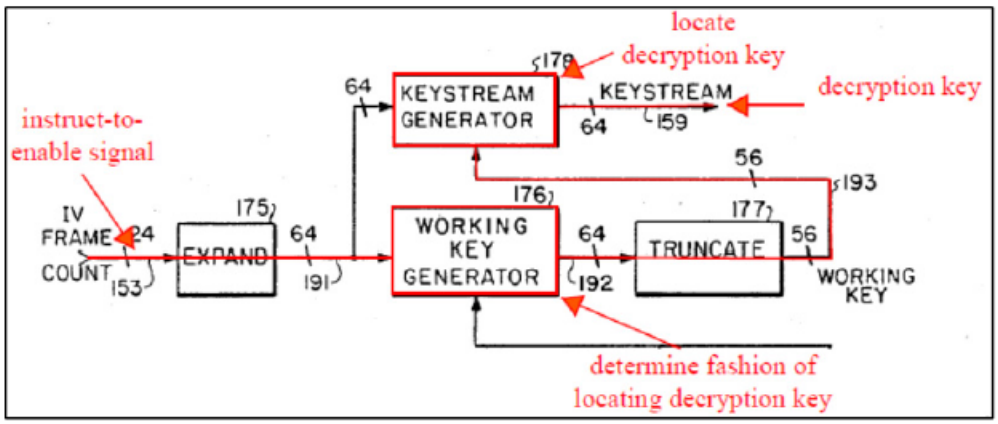


Figure 6 of Gilhousen, annotated by Patent Owner and reproduced above, characterizes its perception of Petitioner's showing, by including annotations of how Petitioner reads elements of claim 13 onto Figure 6. *See* PO Resp. 47 (noting "Petitioner cites the 'IV frame count' in Gilhousen as the 'instruct-to-enable signal' and cites the 'keystream' as the 'first decryption key'").

In its Reply, Petitioner explains,

> Working Key Generator [176] processes the instruct-to-enable signal to generate [the] Working Key Signal [on line 192]. It is

> [the] Working Key Signal that determines the fashion in which the keystream will be located, because a truncated version of that signal is used as an input to Keystream Generator to reproduce the keystream [first decryption key].

Pet. Reply 17 (citing Pet. 20–21; Ex. 1001 ¶¶ 125–126).

Petitioner's showing is persuasive. Contrary to Patent Owner's arguments, claim 13 does not require "transmitting the keystream [i.e., first decryption key] to subscriber stations or preprogramming them with the keystream [i.e., first decryption key]." *See* PO. Resp. 47. Claim 13 at most implicitly requires transmitting (via its receiving and detecting steps) *an instruct-to-enable signal*, and in contrast, does not require transmitting (a pre-existing) first decryption key. In summary, as Petitioner shows, Keystream Generator 178, and/or Keystream Generator 178 in conjunction with the working key (or a truncated version thereof), determines the "fashion" in which *the receiver station locates* the keystream (first decryption key) by processing the IV frame count (instruct-to-enable signal). *See* Pet. 20–21 (arguing "keystream generator 178" reproduces or locates the decryption key "based on said step of determining" (citing Ex. 1004, 14:27–32; Fig. 6; Ex. 1001 ¶¶ 127–128).

Patent Owner also contends that Gilhousen fails to teach "decrypting said encrypted information" and "receiving an encrypted digital information transmission" as recited in claims 13 and 20. PO Resp. 44–46, 50–51. Patent Owner contends "Gilhousen's transmission of scrambled television along with key-regeneration values is not an *all-digital* information transmission because at least the scrambled television programming therein is an analog signal." *Id.* at 45. Patent Owner similarly argues that Gilhousen does not disclose "the decryption of an all-digital signal," and

"[i]t is the 'encrypted information' received in the 'encrypted digital information transmission' that has to be decrypted in the 'decrypting' step." *Id.* at 51.

Patent Owner's arguments are not persuasive. As set forth above, the challenged claims do not require "all-digital" transmissions. *Supra* Section II.A.1–5 (Claim Construction). They do not preclude mixed analog and digital encrypted information. *See id.* Claims 18 and 30 show specifically that "said encrypted information includes television programming," which includes a broad array of programming information, including mixed analog and digital encrypted information, as distinct from "encrypted digital information." In simple terms, claims 13, 20, and 26 recite "encrypted information," which must include non-digital encryption (i.e., scrambling), because "encrypted information" is broader than "encrypted digital information," which claims 13 and 20 also recite.

As another example, similar to the Wall Street Week example disclosed in the '091 patent (and similar to mixed analog/digital systems described in the '490 patent), which includes decrypting of *programming*, the scrambled TV signal on line 152 that Gilhousen's descrambler receives includes "an information transmission that is at least partially digital and a portion of the transmission is encrypted." *See* Pet. 18; Ex. 1003, 159:47–61 (Wall Street Week example); Ex. 1009, Fig. 2A; *supra* Section II.B.1 (addressing Figure 2A of the '091 and '490 patents and finding it describes using amplitude demodulation to demodulate embedded signals). Therefore, even if somehow Gilhousen's descrambling system does not constitute a form of decrypting mixed analog and digital programming as described in the '091 patent and the '490 patent, Gilhousen's scrambling process includes

encryption and its descrambling process includes decryption. *See* Ex. 1004, Abstract, Figs. 5, 7.

Furthermore, as set forth in the Institution Decision, "video line buffer memory 206 in descrambler 150 receives encrypted all-digital information from A/D converter 205 (which further shows that scrambled TV signal 152 includes encrypted digital information that descrambler 150 decrypts)." Inst. Dec. 35–36 (citing Ex. 1004, Abstract, Figs. 5, 7). Patent Owner responds to this preliminary finding and similar arguments by Petitioner by pointing to Gilhousen's digital-to-analog (D/A) converter 62 in the transmitter and stating that "[a]ny digital operation within the scrambling/descrambling stage does not convert the 'information transmission' *actually transmitted or received* into a digital one." PO Resp. 45–46.

Patent Owner's argument concedes Gilhousen discloses digital encrypted information with the information embedded in an analog transmission, similar to the embodiments disclosed in the '091 and '490 patents as described above. The record reflects that Gilhousen operates similarly in material respects to the disclosed embedded digital information systems of the '091 and '490 patents. For example, as noted above, Figure A of the '490 patent and the '091 patent discloses the "ONE TV CHANNEL" entering *amplitude demodulator* 32 *before* going to any of the digital detectors on Paths A, B, and C, similar to the receiving process of Gilhousen. *See* Ex. 1004, Fig. 2A; Ex. 1009, Fig. 2A; *supra* Section II.B.1 (addressing Figure 2A of the '091 and '490 patents and finding it describes using amplitude demodulation to demodulate embedded signals). This shows that these embodiments embraced by the challenged claims involve (analog) amplitude modulated signals that include embedded digital content,

similar to what Patent Owner concedes Gilhousen's process at least includes. *See* Ex. 1001 ¶¶ 118–119. Still further, as described above in the Claim Construction section (Section II.A *supra*), in the '091 patent, upon which Patent Owner relies exclusively to support its substitute claims (as addressed below), at one part, Example #7 describes the signal as "*analog television information*" that "embeds and transmits particular SPAM message [digital] information." Ex. 1003, 155:44–46.

Petitioner also describes persuasively that "[t]he digital-to-analog converter [62 in Gilhousen]. . . performs a modulation that allows digital information to be *carried* on an analog signal for transmission." Pet. Reply 15–16 (citing Ex. 1001 ¶¶ 118–119; Ex. 1004, 8:2–4, 8:2–4, 11:52–12:2, 14:45–50, 15:50–59). Gilhousen supports Petitioner by disclosing that D/A converter 62 (Fig. 3) allows for digital transmission of at least some signals such as "pulse-amplitude-modulated [('PAM')] scrambled audio signals during the horizontal sync pulse interval of the scrambled video signal on line 160." Ex. 1004, 11:66–12:2, Fig. 3. Gilhousen describes the process further as "PAM data signals . . . which when converted into an *analog signal* by digital-to-analog conversion provide *a pulse-amplitude-modulated signal having a level related to the binary value of the digital words*." *Id.* at 11:61–65 (emphasis added).

In other words, these digital PAM *information* signals, although converted (to be carried on) what Gilhousen refers to an "analog signal" (similar to embodiments in the '091 and '490 patents as noted above), constitute *PAM* (i.e., digital *pulse*) signals "*having a level related to the binary value of the digital words*" according to Gilhousen's description. *See* Ex. 1004, 11:63–65 (emphasis added); Ex. 1001 ¶¶ 118–119 (citing Ex.

1004, 8:51–59, 11:52–65); Pet. Reply 15–16. The different "pulse" levels imply that portions of the transmission constitute digital PAM scrambled pulses modulating higher frequency TV waves to create "SCRAMBLED TV." *See* Ex. 1004, Fig. 3 (D/A converter 62), 11:52–12:12.[16]

Gilhousen's PAM pulses occur at least at the baseband level and represent digital information. *See* note 16. Even if the baseband digital information as digital pulses become smoothed somewhat via Gilhousen's D/A converter 62, they still fundamentally represent baseband digital *information* at least in a fashion not precluded by the '091 and '490 patents, allowing the A/D converters 104, 105 at Gilhousen's receiver stage to recover the digital information. *See* Ex. 1004, Figs. 3, 4; *see* Ex. 2031 (comparing analog versus digital waves and modulation techniques).

Moreover, the challenged claims do not recite digital *modulation*. Even a modern day digital modulation receiver does not receive a pure digital signal in practice, rather, it receives signals with noise or other superimposed interference signals due to multipath and other interference, otherwise the bit error rate would be zero, which does not occur. *See* Ex. 2042; Ex. 2046 (describing sinusoidal ripple distortion and error in 256

[16] As mentioned, Gilhousen describes sending all the signals through D/A convertor 62 to create an "analog" signal, albeit one that includes PAM (pulse amplitude modulation), thereby signifying the "analog" signal includes digital information. *Compare* Ex. 1004, 8:1–3, *with id.* at 11:60–12:2; *see* Ex. 1001 ¶¶ 113–124 (describing Gilhousen as including a digital "scrambling" process), ¶ 118 (stating "Gilhousen explains that the digital control signals are 'pulse-amplitude-modulated' such that the digital signals are carried on an analog transmission" (citing Ex. 1004, 8:51–59, 11:52–65)).

QAM systems); Ex. 2031, 3 (describing signals "deeply embedded in noise" and using correlation to find the digital levels transmitted and received with random noise). None of the challenged claims relate to transmission or require receiving a signal carried as a particular or even generic digital modulation type. Rather, all of the challenged claims relate to *receiving* digital information signals, so they do not preclude receiving digital signals buried in noise or otherwise being smoothed over or otherwise embedded in an analog or pulsed carrier.

Moreover, no disclosed circuitry or description in the '091 or '490 patents precludes receiving digital signals embedded in a TV carrier via a D/A converter. Rather, as described above (Section II.B.1), the '091 patent receives signals from a "television channel" in "a "standard amplitude demodulator, 32, which uses standard demodulator techniques, well known in the art, to define the television base band signal." Ex. 1003, 18:44–46, Fig. 2A; 155:44–46 (Example #7 embodiment describing a signal as "*analog television information*" that "embeds and transmits particular SPAM message [digital] information"); *supra* Section II.B.1 (addressing Figure 2A of the '091 and '490 patents and finding it describes using amplitude demodulation to demodulate embedded signals).

Further addressing claims 15 and 23, Patent Owner contends that Gilhousen does not disclose decrypting "a video portion of said programming." PO Resp. 50. This argument also turns on claim construction, because claims 13 and 20, from which claims 15 and 23 depend, recite "a method of decrypting *programming*," "decrypting said encrypted information," and "outputting said programming based on said step of decrypting" (emphasis added). In other words, "decrypting

programming" includes descrambling programming based on a decryption key, as set forth above in the claim construction section. Patent Owner does not dispute that Gilhousen descrambles programming, including video programming, based on decryption keys. *See id.* at 50–51.

In addition, Gilhousen discloses "a digital video information signal." Ex. 1004, 6:47. Petitioner points out

> [e]ven if "decrypting" were limited to deciphering digital data, Gilhousen would still disclose these limitations. In Gilhousen, received television signals are passed to an analog-to-digital converter which "converts the scrambled television signal . . . into a ***digital video*** information signal." Ex. 1004 at 16:26-29. It is this "***digital scrambled video*** information" which is "descrambled." *Id.* at 16:33-64. The video information deciphered in Gilhousen is digital data.

Pet. Reply 17–18.

Some of the PAM signals in Gilhousen discussed above as constituting digital information on or within a TV carrier reside in the "horizontal sync pulse interval of the scrambled *video* signal on line 160." *See* Ex. 1004, 12:1–2, Fig. 3 (emphasis added). Also, the video digital signals Petitioner describes in the quote above go through the same D/A converter 62 as the audio and control digital signals. *See* Ex. 1004, Fig. 3 (showing video line buffer memory 53, MUX 61, and D/A converter 62). Gilhousen's "scrambling" and descrambling of digital baseband signals constitutes a re-ordering or encryption of that digital information.[17] The

[17] *See* Ex. 1004, 7:3–8:3 (describing the processing of digital video signals, including multiplexing and sending the signals in the sequence in which it is stored—to create scrambling), 16:60–64 (reversing the process for descrambling). In other words, the "scrambling" constitutes a form of encryption of digital bits or signals, because Gilhousen's scrambling re-

'490 patent similarly describes "*convert[ing]* the encoded signals [of received transmissions] *into digital information*." Ex. 1009, 4:64–65 (emphasis added). It also discloses "decryptors that may convert the received information, in whole or in part, to other digital information *according to preset* methods or *patterns*." *Id.* at 4:65–67. This disclosure of the '490 patent fairly corresponds to Gilhousen's re-ordering of received digital patterns to descramble that received information by reordering that data into its original pattern (prior to being scrambled). *See* Ex. 1004, 16:60–64 ("Video descrambling is accomplished by retrieving the active video information from the memory 206 in a sequence that is generally the reverse of the storage sequence in the video line buffer memory 543 in the scrambling system shown in FIG. 4)"; note 17; Ex. 1001 ¶ 118 (stating "Gilhousen explains that the digital control signals are 'pulse-amplitude-modulated' such that the digital signals are carried on an analog transmission" (citing Ex. 1004, 8:51–59, 11:52–65)). No specific digital modulation scheme appears in the '490 patent or the '091 patent that would serve to show how challenged claims 15 and 23 distinguish over Gilhousen.

Patent Owner contends that Gilhousen does not disclose "passing said instruct-to-enable signal to a processor" as claim 13 recites. PO Resp. 51. Patent Owner contends working key generator 176 is not a processor because it is nothing "more than a hardwired arithmetic unit operating on input data." *Id.* (citing Ex. 2022 ¶ 175). Patent Owner's argument relies on an overly narrow claim construction of processor, as a processor does not preclude an arithmetic unit operating on data. *See* supra Claim Construction

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orders digital signals relative to their normal captured order. *See id.* at 7:3–7; 16:60–64.

II.A.6; Pet. Reply 18 (citing Ex. 1004, 14:14–19, Fig. 6; Ex. 1001 ¶¶ 123–124). Furthermore, Gilhousen discloses working key generator 176 as part of a "microprocessor chip" and keystream generator 178 as a "ciphering processor chip." Ex. 1004, 22:64–68; *see* Pet. Reply 18 (similar contention).

Patent Owner also contends that Gilhousen does not disclose a "first instruct-to-enable signal including first processor instructions," "a second instruct-to-enable signal including second processor instructions," and related "executing" steps in claim 20. PO Resp. 52. Patent Owner contends that our Initial Decision that construes the "instruct-to-enable signal including . . . processor instructions" as allowing the instruct-to-enable signal to be processor instructions "is not what Petitioner presented in the Petition." *Id.* at 53.

Patent Owner's arguments are insufficient to show that Gilhousen does not anticipate the challenged claims. For example, Patent Owner argues that Gilhousen only discloses input data and not executing instructions. *See id.* at 52–53. Patent Owner also argues that Gilhousen's key generators 178 and 165 do not meet "the proper definition of 'processor' as 'a device that performs operations according to instructions.'" *Id.* at 54 (citing Ex. 2022 ¶¶ 179–180).

Claim 20 does not recite a processor. Even if a processor is implicit in some of the claims and explicit in others, as indicated above, Gilhousen discloses working key generator 176 as part of a "microprocessor chip" and keystream generator 178 as a "ciphering processor chip." Ex. 1004, 22:64–68; *see* Pet. Reply 18 (similar contention). This implies to artisans of ordinary skill that "subscriber key generator" 165, which performs similar processing (*see* Ex. 1004, Fig. 6), also constitutes a processor, as Petitioner

contends. *See* Pet. 26 (contending keystream generator 178 is a processor); Pet. 28 (contending subscriber key generator 165 is a processor).

Contrary to Patent Owner's argument, claim 20 does not require "both" a first (or second) instruct-to-enable signal *and* processor instructions. *See* PO Resp. 52. Claim 20 recites "said . . . first instruct-to-enable signal *including* first processor instructions" and "a second instruct-to-enable signal *including* second processor instructions." In other words, the instruct-to-enable signals may themselves be processor instructions by including them as a subset or more than a subset, the latter simply characterizing the "instruct-to-enable" signal.

The claim 20 limitations themselves provide the proper framework for what the phrase "executing instructions" means—i.e., "executing . . . processor instructions . . . *to provide a first [and second] decryption key*" (emphasis added). Patent Owner does not dispute that Gilhousen processes control signals to provide the recited first and second decryption keys. *See* PO Resp. 54 (obliquely arguing "the issue here is not whether pure numerical data could be characterized as 'control signals,'" without disputing that they are control signals). Petitioner also notes that Patent Owner does not dispute that processor instructions include control signals. *See* Pet. Reply 18 (citing PO Resp. 24–25 (addressing the claim construction of "processor instructions" without disputing they include control signals)).

Gilhousen discloses that the "IV frame count signal" and "the subscriber key generation number" each constitute a type of "*control signal*[] provided to the control processor . . . passed . . . to the descrambler key distribution system 151 on lines 153, 154, 155, 156 and 157, respectively." Ex. 1004, 15:60–16:4 (emphasis added); *see also id.* at 8:51–

55 (describing the signals as part of "a group of control signals"). The control signals (which may or may not be expanded), reasonably constitute processor instructions, because they inform or control the keystream and subscriber key generator processors to provide keystream and subscriber keys. Moreover, without the input control signals in the proper format implicitly, Gilhousen's system does not provide the desired output keys, reasonably signifying the execution of the signals as control instructions. *See* Pet. Reply 18–19; Ex. 1001 ¶¶ 144–53; Ex. 1004, 12:59–68, 14:6–35, 15:60–16:4. Finally, as noted above, Gilhousen discloses processors as Petitioner contends and as noted above (Pet. 26, 28; Ex. 1004, 22:64–23:16), further implying that the relied-upon processors execute the disclosed control signals as the instructions recited by claims 13 and 20.

Petitioner persuasively addresses challenged claims 13–15, 18, 20, 23, and 24 with supporting citations to Gilhousen and Mr. Wechselberger's declaration testimony. *See* Pet. 22–31 (citing Ex. 1001; Ex. 1004). In summary, the challenged claims primarily recite known or implicit features. Claim 14 further limits claim 13 by reciting first and second decryption keys. Claims 15 and 23 recite decrypting video portions of programming with first and second decryption keys. Claims 18 and 24 recite "said encrypted information includes television programming." For these limitations, Petitioner persuasively relies on Gilhousen's keystream and subscriber key to decrypt an encrypted category signal and to decrypt a scrambled television signal on line 152. *See* Pet. 23–28 (citing Ex. 1001, Ex. 1004). Petitioner's showing is persuasive, and we adopt it as our own, as also summarized partly above with respect to claims 13 and 20. *See* Pet. 16–29 (citing Ex. 1001; Ex. 1004).

Patent Owner does not present separate arguments with respect to claims 14, 15, 18, and 24. *See* PO Resp. 55 (relying on arguments with respect to "several elements of claims 13 and 20"), 44–55 (presenting arguments for claims 13, 20, 15, and 23). The burden, however, remains on Petitioner to demonstrate unpatentability. *See Dynamic Drinkware, LLC v. National Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). As discussed above, after reviewing the Petition, supporting evidence, and the other briefs, and based on the record, we find that Gilhousen discloses each limitation of the challenged claims. *See* Pet. 16–29 (citing Ex. 1001; Ex. 1004). Accordingly, in light of the foregoing, we determine Petitioner has shown by a preponderance of evidence that Gilhousen anticipates claims 13–15, 18, 20, 23, and 24.

2. Alleged Anticipation Based on Mason

i. Mason (Ex. 1005)

Mason discloses a system for transmitting and receiving scrambled television signals. Ex. 1005, Abstract. The transmitter provides a cipher block of information including a first key for descrambling the television signal, and means for encrypting the cipher block with a second key common to a plurality of users. *Id.* On reception, a receiver applies the second common keys to the received cipher block, recovers the first key for use in descrambling the signal and the information relating to the respective user, and descrambles the television signal. *Id.* The system may transmit a further key in encrypted form and use the first key to decrypt the further key, which is then used to descramble the television signal. *Id.* This provides a three level key system. *Id.* Using a common second key for a plurality of users minimizes the access time for each user. *Id.*

ii. Claims 13–15, 18, 20, 23, and 24

Addressing the preamble of claim 13, "a method of decrypting programming at a receiver station," Petitioner contends that Mason discloses a receiver that descrambles television signal A. Pet. 31 (citing Ex. 1005, 1:4–7, 2:64–66, 3:13–22, Fig. 1; Ex. 1001 ¶¶ 172–73). According to Petitioner, "'decrypt' as used in the '091 patent encompasses descrambling analog data." *Id.* at 31–32. Petitioner alternatively contends that "even if 'decrypting' were limited to digital data," Mason discloses data frames in a packet system according to the European broadcasting system. *Id.* at 32 (citing Ex. 1001 ¶¶ 172–173; Ex. 1005, 6:62–65). Petitioner also explains that Mason's system includes and operates on encrypted digital data as evidenced by the encryption and decryption circuitry at Figures 1–3. *See id.* (citing Ex. 1036, 21–22).

Addressing step [a], "receiving an encrypted digital information transmission including encrypted information," Petitioner contends that Mason's television signal S(A) "is at least partially digital, as signals $P(T_s+S+P)$ and $D(T_c+P)$ are digital information comprised of 'bits.'" *Id.* at 32–33 (citing Ex. 1005, 3:43–54; Ex. 1001 ¶ 175). In addition to relying on scrambling as encryption, Petitioner explains that the transmission includes digital encryption, because "signal D(Tc+P) includes encrypted period key P, and signal P(Ts+S+P) includes encrypted period key P and encrypted session key S." *See id.* at 33 (citing Ex. 1005, 2:66–3:12, 3:43–36, 6:50–52; Ex. 1001 ¶¶ 175, 177).

Addressing step [b], "detecting in said encrypted digital information transmission the presence of an instruct-to-enable signal," Petitioner

contends that Mason's signal $P(T_s+S+P)$ constitutes the claimed instruct-to-enable signal, because it instructs

> decryption circuit 21 to decrypt the signal to produce session key S and program tiering level T_s. Ex. 1005 at 3:17-21, 3:44-46; Ex. 1001 ¶ 178. Also, $P(T_s+S+P)$ is a signal that carries information that is used by and enables decryption circuit 21 to decrypt signal $P(T_s+S+P)$ to produce session key S and program tiering level T_s, and thus under the construction of "instruct-to-enable" proposed by PMC in the district court litigation, signal $P(T_s+S+P)$ is an instruct-to-enable signal. *See* Ex. 1015 at 1.

Pet. 34.[18]

Addressing step [c] of claim 13, "passing said instruct-to-enable signal to a processor," and similar step [b] in claim 20, "detecting in said encrypted digital information transmission the presence of a first instruct-to-enable signal including first processor instructions," Petitioner relies on Mason's decryption circuit 21 as the claimed processor (*see id.* at 34–35), and contends that Mason "discloses that the first processor instructions of encrypted signal $P(T_s+S+P)$ are executed to provide a first decryption key, because encrypted signal $P(T_s+S+P)$ is decrypted by decryption circuit 21 to produce session key S" (*id.* at 41 (citing Ex. 1005, 3:17–22, Fig. 1; Ex. 1001 ¶¶ 202–204)).

Addressing remaining steps [d], [e], [f], and [g] of claim 13, Petitioner provides a detailed showing, supported by its expert, that reads the claim steps onto Mason's disclosure. Pet. 35–37 (citing Ex. 1001; Ex. 1005). Petitioner also reads the remaining steps of claim 20 and recited steps of

[18] Petitioner contends that it relies on a different instruct-to-enable signal (i.e., $P(T_s+S+P)$ transmitted with the information transmission) than the Examiner relied upon (i.e., D, not transmitted with the information transmission) during prosecution. *See* Pet. 34.

claims 14, 15, 18, 23, and 24 onto Mason's disclosure, supported by its expert. *Id.* at 37–44 (citing Ex. 1001; Ex. 1005). Petitioner's showing is persuasive, and we adopt it as our own, partly as summarized above.

In response, Patent Owner presents arguments similar to those presented with respect to Gilhousen. *See* PO Resp. 56–60. For example, addressing claims 13 and 20, Patent Owner contends that Mason fails to teach "decrypting said encrypted information" and "receiving an encrypted digital information transmission." PO Resp. 56–57. Patent Owner also argues with respect to claims 15 and 23 that Gilhousen does not disclose "decrypt a video portion of said programming." *Id.* at 57.

To support these arguments, Patent Owner relies on its claim construction argument that "encrypted digital information transmission" must be "*entirely digital*," and contends that Mason explicitly describes transmitted TV signal S(A) as a scrambled transmission that is not "*all-digital*." *Id.* at 56 (citing Ex. 1005, 1:4–9, 1:35–40, 1:52–66, 2:64–66; Ex. 2022 ¶¶ 192–197). Patent Owner similarly argues "decrypting" does not "encompass analog descrambling." *Id.* at 57.

These arguments turn on a claim construction by Patent Owner that we do not adopt. *See* Pet. Reply 20–21 (arguing Patent Owner does not dispute Mason meets the limitations under Petitioner's and the Board's construction). The arguments also fail to address Petitioner's showing that Mason's system receives encrypted digital data and decrypts the data. *See* Ex. 1005, Fig. 1 (digitally decrypting $P(T_s+S+P)$ using various keys and decryptors 20, 21), 4:3–56 (describing encryption of "bits" and "blocks" that have bits). Similarly, as Petitioner notes, Mason discloses the decrypting limitations of claims 13, 15, 20, and 23 by describing "session key S . . .

used in a third decryption circuit 23 ***for decrypting*** the information signal A." Pet. Reply 20 (quoting Ex. 1005, 3:17–22) (emphasis by Petitioner).

The arguments also fail to explain how the "method of decrypting programming," as set forth in claims 13 and 20, does not involve descrambling via the use of a key similar to the system of Mason. Programming, in the context of the '091 patent, includes analog television, according to broad disclosures of Figure 2A that use analog amplitude demodulators and according to the Wall Street Week embodiment, as explained above. *See supra* Section I.A., II.A.; Ex. 1003, 10:40–47, 11:50–61, Fig. 1, 159:57–61 (conventional analog Wall Street Week example "actuated by receiving digital key information"), Fig. 2A (amplitude demodulator 32 passing TV channel information, including, *inter alia*, analog audio signals of 0–15 KHz, through audio demodulator 35).

In addition, or in the alternative, the method of decrypting programming as recited in the preamble of claim 13, and outputting programming based on decrypting, as recited in the body of claim 13, do not necessarily require more than decrypting control and other signals embedded as digital encrypted information in the programming and then outputting said programming (including analog television of the Wall Street Week) based on said step of decrypting. *See, e.g.*, Ex. 1003, 148:13–16, 149:1–5, 154:4–6, 155:43–56 (describing Example #7—outputting Wall Street Week analog television at 8:30 PM based on processing of embedded signals "well-known in the art" and/or based on embedded signals in analog television).

Addressing claim 13 further, Patent Owner contends Mason's decryption circuit 21 does not constitute a processor. PO Resp. 59.

Addressing claim 20, Patent Owner contends the Petition does not show how Mason discloses both a first and second decryption key and first and second processor instructions. *Id.* Patent Owner also contends that Mason's "fixed-function circuitry 21 and 23 are not 'processors' since neither is described as a device that operates on data *according to instructions*," and Mason only transmits "numerical values" instead of instructions in signals P(Ts+S+P) and D(Tc+P). *Id.* at 60 (citing Ex. 2022 ¶¶ 209–210).

Claim 13 recites a processor, but claim 20 does not. Even if claim 20 implies two processors by reciting "executing . . . first [and second] processor instructions," Patent Owner does not dispute that circuits 20 and 21 of Mason each constitute a "device that operates on data," i.e., a processor according to our claim construction. *See* PO Resp. 60. As noted above and as Petitioner points out, Patent Owner proposed a similar claim construction for a "processor" as "any device capable of performing operations on data." *See* Pet. 8 (citing Ex. 1016, 12; Ex. 1018, 7–8); *supra* Section II.A.6.

In addition, with respect to executing processor instructions, Patent Owner does not address the preliminary finding in the Institution Decision that "Mason discloses that 'first decryption circuit 20 [is] responsive to distribution key D' and that 'second decryption circuit 21 is responsive to the second key P.' Ex. 1005, 3:17–20. In other words, 'responsive' indicates more than data—it indicates that the signals include control aspects of instructions." Inst. Dec. 41 (quoting Ex. 1005, 3:17–20); *see* PO Resp. 59–60 (arguing Mason only discloses the signals contain "numerical values," without addressing Mason's disclosure about circuits 20 and 21 being "responsive" to the noted keys).

As summarized persuasively by Petitioner, "[i]nstruct-to-enable signals D(Tc+P) and P(T_s+S+P) include 'processor instructions' because they include control signals that instruct decryption circuits 20 and 21 (each of which is a 'processor') to decrypt period key P and session key S." Pet Reply 22 (citing Petition 40–43); Ex. 1001 ¶¶ 203–210; Ex. 1005, 3:17–22, Fig. 1. Patent Owner does not dispute that the meaning of "instructions" includes "control or informational signals." *See* PO Resp. 24–25, 59–60. By being responsive to control or informational keys, decryptor circuits 20 and 21 execute those control signal instructions. *See* Ex. 1001 ¶¶ 203–210 (testifying "P(T_s+S+P) causes decryption circuit 21 to produce the session key S," such that P(T_s+S+P) constitutes "an instruction to the processor to perform its function," of decrypting and/or processing.

Patent Owner also argues that Mason does not disclose "determining a fashion in which said receiver station locates a first decryption key" or "locating said first decryption key" as claim 13 requires. PO Resp. 57–58. According to Patent Owner, "[t]he session key (alleged 'first decryption key') is decrypted, not *located*, from the incoming P(Ts+S+P) signal and then gated for output based on the Ts-Tc comparison. Such decryption and gating operations are fixed and occur in exactly the same way every time." *Id.* at 58.

These arguments are not persuasive. Patent Owner fails to explain what "operations" that the determining and locating steps preclude or require to be "fixed and occur in exactly the same way every time." *See id.* Patent Owner acknowledges the first decryption key S is decrypted "from the incoming P(Ts+S+P) signal." *Id.* In general, as Petitioner argues, even if the claims somehow require "operations" to vary, Mason's operations vary,

because Mason uses different keys depending on respective users and tiering levels. *See* Ex. 1005, Abstract; Ex. 1005, 3:40–46.

In other words, Petitioner persuasively rebuts Patent Owner's characterization of Mason as disclosing merely fixed operations:

> The receiver described by Mason determines the program tiering level Ts applicable to a given television program in order to . . . gain access to the session key S that is used to decrypt a given television program. Petition at 35; Ex. 1005 at 3:40–46; Ex. 1001 ¶[¶] 183–86. The receiver does so by processing instruct-to-enable signal P(Ts+S+P) which carries program tiering level Ts in an encrypted form. *Id.*

Pet. Reply 21.

It follows, as Petitioner shows, that decryptor circuit 21 must "locate" an encrypted version of variable key S in the variable incoming P(Ts+S+P) signal in order to decrypt it to its unencrypted version. *Id*. Claim 13 specifies "determining a fashion" of locating the "first decryption key" occurs "by processing said instruct-to-enable signal." Mason's circuit 21 processes "instruct-to-enable signal" P(Ts+S+P), which in turn, based on variables Ts, S, and/or P, determines the fashion of locating the first decryption key, because it is only by processing P(Ts+S+P) that decryptor circuit 21 "determines a fashion" (e.g., including the "how" of using variable key Ts) of locating and decrypting the key S in the signal P(Ts+S+P). *See* Ex. 1005, Fig. 1; Ex. 1001 ¶¶ 183–86. In addition, although Patent Owner also contends via claim construction that locating and decrypting cannot be "equated" and mean "different operations," this does not mean that locating precludes using variable keys in a decrypting process as a form of locating or as part of locating during initial or further processing of signal P(Ts+S+P). *See* Pet. Reply 20–21. Moreover, contrary to Patent Owner's

arguments, claim 13 does not require both "locating" and "decrypting" of the "first decryption key." *See id.* at 21.

Dr. Weaver's testimony largely tracks Patent Owner's arguments and fails to support Patent Owner for the same reasons outlined above. *See* Ex. 2022 ¶¶ 191–214. Patent Owner does not present separate arguments with respect to claims 14, 15, 18, and 24. *See* PO Resp. 61 (relying on arguments with respect to claims 13 and 20), 56–60 (presenting arguments for claims 13, 20, 15, and 23). The burden, however, remains on Petitioner to demonstrate unpatentability. *See Dynamic Drinkware*, 800 F.3d at 1378.

Petitioner's showing with respect to all of the challenged claims is persuasive, and we adopt it as our own. *See* Pet. 31–44 (citing Ex. 1001; Ex. 1008). For example, claim 14 recites first and second decryption keys, and Petitioner relies on Mason's keys S and P. *See* Pet. 38 (citing Ex. 1005 at 3:17–22, 6:50–57; Ex. 1001 ¶ 192). Claims 15 and 23 recite decrypting video portions of programming with first and second decryption keys. Claims 18 and 24 recite "said encrypted information includes television programming." For these limitations, Petitioner persuasively relies on first and second decryption keys S and P to decrypt scrambled television signal S(A). *See* Pet. 38–44 (citing Ex. 1001; Ex. 1005).

As discussed above, after reviewing the Petition and the supporting evidence and briefs, and based on the record, we find that Mason discloses each limitation of the challenged claims. Accordingly, in light of the foregoing, we determine we determine Petitioner has shown by a preponderance of evidence that Mason anticipates claims 13–15, 18, 20, 23, and 24.

3. Alleged Anticipation Based on Frezza

i. Frezza (Ex. 1006)

Frezza teaches a method of decrypting programming at a receiver station. Frezza's disclosed method "prevent[s] unauthorized programming viewing via a downloadable cable television converter" by comparing a booter checksum with a valid checksum extracted from a scrambled program. Ex. 1006, Abstract. "If the booter checksum and valid checksums match, a descrambler is enabled to descramble the scrambled program signal." *Id.* Frezza's system includes various forms of data, including "synchronization data," and the checksums for descrambling. *Id.* at 3:5–67.

ii. Claims 26 and 30

Addressing the preamble and step [a] of claim 26, respectively "a method of decrypting programming at a receiver station" and "receiving an information transmission including encrypted information," Petitioner contends that Frezza's system includes "encrypted information" in the form of scrambled video signal, which Frezza's system descrambles. *See* Pet. 45–46 (citing Ex. 1006, 2:41–47, 3:37–38, Fig. 1; Ex. 1001 ¶¶ 228–230).

Addressing step [b] of claim 26, "detecting the presence of an instruct-to-enable signal," Petitioner relies on Frezza's stored "initialization program . . . because it instructs the receiver to tune to a channel." *Id.* at 46 (citing Ex. 1006, 2:65–68; Ex. 1001 ¶ 231).

Addressing step [c], "passing said instruct-to-enable signal to a processor," Petitioner contends that Frezza discloses that microprocessor 24 accesses the initialization program. *See id.* at 47 (citing Ex. 1006, 2:65–68, 4:19–22; Ex. 1001 ¶ 232).

Addressing remaining steps [d], [e], [f], and [g] of claim 26, Petitioner provides a detailed showing that matches the claim steps to Frezza's

disclosure. *Id.* at 47–49. Petitioner also maps Frezza's disclosure to the recited steps of claim 30, which depends from claim 26, and recites "wherein said encrypted information includes television programming." *Id.* at 49. Petitioner points to Frezza's disclosure of a scrambled video (television) signal. Pet. 49 (citing Ex. 1006, 2–41, 3:37–38; Ex. 1001 ¶ 240). As indicated, Petitioner supports its showing by citing to its expert. *Id.* at 45–50 (citing Ex. 1001). Petitioner's showing is persuasive, and we adopt it as our own, partly as summarized above.

In response, Patent Owner contends that Frezza does not disclose encrypting and decrypting because "Frezza does not teach any encryption/decryption of digital programming as required by the claims." PO Resp. 61. Contrary to this claim construction argument, claims 26 and 30 do not recite "digital programming" or "digital," let alone the encryption or decryption of anything digital. Claim 26 recites "outputting said programming based on said step of decrypting." Claim 30 implies television programming is encrypted. The structure of the challenged claims further shows, as discussed at length above, that encrypting and decrypting respectively include scrambling and descrambling. In essence, Patent Owner's argument that "it is [not] necessary to distinguish 'encrypted digital information' from 'encrypted information,'" underlies the problem with Patent Owner's claim construction argument—i.e., challenged claim 13 itself makes the distinction that Patent Owner urges must be ignored. *See* PO Resp. 62. Patent Owner does not dispute that Frezza discloses the encryption and decryption limitations as we have construed those terms. *See id.* at 61–62.

As noted above, Petitioner reads the claimed instruct-to-enable signal onto Frezza's stored initialization program. In response, Patent Owner contends that Frezza does not disclose "*detecting* the presence of an instruct-to-enable signal," because Frezza's BOOT ROM contains the initialization program, and "microprocessor 24 must be *pre-informed* of the exact memory location of the initialization program . . . upon powering-up." *Id.* (emphases added).[19] Patent Owner reasons that Frezza's finding of the initialization program cannot constitute detecting it, "[o]therwise, every simple memory read from a known address would become a signal-detection operation, which is not so broadly described in the specifications." *Id.* at 63–64.

Patent Owner's argument that the microprocessor "must be pre-informed" of the memory location of the initialization program upon power up shows that the microprocessor only accesses the BOOT ROM upon power up, thereby detecting the program "[w]hen converter 11 is powered up." *See* Ex. 1006, 2:65–66. In other words, if the BOOT ROM stores the initialization program at the correct location, the processor will detect it; otherwise, it will not detect it. *See id.* at 2:65–68 ("When converter 11 is powered up, an initialization program stored in the 'BOOT ROM' 30 force tunes receiver 18 (via microprocessor 24) to the booter channel on which the incoming hooter image appears.")

Contrary to Patent Owner's assertion that reading the detecting phrase onto Frezza is "at odds with the ordinary meaning of 'detect,'" (PO Resp. 63), Frezza's system identifies the presence or existence of the initialization program in the BOOT ROM (as it must in order to find and execute the

[19] Patent Owner contended in District Court litigation that the "detecting" phrase in claim 26 does not require construction. *See* Ex. 2012, 4.

program). This disclosure, therefore, satisfies the ordinary meaning of "detect" according to Patent Owner's proffered "ordinary meaning": "'detect' (*i.e.*, 'to discover or identify the presence or existence of' something . . . ." *Id.* (citation omitted).

Patent Owner also asserts "Petitioner assumes, without any proof, that Frezza's initialization program (alleged 'instruct-to-enable signal') *designates* the 'booter channel.'" PO Resp. 64. According to Patent Owner, "Petitioner simply says **nothing** about channel designation." *Id.* (citing Ex. 2022 ¶ 230). Petitioner responds as follows:

> While ostensibly based on its construction of "designated," it is unclear what exactly PMC is arguing. There is no dispute that "designated" means "specified," and the initialization program (instruct-to-enable signal) specifies the channel (booter channel) to which the receiver station is automatically tuned upon power-up.

Pet. Reply 23 (citing Ex. 1006, 2:65–68).

Petitioner's point is persuasive. At the cited passage, and as quoted above, Frezza states upon "power[] up, an initialization program stored in the 'BOOT ROM' 30 *force tunes* receiver 18 (via microprocessor 24) *to the booter channel* on which the incoming booter image appears." Ex. 1006, 2:65–68 (emphasis added). Therefore, the initialization program necessarily designates the "booter channel" when it "force tunes" to it.

Dr. Weaver's cited testimony largely tracks Patent Owner's arguments and fails to support Patent Owner for the same reasons outlined above. *See* Ex. 2022 ¶¶ 222–230. Patent Owner does not present separate arguments with respect to claim 30. *See* PO Resp. 61–63. The burden, however, remains on Petitioner to demonstrate unpatentability. *See Dynamic Drinkware*, 800 F.3d at 1378. As discussed above, we have

reviewed the Petition and the supporting evidence and briefs, and based on the record we find that Frezza discloses each limitation of the challenged claims. Accordingly, in light of the foregoing, we determine Petitioner has shown by a preponderance of evidence that Frezza anticipates claims 26 and 30.

D. Alleged Obviousness of Claims 16, 21, and 27

Petitioner alleges that the combination of Gilhousen and Block or Mason and Block would have rendered claims 16 and 21 obvious, and the combination of Frezza and Block would have rendered claim 27 obvious. Pet. 29–31, 44–45, 49–58.

1. Gilhousen, Mason, or Frezza, with Block

i. Block (Ex. 1008)

Block discloses a system for providing subscription television services. Ex. 1008, Abstract. Each subscriber stores credit data associated with payments made by a subscriber. *Id.* A "stored . . . encoded 'use code' . . . provide[s] . . . a record of the impulse purchase programs viewed" (*id.* at 3:49–52), and "the use code will always provide an accurate indication of the . . . ACP [(impulse purchase capability)] programs viewed" (*id.* at 14:5–8).

ii. Claims 16, 21, and 27

Petitioner relies on Block to address the limitation of "storing information evidencing said step of decrypting" as recited in dependent claims 16, 21, and 27, which respectively depend from independent claims 13, 20, and 26. Pet. 29–31, 44–45, 49–50. For example, with respect to combining Block with Frezza to address claim 27, Petitioner contends

> Block adds the feature that if the program is unscrambled, the program identification code "is stored for subsequent retrieval as an encoded 'use code' so that the subscription TV operator can be provided with a record.". . . It would have been obvious to a PHOSITA to combine Frezza and Block and modify Frezza so that if a program was unscrambled, Frezza stored the identification code for that program for later retrieval.

Id. at 50 (citing Ex. 1008, 3:43–52; Ex. 1001 ¶ 245). Petitioner makes a similar showing with respect to the combination of Mason and Block, and the combination of Gilhousen and Block, to address similar limitations in claims 16 and 21. Petitioner specifically notes the similarities of the respective disclosed television subscriber systems, including embedding data with television signals, and contends that another advantageous reason to combine the relevant systems would have been to provide a record for pay-per-view billing. *See* Pet. 29–31, 44–45, 49–50. Petitioner's showing is persuasive, and we adopt it as our own. In summary, claims 16, 21, and 27 add the requirement of keeping track of a decryptor's use via a storage signal (e.g., a count) to the above-discussed requirements of independent claims 13, 20, and 26.

Patent Owner contends that the combinations of Frezza, Mason, or Gilhousen, with Block, fail to suggest the storing step of claims 16, 21, and 27, because Block's use code does not supply evidence of decoding or descrambling of transmitted programming that a user purchases for viewing. *See* PO Resp. 65–67. Patent Owner explains that another code, the STV code, "could . . . thwart the descrambling" of the purchased program, such that the use code "can be stored by a subscriber station to help *identify* the purchased program *presumably* viewed." *Id.* at 65–66 (citing Ex. 1008, 3:29–52). Patent Owner annotates Figure 4 of Block to allege "Block's

inability to evidence decryption/descrambling" based on the alleged function of the STV code. *Id.* at 67.

Patent Owner also contends that there would have been no motivation to combine Block's impulse buying feature with the systems of Frezza, Mason, or Gilhousen, because those systems do not use PPV (pay per view) or impulse purchases, and modifying them would "***require[] substantial modifications and experimentations***," including software changes. PO Resp. 68–70 (citing Ex. (Ex. 2022 ¶¶ 251, 263, 276). Patent Owner similarly contends an artisan of ordinary skill would have to employ "***substantial modifications and experimentations*** . . . to incorporate Blocks' impulse purchase capabilities." PO Resp. 68–69 (listing alleged modifications) (citing Ex. 2022 ¶¶ 251, 263, 271).

Patent Owner's arguments are not persuasive. Block shows that skilled artisans, motivated with a commercial desire to provide impulse or PPV purchases to paying broadcast customers, possessed the requisite skill to modify software and/or hardware in the similar systems of Frezza, Mason, or Gilhousen. *See, e.g.*, Ex. 1008, 19:16–20 (expressly declining to limit the disclosure "to the particular forms disclosed" and noting "variations and changes may be made by those skilled in the art"). The references of record, and both experts, evidence a moderately high level of skill in the electrical engineering broadcasting arts. *See* Ex. 1001 ¶ 87 (Bachelor of Science in "electrical engineering, or equivalent experience," and 2–4 "years of experience in the broadcast or cablecast television transmission fields"); Ex. 2001 ¶¶ 32–34 ("the equivalent of a Bachelor of Science in digital electronics, electrical engineering, computer engineering, computer science,

or a related technical degree," with 2–5 years of "post-degree experience in a similar field").

Regarding the arguments that an STV signal may thwart decoding, such that the use code only shows what a user "presumably viewed," Block states to the contrary in at least two places: The "stored . . . encoded 'use code' . . . provide[s] . . . a record of the impulse purchase programs viewed" (Ex. 1008, 3:49–52), and "the use code will always provide an accurate indication of the . . . IPC programs viewed" (*id.* at 14:5–8). As Petitioner also replies,

> Block explains . . . that "STV" refers to "subscription television" (Ex. 1008 at 4:65–5:1) in which "the video and/or audio signals are encoded (scrambled)" (*id.* at 7:10–11). Block describes that impulse purchase programs are a special category within the larger set of STV programs, thus a PHOSITA would have understood that the STV Program signal would be present in transmissions which include a use code. Ex. 1008 at 5:50–58; Ex. 1055 ¶¶ 7–12.

Pet. Reply 24. In other words, "Block explains that impulse purchase programs are in the category of programs that must be descrambled, and thus the use code that records impulse purchases also records evidence of decrypting." *Id.* (citing Ex. 1008, 3:29–52; Ex. 1001 ¶ 163; Ex. 1055 ¶¶ 7–12).

The record shows that Block explicitly teaches at least a desire to store accurate counting of viewed subscription television programs. *See* Ex. 1008, 3:47–52 ("Also, the unique program code, if transmitted with the cost information, is stored for subsequent retrieval as an encoded 'use code' so that the subscription TV operator can be provided with a record of the impulse purchase programs viewed."). Block discloses "scrambled STV programming," and other programming that does not require scrambling.

See id. at 5:11–17, 7:10–17. In other words, STV viewed programs require decoding/descrambling for viewing, as Petitioner argues. *See id.* at 5:11–17, 7:10–17; Pet. Reply 24; Ex. 1055 ¶¶ 8–12 (explaining the decoder remains inactive under normal programming and the '"STV program signal' which activates 'decode control circuit 98' would always be present when a transmission contains an impulse purchase program and its accompanying use code"). It follows that counting viewed STV programs constitutes, or at least suggests, counting descrambled or decoded programs; therefore, Block's stored use code constitutes, and suggests, providing accurate evidence of the step of decrypting for billing purposes.

As indicated above, Patent Owner cites to Block's Figures 1 and 4 as implying that the decoder provides no feedback and that an STV code provides an overriding input to a decoder. PO Resp. 67. Nevertheless, Block describes Figure 4 as representing "the functional operation" of "one embodiment." *See* Ex. 1008, 4:53–55. Block's stated goal of providing accurate counting of STV viewing use, and the different types of circuitry disclosed, shows Block does not limit its disclosure to either figure and that skilled artisans had the ability and motivation to employ all manner of logic signals to control decoding and/or provide an accurate count of decoded programs. *See id.* at 4:53–55. As another example falling within Block's generic teachings, Block describes addressing the decoder "to alter the viewing record or use code and to set a timer in the decoder." *Id.* at 9:9–13. In similar fashion, Figure 6 shows a use code entering compare circuit 162 with an output to control decoding. *See id.* at 4:60–63, 17:38–53.

Contrary to Patent Owner's arguments, Petitioner does not rely solely on a specific figure or bodily incorporation thereof, and the claimed

invention does not require the changes or experimentation asserted in order to implement a simple storage to evidence the act of decrypting. *See* PO Resp. 67, 69. In other words, the claims at most may require a simple storage, for example, of a tally of the use of the decoder in the systems of Mason, Frezza, and Gilhousen, based on the teachings of Block. Patent Owner does not dispute that the skill level would have been "moderately high," that Block at least teaches the "goal" of storing evidence of accurate counting of use of a decoder for billing or other purposes, or that "common knowledge" would have been involved. *See* PO Resp. 67. Claims 16, 21, and 27 do not recite a requirement for an accurate count of "said step of decrypting," but even if the claims implicitly require such a feature, Block discloses or teaches providing accurate counts of decoded program viewing without being limited to any single embodiment. *See id.* at 65–67; *see, e.g.*, Pet. 50 (relying on Block's general teachings to modify Frezza for counting descrambled programs to help with billing) (citing Ex. 1001 ¶¶ 241–246; Ex. 1008, 3:43–52).

Accordingly, Petitioner shows by a preponderance of evidence Block would have suggested a manner to store evidence of decryption/decoding in order to provide accurate billing information in the similar scrambling television systems of Frezza, Mason, and Gilhousen. As Petitioner also establishes, contrary to Patent Owner's arguments, Block discloses pre-arranged, subscription-based services, similar to those Patent Owner attributes to Gilhousen, Mason, and Frezza. *See* Pet. Reply 24 (citing Ex. 1008, 4:65–5:1); PO Resp. 69. Petitioner also establishes an artisan of ordinary skill would have been motivated to expand the capabilities of Gilhousen, Mason, and Frezza, in order to provide services without paying

in advance for them, as Block suggests. *See id.* at 25–26 (1001 ¶¶ 166–168, 224–224, 244–446; Ex. 1008, 3:29–52; Ex. 1001 ¶ 163; Ex. 1055 ¶¶ 7–12); Ex. 1008, 2:20–26 (providing impulse services without prepaying). Block notes an added obvious benefit of eliminating potential revenue loss by requiring advance payment on a per show basis. Ex. 1008, 4:37–39.

Based on the foregoing discussion, and in light of our analysis of secondary considerations below (namely, that Patent Owner fails to show a nexus to its alleged secondary considerations of non-obviousness), we determine Petitioner has shown by a preponderance of evidence that the combination of Frezza and Block would have rendered claim 27 obvious, and that the combination of either Gilhousen and Block, and Mason and Block, would have rendered claims 16 and 21 obvious.

2. Secondary Considerations

As Petitioner argues, Patent Owner fails to show a nexus to its alleged secondary considerations of non-obviousness: "None of the purported 'evidence' specifically relates to the '091 patent, let alone the Challenged Claims." Pet. Reply 25. By way of example, Patent Owner does not put its licenses in evidence or tie a challenged claim in the '091 patent to any single one of them. *See* PO Resp. 70. Patent Owner alleges it "has received professional acclaim and industry recognition of its inventions." *Id.* (citing Ex. 2024 ¶¶ 33–36). Again, Patent Owner does not even allege a nexus to a challenged claim in the '091 patent. Similar remarks apply to Patent Owner's allegation of citations to "the '091 Patent family." *Id.*; *see Therasense, Inc. v. Becton, Dickinson and Co.*, 593 F.3d 1289, 1299 (Fed. Cir. 2010) ("Abbott is incorrect in contending that it was entitled to the presumption of a nexus. This is not a situation where the success of a

product *can be attributed to a single patent*, because Abbott's Exactech product embodied at least two patents . . . .") (emphasis added).

The proffered evidence of secondary considerations only would be relevant to the claims challenged for obviousness, claims 16, 21, and 27 and not for an anticipation challenge, namely claims 13–15, 18, 20, 23, and 24. Claims 16, 21, and 27 depend respectively from claims 13, 20, and 26, and add an additional step of "storing information evidencing said step of decrypting." Adding this step to a claim anticipated in the prior art and that necessarily lack a nexus to secondary considerations of obviousness does not, by itself, create a nexus based on the added step as an ordered combination or otherwise. Patent Owner does not cite to anything in its secondary considerations that relates to showing a nexus or the unobviousness of claims 16, 21, and 27. To the extent relevant, we incorporate-by-reference our similar findings from a related case, wherein Patent Owner presented the same or similar evidence with respect to a different patent and different patent claims. *See* Ex. 1057, 45–54. Even if some loose nexus exists, considering the evidence as a whole, including the anticipation and obviousness discussions above and Patent Owner's arguments regarding secondary considerations, we conclude Petitioner has shown by a preponderance of evidence that challenged claims 16, 21, and 27 would have been obvious.

E. Summary of Petitioner's Challenges

Based on the foregoing discussion, Petitioner has shown by a preponderance of evidence that the challenged claims are unpatentable as follows:

A. claims 13–15, 18, 20, 23, and 24 as anticipated by Gilhousen;

B. claims 13–15, 18, 20, 23, and 24 as anticipated by Mason;

C. claims 26 and 30 as anticipated by Frezza;

D. claims 16 and 21 as obvious over the combination of Gilhousen and Block;

E. claims 16 and 21 as obvious over the combination of Mason and Block; and

F. claim 27 as obvious over the combination of Frezza and Block.

F. Patentability of Proposed Substitute Claims

In an *inter partes* review, any amended claims must be proposed as a part of a motion to amend the claims. 35 U.S.C. § 316(d). As the moving party, Patent Owner bears the burden of proof in establishing that it is entitled to add proposed substitute claims 53–85. 37 C.F.R. § 42.20(c); *see also Microsoft Corp. v. Proxyconn, Inc.*, 789 F.3d 1292, 1306–08 (Fed. Cir. 2015) (patentee bears the burden of showing that its proposed substitute claims are patentable over the prior art of record); *Prolitec, Inc. v. Scentair Techs., Inc.*, 807 F.3d 1353, 1363–64 (Fed. Cir. 2015) (same); *Idle Free Systems, Inc. v. Bergstrom, Inc.*, Case IPR2012-00027, slip op. at 7 (PTAB June 11, 2013) (Paper 26) (informative) ("For a patent owner's motion to amend, 37 C.F.R. § 42.20(c) places the burden on the patent owner to show a patentable distinction of each proposed substitute claim over the prior art."); *MasterImage 3D, Inc. v. RealD, Inc.*, Case IPR2015-00040 (PTAB July 15, 2015) (Paper 42) (same).

As part of this showing, Patent Owner must demonstrate (1) the amendment responds to a ground of unpatentability involved in the trial; (2) the amendment does not seek to enlarge the scope of the claims of the patent or introduce new subject matter; (3) the amendment proposes a reasonable number of substitute claims; and (4) the proposed claims are supported in the original disclosure. 37 C.F.R. § 42.121.

Upon review of the Motion to Amend, Patent Owner has not met all of the requirements of 37 C.F.R. § 42.121.

1. Responsive to a Ground of Unpatentability and Reasonable Number of Substitute Claims

Contingent upon the determination of unpatentability of the challenged claims, Patent Owner's Motion to Amend seeks to replace all of the challenged claims, claims 13–15, 17, 18, 20, 21, 23, 24, 26, and 27, with proposed substitute claims substitute claims 32–43. Paper 21, 1. That contingency has manifested. Patent Owner's Motion to Amend satisfies the burden with respect to a reasonable number of substitute claims and responsiveness. *See* 37 C.F.R. § 42.121.

2. Written Description and Enablement Support for the Proposed Substitute Claims

A motion to amend claims must identify clearly the written description support for each proposed substitute claim. 37 C.F.R. § 42.121(b); *see also* 35 U.S.C. 316 (d) (an "amendment" may not introduce "new matter"). The requirement that the motion to amend must set forth the support in the original disclosure of the patent is with respect to *each claim*, not for a particular feature of a proposed substitute claim. In other words, it is inadequate to show written description support for just the claim feature added by the proposed substitute claim. The motion must account for the

claimed subject matter as a whole, i.e., the *entire* proposed substitute claim, when showing where there is sufficient written description support for each claim feature. *See Nichia Corp. v. Emcore*, IPR2012-00005, slip op. at 4 (PTAB June 3, 2013) (Paper 27).

Opposing Patent Owner's Motion to Amend (Paper 21), Petitioner notes all of the substitute claims recite "receiving an encrypted digital information transmission including encrypted digital information and unencrypted digital information." Paper 29, 7. For this limitation, and others, Patent Owner relies on "Example #7, and [the] disclosure of the apparatus's functionality (['507] specification beginning) that supports all embodiments." Paper 33, 4 (the "'507 specification" corresponds to Exhibit 2050).[20] Petitioner contends that Patent Owner does not support the substitute claims, in part because "the encrypted and unencrypted digital information that PMC identifies in the specification are not sent in the same transmission, as required by the Substitute Claims." Paper 29, 8.

> In particular, Petitioner presents the following argument:
>
> PMC identifies "local-cable-enabling-message (#7)" as the unencrypted digital information and the "so-called 'digital video' and 'digital audio'" of the Wall Street Week Program as the

[20] Patent Owner states "support of the amended claims is based solely on U.S. Ser. Appl. No. 08/485,507, and centrally focused on 'Example #7' starting on page 288. (Ex. 2050.)" Paper 21, 3. Exhibit 2050 specifies a filing (mail room stamp) date of June 7, 1995 for the '507 specification (or '507 application). Ex. 2050, 1. Based on the face of the '091 patent, we assume the '507 specification corresponds to the '091 patent Specification. Patent Owner's arguments indicate it claims support through continuing applications back to 1987. *See* PO Resp. 8. Normally, Patent Owner must show support through each application in a chain, but Petitioner does not raise the argument and we need not reach it.

> encrypted digital information. Ex. 2130 at 12, 22–23, 34–35; Ex. 1052 at 46:7–47:12, 82:14–21, 88:14–89:7.
>
> . . .
>
> . . . The specification explains that "local-cable-enabling-message (#7)" is transmitted "[i]n the interval between said commence-enabling time and said 8:30 PM time . . . on the frequency of said master control channel." Ex. 2050 at 296, ll. 9–20; *see also* Ex. 1052 at 56:14–19. By contrast, the "digital video and audio" of the Wall Street Week program are transmitted "on cable channel 13, commencing at a particular 8:30 PM time." Ex. 2050 at 294 ll. 12–21; *see also* Ex. 1052 at 47:13–19. The encrypted digital information and unencrypted digital information identified by *PMC are actually transmitted on different channels and at different times, **not** in the same transmission*.

Id. at 7–8 (emphasis added). Petitioner makes a similar assertion related to the timing (i.e., same "transmission" requirement) of the "second instruct-to-enable signal" recited in claims 37–40, and the "instruct-to-enable signal" recited in claims 41–43, the latter of which Patent Owner's declarant (Ex. 2130, 35–36; Ex. 1052, 89:14–18) contends finds support in the specification as the "enable-CC13 instructions." *See* Paper 29, 9–10 (asserting "the 'enable-CC13 instructions' cannot possibly be detected 'in said encrypted digital information transmission.' Ex. 1055 ¶ 24. They are received as part of 'local-cable-enabling-message (#7)' which, as explained above, is received at *an earlier time* and on a different channel—the master control channel—than the 'so-called digital video' and 'digital audio' of the Wall Street Week program.") (Emphasis added).

Petitioner's arguments raise a persuasive point, which Patent Owner fails to address or rebut in opposition. *See* Paper 33, 4–5 (not addressing Petitioner's timing argument). Although Dr. Dorney generally testifies that

substitute claims 32–36 rely on digital video and audio, Dr. Dorney does not address the particular timing aspect raised by Petitioner. *See* Ex. 2030, 11–12 (providing string citations without addressing the implicit timing aspect of the claim 13). The passage cited by Petitioner, relating to "commencing [Wall Street Week transmission] at a particular 8:30 PM time on a particular Friday night" does appear to indicate that Example #7 involves transmitting to subscriber receivers the program at that 8:30 PM time. *See* Ex. 2050, 294:15–27. Other string cites and passages cited by Dr. Dorney fail to clarify if the '507 specification describes the claimed "instruct-to-enable signal" as being "detect[ed] in said encrypted digital information transmission," as each of independent substitute claims 32 and 41 require. *See* Ex. 2130 13, 11–13 (citing the "1st-WSW-program-enabling-message (#7)" and implying it supports the claimed "instruct-to-enable signal" without mentioning how it relates to the relied upon digital and audio video TV program alleged to support the claimed "encrypted digital information transmission").

Petitioner also argues a lack of support of the first and second instruct-to-enable signal recited in substitute claims 37–40. Petitioner contends that the '507 specification describes that signal as being embedded in an analog transmission, contrary to claim 37, which requires "detecting ***in said encrypted digital information transmission*** the presence of a second instruct-to-enable signal." Paper 29, 9.

Patent Owner's declarant identifies "2nd-WSW-program-enabling-message (#7)" as supporting this "second instruct-to-enable signal" recited in claims 37–40. Ex. 2130, 25; Ex. 1052, 85:13–16. Patent Owner does not dispute Petitioner's underlying premise that the '507 specification describes

the "2nd-WSW-program-enabling-message (#7)" as embedded in an analog television program. Paper 33, 6. Rather, Patent Owner responds "*[a]mended claims 37-40 do not require the encrypted and unencrypted digital information to be exclusive of analog signals*, except for any scrambled analog encoded information, in the encrypted digital information transmission." *Id.* (emphasis added). According to Patent Owner, its "claims echo the Board's own construction." *Id.*

The record supports Patent Owner's argument to a certain extent, because the substitute claims include mixed analog and digital signals: i.e., they are not "exclusive of analog signals." *Id.* Stated another way, according to Patent Owner, the substitute claims read on typical digital signals embedded in unscrambled analog television signals. *See id.* Nevertheless, Patent Owner does not show that the relied-upon and disclosed first and second instruct-to-enable signals are part of the same "encrypted digital information transmission including encrypted digital information and unencrypted digital information," which claims 37–40 require. *See* Pet. Reply 9–10.

Specifically, Dr. Dorney's citations do not show that the system sends within the same transmission the claimed "first instruct-to-enable signal" (Ex. 2030, 23–24) (alleged as sent "before said 8:30 PM time" and disclosed as "1st-WSW-program-enabling-message (#7)" embedded in an audio portion (*see* Ex. 2050, 302:20–29)) and the claimed "second instruct-to-enable signal" (Ex. 2030, 25) (alleged as sent "before said 8:30 PM time" and disclosed via the "2nd-WSW-program-enabling message (#7)" (*see* Ex. 2050:308:19–309:34)). Dr. Dorney does not address the timing requirement that the first and second instruct-to-enable signals must appear in the same

transmission according to claims 37–40. *See id.* at 25. Although, as noted, the system appears to send both the first and second instruct-to-enable signals at some time "before said 8:30 PM time" (Ex. 2050, 302:20–29, 308:19), the studio also "*commences* transmitting *analog* television information . . . and embeds and transmits particular SPAM message information," whereby the SPAM messages include the relied upon "2nd-WSW-program-enabling message (#7)." *See* Ex. 2050, 303:19–304:14 (emphasis added).

Consequently, as Petitioner argues, the relied-upon description fails to show clearly that this commencing of an analog transmission provides for the "2nd-WSW-program-enabling message (#7)" (second instruct-to-enable signal) to be detected in the same transmission as the relied-upon first instruct-to-enable signal. *See* Paper 29, 9–10; Ex. 2030, 306:35–307:7 ("Executing the instructions of said portion causes controller, 20, to cause the apparatus of the station of Fig. 4 to cease receiving and decrypting the television information of said cable channel 13 as digital video and audio, to commence receiving said television information as conventional analog television, and to prepare to receive particular embedded SPAM information at the decoder, 30, of signal processor, 200.").

Petitioner also contends that "digital video" and "digital audio" are not enabled. As indicated above, Patent Owner relies upon disclosures of digital audio and video to support its substitute claims, citing to Example #7. *See* Paper 29, 8 (citing Ex. 2050, 291: 9–17; Ex. 1055 ¶ 14). The alleged support relates to "decrypting programming" and the "receiving encrypted digital information" steps of the substitute claims.

For example, Patent Owner replies in part that the "'091 patent" shows a difference between digital and conventional (analog/NTSC) TV, thereby enabling "digital video" and "digital audio," as follows:

> In Example #7, *digital messages are incorporated in both the digital and analog TV transmissi*on. (*Id.* at 288:30–302:7.) Accordingly, "digital TV" is not designated digital due to embedded digital messages, but necessarily is TV encoded in a digital format. Third, the face of the '091 Patent lists prior art teaching digital TV including Huth and Golding as early as 1967. (Ex. 1003 at 14; *see also*, Exs. 2025–26, 2031, 2033–37, 2039). Fourth, commercial implementation is not the threshold when technical knowledge is ubiquitous. Apple's own expert, Mr. Wechselberger (Ex. 1001 at ¶17, ¶45), revealed he fully understood what digital TV was in 1983 by stating, "[t]he reason true digital video transmission techniques are not used in (*sic*) a matter of cost, both in terms of dollars and bandwidth." (Ex. 1027 at 4). Fifth, even Apple concedes digital TV was known. (Paper 29 at 12–13).

Paper 33, 4–5 (emphasis added).

Patent Owner's response does not address the full scope of enablement of the substitute claims, that is, all manner of digital information and/or modulation, including that transmitted with or without analog transmissions, including every type of programming so transmitted as of 1987, all of which Patent Owner implies falls within the scope of the claims. "[T]he specification at the time of filing must teach one of ordinary skill in the art to fully perform this method *across that entire scope*." *MagSil Corp. v. Hitachi Global Storage Techs.,* Inc., 687 F.3d 1377, 1381 (Fed. Cir. 2012) (emphasis added).

> Enablement serves the dual function in the patent system of ensuring adequate disclosure of the claimed invention *and of preventing claims broader than the disclosed invention*. . . . This important doctrine prevents both inadequate disclosure of

> an invention and overbroad claiming that might otherwise attempt to cover more than was actually invented. Thus, a patentee chooses broad claim language at the peril of losing any claim that cannot be enabled across its full scope of coverage. "The scope of the claims must be less than or equal to the scope of the enablement to ensure that the public knowledge is enriched by the patent specification to a degree at least commensurate with the scope of the claims." *Sitrick v. Dreamworks, LLC*, 516 F.3d 993, 999 (Fed. Cir. 2008) (quoting *Nat'l Recovery Techs., Inc. v. Magnetic Separation Sys., Inc.*, 166 F.3d 1190, 1195–96 (Fed. Cir. 1999)); s*ee also In re Fisher*, . . . 427 F.2d 833, 839 (CCPA 1970) ("[T]he scope of the claims must bear a reasonable correlation to the scope of enablement provided by the specification to persons of ordinary skill in the art.").

Id. at 1380–81 (emphasis added).

Simply put, the substitute claims are much "broader than the disclosed invention" and "cover more than was actually invented." *See id.* As stated at the outset, the '091 patent states it covers every type of programming. *See* Ex. 1003, 6:31–34 ("programming" includes "*everything* that is transmitted electronically to entertain, instruct or inform, including television, radio, broadcast print, and computer programming as well as combined medium programming" (emphasis added)). Patent Owner argues as quoted above and as addressed above that the original challenged claims and substitute claims cover "digital TV," or "TV encoded in a digital format." Paper 33, 4–5.

It is not clear what Patent Owner intends to cover by these statements. But, on this record, the claims conceivably would cover, according to Patent Owner's oblique assertions, every type of digital modulation scheme existing in 1987. For example, Patent Owner indicates the claims cover "digital TV" based on its citations to "Huth and Golding as early as 1967."

Paper 33. 4. Other than generic citations to digital video and audio, Patent Owner does not direct attention to any description of a single specific digital modulation scheme described in the '091 patent specification. *See id.* (citing Ex. 2050:30–302:7). As described above in Section II.A.2, the cited passages that rely on Example #7 and the "so-called" video and audio do not specify a clear digital modulation technique and they appear to describe, at least in part, embedding digital control signals in analog television. *See* Ex. 1003, 154:57–64, 155:44–46 (embedding control signals in analog television).

In any event, for enablement, as noted above, Patent Owner relies on what it asserts is well-known in the art. *See id.* at 4–5. As also noted above, Petitioner's expert testifies full-channel or full-field embedded digital transmission, was well-known. *See* Ex. 1001 ¶¶ 44, 41–51. Nevertheless, the '091 patent simply does not disclose what technique it relies upon, and in any event, it does not support and enable all digital modulation techniques seemingly covered by the substitute claims. *See* Ex. 1001 ¶¶ 43–47. Of course, regarding enablement, a specification need not disclose what is well known to those skilled in the art and preferably omits that which is well-known to those skilled and already available to the public. *See In re Buchner*, 929 F.2d 660, 661 (Fed. Cir. 1991); *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1384 (Fed. Cir. 1986); *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1463 (Fed. Cir. 1984).

But Patent Owner does not show that *the full scope* of the claims would have been well-known and enabled in 1987 even if full-channel or full-field embedded digital transmission (or something like Gilhousen's

system) would have been well-known and enabled. Although a specification need not disclose what is well known in the art, the knowledge of one skilled in the art cannot be relied upon to supply information that is required to enable the novel aspect of the claimed invention. *Auto. Techs. Int'l Inc. v. BMW of N. Am., Inc.*, 501 F.3d 1274, 1283 (Fed. Cir. 2007); *ALZA Corp. v. Andrx Pharms., LLC*, 603 F.3d 935, 941 (Fed. Cir. 2010).

Here, however, as throughout the trial proceedings, Patent Owner contends that all-digital television renders its claims novel and unobvious, moving to amend its claims accordingly. *See* PO Resp. 10 (relying on digital television); Paper 21, 3–4 (asserting "all amended claims require receiving the "encrypted digital information transmission is unaccompanied by any scrambled analog encoded information. *This limitation cannot be found in the prior art references cited by the Petitioner*." (emphasis added)), Appendix (including in all substitute claims, *inter alia*, "decrypting digital programming . . . including encrypted digital information and unencrypted digital information, wherein said encrypted digital information transmission is unaccompanied by any scrambled analog encoded information"); Paper 33, 4–5 (Patent Owner citing Example #7, Ex. 2050, 288:30–302:7 for alleged support of "digital and analog TV transmission"); Ex. 2022 ¶ 62 (Dr. Weaver testifying the '091 patent supports "***digital*** video and audio," (citing Ex. 1003, 143:20–30)).

The Example #7 passages of Exhibit 2050 (apparently corresponding to the same Example #7 as described in the '091 patent (Exhibit 1003)) cited by Patent Owner and Dr. Weaver (Paper 33, 4; Ex. 2022 ¶ 62) do not describe any specific digital modulation technique, and it is not clear how the passage supports the full scope of "digital TV" existing in 1987 (Paper

33, 4) or what the argued term encompasses. In addition to describing "*so-called* 'digital video' and 'digital audio,' [as being] *well known in the art*" (Ex. 2050, 32–33 (emphases added)), another relied-upon Example #7 passage describes "[e]xecuting the instructions of said portion causes controller, 20, to cause the apparatus of the station of Fig. 4 to cease receiving and decrypting the television information of said cable channel 13 as digital video and audio, *to commence receiving said television information as conventional analog television . . . .* " Ex. 2050, 306:35–307:5 (emphasis added). Even if these passages imply decrypting audio and video portions of a television show itself (and/or signals embedded in a portion normally reserved for video and or audio in a typical NTSV signal), the passage does not describe what type of digital modulation the disclosed system employs.[21]

In any event, other cited passages to the Specification and to other Exhibits showing what may have been known in the art at the time do not enable the full scope of the substitute claims. *See* Paper 33, 4–5. The cited Exhibits support the testimony of Petitioner's and Patent Owner's experts and reveal that digital television was an emerging field in 1987 (and even later). *See id.* (citing *inter alia*, Exs. 2025–2026, 2031, 2033–2037, 2039); Ex. 1001 ¶ 46 ("It was not until the 1990's that standards and technologies, such as MPEG-2, became sufficiently advanced to provide digital television as that term is used today."), ¶¶ 43–47 (generally showing digital systems

[21] This citation refers to page numbers provided by Patent Owner to Exhibit 2050. It correlates to Patent Owner's citations to Exhibit 2050 in Paper 33. Patent Owner cites to original page numbers of the specification instead of the numbers Patent Owner provides at the bottom of Exhibit 2050.

evolving); Ex. 1055 ¶ 14 (asserting digital television cable systems not enabled); Ex. 2043, 102 (1985 IEEE article supplied by Patent Owner concluding "*considerable circuitry is needed*" to "maintain the degradations of distortions" for digital 16 and 64 QAM (quadrature amplitude modulation)); Ex. 2025, 14 (1980 IEEE article describing "trends" using "multiphase modulation" generating "enthusiastic efforts to develop and use digital approaches in actual television networks"), 20 (describing "[e]xtensive studies and developments" using QAM: "When such technologies become available, an RF bandwidth of 10 MHz or even narrower will be sufficient to transmit television program signals with a slight increase in transmitter power."); Ex. 2046, 487 (1985 IEEE article noting performance degradation in 64–QAM and 256–QAM, describing hybrid data-under-voice (DUV), hybrid data-in-voice (DIV), and data-above-voice systems (DAV), noting "the performance of 256-QAM under various effects . . . is not yet available in the literature," and showing various system block diagrams); Ex. 2040, 2 (1979 IEEE article describing various PSK, QPRS, FDM-FM, and 16 QAM modulation schemes, noting "[a] problem arises at the demodulator in the practical hardware design phase"); Ex. 2043, Abstract (1985 IEEE report describing "the problem of non-linearity characteristics in microwave power amplifiers for digital radio link systems with multi-level modulation").

Dr. Weaver agrees that "digital television may have been in its infancy in 1981 and 1987" (Ex. 2022 ¶ 135) and was "a nascent technology" (*id.* ¶ 141). Nevertheless Dr. Weaver contends digital TV was enabled. For example, Dr. Weaver cites a November 1981 Popular Science article as promoting "HDTV," but the article itself states "*no one plans to disrupt*

today's standard TV programming." *Id.* ¶ 135 (quoting Ex. 2026, 110). The article also describes "this large-bandwidth *requirement is a problem, major efforts* are under way to shrink the frequency space *needed* for digital TV. 'One of the things we can do is reduce the number of bits [binary digits] necessary to describe a picture.' *Id.* ¶ 138 (quoting Ex. 2026 at 110) (emphases added).

The '507 specification does not provide any working examples or guidance with respect to a single digital modulation technique, an emerging technology at the time of the invention. Citations listed partly above by Patent Owner imply Patent Owner intends for the breadth of the claims to include all manner of such techniques, indicating undue experimentation would have been required to enable the full breadth of the substitute claims. Moreover, Petitioner challenges enablement of different types of digital video in the context of conventional cable channels that would have included typical analog programs. *See* Paper 29, 8 (citing Ex. 1055 ¶ 15). The '507 specification does not explain sufficiently how it includes a single digital modulation technique, let alone all other then-existing types of digital modulation video techniques (with or without NTSC signal integration). *See* Paper 21, 11 (Patent Owner indicating the substitute claims cover mixed standard TV and digital programs by arguing they cover encrypted digital video and audio transmissions without "*scrambled* analog encoded information" in the transmission); Ex. 2022 ¶ 130 (citing a 1976 article describing sampling and decoding for NTSC television with error correction).

The evidence suggests, as noted further below in the obviousness discussion of the proposed substitute claims, that Gilhousen enables a type

of digital PAM modulation with NTSV, but nothing in the ’091 patent indicates what the inventors contemplated in the nature of a specific technique. Moreover, Patent Owner contends “Gilhousen teaches away from an all-digital transmission” technique that involves higher sampling rates. Paper 33, 8. This contention further obscures what the ’091 patent enables, because other arguments rely on prior art techniques for enablement, Gilhousen presents one such technique, and the ’091 patent does not discuss different sampling rates.

As the ’507 specification does not describe a single modulation technique, let alone describe integrating a digital modulation technique with a standard television NTSC signal (if that was the intent), it is not clear what it describes and what the substitute claims encompass, and in any case, it does not enable the full scope of various digital modulation techniques embraced by the substitute claims and under consideration or study at the filing time of the ’507 specification (i.e., 1987). *See Auto. Techs.*, 501 F.3d at 1283 (“Noticeably absent is any discussion of the circuitry involved in the electronic side impact sensor that would provide more detail on how the sensor operates.”); *ALZA*, 603 at 942–43.

As an example, as described above in Section II.B.1 (Priority), Patent Owner’s cited Figure 2A (and other figures) show a “standard amplitude demodulator, 32” as a first stage for stripping digital information, which “uses standard demodulator techniques, well-known in the art, to define the television base band signal,” further showing it is not clear how the multitude of cited digital modulation techniques would have been contemplated to be integrated with the ’091 patent’s disclosed techniques. *See* Ex. 1003, Fig. 2A, 18:45–46. During prosecution of the ’091 patent,

Patent Owner described "**example # 6** and especially **example # 7**," as "*includ[ing] both digital and analog television* signals . . . relat[ing] to the 'Wall Street Week program.'" Ex. 1043, 12 (emphasis added).[22]

Absent further description in the '091 patent, by alleging and relying on all manner of different types of digital modulation to transmit every type of programming to support its claims via known prior art, it is not clear what the substitute claims cover, and it follows that that Patent Owner does not show enablement or that the inventors had possession of the full scope of the substitute claims. *See, e.g.*, Ex. 2022 ¶¶ 129, 131 (indicating, by alleging enablement via different articles, that the substitute claims cover, *inter alia*, current "MPEG 2 and MPEG 4" formats, and past "16QAM," "64QAM," and "256QAM" techniques).

Assuming the '091 patent enables one of the known or developing techniques by virtue of implicit reliance on a known technique, the '091 patent fails to indicate which of the known techniques, including a known digital modulation technique, it relies upon. By claiming broadly without a

[22] As discussed above, Patent Owner relies on Figure 2A (Path C) in asserting original 1981 support for "all-digital TV." *See* PO Resp. 33 (citing Ex. 1009, Fig. 2A—which pertains to materially the same Figure 2A in the '091 patent). The '091 patent indicates some aspects of Figures 1–3 relate to Figure 4, a subscriber station that pertains to aspects of Example #7. Material aspects of Figures 1 and 3 apply to Figures 2 and 4, including the same divider 4, monitor 202M, decoder 203, and microcomputer 205. *See* Ex. 1003, 147:50–52. Decoder 203 generally detects digital information embedded in television lines and appears to be contemplated as part of systems in each of Figures 1–4. *See* Ex. 1003, Fig. 1 (referring to decoder 203 as shown in Fig. 2A) Fig. 2 (referring to decoders 30 and 40 in Figs. 2A and 2B), 1:50–55, 12:27–30, 1:50–55, 12:27–30.

sufficiently clear indicator of what type of prior art "digital . . . transmission" and "digital programming" techniques the claims encompass, the substitute claims do not enable the full scope of the claims. *See Auto. Techs.*, 501 F.3d at 1285 ("We also reject ATI's argument that because the specification enables one mode of practicing the invention, *viz.*, mechanical side impact sensors, the enablement requirement is satisfied. We addressed and rejected a similar argument made in *Liebel–Flarsheim Co. v. Medrad, Inc.*, 481 F.3d 1371 (Fed.Cir.2007)."). Based on the foregoing discussion, Patent Owner has not met the burden of showing enablement and written description for the full scope and (allegedly novel aspects) of the claims, which cover all manner of digital modulation techniques.

Given our holding concerning written description and enablement with respect to all of the substitute claims, we decline to address Petitioner's remaining contentions regarding a lack of support for the substitute claims. Patent Owner has not met the burden of demonstrating that the '507 specification supports the challenged claims.

3. Obviousness of the Proposed Substitute Claims

Substitute claim 32 follows:

> A method of decrypting digital programming at a receiver station, said method comprising the steps of:
>
> receiving an encrypted digital information transmission including encrypted digital information and unencrypted digital information, wherein said encrypted digital information transmission is unaccompanied by any scrambled analog encoded information;
>
> detecting in said encrypted digital information transmission the presence of an instruct-to-enable signal;
>
> passing said instruct-to-enable signal to a processor;

> determining a fashion in which said receiver station locates a first decryption key by processing said instruct-to-enable signal;
>
> locating said first decryption key based on said step of determining;
>
> decrypting said encrypted digital information using said first decryption key;
>
> creating, based on at least a portion of said encrypted digital information transmission, a digital record including a unique digital code identifying said receiver station;
>
> automatically transmitting said digital record to a remote station, wherein said transmitting transmits digital information unaccompanied by any non-digital information transmission; and
>
> outputting said digital programming based on said step of decrypting.

i. Gilhousen, Jefferson, Campbell, Claims 32–40

Petitioner contends that the Gilhousen, or the combination of Gilhousen and Jefferson, or Gilhousen and Campbell, renders claims 32–40 obvious. Paper 29, 11–17. Petitioner's showing partly tracks its showing with respect to claim 13. With respect to the receiving limitation set forth in the first step above, Petitioner contends Gilhousen discloses a number of digital signals, some of which are encrypted and others that are not. *See id.* at 12 (citing Ex. 1004, 12:17–28, listing Gilhousen's IV frame count signal, subscriber key generation number, encrypted channel key, and encrypted category key).

Addressing claim 32, Petitioner contends "[a]ll of the scrambled information sent and received in Gilhousen is digital, not analog." *Id.* (citing Ex. 1055 ¶ 27). Petitioner adds "[t]o the extent this limitation is not expressly disclosed in Gilhousen, it would have been obvious, by PMC's own expert's admission. Dr. Weaver devotes nine pages to his opinion that

'digital television . . . was well known to people of ordinary skill in the art by the 1980s.'" *Id.* (citing Ex. 2022 ¶¶ 127–141). As motivation, Petitioner cites the similar reasons for using descrambling of analog television or other signals, for example, in order to limit access of transmitted content to paying customers. *See id.* at 13 (citing Ex. 1001 ¶¶ 52–56); *see, e.g.*, Ex. 1001 ¶ 53 ("the development of encryption/decryption techniques . . . limited access to premium content to the appropriate subscribers").

Petitioner relies on Jefferson to modify Gilhousen to store digital records and include a unique descrambler subscriber address in order to allow a billing center to identify a subscriber and bill her accordingly for impulse purchases. *Id.* at 14; Ex. 1001 ¶ 54 (in the late 1970s, the need to change to provide remote services "led to the development of 'addressable converters,' which were remotely programmable STBs that could be controlled from the headend to provide varied subscription packages and PPV [(pay-per-view)] programming"). Petitioner separately addresses claims 33–40 alleging they would have been obvious with a persuasive showing that partly tracks its similar showing with respect to claim 32. *See* Paper 29, 14–18.

Addressing claims 32–40 as a group, Patent Owner replies that "[s]crambling in the digital domain is not the question. Gilhousen clearly shows 'scrambled TV' being transmitted as analog encoded information. (Ex. 1004, Figs. 1, 3; Ex. 2140, Fig. 4b, incorporated by reference)." Paper 33, 7–8. Patent Owner also contends "Gilhousen teaches away from an all-digital transmission based on Mr. Wechselberger's statement that cost prevented adoption of an all-digital system." *Id.* at 8 (citing Ex. 1027, 4).

In other words, Patent Owner concedes Gilhousen transmits all-digital information at least up to Gilhousen's D/A converter 62. Based on Gilhousen's system, modifying a carrier wave with PAM to retain the digital information in PAM would have been obvious. *See* Ex. 1001 ¶¶ 114–120, ¶ 118 (stating "Gilhousen explains that the digital control signals are 'pulse-amplitude-modulated' such that the digital signals are carried on an analog transmission" (citing Ex. 1004, 8:51–59, 11:52–65)). Although, at the cited passages, Gilhousen refers to the transmission as analog (as discussed above in the challenge to the issued claims), given that Gilhousen modulates a carrier wave with digital video and audio signals via use of a D/A converter (*see* Ex. 1001 ¶ 118; Ex. 1008, Fig. 4), the receiver converts the baseband back to digital, indicating that whether the baseband signals transmit as a digital or an analog signal constitutes minimal or no difference in terms of the functionality of transmitting information. Moreover, Patent Owner does not direct attention to a specific digital modulation scheme in the '091 patent so that no patentable difference can be ascertained about the breadth of the challenged claims relative to a modified or unmodified version of Gilhousen's disclosure.

The record shows an artisan of ordinary skill would have considered Gilhousen's PAM signals readily capable of being transmitted as digital information riding on a carrier. *See* Ex. 1001 ¶¶ 51, 118. As further evidence of this, as noted above, Gilhousen describes the PAM audio information as having "a level related to the binary value of the digital words." Ex. 1004, 11:64–65. Patent Owner's arguments regarding teaching away, significant costs, undue experimentation, etc., do not apply to the data rate scheme that Gilhousen's system already employs and which already

transmits PAM signals, and includes baseband digital video signals, and therefore, easily could have implemented as something like prior art well-known full channel digital schemes or other fully digital modulation schemes. *See* Ex. 1004, 6:46–50 (transmitter A/D converter 52 sampling analog video at 14.32 MHz and storing 8-bit samples of digital video prior to transmission); 1001 ¶ 44; Ex. 2022 ¶¶ 130–131 (Dr. Weaver alleging composite NTSC digital video was known in 1976 and "[b]y 1987, 64QAM and 256QAM were in widespread use, which enabled data rates of 36 Mb/s and 48 Mb/s, respectively.")

Put another way, assuming for the sake of argument the substitute claims require a digital modulation technique, a skilled artisan easily would have envisioned using Gilhousen's PAM digital baseband signals to modulate a standard TV carrier wave for the purpose of retaining and sending the digital information highly suggested by Gilhousen's PAM scheme itself, in addition to the admitted known digital modulation techniques. *See* Paper 33, 7–8; Ex. 1001 ¶¶ 44, 48–51 (discussing known full channel digital systems), ¶¶ 118–120 (discussing Gilhousen); Ex. 2022 ¶¶ 128–131 (alleging well-known digital modulation and digital techniques). Such a scheme would have been obvious for the purpose of obtaining the digital baseband information at the receiver and eliminating a requirement to strip digital information from an encoded analog transmission, using known digital modulation and demodulation techniques cited by Patent Owner, and at most, slightly modifying Gilhousen's scheme. *See* Ex. 1004, Fig. 4.

Patent Owner acknowledges that Gilhousen "selects his [digital] sampling rates and transmission scheme according to the NTSC (analog) standard" (Paper 33, 8), but the claims do not require a conversion to a

higher sampling rate in order to be transmitted without the D/A converter using a simple PAM modulation of a carrier wave to create an "all-digital transmission." As noted, Patent Owner's expert, Dr. Weaver also submits that although the technology was in its infancy, at least some digital techniques were well-known and enabled, including, for example, use of "16QAM modulation." *See* Ex. 2022 ¶¶ 131, 127–41; Paper 29, 12–13 (citing Ex. 2022 ¶¶ 127–141 for the proposition); Ex. 1001 ¶¶ 44–47 (discussing maximizing throughput as well-known in 1981 and 1987 by using "full-channel" by replacing all active video lines with embedded digital data) ¶ 51 (noting digital information obviously could have been anywhere in the video transmission).

In addition, as explained above, Patent Owner's argument in support of claim 37 maintains that the challenged claims do not preclude embedded digital signals (such as "2nd-WSW-program-enabling-message (#7)" (second instruct-to-enable signal)) in an analog transmission. Paper 33, 5–6. Patent Owner submits the amended claims only preclude a *scrambled analog* transmission. *See id.* (Patent Owner arguing "[a]mended claims 37–40 do not require the encrypted and unencrypted digital information to be exclusive of analog signals, except for any scrambled analog encoded information, in the encrypted digital information transmission.").[23] As explained above, Gilhousen's system re-orders the digital audio and video information in the digital (baseband) domain, so that even if it is transmitted on a carrier to somehow create an analog transmission, the transmission contains no *analog* scrambled information. *See* Ex. 1004, 7:3–6, 16:60–64

[23] All the substitute amended claims contain the relevant limitations argued with respect to claims 37–40.

(re-ordering digital base-band signals). Moreover, no dispute exists that digital encryption was well-known and obvious for the purpose of protecting data and Gilhousen's system at least suggests providing other standard encryption (in addition to simple re-ordering as encryption) for the purpose of avoiding piracy or unauthorized viewing. *See, e.g.*, Ex. 1001 ¶¶ 52–65 (describing development of pay-per-view television).

Further regarding claim 32, Patent Owner notes Petitioner "combines Jeffers with Gilhousen to teach creating and automatically transmitting a digital record with a unique digital code identifying the receiver station." Paper 33, 8. Patent Owner contends "Jeffers discloses an identity key ***only for decryption***, and teaches exactly the contents of the subscriber unit ***transmission with the identity key completely absent.***" *Id.* (citing Ex. 1066, 14:54–68). Patent Owner appears to be arguing that Jeffers does not teach identifying the receiver station. *See id.* Patent Owner also alleges Petitioner's declarant provided conclusory testimony, but Patent Owner does not even allege that the combination of Gilhousen and Jeffers fails to disclose or suggest any particular claim element. *See* Paper 33, 8.

Patent Owner's arguments do not rebut Petitioner's showing. The claim 32 recitation "creating [a digital record], based on at least a portion of said encrypted digital information transmission," does not preclude creating the digital record based on unencrypted digital information, because said "encrypted digital information transmission" includes both encrypted and unencrypted digital information according to the first clause of claim 32. Also, contrary to Patent Owner's allegation of Petitioner's showing as conclusory, Petitioner shows that transmitting a digital record with a unique digital code identifying the receiver station would have been obvious over

the combination of Gilhousen and Jeffers in order to track billing of identifiable subscribers. *See* Paper 29, 13–14; Ex. 1055 ¶¶ 28–29. Simply put, the system must identify the receiver station to bill the user, rendering that step obvious for that purpose.

Regarding claims 37–40, Patent Owner presents arguments directed to memory. Paper 33, 9. Claim 37 requires a "central processing unit interacting with random access memory ['RAM'], and reprogrammable nonvolatile memory storing said digital data." Patent Owner contends Petitioner "erroneously identifies four memories in Jeffers, when there are only three." *Id.* Patent Owner also alleges Petitioner "fails to identify the distinctly claimed 'random access memory,'" and that "a CPU is an instruction-based device (Ex. 2144), not just any 'processor.'" *Id.*

These arguments and related arguments fail to allege that using a RAM with a CPU would have been unobvious for the intended purpose of storing data and processing data as required by any well-known CPU system. *See* Paper 33, 9 (citing prior art Ex. 1067 (without a pin cite), and admitting "CPUs may only interact with RAM and ROM memories absent 'reprogrammable nonvolatile memory'"); Ex. 1003, 146:66–68 (describing use of "conventional cable converter boxes with capacity, well known in the art"); 161:1–4 ("microcomputer, 205, radio tuner & amplifier, 213, TV tuner, 215, audio recorder/player, 255, and video recorder/player, 217, all of which are well known in the art"); Paper 29, 4 (Petitioner arguing the invention uses conventional components).

Claim 37 appears to require two memories, a RAM and nonvolatile memory, with a CPU ("central processing unit"). Citing its expert, Petitioner contends "a PHOSITA would have also understood that the

control processor [of Jeffers as combined with Gilhousen] would interact with RAM (for temporary storage) and reprogrammable nonvolatile memory (for permanent storage, e.g., firmware storage)." Paper 29, 16 (citing Ex. 1055 ¶ 36). Petitioner also contends the combination of Gilhousen and Jeffers would have rendered the limitations obvious, where Jeffers "describes the use of 'ROM,' 'EAROM,' 'BRAM,' and 'non-volatile RAM (Random Access Memory).'" *Id.* at 17 (citing Ex. 1066, Fig. 2B, 11:14–16). Petitioner relies on Gilhousen's control processor 202 as "understood . . . to be a central processing unit because it controls the receiver's operation." *Id.* at 16 (citing Ex. 1004, 14:36–44, Fig. 7; Ex, 1055 ¶ 36). Storing user or password data to control viewing as Jeffers teaches in a non-volatile memory would have been obvious in order to preserve the data. *See* Paper 29, 15–17 (citing Ex. 1066, 11:11–18).

Patent Owner also contends Gilhousen and Jeffers "both use the HBI," so that combining Jeffers into Gilhousen must result in removing pieces of the HBI. Paper 33, 9. "The new system is now beyond simple substitution with a predictable outcome." *Id.* This argument is not persuasive, because claims 37–40 do not preclude using an HBI. Patent Owner does not explain why they do or even allege that they do. *See id.* In any event, as explained above, a predictable modification of Gilhousen's system renders it able to transmit all-digital information while using the HBI and/or the VBI, a common practice. *See* Ex. 1001 ¶¶ 37–40 (explaining the typical use of HBI and VBI as using embedded digital control signals, and/or digital closed captioning), ¶ 44 (explaining in a known ANTIOPE system of 1981, "the entire video channel is filled with data packets"), ¶ 47 (in 1981 or 1987, digital information transmission typically meant "a standard television

broadcast signal that carried digital information—either as embedded VBI data or full-channel embedded data (where all active video lines were replaced with digital information)").

Regarding the "storing digital data" clause of claim 37 (*see* Paper 33, 15–16 (addressing the clause)), Patent Owner also points to Petitioner's alleged reliance on Campbell's threshold code 238 as being "transmitted by PCS 50 (head end)" and argues "Campbell is silent as to entry of a threshold setting using a local input (Ex. 1067 at 16:15-18:49, Fig. 13), or any 'reprogrammable nonvolatile memory.'" Paper 33, 9 (citing Ex. 1067, 9:62–68, Figs. 6–7). Patent Owner's argument mischaracterizes Petitioner's showing. Petitioner does not contend Campbell's PCS 50 sends threshold code 238; rather, Petitioner contends code 238 "may be set by the subscriber." Paper 29, 16 (citing Ex. 1067, 14:9–22; Ex. 1055 ¶ 39). Indeed, Campbell discloses "threshold code 238 is set by the authorized party." Ex. 1067, 14:18. As noted, Petitioner also relies on Jeffers and Gilhousen to satisfy the "storing digital data" clause. *See* Paper 33, 15–16 (citing Ex. 1055 ¶¶ 41–42). Also, as indicated above, non-volatile memories for processors were ubiquitous at the time of the invention. It would have been obvious (if not almost necessary) to store Jeffers' or Campbell's user-entered codes in a non-volatile memory and modify Gilhousen's system so that a user would have been able to control viewing by others as the references fairly suggest. *See* Paper 29, 15–16; Ex. 1067, 14:9–22.

Patent Owner also argues "[c]ontrary to claims 34 and 39, Gilhousen teaches two distinct methods: descrambling for the audio / video, and decrypting for the keys. (Paper 29 at 17; Ex. 1004 at 19:28-30; Ex. 2141 at 4:20-33, Figs. 4-7.) Gilhousen and the Substitute Claims distinguish the two

methods." Paper 33, 10. Patent Owner also argues "[u]nlike claims 36 and 40, Gilhousen teaches reception of analog, not digital, video and audio. (Paper 29 at 18; Ex. 1004 at Fig. 3 (line 47))." *Id.*

Contrary to these arguments, as discussed above, Petitioner establishes it would have been obvious to convey all-digital transmission using Gilhousen's system, because Gilhousen's system already processes all data as digital in the digital base band at the receiver and transmitter. Ex. 1004, Abstract, Figs. 3–5. As such, the system easily could have transmitted all-digital information using the NTSC transmission format, based on encryption keys that Gilhousen discloses, as was well known in the art, which is not disputed. *See, e.g.*, Ex. 1001 ¶¶ 44–51 (describing "full-channel" or filling the entire video channel with data packets). Even if re-arranging digital data using a digital encryption key, which Gilhousen also discloses, does not read on encrypting, it also was well-known to provide encryption of all manner of digital data for security—i.e., in order to protect it from unauthorized viewing and for control. *See* Ex. 1001 ¶¶ 48–56. As discussed at length, Gilhousen's system outputs baseband digital programming based on encryption keys. Ex. 1004, Abstract, Fig. 5.

Patent Owner also contends Petitioner

> fails to address outputting "said digital programming" and separately claimed "***also*** outputs information dependent on said digital data." From the [']507 Application, PMC supported the two elements as digital audio (transmitted digital programming) and a user's stock portfolio performance graph (resulting from locally entered digital data stored in reprogrammable nonvolatile memory, and particular to a subscriber).

Paper 33, 9–10 (citing Paper 21, 20–21; Ex. 2130, 28–30). The relevant part of claim 37 recites "outputting said digital programming [which refers back

to the preamble] based on said step of decrypting, wherein said outputting also outputs information dependent on said digital data." The "wherein said outputting also" clause does not require outputting information based on decrypting—it only requires being "dependent on said digital data." Patent Owner does not argue otherwise. The term "digital data" refers back to "information particular to a subscriber." Of course, it need not be a user's stock portfolio performance, contrary to Patent Owner's arguments alleging support. *See id.*

In any case, contrary to Patent Owner's argument, Petitioner does address the limitation, and Patent Owner fails to address Petitioner's showing. *See* Paper 33, 9–10. That is, according to Petitioner's showing, the combination of Gilhousen and Jeffers renders obvious outputting information dependent on subscriber data, because Jeffers allows a subscriber to record a unique pass code "which will then be required to authorize the viewing of an impulse pay-per-view program," and the password or passcode is entered via a receiver keyboard and stored in a non-volatile RAM. *See* Paper 29, 15 (citing Ex. 1066, 11:11–18). Jeffers' passcode/password entered and created by a user to control pay-per-view program viewing at a user's home reasonably constitutes "digital data comprising information particular to a subscriber," and the control pay-per-view program constitutes "information dependent on said digital data." As noted, Patent Owner fails to allege, let alone show, to the contrary.

Based on the foregoing discussion, Patent Owner does not rebut Petitioner's persuasive showing that claims 32–40 would have been obvious. In summary, Petitioner shows that the dependent claims involve predictable encryption and decryption methods related to digital programming. *See*

Paper 29, 14–17. We adopt Petitioner's showing as our own. *See id.* at 11–17. Patent Owner fails to meet its burden of showing claims 32–43 would have been unobvious. Even if Petitioner has the burden, Petitioner shows that claims 32–40 would have been obvious.

ii. Seth-Smith, Claims 32–43

Petitioner contends that Seth-Smith (Ex. 1064) would have rendered claims 32–43 obvious. Paper 29, 18–25. According to Petitioner, addressing common subject matter as recited in the "receiving" step of each of claims 32, 37, and 41, "Seth-Smith discloses receiving an encrypted digital information transmission including encrypted digital information (i.e., encrypted teletext, audio, and command and control data) and unencrypted digital information (i.e., subscriber addressing data)." Paper 29, 18 (citing Ex. 1064, 5:40–46, 9:56–10:11, 12:17–32, 13:67–14:11, 17:30–33, 40:46–47). Citing Seth-Smith and the testimony of Mr. Wechselberger, Petitioner contends that Seth-Smith transmits digital data in the "full field mode," such that "[a PHOSITA] would have understood that when teletext programming is received in 'full field mode,' all the lines of the video signal are occupied by digitally encoded data." *Id.* at 18–19 (citing Ex. 1064, 16–60–64; 1055 ¶ 46. That is, the "received transmission is unaccompanied by any scrambled analog encoded information." *Id.* at 19.

Petitioner reads Seth-Smith's key source code on the (sole or first) instruct-to-enable signal recited in claims 32, 37, and 41. Paper 29, 19 (citing Ex. 1064, 27:65–28:12, 28:34–38). Petitioner cites locating the key of the month ("KOM") as locating said first decryption key. *Id.* ("the key source code instructs the subscriber's decoder how to locate the decryption key"). Petitioner reads the remaining limitations of claims 32–43 onto Seth-

Smith's disclosure. *See id.* at 18–25. Petitioner reads another reference to Seth-Smith ("Seth-Smith 2"), as suggesting the step of storing digital data comprising information particular to a subscriber, and outputting information dependent on said digital data as set forth in claim 37, with some overlap as set forth in claims 32 and 40. *See id.* at 22–23.[24]

With respect to claims 32–43, Patent Owner contends Petitioner "relies on a three sentence description of 'full field mode' to presuppose that video (scrambled analog) is never sent in the claimed transmission." Paper 33, 10 (citing Paper 29, 19; Ex. 1064, 16:60–65). Patent Owner adds "[f]ull field mode may only be used for a single field, is not in the preferred embodiment, and is not necessarily used during the transmission of keys, which [Petitioner] relies on and only occurs hourly for KOM. (Ex. 1064, 20:43–21:2, 23:16–52, Fig. 15)." Paper 33, 11. Patent Owner also contends: "Teletext is typically transmitted with the TV signal, so this feature has limited use." *Id.* at 10–11 (citing Ex. 1064, 7:39–41).

Patent Owner's arguments are not persuasive, the claims read on non-preferred embodiments and teletext. Patent Owner fails to explain how sending a KOM (key of the month) hourly bears on Petitioner's showing. The "determining a fashion" and "locating" steps do not require finding the "first decryption key" (Seth-Smith's KOM) in the received "encrypted digital information transmission." In any event, Seth-Smith sends the KOM key in packet 78 "transmitted on a regular basis throughout the month, e.g.,

[24] Petitioner also contends "Seth-Smith expressly incorporates U.S. Patent No. 4,829,569 (Ex. 1065) by reference," and contends in the alternative it would have been obvious to employ the teachings of U.S. Patent No. 4,829,569 (Ex. 1065) in Seth-Smith in order to address relate problems. *See* Paper 29, 23 n.2.

on the order of once every hour or so." Ex. 1064, 20:67–21:2. That particular packet represents one packet of data sent, and other packets contain other data, with packets sent in groups. *See id.* at 17:18–20, 21:15–45 (describing packets 80, 82, 84, 85), Fig. 10. "The data transmitted in the addressed packet can vary quite widely, as indicated generally in FIG. 13." *Id.* at 20:43–44.

Regarding the "single field" argument, Patent Owner fails to explain why the claims do not read on a single field as part of a group of data. In any event, Seth-Smith's system sends multiple fields together using multiple data packets. For example, Seth-Smith discloses sending 30 frames per second, and 2 "fields" per video "frame." Seth-Smith discloses a 16-field cryptocycle that includes multiple packets, with for example, packet A spanning 8 fields. *See id.* at Fig. 8. In context, to the extent it is relevant, on this record, the claims read on a "single field" of a frame, at least as sent with multiple fields, or packets, where a frame includes VBI, HBI, and video lines, and includes encrypted and unencrypted digital information unaccompanied by any scrambled information, at least in full frame mode. *See* Ex. 1064, Figs. 4, 5, 8, 9, 10, 20. Packets of data may be repeated as parts of different fields in successive fields, or as otherwise necessary. *See id.* at 15:3–15, 54–59, Fig. 8.

Furthermore, regarding the transmission of keys, Petitioner contends Seth-Smith either discloses or renders obvious the substitute claims. Petitioner specifically contends that, even if the substitute claims somehow require including a key with a full field in the same single field or frame, sending control and other information along with a full field or otherwise in successive packets would have been contemplated or well-known based on

Seth-Smith and known prior art techniques. *See* Paper 29, 18. Petitioner also contends "[a] PHOSITA would have understood that when teletext programming is received in 'full field mode,' all the lines of the video signal are occupied by digitally encoded data." *Id.* at 18–19 (citing Ex. 1055 ¶ 46). Mr. Wechselberger's testimony supports Petitioner's contentions. Ex. 1055 ¶ 46 (citing (Ex. 1064, 12:17–32, 13:67–14:11, 16:60–64, 22:39–23:51, Figs. 14, 15); Ex. 1001 ¶ 40 (testifying "by 1981, it was well known in the art to include data and control signals in television programming" VBI lines), ¶ 44 (testifying "[b]y 1981, it was also well known that digital data transmission throughput could be maximized by replacing all the 'active video' information with digital information,") (citing Ex. 1022, 4; Ex. 1021, 16; Ex. 1025, 15).

As noted, Seth-Smith discloses use of VBI, HBI, and the video portion of fields. Ex. 1064, Fig. 4. Seth-Smith discloses sending corporate messages via teletext or utility data. Ex. 1064, 50:61. Seth-Smith discloses "encrypted" "assembled teletext, video, and audio," using "packets," with some portions "in clear text" (i.e., "not encrypted"), and some packet portions including "certain cipher key information used in decrypting system control data." *See* Ex. 1064, 9:55–67. The system transmits "digital audio" during the "horizontal blanking interval and may be provided on a pay-per-listen basis." *Id.* at 9:50–55. The VBI of each field contains "system data . . . as well as addressed packets and teletext lines used to carry data needed for the operation of individual decoders." *Id.* at 12:17–22. The VBIs of "16 total fields are used for complete transmission of all system data required, which includes an encryption key which is changed every 16 fields." *Id.* at 12:25–30.

Figure 1 describes "ENCRYPTION" of "VIDEO, AUDIO, TELETEXT, SYSTEM DATA." Figures 5 and 10 reveal sending video data, including control signals, encrypted data, and full field mode one-bit "to allow teletext or addressed packets to be transmitted on what would otherwise be lines of the video signal." *Id.* at 16:60–65, Figs. 5, 10. Some teletext pages of transmitted packets may be encrypted and linked to other pages that may not be. *Id.* at 22:66–68.

In other words, as set forth above, and as Petitioner contends, Seth-Smith conveys sending data in a digital format that meets the receiving step of claims 32, 37, and 41, i.e., "unaccompanied by any scrambled analog encoded information," especially in the full field mode. The Specification fails to provide the same level of detail that Seth-Smith provides, so that in context, Patent Owner's arguments fail to rebut Petitioner's showing or present a patentable distinction of its substitute claims over Seth-Smith. As noted above in the discussion of support for claim 37, Patent Owner not only concedes, but argues, its claims read on digital data embedded in analog television—albeit to the exclusion of non-scrambled analog. Paper 33, 6 (arguing "[a]mended claims 37-40 do not require the encrypted and unencrypted digital information to be exclusive of analog signals, except for any *scrambled* analog *encoded* information" (emphasis added)).

With further respect to claims 32–36, Patent Owner contends Seth-Smith only provides "one-way" pay-per-view and record keeping systems, and "teaches away from a user station uplink." Paper 33, 11 (citing Ex. 1064, 9:38–40, 10:19–27, 17:45–66, 21:64–66, 27:34–58). In context, Patent Owner does not dispute Petitioner's allegation that a two-way system satisfies certain claim steps. *See id.*; Paper 29, 20–21.

As Patent Owner contends, Seth-Smith states "'it is highly undesirable that a continuous uplink or landline connection be provided.'" Paper 33, 11 (quoting Ex. 1064, 21:64–6610:19–27; citing 10:19–27). Nevertheless, the quoted sentence does not teach away from all two-way communication systems embraced by the claims. As Petitioner shows, Seth-Smith discloses that the system supports impulse pay-per-view (which requires two-way communication). *See* Paper 29, 20 (citing Ex. 1064, 17:54–66). Petitioner also relies on Jeffers and Mr. Wechselberger to support its showing that two-way communication would have been obvious to support pay-per-view data and access to other services such as view data via cable or otherwise. *See id.* (citing Ex. 1055 ¶¶ 57–61; Ex. 1066, 14:58–68, 15:22–25, 15:34–40).

At the passage quoted by Patent Owner, Seth-Smith describes continuously transmitting templates in a menu-driven system as part of an effort to save memory space locally at the decoder so that decoders can be "economically manufactured." *See* Ex. 1064, 21:47–68. At the passage cited by Patent Owner, Seth-Smith specifically states "[t]he system of the invention is completed by means permitting the user to communicate with the broadcaster. . . . for example, to request addition of a service, or to pay a bill or the like." *Id.* at 10:19–28 (stating telephone functionality suffices so that "no uplink facility . . . need be provided.). An artisan of ordinary skill reading the cited and quoted passages in context of the full disclosure of Seth-Smith would have recognized that providing two-way communication for the purpose of providing impulse buying and including "personal messages," by limiting a slew of "identical" screen teletext features "transmitted repetitively" for common messages, would have been economical, feasible, and desirable for different types of communication

purposes, either via telephone, cable, or even another type of uplink facility. *See id.* at 22:2–8. Moreover, "[t]hat a given combination would not be made by businessmen for economic reasons does not mean that persons skilled in the art would not make the combination because of some technological incompatibility. Only the latter fact would be relevant." *In re Farrenkopf*, 713 F.2d 714, 718 (Fed. Cir. 1983) (citing *Orthopedic Equipment Co. v. United States*, 702 F.2d 1005, 1013 (Fed. Cir. 1983)).

With further respect to claims 37–40, Patent Owner contends they "require a CPU ***interacting*** with RAM." Paper 33, 11 (citing Ex. 2143). Patent Owner contends Seth-Smith's "microprocessor 114 ***only receives*** information stored in RAM sent by the MATS processor." *Id.* (citing Ex. 1064, 28:34–40, Fig. 17). This argument is not persuasive. Claim 37 does not specify how "interacting" results in anything claimed in the method. Seth-Smith at least suggests microprocessor 114 interacts with RAM to receive data. Figure 17 indicates RAM 124 sends data to microprocessor 114 via ROM 117, with control keys 8 interacting with the MATS microprocessor which controls RAM 124. *See, e.g.*, Ex. 1064, 27:50–59 (RAM 124 stores received teletext data responsive to microprocessor 114 inputs). In other words, MATS microprocessor 122 and processor 114 dependently work together to handle decoder and teletext functions, as Petitioner fairly indicates. *See* Paper 29, 22. Also, or as such, the two processors together reasonably constitute a CPU. *See* Ex. 1064, 26:59–62 ("As shown in FIG. 17, *the microprocessor 114 is assisted in its operations by a chip* referred to as MATS 122, these letters being an acronym for Microprocessor and Teletext Support." (Emphasis added)).

Patent Owner presents the following arguments with respect to claim 37:

> Next, [Petitioner] argues a passcode (Paper 29 at 22-23; Ex. 1065 at 24:15-27) meets the claimed limitation "storing digital data . . . originated at said receiver station, . . . reprogrammable nonvolatile memory storing said digital data." Seth-Smith is silent about how the passcode originates (possibly by PCS 50 (headend)), where it is stored, and "***also*** outputs information dependent on said digital data", which is different from "outputting said digital programming."

Paper 33, 11. Patent Owner's arguments are not persuasive. At the passage referenced by Patent Owner and relied upon by Petitioner, Seth-Smith clearly indicates a user locally originates the pass code, which allows the user to watch movies and other material dependent on the input of the pass code. *See* Ex. 1065, 24:15–19, 23–27 (describing a user preventing a baby-sitter from purchasing expensive programs via use of "the input of a specific user identification number before it will accept input from a 'BUY' button," and to watch "X-rated movies, . . . the user . . . *need simply input* his personal user identification *when he desires to watch such material*" (emphasis added)). Claim 37 does not specify how long "outputting" lasts, so that the claim allows for outputting movie clips during or immediately after, for example, outputting teletext (where closed-captioning text would be sent during a movie or show). In addition, Patent Owner does not clarify what the phrase embraces, but "also" in the outputting information clause may specify that the "output[ed] information" is *dependent on said digital signal*," such that digital programming (outputted based on said decrypting step) either includes (within it) or does not include (i.e., is somewhat separate in time from) "information dependent on said digital data."

Patent Owner also argues

> [f]or claims 36, 40, and 43, Seth-Smith teaches audio assembled with scrambled video in a preferred embodiment, but is silent as to the audio in the non-preferred embodiment of the "full field mode" teletext relied upon by [Petitioner]. (Paper 29 at 25; Ex. 1064 at 9:46-55, 16:60-65). Teletext output does not have an audio component. (Ex. 2100).

Paper 33, 12. Patent Owner's arguments are not persuasive. As explained above, Petitioner shows that artisans of ordinary skill would have recognized that Seth-Smith conveys within its disclosure that full or partial teletext frames and/or packets may include digital audio in the HBI and/or other control signals in the VBI.

With respect to claims 41–43, Patent Owner contends Petitioner's "identified single-bit 'source switch' command does not ***designate*** a channel as claimed. The Board concurs. (Paper 14 at 45)." *Id.* Contrary to Patent Owner's argument, the single bit in Seth-Smith includes an option of switching the decoder to a single transmitter channel, because "plural transmitters" includes a limited set of two transmitters, one in operation, and the "new transmitter" to which the single bit specifies the disclosed switch (transfer). *See* Ex. 1064, 19:22–27. The passage states the transmitters send "the same program material" on different transmitters, implying, or at least suggesting, each transmitter sends the designated program on the channel designated by that program. *See id.* In other words, skilled artisans would have recognized that Seth-Smith refers to switching to a designated channel so the user can view the same program. In contrast, our preliminary rationale that Patent Owner cites reasons (on that limited preliminary record) that Kelly discloses a stepping process as Patent Owner argued, so that a single bit *as described in Kelly* does not select a channel. *See* Inst. Dec. 45.

In contrast, Seth-Smith does not disclose such a stepping process (and it specifies switching to a transmitter for the same program as noted).

Based on the foregoing discussion, Patent Owner does not rebut Petitioner's persuasive showing that claims 32–43 would have been obvious. In summary, Petitioner shows that the dependent claims involve predictable encryption and decryption methods related to digital programming. *See* Paper 29, 21–25. We adopt Petitioner's showing as our own. *See id.* at 18–25. Patent Owner fails to meet its burden of showing claims 32–43 are unobvious. Even if Petitioner has the burden, Petitioner shows that claims 32–40 would have been obvious.[25]

III. CONCLUSION

Petitioner has demonstrated, by a preponderance of the evidence, that claims 13–15, 17, 18, 20, 21, 23, 24, 26, 27, and 30 of the '091 patent are unpatentable. Patent Owner has not demonstrated, by a preponderance of the evidence, that the Motion to Amend meets the requirements set forth in 37 C.F.R. § 42.121. Regardless of who carries the burden on the Motion to Amend, the record shows by a preponderance of the evidence that the proposed substitute claims are not patentable.

[25] Petitioner also contends the substitute claims do not embrace patent-eligible subject matter as 35 U.S.C. § 101 requires, because the claims recite abstract features involving "well-understood, routine, conventional activity." *See* Paper 29, 4 (citing *Affinity Labs of Tex., LLC v. DIRECTV, LLC*, 838 F.3d 1253, 1262 (Fed. Cir. 2016); *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 715 (Fed. Cir. 2014). Given our holding of unpatentability of the substitute claims, we need not reach this additional issue, which somewhat involves a determination of what may have been conventional, routine, thereby potentially overlapping with our determination of obviousness

IV. ORDER

For the reasons given, it is

ORDERED that claims 13–15, 17, 18, 20, 21, 23, 24, 26, 27, and 30 of the ’091 patent are unpatentable;

FURTHER ORDERED that Patent Owner’s Motion to Amend is *denied*; and

FURTHER ORDERED that because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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