UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON, D.C.

Before the Honorable MaryJoan McNamara
Administrative Law Judge

In the Matter of	
CERTAIN DIGITAL VIDEO RECEIVERS AND RELATED HARDWARE AND SOFTWARE COMPONENTS	**Investigation No. 337-TA-1103**

ROVI'S CORRECTED POST HEARING BRIEF

TABLE OF CONTENTS

TABLE OF ABBREVIATIONS

Abbreviation	Full Name
’011 Patent	US Patent No. 7,779,011
’585 Patent	US Patent No. 7,827,585
’741 Patent	US Patent No. 9,369,741
1001 Investigation	Investigation No. 337-TA-1001
Agmt.	Agreement
Asgmt.	Assignment
AIA	America Invents Act
ALJ	Administrative Law Judge
API	Application program interface
AS&R	Advanced Search & Recommendation
Asserted Patents	’011, ’585, ’741 Patents, collectively
Asserted Products	Certain digital video receivers and related hardware and software components of Comcast’s X1 System
Att.	Attachment
CapEx	Capital Expenditure
CBP	U.S. Customs and Border Protection
CDO	Cease and desist order
COGS	Cost of Goods Sold
Comcast	Comcast Corporation; Comcast Cable Communications, LLC; Comcast Cable Communications Management, LLC; Comcast Business Communications, LLC; Comcast Holdings Corporation; Comcast Shared Services, LLC, collectively
Commission or Comm’n	United States International Trade Commission
Complainant(s)	Rovi Corporation; Rovi Guides, Inc; and Veveo, Inc.,

Abbreviation	Full Name
	collectively
CPHB	Complainants' Pre-Hearing Brief
CX	Complainants' exhibit
CDX	Complainants' demonstrative exhibit
Dep.	Deposition transcript
DI	Domestic Industry
DI Products	i-Guide, Passport, AS&R, Next-Gen Platform, and TiVo Bolt with Experience 4.0, collectively
DOE	Doctrine of Equivalents
Ex.	Exhibit
FCC	Federal Communications Commission
Fig[s].	Figure[s]
FP&A	Financial Planning and Analysis
Hearing	The Evidentiary Hearing that took place in October 2018 in this Investigation (Inv. No. 337-TA-1103)
HD	High definition
HDD	Hard disks
HW	Hardware
ID	Initial Determination
IP	Internet Protocol
IPG	Interactive Program Guide
IPR	Inter Partes Review
iVOD	Instant Video-On Demand
JX	Joint exhibit

Abbreviation	Full Name
LEO	Limited exclusion order
Ltr.	Letter
Markman Order	Order No. 41 (Oct. 15, 2018)
Mot.	Motion
MSD	Motion for Summary Determination
MTC	Motion to Compel
NDA	Non-Disclosure Agreement
P&E	Plant and Equipment
P&L	Profit and Loss
POSITA	Person of Ordinary Skill In The Art
PTAB	Patent Trial and Appeal Board
PTO	U.S. Patent and Trademark Office
R&D	Research and Development
RAM	Random-Access Memory
Reb.	Rebuttal
Resp.	Response
Respondent(s)	Comcast Corporation; Comcast Cable Communications, LLC; Comcast Cable Communications Management, LLC; Comcast Business Communications, LLC; Comcast Holdings Corporation; Comcast Shared Services, LLC, collectively
RPHB	Respondents' Pre-Hearing Brief
[redacted]	[redacted]
Rog[s]	Interrogatory / Interrogatories
Rovi	Rovi Corporation; Rovi Guides, Inc; Rovi Technologies Corporation; and Veveo, Inc., collectively

Abbreviation	Full Name
RWS	Rebuttal Witness Statement
RX	Respondents' exhibit
RDX	Respondents' demonstrative exhibit
RPX	Respondents' physical exhibit
S&M	Sales and Marketing
Sched.	Schedule
SD	Standard definition
STB	Set-top box
Stip.	Stipulation
Supp.	Supplemental
T9	Text on 9 keys
Tr.	Transcript
TSI	Tivo Solutions, Inc.
TV	Television
U.S.	United States
VCR	Videocassette recorder
Veveo	Veveo, Inc.
[redacted]	[redacted]
WS	Witness Statement
[redacted]	[redacted]

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I. INTRODUCTION

From the invention of a TV Guide-on-Screen to the acquisition of TiVo, the Rovi companies have been pioneers in the media technology industry. At Rovi offices across the United States, Rovi's talented engineers, product managers, and others develop, maintain, and grow its interactive program guide (IPG) products and entertainment-content solutions. In April 2016, Rovi brought proceedings in the ITC and in district courts against Comcast because Comcast—alone among its many pay-TV cable and satellite competitors—refused to renew its license to Rovi's patent portfolio. In the 1001 Investigation,[1] the Commission found that Comcast violated Section 337, and issued an Exclusion Order and Cease and Desist Orders. After removing the infringing feature subject to that finding, Comcast continued to import products that infringe other Rovi patents, forcing Rovi to come to the Commission a second time to enforce its patent rights.

A. Procedural History

On February 8, 2018, Rovi[2] filed its Complaint naming Comcast[3] as Respondent. The Commission instituted the Investigation on March 12, 2018. Pre-Hearing briefs were filed in August 2018, and the Hearing was held in October 2018.

B. The Parties

Complainant Rovi Corporation is incorporated in Delaware and has a principal place of business in San Jose, CA. Rovi Guides, Inc. (f/k/a Gemstar-TV Guide International Inc.) is

[1] *Certain Digital Video Receivers & Hardware & Software Components Thereof*, Inv. No. 337-TA-1001, Comm'n Op. (Nov. 21, 2017) (*Digital Video Receivers*).

[2] Rovi Corporation, Rovi Guides, Inc, Rovi Technologies Corporation, and Veveo, Inc. (collectively, Rovi). Rovi Tech. Corp. has since been withdrawn. Order No. 33 (Aug. 29, 2018).

[3] Corporation, Comcast Cable Communications, LLC, Comcast Cable Communications Management, LLC, Comcast Business Communications, LLC, Comcast Holdings Corporation, and Comcast Shared Services, LLC (collectively, Comcast).

incorporated in Delaware, has a principal place of business in San Jose, CA, and is a wholly-owned subsidiary of Rovi Corporation. Rovi Guides, Inc. owns the '585 and '741 Patents. JX-0173 (Stips.) at ¶¶ 2-3. Veveo, Inc. is incorporated in Delaware, has a principal place of business in Andover, MA, and is a wholly-owned subsidiary of Rovi Corporation. Veveo, Inc. owns the '011 Patent. *Id.* ¶ 4. These Rovi companies provide IPG products and entertainment-content solutions in use by hundreds of pay-TV providers and millions of home subscribers in the United States. Rovi also has a significant patent licensing program, and every major pay-TV provider in the United States has a license to Rovi's portfolio—except Comcast.

Respondents Comcast Corporation and Comcast Holdings Corporation are Pennsylvania corporations. Comcast's Resp. at 8 (Apr. 3, 2018). Comcast Cable Communications, LLC, Comcast Cable Communications Management, LLC are Delaware LLCs. *Id.* at 9. Comcast Business Communications, LLC is a Pennsylvania LLC. *Id.* These companies all have principal places of business in Philadelphia, PA. *Id.* Comcast Shared Services, LLC is a Delaware LLC with a principal place of business in New York, NY. *Id.*

C. Overview of the Technology & Patents

The Asserted Patents relate to IPG technology and functionalities for entertainment content: searching, managing recordings, and restarting a program from the beginning. Complaint ¶¶ 61, 75, 89. An IPG allows users to navigate a guide to access program information and content. Armaly Tr. 116:20-117:3; Gaeta Tr. 201:15-202:8.

Rovi asserts U.S. Patent No. 7,779,011 ('011 Patent), claims 1 and 9; U.S. Patent No. 7,827,585 ('585 Patent), claims 1, 8, 11, 15, and 22; and U.S. Patent No. 9,369,741 ('741 Patent), claims 1, 8, and 14 (collectively, Asserted Patents and Claims). The '011 Patent, titled "Method and System for Dynamically Processing Ambiguous, Reduced Text Search Queries and Highlighting Results Thereof," issued on August 17, 2010. JX-0001 ('011 Patent); JX-0002

('011 Patent Correction). This patent relates to searches for items including, but not limited to, television content, where the user's search query is input using a device having a text input interface with overloaded keys. JX-0001 ('011 Patent).

The '585 Patent, titled "Electronic Program Guide with Digital Storage," issued on November 2, 2010. JX-0004 ('585 Patent). This patent relates to managing the recording of television programs, allowing users to flexibly manage the recording of television programs by, for example, configuring padded recording times so the ending of the program that runs over the scheduled time is not missed. *Id.*

The '741 Patent, titled "Interactive Television Systems with Digital Video Recording and Adjustable Reminders," issued on June 14, 2016. JX-0006 ('741 Patent). This patent enables a user to start a program from the beginning when, for example, the user tunes to the program after the broadcast has already started. *Id.*

D. The Products at Issue

1. The Accused Products

Generally, the Accused Products comprise certain digital video receivers and related hardware and software components of Comcast's X1 System, including all Comcast X1 set-top boxes (STBs) initially imported after April 1, 2016.[4] Compl. ¶¶ 51-55, Doc. No. 636148 (Feb. 8, 2018). As explained below as to each Asserted Patent, there is no difference relevant to infringement among the X1 Accused Products. Comcast has identified certain accused STBs as [redacted], JX-0163C ([redacted]).

2. Domestic Industry Products

The Domestic Industry Products are set forth in a timeline, CDX-0019, presented at the

[4] Rovi seeks no remedy as to any product that was initially imported during the term of the parties' license agreement that expired on March 31, 2016. Compl. ¶ 9 n.2; Complainants' Notice of Withdrawal of Certain Accused Products, Aug. 1, 2018 (Doc. ID No. 651870).

Hearing and attached here as DI Attachment 1, Ex. A[5]; Armaly Tr. 120:5-125:10. They include:

- **Rovi's Classic Guides, i-Guide and Passport (practicing the '585 Patent)**, are IPGs that operate on QAM networks (as opposed to newer IP networks) and provide users with interactive discovery and navigation functions. Gaeta Tr. 200:22-202:8; CX-1159 (i-Guide Video); CX-1162 (Passport Video). *Id.* at 204:18-205:17; CX-0640 (i-Guide Product Details); CX-0641 (Passport Product Details). Approximately 8 million U.S. subscribers use the Classic Guides in their homes today. CX-1379C (U.S. Revenue). Updated versions are scheduled for release soon. Gaeta Tr. 221:10-20, 225:3-11; CX-0488C (Roadmaps) at 8-9.
- **Rovi's AS&R software (f/k/a SmartRelevance, SmartSearch, and Reveal) (practicing the '011 Patent)** provides an advanced television experience via features directed at improving users' ability to quickly search for content. Koenig Tr. 427:20-435:7. One such feature, which practices the '011 Patent, relates to the use of overloaded key index searching to provide incremental and highlighted search results. *Id.* at 430:6-434:10. AS&R customers have included Verizon, DISH, DirecTV, and Comcast. *Id.* at 435:12-20. Cablevision/Altice currently uses AS&R. *Id.* at 435:21-438:2
- **Rovi's Next-Gen Platform (practicing the '011, '585 and '741 Patents) (Next-Gen)** is Rovi's newest IPG solution. Next-Gen delivers IP-based capabilities derived from both FanTV and TiVo elements. *Id*. at 239:3-242:11. The platform provides users with guide and content discovery services, and it can be run on a variety of hardware devices. *Id.* at 239:14-25. Rovi first released Next-Gen ([redacted]) in April 2018. *Id.* at 248:6-8. That release practiced the '585 and '741 Patents. Rovi has been developing the next planned release ([redacted]), which will include [redacted]. *Id.* at 248:9-252:21. In June 2018, before the close of fact discovery, Rovi completed the Next-Gen prototype for that feature, and provided Comcast a running instance of it. *Id.*; CX-0476C (Roadmap) at 2.
- **Licensee TSI's TiVo Bolt with Experience 4.0 (practicing the '585 and '741 Patents)** combines TiVo hardware (Bolt/Bolt VOX) and TiVo software (Experience 4.0) to provide a viewing experience supported by STB hardware, front-end client software, and back-end software. JX-0096C (Denney Dep.) at 16:16-17:8, 58:15-59:15; JX-0171C (Denney Dep.) at 26:17-27:9, 47:6-11; JX-0126C (Thun Dep.) at 15:11-22, 17:20-23.

II. JURISDICTION

A. The Commission Has Jurisdiction Under *Suprema*

The Commission has personal jurisdiction over Respondents and subject matter jurisdiction over this Investigation. JX-0173 (Stipulations) at ¶ 1. The Complaint alleges a violation of Section 337, and the Accused Products have been imported. Compl.; *Amgen v. ITC*,

[5] For domestic industry and each Asserted Patent, Rovi includes attachments with illustrations and charts to aid the reader.

902 F.2d 1532, 1536 (Fed. Cir. 1990); CX-1206C (Comcast Rog. Resp.) at 14 ([redacted]). There is no dispute that Rovi has standing. JX-0173 at ¶¶ 2-4; JX-0014, JX-0016–17 (Assignments); *Certain Devices with Secure Commc'n Capabilities*, Inv. No. 337-TA-818, Order No. 18, 2012 ITC LEXIS 2675, at *3-4 (July 18, 2012).

Comcast renews its failing argument that the Commission has no jurisdiction over X1 STBs because they are not "articles that infringe" at importation. As the Commission found in the 1001 Investigation, however, *Suprema* settled this issue in Rovi's favor.[6] The Federal Circuit considered *en banc* whether goods are "articles that infringe" if "direct infringement does not occur until after importation," finding that § 337 grants the Commission "authority to prevent importation of articles that have been part of inducement as an unfair trade act," even if the "acts necessary for induced infringement, including acts of direct infringement," "cannot occur at the time of importation." *Suprema, Inc. v. ITC*, 796 F.3d 1338, 1340, 1349 (Fed. Cir. 2015).

Comcast confuses the law by arguing that it does not induce infringement "until well after importation, when Comcast supplied a subscriber with those devices and instructed her how to use them." RPHB at 8. The timing of Comcast's inducing activity is irrelevant as a legal matter—the Federal Circuit's opinion in *Suprema* did not depend on whether the inducement took place before, during, or after importation. 796 F.3d at 1349. The focus of the inducement inquiry is not on timing but "on the party accused of inducement as the prime mover in the chain of events leading to infringement." *Forest Labs., Inc. v. Ivax Pharms., Inc.*, 501 F.3d 1263, 1272 (Fed. Cir. 2007). Here, Comcast is the prime mover: it plans and executes the chain of events from design and importation, through encouragement and instruction, which lead to direct infringement by its customers. Indeed, the term "induce" "is as broad as the range of actions by

[6] Rovi and OUII have addressed this issue in briefing to the Federal Circuit. *See* Rovi and OUII Briefs, *Comcast Corp. v. ITC*, Case No. 18-1450, Dkt. Nos. 87, 89 (Fed. Cir. June 15, 2018).

which one in fact causes, or urges, or encourages, or aids another to infringe a patent." *Tegal Corp. v. Tokyo Electron Co.*, 248 F.3d 1376, 1378-79 (Fed. Cir. 2001). The record is replete with evidence of continual inducement before, during, and after importation of the accused STBs:

First, "design of a device that contemplates use in an infringing manner" supports "induced or contributory infringement." *Nazomi Commc'ns, Inc. v. Nokia Corp.*, 739 F.3d 1339, 1346 (Fed. Cir. 2014). Comcast's design of the X1 STBs contemplates infringing use by Comcast's customers. Comcast entered into omnibus supply agreements with its STB suppliers, JX-0060C (ARRIS Agmt); JX-0072C (Technicolor Agmt), providing each supplier with [redacted] CX-0699C ([redacted]) at 9; CX-0707C ([redacted]) at 7; CX-0681C ([redacted]) at 5. Comcast's suppliers [redacted]. JX-0100C (Folk Dep.) at 35:16-20, 70:4-12, 71:22-72:7; CX-1301C (Parsons Dep.) at 20:3-25. These [redacted] CX-0699C ([redacted]) at 35-38; Balakrishnan Tr. at 790:1-792:12, 1034:4-1036:10; Bovik Tr. 560:3-22. [redacted]. JX-0060C (ARRIS Agmt) at 16-17; JX-0100C (Folk Dep.) at 97:18-99:16; JX-0072C (Technicolor Agmt) at 17-19. Comcast continues to have its STBs built [redacted] today. JX-0100C (Folk Dep.) at 35:16-20.

Comcast also requires its suppliers to [redacted] JX-0100C (Folk Dep.) at 115:15-21, 118:3-119:13. That

[redacted] McCann Tr. 1431:11-1432:13, 1444:7-1445:16; Allinson Tr. 1491:17-1494:20; JX-0100C (Folk Dep.) at 115:15-21, 118:3-119:13. The [redacted]. Allinson Tr. 1493:1-94:20. The [redacted], including overloaded key search requests, storage setting options, and restart functionality. Balakrishnan Tr. 740:4-745:4, 1058:11-24; Bovik Tr. 560:3-23. Comcast representatives admitted that [redacted]. McCann Tr. 1448:16-1449:25. And [redacted]. Allinson Tr. 1493:10-14. Comcast-[redacted] thus satisfies essential claim limitations of the Asserted Patents and contains features directed to the infringing functionalities. Comcast induces infringement by [redacted], knowing those STBs will later be used by its customers, after importation, to directly infringe the Asserted Claims of Rovi's Asserted Patents.

Second, "'recommend[ing],' 'encourag[ing],' and promot[ing]'" infringing uses and providing specific instructions to enable infringement demonstrate Comcast's inducement. *See Takeda Pharm. U.S.A., Inc. v. W.-Ward Pharm. Corp.*, 785 F.3d 625, 631 (Fed. Cir. 2015); *Arthrocare Corp. v. Smith & Nephew, Inc.*, 406 F.3d 1365, 1377 (Fed. Cir. 2005). The evidence shows that Comcast engages in a broad campaign—before, during, and after importation—to promote the use of X1 STBs in infringing ways. Comcast instructs its customers—by its website and videos that include step-by-step instructions that result in infringement—how to use the X1 system in such ways. *See* §§ IV(D)(2)(b) ('011), V(C)(2)(b) ('585), VI(C)(2)(b) ('741), *infra*.

Third, according to *Suprema*, § 337 is "satisfied by . . . importation that is part of inducement." 796 F.3d at 1348. ALJ McNamara indicated she will grant Rovi's pending motion for summary determination on the issue of importation by Comcast, Mot. No. 1103-023 (July 27, 2018), finding that Comcast imports the Accused Products. Hrg. Tr. 31:2-11, 2155:10-2156:5.

Indeed, the facts here are stronger than those in *Suprema*, *a fortiori* the Commission has jurisdiction. *Suprema* involved imported devices that were not specially designed to support infringement, were not pre-loaded with infringing software, and were sold to various parties that used them with various software. 796 F.3d at 1341-42. In *Suprema*, the inducing infringer merely "collaborat[ed]" in the post-importation integration of hardware and software to create an infringing system. *Id.* at 1343. Here, the imported articles are [redacted].

Comcast's argument that § 337 does not reach direct infringement of method claims, RPHB at 9-10, should also be rejected, as it depends on a decision that predates the controlling decision in *Suprema*. *SiRF Tech., Inc. v. ITC*, 601 F.3d 1319, 1332 (Fed. Cir. 2010). *Suprema* makes clear that, "[i]f Congress meant to forbid the Commission from looking past the time of importation in defining Section 337's reach, Section 337 would not have reached even garden-variety direct infringement. . . . [W]e cannot attribute that result to Congress." 796 F.3d at 1360.

B. Comcast Imports, Sells After Importation, and Re-Imports Accused Products

Comcast imports and sells Accused Products after importation. The ALJ intends to grant Rovi's motions for summary determination regarding importation, Mot. No. 1103-023, and sale after importation, Mot. No. 1103-031. Hrg. Tr. 31:2-11, 2155:10-2156:5. For reasons explained above, S*uprema* provides the Commission with jurisdiction over both acts.

Comcast also *re-imports* Accused Products owned by Comcast after [redacted]—a

third activity independently meeting the importation requirement. *Certain Digital Set Top Boxes & Components*, Inv. No. 337-TA-712, ID, 2012 ITC LEXIS 2849, at *53 (May 20, 2011).

Comcast hires [redacted]. Buniewski Tr. 923:24-925:3. All returned STBs that require functional repair (as opposed to simple refurbishment) are [redacted]. *Id.* at 925:4-926:11; JX-0098C (Eissinger Dep.) at 26:15-30:7, 33:16-20. After the repair is completed in [redacted]uniewski Tr. 926:12-929:14; CX-0580C (Comcast Process Flow) at 2; JX-0098C (Eissinger Dep.) at 48:11-49:6, 55:2-8. [redacted] Buniewski Tr. 937:10-938:20; CX-0894C ([redacted]).[7] STBs identified in CX-0894C that were initially imported into the United States on or after April 1, 2016, subsequently [redacted], and then re-imported into the United States, constitute unfair re-importations under § 337. Those Accused Products include *at least* every XG1v4 (AX014ANC, AX014ANM) and Xi5 (PX051AEI) STB set forth in CX-0894C, as these models were not imported into the U.S. prior to April 1, 2016. *See* CX-0560C (ARRIS Imports) (showing that XG1v4 and Xi5 STBs were first imported in August 2016).

Comcast argues it is not the importer of record and has no "control" over re-importation. RPHB at 12-13. But it is well-established that a party that causes goods to be brought into the United States is an "importer" under § 337—there is no requirement that the party be the "importer of record." *Hooven & Allison Co. v. Evatt*, 324 U.S. 652, 658-64 (1945); *Terry Haggerty Tire Co., Inc. v. United States*, 899 F.2d 1199, 1201 (Fed. Cir. 1990); *Digital Video*

[7] *Compare* CX-0894C ([redacted]) (identifying XG1, XG2, XiD, and Xi5 STBs) *with* CX-1206C (Comcast Rog. Resp.) at Att. A (identifying models AX013ANM, AX013ANC, AX014ANC, AX014ANM as XG1 STBs; SX022ANC, PX022ANM, PX022ANC as XG2 STBs; models PXD01ANI, CXD01ANI as XiD STBs; and PX051AEI as Xi5 STBs).

Receivers, ID at 12. Indeed, Comcast has already been found—both in the 1001 Investigation and in this Investigation (order pending)—to be an importer for purposes of § 337. Here, there is no question that Comcast is the efficient cause of these re-importations:

- Comcast [redacted], and Comcast has continued to rely on [redacted] for those services. Buniewski Tr. 923:15-924:22; JX-0030C.
- Comcast knows its STBs are repaired in [redacted] and then re-imported. Buniewski Tr. 929:23-932:21; JX-0098C (Eissinger Dep.) at 26:15-27:6, 29:9-12, 69:2-10, 74:9-12.
- Comcast [redacted] during the entire repair and re-importation process. Buniewski Tr. 926:18-927:9; JX-0098C (Eissinger Dep.) at 108:7-110:13, 114:13-17; JX-0124C (Shank Dep.) at 103:7-12. Repair invoices demonstrate that [redacted] have been repaired in [redacted] after Comcast's license to Rovi's patents expired in 2016. Buniewski Tr. 934:2-937:1; CX-0296C (Invoice) at 3; CX-0882C–CX-0883C (Invoices).
- Comcast receives [redacted] in the United States. Buniewski Tr. 930:22-932:21; CX-0322C (Email with Inventory Report).
- Comcast requires [redacted] Buniewski Tr. 925:4-12, 931:24-933:22; JX-0098C (Eissinger Dep.) at 54:8-56:14.

III. CLAIM CONSTRUCTION

The terms construed by ALJ McNamara in her Markman order are applied to the analysis below in each relevant limitation. Order No. 41 (Oct. 15, 2018).

IV. '011 PATENT (VEVEO)

During the hearing, Dr. Alan Bovik explained the invention of the '011 Patent, explained the Comcast X1 system, including the "unresolved overloaded key" numbers search feature, opined that Comcast infringes claims 1 and 9 of the '011 Patent, and opined that two Rovi domestic industry products—the Veveo AS&R product as it exists on Cablevision/Altice head-end servers, and Rovi's Next-Gen, as of the close of fact discovery in this Investigation—practice claims 1 and 9 of the '011 Patent.

A. The Inventions of the Asserted Claims of the '011 Patent

The '011 Patent relates to the use of unresolved, overloaded keys to search for items, such as television content. JX-0001 ('011 Patent); JX-0002 (Correction). An overloaded key is a key that could represent more than one alphanumeric character. Examples are the 2-9 keys on a touchtone phone or remote control. Bovik Tr. 548:13-549:18. Figure 1 from the '011 Patent shows an exemplary set of overloaded keys (the 2-9 and 0 keys). '011 Att. 1 (JX-0001.6). An unresolved keystroke occurs when a user, on an overloaded keypad, enters a keystroke that has more than one meaning. In Figure 1, for example, the "2" key could mean "2," "A," "B," or "C." Bovik Tr. 549:10-18; CDX-0008C.11. Alone, the key press is ambiguous or "unresolved."

Unresolved keystrokes present a problem for search queries because they have more than one possible meaning, making the user's intention ambiguous. JX-0001 ('011 Patent) at 1:43-45; Bovik Tr. 549:23-550:5; CDX-0008C.14. At the time of the invention, techniques existed for disambiguating overloaded keys, including "multi-tap" in which pressing the "2" key once means the letter "A," pressing the "2" key twice within a certain time means the letter "B," and pressing the "2" key three times within a certain amount of time means the letter "C." Bovik Tr. 549:10-50:1; CDX-0008C.12. But disambiguation systems such as multi-tap proved unsuitable when using overloaded keys to perform search queries because they required many keystrokes. JX-0001 ('011 Patent) at 1:43-45, 1:50-53, 1:55-57; Bovik Tr. 549:24-550:5; CDX-0008C.13.[8]

The '011 invention solved these disambiguation problems. JX-0001 ('011 Patent). at 2:15-17, 3:23-25; Bovik Tr. 550:9-551:1; CDX-0008C.15. The invention first creates a pre-defined searchable index of words describing content (such as shows) and matches each letter in

[8] Another known disambiguation solution involved giving a user completion choices for each word as ambiguous keystrokes are entered. JX-0001 ('011 Patent) at 1:50-53, 1:57-60. But this solution added steps and complexity by requiring users to make a choice from a list of all possible word matches. *Id*. at 1:57–2:7.

parts of one or more words (e.g., prefix letters in the title words) to its corresponding number for on an overloaded key. JX-0001 (’011 Patent) at 3:49-53, 3:27-29; Bovik Tr. 551:8-552:4; ’011 Att. 2 (CDX-0008C.16). In the index, the prefix substrings for “Toon” would be mapped to “8,” “86,” and “866” (the “8” corresponding to “T,” the first “6” corresponding to “o,” and the second “6” corresponding to the second “o”).

Next, items are grouped into subsets that have the same matches to overloaded keys. Bovik Tr. 552:5-15. As illustrated in ’011 Attachment 3 (CDX-0008C.17), item titles that were determined to correspond with unresolved keystroke matches are grouped into subsets. This grouping into subsets is commonly called an “inverted index.” Bovik Tr. 552:16-18.

Once items are indexed, users search by inputting one unresolved, overloaded keystroke at a time that, when disambiguated, represents a prefix substring of at least one word in the name of the item. JX-0001 (’011 Patent) at 5:26-29, 7:4-8:11; *id.* at Figs. 6A, 6B, 7A, 7B; Bovik Tr. 553:21-554:5. The user’s query is compared to the index of item names that were previously mapped to their matching unresolved keystrokes. Since the user’s input is ambiguous, the results include the matches for all the ambiguous input characters represented by each overloaded key input. JX-0001 (’011 Patent) at 5:32-35. On the display, as keystrokes are incrementally entered, the letters in the titles of the items that were determined to have caused the displayed items to be associated with the unresolved keystrokes input by the user are highlighted to illustrate how the unresolved keystrokes match the information associated with the displayed items. *Id.* at 7:41-48; Bovik Tr. 552:23-554:15; CDX-0008C.18.

Figures 6A and 6B of the ’011 Patent show an exemplary display of the search results with highlighting of certain displayed characters. In this example, the user, searching for the movie “Tootsie,” has input the search query of the unresolved keystrokes 8, then 6, then 6. Bovik

Tr. 555:5-557:19; CDX-0008C.19-22. In the display, the "Too" of "Tootsie" is highlighted—showing the user the characters associated with the displayed items that matched the unresolved keystrokes. *See* '011 Att. 4 (CDX-0008C.22). The results are displayed to the user in a particular order based on criteria, such as temporal relevance, location relevance, popularity, and personal preferences. JX-0001 ('011 Patent) at 5:38-42; Bovik Tr. 558:12-59:5; CDX-0008.24.

B. The '011 Accused Products

The '011 Accused Products are STBs (initially imported on or after April 1, 2016) that implement the X1 Platform, [redacted], which are representative of Comcast's [redacted]. JX-0163C (Representative Products). Dr. Bovik and Mr. Williams confirmed that there is no difference among these Comcast products for X1 search functions using overloaded key searches and resolution of ambiguous keystrokes. Williams Tr. 341:7-343:15; Bovik Tr. 567:5-18.

Comcast's X1 system includes a STB, such as the [redacted], an IPG that accessed through the STB, [redacted]. Bovik Tr. 560:3-562:24. Both the STB and the [redacted] contain guide software, with the "[redacted]" software installed on the STB and the "[redacted]" located on the [redacted]. *Id.* at 560:3-23, 599:23-600:24. The Metadata and Content Discovery platform contains software for ingesting and indexing program information metadata (called "Merlin"), and metadata search functionality called [redacted] Bovik Tr. 561:8-16; CDX-0008C.38.

Upon ingestion of program metadata, [redacted]" *See, e.g.*, CX-1019C (Entity Document for "Disney's Descendants 2"). [redacted] (e.g., for "Disney's," "d,"

"di," "dis," etc.). Bovik Tr. 568:15-569:7, 586:13-22. For most fields, [redacted] *Id*. at 568:15-570:3; '011 Att. 5 (CDX-0008C.40); CX-1019C.3. Comcast created [redacted] (e.g., an Entity Document) into groups that are associated with that same prefix substring in other files. Bovik Tr. at 568:9-21; 587:3-590:23.

Comcast's X1 users access the STB with a remote control to search for program content by entering numbers on the remote's keypad. [redacted]. Bovik Tr. at 568:9-570:8; CDX-0008C.41; JX-0107C (Kallurkar Dep. (Jun. 21, 2018)) at 154:5-155:13. [redacted] *See* Bovik Tr. 596:17-597:17; '011 Att. 6 (CDX-0008C.43) ([redacted]).

The displayed results are ranked according to a formula in the [redacted] code. Bovik Tr. 597:25-598:24; RX-0541C; CDX-0008C.44. While the algorithm runs on Comcast servers, X1 overloaded key searching would not work without the STB. No search could be entered, and no results could be received or displayed, without the STB. Bovik Tr. 567:19-21.

C. Comcast's Development of Overloaded Key Searching in X1

Comcast did not develop the unresolved, overloaded key search feature used originally in X1. In 2010, Comcast hired Veveo—the inventors of the '011 Patent—to design and develop

overloaded key searching for the X1 platform. Koenig Tr. 447:1-448:14; Kotay Tr. 492:10-18.[9]

Comcast's relationship with Veveo dates to 2006, when Comcast asked Veveo to develop a search capability in an I. Koenig Tr. 445:14-446:2. After entering a non-disclosure agreement, Veveo demonstrated its search technology to Comcast and discussed potential collaborations. But Comcast decided to pursue a search feature with StreamSage, another company it had acquired. Koenig Tr. 446:3-10; CX-0001C (NDA); CDX-0004C.9.

In 2009, after StreamSage had come up short, Comcast and Veveo renewed their discussions. Comcast and Veveo first entered a new nondisclosure agreement. Koenig Tr. 447:1-21; CX-0002C (NDA); CDX-0004C.10. In 2010, they entered a software license to develop a search feature for a new Comcast project called Xcalibur (later renamed X1). *Id.* 447:22-448:14, 452:15-24; Kotay Tr. 492:14-16; JX-0034C.1 (Veveo License Agmt.). The license allowed Comcast to use Veveo's Search and Recommendation Platform in the Xcalibur platform, but granted Comcast no rights in Veveo's patents. *Id.* 454:20-455:6; JX-0034C.1 (Veveo License Agmt.). The license also required Comcast to maintain strict confidentiality over Veveo's technical information. *Id.* at 455:7-09; JX-0034C.1-2; CDX-0004C.16-18.

Pursuant to the license, Veveo provided Comcast with confidential information regarding its search technology, including an internal "White Paper" and Veveo's Application Programming Interface (API). Koenig Tr. 449:21-452:14; Kotay Tr. 494:3-17; CX-1417C (Email from T. Moody); CX-1418C (Veveo Client-Server Protocol); CX-1380C (Veveo Information Retrieval System); CDX-0004C.11-.13. Veveo also made presentations describing its patents, consulted on the development of a search engine for the X1 platform, and embedded a Ph.D. engineer, Terry Moody, with the X1 team. Koenig Tr. 452:15-453:4; Kotay Tr. 494:22-

[9] Rovi acquired Veveo in February 2014 as a wholly-owned subsidiary. CX-0249 (Rovi Corp., Form 10-K, Feb. 21, 2014); Koenig Tr. 462:06-11.

495:8; CX-0352C.1, 44-45 (Comcast Veveo Overview Presentation); CDX-0004C.14-.15.

In 2011, Comcast introduced X1 in Augusta, Georgia with the Veveo search feature. Kotay Tr. 495:9-496:6. As Comcast expanded X1 into new markets, it included Veveo search and actively promoted its unresolved, overloaded key searching. Koenig Tr. 456:12-457:21. Brian Roberts, Comcast's CEO, demonstrated Veveo search as an innovative new feature at the 2011 National Cable Television Show. CX-1082 (B. Roberts Demo Video); CDX-0008C.33-34.

Nonetheless, in 2013, shortly before Veveo was to receive a substantial payment for Comcast exceeding one million X1 subscribers, Comcast terminated its relationship with Veveo and substituted its [redacted]. Koenig Tr. 459:16-460:14; Kotay Tr. 532:12-533:7; JX-0034C.10 (Veveo License Agmt.); CDX-0004C.18; CX-0312C (Ltr. From S. Kotay to Veveo); CDX-0004C.20. Between 2011 and 2013, Comcast had been leveraging its knowledge of Veveo's proprietary search feature to develop its own [redacted]. Kotay Tr. 496:25-499:13, 501. Indeed, Comcast developed [redacted]. *Id*. at 498:2-499:24. Comcast succeeded—[redacted]. Koenig Tr. 460:22-461:19; Bovik Tr. 563:7-567:1; CX-1082 (Roberts Demo Video); CDX-0008C.34 (Roberts X1 Veveo search demonstration); CDX-0004C.19 (X1 Veveo search demonstration); CX-1091 (How to Get Started with X1); CDX-0008C.35 ([redacted]).

On August 7, 2013, Veveo sued Comcast for patent infringement, including infringement of the '011 Patent. Koenig Tr. 460:22-461:9; CX-1172C.9, 17 (Complaint). Veveo later dismissed the case without prejudice prior to Rovi's acquisition of Veveo. Koenig Tr. 461:20-25.

D. Comcast's Infringement

At the hearing, Dr. Bovik opined that Comcast's Accused Products practice claims 1 and 9 of the '011 Patent, explaining in detail how they satisfy each limitation of the claims, and describing how the infringing features have been used by Comcast customers.

1. Direct Infringement

a. Comcast's X1 System Practices the Asserted Claims

The independent Asserted Claims all require a method or system that processes unresolved, overloaded keystrokes, in which a key is in a fixed association with a number and at least one alphabetic character to identify an item in a set of items, in which each item is associated with information comprising one or more words, in accordance with limitations:

- [1a, 9a] *Indexing* the items by associating subsets with strings of one or more unresolved keystrokes for the overloaded key such that the items are directly mapped to the strings of unresolved keystrokes for various search query prefix substrings.
- [1b, 9b] *Determining*, for a subset of items, which letters and numbers in the information associated with items, caused the items to be associated with the strings of unresolved keystrokes that are directly mapped to the subset of items.

Then,

- [1c, 9c] Receiving a user search query composed of unresolved keystrokes that comprises a prefix substring for at least one word in the information associated with the desired item.
- [1d, 9d] Identifying and displaying, in response to each unresolved keystroke, the subsets of items and the associated information for the strings of unresolved keystrokes based on the direct mapping of strings of unresolved keystrokes to subsets for items.
- [1e, 9e] Highlighting, as the identified items are displayed, the letters and numbers in the information that were determined to have caused the displayed items to be associated with the strings of unresolved keystrokes that are directly mapped to the items to show how the unresolved keystrokes entered match the information.
- [1f, 9f] Ordering the displayed items in accordance with one or more criteria.

JX-0001 ('011 Patent), claims 1 and 9; Bovik Tr. 558:12-559:5; CDX-0008C.24.

i. Claim 1

Dr. Bovik analyzed Comcast's source code and documents, operated the X1 overloaded key search functionality, and reviewed testimony of Comcast's witnesses responsible for design of its overloaded key search feature. Dr. Bovik then applied the ALJ's claim constructions in finding that the X1 Accused Products practice each limitation of the Asserted Claims as follows:

***Claim 1 Preamble**: A method of processing unresolved keystroke entries by a user from a keypad with overloaded keys in which a given key is in fixed association with a number and at least one alphabetic character, said unresolved keystroke entries being directed at identifying an item from a set of items, each of said items being associated with information describing the item comprising one or more words, said method comprising:*

The ALJ found the preamble "limiting, but only as to the 'environment' in which the invention operates and does not recite additional steps or components in the claimed invention." Order No. 41 at App. A, p. 2. Dr. Bovik opined that the X1 Accused Products operate in the recited environment by permitting users to perform searches for items (e.g., TV shows) with unresolved keystrokes on handheld remotes containing overloaded keys in which numeric keys are associated with one or more letters. Bovik Tr. 576:25-579:18. [redacted]—displaying one or more words describing the item (e.g., the title of the show). *Id.* at 555:14-556:20.

At the hearing, Comcast's expert (Dr. John Kelly) did not dispute that the X1 Accused Products satisfy the preamble language of claim 1 other than asserting the Accused Products do not "display" the results of unresolved keystroke searches, because Comcast does not provide its customers with a television. Kelly Tr. 1770:3-1771:4. But the X1 Accused Products operate as part of a system, and no user can search Comcast's X1 Guide (or even see the guide) without an accused STB and display. Bovik Tr. 567:19-21. Dr. Kelly made clear that his opinion regarding "display" was limited to claim 1 and did not include claim 9. RDX-0004C.40.

***1(a) Indexing:** indexing said items by associating subsets of said items with corresponding*

strings of one or more unresolved keystrokes for overloaded keys so that the subsets of items are directly mapped to the corresponding strings of unresolved keystrokes for various search query prefix substrings;

The ALJ construed (as the parties agreed) the following terms in this limitation:

- Prefix substring(s): "a variable length string of characters that contains fewer than all the characters making up the word."
- Item: "information units, each with a name comprising one or more words."
- Directly mapped: "each alphanumeric character of a prefix substring associated with an item is matched with its corresponding numeric key equivalent on an overloaded keypad."

Order No. 41 at App. A, pp. 1, 8-13.

Applying these constructions,[10] Dr. Bovik testified that the X1 Accused Products, operating in the X1 system, practice the indexing limitation. [redacted]. Tr. 580:21:14-584:15. In this process, Comcast's [redacted]. *Id*. at 582:17-583:7. For example, in the [redacted] for the film "Disney's Descendants 2," the [redacted]: 3, 34, 347, 376, and 34763. Bovik Tr. 582:17-584:4; '011 Att. 7 (CDX-0008C.60); *see also* JX-0107C (Kallurkar Dep. (Jun. 21, 2018)), at 170: 19–172:19; CDX-0008C.62. Dr. Kelly did not dispute that the Accused Products satisfy this limitation. Tr. 1783:4-1784:2.

[10] These construed terms appear in the other limitations of the Asserted Claim. Dr. Bovik applied these same constructions for each such limitation.

***1(b) Determining**: for at least one subset of items, determining which letters and numbers present in the information **associated** with and describing the indexed items of said subset caused said items to be associated with the strings of one or more unresolved keystrokes that are directly mapped to said subset;*

This limitation was added during prosecution, placed after the direct mapping limitation and before those describing operation once a user begins inputting a query. Bovik Tr. 584:16-585:9. The inventors explained that it requires "the determination of what letters and numbers in information describing particular items (e.g., letters in words of the titles) caused the items to be grouped in a particular subset that is directly mapped to a particular string of unresolved keystrokes . . . It is these letters and numbers that are later highlighted upon identification and display of the subsets for items, not simply any letters and numbers that correspond to the unresolved keystrokes." Bovik Tr. 585:11-19; JX-0008.882 ('011 File History).

With this explanation, Dr. Bovik testified that Comcast's X1 [redacted] search engine uses fragment fields in the [redacted] such as [redacted]. Tr. 586:13-587:2. For example, as part of the indexing process, [redacted]. Likewise, the [redacted] will determine the subset of items that will be grouped in the "34" index when the user presses the unresolved, overloaded "3" key (which corresponds to the letter "d"), followed by the unresolved, overloaded "4" key (which corresponds to the letter "i"). *Id*.

Determining this causal association allows [redacted] to group the items for viewing into subsets based on the sequence of unresolved keystrokes entered by the user. *See* '011 Att. 8 (CDX-0008C.68); Bovik Tr. 586:13-587:2. [redacted]

[redacted] *Id*. This would not have been possible without the field "t9TitleFragments"—in which case, the number "3" would have been determined to mean "3" and only "3." In that case, the letters present in the titles that caused the items to be associated with the unresolved keystroke "3" could not have been determined, because none of the titles in the example include the number "3." *Id*.

Dr. Kelly contended that [redacted]. Kelly Tr. 1694:3-25. Dr. Kelly cited the search query "5205205263," which returns, among other things, "La La Land." RX-0004.35 ('348 Patent); RX-1578C.9 (Kelly Rebuttal Report Screenshots); Kelly Tr. 1695:7-1696:4. According to Dr. Kelly, the association between the numerical query and "La La Land" could have been caused by the first two letters ("La") in the first word, the first two letters ("La") in the second word, or the first two letters ("La") in the third word—and only a source code review can provide the answer. Kelly Tr. 1695:7-1699:8. Dr. Kelly's position fails.

First, Dr. Kelly based his non-infringement argument on a construction of "determining" that Comcast never requested and the ALJ never adopted—namely, that the determining step has nothing to do with grouping items into subsets matched to overloaded keys, but rather that determining is part of highlighting such that the later "highlighting" step must be the "direct

result of" the earlier determining step. Kelly Tr. 1804:7, 1806:7. But nothing in either the "determining" or "highlighting" limitation (or the ALJ's claim constructions) requires that the determining step directly result in the highlighting; instead, the claims simply require that, "in response to each unresolved keystroke," the letters and number that are highlighted are the same letters and numbers "that were determined to have caused" the association with the unresolved key strokes. JX-0001 ('011 Patent) at claim 1(b) and 1(e); Bovik Tr. 597:8-17; Kelly Tr. 1780:25-1781:14. Moreover, the determining limitation appears in the claims *before* any search query is received—this limitation does not depend on what is highlighted in limitation 1(e).

Second, Dr. Kelly's non-infringement argument conflicts with his application of the determining limitation to the prior art. Dr. Kelly admitted that, for the purpose of invalidity, the prior art Gross and Smith references satisfy the determining limitation by grouping into subsets with an inverted index—just as X1's Solr/Lucene inverted index groups metadata items into subsets. Kelly Tr. 1772:11-24; Bovik Tr. 587:8-588:11.

Third, [redacted] (*e.g.*, "3-4-7," which causes the display of "Disney" with "Dis" highlighted). Bovik Tr. 597:8-16; Kelly Tr. 1782:1-1784:2; CDX-0008C.53. Dr. Kelly's examples all [redacted]. Kelly Tr. 1695:7-1696:16, 1708:8-28. Even as to these cases, [redacted]. Kelly Tr. 1708:8-1709:3.

***1(c) Receiving**: subsequent to said indexing, receiving from a user a search query for desired items composed of **unresolved** keystrokes, said search query comprising a prefix substring for at*

least one word in information associated with the desired item;

Dr. Bovik testified that the X1 Accused Products, operating in the X1 system, receives from a user (after indexing) a search query for desired items composed of unresolved keystrokes, comprising a prefix substring for at least one word in a title associated with a show or movie. Tr. 588:17-590:16; CX-1054C.5-7, 9 (Snapshot-011-1-2 Screenshots); CDX-0008C.75-78. In [redacted]. *Id.* at 569:4-570:10, 590:20-591:10; CDX-0008C.79. Dr. Kelly did not contest this at the hearing.

1(d) Identifying and Displaying*: in response to each unresolved keystroke, identifying and displaying the subsets of items, and information associated therewith, that are associated with the strings of one or more unresolved keystrokes received from the user based on the direct mapping of strings of unresolved keystrokes to subsets of items;*

Dr. Bovik testified that the X1 Accused Products, operating in the X1 system, practice this limitation. In response to each successive unresolved keystroke received by the Accused Products, [redacted] identifies the subsets of results together with titles and other information associated with the strings of unresolved keystrokes received from the user based on the direct mapping and grouping as recited in the indexing and the determining steps. [redacted] Tr. 591:11-592:11. [redacted] *See* '011 Att. 9 (CX-1054C.9) (Snapshot-011-1-2 Screenshots) (the search 3-4-7, which returns the selectable title "Disney's Descendants 2"); *see also* CX-1054C.5-11 (Snapshot-011-1-2 Screenshots); Bovik Tr. 591:11-592:11; CDX-0008C.75-86.

Dr. Kelly asserted that the Accused Products do not meet this limitation of claim 1 (not claim 9) because they do not display. Rather, the Accused Products only transmit "key presses" and receive only "drawing commands," and only a third party television can display. Kelly Tr.

1714:14-1715:4. [redacted]. Bovik Tr. 595:25-596:14. Further, [redacted]. McCann Tr. 1432:3-9, 1433:5-11, 1434:4-6, 1435:11-14, 1435:23-1436:1, 1436:22-1437:3, 1440:18-24, 1441:1-4, 1443:10-1, 1444:11-18; Allinson Tr. 1492:22-25, 1493:10-17, 1494:3-20, 1496:17-1498:11, 1499:25-1500:21. Dr. Kelly conceded that no X1 overloaded key search is possible without an Accused Product. Kelly Tr. 1763:19-1764:9.

***1(e) Highlighting**: in response to each unresolved keystroke, as the identified items are displayed, highlighting the letters and numbers present in the one or more words in said information describing the identified items that were determined to have caused the displayed items to be associated with the strings of unresolved keystrokes that are directly mapped to said items received so as to illustrate to the user how the unresolved keystrokes entered match the information associated with the displayed items; and*

The X1 Accused Products, operating in the X1 system, meet this limitation by highlighting letters and numbers present in the displayed title that were determined to have caused the association between the unresolved keystrokes and the direct mapping to the titles of the content items. Bovik Tr. 596:17-597:24. Screenshots taken using the Accused Products with Comcast's X1 system show the [redacted] For example, when the user presses the unresolved overloaded "3" key followed by the unresolved overloaded "4" key and then the unresolved overloaded "7" key, the search returns results with "Disney" in the first word of the title, with the letters "d," "i," and "s" bolded (highlighted). *See* '011 Att. 9 (CX-1054C.9) (Snapshot-011-1-2 Screenshots)*; id.* at .5-.11; Bovik Tr. 596:22-597:24; CDX-0008C.75-.86. The highlighted letters, which appear incrementally as the user inputs each unresolved keystroke, are the very same letters that caused "dis" to be associated with "347" during the indexing process. Bovik Tr. 597:8-17.

As discussed above, [redacted]

[redacted]. Kelly Tr. 1804:10-22, 1806:2-07. In other words, according to Dr. Kelly, the claim language demands that, for every query input, a determination is made as to what letters and numbers corresponding to ambiguous overloaded keys caused the displayed titles to be grouped with a substring of overloaded keystrokes, and then, for each incremental keystroke, only highlight those exact letters and numbers.

[redacted]

Bovik Tr. 571:8-572:4. Yet Dr. Kelly admitted that nothing in the claim language requires use of the same algorithms for grouping subsets in the determining and highlighting in limitations. Kelly Tr. 1779:17-1781:14. Further, Dr. Kelly agreed that his reading of these limitations not only conflicted with how he applied them in his invalidity analysis, but required him to read requirements into the claim language that do not appear and were not part of any claim construction. Kelly Tr. 1782:22-1785:22. Finally, as discussed above, the undisputed evidence shows that, for the vast majority of searches, particularly as search results are incrementally returned with each overloaded keystroke (which the Asserted Claims require), the highlighting *does* exactly match the associations that were created in the determining step. Bovik Tr. 573:22-574:1. Thus, at least for these searches, Dr. Kelly's non-infringement assertions are unavailing.

***1(f) Ordering**: ordering the displayed items in accordance with one or more given criteria.*

Dr. Bovik confirmed that the Accused Products, operating in the X1 system, meet the ordering limitation by displaying items [redacted]

[redacted] Bovik Tr. 597:25-598:24; RX-0541C (Comcast Source Code) at COMC_SDNY9278_SC000093; CDX-0008C.95-96. Dr. Kelly did not dispute that the Accused Products, operating in the X1 system, satisfy this limitation.

ii. Claim 9

Drs. Bovik and Kelly agreed that the limitations of claims 1 and 9 are effectively the same, except claim 1 recites an overloaded key search method and claim 9 recites a system for processing overloaded keystroke entries. JX-0001 ('011 Patent); Bovik Tr. 599:2-06; CDX-0008C.23; Kelly Tr. 1745:22-1746:15. Claim 9 also contains preamble language reciting that the claimed system includes "a computer-readable medium comprising instructions for causing the computer system to" process the unresolved keystrokes. JX-0001 ('011 Patent). The ALJ found that, while claim 9's preamble limits only the environment, the computer readable media language means "one computer readable medium or more than one computer readable media containing instructions for causing the computer system to perform the recited steps." Order No. 41 at App. A, p. 6. Applying this construction, Dr. Bovik explained [redacted] Bovik Tr. 599:23-600:15; CDX-0008C.100. Dr. Kelly offered no response.

b. Comcast and its Users Directly Infringe

The evidence at the hearing plainly showed that Comcast directly and willfully infringed (and continues to infringe), the Asserted Claims of the '011 Patent.

First, Comcast's own use of the X1 overloaded key search feature infringes claim 1 under 35 U.S.C. § 271(a). [redacted]. Bovik Tr. 604:13-20; CDX-0008C.110; Kotay Tr. 504:21-505:4; JX-0107C (Kallurkar Dep. (Jun. 21, 2018)) at 39:6-40:3. [redacted]

[redacted] Bovik Tr. 602:3-13; CX-0357C.54 (X1 Guide Feature Use and Satisfaction Survey); CX-0355C.22 (2016 X1 Quality Year End Review Presentation); CX-0356C.12 (Comcast CoMPASS Monthly Executive Update); CDX-0008C.107-109.

Second, after terminating the Veveo license and leveraging its overloaded key search feature, Comcast made and continues to make and provide to its subscribers an overloaded key search feature (with nearly identical functionality as Veveo's search feature) using Accused Products—which are made to Comcast's specifications. CX-1083 (Veveo search video), CX-1082 (Veveo search video); CX-1091 ([redacted]); JX-0100C (Folk Dep.) at 35:16-20, 115:15-21, 118:3-119:13; CX-1301C (Parsons Dep.) at 20:3-25; CX-0699C ([redacted]) at 9; CX-0707C ([redacted]) at 7; CX-0681C ([redacted]) at 5. Comcast's making and selling of an overloaded key search feature in X1 infringe system claim 9. 35 U.S.C. § 271(a).

2. Induced Infringement

To show that Comcast induces infringement of the '011 Patent, Rovi must show: "(i) that there has been direct infringement; and (ii) that the alleged infringer 'knowingly induced infringement and possessed specific intent to encourage another's infringement.'" *Certain Microfluidic Devices* (*Microfluidic Devices*), Inv. No. 337-TA-1068, ID at 13 (Sept. 20, 2018) (citing *Minnesota Mining & Mfg. Co. v. Chemque, Inc.*, 303 F.3d 1294, 1304-05 (Fed. Cir. 2002)). Direct infringement may be shown by circumstantial evidence and rest on a single instance of infringement during the relevant time. *Id.* at 113.

The specific intent requirement requires that Comcast "was aware of the patent, induced direct infringement, and that [Comcast] knew [its] actions would induce actual infringement." *Id.* at 114. A complaint alleging infringement is sufficient to establish knowledge of the patent. *Certain Beverage Brewing Capsules, Components Thereof, & Prods. Containing the Same* (*Brewing Capsules*), Inv. No. 337-TA-929, Comm'n Op. at 19 (Apr. 6, 2016).

a. Comcast Had Pre-suit Knowledge of the '011 Patent

[redacted]. Koenig Tr. 447:1-456:25. On August 7, 2013, Comcast received notice of the '011 Patent and Rovi's allegations of infringement when Veveo filed a district court complaint asserting the '011 Patent against Comcast's X1 system, alleging that Comcast developed its X1 system with Veveo's intellectual property, know-how, software, and trade secrets. Armaly Tr. 147:3-08; CX-1172C (Veveo Complaint) at 7, 9-11. Rovi then provided detailed patent infringement allegations in claim charts asserting claims 1, 9, and 17 against Comcast's X1 system in an action filed on January 10, 2018 in the District Court of Massachusetts. Armaly Tr. 147:9-148:23; CX-1182 (D. Mass. Complaint); CX-0964 ('011 Patent Claim Chart). Comcast admits longstanding pre-suit knowledge of the '011 Patent. *See* CX-1208C (Comcast Rog Rsp.) at 25-32.

b. Comcast Encourages Direct Infringement by U.S. Customers

Well aware of Rovi's detailed allegations, Comcast provides videos and documents that instruct, direct, or advise customers to use the X1 unresolved overloaded key search functionality implemented on the X1 System, including at the time of the STB installation, and does so with intentional disregard of the '011 Patent. Bovik Tr. 604:21-606:1; CDX-0008C.111-113. For example, Dr. Bovik explained that CX-0393C.130 demonstrates Comcast's expectation that its customers be instructed about intuitive search functionality when X1 is installed in their homes. Bovik Tr. 604:21-606:1; CX-0393C.130 (Comcast Xfinity TV on the X1 Platform). Likewise, Dr. Bovik explained that CX-0062, a Comcast online support page dated December 7, 2017, is an example of Comcast encouraging its customers to use overloaded keypad functionality. Bovik Tr. 604:21-606:1; CX0062.1-3 (Search X1 with the Remote Control Keypad). Further, Comcast admits that it teaches its customers how to use X1 features, including through the use of "how-

to" videos. JX-0131C (Wallace Dep.) at 55:3-5, 59:19-60:20, 63:12-15, 75:10-77:1; CX-1098 (Video) at 0:53-1: (highlighting the accused feature). Comcast offered no rebuttal.

c. Comcast Users Directly Infringe the '011 Patent

Comcast customers directly infringe the Asserted Claims of the '011 Patent. Bovik Tr. 603:10-606:1; CDX-0008C.114-115; *Microfluidic Devices*, ID at 113 (finding that even circumstantial evidence of a single instance of direct infringement is sufficient to support a finding of inducement). CX-0357C shows that a high percentage of Comcast customers use search functionality. Bovik Tr. 603:10-606:1; CX-0357C (Comcast Survey) at 54. [redacted]. Bovik Tr. 603:10-606:1; CX-0355C (Comcast Review) at 22; CX-0356C (Comcast Monthly Review May 2014) at 12.

Furthermore, Rovi's expert, Dr. Shamos, testified about a focus group he attended where Comcast customers were asked to identify whether they made use of the features covered by the Asserted Claims of the '011 Patent. Tr. 389:5-9, 391:3-24, 394:9-395:18, 396:23-397:9, 397:21-398:23, 421:25-423:17 (discussing Comcast customers' actual use of the Accused Products in the United States after the filing of the Complaint to overloaded key searching within the meaning of the Asserted Claims of the '011 Patent); '011 Att. 10 (CDX-0012C.14) (tabulated results of Comcast Customer focus group); CX-0543 (focus group results); '011 Att. 11 (CX-0543.6). This evidence shows, that *after* the filing of the Complaint in this Investigation at least one Comcast customer in the U.S. made post-importation use of the Accused Products to infringe the Asserted Claims of the '011 Patent.[11] On cross examination of Dr. Shamos, Comcast raised the issue of a survey (separate and distinct from the focus group) conducted by Dr. Schwartz.

[11] Dr. Shamos also testified that he used the Accused Products in his home in Pittsburgh to perform the overloaded key search functionality of the Asserted Claims. Shamos Tr. 398:5-23.

The survey supports Dr. Shamos' opinion that at least one Comcast customer made post-importation use of the accused overloaded key search functionality. *See* Shamos Tr. 421:25-422:14; RDX-0016C.10 (citing CX-1335C.10 reflecting the opinion that "[e]ach of the evaluated features are used by at least half of the respondents"); CX-1336C (results of survey).

[redacted]. *SiRF Tech. Inc.*, 601 F.3d at 1330-31 (confirming that direct infringement occurs when software in the defendant's product practices the claim when a customer later uses the product).

d. Comcast Intends to Induce Infringement or Has Been Willfully Blind

Comcast (at best) has turned a blind eye to its continuing infringement and inducement. Comcast has asserted no belief of non-infringement outside of litigation (and has entirely failed to present any evidence showing that any such belief in non-infringement was reasonable, when it was believed, who believed it, how that belief was formed, etc.), and has continued to encourage its customers continuing post-importation direct infringement.

Comcast never provided Rovi with a responsive claim chart or any specific feedback as to why it contended it did not infringe the '011 Patent (or why it felt it did not need a renewed license). Although Comcast witnesses John McCann, Vice president of Product Engineering, and Steven Allinson, Senior Director of Product Management for Consumer Premise Equipment Software, [redacted]

[redacted]. McCann Tr. 1425:5-1428:8; Allinson Tr. 1490:20-1491:16; *see also* Kotay Tr. 503:24-504:20 (likewise providing no such testimony). Even Comcast's chief litigation counsel responsible for this Investigation could not remember when he had last read the '011 Patent. JX-0111C (Marcus Dep.) at 23:12-14.

Comcast claims that because Veveo dismissed its district court complaint asserting the '011 Patent in 2013, Comcast lacks the requisite intent to induce. RPHB at 22. But Comcast fails to acknowledge that (1) the 2013 Complaint was dismissed because of representations that Comcast would [redacted], and (2) the Complaint was dismissed without prejudice so that the patents could be reasserted later. Koenig Tr. 461:20-462:11. *See Beverage Brewing*, Comm'n Op. at 20-21 (requiring evidence that a belief of non-infringement was reasonable and in good-faith); *Microfluidic Devices*, ID at 127-28 (rejecting unsupported claims of no intent to infringe)*; see also Digital Video Receivers*, ID at 232-34, 399-400 (finding intent to infringe where Comcast was provided with claim charts and offered no technical response).

Furthermore, as testified by Mr. Koenig and Mr. Kotay, Veveo and Comcast worked closely together for years to implement search functionality into Comcast's X1 system: [redacted]. Koenig Tr. 448:1-456:25; Kotay Tr. 492:10-495:24, 498:2-500:25. This close relationship enabled Comcast to [redacted]. Koenig Tr. at 461:11-19; *see Microfluidic Devices*, ID at 114 (copying patented technology evidences willful blindness). Comcast argues that it did not "copy" Veveo's source code. But the '011 Patent does not claim source code. As discussed above, Comcast made sure it [redacted]

[redacted] These facts evidence Comcast's willful blindness to infringement.

With knowledge of the '011 Patent and of Rovi's specific allegations of infringement, and aware that Rovi will aggressively protect its patent rights, Comcast continues to design, import, encourage, and instruct its U.S. customers to make use of the Accused Products in a manner that results in their direct infringement. *See* §§ II(A), IV(D)(2)(b), *supra*; *Cisco Sys., Inc. v. Nokia Corp.*, 873 F.3d 1354, 1360, 1362-63 (Fed. Cir. 2017); *Suprema*, 796 F.3d at 1348. In fact, with knowledge of the specific claims of infringement, Comcast has only ramped up importation of Accused Products. JX-0124C (Shank Dep.) at 54:21-55:14 ([redacted]); CX-1206C.165-C.440 (Comcast Rog. Resp.) at Att. A ([redacted]); CX-0915C (ARRIS Units Shipped) ([redacted]); CX-0894C ([redacted]) ([redacted]). Comcast has known, or has been willfully blind to the fact, that it thereby induces its customers and suppliers to infringe. *See Digital Video Receivers*, ID at 232-34, 399-400; *Microfluidic Devices*, ID at 127; *Commil USA, LLC v. Cisco Sys., Inc.*, 135 S. Ct. 1920, 1928 (2015); *Global-Tech Appliances, Inc. v. SEB S.A.*, 563 U.S. 754, 769-71 (2011).

E. Technical Prong of Domestic Industry

Dr. Bovik testified that two Rovi products—Veveo AS&R and Next-Gen—practice the Asserted Claims of the '011 Patent, and either suffices to establish the technical prong of domestic industry. Veveo AS&R is licensed to Altice (formerly Cablevision) in the New York tri-state area. Next-Gen is in development, and [redacted]

[redacted]. Dr. Bovik explained how these separate products contain [redacted] in accordance with the limitations of the asserted claims in much the same way as Comcast's Accused Products. Dr. Kelly disputed none of this evidence.

Preamble: Dr. Bovik explained that the Veveo AS&R and Next-Gen operate in the environment recited in the preambles of claims 1 and 9 by [redacted]. Bovik Tr. 616:24-617:15, 661:21-662:4; CX-1034C.2 (Screenshot); CDX-0008C.120-121. Nex-Gen accepts the [redacted] entries through an [redacted]—well within the scope of the claims. CX-1034C.2 (Screenshot). For claim 9, Dr. Bovik described the locations of media containing instructions for overloaded key searching for both domestic industry products, including the [redacted]. Bovik Tr. 669:14-671:5.

Indexing and Determining (claims 1 and 9 (a) and (b)): Veveo AS&R meets the indexing steps [redacted]. Bovik Tr. 620:22-621:7; CDX-0008C.124, 126. AS&R further satisfies the determining steps through a [redacted]. Bovik Tr. 622:21-623:7; CDX-0008C.125, 130. Similarly, the Next-Gen uses the [redacted]. Bovik Tr. 621:17-622:20; CDX-0008C.124, 126. Next-Gen also uses the [redacted]—just as in X1. Bovik Tr. 623:3-10;

CDX-0008C.130.

Receiving, Identifying and Displaying (claims 1 and 9 (c) and (d)): Both Veveo AS&R and Next-Gen, [redacted], and then identify and display subsets of program titles than can be selected to access the program content. *See* Bovik Tr. 661:6-665:9; '011 Att. 12 (CDX-0008C.135); *see also* CX-1048C.9-11, 14 (Screenshots); CX-1034C.2-5 (Screenshots); CDX 0008C.133-135, 139-142 (Screenshots). The AS&R screenshots were taken through web browser interfaces, but they accessed the code that operates AS&R. Both products involved the input of [redacted] where the code interpreted numeric keystrokes as unresolved, overloaded keystrokes (Veveo AS&R).

Highlighting (claims 1 and 9 (e)): As shown in screenshots, Veveo AS&R and Next-Gen incrementally return the identified program results, [redacted]. Bovik Tr. 665:10-668:10; '011 Att. 13 (CX-1048C.11) (AS&R Screenshot); '011 Att. 14 (CX-1034C.8 (Next-Gen Screenshot); CX-1048C.9-11, 14 (Screenshots), CX-1034C.2-5 (Screenshots); CX-972C.14 (Next-Gen code); CDX 0008C.145-151.

Ordering (claims 1 and 9 (f)): Both Veveo AS&R and Next-Gen order search results according to [redacted]. Bovik Tr. 668:17-22; CX-972C.14 (Next-Gen code); CDX 0008C.154-155. Although Dr. Kelly did not challenge Dr. Bovik's mapping of the claim limitations to AS&R and Next-Gen, Dr. Kelly made two arguments that Rovi failed to establish the technical prong of domestic industry.

First, Dr. Kelly argued that AS&R could not satisfy the technical prong of domestic industry because Altice customers currently do not access overloaded key searching. Kelly Tr. 1786:9-1787:25. But Dr. Bovik demonstrated that the [redacted] of the '011 Patent—and Dr. Kelly offered no evidence in rebuttal. Mr. Koenig testified that [redacted] Tr. 435:21-437:15. The patented system thus exists and is licensed to a U.S. customer. Nothing more is required to satisfy the technical prong. 19 U.S.C. § 1337(a)(2). Comcast argues that *Microsoft Corp. v. ITC*, 731 F.3d 1354, 1361 (Fed. Cir. 2013), precludes a finding that AS&R is a domestic industry product. But in *Microsoft*, the complainant had not produced any evidence showing that the practicing source code in question was actually implemented into the alleged domestic industry product. *Id.* Here, Rovi presented unrebutted evidence that the [redacted]. KoenigTr . 436:23-438:2.

Second, Dr. Kelly asserted that Next-Gen cannot satisfy the technical prong because it did not support unresolved overloaded key searching at the time Rovi initiated this Investigation. Kelly Tr. 1788:1-19. Based on Dr. Kelly's view of the law, he did not even analyze the technical prong for Next-Gen. But § 337 expressly covers patented articles that either exist or are "*in the process of being established*." 19 U.S.C. § 1337(a)(2) (emphasis added). Accordingly, "there is no rigid rule that the Commission must consider only . . . the investments in a domestic industry at the time of the filing of a complaint." *Certain Digital Cameras, Software, & Components Thereof (Digital Cameras)*, Inv. No. 337-TA-1059, Order No. 52, at 3-4 (Feb. 20, 2018). Rather, a two-part test controls whether "an industry in the process of being established." *Certain Video Game Sys. and Controllers (Video Game Sys.)*, Inv. No. 337-TA-743, ID, 2013 ITC LEXIS 1996, at *281-82 (Nov. 2, 2011) (citing *Certain Stringed Musical Instruments & Components*

Thereof (*Stringed Instruments*), Inv. No. 337-TA-586, Comm'n Op. at 13 (May 16, 2008)). "First, the complainant must 'demonstrate that he is taking the necessary tangible steps to establish such an industry in the United States. *Id.* "Second, the complainant must show that there is a 'significant likelihood that the industry requirement will be satisfied in the future. *Id.* Both prongs are analyzed at the close of fact discovery, not at the time the complaint is filed. *Digital Cameras,* ID at 45-48 (Aug. 17, 2018).

At the close of fact discovery, Next-Gen contained [redacted] and had been tested to verify that it did so. Gaeta Tr. 249:15-250:21; CX-0776C (Hydra-7615). Dr. Bovik observed the Next-Gen [redacted]. Tr. 609:12-616:23; *see also* JX-0096C (Denney Dep.) at 73:13-75:17. Comcast disputes none of these facts, which demonstrate that the technical prong was satisfied for the '011 Patent by the close of fact discovery in this Investigation. *Digital Cameras*, ID at 45-48.

V. '585 PATENT

A. The Inventions of the Asserted Claims of the '585 Patent

Rovi's expert—Dr. Ravin Balakrishnan—testified that the Asserted Claims of the '585 Patent (JX-0004) cover two ways of providing user selectable storage options for controlling *how* a program or programs are to be recorded. As he explained, in reference to CDX-0006C.8-.10, the first invention, covered by claims 1 and 15, provides for user selection and setting of a storage option that is applied globally to all programs (plural) selected for recording thereafter through an IPG. Balakrishnan Tr. 732:2-20, 733:9-743:15, 734:16-735:22, 793:17-794:20, 799:22-800:5 (describing the difference between the "global" storage option of claims 1 and 15 and the "program specific" storage option of claims 8, 11, and 22). The second invention, covered by claims 8, 11, and 22, provides for user selection of a program (singular) from a

program listing followed by the selection and setting of storage options from an IPG applied only to that program. *Id.* '585 Att. 1 (CDX-0006C.8) (illustrating the difference between claims).

As Dr. Balakrishnan further explained, in both inventions, the storage options selected by the user must relate to *how* the program or programs selected by the user are stored on the "random access digital storage device." Tr. 765:12-766:6, 800:21-808:3, 809:12-812:17 (describing the "how" storage options as different from the selection of the program or programs to be recorded). These "how" storage options include start time, stop time, HD/SD format, and/or keep until—but they *do not* include the selection of the program or programs to be recorded. *Id.*

B. The '585 Accused Products

The Accused Products for the '585 Patent are STBs (hardware and software) [redacted] by ARRIS and Technicolor, that run Comcast's X1 Guide and were imported on or after April 1, 2016. *See id.* 737:4-738:15, 745:9-19 (describing the Accused Products); Allinson Tr. 1494:3-7 [redacted] Comcast [redacted] so that each STB [redacted] Balakrishnan Tr. 739:12-740:6; s*ee also* § II(A), *supra*.

For the '585 Patent, Comcast identified [redacted]

JX-0163C (Representative Products); Balakrishnan Tr. 737:4-738:15. '585 Patent Att. 2 (CDX-0006C.12, excerpting JX-0163C) [redacted]

Rovi's expert, Mr. Jim Williams, explained that he traveled to Comcast counsel's office

and inspected working samples of each representative Accused Product. Tr. 336:12-340:19, 344:15-348:5 (discussing JX-0163C (Representative Products), CX-1131C, CDX-0014C.21). Mr. Williams testified that, as part of his inspection, he took the videos and screenshots demonstrating the operation of these products which are in evidence as CDX-0014C.21, CX-1031C, CX-1027C, CX-1051C, CX-1053C, CX-1056C, CX-1058C, CX-1059C, CX-1063C, CX-1065C, CX-1066C, CX-1070C, CX-1131C, CX-1136C, CX-1147C, CX-1148C, CX-1154C. *Id*. at 347:22-348:5 (sponsoring these exhibits). Dr. Balakrishnan testified that he relied on Mr. Williams' work, and that this evidence, in addition to other documentary and testimonial evidence, shows that each Accused Product infringes each Asserted Claim of the '585 Patent. Tr. 787:7-11, 823:25-824:4.

In addition to Comcast's identification of three representative Accused Products, Rovi's experts, Mr. Williams and Dr. Balakrishnan, testified that each Accused Product operates in the same material way with respect to the infringement of each Asserted Claim of the '585 Patent so that if one product is found to infringe, the other products should also be found to infringe. Williams Tr. 336:12-340:19, 344:15-348:5 (discussing JX-0163C (Representative Products), CX-1131C, CDX-0014C.21); Balakrishnan Tr. 738:9-739:2, 752:6-9 (1pre), 766:7-16 (1a), 769:23-770:3 (1a), 778:7-17 (1b), 779:10-20 (1b), 780:11-21 (1b), 782:7-15 (1c), 784:15-18 (1d), 786:11-13 (13). Other than taking issue with [redacted], Comcast has provided no evidence that any of the Accused Products operate differently in any way material to infringement.[12]

[12] As discussed further below, because no Asserted Claim of the '585 Patent limits the location of the "random access digital storage device" the location of the hard drive is not germane to infringement of any Accused Product. JX-0004 ('585 Patent) at 4:1-3 (showing no such location limitation); Balakrishnan Tr. 746:4-21, 768:12-770:24.

C. Comcast's Infringement

1. Direct Infringement

The Accused Products infringe each Asserted Claim of the '585 Patent. Balakrishnan Tr. 787:7-11, 823:25-824:4 (providing ultimate opinion of infringement by Comcast). Comcast directly infringes the Asserted Claims through its importation of each Accused Product.[13] JX-0100C (Folk Dep.) at 19:18-20:15, 45:18-46:5, 48:13-49:5, 60:3-61:6, 131:12-132:4 (testifying as to Comcast's [redacted]); JX-0060C (ARRIS Supply Agreement) [redacted] *see Digital Video Receivers*, Comm'n Op. at 1, 10-11 (holding that Comcast imports Accused Products). Comcast also directly infringes each of the Asserted Claims by selling the Accused Products in the U.S. after importation by charging customers for unreturned STBs.[14] In addition, following importation of the STBs into the U.S., Comcast and its customers directly infringe the Asserted Claims of the '585 Patent by practicing the methods of claims 1 and 8 and by building the system of claims 11, 15, 22 (as directed and instructed by Comcast).

a. Claim 1 – "Global" Storage Settings

[1.pre] *A method for allowing a user to select storage options for storing programs using an IPG implemented on user television equipment, the method comprising:*

The parties agree that this preamble is limiting. Order No. 41 at 28. As Dr. Balakrishnan testified, the Accused Products meet this limitation under the ALJ's constructions of "IPG" and "implemented on user television equipment." Tr. 734:16-735:22, 741:4-745:19, 747:8-762:24 (discussing CX-1051C.1, 20 (XG1), CX-1056C.1, 22 (XG1v3), CX-1063C.1, 18 (XG2), CX-

[13] Rovi filed an MSD on the issue of importation by Comcast. Mot. Dkt. No. 1103-023 (July 27, 2018). The ALJ indicated she will grant Rovi's motion and find that Comcast imports the Accused Products. Hearing Tr. 31:2-7.

[14] Rovi filed an MSD on the issue of sale after importation by Comcast. Mot. Dkt. No. 1103-031 (Aug. 17, 2018). The ALJ indicated she will grant Rovi's motion and find that Comcast sells the Accused Products in the U.S. after importation. Hearing Tr. 31:2-7.

1066C.1, 28 (XiD) and how claim 1.pre is met by the Accused Products); *see also* '585 Patent Att. 4 (excerpts of these exhibits); Att. 5 (same).

Dr. Balakrishnan's demonstrative exhibits, CDX-0006C.23-.37, summarize the evidence relevant to this limitation. As Dr. Balakrishnan testified, Comcast's X1 System includes an [redacted] Tr. 741:4-746:21, 750:16-752:5, 754:7-758:20, 761:1-762:18 (explaining the [redacted] *see also* CX-0718C.6-.7. Dr. Balakrishnan testified that '585 Attachment 3 (CDX-0006C.33) is a "simplified" overview of Comcast's X1 system [redacted] Tr. 756:23-762:24 [redacted] satisfies the ALJ's construction of "IPG").[15]

The [redacted] meets the ALJ's construction of "IPG." [redacted]." Albonesi Tr. 1928:19-20. Comcast engineers Mr. McCann and Mr. Allinson testified that the [redacted]

[15] While Comcast attempted to take issue with CX-0607C.4 ("[redacted]") cited in demonstrative CDX-0006C.33, Rovi pointed out in re-direct that Comcast itself cited this very document in its contention interrogatory responses on non-infringement. Balakrishnan Tr. 908:14-912:3 (referring to CX-1230C.56 showing Comcast itself citing CX-0607C). Dr. Balakrishnan then testified that additional documentary evidence (including CX-0718C.6-.7 summarized on CDX-0006C.29) and testimonial evidence (including the testimony of numerous Comcast engineers summarized on CDX-0006C.30-.31, .34-.37) was consistent with his simplified X1 overview demonstrative. Balakrishnan Tr. 912:12-916:6.

McCann Tr. 1432:3-9, 1440:18-24, 1444:15-19; Allinson Tr. 1492:22-25; *see also* Balakrishnan Tr. 741:4-746:21, 750:16-752:5; 754:7-16 [redacted] Comcast engineers also testified that without the [redacted] there would be no generation of a display of program listings or user navigation or interaction with the displayed IPG based on user commands. McCann Tr. 1448:16-1449:7, 1449:15-22; Allinson Tr. 1496:17-1498:11, 1499:25-1500:21.

The screenshots in evidence as CX-1051C.20, CX-1056C.22, CX-1063.18, and CX-1066.28, and included as '585 Attachment 4 (CDX-0006C.25), show a [redacted] "IPG" [redacted]. Balakrishnan Tr. 751:17-752:9 (discussing this evidence); *see also* CX-0156 (Comcast website explaining how to "navigate" the displayed "X1 guide"). As Dr. Balakrishnan testified, [redacted] implemented on user television equipment (the STB) at a user site (a user's home). Tr. 741:4-746:21, 750:16-752:5, 753:3-756:22; Albonesi Tr. 1909:5-10 (Comcast expert agreeing that [redacted] McCann Tr. 1432:7-9 (same). It is beyond dispute that the STBs are intended for use and are used at user sites—a user's home. Balakrishnan Tr. 752:10-753:2, 824:5-833:7.

[1.a] *providing the user with an opportunity to select at least one storage option for storing a program to be recorded, wherein the at least one storage option relates to at least one storage setting configured to control how programs are to be digitally stored on a random access digital storage device*

Dr. Balakrishnan's demonstrative exhibits, CDX-0006C.40-.56, summarize the evidence showing that each Accused Product meets this limitation. As Dr. Balakrishnan testified, the Accused Products meet this limitation under the ALJ's constructions of "storage setting configured to control how programs are to be digitally stored" and "random access digital

storage device." Tr. 762:25-776:17 (discussing CX-1051C.1 (XG1), CX-1056C.1 (XG1v3), CX-1063C.1 (XG2), CX-1066C.1 (XiD) as evidence that claim 1.a is met by the Accused Products).

Providing the user with an opportunity to select at least one storage option for storing a program to be recorded. The screenshot in evidence as CX-1051C.1 (including the similar screenshots in evidence at CX-1056C.1, CX-1063C.1, and CX-1066C.1), and included as '585 Attachment 5 (CDX-0006C.42), shows that each Accused Product provides the user with an opportunity on the "Settings/Preferences/General" screen of Comcast's X1 Guide to toggle "On" or "Off" the "Auto Pad Recordings" setting for all recordings. Balakrishnan Tr. 763:16-766:16 (discussing this evidence). As Dr. Balakrishnan explained, when the "Auto Pad Recordings" is set to "On," recordings of all programs will be scheduled with extra time before the scheduled start time and after the scheduled end time. *Id*. 764:17-766:6 (discussing how the Auto Pad Recording function will globally add time before and after all scheduled recordings); CX-0156.2 (X1 Web Page instructing how to "Turn on Auto Pad Recordings"). The user's selection of "Auto Pad Recordings" is a storage option applied globally to subsequent recordings of programs selected for recording by the user. Balakrishnan Tr. 764:2-10.

User selection of the "Auto Pad Recordings" option is not the selection of *what* will be recorded, but rather is the user's selection of *how* selected programs will be recorded in the future, i.e., with extra, padded time before and after the scheduled start time. *Id*. 765:12-766:6.

Wherein the at least one storage option relates to at least one storage setting. The Auto Pad Recordings storage option, when selected by a user, adds time to a recording (*e.g.*, it pads the program to be recorded by adding time before and after the scheduled start and end time). Balakrishnan Tr. 750:13-751:12, 763:16-766:16; CX-0156.2. Dr. Balakrishnan explained that there is necessarily a direct relationship between the user's selection of the Auto Pad Recording

"storage option" and the resultant modification of the underlying "storage setting" that controls how programs are recorded with (a) extra time at the beginning and (b) extra time at the end. *Id.* 765:1-766:16. Dr. Balakrishnan explained that the "storage option" relates to the "storage setting" because [redacted] *Id.* 916:9-919:1; CX-0156.2. As explained further in reference to claim 1.b below, and as shown in '585 Attachment 6 (CX-1051C.21), the user's selection of the Auto Pad "storage option" results in modification of the "storage setting" because [redacted] Balakrishnan Tr. 776:18-780:25, 916:9-919:1.

Storage setting configured to control how programs are to be digitally stored on a random access digital storage device. User selection of the Auto Pad Recordings "storage option" results in the modification of "storage settings" in the form of scheduling (a) extra time before and (b) extra time after the program selected to be recorded. This added time [redacted] Balakrishnan Tr. 766:17-776:12. When the "Auto Pad Recordings" is set to "On," [redacted] *Id.* 764:17-766:6. User selection of the "Auto Pad Recordings" option is not the selection of *what* will be recorded, but rather is user selection of *how* the selected program will be digitally stored on a random access digital storage device, i.e., with extra, padded time before and after the scheduled start time. *Id.* 765:12-766:6.

Comcast contends that the Accused Products do not meet this limitation because user selection of the Auto Pad "storage option" (and for claim 8.c, discussed below, user selection of the start time, stop time, HD/SD format, and/or keep until "storage options") does not result in modification of a "storage setting" controlling how programs are to be digitally stored on a random access digital storage device. According to Dr. Albonesi's narrowed "construction of the ALJ's construction," this limitation can only be satisfied if the user is permitted to control "how data is put on the disk." Albonesi Tr. 1933:2-6, 1933:24-1934:4, 1939:16-23, 1948:23-1949:13. But this narrowed "construction of the ALJ's construction" is made up, wrong, and provides no basis for a determination that this element is not present in the Accused Products.

First, Dr. Albonesi's construction is nonsensical: all data stored on a hard drive is digital data that is mechanically "put on the disk" as a series of 1s and 0s. Albonesi Tr. 1938:17-19 (admitting this). It is not possible for a user to modify the manner or placement of the series of 1s and 0s as digital data is deposited on a hard disk. *See id.*; Balakrishnan Tr. 2097:6-18 (disagreeing with Dr. Albonesi's "put on the disk" argument).

Second, Dr. Albonesi's "construction of the ALJ's construction" is *not* based on the construction or any intrinsic or extrinsic evidence—it is made up with zero supporting evidence. Albonesi Tr. 1933:2-6, 1933:24-1934:4, 1939:16-23, 1948:23-1949:13. In rebuttal, Rovi's expert Dr. Balakrishnan testified that the figures and specification of the '585 Patent foreclose Dr. Albonesi's attempt to narrow the scope of the ALJ's construction. As he explained, Fig. 14 of the '585 Patent shows user selectable "storage options" including "language," "video format," "parental controls," and "auto-erase." Balakrishnan Tr. 2101:18-2103:3; JX-0004 ('585 Patent), Fig. 14. Figure 16 of the '585 Patent, then, "illustrates [the] steps involved [in] providing the user with the ability to define selectable options." *Id.* at 2098:14-2101:17; JX-0004 ('585 Patent) 16:

29-43, Figure 16. As shown in '585 Attachment 7, Fig. 16 of the '585 Patent (together with the corresponding portion of the specification) makes clear that "language, video format, enforcement of a parental control, and auto-erase" are user selectable "storage options" that control how "the program guide stores the programs and associated program data on digital storage device 49 *according to how* the storage options are defined as set forth in steps 426, 428, 430, and 432 respectively." *Id.* at 16: 29-43 (emphasis added). For example, block 426 of Figure 16 describes "digital[] stor[age of] programs and associated data *according to* language storage option." *Id.* at Fig. 16 (emphasis added). And, block 428 of Figure 16 describes "digital[] stor[age of] programs and associated data *according to* video format option." *Id*. As Dr. Balakrishnan summarized, the intrinsic evidence is an "explicit disclosure of how the storage options are defined as set forth and how the program guide stores those programs according to those how storage options." Balakrishnan Tr. 2098:9-2103:17.

Much like the "language, video format, enforcement of a parental control, and auto-erase" storage options discussed in the '585 Patent's specification, Auto Pad is a user selectable "storage option" in the Accused Products that controls how "the program guide stores the programs and associated program data on digital storage device" by adding extra time to the recording of the selected program before and after the scheduled start and end time, respectively.[16] *Id.* 750:13-751:12, 763:16-766:16.

There is no dispute that a hard drive, as utilized for recording user selected programs according to user selected storage options, is a "random access digital storage device." Taking that construction, Dr. Balakrishnan testified that each of the Accused Products makes use of a

[16] For the same reasons, user selection of the start time, stop time, HD/SD format, and/or keep until "storage options" in the Accused Products are also user selectable "storage options") as discussed below in claim 8.c.

"random access digital storage device" in the form of a hard drive for recording program(s) according to user selected storage options. Tr. 770:18-25, 771:1-776:12 (testifying that each Accused Product has a hard drive). Comcast's expert agreed that hard drives are "random access digital storage devices." Albonesi Tr. 1908:11-14, 1913:10-14.

As shown in Dr. Balakrishnan's demonstrative CDX-0006C.56 (included as '585 Attachment 8), the Accused Products include either:

- Balakrishnan Tr. 771:1-776:12 (Albonesi Tr. 1909:8-10 Balakrishnan Tr. 767:19-23 Albonesi Tr. 1913:12-21 (same).
- Balakrishnan Tr. 746:4-21, 768:12-770:24 (testifying how the Albonesi Tr. 1913:4-14 (agreeing that meet the ALJ's construction); *id.* 1917:16-1918:1; JX-0133C (Young Dep.) at 33:5-9 (Comcast engineer testifying that *see also* Balakrishnan Tr. 767:19-23; Albonesi Tr. 1917:16-1918:1 (testifying that the

This evidence demonstrates that the representative , both alone and when paired with an includes a . Comcast contends that the representative XG2 and the XiD (when it is paired with an XG2) does not meet this limitation because . Albonesi Tr. 1902:17-1903:4. However, no part of any Asserted Claim limits the scope of infringement (including post-importation induced infringement) Balakrishnan Tr. 746:4-21, 768:12-770:24. Indeed, the '585 Patent specification expressly makes

clear that the "digital storage device 31 can be contained in STB 28" (as it is with the XG1) "or it can be an external device connected to the STB 28 via an output port and appropriate interface" (as it is with the XG2). JX-0004 ('585 Patent) at 4:1-3. In the absence of any claim limitation restricting the location of the hard drive, [redacted] is irrelevant to infringement—especially where, as here, and as discussed in the inducement section below, it is not disputed that Comcast directs and instructs its customers to make use of all STBs (including the representative XG2) in a manner that Dr. Balakrishnan has testified results in the direct infringement of the Asserted Claims of the '585 Patent following their importation into the U.S.

[1.b] *in response to a user selection of the at least one storage option, modifying the at least one storage setting*

Demonstrative exhibits, CDX-0006C.59-.62, summarize the evidence showing that each Accused Product meets this limitation. Balakrishnan Tr. 776:18-780:25, 916:9-919:1. As discussed above for claim 1.a, Dr. Balakrishnan testified that [redacted] (such as Auto Pad recording) [redacted] *Id.* at 764:17-766:6, 916:9-919:1.

The screenshots in evidence at CX-1051C.18-.21, CX-1056C.1-.2, 22, .27-.28, CX-1063C.1, .17-.18, .25, and CX-1066C.18-.19, .28-.29, and included as '585 Attachments 9-10, show that [redacted], the user may select [redacted] Balakrishnan Tr. 777:5-778:17; *see also id.* 750:13-752:9, 778:19-780:21 [redacted]

[redacted]"). As shown in CX-1051C.21 (included as part of '585 Attachment 10), after the [redacted]. *Id.* 785:20-786:13 (discussing how user [redacted]

Comcast argues that this evidence—showing that user selection of the Auto Pad "storage option" and resultant [redacted] showing that the [redacted] is insufficient because Dr. Balakrishnan was required to review Comcast source code and point to a specific variable or flag in the code as proof of [redacted] *Id.* 886:19-887:18. But such evidence is not required to prove infringement. Dr. Balakrishnan did not need to review source code because he could [redacted] [in CDX-0006C.62, '585 Att. 10, excerpting CX-1051C.21], [redacted]." *Id.* at 917:3-918:1. Dr. Balakrishnan thus had no need to review the source code and name a particular flag for this storage setting modification because he could see and confirm by using the Accused Products that the storage setting was modified: [redacted] *Id.* (explaining that

he [redacted] because [redacted]

[1.c] *displaying in the IPG at least one program listing related to at least one program*

Dr. Balakrishnan's demonstrative exhibits, CDX-0006C.65-.66, summarize the evidence showing that each Accused Product meets claim limitation 1.c. As Dr. Balakrishnan testified, the Accused Products meet this limitation under the ALJ's construction of "IPG" as discussed above with respect to claim 1.pre. Tr. 781:1-782:19. The screenshots in evidence as CX-1051C.20 (including the similar screenshots in evidence at CX-1056C.22, CX-1063C.18, CX-1066C.28), and included as '585 Attachment 4, shows [redacted] *Id.* at 781:16-782:15; *see also* CX-0161.

[1.d] *providing the user with an opportunity to select a program listing from the at least one displayed program listing for recording on the random access digital storage device*

Dr. Balakrishnan's demonstrative exhibits, CDX-0006C.69-.71, summarize the evidence showing that each Accused Product meets claim limitation 1.d. As Dr. Balakrishnan testified, the Accused Products meet this limitation under the ALJ's construction of "random access digital storage device" as discussed above for claim 1.a. Tr. 782:20-784:18.

The screenshots in evidence as CX-1051C.20 (including the similar screenshots in evidence at CX-1056C.22, CX-1063C.18, CX-1066C.28), and included as '585 Attachment 4, show that the Accused Products provide a user [redacted] from the [redacted] Balakrishnan Tr. 783:11-784:14.

As discussed for claim 1.b, the screenshots in evidence as CX-1051C.18-.21, CX-

1056C.1-.2, .22, .27-.28, CX-1063C.1, .17-.18, .25, CX-1066C.18-.19, .28-.29, and included as '585 Attachments 9-10, show that the [redacted] Balakrishnan Tr. 783:14-22 [redacted] As discussed for claim 1.a, the recording—[redacted] is performed on [redacted] *Id.* 784:3-14 (testifying regarding the location and functionality of recording programs [redacted] *see* discussion of claim 1.a above, explaining that the location of the hard drive is immaterial to infringement (including post-importation induced infringement).

[1.e] *recording the program on the random access digital storage device based on the modification of the at least one storage setting*

Demonstrative exhibits CDX-0006C.74-.78 summarize the evidence relevant to this limitation. As Dr. Balakrishnan testified, the Accused Products meet this limitation under the ALJ's construction of "random access digital storage device" as discussed above for claim 1.a. Tr. 784:19-787:6 (discussing CX-1051C.20-.21 [redacted], CX-1063C.18, .25 [redacted], CX-1066C.28-.29 [redacted] as evidence that 1.e is met by the Accused Products).

Again, and as discussed for claim 1.b, the screenshots in evidence at CX-1051C.18-.21, CX-1056C.1-.2, .22, .27-.28, CX-1063C.1, .17-.18, .25, CX-1066C.18-19, 28-29, and included as '585 Attachments 9-10, show that the [redacted] that after the [redacted] Balakrishnan Tr. 785:12-786:13. As discussed for claim 1.a, the recording with the user selected recording [redacted] either [redacted] *Id.*

784:3-14.

b. Claim 15: The System Claim Analog to Method Claim 1

Claim 15 is a system claim parallel in structure to claim 1. Balakrishnan Tr. 787:12-792:12 (discussing CDX-0006C.81-.93 and similarities between claim 1 and 15 and evidence of infringement for both). As Dr. Balakrishnan testified, claim 15 is infringed by the Accused Products for the same reasons, and based on the same evidence, described for claim 1. *Id.* at 788:3-20. CDX-0006C.82, included as '585 Attachment 11, shows the overlap between claim 1 (already shown) and the additional elements needed for infringement of claim 15. In addition to the limitations of claim 1, claim 15 also requires "a display screen" and "an IPG implemented at least partially on circuitry." Balakrishnan Tr. 787:12-792:12.

Comcast contends that the Accused Products do not meet the "display screen" limitation because Comcast does not [redacted] This argument fails for several reasons. *First,* it ignores the requirements of the claimed system. Neither Comcast nor its customers could use the Accused Products without a display screen connected to the Comcast STBs—its own engineer [redacted] *See* Allinson Tr. 1473:25-1476:3; Balakrishnan Tr. 789:1-25 [redacted] *Second,* Comcast's engineer also testified that [redacted] in each STB [redacted] Allinson Tr. 1496:17-1498:11, 1499:25-1500:21. As with claim 1.pre, the [redacted] there would be no generation of a display. McCann Tr. 1448:16-22; Allinson Tr. 1496:17-1498:11, 1499:25-1500:21 (same). *Third,* Comcast by conduct has admitted that its system contains a display. In identifying [redacted]

[redacted] Williams Tr. 334:11-13 ([redacted] *see also* '585 Att. 12 (CX-1027C.1) (photograph of [redacted]. *Fourth*, Comcast instructs and directs customers to use display devices, such as televisions, to *view* the display output of Accused Products. Balakrishnan Tr. 789:1-25 [redacted] CX-0156 (Comcast website instruction to use the functionality of the Accused Products with screenshots from a display device); CX-0161 (same); CX-1091 (same); CX-1097 (same).

As to the "IPG implemented at least partially on circuitry," Dr. Balakrishnan testified that the Accused Products include [redacted] Tr. 790:13-792:12, 820:22-821:15. This is the same evidence as discussed for claims 1.pre and 1.a.

c. Claim 8 – "Program Specific" Storage Settings

[8.pre] *A method for recording programs using an IPG implemented on user television equipment, the method comprising*

Dr. Balakrishnan's demonstrative exhibits, CDX-0006C.97-.98, summarize the evidence showing that each Accused Product meets claim limitation 8.pre. The ALJ found that the preamble of claim 8 is limiting, "but it limits only the environment in which the invention operates and does not require additional steps or components in the claimed invention[.]" As Dr. Balakrishnan testified, claim 8's preamble is satisfied for the same reasons as claim 1's preamble. Tr. 794:21-796:20 (discussing CX-1063C.2 [redacted], CX-1051C.20 [redacted], CX-1056C.22 [redacted], CX-1066C.2 [redacted] as evidence that 8.pre is met by the Accused Products).

[8.a] *displaying in a display screen at least one program listing relating to at least one program*

Demonstrative exhibits CDX-0006C.101-.102 summarize the evidence showing that each Accused Product meets this limitation. As Dr. Balakrishnan testified, the Accused Products meet this limitation for the same reasons as discussed above for claim 1.c. Tr. 794:21-797:17 (discussing CX-1063C.2 [redacted], CX-1051C.20 [redacted], CX-1056C.22 [redacted], CX-1066C.2 [redacted] as evidence that 8.a is met). '585 Att. 13 (CX-1063C.2) shows the program listing [redacted] Balakrishnan Tr. 793:21-797:17.

[8.b] *providing a user with an opportunity to indicate a program to be recorded on a random access digital storage device by selecting a program listing from the at least one displayed program listing, wherein the selected program listing corresponds to the program to be recorded*

Demonstrative exhibits CDX-0006C.105-.108 summarize the evidence showing that each Accused Product meets claim limitation 8.b. As Dr. Balakrishnan testified, this limitation is met for the same reasons as discussed above for claim element 1.d. Tr. 797:18-799:21 (discussing CX-1063C.3 [redacted], CX-1051C.22 [redacted], CX-1056C.23 [redacted], CX-1066C.3 [redacted] as evidence that 1.b is met by the Accused Products). '585 Attachment 14 (CX-1063C.3) shows that from the [redacted] 798:10-799:6. Choosing the program is [redacted] *Id.* 765:12-766:6, 800:21-808:3, 809:12-812:17. Once selected, the program will [redacted] as discussed above for claim 1.d. *Id.* 799:7-21.

[8.c] *providing the user with an opportunity to select at least one storage option for storing the program to be recorded, wherein the at least one storage option relates to at least one storage setting configured to control how the program is to be digitally stored on the random access digital storage device*

Demonstrative exhibits CDX-0006C.111-.117 summarize the evidence showing that each Accused Product meets this limitation. As Dr. Balakrishnan testified, the Accused Products meet

this limitation for similar reasons as discussed above for claims 1.a, 1.b, and 1.d. Tr. 799:22-913:7 (discussing CX-1063C.5, .7, .11, .13 [redacted], CX-1051C.5-.7, .10, .12, .25-.26 [redacted], CX-1056C.6-.8, .10, .12, .29, .30 [redacted], CX-1066C.5-.8, .11, .13 [redacted] as evidence that 8.c is met by the Accused Products).

Here, however, the "storage options" are not [redacted] (as with "Auto Pad" discussed for claim 1). The evidence for claim 8.c shows [redacted] Dr. Balakrishnan testified that the [redacted] shown in CX-1063C.5, .7, .11, .13 (and included as '585 Attachments 15-18)—are [redacted] in the Accused Products that control [redacted] Tr. 800:21-808:3. These different [redacted] *Id.* 765:12-766:6, 800:21-808:3, 809:12-812:17.

Comcast again argues that Dr. Balakrishnan was required to review Comcast source code and point to a variable or flag as proof of a storage setting. But, as discussed for claim 1.b, such evidence or testimony is not required to prove infringement because [redacted] *See id.* 813:8-817:1; '585 Att. 19 (CX-1063C.12-.13).

[8.d] *in response to receiving the user selection of the at least one storage option, modifying the at least one storage setting for the program to be recorded*

Demonstrative exhibits CDX-0006C.120-.123 summarize the evidence showing that each Accused Product meets this limitation. As Dr. Balakrishnan testified, the Accused Products meet

these limitations for the same reasons as discussed above for claim 1.b. Tr. 813:8-817:1 (discussing CX-1063C.2, .12-.13, .16 [redacted], CX-1051C.11-.12, 20 [redacted], CX-1056C.11-.12 [redacted], CX-1066C.2, .12-.13 [redacted] as evidence that claim 8.d is met by the Accused Products). Dr. Balakrishnan testified, in reference to CX-1063C.12-.13 (included as '585 Attachment 19) that upon [redacted] will be [redacted] Tr. 813:8-817:1; *see also* '585 Att. 20 (CX-1063C.16) (showing that the [redacted] are modified so that the [redacted]

[8.e] *recording the program on the random access digital storage device based on the modification of the at least one storage setting for the program*

Demonstrative exhibits CDX-0006C.126-.128 summarize the evidence showing that each Accused Product meets this limitation. As Dr. Balakrishnan testified, this claim is infringed for the same reasons as discussed above for claim 1.e. Tr. 817:2-818:17 (discussing CX-1063C.14, .16 [redacted], CX-1051C.11-.12, 20 [redacted], CX-1056C.11-.12 [redacted], CX-1066C.2, .12-.13 [redacted] as evidence that claim 8.e is met by Accused Products).

In the screenshots at CX-1063C.14 and .16 (included as '585 Attachment 21), the [redacted] respectively, the recording of [redacted] so that the [redacted]

[redacted] *Id.* As Dr. Balakrishnan explained, [redacted] Tr. 818:1-7. As explained above for claim 1.b, [redacted] the recording time changes. *Id.*

d. Claim 11

Demonstrative exhibits CDX-0006C.144-.149 summarize the evidence showing that the Accused Products infringe claim 11. As Dr. Balakrishnan testified, this claim is infringed for the same reasons as [redacted] Tr. 821:20-823:24 (discussing CX-1063C.5-.6 ([redacted]), CX-1051C.5, .25-.26 [redacted]), CX-1056.6, .29-.30 [redacted], CX-1066C.5, .6 [redacted] as evidence that claim 11 is met by the Accused Products). [redacted] *Id.* at 822:13-823:19 (testifying how [redacted] and thus [redacted]

e. Claim 22

Demonstrative exhibits CDX-0006C.131-.141 summarize the evidence showing that the Accused Products infringe claim 22. As Dr. Balakrishnan testified, claim 22 is a system claim, but is otherwise parallel in structure to claim 8. Tr. 819:2-921:19 (discussing similarities between claim 8 and 22 and evidence supporting both). In addition to the limitations of claim 8, claim 22 also requires: "a display screen" and "an IPG implemented at least partially on circuitry" which is programmed to "display in the display screen at least one program listing related to at least one program. Claim 22 is infringed by Comcast for the same reasons described for claim 8. *Id.* 819:12-24 (discussing CDX-0006C.131-.43).

2. Induced Infringement

a. Comcast Had Pre-suit Knowledge of the '585 Patent

Like the '011 Patent, § IV(D)(2)(a), *supra*, Comcast has known of the '585 Patent since well before Rovi filed its Complaint. The 2010 Amended Patent License [redacted]. Armaly Tr. 144:8-11; JX-0026C (2010 License) at Ex. C-112. As part of the parties' negotiations for renewal of that license, Rovi presented [redacted] in this Investigation. Armaly Tr. 144:19-146:7; CX-0318C ("Next Steps" Email); CX-0953C ('585 Patent Chart); CX-0954C ('585 Patent Chart). Rovi also provided further detailed claim charts to Comcast on January 10, 2018 when Rovi filed a complaint alleging patent infringement in the Central District of California. Rovi set forth with particularity allegations that Comcast's X1 system infringed Asserted Claims which were later included in this Investigation. Armaly Tr. 147:9-148:17; CX-1181 (C.D. Cal. Complaint); CX-0966 ('585 Patent Chart). Comcast [redacted] *See* CX-1208C (Comcast Interrog. Resp.).

b. Comcast Encourages Direct Infringement by its U.S. Customers

Despite knowledge of Rovi's detailed allegations of infringement since 2014, Comcast continues to instruct users to infringe. A Comcast online support webpage dated September 2018, CX-0156, provides step-by-step instructions to set a global storage option. Comcast domestic users [redacted] Balakrishnan Tr. 826:7-829:25. Another Comcast online support webpage dated January 2018, CX-0161, provides step-by-step instructions to set a program-specific storage option. Comcast domestic users [redacted] Importantly, Comcast has not rebutted this clear evidence of inducement or

attempted to show that users following instructions in CX-0156 and CX-0161 do not infringe the Asserted Claims of the '585 Patent. Albonesi Tr. 1922:21-1923:2, 1923:14-17 (stating that [redacted] *see also* Balakrishnan Tr. 752:10-753:2, 826:7-833:7; CDX-0006C.157-.165.

c. Comcast Users Directly Infringe the '585 Patent

When each imported STB is used by Comcast (e.g., its employees), or a Comcast customer in the U.S. after importation as instructed and directed by Comcast, that use directly infringes claims 15 and 22 of the '585 Patent. Balakrishnan Tr. 826:7-833:7. Moreover, the customer is also induced to build the infringing system—including the "display screen"—as required by claims 1, 8, and 11. *Id.* 826:7-833:7. Here, Rovi has presented direct (and unrebutted) evidence that Comcast's domestic customers use imported STBs, following their importation into the U.S., in the manner instructed by Comcast and thus directly infringe the Asserted Claims of the '585 Patent. *Certain Microfluidic Devices*, ID at 113.

Dr. Shamos attended the focus group where Comcast customers were asked to identify whether they made use of the features covered by the Asserted Claims of the '585 Patent. Shamos Tr. 389:5-9, 392:20-393:5, 394:9-395:18, 397:10-398:4, 398:24-399:4, 421:25-423:17 (discussing Comcast customers' actual use of the Accused to set storage options within the meaning of the Asserted Claims of the '585 Patent); '585 Att. 22 (CDX-0012C.14) (tabulated results of Comcast Customer focus group); CX-0543 (focus group results); '585 Att. 23 (CX-0543.6). This evidence shows that during this Investigation at least one Comcast customer in the U.S. made use of the Accused Products to infringe the Asserted Claims of the '585 Patent (by

practicing the methods of claims 15 and 22 and building the systems of claims 1, 8, and 11).[17] The survey of Comcast customers conducted by Dr. Schwartz is further evidence that at least one Comcast customer made use of the Accused Products to infringe the '585 Patent Asserted Claims. Shamos Tr. 421:25-422:14; RDX-0016C.10 (citing CX-1335C.10 reflecting the opinion that "[e]ach of the evaluated features are used by at least half of the respondents"); CX-1336C (results of survey). And Keith Vachris, Comcast's Executive Director of Product Management, testified that [redacted] JX-0128C (Vachris Dep) at 49:21-52:7.

d. Comcast Specifically Intends to Induce Infringement or Has Been Willfully Blind to Infringement

Despite its longstanding knowledge, Comcast (at best) has turned a blind eye to its continuing infringement of the Asserted Claims of the '585 Patent. Comcast has asserted no belief of non-infringement outside of litigation (and has entirely failed to present any evidence showing that any such belief in non-infringement was reasonable, when it was allegedly believed, who believed it, how that belief was formed, to whom it was communicated, etc.), and has continued to encourage its customers continuing post-importation direct infringement.

Comcast never provided Rovi with a responsive claim chart or any specific feedback as to why it contended it did not infringe the '585 Patent or need a renewed license. Armaly Tr. 145:25-146:9. Although Mr. McCann and Mr. Allinson were well aware of Rovi's enforcement of its patent rights, of this Investigation, and of the intricate workings of Comcast's products, neither could provide any testimony as to the '585 Patent or whether Comcast lacked the intent to infringe the Asserted Claims of the '585 Patent, any steps Comcast took to avoid infringement

[17] Dr. Shamos also used the Accused Products in Pittsburgh during the Investigation to perform the storage options functionality of the Asserted Claims (and thus he directly infringed the apparatus claims and Comcast directly infringed the method claims). Shamos Tr. 398:24-399:4.

at any point in time (e.g., after the license expired or after receiving Rovi's claim charts), or as to any alternative design alleged by Comcast to be non-infringing. McCann Tr. 1425:5-1428:8; Allinson Tr. 1490:20-1491:16. Comcast's chief litigation counsel could not remember when he had last read the '585 Patent. JX-0111C (Marcus Dep) at 23:21-24:1.

Comcast now claims that it believed [redacted]—and yet Comcast acknowledges [redacted]. RPHB at 22. [redacted]. *See Beverage Brewing*, Comm'n Op. at 20-21; *Microfluidic Devices*, ID at 127-28; *Bose Corp. v. SDI Techs., Inc.*, 558 Fed. App'x 1012, 1024 (Fed. Cir. 2014).

Comcast continues to design, import, encourage, and instruct its U.S. customers to use the Accused Products in a manner that results in direct infringement of these claims. *See* §§ II(A), V(C)(2)(b), *supra*; *Cisco*, 873 F.3d at 1360, 1362-63; *Suprema*, 796 F.3d at 1348. Indeed, Comcast has ramped up importation of Accused Products. *See* § IV(D)(2)(d), *supra*; *Microfluidic Devices*, ID at 127. Comcast knows, or is willfully blind to the fact, that it thereby induces its customers and suppliers to infringe. *Microfluidic Devices*, ID at 127; *Commil*, 135 S. Ct. at 1928; *Global-Tech*, 563 U.S. at769-71. Indeed, Comcast was found to be willfully blind in the 1001 Investigation in these very circumstances, where Rovi had provided detailed claim charts during negotiations and Comcast had offered no technical response. *Digital Video Receivers*, ID at 232-34, 399-400 (affirmed by the Commission).

D. Technical Prong of Domestic Industry

Four domestic industry products practice claims 8, 11, and 22 of the '585 Patent: Rovi's i-Guide, Passport, and Next-Gen Platform, and TSI's TiVo Bolt with Experience 4.0 (collectively, "Rovi and TSI Guides"). Balakrishnan Tr. 833:22-834:2; *see* CDX-0006C.167 (chart showing the Rovi and TSI Guides). Comcast's expert admitted that if Comcast's Accused Products are found to infringe the Asserted Claims, [redacted]

[redacted]. Albonesi Tr. 1905:5-14, 1907:9-14, 1907:24-1908:3; *see also* McCann Tr. 1438:23-1439:8 (testifying that the [redacted]

1. Claims 8 and 22[18]

[8.pre] *A method for recording programs using an IPG implemented on user television equipment, the method comprising*

The Rovi and TSI Guides meet this limitation. Balakrishnan Tr. 835:8-837:11; CX-1071.6 & CX-1028C.1 (i-Guide); CX-1071.24 & CX-1038C.1 (Passport); CX-1071.44 & CX-1035C.1 (Next-Gen); CX-1071.58 & CX-1024C.2 (TiVo Bolt). Rovi and TSI Guides are IPGs implemented on STBs. *Id.* at 835:8-837:11; '585 Att. 24 (CDX-0006C.173) (citing, e.g., CX-1071.44 showing Next-Gen). Rovi and TSI Guides running on the relevant STBs are applications, and the STBs store and run the applications at user locations. *Id.* at 836:1-837:2. Comcast does not dispute that this element is met. RPHB at 45-46.

[8.a] *displaying in a display screen at least one program listing relating to at least one program*

The Rovi and TSI Guides meet this limitation. Balakrishnan Tr. 837:12-838:10 (discussing CX-1071.6 & CX-1028C.1 (i-Guide); CX-1071.24 & CX-1038C.1 (Passport); CX-1071.44 & CX-1035C.1 (Next-Gen); CX-1071.58 & CX-1024C.2 (TiVo Bolt)). They display at least one program listing relating to at least one program in a grid guide. *Id.*; '585 Att. 24 (CDX-0006C.173) (citing, e.g., CX-1071.44 showing Next-Gen). Comcast does not dispute that this element is met by the Rovi and TSI Guides. *See* RPHB at 45-46.

[8.b] *providing the user with an opportunity to indicate a program to be recorded on a random access digital storage device by selecting a program listing from the at least one displayed program listing, wherein the selected program listing corresponds to the program to be recorded*

[18] Claim 22 is a system claim, but is otherwise parallel in structure to claim 8. The Rovi and TSI Guides practice claim 22 for the same reasons that they practice claim 8.

The Rovi and TSI Guides meet this limitation. Balakrishnan Tr. 838:11-840:8; CX-1071.9, CX-1028C.2-3 (i-Guide); CX-1071.26, CX-1038C.2 (Passport); CX-1071.46, CX-1035C.2 (Next-Gen); CX-1071.60, CX-1024C.3 (TiVo Bolt). Rovi and TSI Guides provide the user an opportunity to indicate a program to be recorded on a random access digital storage device by selecting a program listing from the at least one displayed program listing, wherein the selected program listing corresponds to the program to be recorded. *Id.*; '585 Att. 25 (CDX-0006C.182) (citing, e.g., CX-1071.46 showing Next-Gen guide). The Rovi and TSI Guides [redacted] *Id.*; CX-0860C.82 ([redacted]); CX-0859.19, .333, .518, .523 ([redacted]); CX-0854 ([redacted]); CX-0229 ([redacted]).

[8.c] *providing the user with an opportunity to select at least one storage option for storing the program to be recorded, wherein the at least one storage option relates to at least one storage setting configured to control how the program is to be digitally stored on a random access digital storage device*

The Rovi and TSI Guides meet this limitation. Balakrishnan Tr. 840:9-843:6; CX-1071.10, CX-1028C.7 (i-Guide); CX-1071.28, CX-1038C.5 (Passport); CX-1071.46, CX-1071.47, CX-1035C.3, .6 (Next-Gen); CX-1071.60, CX-1071.61, CX-1024C.3, .6 (TiVo Bolt). In each of the screenshots referenced above, the highlighted storage option has been selected by the user and relates to at least one storage setting configured to control *how* the selected program (e.g., the *what*) is to be digitally stored on a random access digital storage device [redacted]). *Id.*; '585 Att. 26 (CDX-0006C.188) (citing, e.g., CX-1071.46 [redacted] Comcast agrees that [redacted]." RPHB at 45. The Rovi and TSI Guides include hard drives for storing

programs as discussed for claim 8.b. The Rovi and TSI Guides thus meet this limitation for the same reasons that Comcast's Accused Products infringe. Balakrishnan Tr. 840:9-843:6.

[8.d] *in response to receiving the user selection of the at least one storage option, modifying the at least one storage setting for the program to be recorded*

The Rovi and TSI Guides meet this limitation. Balakrishnan Tr. 843:7-846:5; CX-1071.10, CX-1028C.7 (i-Guide); CX-1071.28, CX-1038C.5 (Passport); CX-1071.46, CX-1071.47, CX-1035C.3, .6 (Next-Gen); CX-1071.60, CX-1071.61, CX-1024C.3, .6 (TiVo Bolt). Rovi and TSI Guides, in response to receiving the user selection of a storage option [redacted] *Id.*; '585 Att. 27 (CDX-0006C.199) (citing, e.g., CX-1028C.21 showing the i[redacted]). Comcast agrees that [redacted] RPHB at 45. Rovi and TSI Guides meet this limitation for the same reasons that the Accused Products infringe. Balakrishnan Tr. 843:7-846:5.

[8.e] *recording the program on the random access digital storage device based on the modification of the at least one storage setting for the program*

The Rovi and TSI Guides meet this limitation. Balakrishnan Tr. 846:6-846:24; CX-1071.10, CX-1028C.7 (i-Guide); CX-1071.28, CX-1038C.5 (Passport); CX-1071.46, CX-1071.47, CX-1035C.3, .6 (Next-Gen); CX-1071.60, CX-1071.61, CX-1024C.3 (TiVo Bolt). Rovi and TSI Guides record the program on a random access digital storage device [redacted] based on the modification of the at least one storage setting. *Id.*; '585 Att. 28 (CDX-0006C.203) (citing, e.g., CX-1071.46 showing Next-Gen modified storage settings for "Jeopardy"). The Rovi and TSI Guides include [redacted] for storing programs as discussed for claim 8.b.

2. Claim 11

The Rovi and TSI Guides meet this claim. Balakrishnan Tr. 847:5-848:12; CX-1071.14 (i-Guide); CX-1071.43 (Passport); CX-1071.50 (Next-Gen); CX-1071.61 (TiVo Bolt). Dr. Balakrishnan testified that one of the storage options provided in the Rovi and TSI Guides is [redacted]. *Id.*; *see* CX-1024C.6 (Screenshots of TiVo Bolt Operation); CX-1028C.7 (Screenshots of Rovi Guides Operation).

VI. '741 PATENT

A. The Inventions of the Asserted Claims of the '741 Patent

The '741 Patent, titled "Interactive Television Systems with Digital Video Recording and Adjustable Reminders" and referred to as the "Restart" or "Start Over" patent, is in evidence as JX-0006 ('741 Patent). The Asserted Claims relate to broadcasting a "live" program and providing a user an option to "restart" the program when the user tunes in late. Karger Tr. 1508:23-1509:2 (Comcast expert agreeing that "at a high level, these claims address acting on an indication relevant to the show that is currently being watched, such as restarting a show"); *see also* Balakrishnan Tr. 1029:4-1031:1; '741 Att. 1 (CDX-0006C.305). The claimed restart "option" is provided as an indication displayed simultaneously with video of the program with specific timing. Balakrishnan Tr. 1030:2-4 ("There's an indication step that based on that availability of the archived copy, it displays an indication along with some timing constraints").

B. The '741 Accused Products

The Accused Products for the '741 Patent are the Comcast STBs (hardware and software) made for Comcast, [redacted], by ARRIS and Technicolor, running in the X1 System and initially imported on or after April 1, 2016. *Id*. at 1032:8-20, 1034:10-1036:5, 1037:2-1038:9, 1040:1-4. Comcast [redacted]. JX-0163C (Representative Products); Williams Tr. 337:25-338:4; Balakrishnan Tr. 1032:8-

1034:3. [redacted]. JX-0163C (Representative Products); Williams Tr. 337:25-338:4; Balakrishnan Tr. 1032:8-1034:3. For the '741 Patent, there is no material difference between any of the Comcast STBs. Williams Tr. 340:20-341:2; Balakrishnan Tr. 1036:6-23; '741 Att. 2 (CDX-0006C.307). Comcast did not introduce evidence to the contrary.

C. Comcast's Infringement

1. Direct Infringement

Comcast directly infringes the asserted claims of the '741 Patent by importing the '741 Patent Accused Products.[19] JX-0100C (Folk Dep.) at 19:18-20:15, 45:18-46:5, 48:13-49:5, 60:3-61:6, 131:12-132:4 (testifying as to [redacted]); JX-0060C (ARRIS Supply Agreement) (showing [redacted]); *see Digital Video Receivers*, Comm'n Op. at 1, 10-11 (holding that Comcast imports Accused Products). Comcast also directly infringes the asserted claims of the '741 Patent by selling the Accused Products after importation.[20]

Comcast directly infringes asserted claims of the '741 Patent after importation. Customer use of the claimed "Restart" or "Start Over" functionality is also evidence of Comcast's use of the claim 1 system and performance of each and every step of claims 8 and 14. Customer use of the accused Grid Guide, Mini Info Overlay, or Restart Reminder results in use of the claimed

[19] Rovi filed an MSD on the issue of importation by Comcast. Mot. Dkt. No. 1103-023 (July 27, 2018). The ALJ indicated she will grant Rovi's motion and find that Comcast imports the Accused Products. Hearing Tr. 31:2-7.

[20] Rovi filed an MSD on the issue of sale after importation by Comcast. Mot. Dkt. No. 1103-031 (Aug. 17, 2018). The ALJ indicated she will grant Rovi's motion and find that Comcast sells the Accused Products in the U.S. after importation. Hearing Tr. 31:2-7.

system or practice of the claimed methods. Evidence of customer use is discussed below.

a. Claim 1

[1.pre] *A system comprising:*

The preamble of claim 1—"A system comprising"—is not a limitation. The preamble defines claim 1 as a system claim. Balakrishnan Tr. 1039:21-1040:4.

[1.a] *storage circuitry for storing archived copies of videos*

The parties agreed that this phrase should be construed to mean "a circuit or system of circuits for storing archived copies of videos." Order No. 41 at 35. The ALJ construed "archived copies" to mean "real or virtual copies of programs retained by the system." *Id* at 36. Comcast's X1 system retains real or virtual copies of programs. Balakrishnan Tr. 1040:25-1041:19; *see* CDX-0006C.318-.321 (summarizing evidence supporting the Accused Products' satisfaction of claim 1.a). He testified that [redacted] Tr. 1042:7-10; *see* CX-0815C.69 (iVOD Overview); CX-0440C.192 (iVOD Features). Dr. Balakrishnan testified with reference to CX-0822C.1 (iVOD Overview) that [redacted] Tr. 1043:12-1045:5; '741 Att. 4 (CDX-0006C.321). Comcast did not present any contrary evidence regarding claim 1.a.

[1.b] *control circuitry configured to:*

The ALJ construed "control circuitry configured to" to mean "a processor or processors configured to." Order No. 41 at 45. There is no dispute that the Accused Products include "a processor or processors." Balakrishnan Tr. 1045:20-1046:12 (identifying processors in the STBs and the [redacted]); CDX-0006C.324-.325. Dr. Balakrishnan testified that the processors in the STBs and [redacted] Tr. 1045:20-

1046:12; '741 Att. 5 (CDX-0006C.325). Claim 1 requires that the "processor or processors" be configured to perform claim elements 1.c-1.e. The configuration of the STB and [redacted] and associated software will be specifically described in each claim element below.

[1.c] *[control circuitry configured to] transmit a video to a plurality of user equipment, wherein the transmitting begins at a start time and ends at an end time*

CX-1052C.4 (Screenshot) (and parallel exhibits CX-1064C.4 (same) and CX-1069C.5 (same))[21] shows that [redacted] Balakrishnan Tr. 1047:14-1048:13 (explaining '741 Att. 6 (CDX-0006C.329)); *see* CDX-0006C.328-.331 (summarizing evidence supporting the Accused Products' satisfaction of claim 1.c). Dr. Balakrishan testified that [redacted] Tr. 1048:14-16. Dr. Balakrishnan relied on [redacted]. *Id*. at 1048:17-1050:14 (describing the Accused Products' [redacted]); CDX-0006C.331. Comcast did not present any evidence disputing the presence of control circuitry configured in accordance with claim 1.c.

[1.d] *[control circuitry configured to] access a database to determine whether an archived the video is available to a user after the start time*

The Accused Products include control circuitry configured to access a database as set forth in claim 1.d. Balakrishnan Tr. 1058:17-19 ([redacted]). The accused control circuitry is the processors

[21] For each of the relevant limitations, Dr. Balakrishnan testified primarily from Mr. Williams' CX-1052C screenshots. Dr. Balakrishnan also testified that the screenshots from CX-1064C and CX-1069C reflected the same operation shown in CX-1052C for the other representative products. For the purposes of streamlining this brief, Rovi will not explicitly refer herein to the parallel cites testified to by Dr. Balakrishnan as there is no material difference between the Accused Products relating to the '741 Patent's infringement.

(and associated software) running on the STBs and [redacted] as described below. *Id*. at 1058:18-24. Dr. Balakrishnan testified about *three different embodiments* of the accused re-start functionality, each of which separately and independently infringe the Asserted Claims of the '741 Patent. *See generally* CDX-0006C.334-.340 (summarizing evidence of the Accused Products' satisfaction of claim 1.d). The three different and independently infringing restart embodiments are the: (1) Grid Guide; (2) Mini Info Overlay; and (3) Restart Reminder embodiments. Balakrishnan Tr. 1051:25-1052:11 (Grid Guide), 1054:17-1055:17 (Mini Info Overlay), 1056:16-1057:8 (Restart Reminder).

The "Grid Guide" and "Mini Info Overlay" embodiments remain in the X1 Accused Products—and Comcast disputes whether these embodiments infringe the Asserted Claims of the '741 Patent. *See, e.g.*, Karger Tr. 1514:25-1515:6 (specifically constraining non-infringement opinion to "Comcast's mini info screen and grid guide restart features"). Shortly after this Investigation was filed, Comcast removed the "Restart Reminder" embodiment—but, Comcast presented no evidence disputing Rovi's evidence showing that this embodiment infringes the Asserted Claims of the '741 Patent. Although Comcast removed the "Restart Reminder" feature [redacted], Rovi continues to be entitled to remedies directed at the feature.[22]

In demonstrating the Accused Products' satisfaction of claim 1.d, Dr. Balakrishnan first testified about the STB's display of the "Grid Guide" embodiment. '741 Att. 28 (CX-1052C.2) (Screenshot) (as annotated at CDX-0006C.335). Dr. Balakrishnan compared CX-1052C.2 and

[22] As Comcast has not entered into a consent decree concerning the Restart Reminder functionality, and there has been no other finding or stipulation removing this embodiment from the scope of the Investigation, and because Comcast presented no rebuttal evidence, the ALJ should find it undisputed that the "Restart Reminder" embodiment infringes the Asserted Claims, including element [1.d]. *See* 19 U.S.C. § 1337(c) (compelling a Commission determination except in the case of a consent order or termination); 19 C.F.R. § 210.21 (providing for specific ways in which an instituted Investigation can be terminated); *Microfluidic Devices*, ID at 44-45 (failure to timely present rebuttal evidence constitutes waiver under G.R. 7.2).

CX-1052C.1 (different views of Comcast's Grid Guide) and explained how each supported his conclusion that the Accused Products satisfy claim 1.d:

[redacted]

Tr. 1054:5-16; *id.* at 1051:25-1052:25 (discussing CX-1052C.2 (Screenshot) and [redacted]), 1053:18-1054:16 (discussing CX-1052C.1 (Screenshot) and the [redacted]); '741 Atts. 7-8 (CDX-0006C.335-.336). For CX-1052C.2 (Screenshot), Dr. Balakrishnan testified that "[redacted]" Tr. 1055:15-17. The STB processors [redacted]. *Id*. at 1058:11-24.

Dr. Balakrishnan next testified about [redacted]. '741 Att. 29 (CX-1052C.4) (Screenshot) (as annotated at CDX-0006C.337); *see* Tr. 1054:17-1056:15. For CX-1052C.4 (Screenshot), Dr. Balakrishnan testified that [redacted] Tr. 1055:24-1056:3. The STB processors [redacted] *Id*. at 1058:11-24.

Finally, Dr. Balakrishnan discussed CX-0815C.71-.73 (iVOD Overview) which included [redacted]

[redacted]. *See* '741 Att. 30 (CX-0815C.73) (iVOD Overview); Tr. 1056:16-1058:10 ([redacted]). The Restart Reminder functionality is different in that [redacted]. CX-0815C.73 (iVOD Overview) [redacted]. Comcast [redacted]. Balarkrishnan Tr. 1075:10-15. Nonetheless, for the "Restart Reminder," the STB processors [redacted]. *Id*. at 1058:11-24. This evidence is undisputed.

As to all three embodiments, Comcast did not present any evidence disputing the presence of control circuitry, in the Accused Products, configured in accordance with claim 1.d.

[1.e – part 1] *[control circuitry configured to] based on determining that the archived copy is available to the user after the start time, cause an indication corresponding to the archived copy to be displayed simultaneously with the video*

The presence of the first part of the claim 1.e limitation is not disputed. The claimed control circuitry configured to perform the first part of claim 1.e is found in the Accused Products. *Id.* at 1061:6-1063:14 (Mini Info Overlay), 1069:25-1072:15 (Grid Guide), 1075:7-24 (Restart Reminder). The processors within each of the Accused Products, along with other associated circuity, are configured to display indications corresponding to the archived copy simultaneously with the video. *Id*. at 1076:14-21. The successful [redacted] performed by the control circuitry of claim 1.c [redacted]. *Id.* at 1060:18-22, 1061:1-5. Each of the three restart embodiments (as shown in the screenshots

excerpted for claim 1.c), [redacted]. *See id.* at 1061:6-1063:14 (Mini Info Overlay), 1069:25-1072:15 (Grid Guide), 1075:7-24 (Restart Reminder); '741 Atts. 9 (Mini Info Overlay), 10 (Grid Guide), 11 (Restart Reminder). Comcast did not present any evidence disputing the presence of Accused Product control circuitry configured in accordance with the first part of claim 1.e.

[1.e – part 2] *[control circuitry configured to] after a specified time after the start time but before the end time, wherein the specified time was configured prior to the start time*

Whether Comcast's products meet the second part of claim 1.e is the main dispute between the parties, but only as to the "Grid Guide" and "Mini Info Overlay" embodiments. *See* Karger Tr. 1513:24-1514:3 [redacted]. With respect to the "Restart Reminder" embodiment, Comcast has presented no evidence that shows this embodiment fails to satisfy the requirements of any Asserted Claim, including without limitation claim 1.e-part 2.

For the Restart Reminder embodiment [redacted], Dr. Balakrishnan testified that [redacted] *See generally* Tr. 1075:7-1076:13 (Restart Reminder); *see also* CX-0815C.73 (iVOD Overview) ([redacted]). Comcast designed the Accused Products such that [redacted]. *See* Balakrishnan Tr. 1075:7-1076:13 (Restart Reminder); *see also* CX-0815C.73 (iVOD Overview).

As to the "Grid Guide" and "Mini Info Overlay" embodiments which remain in the Accused Products, Rovi presented evidence showing that the Accused Products include control circuitry configured to cause the display of the relevant indication *after a specific duration of time*. Dr. Balakrishnan explained, for each of the "Grid Guide" and "Mini Info Overlay" embodiments, how the Accused Products' control circuitry [redacted]. *See generally* Tr. 1063:15-1069:24 (Mini Info Overlay), 1072:16-1075:6 (Grid Guide). For the Mini Info Overlay and Grid Guide restart functionalities, Dr. Balakrishnan played videos [redacted]. *See* CX-1137C (Video) at 0:46-0:57 (Mini Info Overlay), 0:15-0:20 (Grid Guide); *see also* Balakrishnan Tr. 1063:15-1069:24 (explaining significance of the Mini Info Overlay video), 1072:16-1075:6 (explaining the significance of the Grid Guide video).

For each of these two embodiments, Dr. Balakrishnan specifically identified how the Accused Products' [redacted] Mini Info Overlay screen (CX-1052C.4 (Screenshot) (as annotated at CDX-0006C.337)) and Grid Guide screen (CX-1052C.2 (Screenshot) (as annotated at CDX-0006C.335)) [redacted] Tr. 1136:21-25; *see also id.* at 1069:21-22 (Mini Info Overlay: [redacted]), 1074:13-14 (Grid Guide: [redacted]), 1126:23-25 [redacted], 1130:9-11 [redacted], 1142:19-21 [redacted]

[redacted]. Dr. Balakrishnan's testimony is also consistent with the testimony of Comcast engineer Mr. McCann that "[redacted]." Tr. 1450:5-9; *see also id*. at 1450:10-16 ([redacted]), 1461:14-1462:3 ([redacted]).

Comcast makes two arguments that the "Grid Guide" and "Mini Info Overlay" embodiments do not meet the requirements of this limitation, which requires the display of a restart indication *after* "a specific duration of time or at a clock time." Order No. 41 at 39. Comcast first argues that this is not met because [redacted] Karger Tr. 1515:7-13. This argument fails because there is no requirement for user action. And, Rovi does not rely on the user's press of a key to meet the "after a specified time" limitation. The user's press of the "Guide" button, navigation on the Grid Guide, or press of the "Info" button [redacted] as required in claim 1.d, but user action is not relevant to whether the Accused Products satisfy the display of the restart indicator after a specified time as required by claim 1.e. The claimed specified tim [redacted]. Balakrishnan Tr. 1060:18-22, 1061:1-5.

Comcast next offers its so-called "inherent latency" argument. Comcast argues that the Accused Products do not satisfy the timing requirements of the second part of claim 1.e because the display of the restart indications do not occur at *exactly* the same time every time a

determination is made that an archived copy is available to a user. *See, e.g.*, Karger Tr. 1519:9-14 (testifying that no explicit time is set by Comcast), 1522:5-15 (testifying to the presence of latency), 1530:3-20 (testifying to factors causing variability in the timing). In other words, Comcast argues that because things like network latency cause the timing of the display to vary, the Accused Products do not display the relevant indications after a specific (i.e., non-variable) duration. This argument fails because the variability in time pointed to by Comcast is a result of external factors *in addition* to the claimed control circuitry Comcast built into the Accused Products. The graphic included as '741 Attachment 31 helps illustrate the flaws in Comcast's argument. The "X" on the left is the point in time when the Accused Products make the determination that an archived copy is available to the user after the start time. The blue-colored arrow to its immediate right reflects the timing engineered by Comcast into the system to respond to the user's button push relied upon by Dr. Balakrishnan (i.e., the "specified time" for the response engineered by Comcast), and the red-colored arrow represents time that may or may not be added to the ultimate display of the indication as a result of external factors (i.e., factors outside the accused control circuitry of the X1 system) such as network latency. Balakrishnan Tr. 1063:15-1069:24 (Mini Info Overlay), 1072:16-1075:6 (Grid Guide).

Infringement is not avoided by adding elements or features to an otherwise infringing system. *Amstar Corp. v. Envirotech Corp.*, 730 F.2d 1476, 1482 (Fed. Cir. 1984). But that is precisely what Comcast contends here—that the existence of external factors such as network latency causes a claim element present in the accused control circuitry (circuitry configured to display the restart indications after a specific duration of time) to no longer be present.

The claim language as construed by the ALJ defines the scope of the invented control circuitry and controls whether the claim is infringed. *Phillips v. AWH Corp.*, 415 F.3d 1303,

1312 (Fed. Cir. 2005). Rovi need only show that the processors of the Accused Products are configured to perform the claim elements. *ParkerVision, Inc. v. Qualcomm Inc.*, 903 F.3d 1354, 1361 (Fed. Cir. 2018) ("We explained long ago that '[a]pparatus claims cover what a device *is*, not what a device *does*.'") (internal citation omitted). Claim 1's language does not require a showing that the Accused Products operate in a particular manner when used in a larger system (which introduces "external factors" like network latency into the equation). Thus, the primary flaw in Comcast's "inherent latency" non-infringement argument is its improper reliance on factors ("external factors") other than the configuration of the Accused Products' control circuitry as proof of non-infringement.

For each of the three restart embodiments, Dr. Balakrishnan's analysis properly focused on the [redacted]" Balakrishnan Tr. 1067:2-4; *see also id.* at 1068:9-19 (confirming Dr. Balakrishnan's analysis of the [redacted]), 1073:24-1074:19 (same), 1076:14-21 (same). Dr. Balakrishnan's analysis specifically distinguished between the [redacted]. *See, e.g.*, Balakrishnan Tr. 1137:23-1138:21 (explaining the difference between [redacted]), 1136:17-1137:3, 1138:22-1139:18 (providing examples of "engineered latencies" and confirming Comcast's decision to include such latencies). Dr. Balakrishnan found that the [redacted]

[redacted]

[redacted]

Id. at 1069:21-24; *see also id*. at 1075:4-6 [redacted].

There is no dispute that an [redacted]. *See, e.g.*, Balakrishnan Tr. 1064:13-14 [redacted]; Karger Tr. 1619:13-21 [redacted]. Karger Tr. 1627:6-12. [redacted], McCann Tr. 1450:5-12; *see also id.* at 1461:14-1462:3; CX-1472C.6 (Comcast Test) ([redacted]), Comcast asserts that this [redacted]

Nonetheless, Comcast witnesses acknowledged the role of [redacted]

[redacted]

[redacted]

[redacted]

Karger Tr. 1520:21-1521:7; *see also id.* at 1618:17-1619:4 ([redacted]); McCann Tr. 1406:1-18, 1407:22-1408:19 ([redacted]).

Despite these admissions, Comcast asserts that the Accused Products do not cause the display of the restart indicators after a specific duration of time. But Comcast largely ignores Dr. Balakrishnan's testimony about the configuration of *the Accused Products' control circuitry* and instead repeatedly elicited testimony about things other than the control circuitry ("external factors" irrelevant to infringement). Dr. Karger, for example, stated that [redacted] Tr. 1522:12-15. He pointed to the impact of [redacted] *Id.* at 1530:3-17, 1620:11-23. Comcast engineers testified about the [redacted]. McCann Tr. 1416:17-23 [redacted], 1416:24-1417:5 [redacted]. All these things are external factors (the red arrow in '741 Attachment 31) that may add time beyond the claimed specified time in practice, but they are not the claimed and accused control circuitry or the specified time selected and engineered by Comcast into the Accused Products (the blue arrow in '741 Attachment 31).[23]

[23] Claim 1 is a system claim, not a method claim; therefore, infringement must be determined by the structure and configuration of the system. External variables potentially impacting operation of the Accused Products when executed cannot provide a basis for non-infringement. *See McCullough Tool Co. v. Will Surveys, Inc.*, 343 F.2d 381, 402 (10th Cir. 1965) ("[I]nfringement

Comcast critiques Dr. Balakrishnan's testimony concerning the [redacted]. Karger Tr. 1642:25-1645:2. By this argument Comcast contends that [redacted]. This argument does not apply to the asserted '741 Patent claims because the claims do not require [redacted]—the claims only require a specified time delay before a restart indication for "the archived copy." *See, e.g.*, JX-0006 ('741 Patent) at 38:5-7 ("cause an indication corresponding to *the* archived copy" to be displayed after a specified time). Comcast [redacted]. Balakrishnan Tr. 1065:10-1066:4. Comcast [redacted]. McCann Tr. 1446:3-14, 1447:16-1448:1. These instructions and protocols operate in a [redacted]. Balakrishnan Tr. 1074:16-19, 1137:23-1140:12. As noted above, Comcast [redacted]. McCann Tr. 1450:5-16; *id.* at 1461:14-1462:3; CX-1472C.6 (Comcast Test) ([redacted]).

The timing bounds of the display of the restart indication are specifically set by the claim: the indication must be displayed *after* a specific duration of time *that falls after the start time but before the end time*. Order No. 41 at 42-43. The claim does not dictate that the duration be long

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cannot be avoided by the mere fact that the accused device is more or less efficient or performs additional functions").

or short or even discernable—it is left to the implementer. There can be no real dispute that the Accused Products are configured to cause the display of the accused restart indications after the start time and before the end time of the program. *See, e.g.*, '741 Att. 9 (CDX-0006C.346) (evidencing the display of restart indications at 5:31pm for a program airing between 5:00-6:00pm); Balarkrishnan Tr. 1102:15-23 (testifying concerning the required bounds). A user tunes to a program after it has started, Balakrishnan Tr. 1064:18-1065:9, then after the specific time for system response engineered into the system by Comcast discussed above, *id.* at 1065:10-22, plus the time needed to account for any external factors like latency (not relevant to determining infringement) discussed above, *id*. at 1118:19-25, the "Grid Guide" and "Mini Info Overlay" embodiments (along with the undisputed "Restart Reminder" embodiment) are displayed to the user. Balakrishnan Tr. 1061:6-1063:14 (Mini Info Overlay), 1069:25-1072:15 (Grid Guide), 1075:7-24 (Restart Reminder); '741 Att. 9 (Mini Info Overlay), 10 (Grid Guide), 11 (Restart Reminder). Credible and persuasive evidence thus shows that the accused restart indications are displayed *after a specific duration of time* built into the Accused Products by Comcast.

[1.f] *[control circuitry configured to] receive a user response to the indication that is displayed; and*

The Accused Products include "control circuitry" configured to "receive a user response to the indication that is displayed." Dr. Balakrishnan testified that the Accused Products [redacted]. *See generally* Tr. 1077:7-1080:4. Dr. Balakrishnan pointed to testimony from Comcast engineers that [redacted] *Id.* at 1077:21-1078:17; CX-1027C.1 (X1 Setup). Dr. Balakrishnan further explained that in each of the three accused restart embodiments, the STB's processors [redacted]

[redacted]. *See* Tr. 1078:18-1080:1 ([redacted]d in Mini Info Overlay (CX-1052C.4), Grid Guide (CX-1052C.2), and Restart Reminder (CX-1074.2)); '741 Att. 12 (CDX-0006C.359) (Mini Info Overlay); Att. 13 (CDX-0006C.360) (Grid Guide); Att. 14 (CDX-0006C.361) (Restart Reminder). Comcast did not present any evidence disputing the presence of Accused Product control circuitry configured in accordance with claim 1.f.

[1.g] *[control circuitry configured to] based on the received user response, retrieve, from the storage circuitry, the archived copy*

The Accused Products include "control circuitry" configured to, "based on the received user response, retrieve, from the storage circuitry, the archived copy." Dr. Balakrishnan testified that the [redacted]. *See generally* Tr. 1080:19-1083:4. Dr. Balakrishnan provided examples of [redacted]. *Id*. at 1080:24-1081:11; CX-1052C.8 (Screenshot); '741 Att. 15 (CDX-0006C.366). Dr. Balakrishnan also played a video showing [redacted]. Tr. 1081:21-1082:13; CX-1137C (Video) at 1:48-2:10; '741 Att. 16 (CDX-0006C.368). Dr. Balakrishnan testified that the [redacted]. Tr. 1082:14-20. Comcast did not present any evidence disputing the presence of Accused Product control circuitry configured in accordance with claim 1.g.

b. Claim 8

Claim 8 is a method claim and requires performance of each and every step of the claim. *Joy Techs., Inc. v. Flakt, Inc.*, 6 F.3d 770, 773 (Fed. Cir. 1993). Otherwise, each limitation of claim 8 is found in claim 1. Balakrishnan Tr. 1083:10-17; '741 Att. 3 (CDX-0006C.313).

Comcast performs each and every step of claim 8 as discussed throughout this Section VII. *See also id.* at 1083:18-20. Dr. Balakrishnan testified: "Because I've shown all the elements of claim 8 in my analysis of claim 1, so the same reasoning and evidence applies to showing that claim 8 is infringed in its entirety." *Id.* at 1083:14-17.

c. Claim 14

Claim 14 is dependent on claim 8.

[14.pre] *The method of claim 8, further comprising:*

Claim 14.pre is not a limitation. The method of claim 8 is satisfied for the reasons set forth above. *Id.* at 1084:1-3.

[14.a] *removing the archived copy from the storage device at an end of a retention period, wherein the archived copy on the storage device is associated with the retention period*

Comcast removes the archived copy from the storage device at the end of a retention period, wherein the archived copy on the storage device is associated with the retention period. *See* '741 Att. 17 (CDX-0006C.380). Dr. Balakrishnan testified that in some instances [redacted]. Tr. 1084:12-1085:2; *see* CX-0815C.75 (iVOD Overview) ([redacted]), .76 ([redacted]). Comcast did not present any evidence disputing the presence of Accused Product control circuitry configured in accordance with claim 14.a.

2. Induced Infringement

Comcast induces the infringement of claim 1 of the '741 Patent.

a. Comcast Had Pre-suit Knowledge of the '741 Patent

Like the other Asserted Patents, *see* §§ IV(D)(2)(a) & V(C)(2)(a), *supra*, Comcast had specific knowledge of the '741 Patent—and Rovi's allegations of infringement—before Rovi

filed the Complaint in this Investigation. Rovi provided claim charts asserting claims 1, 8, and 15 of the '741 Patent against the Comcast X1 system on January 10, 2018, when Rovi filed a complaint alleging patent infringement in the Central District of California. Armaly Tr. 147-148; CX-1181 (C.D. Cal. Complaint); CX-0968 ('741 Patent Claim Chart); CX-1208C (Comcast Rog. Resp.) at 25-32.

b. Comcast Encourages Direct Infringement by U.S. Customers

Comcast nevertheless continued to encourage its users to infringe the '741 Patent. Balakrishnan Tr. 1086:6-1088:2. Through the Investigation, Comcast [redacted]. *Id.* at 1086:6-17 [redacted]; CX-1052C.2 (Screenshot), .4 (Same). Comcast provided even clearer instructions on Comcast's website encouraging and instructing use of the accused restart functionality. Balakrishnan Tr. 1086:22-1088:2; CX-0150 (Comcast Website) (accessed Feb. 2018: "When the notification appears, press Info on the remote to invoke the Mini Info. Then select Restart from the action bar to start the program from the beginning"); CX-0227 (Comcast Website) (accessed Sept. 2018: explaining how to use the Restart Reminder embodiment). Comcast specifically directed its users how to perform the accused restart functionality in its customer support forums. *Id.* at 1087:8-1088:2; CX-0220 (Comcast Support) (copyright 2018: instructing customers to "[p]ress info and when the options bar pops up arrow to Restart and Press Ok"); *see also* CX-0160 (copyright 2018: similar customer support instruction); CX-0175 (copyright 2018: similar customer support instruction).

c. Comcast Users Directly Infringe the '741 Patent

When each imported STB is used by a Comcast customer in the U.S. after importation as instructed and directed by Comcast, that customer's use infringes claim 1 of the '741 Patent.

Balakrishnan Tr. 1086:6-1088:2. In this Investigation, Rovi has presented direct (and unrebutted) evidence that Comcast's domestic customers make use of the imported STBs, following their importation into the U.S., in the manner instructed by Comcast and thus directly infringe the Asserted Claims of the '741 Patent. *Microfluidic Devices*, ID at 113.

Dr. Shamos testified that he attended a focus group where Comcast customers were asked to identify whether they made use of the features covered by the Asserted Claims of the '741 Patent. Tr. 389:5-9, 393:6-396:5, 397:21-398:4, 422:15-423:17; CDX-0012C.14 (Tabulated Results of Focus Group); CX-0543 (Focus Group Results). This evidence shows, beyond any doubt, that at the relevant time at least one Comcast customer in the U.S. made post-importation use of the Accused Products to infringe the Asserted Claims of the '741 Patent. The survey of Dr. Schwartz further supports Dr. Shamos' opinion that at least one real Comcast customer made use of the "Restart from the Beginning" functionality. Shamos Tr. 421:25-422:14; RDX-0016C.10 (citing CX-1335C.10 reflecting the opinion that "[e]ach of the evaluated features are used by at least half of the respondents"); CX-1336C (Survey Results).

Comcast employees confirmed additional usage of the accused restart functionality. Keith Vachris, Comcast's Executive Director of Product Management, testified that [redacted]. JX-0128C (Vachris Dep.) at 61:11-16; *see also id*. at 60:6-11 (testifying that [redacted]). Neil Shank, a Comcast vice president in the procurement department, testified that [redacted] JX-0124C (Shank Dep.) at 134:13-17, 136:21-137:12.

d. Comcast Intends to Induce Infringement or Has Been Willfully Blind

Despite its pre-suit knowledge, Comcast (at best) has turned a blind eye to its continuing infringement of the Asserted Claims of the '741 Patent. Like the other Asserted Patents, §§ IV(D)(2)(d) & V(C)(2)(d), *supra*, Comcast has asserted no belief of non-infringement outside of litigation (and has thereby failed to present any evidence showing that any such belief in non-infringement was reasonable, when it was believed, who believed it, how that belief was formed, etc.). Comcast has continued to encourage its customers to infringe post-importation.

In licensing negotiations, Comcast never provided Rovi with a responsive claim chart or any specific feedback as to why it contended it did not infringe the '741 Patent (or why it felt it did not need a license). Although they were well aware of Rovi's enforcement of its patent rights, of this Investigation in particular, and of the intricate workings of Comcast's products, neither Mr. McCann nor Mr. Allinson could provide any testimony as to the '741 Patent, whether Comcast lacked the intent to infringe the Asserted Claims of the '741 Patent, any steps Comcast took to avoid infringement at any point in time (e.g., after the license expired or after receiving Rovi's claim charts), or any alternative design alleged by Comcast to be non-infringing. McCann Tr. 1425:5-1428:8; Allinson Tr. 1490:20-1491:16. Comcast's chief litigation counsel had not read the '741 Patent. JX-0111C (Marcus Dep.) at 18:13-20, 26:8-10.

Comcast claims that it lacks the requisite intent to infringe the '741 Patent because [redacted]. RPHB at 22. [redacted] does not evidence an intent to avoid infringement. Comcast did not point to any alleged belief as to the other two implementations nor any allegedly reasonable business decision made on such a belief. *See Beverage Brewing* Comm'n Op. at 20-21; *Microfluidic Devices*, ID at 127-28; *Bose*, 558 Fed. App'x at 1024.

With full knowledge of the '741 Patent, then, and of Rovi's specific allegations of infringement against Comcast's X1 products, Comcast continues to design, import, encourage, and instruct its U.S. customers to make use of the Accused Products in a manner that results in their direct infringement of these claims. *See* §§ II(A), VI(C)(2)(b), *supra*; *Cisco*, 873 F.3d at 1360, 1362-63; *Suprema*, 796 F.3d at 1348. Comcast has only ramped up importation of Accused Products. *See* § IV(D)(2)(d), *supra*; *Microfluidic Devices*, ID at 127. Comcast has known, or has been willfully blind to the fact, that it thereby induces its customers and suppliers to infringe. *See Digital Video Receivers*, ID at 232-34, 399-400; *Microfluidic Devices*, ID at 127; *Commil*, 135 S. Ct. at 1928; *Global-Tech*, 563 U.S. at 769-71.

D. Technical Prong of Domestic Industry

Rovi's Next-Gen and TSI's Bolt with Experience 4.0 systems practice claims 1 and 8 of the '741 Patent. Balakrishnan Tr. 1088:10-18; CDX-0019 (DI Timeline). The Next-Gen and Bolt systems will be addressed together they practice claims 1 and 8 in a similar manner.

1. Claim 1

[1.pre] *A system comprising:*

To the extent the preamble of claim 1 is a limitation, it is met by the Next-Gen and Bolt systems. Balakrishnan Tr. 1089:7-9.

[1.a] *storage circuitry for storing archived copies of videos*

The Next-Gen and Bolt systems include a system of circuits for storing archived copies of videos. *Id*. at 1089:14-1090:1. Dr. Balakrishnan testified that [redacted] (Next-Gen Screenshots) and CX-1025C.1-2 (Bolt Screenshots). *Id.*; '741 Att. 18 (CDX-0006C.404). The "Start Over From" text on each screenshot indicates an archived copy is available, and the location of storage (e.g., Netflix) is identified immediately thereunder. *Id.*; Balakrishnan Tr. 1089:14-1090:1.

[1.b] *control circuitry configured to:*

The Next-Gen and Bolt systems include processors configured to perform claim elements [1.c]-[1.g] in the claimed manner. Balakrishnan Tr. 1090:9-12 [redacted]; CX-0229.3-.4 (Exemplary Technical Specifications of Bolt STB).

[1.c] *[control circuitry configured to] transmit a video to a plurality of user equipment, wherein the transmitting begins at a start time and ends at an end time*

The Next-Gen and Bolt systems include "control circuitry" configured to transmit video as claimed. Dr. Balakrishnan testified that CX-1036C.2 (Next-Gen Screenshots) and CX-1025C.1 (Bolt Screenshots) [redacted]. Tr. 1090:23-1091:13; *see also* Gaeta Tr. 240:1-13; '741 Att. 19 (CDX-0006C.410). Both CX-1036C.2 (Next-Gen Screenshots) and CX-1025C.1 (Bolt) [redacted]. Balakrishnan Tr. 1090:23-1091:13; Gaeta Tr. 240:1-13; '741 Att. 19.

[1.d] *[control circuitry configured to] access a database to determine whether an archived the video is available to a user after the start time*

The Next-Gen and Bolt systems include [redacted]. Balakrishnan Tr. 1091:17-1092:11. As Dr. Balakrishnan testified with regard to Comcast's system, he explained the significance of restart indications displayed by the Next-Gen and Bolt systems. *See* '741 Att. 20 (CDX-0006C.413) (Next-Gen), Att. 21 (CDX-0006C.414) (Bolt). As seen in the excerpt from CX-1036C.2 (Next-Gen Screenshot), [redacted] Balakrishnan Tr.

1091:17-1092:5 (discussing CDX-0006C.413); '741 Att. 32 (CX-1036C.2); *see also id.* at 1092:6-11 (discussing Bolt operation as shown in CX-1025C.1-2). In CX-1036C.2 (Next-Gen Screenshot) and CX-1025C.1 (Bolt Screenshot), [redacted] *Id.* at 1091:17-1092:11. The Next-Gen and Bolt systems [redacted]. *Id.*

[1.e] *[control circuitry configured to] based on determining that the archived copy is available to the user after the start time, cause an indication corresponding to the archived copy to be displayed simultaneously with the video after a specified time after the start time but before the end time, wherein the specified time was configured prior to the start time*

The Next-Gen and Bolt systems include "control circuitry" configured to, based on determining that the archived copy is available to the user after the start time, cause an indication corresponding to the archived copy to be displayed simultaneously with the video after a specified time after the start time but before the end time, wherein the specified time was configured prior to the start time. *Id.* at 1095:15-17. The Next-Gen and Bolt systems satisfy claim 1.e in two ways. In both instances, [redacted]. *Id.* at 1092:18-1093:12; '741 Att. 22 (CDX-0006C.417), Att. 23 (CDX-0006C.418). The [redacted] CX-1036C.2 (Next-Gen Screenshot) and CX-1025C.1 (Bolt Screenshot), [redacted] (included as '741 Attachment 23). *See* Balakrishnan Tr. 1092:18-1093:12. The Next-Gen and Bolt systems [redacted]. *See, e.g., id.* at 1094:9-11 ([redacted]

[redacted]).

Dr. Balakrishnan testified about the Restart Reminder used in the Next-Gen and Rovi systems with reference to CX-1119C (Next-Gen Video) at 0:28-0:32. *Id*. at 1093:13-1094:15; *see also* CX-1112C (Bolt Video) at 0:24-0:29 (same); '741 Att. 24 (CDX-0006C.419). The Next-Gen and Bolt [redacted]. Balakrishnan Tr. 1094:1-4 [redacted]. Claim 1.e requires the relevant display to be after a specific duration of time that falls after the start time but before the end time. The Next-Gen and Bolt systems satisfy this requirement for the same reasons that Comcast's Restart Reminder embodiment infringes. *See id*. at 1094:5-8 [redacted].

Dr. Balakrishnan also testified about the Next-Gen and Bolt [redacted]. *Id*. at 1094:16-1095:14. Both the Next-Gen and Bolt systems [redacted] *Id.* Dr. Balakrishnan testified about the restart functionality in CX-1119C (Next-Gen Video) at 0:41-0:44. *See also* CX-1112C (Bolt Video) at 0:34-0:38. He explained that after [redacted] Tr. 1094:19-22.

Dr. Balakrishan further testified that Rovi (in the case of Next-Gen) and TiVo (in the case of Bolt) [redacted]. Tr. at 1095:5-14. Dr. Balakrishnan

confirmed that the [redacted] *Id.*

Comcast argued that the Next-Gen and Bolt systems [redacted]. Karger Tr. 1536:12-13 [redacted]. For the same reasons set forth above, the Next-Gen and Bolt system practice claim 1.e in that each system includes control circuitry configured to cause an indication corresponding to the archived copy to be displayed simultaneously with the video after a specific duration of time falling after the start time but before the end time, wherein the specified time was configured prior to the start time.

[1.f] *[control circuitry configured to] receive a user response to the indication that is displayed; and*

The Next-Gen and Bolt systems [redacted]. Balakrishnan Tr. 1095:18-1096:14; '741 Att. 25 (CDX-0006C.423) (Next-Gen), Att. 26 (CDX-0006C.424) (Bolt). Dr. Balakrishnan testified that [redacted] Tr. 1095:24-1096:1; CX-1036C.2-.3 (Next-Gen Screenshots); CX-1025C.1-.2 (Bolt Screenshots).

[1.g] *[control circuitry configured to] based on the received user response, retrieve, from the storage circuitry, the archived copy.*

The Next-Gen and Bolt systems include "control circuitry" configured to, based on the received user response, retrieve, from the storage circuitry, the archived copy. Dr. Balakrishnan demonstrated the operation of the [redacted]. *See* Tr. 1096:18-1097:6; CX-1119C (Next-Gen Video) at 1:14-25; CX-1112C (Bolt Video) at 1:20-48; '741 Att. 27 (CDX-0006C.427). He testified: [redacted]

[redacted] Tr. 1096:21-24.

2. Claim 8

Claim 8 is practiced by Rovi and TiVo through the Next-Gen and Bolt systems for the same reasons and same evidence provided for claim 1. *Id.* at 1097:7-11 ("Q. Do we need to go through claim 8? A. No, all the elements of claim 8 are also found in claim 1, so I've already shown that it's practiced in claim 1, so therefore, the same analysis will apply for claim 8.").

VII. DOMESTIC INDUSTRY – ECONOMIC PRONG

A domestic industry exists for each of the DI Products. Rovi has pioneered the development of IPGs for decades. *See* DI Att. 1 (CDX-0019). As media technology has evolved, Rovi has invested heavily to meet new market demands. Rovi's Strategic IP Advisor (Samir Armaly), VP of Product & Business Operations (Sarah Gaeta), and VP of Technical Sales (Mike Koenig) testified about Rovi's three-pronged approach to the changing market: (1) [redacted]; (2) d[redacted]; and (3) [redacted]. Gaeta Tr. 212:3-214:15, 230:19-239:13; Koenig Tr. 434:20-439:23; Armaly Tr. 115:18-125:10. To meet these goals, Rovi invests in plant and equipment (P&E), labor and capital, and engineering and research and development (R&D) for the DI Products. From 2012 through 2017, Rovi and TSI invested [redacted] in the DI Products, including more than [redacted] in P&E under subsection (A), [redacted] in labor and [redacted] in capital under (B), and [redacted] in R&D and engineering under (C).

Dr. Jonathan Putnam, an expert whose opinions have been relied upon in dozens of Commission investigations, concluded that Rovi and TSI have a domestic industry for each DI

Product. Putnam Tr. 1235:2-12, 1239:10-13, 1271:5-9. He testified that Rovi's investments were significant and substantial for each DI Product for the periods of 2012-2017 and for 2016-2017. Putnam Tr. 1241:6-25, 1244:1-16, 1250:9-1251:25, 1253:16-1254:19, 1257:2-1259:1, 1269:1-13. By contrast, Comcast's expert, Mr. Todd Schoettelkotte, did not offer any alternative measure of Rovi's domestic industry, did not identify a single data point that was wrong, and did not dispute Dr. Putnam's conclusion that the investments were significant or substantial. Schoettelkotte Tr. 2042:11-2046:24. The only evidence demonstrates that a domestic industry exists.

A. Legal Standards

The Commission may find a violation of § 337 "if an industry in the United States relating to the articles protected by the patent . . . exists or is in the process of being established." 19 U.S.C. § 1337(a)(2). The economic domestic industry requirement is satisfied by meeting any *one* of three subsections: (A) significant investment in P&E; (B) significant employment of labor or capital; or (C) substantial investment in the patent's exploitation, including engineering and R&D. *Id.* at § 1337(a)(3). To determine whether investments are "significant" or "substantial," the Commission performs a flexible, quantitative review. *Lelo Inc. v. ITC,* 786 F.3d 879, 883-84 (Fed. Cir. 2015). There is no "rigid formula" or minimum expenditure required. *Certain Male Prophylactic Devices, Inc.* (*Male Prophylatic*), Inv. No. 337-TA-546, Comm'n Op. at 39, (Aug. 1, 2007). Recognizing that "parties may not keep [a] precise record of how their costs are incurred," "the Commission has adopted a flexible and market-oriented approach to determining the existence of a domestic industry." *Certain Table Saws Incorporating Active Injury Mitigation Tech. & Components Thereof* (*Table Saws*), Inv. No. 337-TA-965, ID at 12 (Mar. 22, 2016). As the ALJ has noted, "the Commission is scrupulous in its efforts to give some flexibility . . . in the area of domestic industry." *Digital Cameras,* Inv. No. 337-TA-1059, Order No. 52, at 4.

A "precise accounting is not necessary" under this flexible approach. *Stringed*

Instruments, Comm'n Op. at 26. Instead, a reasonable allocation methodology may be used to quantify the investments, and the Commission has relied upon high-level-of-generality allocations created only for litigation. *See, e.g.*, *Certain Solid State Storage Drives, Stacked Elecs. Components, & Prods. Containing Same* (*Solid State Storage*), Inv. No. 337-TA-1097, Comm'n Op. at 15-20 (June 29, 2018) (space allocation); *Certain Graphics Processors & Prods. Containing the Same* (*Graphics Processors*), Inv. No. 337-TA-1099, Order No. 16 at 3 (Apr. 30, 2018) (volume allocation). In this Investigation, Rovi's cost center allocation methodology is the same one it relies on in the ordinary course of business, more granular than the estimates in *Solid State Storage* or *Graphics Processors*, and reasonable for purposes of domestic industry. *Digital Video Receivers*, ID at 580-84 (finding DI based on Rovi's allocations); *see also Certain Prods. Containing Interactive Program Guide & Parental Control Tech.* (*Interactive Program Guide*), Inv. No. 337-TA-845, ID at 305, 312 (June 7, 2013) (finding DI based on Rovi's routine tracking of "expenses by product-specific 'cost centers'").

B. Rovi's Significant and Substantial Investment in Its Domestic Industry

1. Rovi Relies on Its Product Allocations in the Ordinary Course of Business

Rovi has demonstrated its significant investments in the DI Products through product allocations made in the ordinary course of business. These are the same allocations Rovi uses to [redacted]. Sargis Tr. 1158:6-1162:16; CX-0924C (Cost Center Expends.).

As Rolan Sargis, Rovi's VP of Financial Planning & Analysis ("FP&A"), explained: Rovi, like many large public companies, [redacted]. Tr. 1155:3-1157:3; *see also* Gaeta Tr. 227:5-228:25; Putnam Tr. 1231:24-1232:2. Rovi organizes its employees into [redacted], and their corresponding expenditures are [redacted],

[redacted]. Sargis Tr. 1155:7-1156:16; CX-0170C (Sargis Dep.) at 18:21-19:3, 46:15-50:3. Rovi captures the expenditures of each [redacted], an enterprise resource planning system. Sargis Tr. 1154:3-1156:16, 1165:14-1166:13; Putnam Tr. 1231:24-1232:2. Rovi's [redacted] is subject to audit for compliance with accounting rules by external and internal auditors, including [redacted]. Sargis Tr. 1154:3-21, 1159:2-13; Putnam Tr. 1232:3-12. The [redacted] data are the building blocks of Rovi's audited financial statements and external SEC reporting. Sargis Tr. 1158:6-15; Schoettelkotte Tr. 2041:12-16.

Each [redacted]—typically a V[redacted]r—who is responsible for the work of her team and is familiar with each team member's activities. Sargis Tr. 1156:17-1157:21; CX-0920C (Cost Center Owners); Gaeta Tr. 227:5-228:18. The [redacted] and compliance with budgets. Sargis Tr. 1156:17-1157:21, 1159:14-1160:4, 1216:20-1217:7; Putnam Tr. 1230:5-1231:13. Rovi must reasonably measure its products' profitability so that it can invest and report properly. Putnam Tr. 1225:15-1226:10, 1381:9-18; Sargis Tr. 1161:15-1162:16; Schoettelkotte Tr. 2047:11-2048:25; DI Att. 2 (CDX-0016C.9). To that end, Rovi performs an [redacted]. Sargis Tr. 1159:14-1160:4; CX-0170C (Sargis Dep.) at 21:16-22:9; Schoettelkotte Tr. 2048:8-2049:7. The [redacted] are used to set [redacted]—so Rovi uses this data to [redacted]. Putnam Tr. 1225:25-1227:11, 1230:5-1231:23, 1380:11-1381:18; Sargis Tr. 1159:14-1160:22; DI Att. 2 (CDX-0016C.9).

While many of Rovi's [redacted],[24] others are shared across [redacted]. Sargis Tr. 1182:8-19. For shared [redacted], the [redacted] assessment requires that Rovi [redacted]. CX-0170C (Sargis Dep.) at 21:13-22:9, 25:13-26:4; CX-0122C (Sargis Dep.) at 59:7-63:12. Sarah Gaeta, for example, testified that as a former cost center owner and VP of Rovi's Classic Guides, her time was split across products, which resulted in her costs being allocated [redacted] to Passport, [redacted] to i-Guide, and [redacted] across various smaller projects. Tr. 229:1-10. This allocation process provides Rovi with a full picture of its product expenditures so that it can make informed business decisions.

Because [redacted] possess the most knowledge about how employees spend their time, they are in the best position to determine [redacted] Sargis Tr. 1156:17-1157:3, 1160:23-1161:3, 1213:1-25; CX-0170C (Sargis Dep.) at 43:12-21; Putnam Tr. 1230:5-1231:13, 1260:12-20; Schoettelkotte Tr. 2051:1-16. To arrive at the appropriate allocation, the [redacted] works with a dedicated Rovi [redacted], who provides them with [redacted]. Sargis Tr. 1160:11-1161:3, 1213:1-25.

Reasonable accuracy of the product allocations is further ensured through Rovi's [redacted]. Sargis Tr. 1162:4-16; Putnam Tr. 1230:5-1231:23. Product allocations are internally monitored by the [redacted] to ensure consistency and reliability, and the resulting product P&Ls are also monitored by [redacted] Sargis Tr. 1162:4-16; CX-0170 (Sargis Dep.) at 41:21-42:23, 46:15-48:9. A [redacted]

[24] The majority of Rovi's investments are in [redacted] that are [redacted], and, therefore, [redacted]. *See, e.g.*, CX-0924C ("i-Guide – EB Summary" Tab, Row 14, Columns U-AA) (indicating that [redacted]. CX-0924C.

(like Ms. Gaeta) who is responsible for a product's budget and P&L. Gaeta Tr. 201:3-12; Putnam Tr. 1230:5-1231:23; 1379:25-1380:17. Because she is accountable for her [redacted]. Putnam Tr. 1230:5-1231:23; 1380:8-17. Since there is only so much to go around, the product leads are incentivized to be—and keep the other product leads—honest. As Dr. Putnam described, a product lead would not [redacted]. *Id.* In addition, the [redacted]. Sargis Tr. 1162:4-16. And they are also incorporated into the [redacted] of Rovi's SEC filings. *Id.* at 1160:5-10; CX-0243, CX-0248-0251 (Rovi 10-Ks).

Neither Comcast nor Mr. Schoettelkotte claims that Rovi's product allocation methodology is unreliable for Rovi's everyday business purposes. Schoettelkotte Tr. 2048:8-2050:2. And after months of discovery and an additional post-discovery production from Rovi addressing every request made by Comcast, Mr. Schoettelkotte did not identify any alleged error in Rovi's allocations or the resulting DI expenditure figures. Schoettelkotte Tr. 2044:1-5.

Under Commission precedent, Rovi's ordinary-course-of-business-budgeting practice is a "reasonable and appropriate allocation methodology." *Certain Ink Cartridges & Components Thereof*, Inv. No. 337-TA-946, ID at 67 (Oct. 28, 2015). In fact, Rovi has used this methodology for many years, and this is not the first time Rovi has offered it to prove a domestic industry before the Commission. *Digital Video Receivers*, ID at 580-84; *Interactive Program Guide*, ID at 305, 312. In the 1001 Investigation, Rovi presented the same allocation methodology. *Digital Video Receivers*, ID at 580-84. In finding a domestic industry for i-Guide and Passport, ALJ

Shaw credited Rovi's methodology.[25] *Id.* The Commission chose not to review that finding, and Comcast did not appeal. *Id.*, Comm'n Op. at 35-36.

2. Rovi's Investments Satisfy the Economic DI Requirement

Dr. Putnam testified to the domestic investments by Rovi reflected in Table 1 included as DI Attachment 37 (with accompanying footnotes).

Significance & Substantiality. Dr. Putnam opined that Rovi's investment in each DI Product was significant and substantial under each statutory subsection for the full period and 2016 to 2017 alone, based both on the absolute magnitude of the investment and on its relation to Rovi's overall foreign and domestic investment in the category. To measure relative significance, Dr. Putnam calculated that the U.S. investments amounted to the vast majority of Rovi's worldwide expenditures, that a large portion of the U.S. expenditures was dedicated to the DI Products, and that each DI Product constituted a large portion of those expenditures. Putnam Tr. at 1242:3-1243:3; *see Certain Printing & Imaging Devices & Components Thereof*, Inv. 337-TA-690, Comm'n Op. at 27-28 (Feb. 17, 2011).[26] In the 1001 Investigation, ALJ Shaw found a domestic industry for i-Guide and Passport based on Rovi's significant investments in plant and

[25] ALJ Shaw noted that "Rovi tracks its expenses by 'cost centers' associated with R&D and engineering activities, and regularly performs a product P&L process to allocate these expenses to certain products." *Digital Video Receivers*, ID at 582. ALJ Shaw found a domestic industry based on R&D and S&M cost center expenditures. He did not look to COGS because there was insufficient testimony regarding the nature of those expenditures. ALJ Shaw did not rule, as Comcast has incorrectly suggested, that Rovi's allocation process was unreliable. In this Investigation, by contrast, Dr. Putnam and Ms. Gaeta testified that COGS expenditures are used to [redacted]. Putnam Tr. 1244:17-1249:7; DI Att. 3 (CX-0016C.27); Gaeta Tr. 229:11-230:11.

[26] Dr. Putnam further testified that, while his calculations properly included COGS and S&M, his opinions would not change if those expenditures were removed. Tr. 1244:17-1249:7; DI Att. 3 (CDX-0016C.27). Accordingly, he provided alternative expenditure schedules with S&M excluded, *see* CDX-0017C.7; DI Att. 13 (CDX-0016C.29), along with schedules of COGS expenditures that require only simple subtraction to exclude them from the total investments, *see* CDX-0017C.8; DI Att. 14 (CDX-0016C.28). Putnam Tr. 1247-48.

equipment, significant employment of labor and capital, and substantial investment in the exploitation of the relevant patents. *Digital Video Receivers*, ID at 578, 580. That determination—which covered investments from 2012 to 2015, and was neither reviewed nor appealed—overlaps with the relevant period in this Investigation.

a. Classic Guides

Based on Rovi's business activities and the investments in Table 1 (included as DI Attachment 37), Dr. Putnam testified—and Mr. Schoettelkotte did not refute—that Rovi's investments in i-Guide and Passport satisfy subsections (A), (B), and (C) of the domestic industry economic prong. Putnam Tr. 1239:10-13, 1241:6-1242:2, 1244:1-16, 1250:9-17; Schoettelkotte Tr. 2046:6-21. Rovi has invested in Classic Guides to provide hundreds of cable operators and millions of users with interactive discovery and navigation for entertainment content. Gaeta Tr. 201:15-208:22; CX-1159 (i-Guide Video); CX-1162 (Passport Video). Classic Guide users are passionate about their guide experience, and Rovi's cable operator customers are able to deploy these guides on hardware paid for years ago without having to incur the significant cost of building out new IP networks. Gaeta Tr. 233:3-23. While Comcast has characterized i-Guide and Passport as dinosaur products of the past, Ms. Gaeta explained that they are far from extinct. *Id.* at 230:19-234:15, 322:17-324:9. Indeed, at the beginning of 2018 approximately [redacted] U.S. cable operators were deploying i-Guide to [redacted] U.S. subscribers, and approximately [redacted] U.S. cable operators were deploying Passport to [redacted] U.S. subscribers. *Id.* at 210:3-22, 321:6-322:16; CX-1379C (U.S. Revenue).

To meet demand and increase product functionality, Rovi consistently invests in and periodically releases new versions of i-Guide and Passport. Gaeta Tr. 212:3-215:17. Rovi currently supports [redacted] i-Guide releases, [redacted], and [redacted] Passport releases, Passport [redacted]. *Id.* at 212:3-8. For over a year Rovi has been developing the [redacted] of i-

Guide ( ) and Passport ( ); these will be . *Id.* at 221:10-20, 223:4-225:11. Although each release provides additive functionality, the '585 Patent functionality has been practiced consistently by every release of the products for at least a decade, including all of the releases currently in the marketplace. *Id.* at 217:4-24.

The i-Guide engineering team developing new releases consists of some engineers and engineers in the United States, primarily based in Rovi's office, with additional support coming from Rovi offices in . *Id.* at 226:4-20. For Passport there are engineers and engineers in the United States, all based in one of Rovi's offices. *Id.* at 226:4-24.

Subsections (A) and (B). From 2012 to 2017, Rovi invested in the U.S. over in plant and equipment for i-Guide and over for Passport. From 2016 to 2017 alone, Rovi invested in the U.S. over in plant and equipment for i-Guide and for Passport. Putnam Tr. 1241:6-13; CDX-0017C.5; DI Att. 15 (CDX-0016C.21). By the end of 2017, Rovi had built up a stock of more than in plant and equipment allocated to i-Guide and more than allocated to Passport. Putnam Tr. 1240:3-15, 1241:14-1242:2; CX-0243 (10-K); CX-0248-CX-0251 (10-Ks); CX-0924C (Cost Center Expends.); DI Att. 16 (CDX-0016C.23); CDX-0017C.2.

From 2012 to 2017, Rovi invested over in labor for i-Guide and over for Passport. From 2016 to 2017 alone, Rovi's domestic investments in labor were over for i-Guide and over for Passport. Putnam Tr. 1244:1-9; DI Att. 17 (CDX-0016C.26); CDX-0017C.6, .9-.10; CX-0918C; CX-0924C. Dr. Putnam determined that from 2012 to 2017, Rovi spent over of capital on i-Guide and more than

on Passport. Rovi spent more than [redacted] of capital on i-Guide and more than [redacted] on Passport in 2016 and 2017. Putnam Tr. 1250:3-17; DI Att. 18 (CDX-0016C.32); CDX-0017C.11; CX-0924C (Cost Center Expends.); CX-0243 (10-K), CX-0248-CX-0251 (10-Ks).

Dr. Putnam concluded, and Mr. Schoettelkotte did not contest, that Rovi's investments under subsections (A) and (B) were significant as to i-Guide and Passport. Putnam Tr. 1239:10-13, 1241:6-1242:2, 1244:1-6, 1250:3-17; Schoettelkotte Tr. 2046:6-24.

Subsection (C). From 2012 to 2017, Rovi invested over [redacted] in R&D and engineering in i-Guide and over [redacted] in Passport. Putnam Tr. 1250:18-1251:19; DI Att. 19 (CDX-0016C.35); CDX-0017C.14; CX-0924C (Cost Center Expends.). In 2016 and 2017 alone, Rovi invested over [redacted] on i-Guide and over [redacted] on Passport. *Id.* at 1251:11-16; DI Att. 19 (CDX-0016C.35); CDX-0017C.14; CX-0924C (Cost Center Expends.). Dr. Putnam concluded, and Mr. Schoettelkotte did not contest, that these investments were substantial. *Id.* at 1250:18-1251:19; Schoettelkotte Tr. 2046:6-24.[27]

Dr. Putnam also testified—and Mr. Schoettelkotte did not contest—that these R&D and engineering investments were related to the '585 Patent. Subsection (C) requires substantial investment in "exploitation" of the asserted patent and looks for a nexus between the patent and the investment. But "no patent-by-patent allocation" is required, as this would be an "unduly narrow interpretation of 'exploitation.'" *Certain Integrated Circuit Chips & Prods. Containing the Same* (*Integrated Circuit Chips*), Inv. No. 337-TA-859, Comm'n Op. at 41-42 (Aug. 22, 2014). Further, "most firms have little reason to keep research and development records on a patent-by-patent basis, as opposed to a project-by-project basis." *Id.* Therefore, "exploitation" under subsection (C) is construed broadly to encompass "activities such as efforts to improve,

[27] *See also Digital Video Receivers*, ID at 578, 580 (concluding that Rovi's "R&D expenses . . . are a significant investment in plant and equipment" for i-Guide and Passport).

develop, or otherwise take advantage of the asserted patent." *Id.* at 39. There is a nexus here:

First, the fact that both i-Guide and Passport practice the '585 Patent "support[s] the inference that the investment was itself an exploitation of the patent." *Id.* at 42. *Second*, the evidence shows that Rovi's investments in R&D and engineering exploit the recording options functionality of the '585 Patent practiced by i-Guide and Passport. While the '585 patented feature has been present in i-Guide and Passport since [redacted], in developing each new release, Rovi's engineers perform [redacted]. Gaeta Tr. 215:18-221:9; Putnam Tr. 1259:20-1266:9; CDX-0017C.25-.26; DI Att. 20 (CDX-0016C.56). Regression testing ensures that the specific functionality is operating as expected by subjecting it to a battery of tests and comparing the results to those expected of the patented functionality. Gaeta Tr. at 215:18-220:2. [redacted]. *Id.* at 219:15-220:2. For example, regression testing for the '585 Patent feature ensures that the recording options functionality is operating properly. *Id.* at 217:4-220:2.

In addition to regression testing, Rovi spent the [redacted] improving upon the '585 Patent feature in its most recent version of i-Guide, [redacted]. *Id.* at 221:10-225:11. Rovi engineers developed new [redacted] that [redacted] the recording options functionality of the '585 Patent into the [redacted]. *Id.* at 221:10-223:3. This functionality had to be [redacted]. *Id.*

Given the direct relationship between the [redacted], and the '585 Patent features, Rovi's investments in R&D and engineering for i-Guide and Passport satisfy the nexus requirement under subsection (C). Putnam 1259:20-1266:9; DI Atts. 20, 25-26 (CDX-0016C.54-.56).

b. AS&R

Mr. Koenig testified that AS&R development began at Veveo. Tr. 429:6-435:7. Veveo patented a number of new search technologies, including the overloaded key search functionality ('011 Patent). Veveo licensed its products (e.g., SmartRelevance f/k/a Reveal)[28] that practiced those patents to cable operators such as Comcast. *Id.* at 433:13-434:19, 435:12-439:23. Rovi purchased Veveo in 2014, renamed SmartRelevance to AS&R,[29] and continued its development. *Id*. 434:20-435:7, 439:9-23; JX-0099C (Fennelly Dep.) at 57:22-59:20; Armaly Tr. 119:15-120:6, 121:14-122:14. Rovi continues to employ a U.S.-based workforce for AS&R, which included as many as [redacted] in 2016. Putnam Tr. 1382:4-15; CDX-0017C.10; CX-0924C (Cost Center Expends.); JX-0099C (Fennelly Dep.) at 57:22-59:20. This workforce helps ensure that AS&R [redacted] and provides [redacted] for the product. Koenig Tr. 439:9-23; JX-0099C (Fennelly Dep.) at 57:22-59:20. While a portion of the AS&R costs have [redacted], this change does not alter the magnitude of domestic investments in the product in the relevant timeframe, as Rovi has invested [redacted] in AS&R since 2014 and continues to support the product today. Putnam Tr. 1382:4-15; *Certain Battery-Powered Ride-On Toy Vehicles & Components Thereof*, Inv. No. 337-TA-314, ID, 1990 ITC LEXIS 393, *26-31 (Dec. 5, 1990); *Certain Variable Speed Wind Turbines & Components Thereof*, Inv. No. 337-TA-376, Comm'n Op. at 24-26 (Nov. 1996). Currently, AS&R generates [redacted] in revenue and provides its licensee, Cablevision/Altice, with the ability to employ [redacted] by practicing the '011 Patent. Koenig Tr. 436:11-438:2, 439:24-442:21; CX-0917C (Tabs, "ASR Rev Summary" & "AS&R Rev Detail"). Rovi's investments in AS&R satisfy

[28] Veveo's Reveal product was renamed to SmartRelevance/SmartSearch. Koenig Tr. 434:4-12.

[29] Smart Relevance/SmartSearch constituted one product, which was then renamed "AS&R" upon Rovi's acquisition of Veveo. Koenig Tr. 433:4-12, 434:20-435:7.

subsections (A), (B), and (C) of the domestic industry economic prong.

Subsections (A) and (B). Dr. Putnam testified that from 2014 to 2017, Rovi invested over [redacted] in plant and equipment for AS&R, with [redacted] of that investment in 2016 and 2017 alone. Tr. 1253:16-25; CDX-0017C.5; DI Att. 21 (CDX-0016C.38); CX-0924C (Cost Center Expends.).[30] Rovi has also invested heavily in U.S. labor and capital related to AS&R. From 2014 through 2017, Rovi invested over [redacted] in labor related to AS&R, with over [redacted] invested in 2016 and 2017 alone. *Id.* at 1254:1-7; CDX-0017C.2; DI Att. 22 (CDX-0016C.39); CX-0924C (Cost Center Expends.). From 2014 to 2017, Rovi also invested [redacted] in capital related to AS&R, with [redacted] invested in 2016 and 2017 alone. Putnam Tr. 1254:8-13; CDX-0017C.11; DI Att. 23 (CDX-0016C.40); CX-0243 (10-K), CX-0249-CX-0251 (10-Ks). Dr. Putnam testified, and Mr. Schoettelkotte did not refute, that these investments are significant under subsections (A) and (B). *Id.* at 1253:16-1254:24; Schoettelkotte Tr. 2046:6-17.

Subsection (C). Finally, Rovi has invested most heavily for AS&R in the area of R&D and engineering under subsection (C). From 2014 to 2017, Rovi invested, on average, more than [redacted] a year, totaling [redacted] over the period. Putnam Tr. 1254:14-19; CDX-0017C.14; DI Att. 24 (CDX-0016C.41); CX-0924C (Cost Center Expends.). From 2016 to 2017 alone, Rovi invested [redacted]. *Id.* at 1254:14-19; CDX-0017C.14; DI Att. 24 (CDX-0016C.41). Rovi's R&D and engineering investments in AS&R exploit the '011 Patent. Because the product practices the Patent, these investments constitute *de facto* exploitations of the '011 patented features practiced by AS&R. *Integrated Circuit Chips*, Comm'n Op. at 42; Putnam Tr. 1259:20-1265:16. In addition, Mr. Koenig testified that the'011 Patent feature has been subject

[30] As explained at the Hearing, some of the corresponding investment figures for AS&R are labeled as "FanTV API / Veveo Adv S&R" in CX-0924C. *See* Sargis Tr. at 1165:6-13; Koenig Tr. 441:3-20.

to the same type of [redacted] for each new update and bug fix for AS&R as described above for the Classic Guides. Koenig Tr. 439:9-23; JX-0099C (Fennelly Dep.) at 57:22-59:20; DI Att. 25-27 (CDX-0016C.54-.55, .58); § VII(B)(2)(a), *supra* (describing regression testing).

c. Next-Gen Platform

Rovi is also investing in Next-Gen, which launched during discovery in this Investigation in April 2018, [redacted] across the United States. Gaeta Tr. 241:18-21, 242:9-16. Its investments in Next-Gen satisfy subsections (A), (B), and (C).

i. The domestic industry for Next-Gen is in the process

Domestic industry may also be satisfied for a product in development. An industry is "in the process" if: (i) the patent owner "is taking the necessary *tangible steps* to establish such an industry in the United States"; and (ii) there is "a *significant likelihood* that the industry requirement will be satisfied in the future." H. Rep. 100-40 at 157 (emphasis added); S. Rep. 100-71 at 130; *Stringed Instruments*, Comm'n Op. at 16; *Digital Cameras*, ID at 73.

The statute does not require that a product be *in production* when the complaint is filed. As the ALJ recognized in *Digital Cameras*, a "production-ready" requirement would effectively eliminate "in the process" cases altogether. ID at 44-47; *Certain Non-Volatile Memory Devices & Prods. Containing Same*, Inv. No. 337-TA-1046, Comm'n Op. at 41-44 (Oct. 26, 2018) (finding that § 337 does not require commercial production for in the process claims).

The Commission has clearly held that activities and investments beyond the filing of the complaint may be considered according to "specific facts or circumstances" of an investigation. *Certain Collapsible Sockets for Mobile Elec. Devices & Components Thereof*, Inv. No. 337-TA-1056, Comm'n Op. at 15 (July 9, 2018). For example, where products are in development at the time of filing of the complaint, the ALJ has considered facts concerning technical development through the close of fact discovery. In these circumstances, the ALJ has held that "two (2) dates

are germane to the technical domestic industry analysis": the date the complaint is filed and the date fact discovery closes. *Digital Cameras*, ID at 48. In this Investigation, the Complaint was filed on February 8, 2018, and fact discovery closed on June 29, 2018. Order No. 4, at 3. Within this framework, and as set forth below, Next-Gen easily meets the "in the process" standard. Putnam Tr. 1254:25-1259:19; DI Att. 28 (CDX-0016C.45).

Tangible Steps Before Filing the Complaint. Before filing its Complaint, Rovi took tangible steps toward completing and launching Next-Gen. Rovi has long been planning for and investing in an internet protocol (IP)-based guide product. Gaeta Tr. 235:15-239:13. Rovi made its first major step in 2014, when Rovi acquired Fanhattan and its IP-based guide called FanTV. *Id.* at 235:15-236:4; JX-0101C (Gaeta Dep.) at 95:8-96:5; JX-0126C (Thun Dep.) at 11:12-12:4; Armaly Tr. 119:15-25, 122:20-25. Rovi then acquired TiVo in 2016, along with its engineers and its hardware and software technology. Gaeta Tr. 236:20-237:24, 239:3-13; Armaly 123:15-125:10. At that point, Rovi had the pieces it needed to create Next-Gen.

Chris Thun, VP of Product Management at TSI, testified that in the [redacted]. JX-0126C (Thun Dep.) at 16:6-17:19, 46:18-47:9; Gaeta Tr. at 239:3-242:8. By January 2018, Rovi's development of Next-Gen was advancing:

- Product-specific engineering plans were in place and being followed. Gaeta Tr. 243:3-244:10; CX-0488C (Product Roadmap) at 7 (showing planned development for [redacted]).
- Rovi's engineers developed the code that would be used in the first release. JX-0126C (Thun Dep.) at 99:13-21.
- [redacted] Gaeta Tr. 244:11-245:6; JX-0126C (Thun Dep.) at 16:6-17:19.
- [redacted]. Gaeta Tr. 249:15-253:6; CX-0776C (JIRA ticket); CX-0800C (JIRA ticket).

- Marketing presentations had been created to explain the features, advantages, and value proposition of Next-Gen. Gaeta Tr. 254:6-15; CX-0477C.

Next-Gen was announced to the public in January 2018 at the Consumer Electronics Show (CES) 2018 conference. Gaeta Tr. 245:19-247:25. CES marketing efforts included customer-specific briefings and interviews with trade publications and a public press release introducing the Platform. Gaeta Tr. 245:19-247:25; CX-0823C.9-.10 (Executive Briefing Book).

Tangible Steps Before the Close of Discovery. After filing and before the close of fact discovery, Rovi launched the platform, developed a customer base, began earning revenue, and continued developing additional features that will be added to the next release of the Next-Gen. By [redacted] Gaeta Tr. 248:9-249:20; CX-0476C.2 (STB Roadmap). In April 2018, Rovi released Next-Gen ([redacted]) to its consumer retail business and to its operator market. Gaeta Tr. 248:6-8; JX-0096C (Denney Dep.) at 63:15-64:24. Rovi made both the source code and a running instance of that release available to Comcast during fact discovery. Mr. James Denney, VP of Product & Strategy at TSI, testified that since the initial release in April, [redacted] Gaeta Tr. 248:6-253:6; JX-0096C (Denney Dep.) at 73:5-22, 102:17-103:10; 290:2-21; RX-0363C.27 (Rovi Resp. to Rog. 43); RX-0372C.40 (Rovi Resp. to Rog. 79). For example, Rovi continued to develop the [redacted]. Gaeta Tr. 248:6-253:6; CX-0789C (JIRA ticket) (created in 2018, with engineering comments throughout the year); CX-0790C (same); CX-0776C (same); CX-0800C (same). [redacted] *Id*. at 249:15-253:6. Rovi

made available to Comcast both the source code and a running instance of the prototype before the close of fact discovery, and Comcast's experts inspected that code. Rovi. Opp. Mot. to Exclude, Mot. No. 1103-047, at 2, 6 n.4 (Oct. 21, 2018).

Rovi continues to market Next-Gen to existing and potential customers. Gaeta Tr. 253:7-254:15. In addition to its website promotions, Rovi also markets the platform through licensees ( ) and through retail channels. *Id.* at 253:7-17; CX-0235. *Id.* at 254:16-255:13; CX-0926C.

As a result of its investments, by the close of fact discovery, Rovi had successfully enlisted customers for Next-Gen. *Id.* at 255:14-18. For TiVo Bolt hardware users, the April 2018 software release ( ) , creating an instant retail consumer base. JX-0096C (Denney Dep.) at 232:11-233:10. In addition, Rovi had licensed Next-Gen to operators, including . JX-0101C (Gaeta Dep.) at 213:20-214:16, 216:2-20. As a result, Next-Gen has begun to earn revenue, and Rovi expects future revenue growth. Gaeta Tr. 255:19-256:2. Taken together, Rovi's efforts demonstrate both tangible steps and a significant likelihood that Rovi will satisfy the domestic industry requirement within a reasonable time in the future.

ii. Investments in Next-Gen

Rovi's investments in Next-Gen satisfy Subsections (A), (B), and (C):

Subsections (A) and (B). From 2014 to 2017, Rovi invested in plant and equipment for Next-Gen, with over of that investment taking place in 2016 and 2017. Putnam Tr. 1257:11-15; CDX-0017C.5; DI Att. 29 (CDX-0016C.47); CX-0924C (Cost Center Expends.). As a result, by the end of 2017, Rovi had built up a stock of over

in plant and equipment allocated to Next-Gen. CDX-0017C.3; DI Att. 30 (CDX-0016C.46); CX-0924C (Cost Center Expends.); Putnam Tr. 1257:2-10. From 2014 to 2017, Rovi invested over [redacted] in Next-Gen-related labor (compensation, benefits, and commissions), with over [redacted] invested in 2016 and 2017 alone. CDX-0017C.6; DI Att. 31 (CDX-0016C.48); CX-0924C (Cost Center Expends.); Putnam Tr. 1257:18-22. By the end of 2017, Rovi had employed [redacted] employees to work on Next-Gen. Putnam Tr. 1257:23-1258:2; DI Att. 31 (CDX-0016C.48). From 2014 to 2017, Rovi spent [redacted] of U.S. capital to support Next-Gen, [redacted] of which was spent in 2016 and 2017. CDX-0017C.11; DI Att. 32 (CDX-0016C.49); Putnam Tr. 1258:3-10. Dr. Putnam testified, and Mr. Schoettelkotte did not refute, that these investments were significant under Subsections (A) and (B). Putnam Tr. 1257:2-1258:10; Schottelkotte Tr. 2046:6-24.

Subsection (C). Rovi has invested substantially in R&D and engineering to exploit the ’011, ’585, and ’741 Patents under subsection (C). From 2014 through 2017, Rovi invested over [redacted] in R&D and engineering for Next-Gen; over [redacted] of that investment took place in 2016 and 2017. CDX-0017C.14; DI Att. 33 (CDX-0016C.50); CX-0924C (Cost Center Expends.); Putnam Tr. 1258:11-16. Dr. Putnam concluded, and Mr. Schoettelkotte did not refute, that Rovi’s R&D and engineering investments in Next-Gen were substantial. Putnam Tr. 1258:11-1259:1; Schoettelkotte Tr. 2046:6-24.

Rovi’s investments in R&D and engineering relating to Next-Gen exploit the ’011, ’585, and ’741 Patents: Before the close of fact discovery, Rovi’s investments included [redacted] Gaeta Tr. 244:11-245:6. [redacted]

[redacted] CX-0776C (JIRA ticket); CX-0789C-CX-0790C, CX-0800C (JIRA tickets); CX-0476C.2 (STB Roadmap) (indicating that future release of Next-Gen (i.e., [redacted]) scheduled for [redacted] would include [redacted] (i.e., [redacted]) functionality); CDX-0017C.25. Throughout this period, Rovi performed [redacted] for Next-Gen, each of which tests all three of the patented features. Gaeta Tr. 244:11-245:6; 252:22-253:6; CX-0476C (STB Roadmap). A nexus therefore exists between Rovi's R&D and engineering investments and the patented features of the '011, '741, and '585 Patents practiced by Next-Gen. Putnam Tr. 1259:20-1267:25; CDX-0017C.25-.26 (Nexus); CDX-0017C.32 (Cost Center); DI Atts. 20, 25-27, 34 (CDX-0016C.54-.58). No Comcast witness rebutted Rovi's nexus evidence.

3. Comcast's Arguments Are Contrary to Law and Divorced From Fact

a. Criticism Regarding "Transparency" Is Irrelevant and Unsupported

Comcast argues that Rovi's allocation process lacks "transparency" and that Rovi's allocations are thus purportedly "unverifiable" and "unreliable." RPHB at 105-108 & Supp. 1-3; Schoettelkotte Tr. 2042:2-2043:20. This argument fails.

First, there is no lack of transparency. Rovi's cost-center methodology, explained above, was described in detail by Rovi's witnesses during depositions and at the Hearing, and Comcast understands how it works. Comcast implies that Rovi must allocate based on a rigid formula or precise accounting methodology. RPHB at 105-108; Putnam Tr. 1316:20-25. But as Mr. Schoettelkotte agreed, Rovi is under no obligation to structure its business in any particular manner, and no rigid formula or precise accounting is necessary to satisfy the domestic industry requirement. Schoettelkotte Tr. 2050:4-19; *see also Stringed Instruments*, Comm'n Op. at 25-26 (noting "[a] precise accounting is not necessary"); *Male Prophylactic Devices*, Comm'n Op. at

39 (rejecting application of "any rigid formula"). Rovi's business and reporting needs are best served by allowing cost center owners to perform expenditure allocations, and—as a matter of established precedent—that methodology is sufficiently transparent to prove the existence of Rovi's domestic industry. *Digital Video Receivers*, ID at 580-84; *Interactive Program Guide*, ID at 305, 312.

Second, Rovi's allocations are verifiable. As discussed above, they are regularly verified by the [redacted] and the [redacted] *in the ordinary course of business*: These data are used [redacted]; both [redacted] on the process and the resulting [redacted] are subject to outside audit by independent auditors; and the process is [redacted] for external reporting to the SEC, shareholders, and the public. Sargis Tr. 1158:6-1162:16; Putnam Tr. 1225:15-1226:21, 1230:5-1231:23, 1380:11-1381:18; Gaeta Tr. 201:3-12, 227:5-229:10. Furthermore, Rovi's allocations have been verified in this Investigation. Rovi produced breakdowns of [redacted]. CX-0920C (Tab, "Dept List New," Columns F, M, & V); Sargis Tr. 1157:4-1158:5.[31] Rovi produced a detailed list of expenditures [redacted]. *Id.* at 1163:21-1164:10, 1166:6-13; CX-0924C (Cost Center Expends.); *see also* CX-1363C (Tab: "USFY11FY17); Sargis Tr. 1169:18-1171:2 (noting further supplemental detailed information produced). Rovi produced its public SEC financial reports. *See, e.g.*, CX-0243; CX-0248-CX-0251. And Rovi employees provided testimony concerning the allocation process. Dr. Putnam used this information to identify and interview the [redacted] responsible for 75% of the

[31] Rovi produced a list of all [redacted] (CX-0920C) on April 16, 2018, and thereafter cross-referenced the list in an interrogatory response dated May 11, 2018. CX-0920C (Bates No. ROVI_1103-ITC00360544); RX-0364C.103 (Rovi Supp. Resp. to Comcast Rog. 79). Dr. Putnam interviewed individuals that were responsible for certain [redacted] in 2018.

investments in the DI Products. Putnam Tr. 1371:8-1372:12, 1390:21-1391:8; CDX-0017C.32.[32] Based on this information, Dr. Putnam verified, quantified, and classified Rovi's domestic industry investments, and he produced detailed schedules explaining how he performed those calculations. *See* CDX-0017C; Putnam Tr. 1225:15-1227:11.

Comcast's claim that Rovi's allocations are "unverifiable" is gamesmanship: Mr. Schoettelkotte could have verified the allocations himself; he simply chose not to try. Schoettelkotte Tr. 2042:11-2046:24, 2065:6-14. Comcast and Mr. Schoettelkotte had access to all of the information that Dr. Putnam used to verify the allocations. Indeed, Comcast was given everything it asked for and more. It was even given the notes from Dr. Putnam's interviews with the [redacted]. CDX-0017C.32[33]. Mr. Schoettelkotte testified that "to understand the activities in those [redacted], one must talk to the [redacted]." Tr. 1987:7-19. But Mr. Schoettelkotte made no effort to do so. Notably, Mr. Schoettelkotte declined to adopt Comcast's apparent position that Dr. Putnam needed to interview every past and current cost center owner to verify Rovi's allocations. *Compare* Putnam Tr. 1355:15-1356:23 *with* Schoettelkotte Tr. 2053:11-16. Comcast has been aware of Rovi's use of [redacted] since at

[32] Mr. Schoettelkotte identified a few of the thousands of data points in CX-0924C, observing that Dr. Putnam's 2018 cost center interviewees were not listed as responsible for the cost centers from 2012 to 2015, and that a few of the allocations changed from year to year. Tr. 2001:5-2004:19. But as the ALJ noted, Dr. Putnam conducted a point-in-time survey. *Id.* at 2061:20-2063:16. And allocation percentages change year-over-year due to normal product lifecycles. Putnam Tr. 1354:18-1355:5.

[33] Mr. Schoettelkotte criticizes what he describes as variations in the way that the cost center owners determined allocation percentages. Schoettelkotte Tr. 1996:24-2001:4; CX-1346C. But as Dr. Putnam explained, the process itself is consistent as every cost center owner is asked to make product allocations as part of an annual P&L process. There is no dispute that the allocation process results in allocations to each product. Schoettelkotte Tr. 2042. Moreover, the allocations themselves are similar as most cost center owners allocate based on labor. Putnam Tr. 1375:22-1378:3. And any immaterial variations only underline the strengths of Rovi's accounting methodology because it allows the cost center owners to customize the process to best match the cost center activities. Putnam Tr. 1378:4-17.

least the 1001 Investigation. *See Digital Video Receivers*, ID at 582. And while Comcast subpoenaed and deposed three [redacted] (i.e., Chris Thun, Sarah Gaeta, and James Denney), who Rovi had identified as [redacted] since April (CX-0920C), Comcast did not ask these individuals any questions concerning their [redacted] responsibilities. Comcast did not seek deposition of any other [redacted] identified by Rovi: not when they were identified in April, or again in June, or even in Comcast's subsequent motion to compel.[34]

As the ALJ suggested, Mr. Schoettelkotte could have verified the allocations by "tracking back from the 10-K reports to the expenditures." Schoettelkotte Tr. 2065:6-14. But again, Mr. Schoettelkotte made no effort to do so. *Id.* (noting that he "did not ask questions of Rovi" or "request any additional information on that score"). The approach that Comcast and Mr. Schoettelkotte took with respect to domestic industry—closing their eyes and refusing to conduct any meaningful investigation into or analysis of the expenditure data—does nothing to undermine Dr. Putnam's well-supported opinions that Rovi's domestic investments are significant and substantial. It simply ensured that Mr. Schoettelkotte would have no helpful opinion to offer at the Hearing. *See, e.g.*, Schoettelkotte Tr. 2049:8-2050:3, 2059:4-19 (opining simply that, because the allocations were "internal in nature," he could not identify them "with any degree of certainty"). Mr. Schoettelkotte did not pursue any alternative measure of Rovi's domestic industry or perform any calculations of his own, *Id.* at 2042:11-2046:24, because any such analysis would have found—no matter how the data is presented—that Rovi's investments in the DI Products are significant and substantial under the statutory requirements.

[34] Comcast's motion to compel requested a supplemental deposition with Mr. Denney. Comcast Mot. to Compel, Motion No. 11-03-012 (June 29, 2018). In response to the ALJ's order on the motion, Rovi offered not only Mr. Denney for deposition but also a supplemental deposition with Mr. Sargis, who is most familiar with Rovi's P&L process from a financial perspective. Comcast did not request any other fact witnesses to testify to Rovi's allocation process.

Third, even Mr. Schoettelkotte was not willing to testify at the Hearing that Rovi's allocations are *actually* unreliable. Mr. Schoettelkotte suggested only that because Rovi uses [redacted], he could not opine as to their reliability. *Id.* at 2049:8-22, 2059:4-19. But Rovi's internal use is not a weakness; instead, this reliance proves that the process is reliable: Rovi uses the [redacted], the very investments that § 337(a)(3) directs the Commission to determine. Putnam Tr. 1225:15-1227:11, 1230:5-1231:23, 1380:8-1381:18. As shown above, Rovi [redacted] these allocations to make its [redacted]. Sargis Tr. 1159:14-1162:16; Putnam Tr. 1225:15-1226:21; Gaeta Tr. 201:3-12, 227:5-229:10. And the evidence reflects that the [redacted] expenditures are subject to both external and internal audit processes, including testing of the expenditures and their externally reported classification categories (e.g., R&D, sales and marketing ("S&M"), and cost of goods sold ("COGS")). Sargis Tr. 1154:1-21, 1158:6-1159:13; Putnam Tr. 1225:15-1227:11, 1230:5-1232:12; CX-0924C (Cost Center Expends.); CX-0243 (10-K), CX-0248-CX-0251 (10-Ks). The Commission regularly finds a domestic industry based on approximations and estimates, and Rovi's real world approach is no less accurate. *See Certain Two-Way Radio Equip. & Sys., Related Software & Components Thereof*, Inv. No. 337-TA-1053, ID at 241 (July 3, 2018) (relying on sales-based allocations); *Solid State Storage*, Comm'n Op. at 15-20 (relying on office space allocations); *Graphics Processors*, Order No. 16, at 3 (noting volume-based allocations acceptable).

Indeed, with access to all the information that Comcast requested, including supplemental depositions and discovery, Mr. Schoettelkotte could not identify "a single data point" that was "wrong." Schoettelkotte Tr. 2044:1-5. He conceded that Rovi uses the [redacted] to allocate by product "in its ordinary course of business," *id.* at 2042:2-7; he agreed that Rovi endeavors to

make a profit and "[redacted] [those] allocations to internally [redacted]," *id.* at 2047:11-2048:7; he confirmed that there was no reason to think that the [redacted] were "cooking the books," *id.* at 2049:1-7; and he conceded that Rovi is in fact servicing [redacted] of domestic users and employing [redacted] of domestic engineers and product managers to support the DI Products, *id.* at 2054:6-2058:23.

b. Technical Prong Matches the Economic Prong

Comcast argues that Rovi's economic and technical evidence for domestic industry does not match because Rovi's DI products have multiple releases or have had name changes. RPHB at 108-09 (offering i-Guide versions [redacted] as an example). Not so. In the software industry, products are routinely upgraded with bug fixes or adapted for different platforms or customers, and iterations *of the same product* are often given release numbers. *See generally* Gaeta Tr. at 212-217. Comcast offers no authority for the proposition that domestic industry expenditures must be narrowed to a particular *release* of a DI product. And in this case, Comcast has pointed to no material difference between Rovi's product releases.

c. Comcast's Declining Investments Argument Fails

Comcast has implied that a domestic industry was not proven for i-Guide, Passport, and AS&R due to alleged revenue or investment declines. RPHB at 112, 114. Comcast's argument fails. First, investment trends are legally irrelevant. The Commission has repeatedly found the existence of a domestic industry *even where the product was declining or no longer being manufactured*. *See, e.g., Certain Video Graphics Display Controllers & Prods. Containing Same*, Inv. No. 337-TA-412, Comm'n Decision Not to Review, 1999 ITC LEXIS 503, at *8-13 (Aug. 2, 1999).[35] Second, the argument is factually inaccurate. As evidence of purported

[35] The case Comcast cited in its pre-hearing brief is not on point. RPHB at 11 (citing *Video Game Sys.*, ID). In *Video Game Systems*, the ALJ concluded that the last qualifying investments

declines, Comcast points to predictions made by Rovi in 2016. Schoettelkotte Tr. 2013:2-2015:10. But as Ms. Gaeta explained, the negative forecasts never came to pass. Gaeta Tr. 230:19-232:3, 322:17-324:18. Demand for i-Guide and Passport remain strong, and Rovi's R&D investments have *increased*. Gaeta Tr. 230:19-233:23; Putnam Tr. 1251:25-1253:9; CDX-0017C.14 (showing increase in investment from [redacted] in 2014 to [redacted] in 2017 for i-Guide and increase from [redacted] in 2014 to [redacted] in 2017 for Passport); CX-0924C.

d. Rovi's Expenditures Are Not Stale

Dr. Putnam's testimony and schedules provide a period of 2012-2017 for i-Guide and Passport, and 2014-2017 for AS&R and Next-Gen. Comcast has suggested that five years of investments is too long—or includes "stale" investments, RPHB at 110—but here again Comcast is wrong on the law. Five years is a legally appropriate timeframe for domestic industry investments, and there is no mechanism to "discount" four or five-year old investments as Comcast suggests. *See Certain Marine Sonar Imaging Devices, Including Downscan & Sidescan Devices, Prods. Containing the Same, & Components Thereof* (*Marine Sonar*), Inv. No. 337-TA-921, Comm'n Op. at 54-57 (Jan. 6, 2016) (crediting investments five years prior to filing complaint); *Certain Elec. Digital Media Devices & Components Thereof*, 337-TA-796, Comm'n Op. at 98-102 (Sept. 6, 2013) (same). In any event, Dr. Putnam's unrebutted opinions regarding the significance of the investments in 2016 and 2017 alone obviate the concern.

e. Expenditures Early in Next-Gen's Lifecycle Should Be Considered

Comcast suggests that Next-Gen investments prior to the fall of 2017 cannot be used to prove domestic industry because the expenditures also supported prior products, such as FanTV. RPHB at 112, 114; Putnam Tr. 1362:23-1363:16. But whether investments benefit other products

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for the domestic industry analysis took place over 3.5 years prior to the filing of the complaint, and the only *current* expenses were on litigation., ID at 164. This is far from the case here.

is immaterial. *Certain Robotic Vacuum Cleaning Servs. & Components Thereof* (*Robotic Vacuum*), Inv. No. 337-TA-1057, ID at 367-68 (June 25, 2018) (unreviewed in relevant part). Comcast's claim is also belied by the facts. Ms. Gaeta testified that Next-Gen is the culmination of years of investment, beginning at least in 2014 with Rovi's acquisition of FanTV and subsequent development of the product into Next-Gen. Tr. 235:15-236:19, 239:3-242:11; JX-0126C (Thun Dep.) at 16:6-17:19, 46:18-47:9. Based on this information, Dr. Putnam properly concluded that expenditures associated with FanTV since 2014 properly count toward Next-Gen development. Tr. 1259:2-14.

In any event, Comcast's criticism does not apply to metrics at the end of 2017, when there is no dispute that Rovi was investing in Next-Gen and *not* FanTV. By 2017, Rovi was spending—*every month*—an average of [redacted] in plant and equipment, [redacted] in labor expenditures, [redacted] in capital expenditures, and [redacted] in R&D and engineering investments. CX-0924C (Cost Center Expends.); DI Att. 39, 31, 33 (CDX-0016C.47, .48, .50). These investments alone are significant and substantial. *Digital Cameras*, ID at 84-85 (finding substantial investments for a developing product based on average monthly investments).

f. Comcast's Contention that Rovi Has Failed to Show Plant and Equipment and Capital Expenditures is Belied by the Record

Comcast also argues that Rovi's investments in stock of plant and equipment and its capital expenditures are unreliable because Rovi does not allocate these investments by product in the ordinary course of business. Schoettelkotte Tr. at 2032:8-2034:14. As Dr. Putnam explained, however, Rovi's stock of plant and equipment and capital expenditures are captured in Rovi's 10-Ks and largely [redacted]. Putnam Tr. 1239:14-1240:15, 1249:14-1250:2; *see, e.g.*, CX-0243.61, .88 (Rovi 10-K). Dr. Putnam reviewed Rovi's publicly reported company-wide stock in plant and equipment and capital expenditures for every year from 2012 to 2017.

CDX-0017C.2, .11. He then calculated, for each DI Product, the ratio between Rovi's overall U.S. labor costs and the labor costs for that product. Finally, Dr. Putnam multiplied these ratios by Rovi's overall investments in labor and capital respectively. Putnam Tr. 1239-40, 1249-50; CDX-0017C.2, .11. Comcast has not proffered any evidence that Dr. Putnam's methodology is unreliable, it has not suggested an alternative method that he should have used, and Mr. Schoettelkotte did not present any counter calculation or analysis.

g. Rovi Does Not Double-Count Investments

Comcast suggests that the same R&D-related equipment and labor expenditures cannot be included under multiple subsections. RPHB at 115. Comcast is wrong: overlap is permitted because the statutory subsections are independent. *Solid State Storage*,, Comm'n Op. at 14; *Digital Video Receivers*, ID at 578-80.

C. Licensee TSI's Investments Satisfy the Economic DI Requirement

TiVo Solutions, Inc. (TSI) has a license from Rovi to practice the Asserted Patents. Armaly Tr. 129:6-130:8; CX-1424C; JX-0084C; JX-0058C; CX-1374C–1375C (Agreements). TSI has also made significant investments in plant and equipment, undertaken significant employment of labor and capital, and made substantial investments in engineering and R&D as to its TiVo Bolt with Experience 4.0. *See* DI Att. 38.

1. TiVo Measures Investments by Product Based on Engineer Hours

TSI, which was acquired by Rovi's parent in 2016, operates differently than Rovi. In the ordinary course of business, [redacted] Sargis Tr. 1171:10-1172:16; JX-0096C (Denney Dep.) at 257:18-259:20; Putnam Tr. 1268:2-15; CX-0922C ([redacted]). For TiVo Bolt with Experience 4.0, [redacted]

[redacted] Sargis Tr. 1171:10-23; CX-0922C ([redacted]).[36] TSI multiplied the [redacted] in the U.S. by an [redacted] to arrive at the qualifying investments shown in Table 2 (included as DI Attachment 38). *See Robotic Vacuum*, ID at 358, 368 (accepting investment calculation based on labor hours).

2. TSI's Investments in TiVo Bolt with Experience 4.0 are Significant Under Paragraphs A and B and Substantial Under Paragraph C

TSI's investments in TiVo Bolt with Experience 4.0 satisfy subsections (A), (B), and (C) of the economic domestic industry requirement. Starting in the [redacted], TSI began [redacted]. Armaly Tr. 127:9-24. TSI began developing TiVo Bolt with Experience 4.0 in [redacted]. CX-0922C (Summary Tab) (capturing investments for TiVo Bolt going back to [redacted]); JX-0096C (Denney Dep.) at 190:7-10. And TSI launched this [redacted] DI Product in October 2017. JX-0096C (Denney Dep.) at 151:11-18; CX-0921C (TiVo Bolt Shipments); Sargis Tr. 1178:1-20. TiVo Bolt with Experience 4.0 is a physical STB installed with IPG software that practices the '585 and '741 Patents. JX-0096C (Denney Dep.) at 58:1-59.:15 As of the filing of the Complaint, [redacted] consumers were using TiVo Bolt with Experience 4.0. Compl., Ex. 186.

Subsections (A) and (B). Dr. Putnam testified that by the end of 2017, TSI had built up a stock of about [redacted] allocated to TiVo Bolt with Experience 4.0. Tr. 1269:1-6. CX-0253 (10-K); CDX-0017C.37; DI Att. 35 (CX-0016C.64).

From 2014 to 2017, TSI invested more than [redacted] in labor related to TiVo Bolt

[36] Near the end of discovery, Comcast sought to compel TSI [redacted], TSI [redacted], and a second deposition of Mr. Denney. Rovi produced the requested records, (CX-1362C (TSI [redacted]); CX-1379C ([redacted])), and presented Mr. Denney *and* Mr. Sargis, for second depositions. Mr. Schoettelkotte did not timely supplement his report with any new opinions or analysis; Comcast withdrew an untimely supplemental report.

with Experience 4.0, Putnam Tr. 1269:1-9; CDX-0017C.38; DI Att. 35 (CDX-0016C.64). From 2014 to 2017, TSI invested more than [redacted] in capital related to TiVo Bolt with Experience 4.0. Putnam Tr. 1269:1-9; CX-0017C.41; CX-0016C.64.

Dr. Putnam testified, and Mr. Schoettelkotte did not refute, that for TiVo Bolt with Experience 4.0, TSI invested significantly in plant and equipment under subsection (A) and labor and capital under subsection (B). Putnam Tr. 1269:1-13, 1271:5-9; Schoettelkotte Tr. 2046:6-24.

Subsection (C). TSI has invested substantially in R&D and engineering to exploit the '585 and '741 patented features of the TiVo Bolt with Experience 4.0 under subsection (C). From 2014 to 2017, TSI invested over [redacted] in R&D and engineering for the TiVo Bolt with Experience 4.0. Putnam Tr. 1269:1-11; CDX-0017C.42; DI Att. 35 (CDX-0016C.64). Dr. Putnam testified, and Mr. Schoettelkotte did not refute, that TSI's R&D and engineering investments in TiVo Bolt with Experience 4.0 were substantial. Putnam Tr. 1269:10-13, 1271:5-9; Schoettelkotte Tr. 2046:6-24.

TSI's investments in R&D and engineering related to TiVo Bolt with Experience 4.0 exploit the '585 and '741 Patents. Because the product practices the '585 and '741 Patents, these investments constitute *de facto* exploitations of the '585 and '741 patented features practiced by the TiVo Bolt with Experience 4.0. *Integrated Circuit Chips*, Comm'n Op. at 42. TSI's U.S.-based engineers conducted [redacted] of these patented features before the product's launch in 2017. JX-0096C (Denney Dep.) at 263:5-16, 285:13-25. TSI directed these investments to, for example [redacted]. JX-0096C (Denney Dep.) at 215:19-219:17; CDX-0017C.25-.26; Putnam Tr. 1269:18-23. Dr. Putnam interviewed the TiVo Bolt with Experience

4.0 product lead (Jim Denney) to confirm the nature and focus of TSI's investments and concluded that TSI's R&D and engineering activities exploited the features covered by the '585 and '741 Patents. CDX-0017C.25-.26; Putnam Tr. 1269:10-23. Based on these interviews and other evidence produced in this Investigation. Dr. Putnam concluded that a nexus exists between TSI's R&D and engineering investments and the patented features of the '585 and '741 Patents practiced by the TiVo Bolt with Experience 4.0. Putnam Tr. 1269:18-23. No Comcast witness rebutted this nexus evidence.

3. Comcast's Criticisms of TSI's Investments Are Unfounded

Comcast's primary criticisms of Rovi's domestic industry proffer do not apply to TSI investments. [redacted] were not used in TSI's domestic industry proffer. Sargis Tr. 1172:9-16. And because TSI's engineers and R&D professionals [redacted], but other employees do not, TSI's proffer does not rely on any S&M or COGS investments.

Still, Comcast may speculate that Rovi double counts expenditures on Next-Gen and TiVo Bolt with Experience 4. RPHB at 112. The evidence shows otherwise. While Rovi and TSI jointly developed these products, the testimony is unequivocal: (1) different methodologies employed by the companies set them apart; and (2) TSI [redacted] were explicitly excluded from Rovi's proffer. Putnam Tr. 1268:2-15, 1270:19-1271:4; Sargis Tr. 1172:9-16, 1175:2-12.

Comcast has argued that the expenditures on the [redacted] and on the [redacted] were distinct and thus TSI has not shown the investments were related to the DI Product. RPHB at 117. This argument ignores the realities of product development: TSI's software and hardware are distinct components of a product that work together. *See, e.g.*, JX-0096C (Denney Dep.) at 16:11-17:8 (explaining that some products are combinations of software and hardware), 58:24-59:15 (explaining that "TiVo Bolt is the Bolt hardware that runs the Experience 4.0 software"), 211:15-212:15 (explaining that the product management included

reports for hardware and software). The time spent engineering both the hardware and the software is related to the final combined product, which practices the patents—much akin to Comcast's Accused STBs with the X1 platform. *See Marine Sonar*, Comm'n Op. at 58 n.28 (finding as qualifying investments "it takes to conceive and bring to market" a device composed of both hardware as software).

Finally, Comcast has argued that TiVo Bolt with Experience 4.0 is not a DI Product because its [redacted] in April 2018. RPHB at 118. This argument also fails. The relevant date for purposes of an *established* DI Product is the date of the complaint. *Motiva LLC v. ITC*, 716 F.3d 596, 601 n.6 (Fed. Cir. 2013). Dr. Putnam and Mr. Schoettelkotte both testified that: (i) TiVo Bolt with Experience 4.0 was in the marketplace at the time the Complaint was filed; (ii) TSI had investments related to TiVo Bolt with Experience 4.0 at the time the Complaint was filed; and (iii) the fact that TiVo Bolt with Experience 4.0 later had its [redacted] does not impact the investments at the time of the filing of the Complaint. Putnam Tr. 1269:24-1270:4; Schoettelkotte Tr. 2040:17-2041:8. Moreover, this is not a circumstance where a product is discontinued altogether. The same hardware components are now sold with Next-Gen software, developed pursuant to the joint development agreement between Rovi and TSI. Armaly Tr. 127:9-130:8; Gaeta Tr. 239:3-241:17; CX-1424C; JX-0084C; JX-0058C; CX-1374C; CX-1375C. In essence, Comcast argues that Rovi's complaint was filed at precisely the *wrong* time: it claims that TiVo Bolt with Experience 4.0 cannot constitute a DI product because the software was [redacted], and yet Next-Gen cannot constitute a DI product because it did not exist at the time of the complaint. Both arguments are wrong. The flexible inquiry of the domestic industry economic requirement recognizes the evolution of product development and allows for investments in both

existing products *and* products in the process of development.

VIII. REMEDY AND BONDING

A. A Limited Exclusion Order Should Issue to Exclude All Infringing Products

Rovi requests that the Commission issue a permanent limited exclusion order specifically directed to each named Respondent, their subsidiaries, related companies, agents, affiliates, and suppliers that import the Accused Products on behalf of Comcast, to exclude the entry into the United States of the Accused Products.

If Respondents are found to have violated § 337, the statute provides that an exclusion order shall issue. 19 U.S.C. § 1337(d)(1). As part of the Commission's broad authority to stop unfair trade practices, *Suprema*, 796 F.3d at 1350, the Commission's practice is to issue an exclusion order covering all infringing products imported[37] by or on behalf of the respondent found to violate § 337. *Certain Hardware Logic Emulation Sys. & Components Thereof*, Inv. No. 337-TA-383, Comm'n Op., 1998 ITC LEXIS 63, at *31-32 (Apr. 1, 1998). Here, as in the 1001 Investigation, the Commission should specify that the exclusion order applies against Comcast *and* ARRIS and Technicolor—the importers of record acting for Comcast.[38]

B. The Commission Should Issue a Cease and Desist Order

Rovi requests the Commission issue permanent cease and desist orders prohibiting the same entities from, among other things, importing, selling for importation, marketing, advertising, offering for sale, offering for lease, selling, leasing, distributing, licensing, using, or

[37] Rovi anticipates addressing further details regarding its requested relief—including proposing specific language for the LEO and cease and desist order—in future briefing and submissions to the Commission, after the Initial and Recommended Determinations issue.

[38] While Comcast may argue that ARRIS and Technicolor should not be included in the LEO because they are not parties to the Investigation, the ALJ has already determined that the importation of the Accused Products by those entities is in actuality an importation *by Comcast*. The LEO should therefore name those entities to assist Customs in administering the remedy. *See* 19 U.S.C. § 1337(d)(1) (providing that an LEO should cover infringing articles "imported by any person violating" Section 337).

otherwise transferring the infringing products within the United States.

Cease and desist orders are designed to cover unfair acts in the United States after importation, irrespective of whether the acts themselves would violate § 337. 19 U.S.C. § 1337(f)(1); *Certain Erasable Programmable Read Only Memories*, Inv. No. 337-TA-276, 1990 ITC LEXIS 265, at *55-56 (Aug. 1, 1990). The Commission "generally issues cease and desist orders when there is a commercially significant amount of infringing, imported product in the United States that could be sold so as to undercut the remedy provided by an exclusion order. *E.g.*, *Certain Protective Cases & Components Thereof*, Inv. No. 337-TA-780, Comm'n Op., 2013 ITC LEXIS 2008, at *35 (Oct. 31, 2012) (citations and quotations omitted).

Cease and desist orders are needed here. Comcast has a significant inventory of infringing products that it could use to circumvent an exclusion order. Dr. Putnam concluded that as of May 2018, Comcast's and its suppliers' inventory of STBs (all dedicated to Comcast) totals more than [redacted] STB units on-hand at Comcast's hub and spoke warehouses alone (even excluding units in consumer homes, service trucks, and at repair vendors, all of which Comcast [redacted]). Putnam Tr. 1272:3-1273:1; CDX-0016C.72-73; JX-0124C (Shank Dep.) at 48:15-49:21; CX-0873C (Comcast On Hand STBs); CX-0939C (Inventory Held By ARRIS); CX-0570C (Inventory Held By Technicolor). This inventory would allow Comcast to circumvent an exclusion order—indeed, Comcast has admitted that it has built up stockpiled inventory at levels in excess of $319 million—$143 million at Comcast's facilities alone—a commercially significant amount by any standard. Putnam Tr. 1271:16-1275:3; CDX-0016C.72. Notably, Comcast did not offer any fact or expert testimony during the hearing to rebut Rovi's evidence or Dr. Putnam's conclusions. And Comcast has no plans to stop its build-up of additional inventory in the future. JX-0124C (Shank

Dep.) at 54:21-55:14.

C. Bond

1. A Bond Should be Imposed to Compensate Rovi for Harm Caused by Comcast

A respondent found liable may continue importing infringing products during the Presidential Review period by posting a bond. Rovi is entitled to a bond to "offset [Comcast's] competitive advantage from the continued unfair act[,]" and "to protect [Rovi] from any injury" during the sixty-day Presidential Review period. *Certain Audio Digital-to-Analog Converters & Prods. Containing Same*, Inv. No. 337-TA-499, Comm'n Op. at 25 (Mar. 3, 2005). Rovi is harmed by Comcast's direct competition in the syndication market, where Rovi and Comcast offer IPG software to regional cable providers. Putnam Tr. 1284:9-19; Armaly Tr. 149:22-150:25. Comcast also injures Rovi by failing to pay for the use of Rovi's patents—royalties that are paid by Comcast's competitors, including every other major Pay-TV provider. *Id.*

2. A Bond Based on a Price Differential[39] or Royalty is Appropriate

A bond sufficient to protect Rovi from harm during Presidential Review may be calculated as either the price differential between a domestic industry product and the imported infringing product or a reasonable royalty. *Certain LCD Devices, Including Monitors, Television, & Modules, & Components Thereof*, Inv. No. 337-TA-741, Inv. No 337-TA-749, ID, 2012 ITC LEXIS 459, at *635-637 (Jan. 12, 2012). Dr. Putnam calculated a bond rate based on an estimated price differential of [redacted] per STB as adequate to protect Rovi from injury. Putnam Tr. 1278:2-1280:5. Because Rovi does not sell STBs, and Comcast's leases and sales of its STBs did not provide Dr. Putnam with a "comparable transaction" with which to do a traditional price comparison, Dr. Putnam instead calculated an "imputed price" of Comcast's

[39] In the 1001 Investigation, the Commission did not impose a bond during Presidential Review. *Digital Video Receivers*, Comm'n Op. at 47. Here, by contrast, Rovi submitted fact and opinion evidence regarding a price differential sufficient to calculate an appropriate bond.

STBs by which he could calculate a price differential between the accused Comcast STBs and the domestic industry STBs sold by Rovi's licensee TSI. *Id.*; CDX-0016C.76-78. The imputed price was estimated by multiplying the price-to-cost ratio of the domestic industry product, TiVo Bolt with Experience 4.0 STB, sold by TSI—[redacted]—by the cost of Comcast's STBs.[40] Putnam Tr. 1279:2-20; CDX-0016C.76. Dr. Putnam then compared those estimates to the sales price of the TiVo Bolt with Experience 4.0, concluding that the price differential is approximately [redacted] per STB (depending on whether he used Comcast or ARRIS data). *Id.*; CDX-0016C.76-78; CX-0915C (Units Shipped and Net Sales Comcast Total); CX-0921C (Shipment Report by Product); CX-0939C (Inventory Month Ending for Jan-Mar 2018 for Accused Products). These represent reasonable estimates of a price differential that can and should be used to set a bond, and any bond in the range identified by Dr. Putnam is appropriate.

Alternatively, Dr. Putnam testified that a bond of [redacted] per Comcast U.S. subscriber per month would also protect Rovi from injury. Tr. 1281:19-1282:24; CDX-0016C.81. Dr. Putnam considered the importance of the Rovi patent portfolio to the Pay-TV industry, comparability of the Verizon (patent-only[41]) license to the facts here, and prior precedent basing a bond amount on a portfolio licensing rate. *See* Tr. 1280:6-1282:24; JX-0056C (Verizon License). He also explained that setting the bond at the portfolio rate, even for just the Asserted Patents here, would be appropriate because it reflects widespread industry licensing practices. Putnam Tr. 1281:19-1283:24. Because a bond is intended to prevent harm from continued infringement

[40] Because the cost data provided by Comcast and ARRIS varied slightly, Dr. Putnam calculated imputed costs using both figures. Putnam Tr. 1279:21-1280:5; CDX-0016C.77.

[41] In the 1001 Investigation, the ALJ and the Commission found Rovi's reliance on a variety of portfolio license rates to be inadequate because these rates were not tied to the then-asserted patents, and because some licenses included both patents and software. *Digital Video Receivers*, Comm'n Op. at 46-47. But here, the Verizon license relied upon by Dr. Putnam covers only patents, and Dr. Putnam specifically explained why using the portfolio rate as the bond is appropriate even for a small subset of patents. *See* Putnam Tr. 1281:19-1283:24.

during the Presidential Review, setting a bond at the royalty rate agreed to by a comparable Pay-TV provider for a license to the Asserted Patents is appropriate—it represents the amount at which Rovi has willingly agreed to forego its right to sue for infringement.

3. In the Alternative, a 100% Bond Should be Imposed

Comcast and its expert Mr. Schoettelkotte criticize Dr. Putnam's analysis, arguing that (1) no price comparison is viable due to the different business models of Comcast and Rovi's licensee TiVo Solutions, and (2) Dr. Putnam's reasonable royalty calculation is flawed because Rovi licenses its patents on a portfolio basis. Schoettelkotte Tr. 2034:6-2037:3. Even to the extent Mr. Schoettelkotte's criticisms have merit—and they do not—they do not eliminate the need for a bond; they only justify setting the bond at 100% of the entered value of the infringing products, Putnam Tr. 1283:6-1284:19, as the Commission has done in similar investigations.

Commission precedent prescribes a 100% bond where "no meaningful price comparison" can be performed and where there is insufficient evidence in the record to determine a reasonable royalty rate. *Certain LCD Modules, Prods. Containing Same, & Methods Using the Same* (*LCD Modules*), Inv. No. 337-TA-634, Comm'n Op. at 6 (Nov. 24, 2009). Thus, even if the ALJ were to give weight to Mr. Schoettelkotte's criticisms of the evidence and Dr. Putnam's analysis, that same criticism establishes that it is exceedingly difficult for the Commission to tabulate a bond for the Asserted Patents in this Investigation. In such situations, the proper path is *not* to award a zero or minimal bond, as Comcast and Mr. Schoettelkotte contend. *See* RPHB at 122-25; Schoettelkotte Tr. 2034:15-25. Instead, the Commission typically awards a bond of 100%. *LCD Modules*, Comm'n Op. at 6; *Certain Flash Memory Circuits & Prods. Containing Same*, Inv. No. 337-TA-382, Comm'n Op. at 26-27 (June 2, 1997) (imposing 100% bond where the DI products and accused products were sold at different levels of commerce and rejecting respondents' proposed "de minimis" royalty-based bond).

Dated: November 30, 2018

Respectfully submitted,

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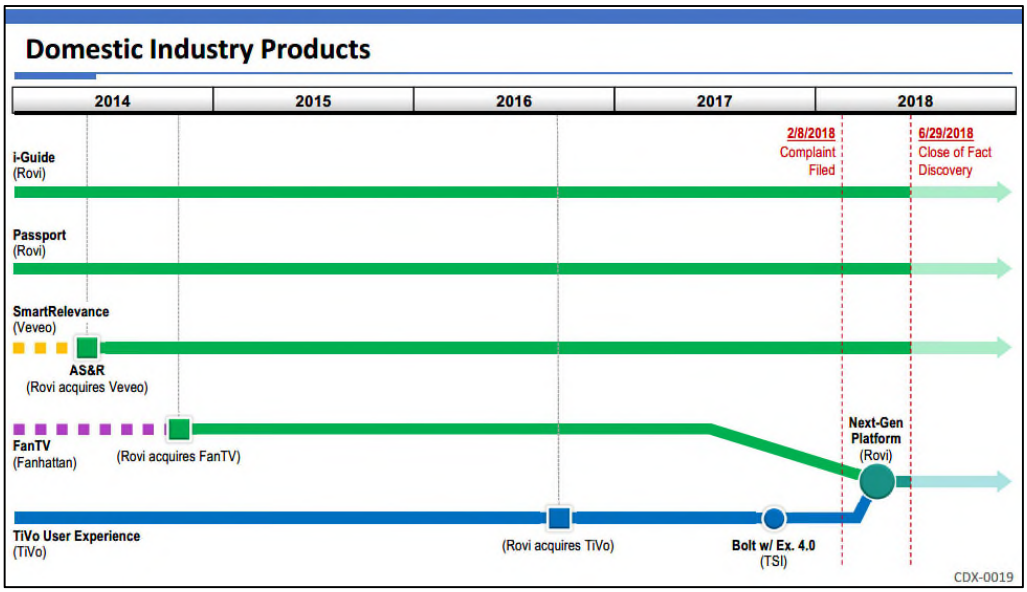
Counsel for Complainants Rovi Corporation; Rovi Guides, Inc.; Rovi Technologies, Corp.; and Veveo, Inc.

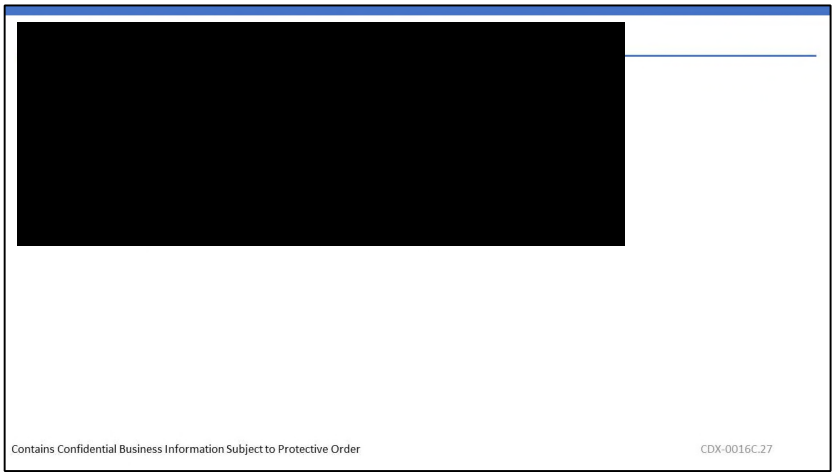
Exhibit A

1. DI Attachment 1:



2. DI Attachment 2:

3. DI Attachment 3:



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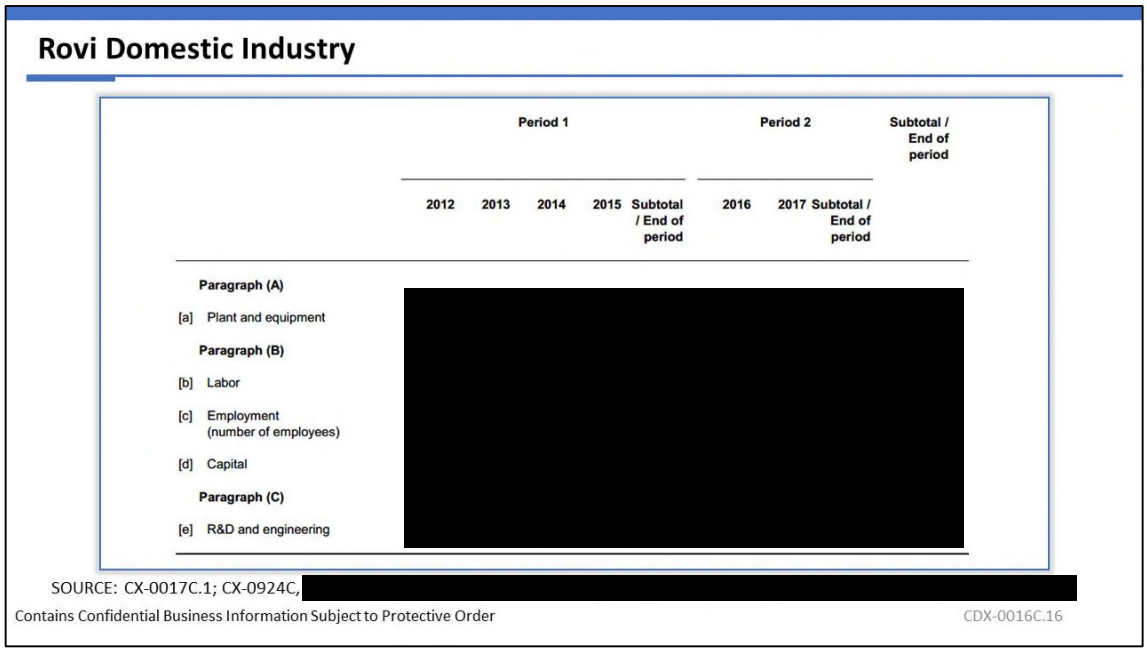

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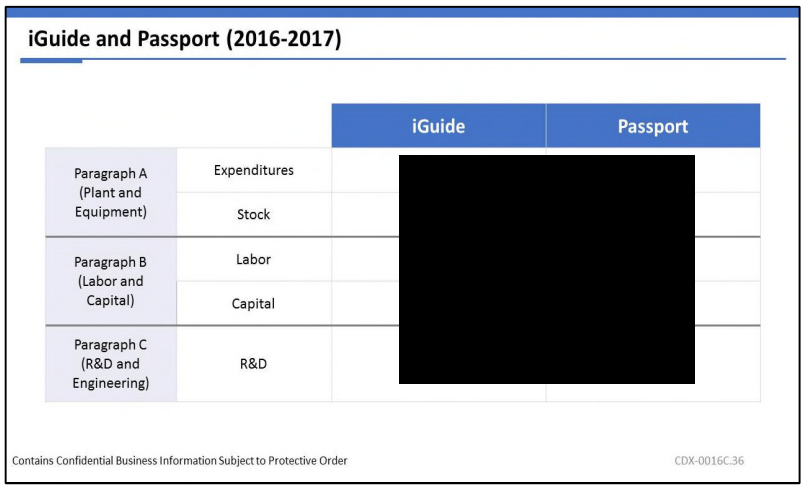
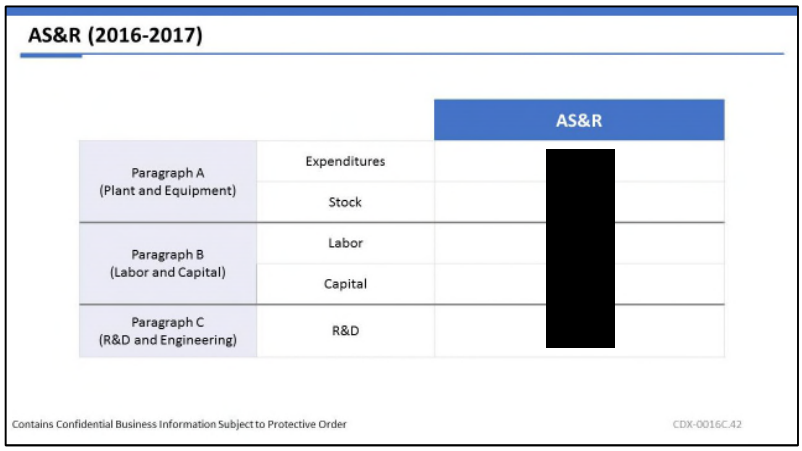


6. DI Attachment 6:



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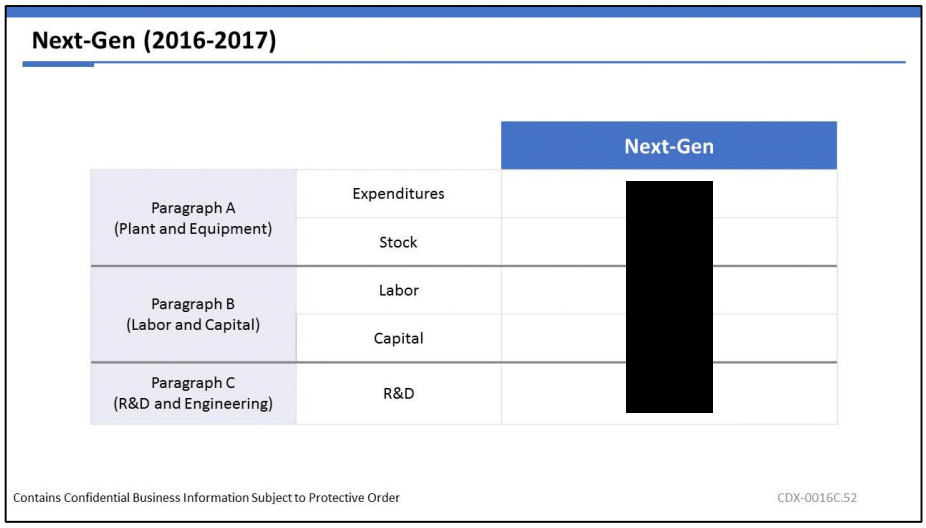
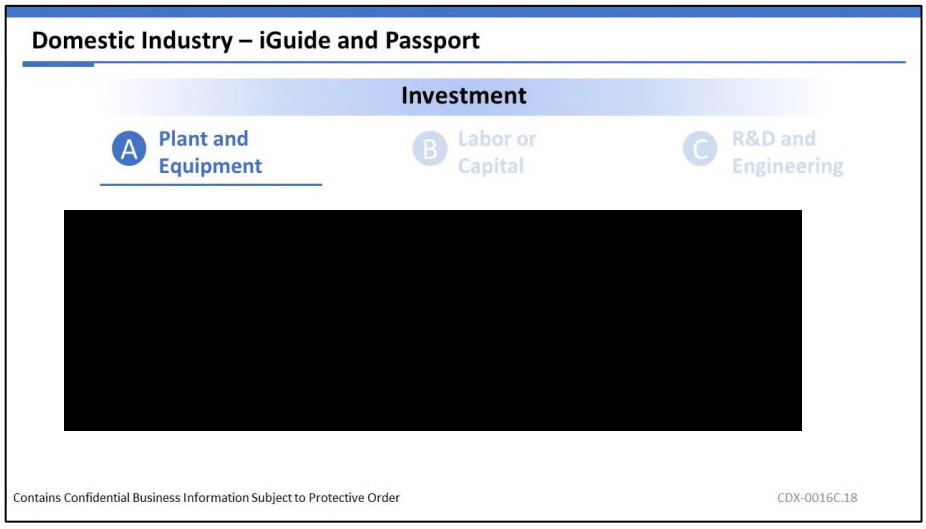


8. DI Attachment 8:



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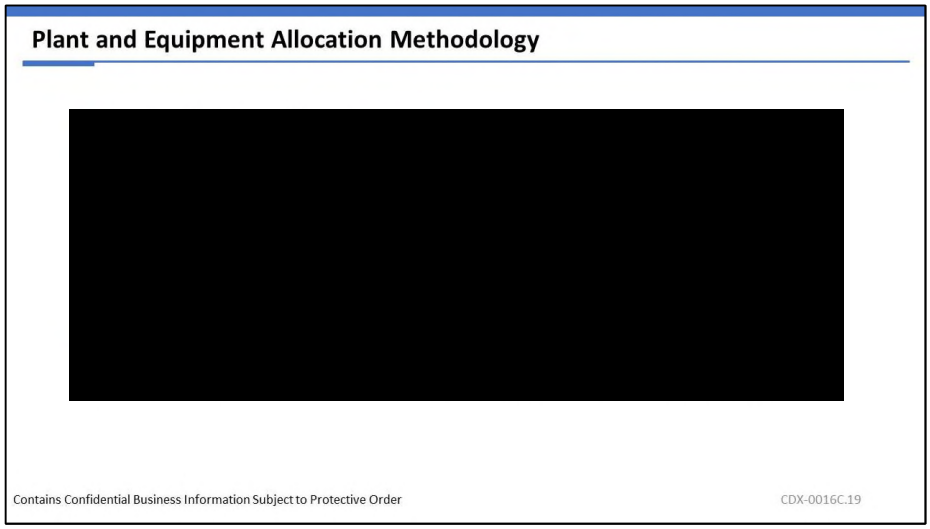
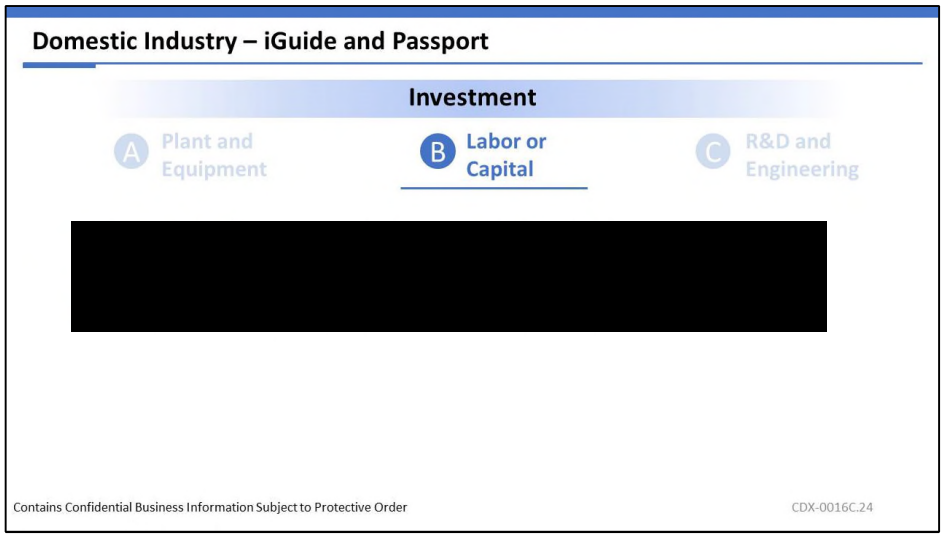


10. DI Attachment 10:



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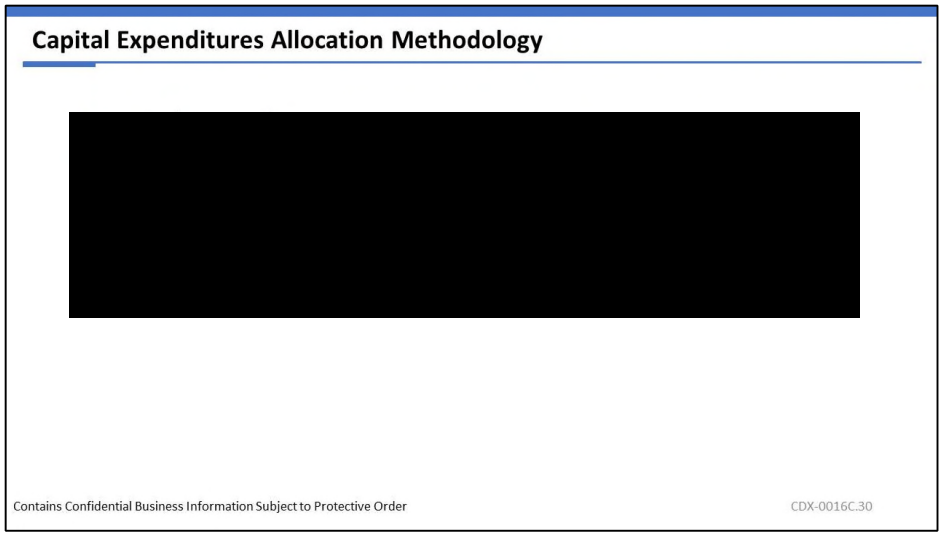
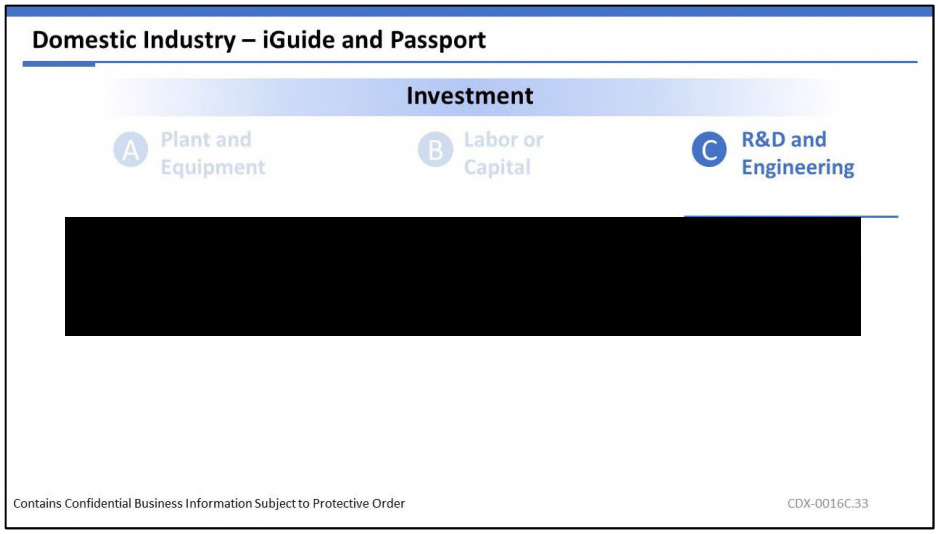
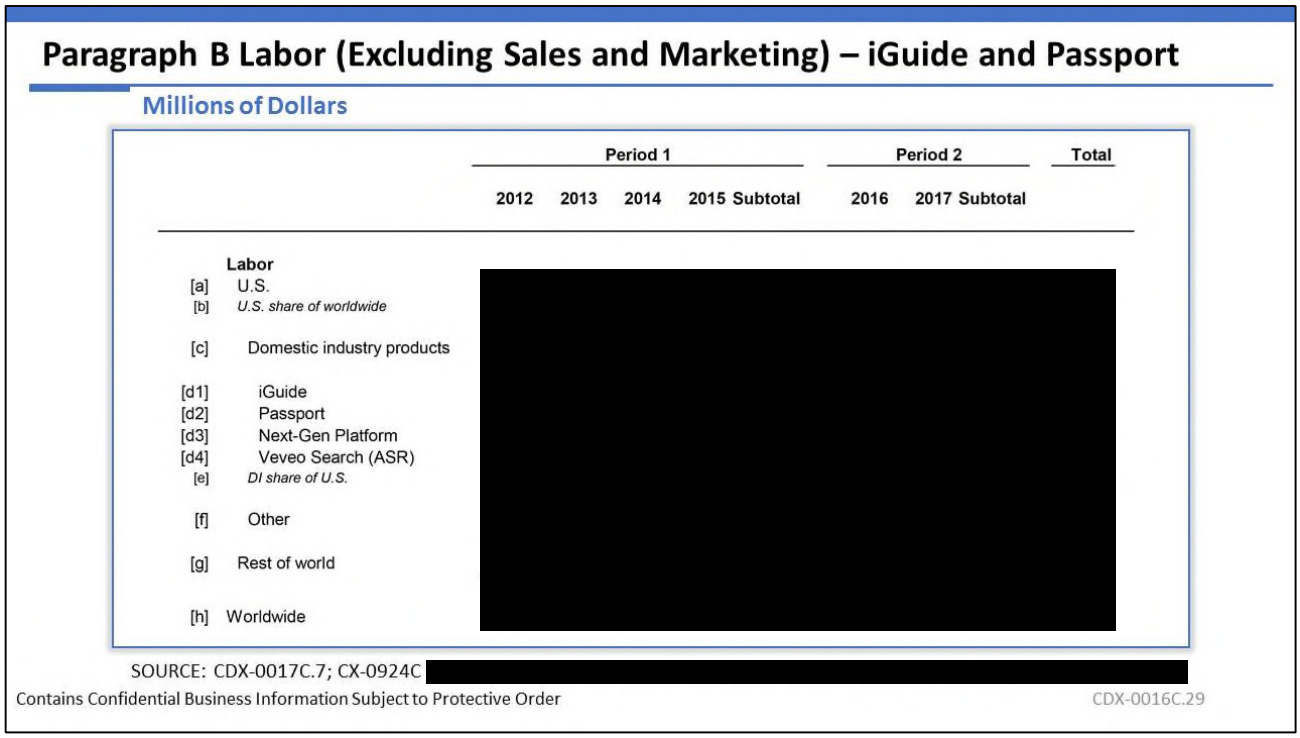


12. DI Attachment 12:



13. DI Attachment 13:



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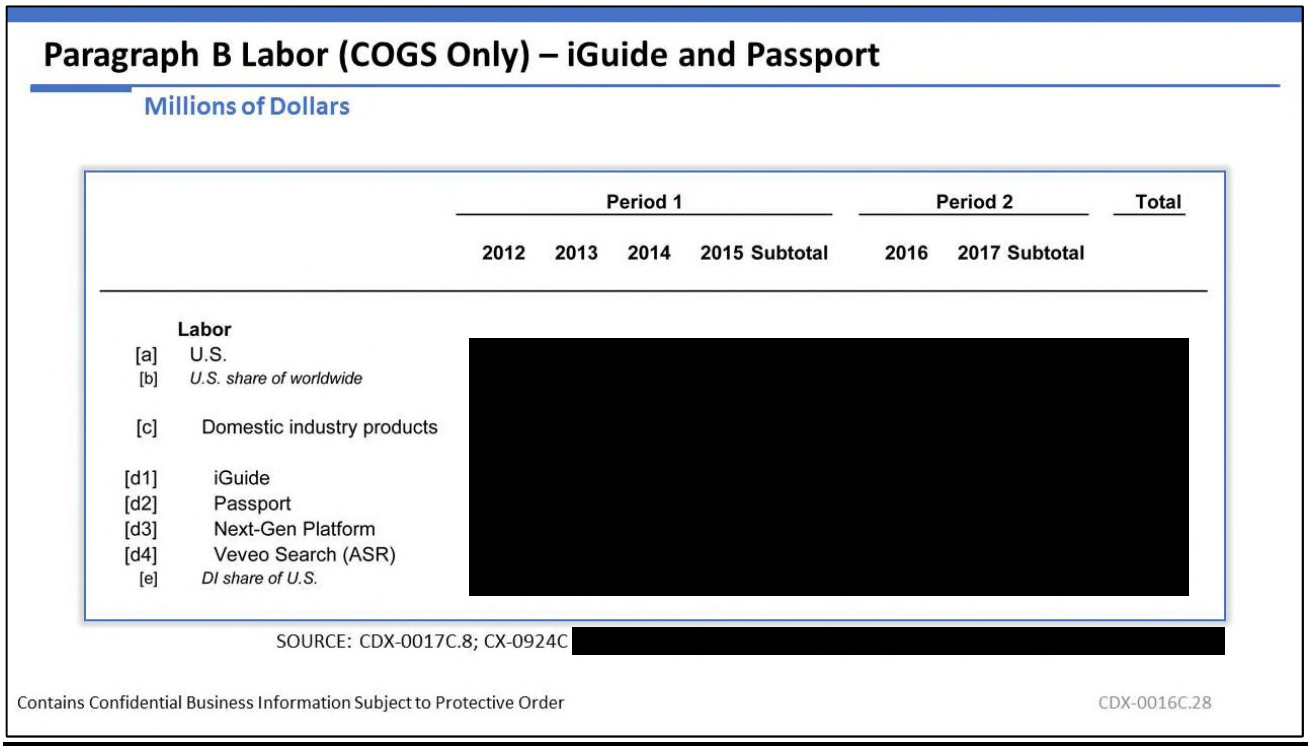

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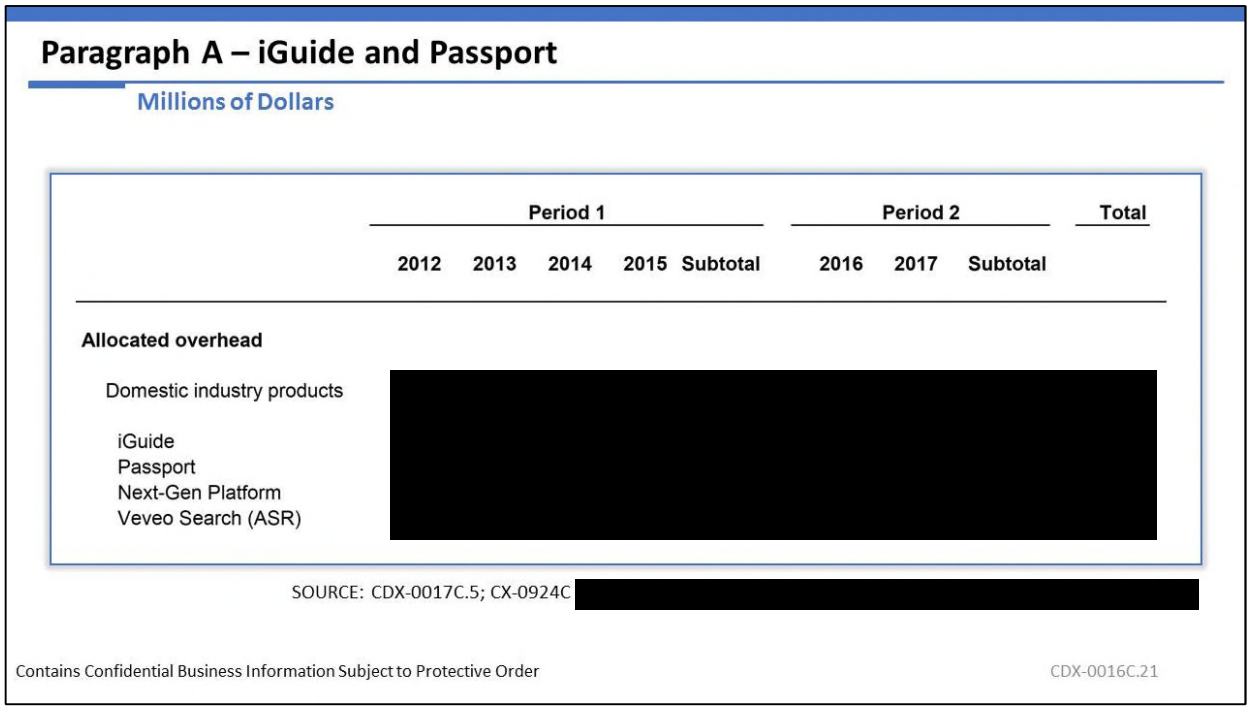

Paragraph A – iGuide and Passport

Millions of Dollars

	Period 1					Period 2			Total
	2012	2013	2014	2015	Subtotal	2016	2017	Subtotal	
Allocated overhead									
Domestic industry products									
iGuide									
Passport									
Next-Gen Platform									
Veveo Search (ASR)									

SOURCE: CDX-0017C.5; CX-0924C [redacted]

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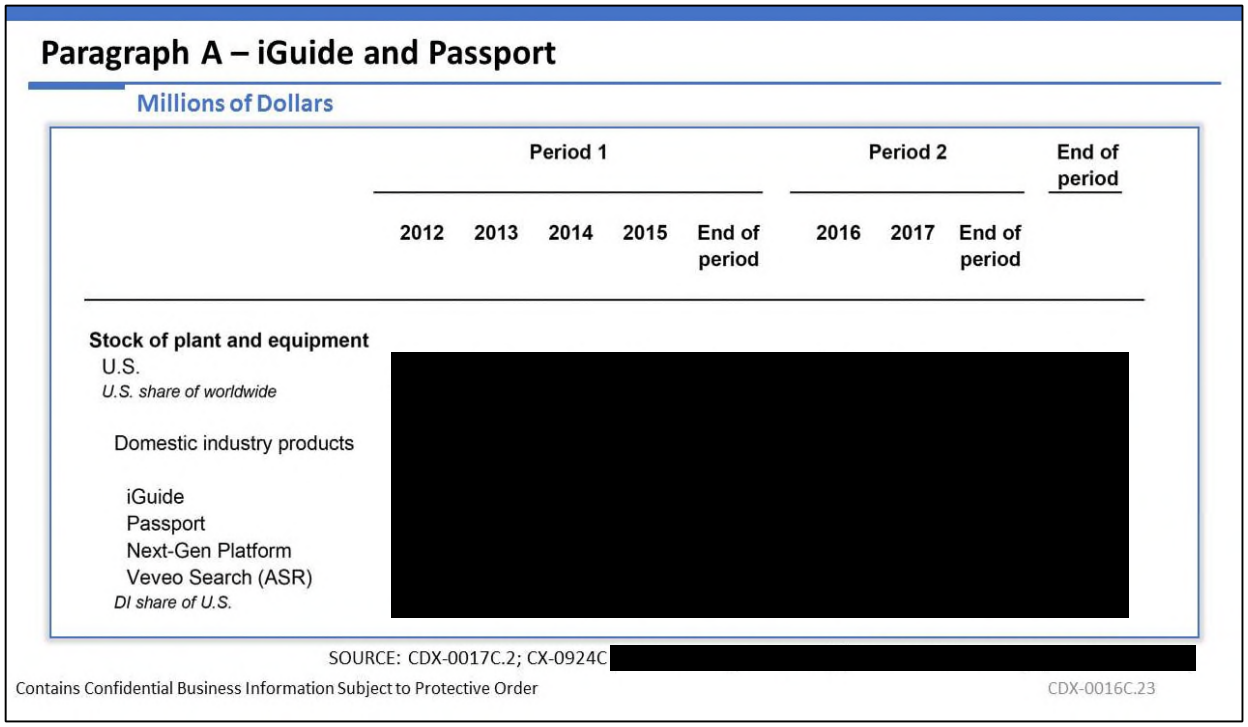
CDX-0016C.21

16. DI Attachment 16:



Paragraph A – iGuide and Passport

Millions of Dollars

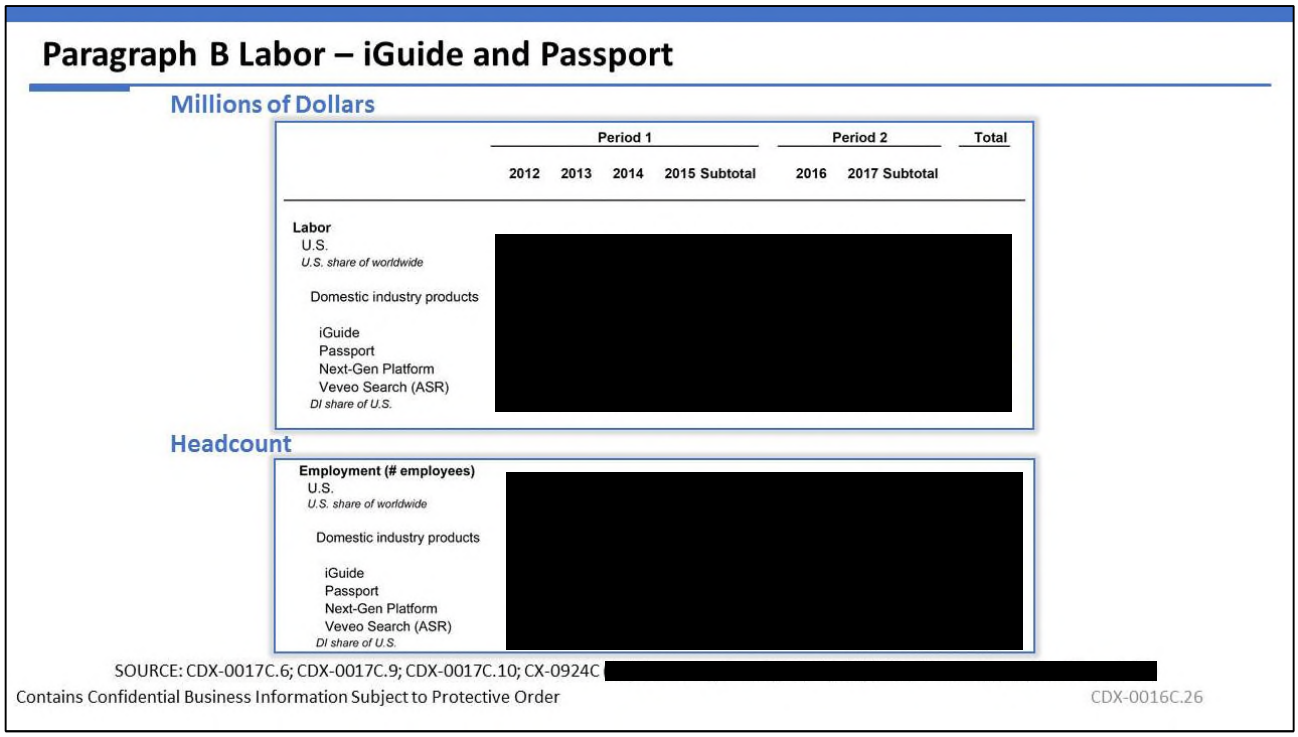
	Period 1					Period 2			End of period
	2012	2013	2014	2015	End of period	2016	2017	End of period	
Stock of plant and equipment									
U.S.									
U.S. share of worldwide									
Domestic industry products									
iGuide									
Passport									
Next-Gen Platform									
Veveo Search (ASR)									
DI share of U.S.									

SOURCE: CDX-0017C.2; CX-0924C [redacted]

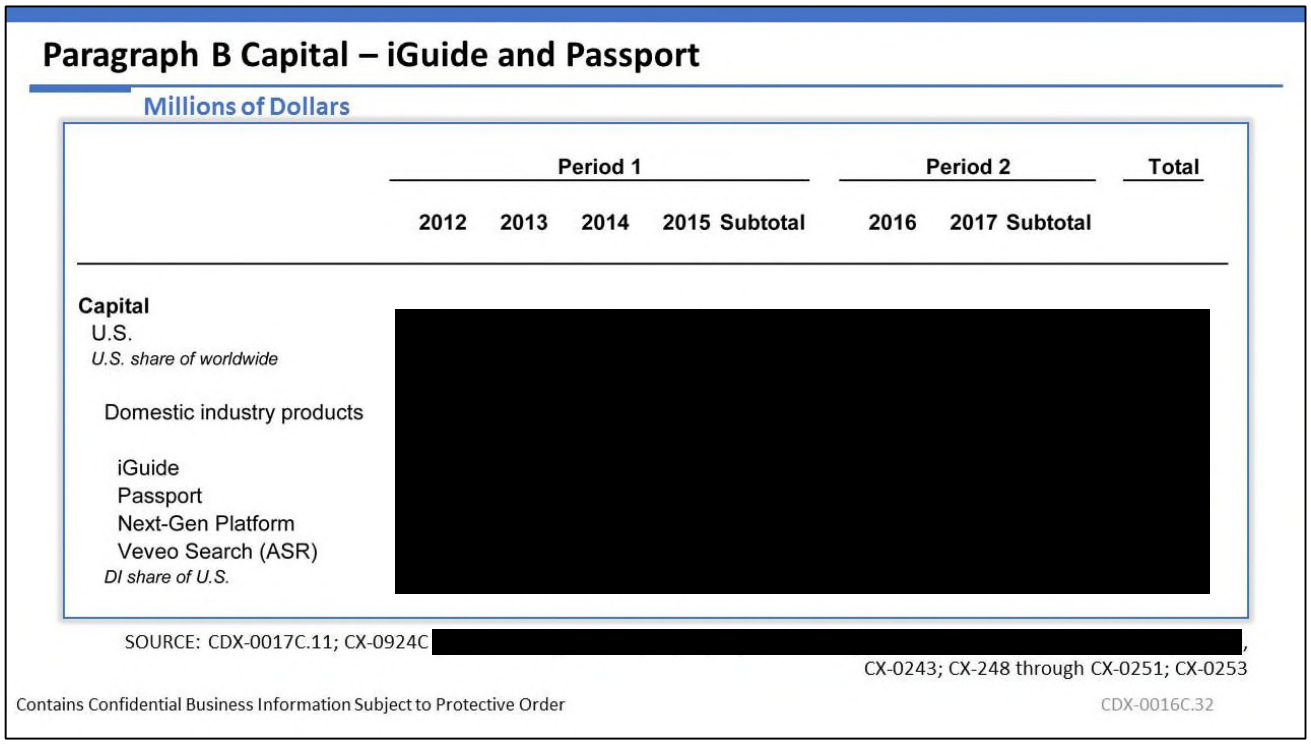
Contains Confidential Business Information Subject to Protective Order

CDX-0016C.23

17. DI Attachment 17:



18. DI Attachment 18:



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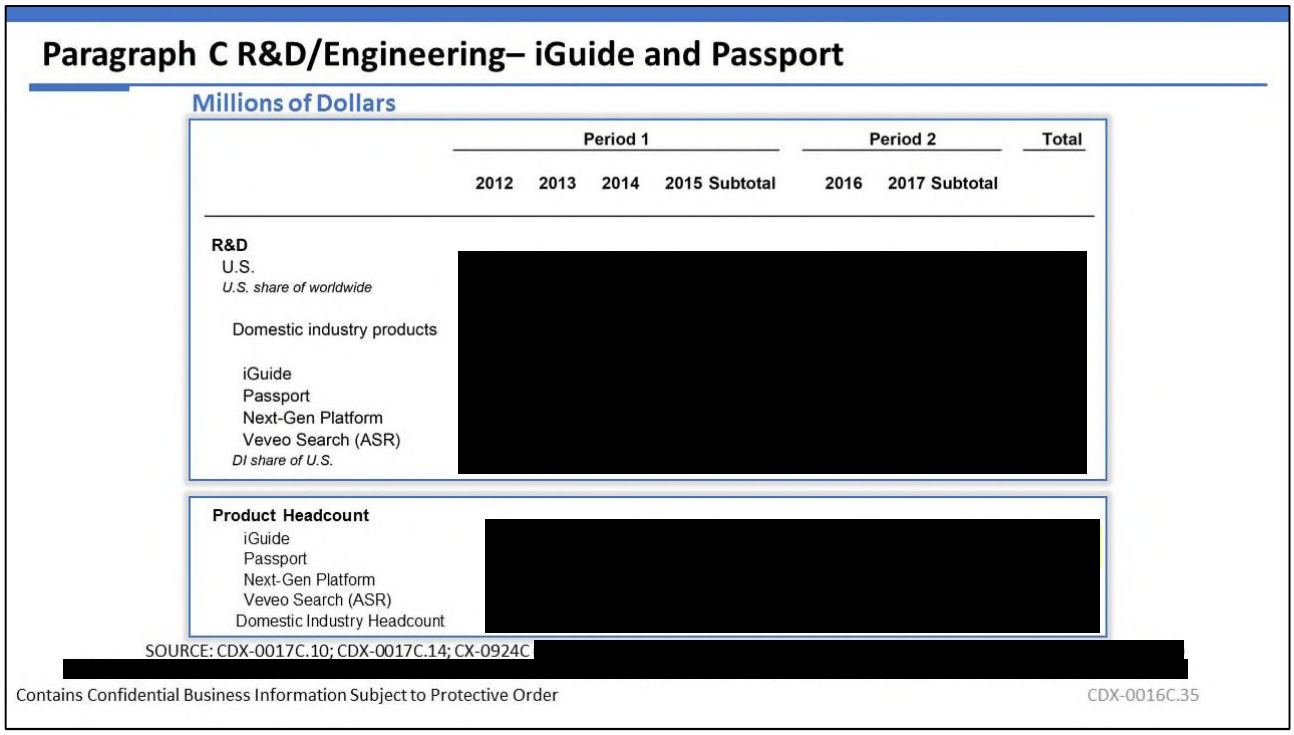
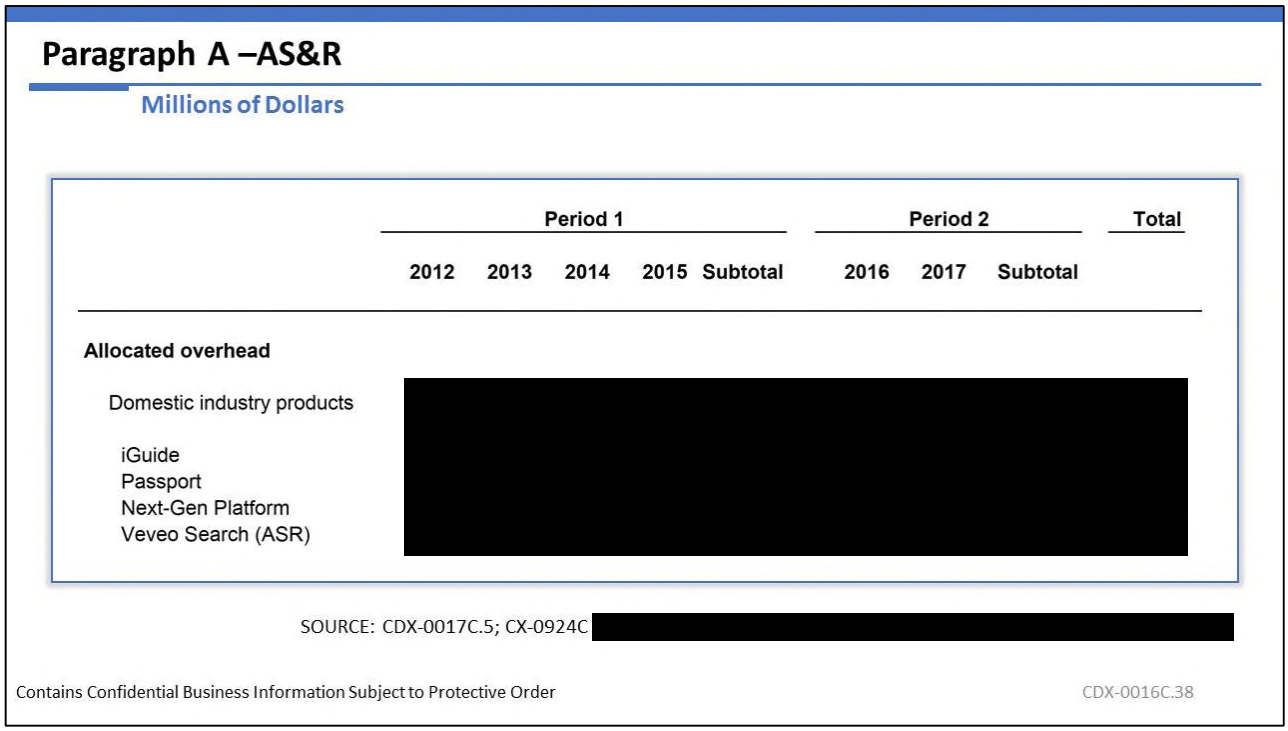


20. DI Attachment 20:

21. DI Attachment 21:



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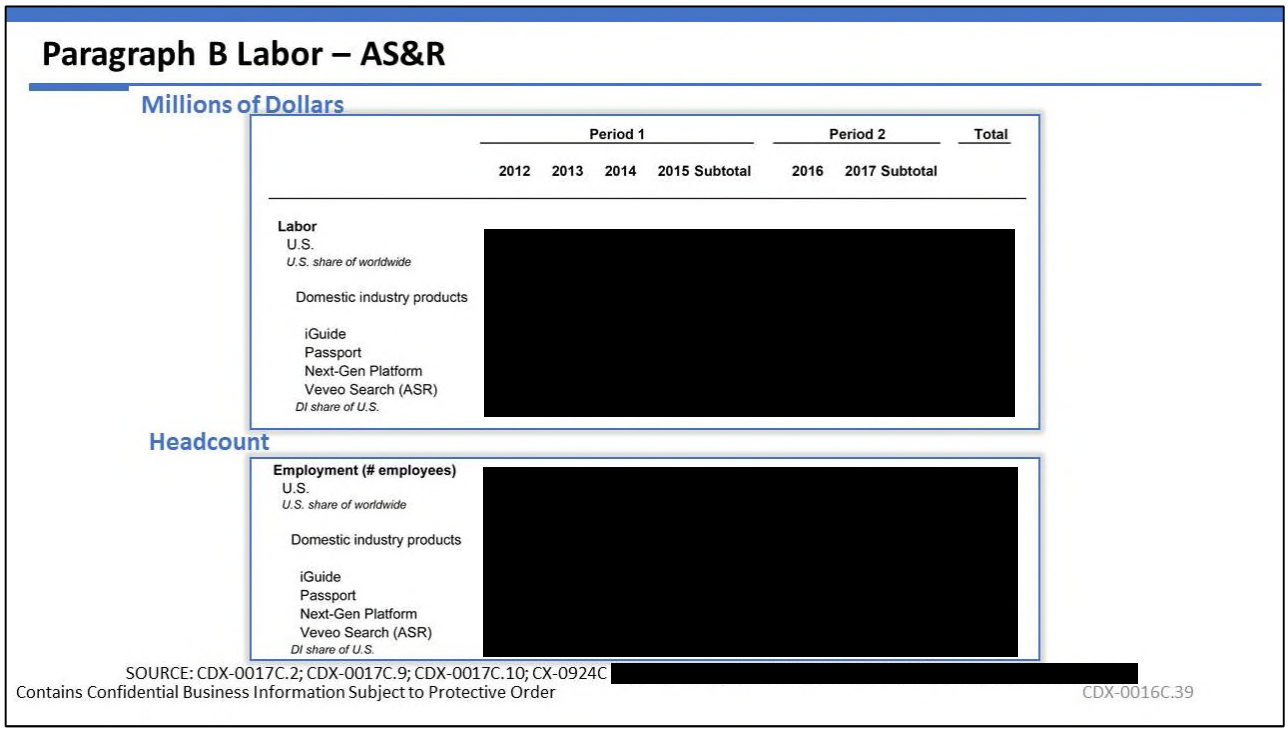

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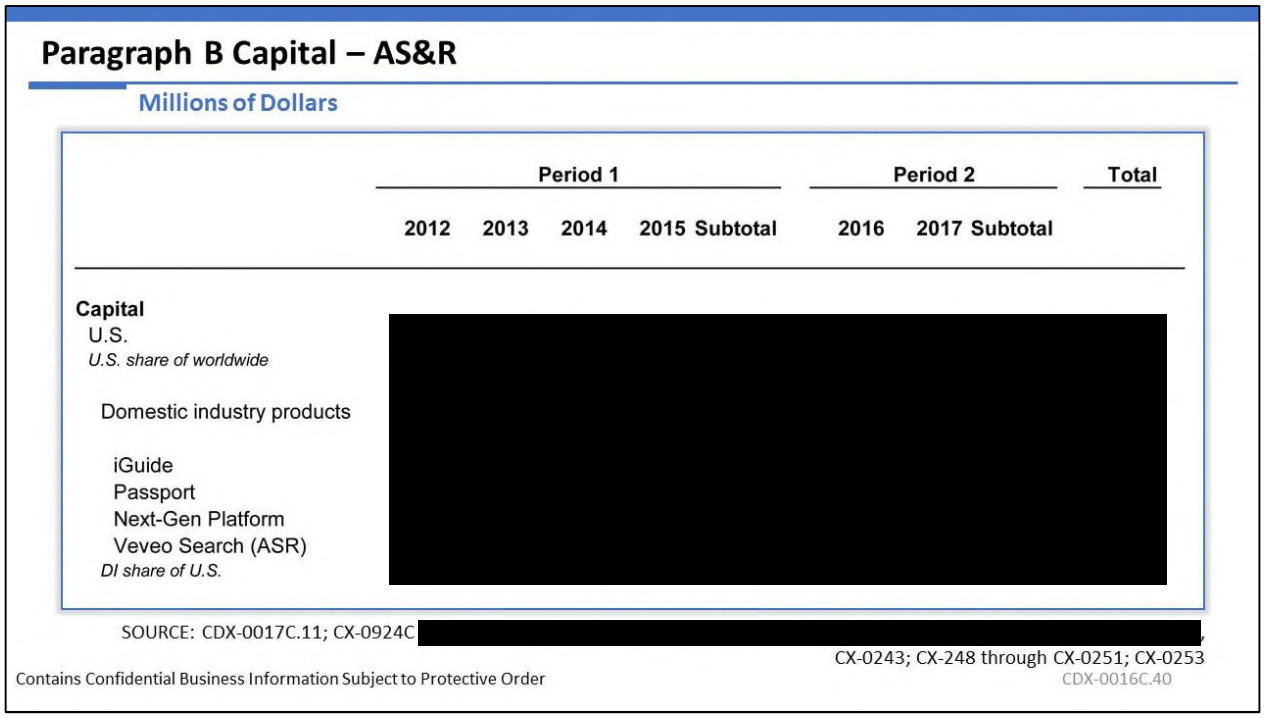


Paragraph B Capital – AS&R

Millions of Dollars

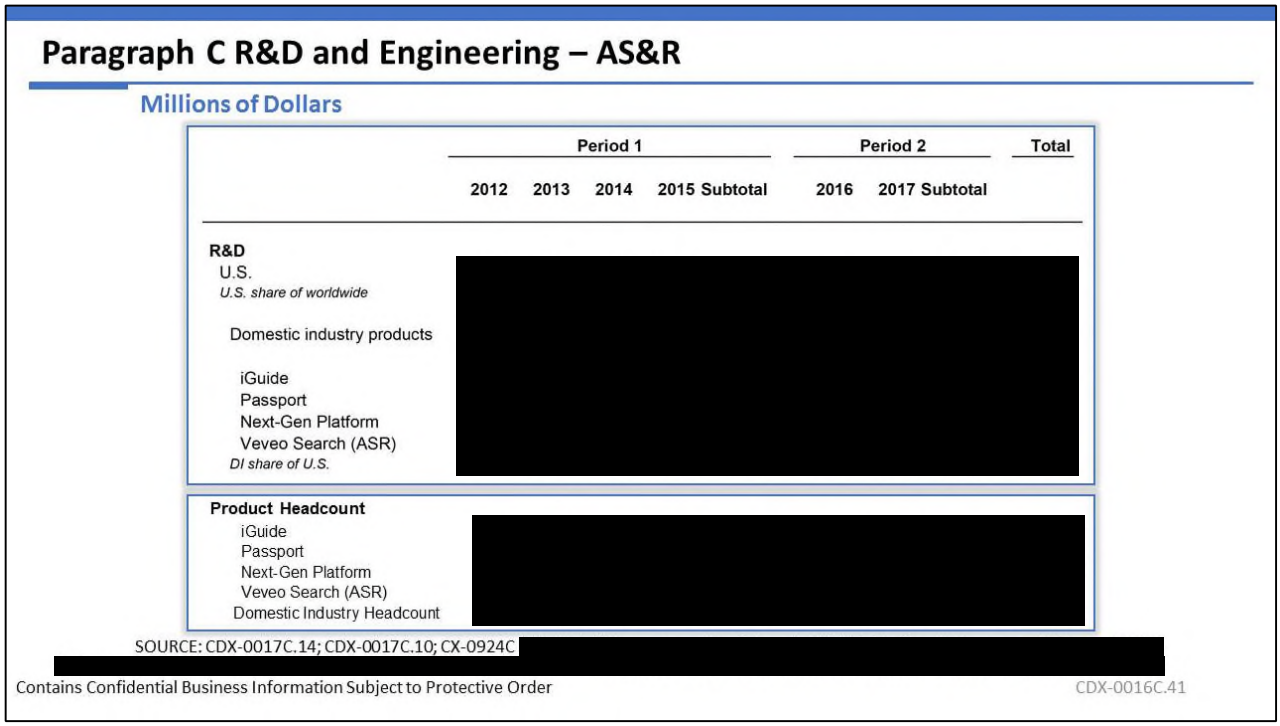
	Period 1					Period 2			Total
	2012	2013	2014	2015	Subtotal	2016	2017	Subtotal	
Capital									
U.S.	[redacted]								
U.S. share of worldwide									
Domestic industry products									
iGuide									
Passport									
Next-Gen Platform									
Veveo Search (ASR)									
DI share of U.S.									

SOURCE: CDX-0017C.11; CX-0924C [redacted], CX-0243; CX-248 through CX-0251; CX-0253

Contains Confidential Business Information Subject to Protective Order

CDX-0016C.40

24. DI Attachment 24:



Paragraph C R&D and Engineering – AS&R

Millions of Dollars

	Period 1					Period 2			Total
	2012	2013	2014	2015	Subtotal	2016	2017	Subtotal	
R&D									
U.S.	[redacted]								
U.S. share of worldwide									
Domestic industry products									
iGuide									
Passport									
Next-Gen Platform									
Veveo Search (ASR)									
DI share of U.S.									
Product Headcount									
iGuide	[redacted]								
Passport									
Next-Gen Platform									
Veveo Search (ASR)									
Domestic Industry Headcount									

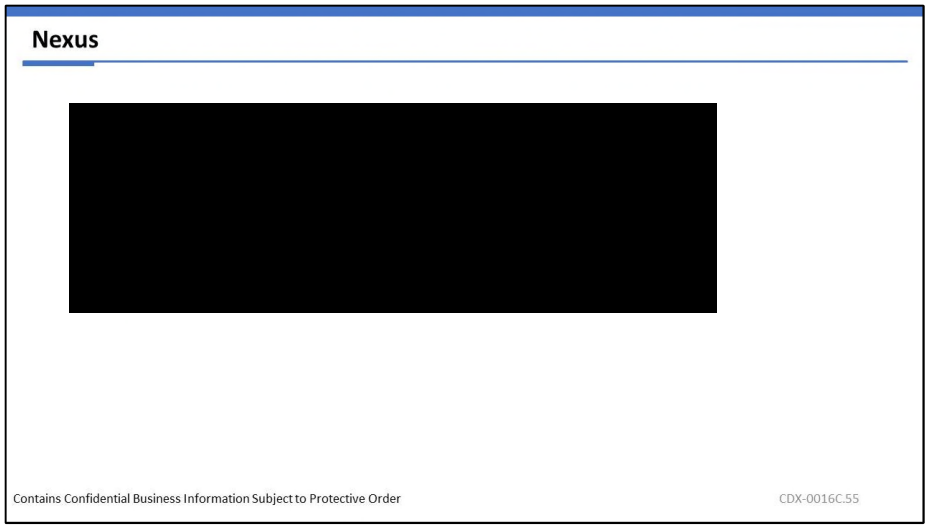
SOURCE: CDX-0017C.14; CDX-0017C.10; CX-0924C [redacted]

Contains Confidential Business Information Subject to Protective Order

CDX-0016C.41

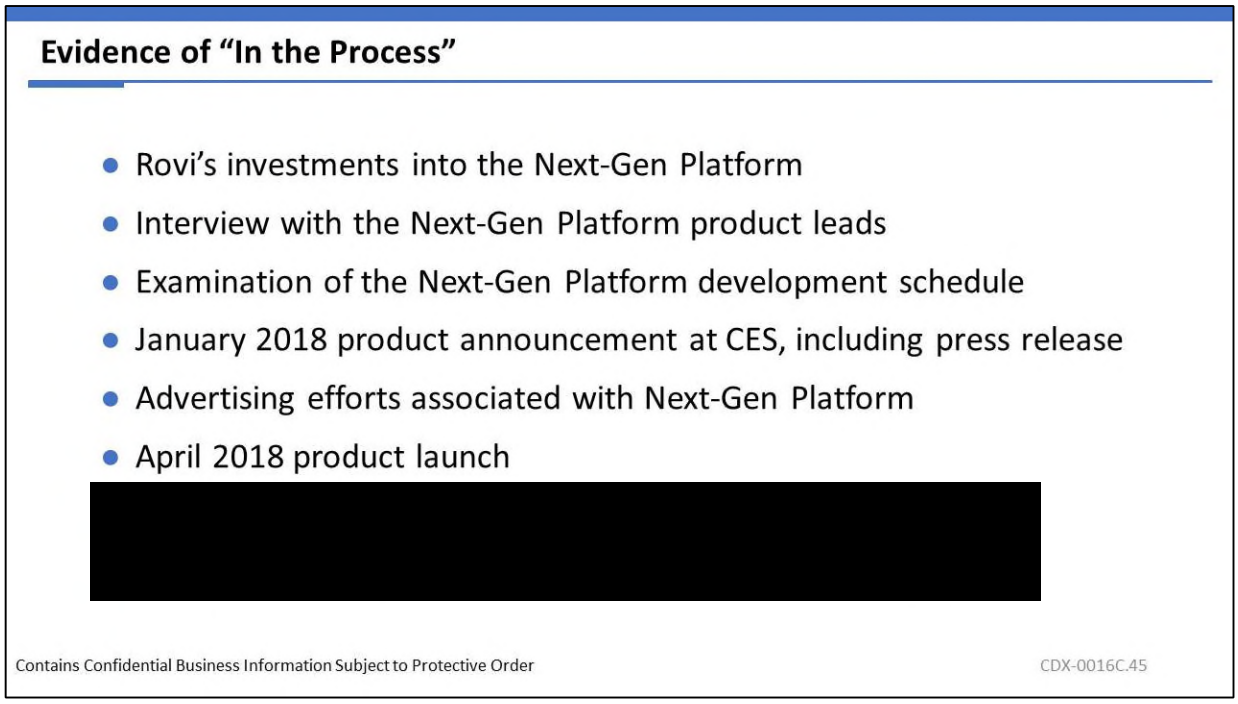
25. DI Attachment 25:

26. DI Attachment 26:



27. DI Attachment 27:

28. DI Attachment 28:



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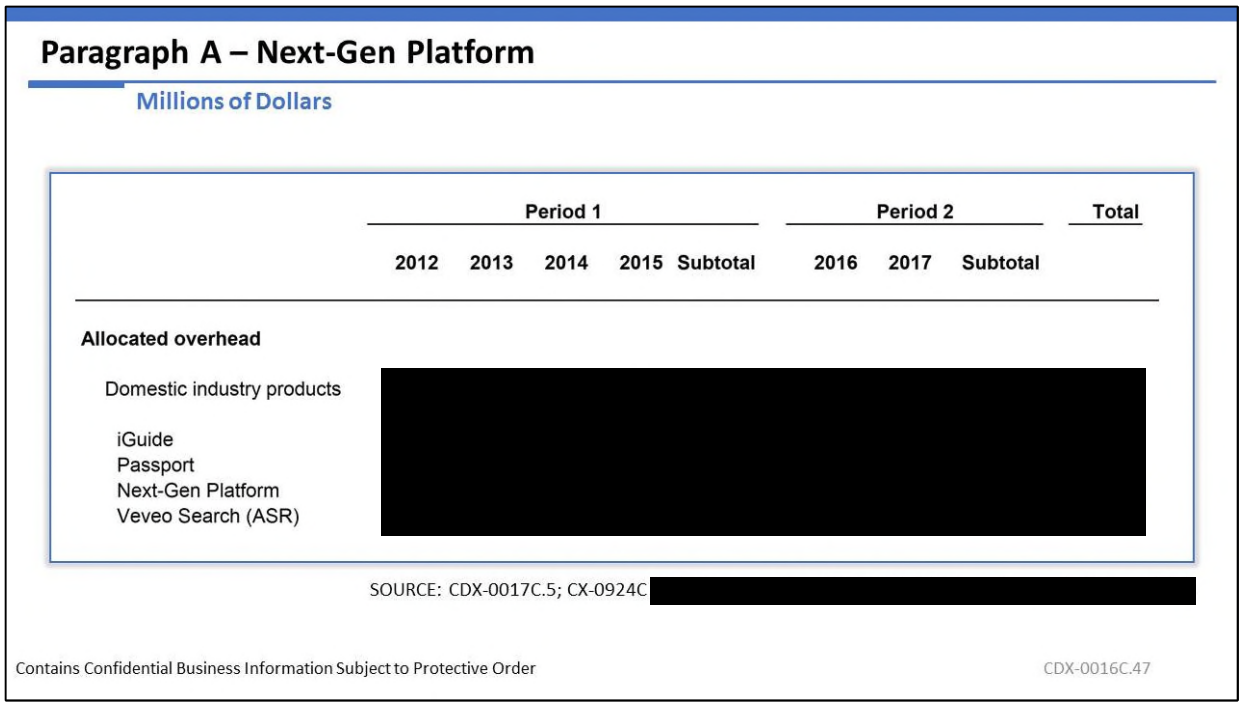

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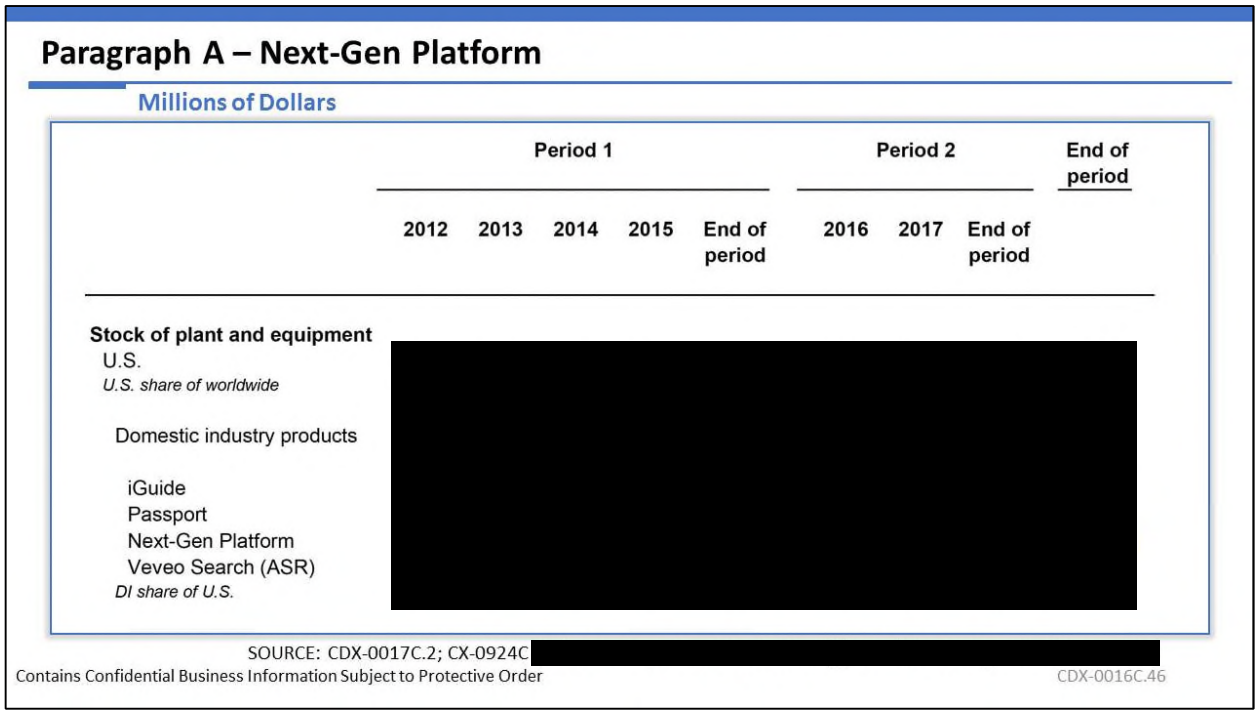

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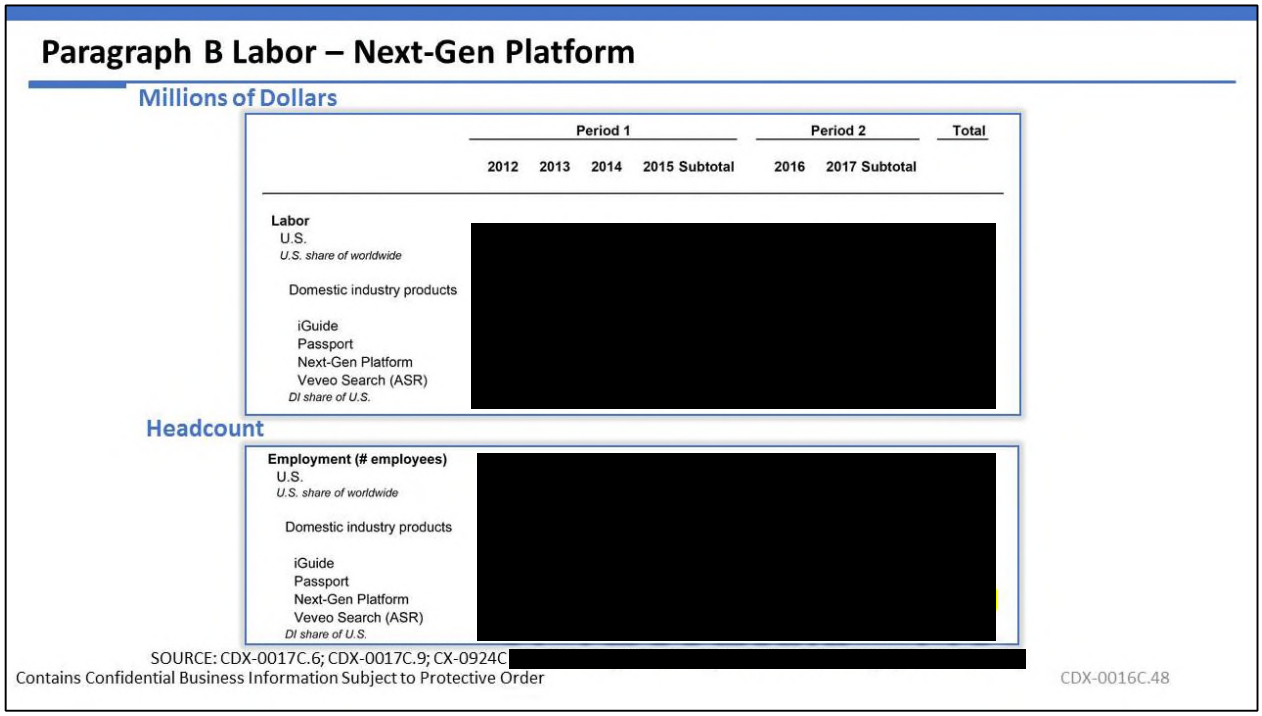

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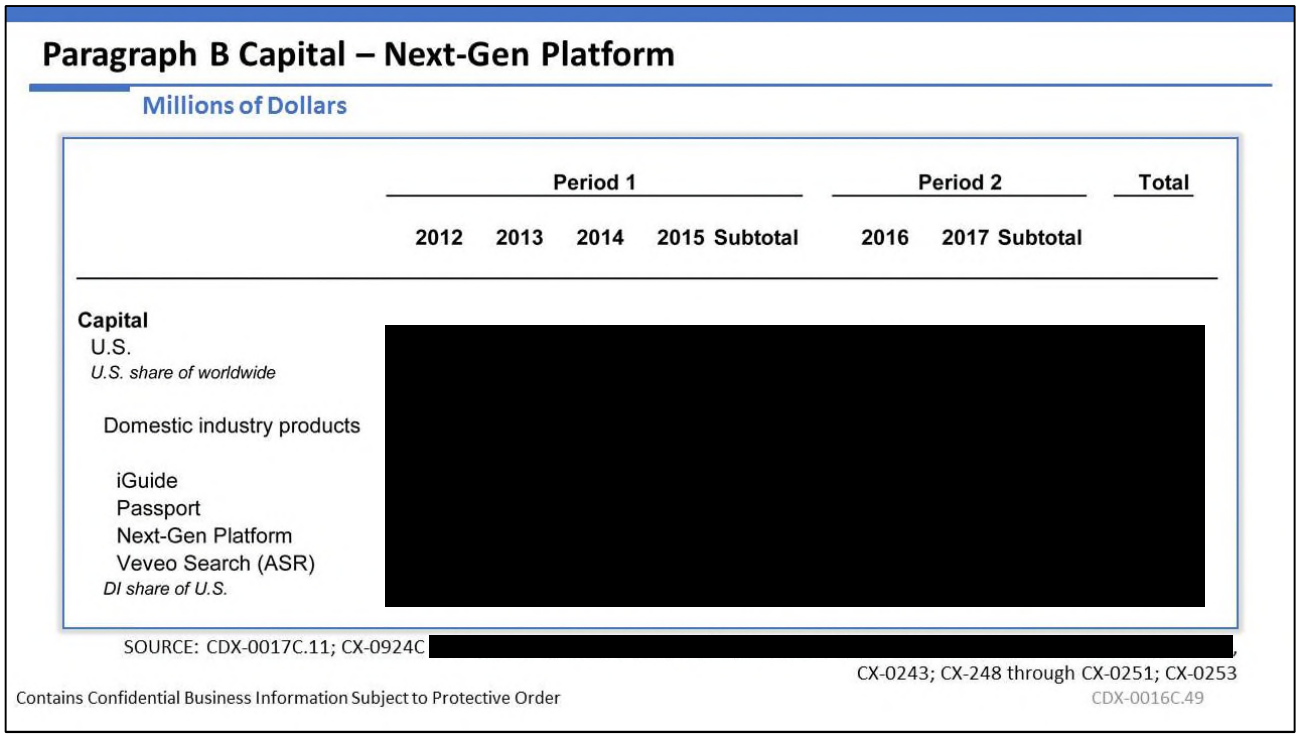

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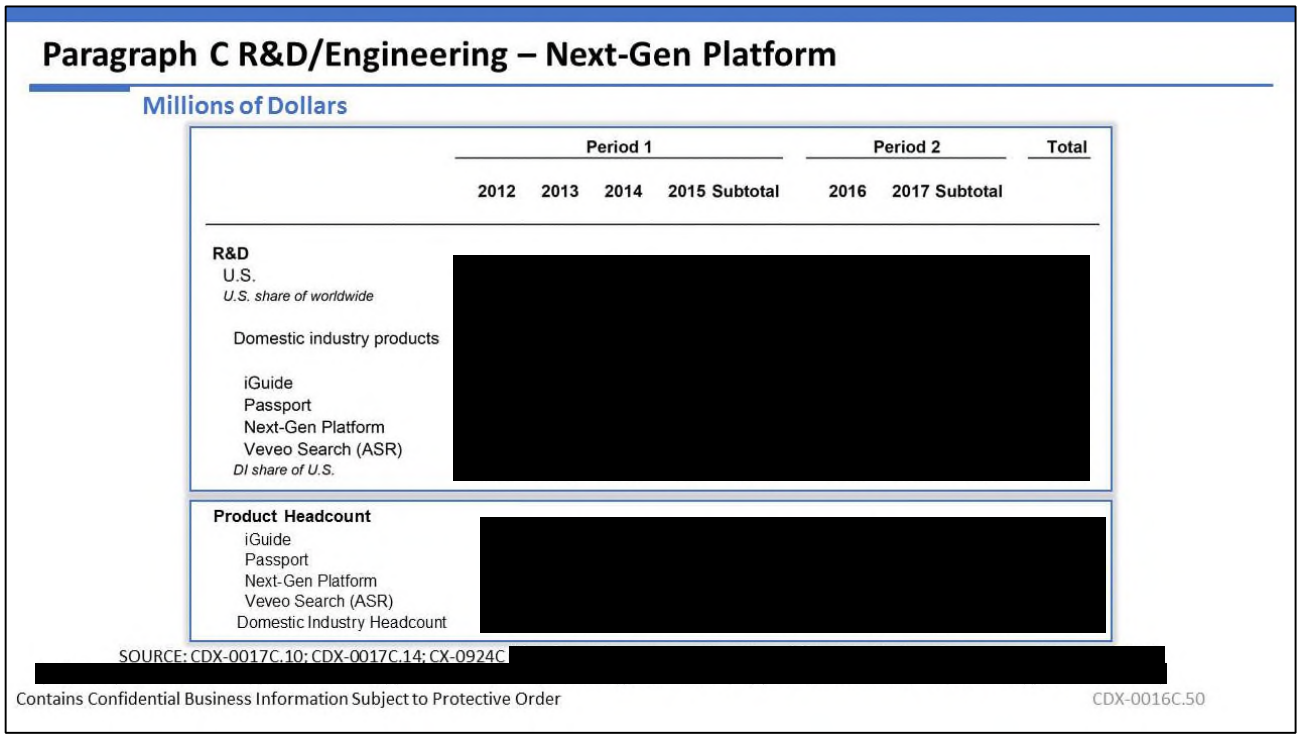

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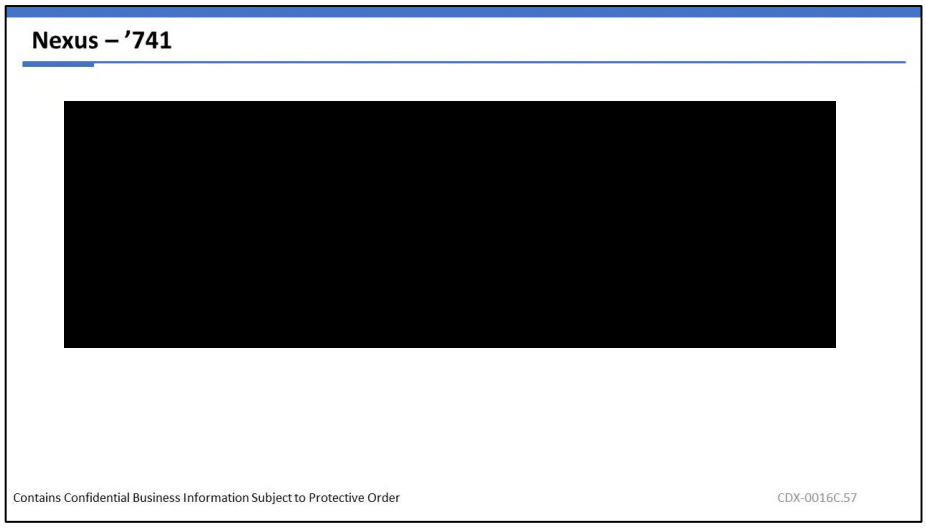

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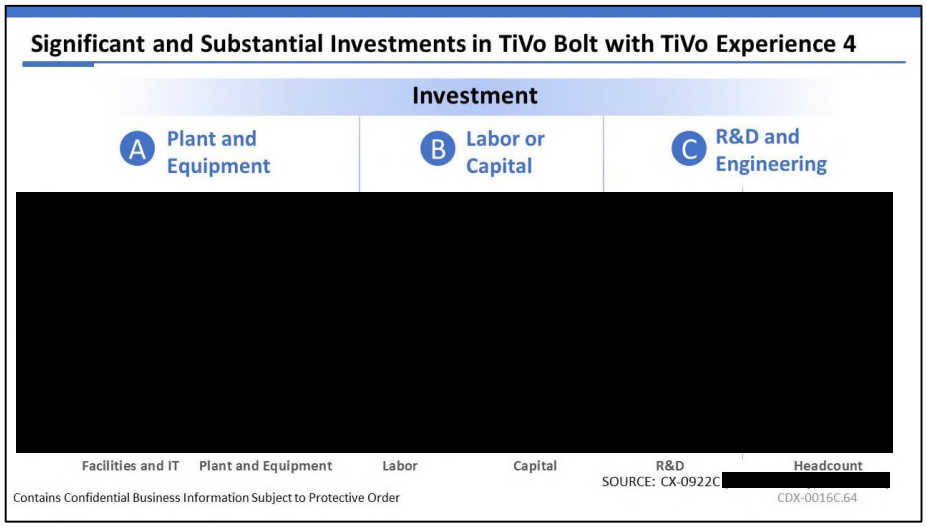
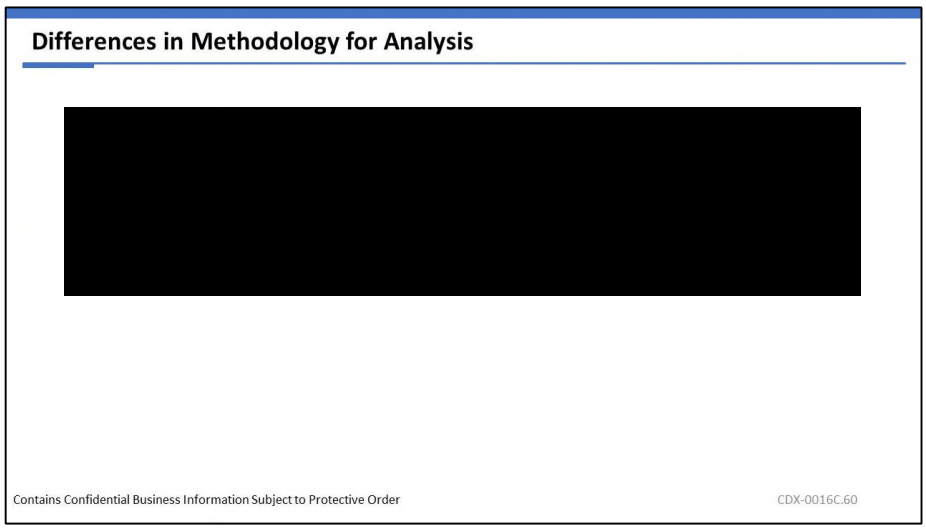


36. DI Attachment 36:



37. DI Attachment 37:

Table 1: Summary of Rovi's U.S. Investments in Domestic Industry Products					
Rovi					
§ 337(a)(3) category	**i-Guide**	**Passport**	**AS&R**[1]	**Next-Gen**[2]	**Total**[3]
(A) Plant & Equipment Expenditures (Flow – Allocated Overhead)[4] ($M, full period [2016-17])	[redacted]				
(A) Plant & Equipment Stock ($M, at end of 2017)[6]	[redacted]				
(B) Labor Expenditures[5] ($M, full period [2016-17])	[redacted]				
(B) Labor Employees[7] (Full-time equivalents, at end of 2017)	[redacted]				
(B) Capital Expenditures[6] ($M, full period [2016-17])	[redacted]				
(C) R&D & Engineering Expenditures[7] ($M, full period [2016-17])	[redacted]				

***** *Dr. Putnam did not opine on the significance of the end of period P&E stock or employees for AS&R. These figures are found in his schedules, however, and included here for completeness.*

[1] The investment figures labeled as "[redacted]" in CX-0924C correspond to AS&R. Sargis Tr. at 1165:6-13; *see* Koenig Tr. 441:12-20.

[2] The investment figures labeled as "[redacted]" in CX-0924C correspond to the Next-Gen Platform. *See* Sargis Tr. at 1164:21-1165:5.

[3] CDX-0017C.1; CDX-0016C.16, .36, .42, .52 (included as DI Attachment 3; CX-0924C (Cost Center Expends.).

[4] CDX-0017C.5 (Flow P&E); CDX-0017C.2 (Stock P&E). As Dr. Putnam explained, P&E is measured in two ways: (1) expenditure "flows" to purchase P&E; and (2) "stock" valuations of P&E. Putnam Tr. 1237:22-1240:21; CDX-0016C.18-.19 (included as DI Attachments 8-9). Because Rovi is a software company, its information technology ("IT") and facilities are its primary investments in P&E. Putnam Tr. 1239:14-1240:15. For expenditure flows, Rovi allocates the investments to products in the ordinary course. For stock, Rovi reports its P&E value on its balance sheets reported in its 10-Ks. Dr. Putnam used this information to calculate the portion for each DI Product by using the ratio of the product's labor to overall U.S. labor. *Id.*

[5] CDX-0017C.6 (Labor Expend.); CDX-0017C.9-.10 (Employees); CX-0918C (Employee Count); CDX-0016C.24 (included as DI Attachment 10).

[6] To calculate capital expenditures, Dr. Putnam multiplied the expenditures reported on Rovi's financial statements (10-Ks) by the ratio of the DI Product's labor to total U.S. labor. Putnam Tr. 1249:14-1250:2; CDX-0017C.11 (CapEx); CDX-0016C.24, .30 (included as DI Attachments 10-11).

[7] CDX-0017C.14 (R&D); CDX-0016C.33 (included as DI Attachment 12).

38. DI Attachment 38:

Table 2: Summary of TSI's U.S. Investments on Domestic Industry Products	
TSI	
§ 337(a)(3) category	**Bolt with Experience 4.0**
(A) Plant & Equipment Stock[8] ($M, at end of 2017)	[redacted]
(B) Labor Expenditures[9] ($M, full period [2016-17])	
(B) Labor Employees[22] (Full-time equivalents, at end of 2017)	
(B) Capital Expenditures[10] ($M, full period [2016-17])	
(C) R&D & Engineering Expenditures[11] ($M, full period [2016-17])	

[8] Putnam Tr. 1269; CDX-0016C.64 (included as DI Attachment 35); CDX-0017C.36-.37, .43, .45; CX-0922C; CX-0253. In 2016, TSI's plant and equipment stock was [redacted]; in 2015, it was [redacted].

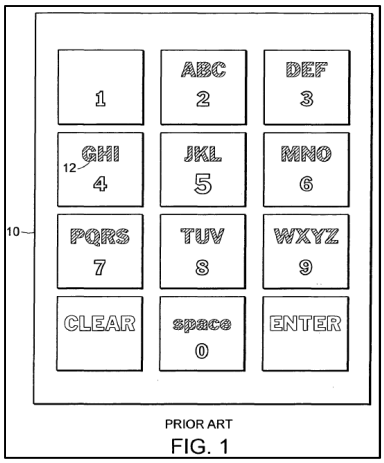
[9] Putnam Tr. 1269; DI Attachment 35; CDX-0017C.36, .38-.40; CX-0922C.

[10] Putnam Tr. 1269; DI Attachment 35; CDX-0017C.36, .41, .43, .45; CX-0922C; CX-0253.

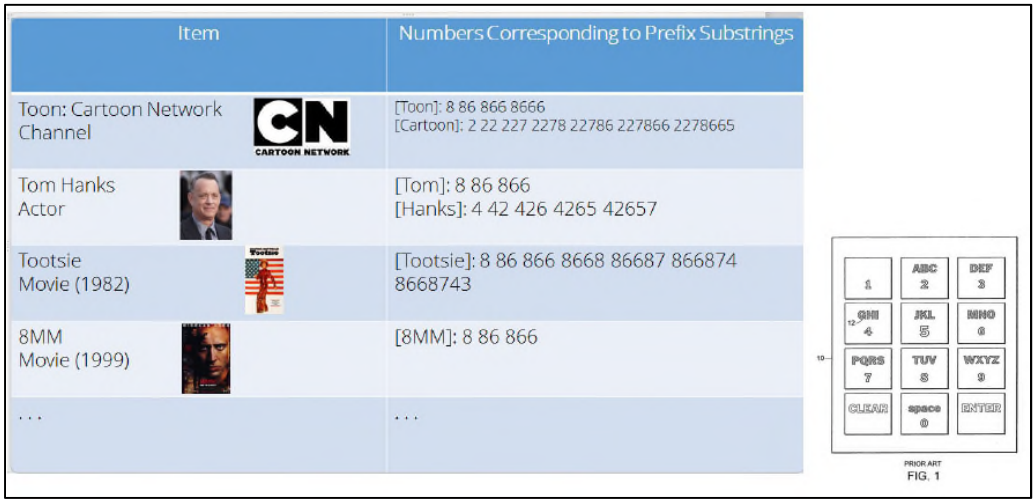
[11] Putnam Tr. 1269; DI Attachment 35; CDX-0017C.36, .42, .44; CX-0922C.

Exhibit B

1. ’011 Patent Attachment 1:



2. ’011 Patent Attachment 2:



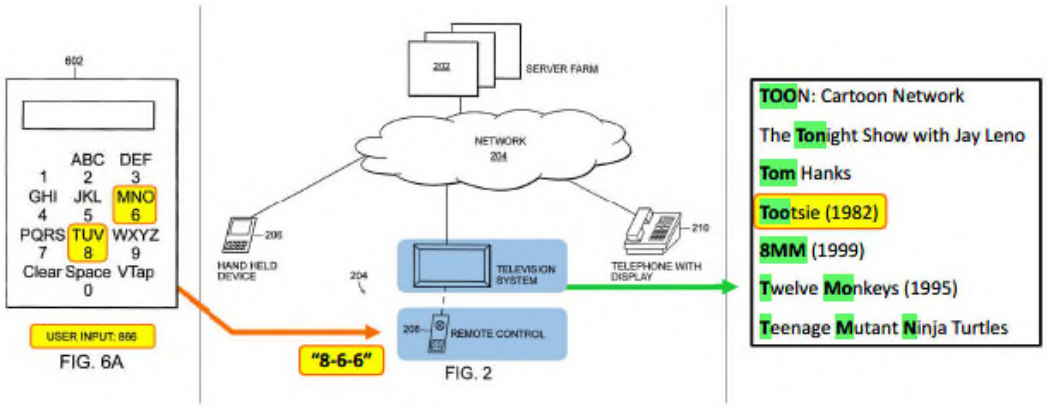
Item	Numbers Corresponding to Prefix Substrings
Toon: Cartoon Network Channel	[Toon]: 8 86 866 8666 [Cartoon]: 2 22 227 2278 22786 227866 2278665
Tom Hanks Actor	[Tom]: 8 86 866 [Hanks]: 4 42 426 4265 42657
Tootsie Movie (1982)	[Tootsie]: 8 86 866 8668 86687 866874 8668743
8MM Movie (1999)	[8MM]: 8 86 866
. . .	. . .

3. ’011 Patent Attachment 3:

The Index:

Unresolved Overloaded Keystrokes	Subsets of Associated Item Titles
8	**T**oon: Cartoon Network The **T**onight Show with Jay Leno **T**om Hanks **T**ootsie **8**MM **T**welve Monkeys **T**eenage Mutant Ninja Turtles
86	**To**on: Cartoon Network The **To**night Show with Jay Leno **To**m Hanks **To**otsie **8M**M **T**welve **M**onkeys **T**eenage **M**utant Ninja Turtles
866	**Too**n: Cartoon Network The **Ton**ight Show with Jay Leno **Tom** Hanks **Too**tsie **8MM** **T**welve **M**onkeys **T**eenage **M**utant **N**inja Turtles

4. ’011 Patent Attachment 4:



JX-0001.7, JX-0001.11 (Figs.2, 6A, and 6B)

5. ’011 Patent Attachment 5:

[redacted]

6. ’011 Patent Attachment 6:

[redacted]

7. ’011 Patent Attachment 7:

8. ’011 Patent Attachment 8:

Inverted Index Entry	Field	Exemplary Subset of Items Associated with the Index Entry
"3"	t9TitleFragments	"Family Guy" "Formula One Racing" "Empire" "ESPN" "Disney's Descendants 2"
"34"	t9TitleFragments	"Disney Channel" "Hawaii Five-O" "Fifty Shades Freed" "Fixer Upper" "Disney's Descendants 2"
"347"	t9TitleFragments	"Disney Junior" "Discovery Channel" "The First 48" "Chicago Fire" "Disney's Descendants 2"
"d"	titleFragments	"Disney Channel" "The Walking Dead" "Disney Junior" "Dragon Ball Super" "Dateline NBC"
"di"	titleFragments	"Disney Channel" "Discovery Junior" "Dietland" "Discovery Channel" "DIY Network"
"dis"	titleFragments	"Disney Channel" "Disney Junior" "Discovery Channel" "Disney's Descendants 2" "Disney XD"

9. ’011 Patent Attachment 9:

10. ’011 Patent Attachment 10:

Comcast X1 Customers Use the Accused Functionality

FEATURE	FAMILIARITY			FREQUENCY OF USE					
	Not Familiar	Familiar / Never Used	Familiar / Used	Several / Week	Once a week	2-3 times / month	Once a month	Once every 3 months	3 times or less last 12 months
Restart Now (’741 Patent): Noon Group		5	5	3		1	1		4
Restart Now (’741 Patent): 5:30 Group	6	1	3		1		1	1	1
Restart Now (’741 Patent): TOTAL	**6**	**6**	**8**	**3**	**1**	**1**	**2**	**1**	**5**
Overloaded Keys (’011 Patent): Noon Group	5	3	2	2					6
Overloaded Keys (’011 Patent): 5:30 Group	7	1	2	2					2
Overloaded Keys (’011 Patent): TOTAL	**12**	**4**	**4**	**4**	**0**	**0**	**0**	**0**	**8**
Storage Options (’585 Patent): Noon Group	1	3	6	1	2	2			4
Storage Options (’585 Patent): 5:30 Group	4	3	3				1		4
Storage Options (’585 Patent): TOTAL	**5**	**6**	**9**	**1**	**2**	**2**	**1**	**0**	**8**

CDX-0012C.14

11. ’011 Patent Attachment 11:

HSR #2785

RESPONDENT NAME: ALESHIA

Pittsburgh 12:00pm Group

	Familiarity/Usage			Last Time Used	How Often Used					
	Not Familiar	Familiar/ Never Used	Used		Several times a week	Once a week	2-3 times a month	Once a month	Once every 3 months	3 times or less in past 12 months
Feature J	☐	☑	☐		☐	☐	☐	☐	☐	☐
Feature B	☐	☐	☑	today	☑	☐	☐	☐	☐	☐
Feature T	☐	☐	☑	last week	☐	☑	☐	☐	☐	☐
Feature G	☐	☐	☑	today	☑	☐	☐	☐	☐	☐
Feature N	☑	☐	☐		☐	☐	☐	☐	☐	☐
Feature K	☐	☐	☑	yesterday	☑	☐	☐	☐	☐	☐

ROVI_1103-ITC00477384

CX-0543.6
ITC Inv. No.:

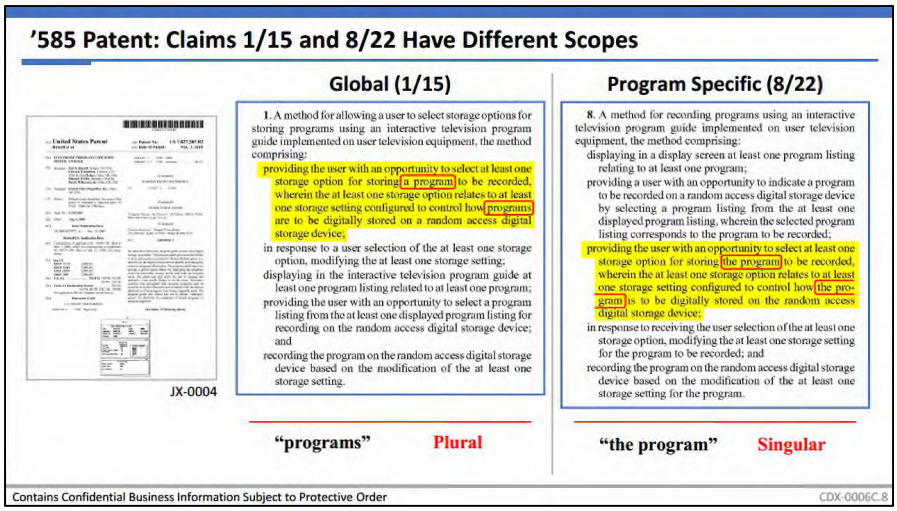
12. ’011 Patent Attachment 12:

13. ’011 Patent Attachment 13:

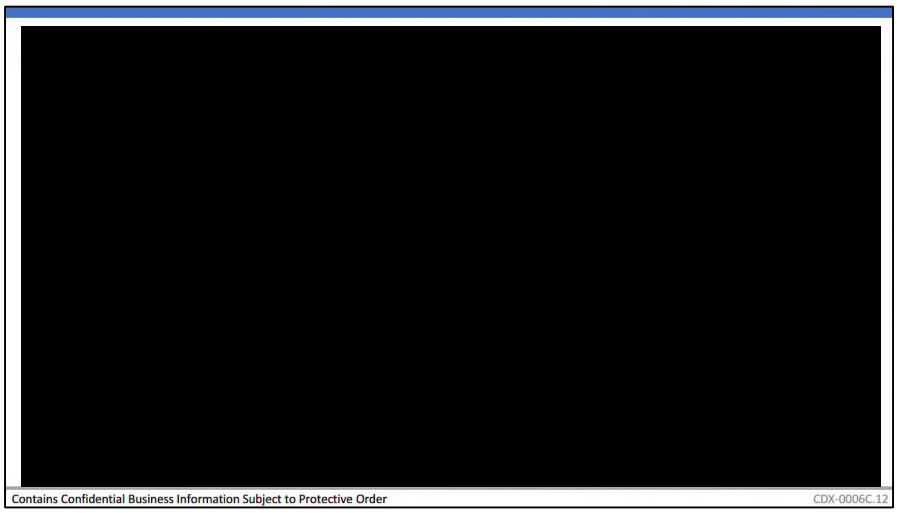
14. ’011 Patent Attachment 14:

Exhibit C

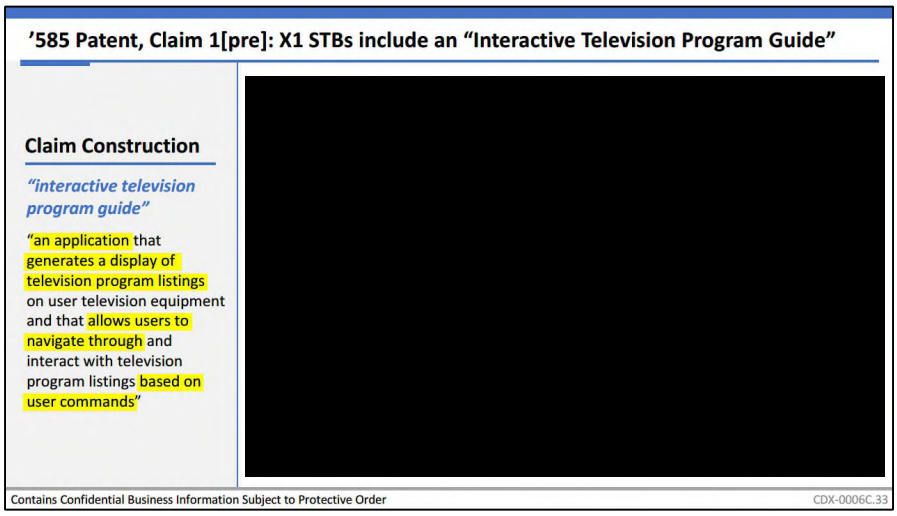
1. ’585 Patent Attachment 1:



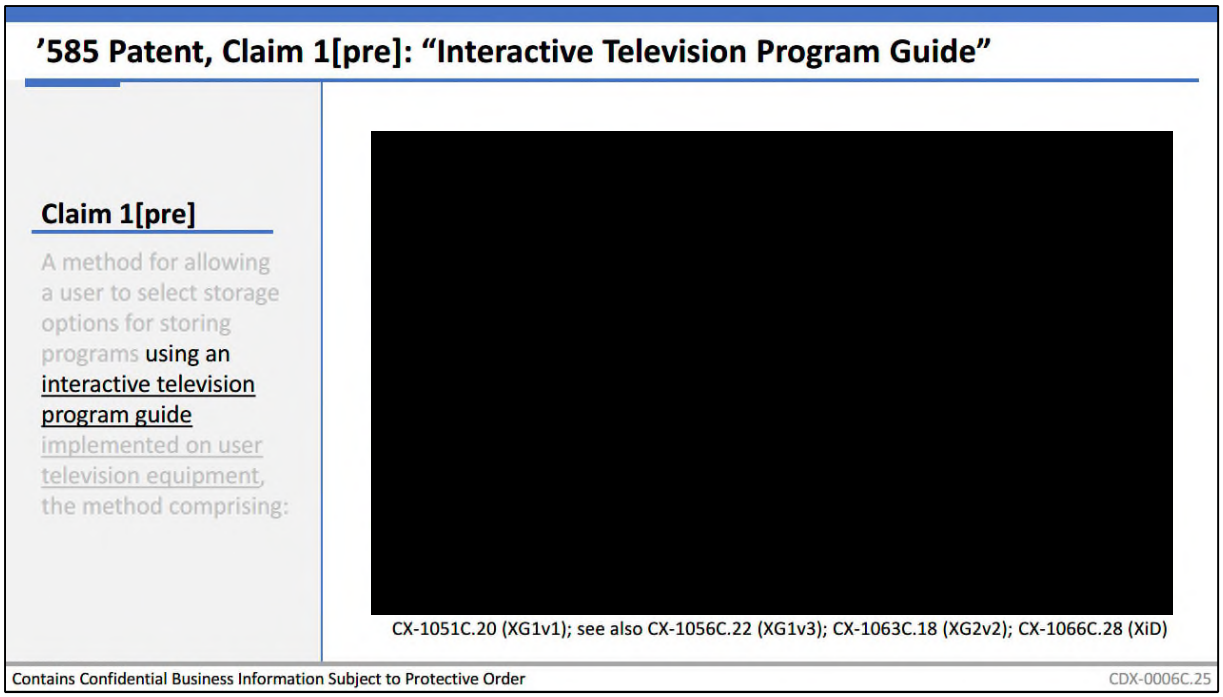
2. ’585 Patent Attachment 2:



3. ’585 Patent Attachment 3:



4. ’585 Patent Attachment 4:



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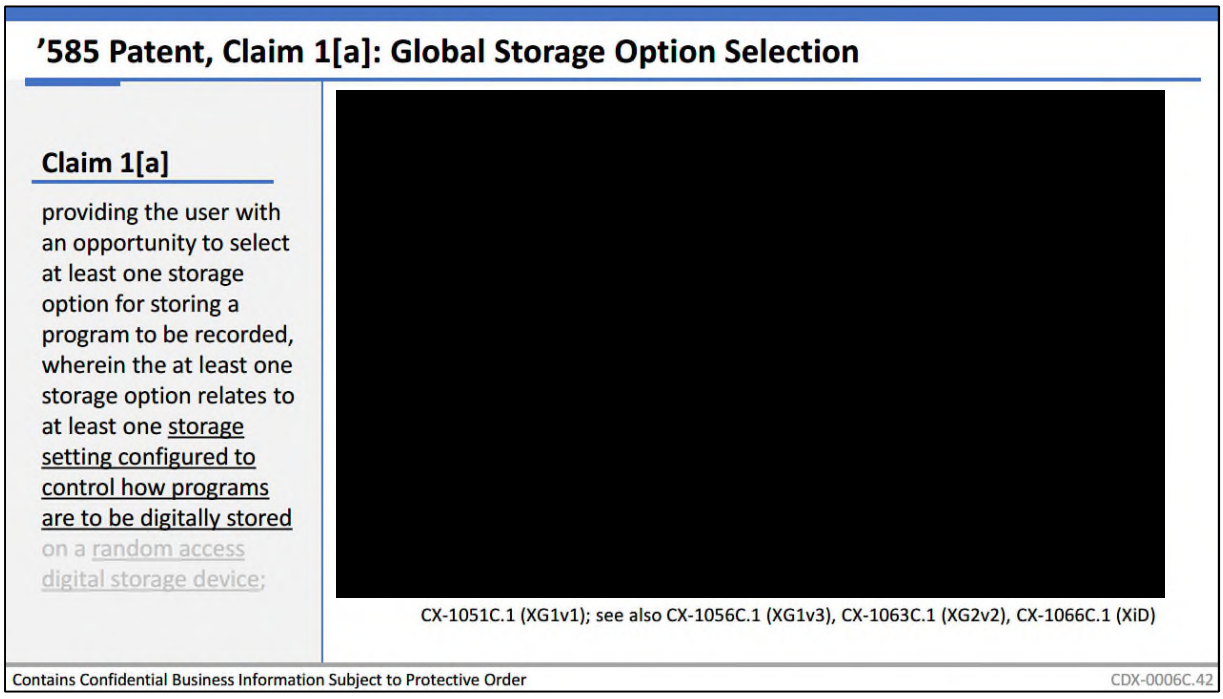

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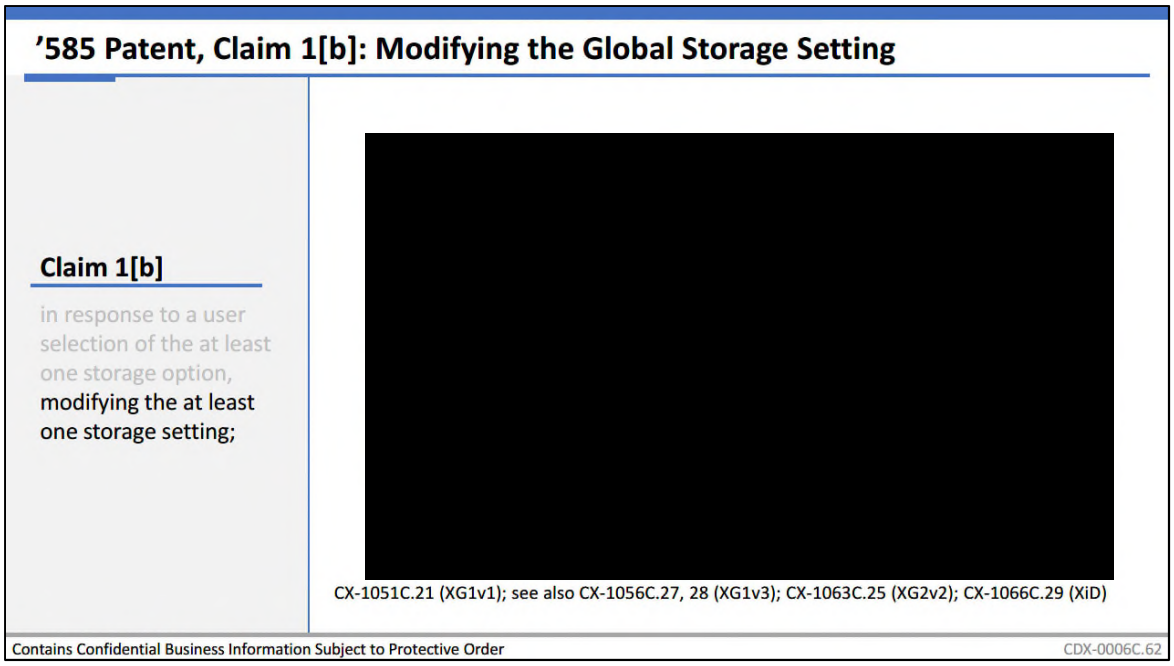
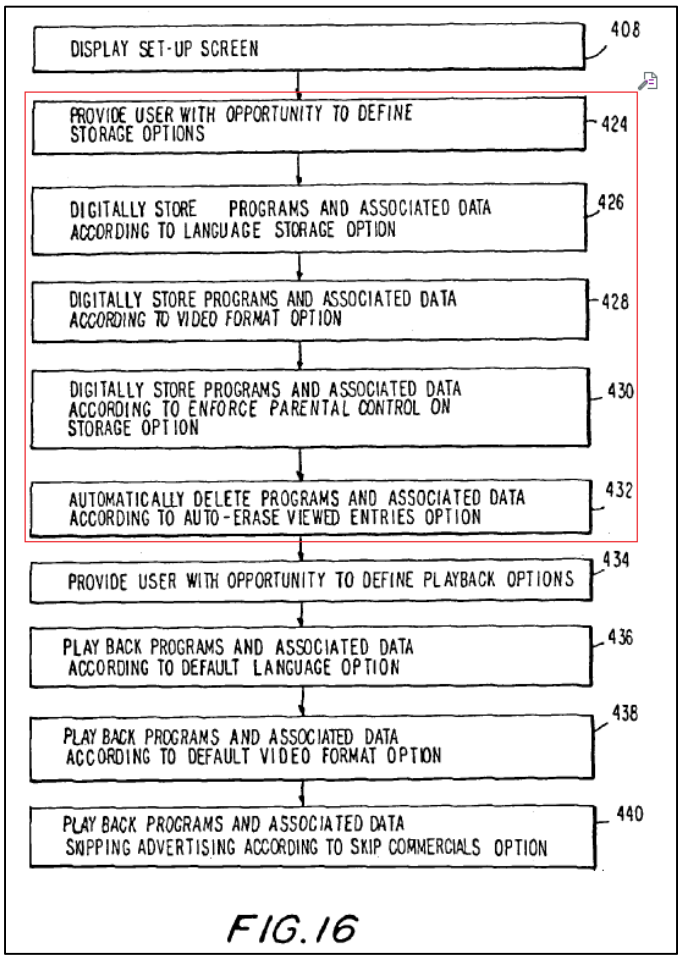


7. ’585 Patent Attachment 7:



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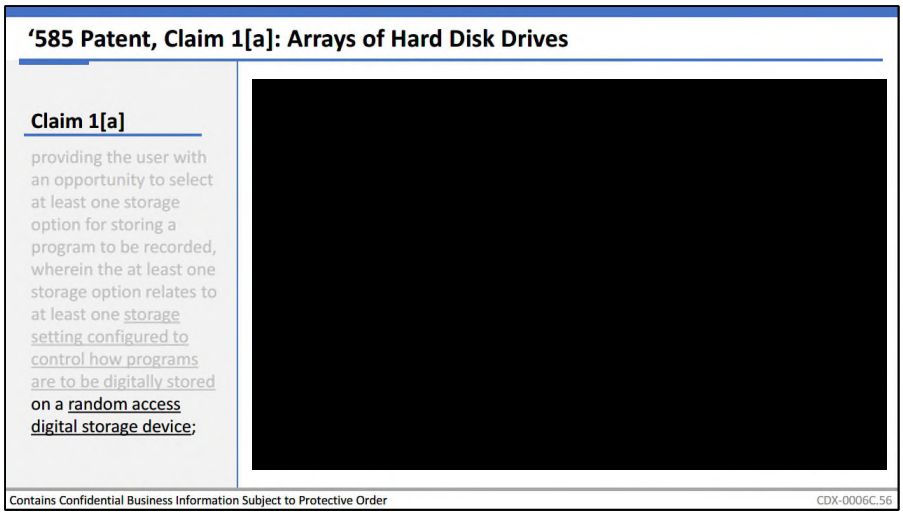

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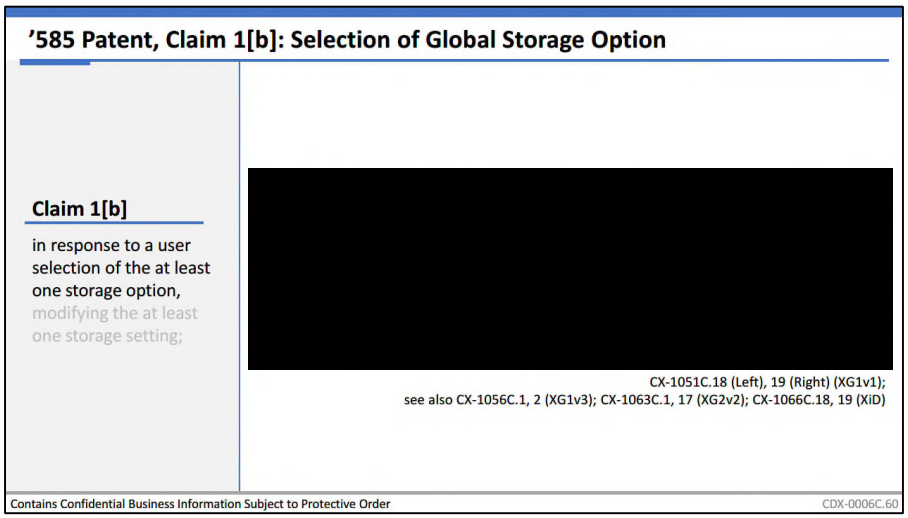
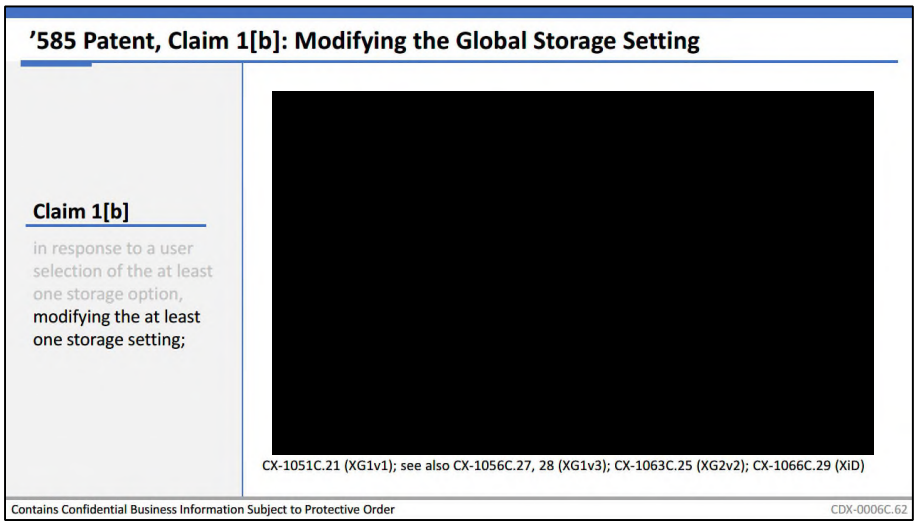


10. ’585 Patent Attachment 10:



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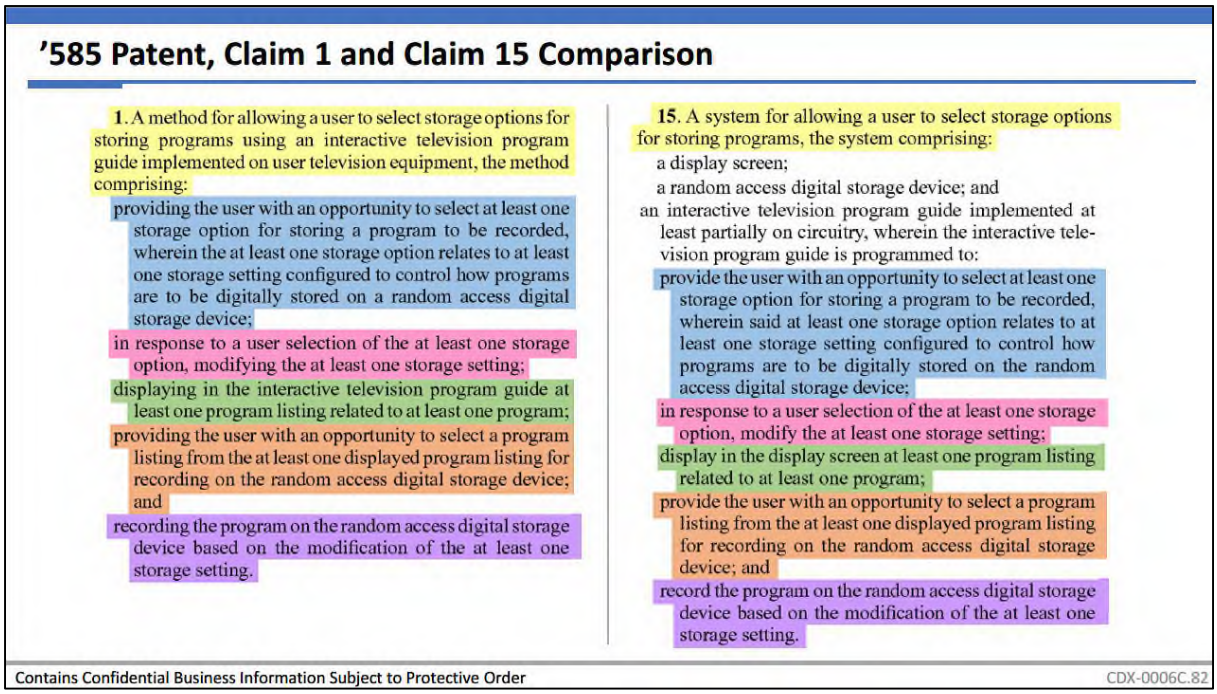
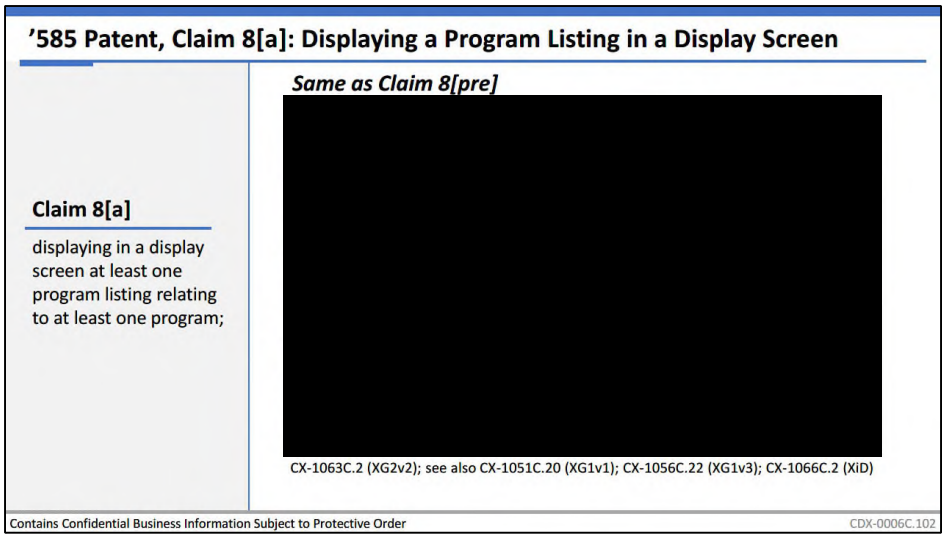


12. ’585 Patent Attachment 12:

13. **’585 Patent Attachment 13:**



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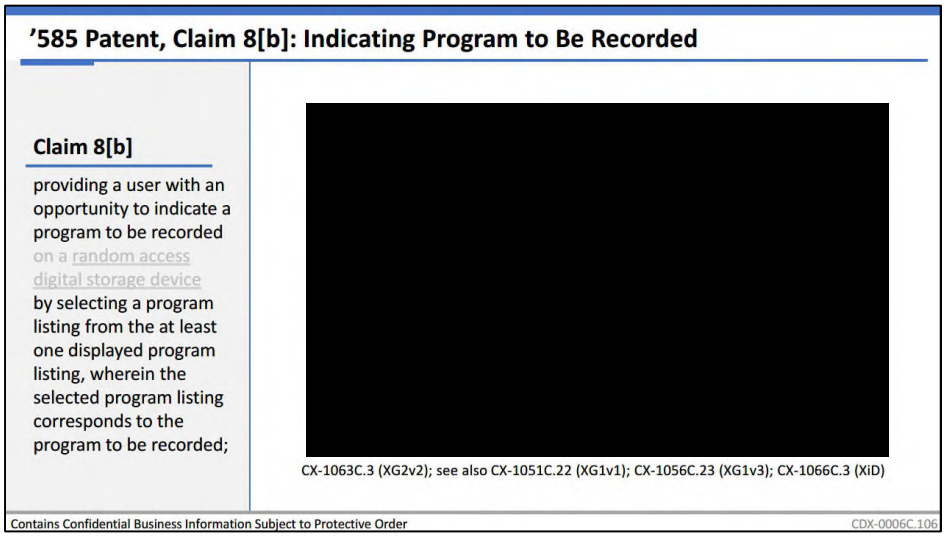

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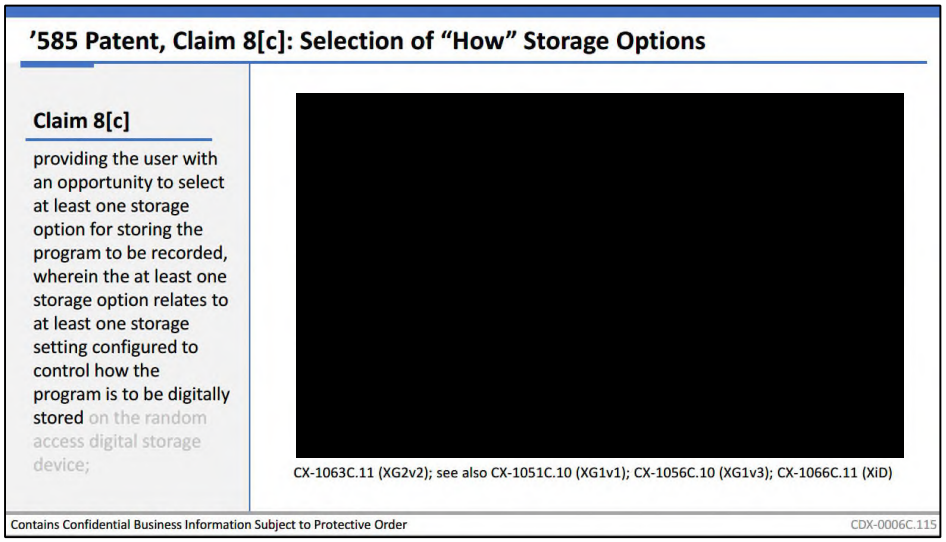

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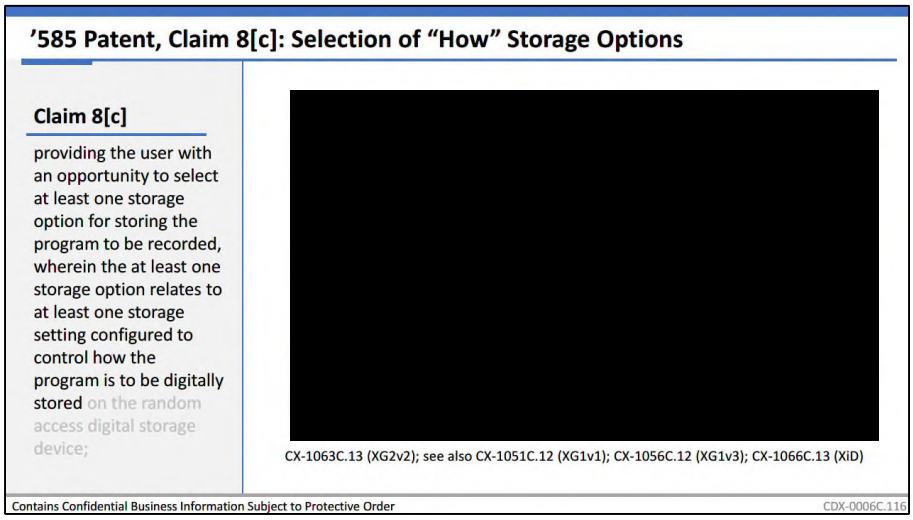
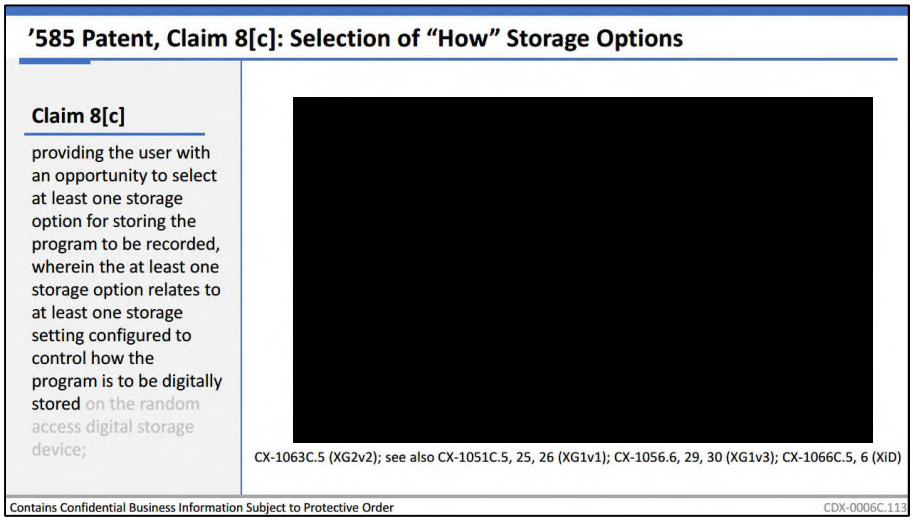


17. ’585 Patent Attachment 17:



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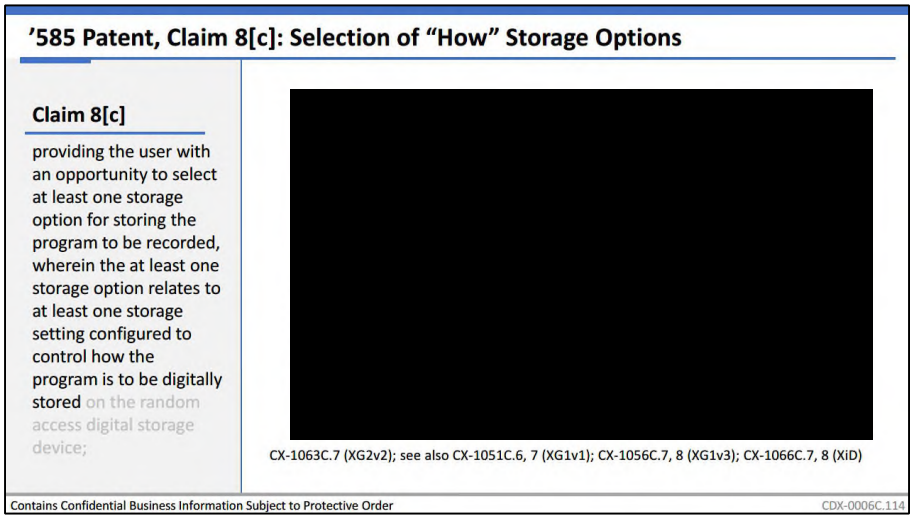
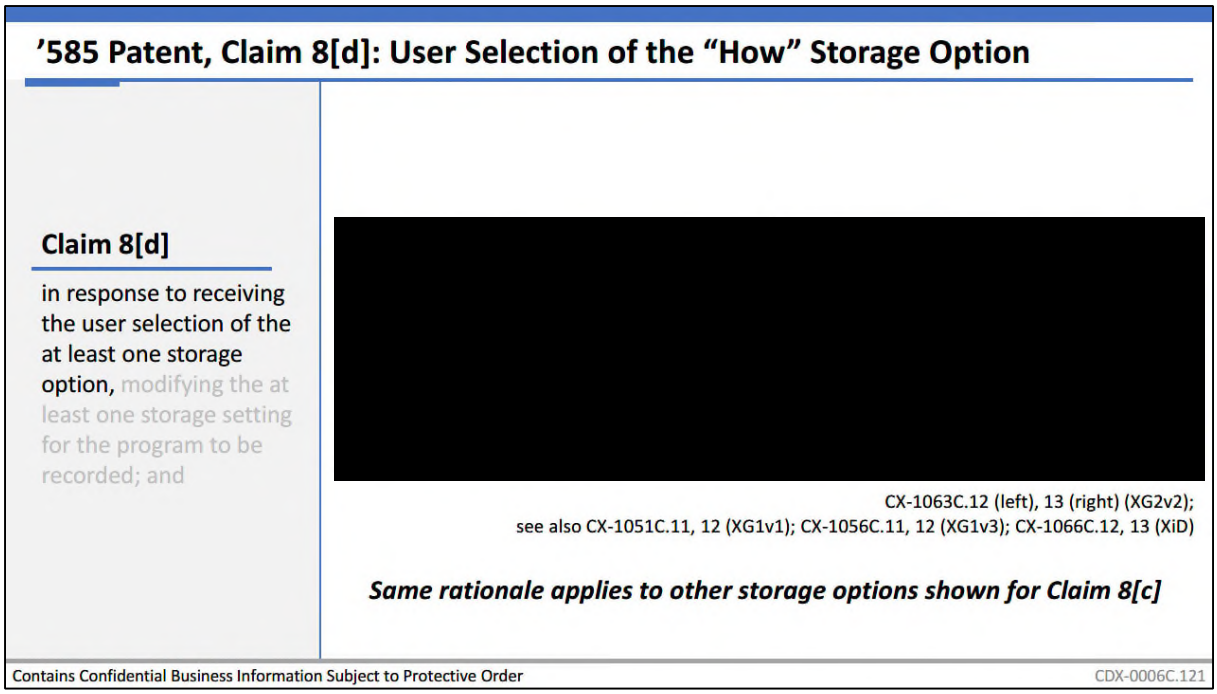
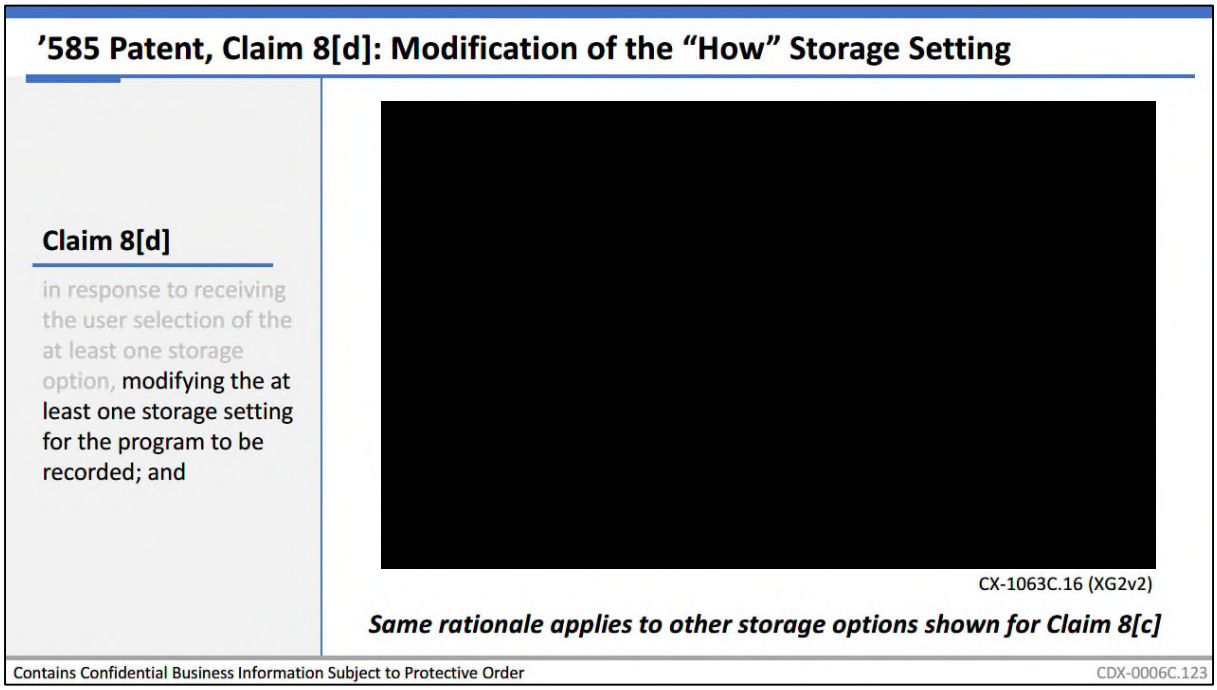


19. ’585 Patent Attachment 19:



20. ’585 Patent Attachment 20:



21. ’585 Patent Attachment 21:

’585 Patent, Claim 8[e]: Recording Based on the Modification

Claim 8[e]

recording the program on the random access digital storage device based on the modification of the at least one storage setting for the program.

CX-1063C.14 (left), 16 (right) (XG2v2)

Same rationale applies to other storage options shown for Claim 8[c]

Contains Confidential Business Information Subject to Protective Order CDX-0006C.127

22. ’585 Patent Attachment 22:

Comcast X1 Customers Use the Accused Functionality

	FAMILIARITY			FREQUENCY OF USE					
FEATURE	**Not Familiar**	**Familiar / Never Used**	**Familiar / Used**	**Several / Week**	**Once a week**	**2-3 times / month**	**Once a month**	**Once every 3 months**	**3 times or less last 12 months**
Restart Now (’741 Patent): Noon Group		5	5	3		1	1		4
Restart Now (’741 Patent): 5:30 Group	6	1	3		1		1	1	1
Restart Now (’741 Patent): TOTAL	**6**	**6**	**8**	**3**	**1**	**1**	**2**	**1**	**5**
Overloaded Keys (’011 Patent): Noon Group	5	3	2	2					6
Overloaded Keys (’011 Patent): 5:30 Group	7	1	2	2					2
Overloaded Keys (’011 Patent): TOTAL	**12**	**4**	**4**	**4**	**0**	**0**	**0**	**0**	**8**
Storage Options (’585 Patent): Noon Group	1	3	6	1	2	2			4
Storage Options (’585 Patent): 5:30 Group	4	3	3				1		4
Storage Options (’585 Patent): TOTAL	**5**	**6**	**9**	**1**	**2**	**2**	**1**	**0**	**8**

CDX-0012C.14

23. ’585 Patent Attachment 23:

RESPONDENT NAME: ALESHIA

Pittsburgh 12:00pm Group

	Familiarity/Usage				How Often Used					
	Not Familiar	Familiar/ Never Used	Used	Last Time Used	Several times a week	Once a week	2-3 times a month	Once a month	Once every 3 months	3 times or less in past 12 months
Feature J	☐	☑	☐		☐	☐	☐	☐	☐	☐
Feature B	☐	☐	☑	today	☑	☐	☐	☐	☐	☐
Feature T	☐	☐	☑	last week	☐	☑	☐	☐	☐	☐
Feature G	☐	☐	☑	today	☑	☐	☐	☐	☐	☐
Feature N	☑	☐	☐		☐	☐	☐	☐	☐	☐
Feature K	☐	☐	☑	yesterday	☑	☐	☐	☐	☐	☐

24. ’585 Patent Attachment 24:

’585 Patent, Claim 8[pre]: Interactive Television Program Guide

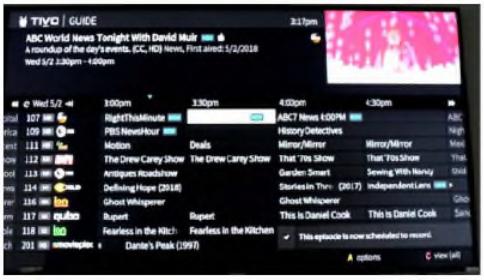
Claim 8[pre]

A method for recording programs using an interactive television program guide implemented on user television equipment, the method comprising:

NextGen

CX-1071.44; see also CX-1035C.1

Bolt

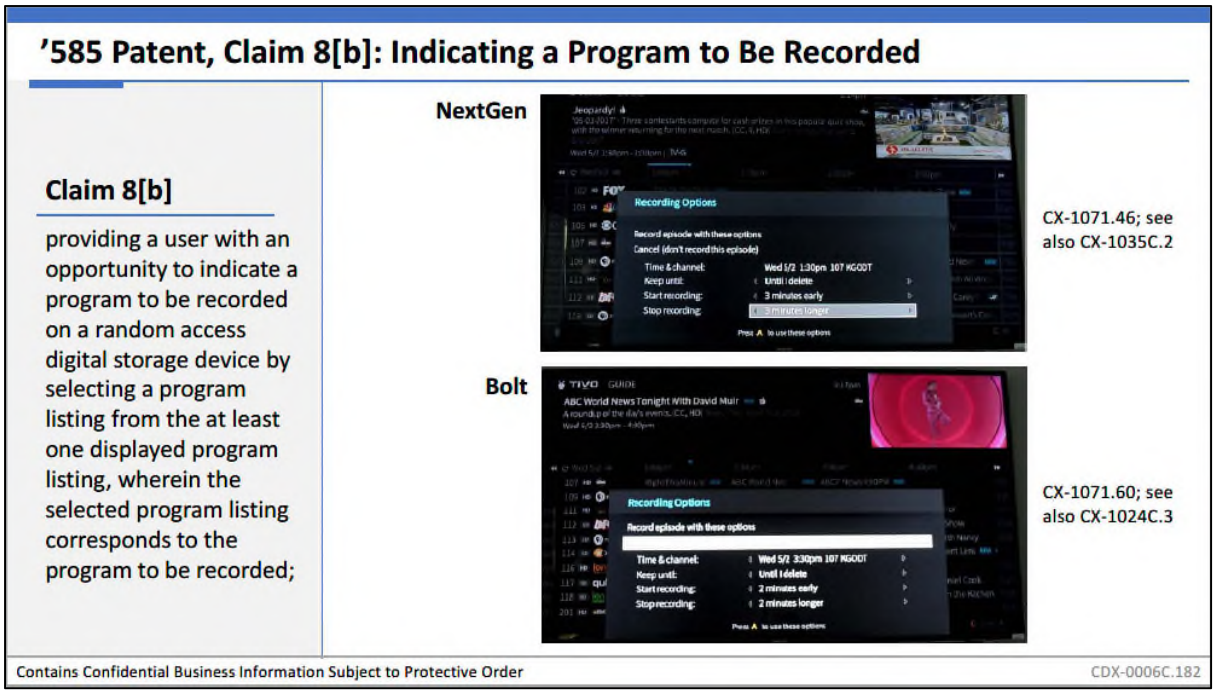


CX-1071.58; see also CX-1024C.2

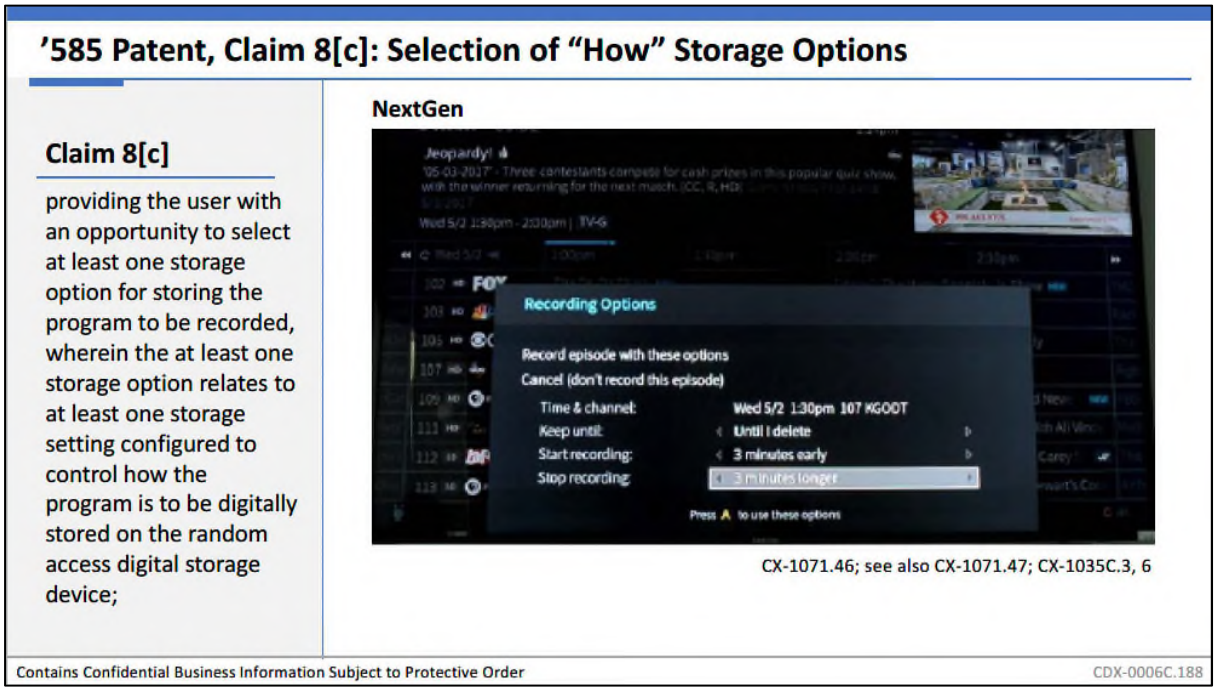
Contains Confidential Business Information Subject to Protective Order

CDX-0006C.173

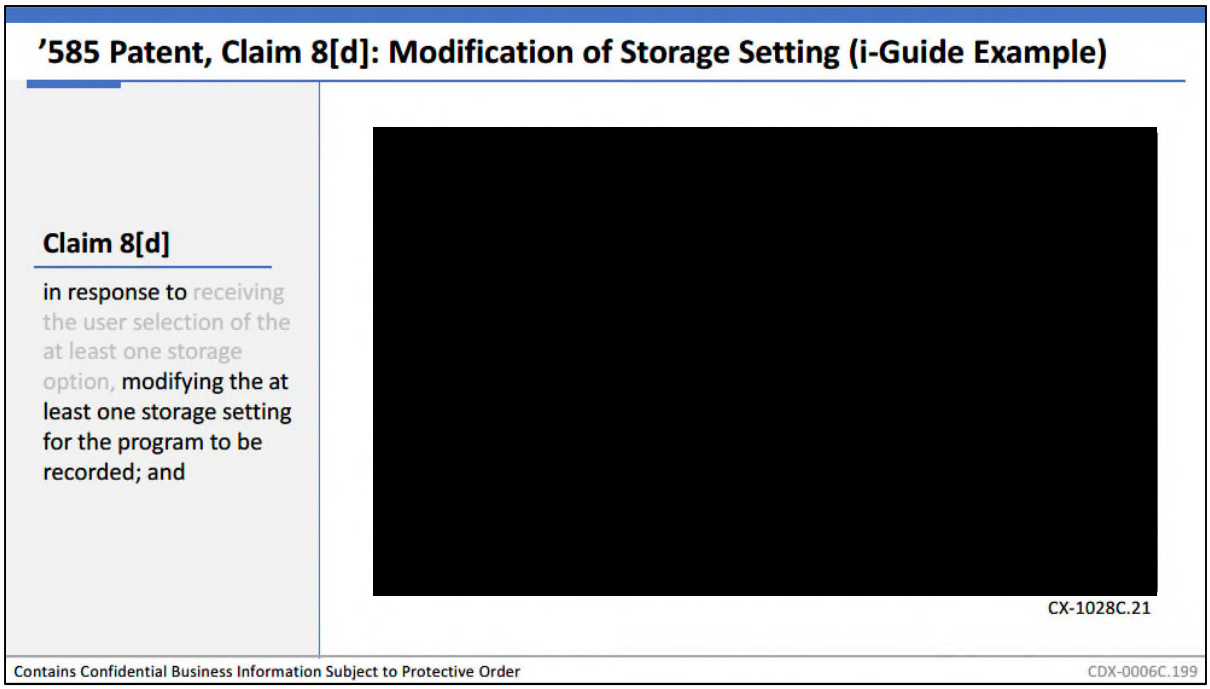
25. ’585 Patent Attachment 25:



26. ’585 Patent Attachment 26:



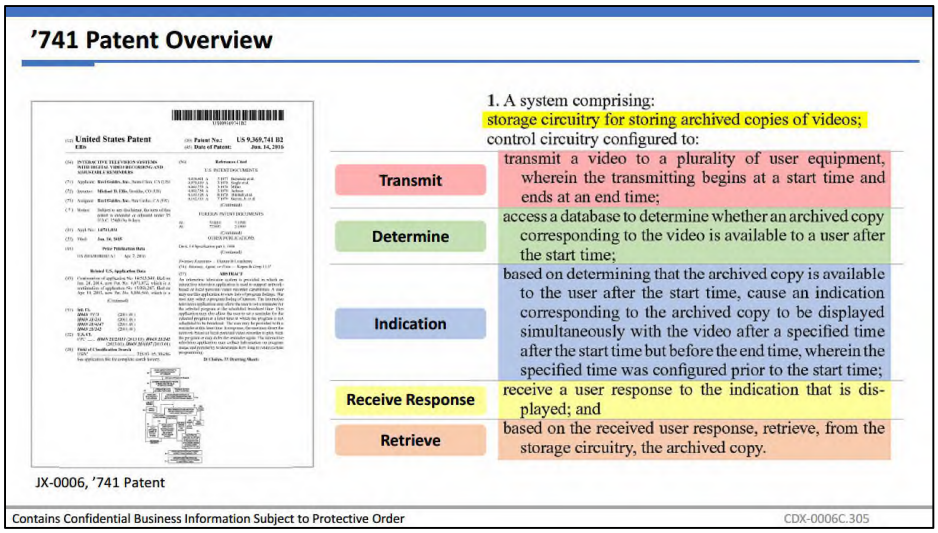
27. ’585 Patent Attachment 27:



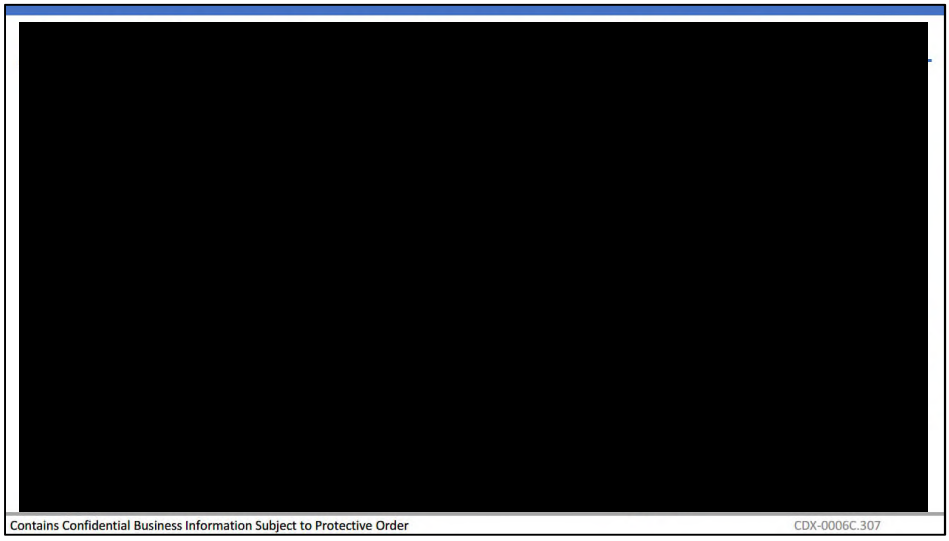
28. ’585 Patent Attachment 28:

Exhibit D

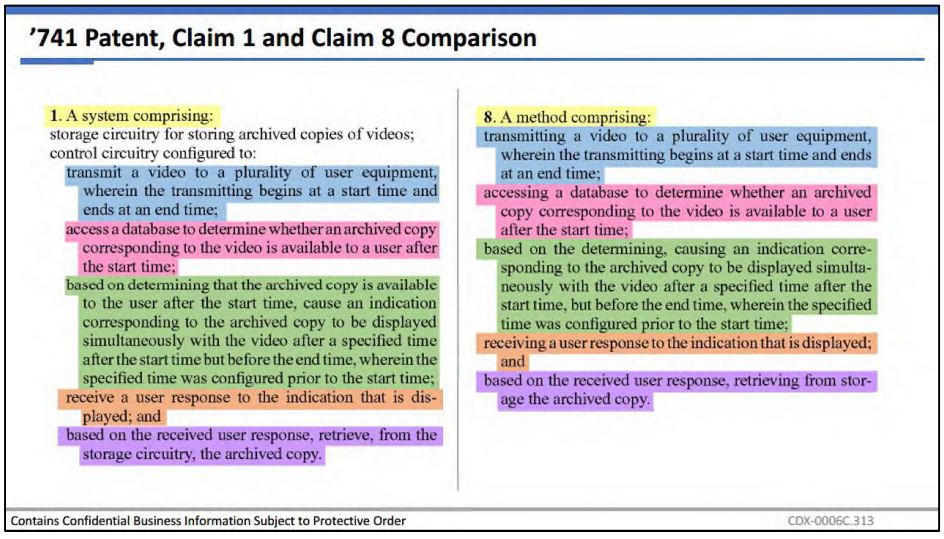
1. ’741 Patent Attachment 1:



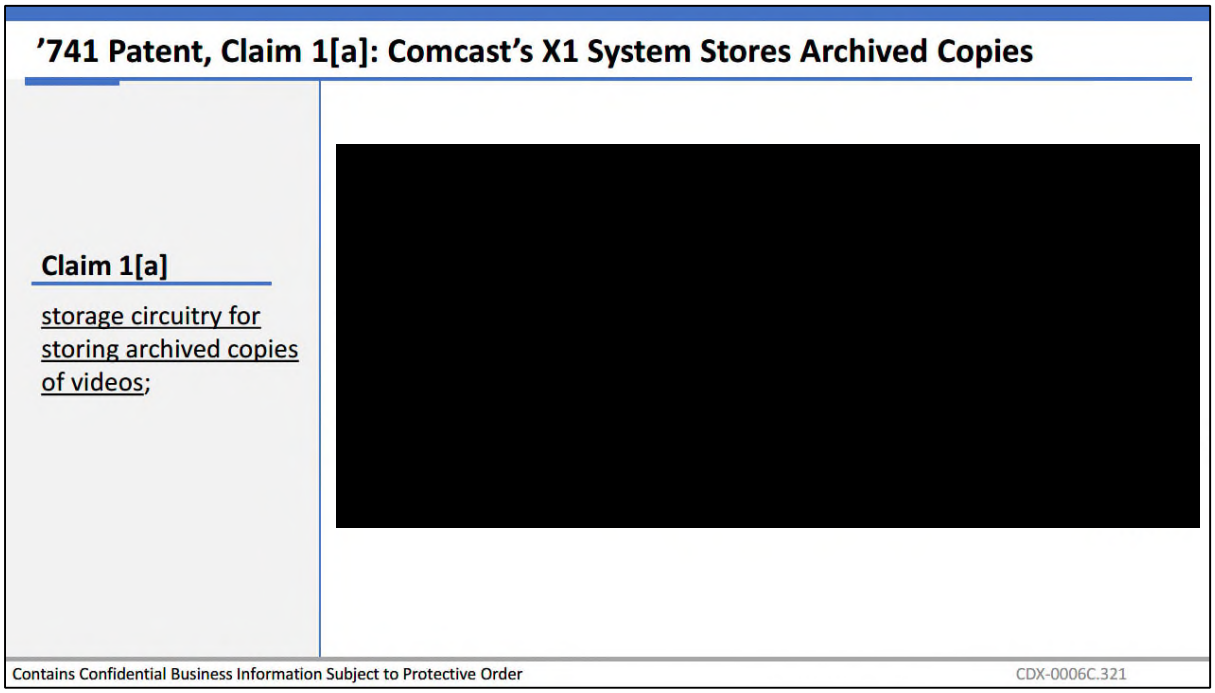
2. ’741 Patent Attachment 2:



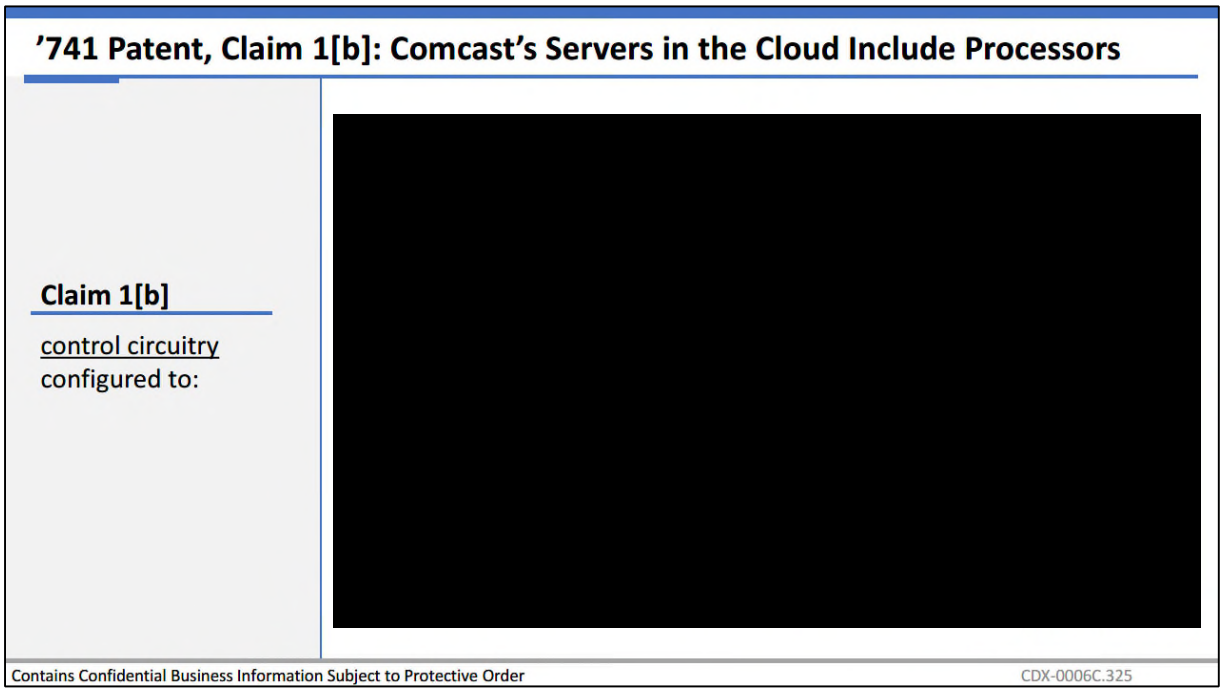
3. ’741 Patent Attachment 3:



4. **’741 Patent Attachment 4:**



5. **’741 Patent Attachment 5:**



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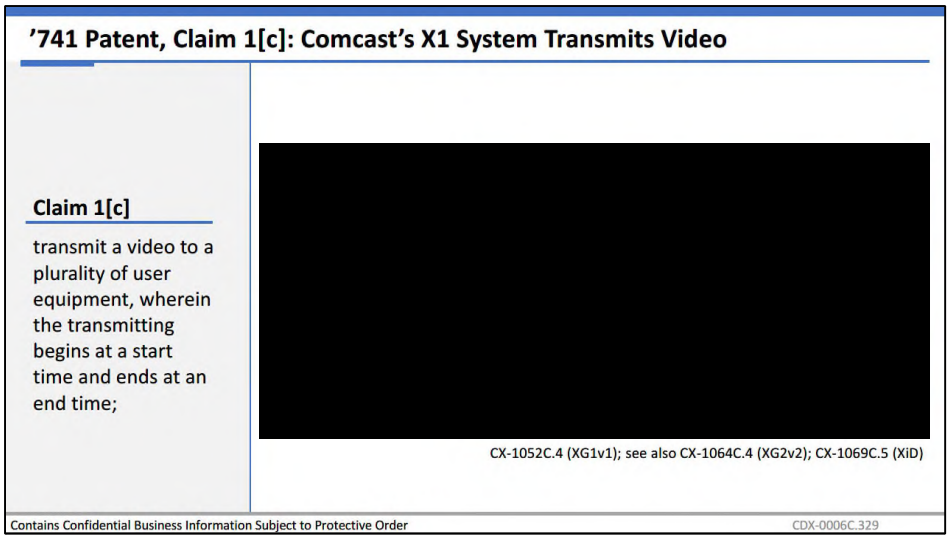
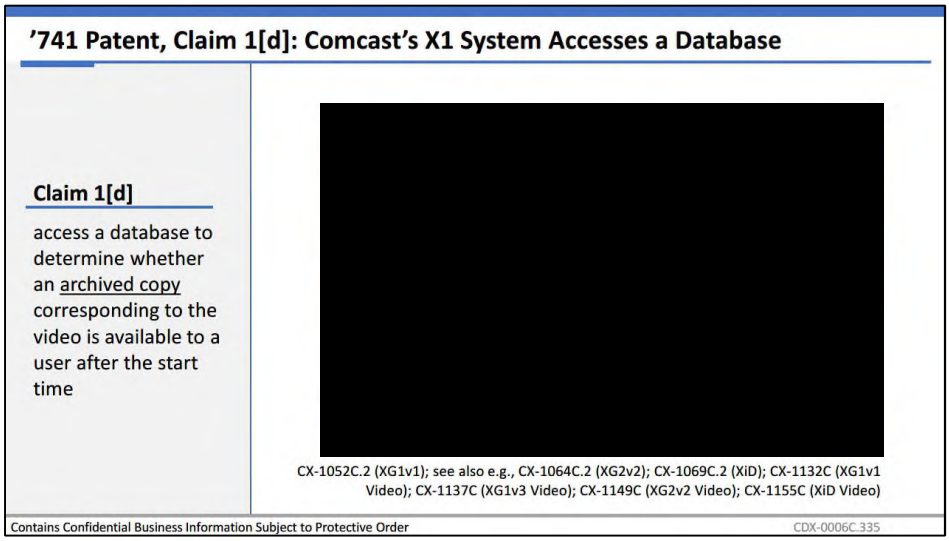


7. **’741 Patent Attachment 7:**



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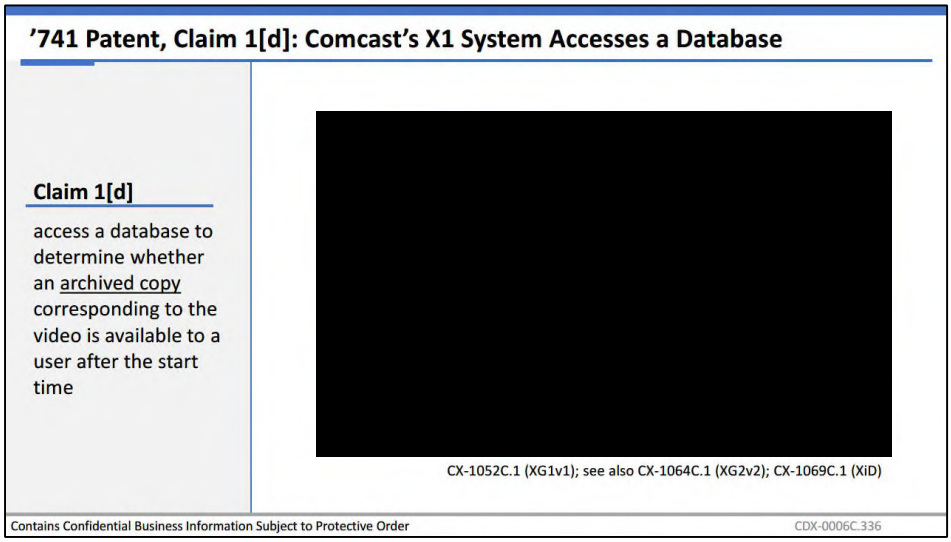

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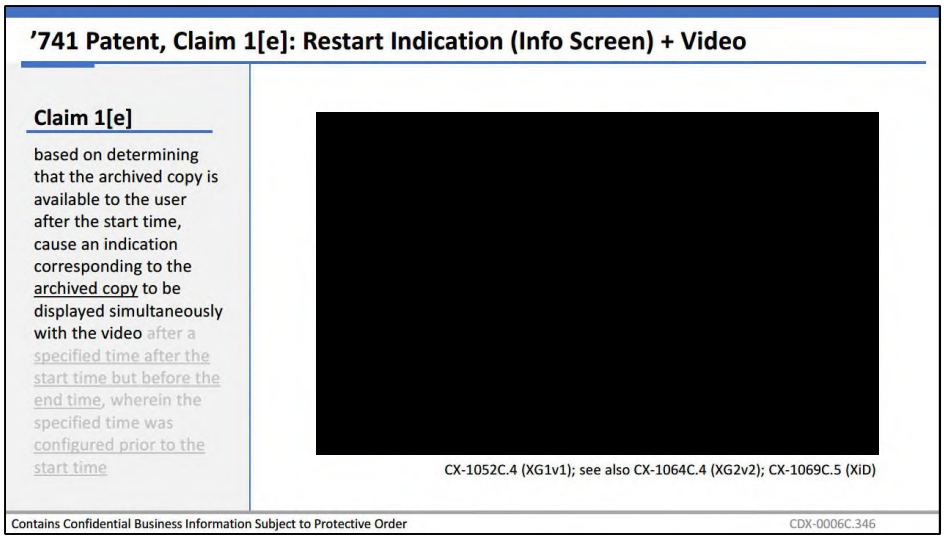

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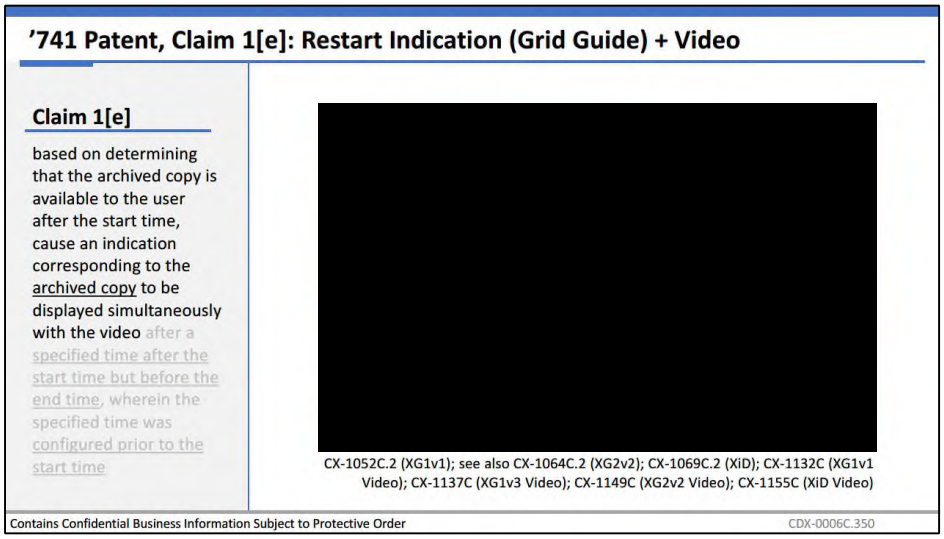

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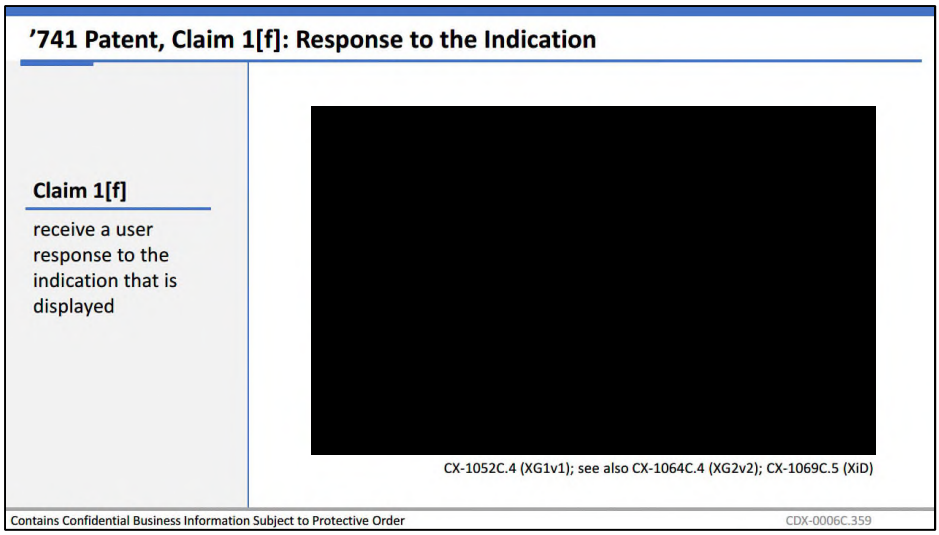

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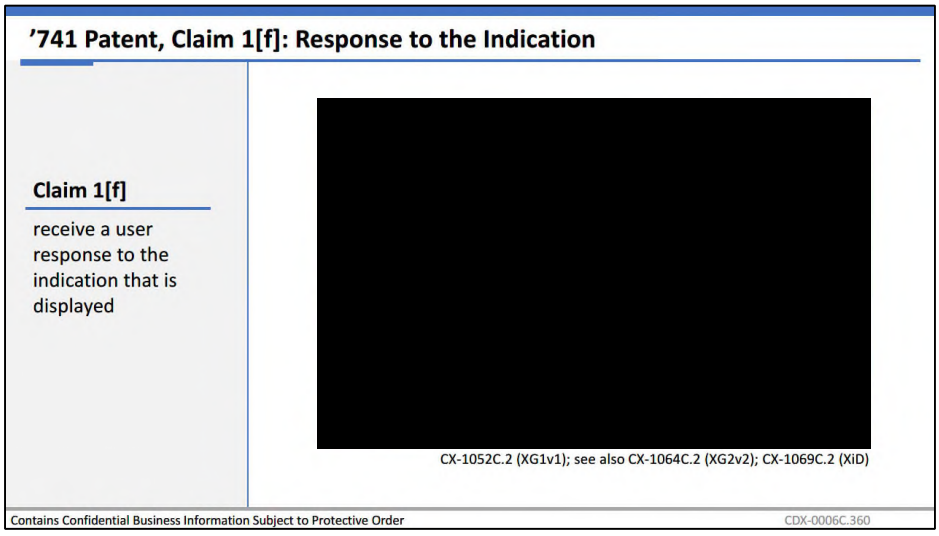

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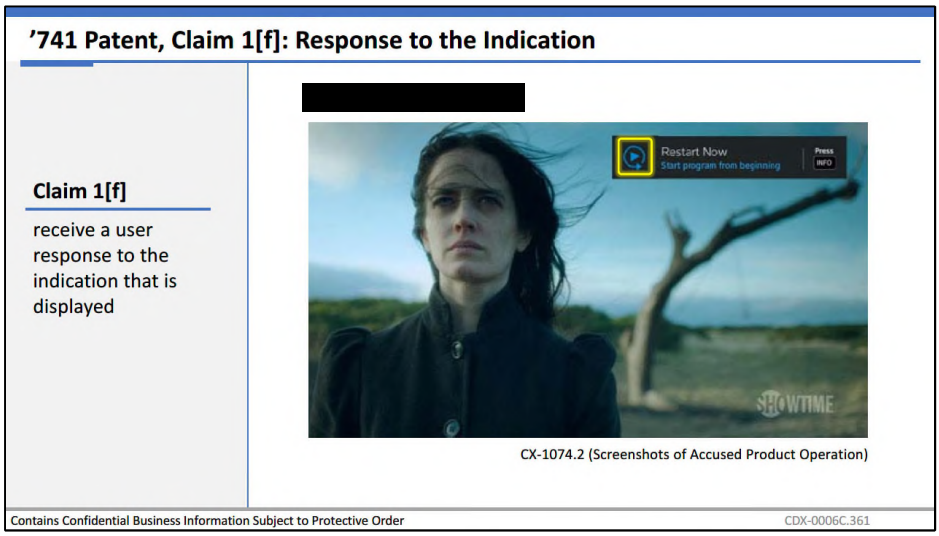

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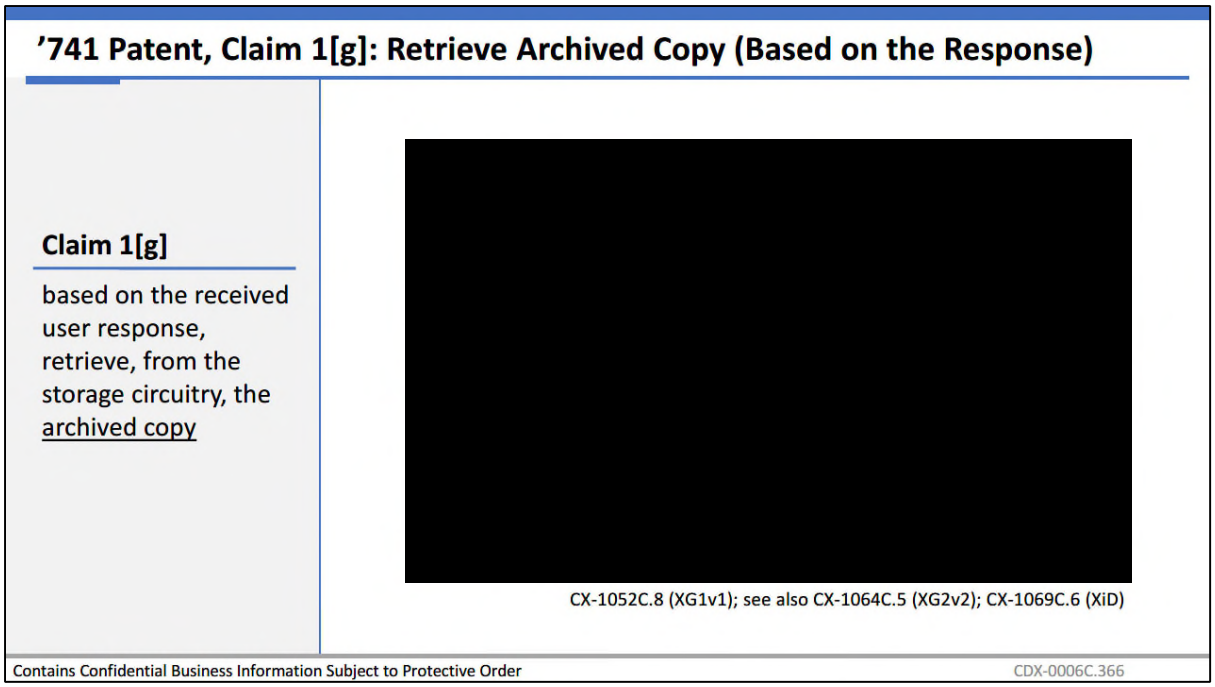

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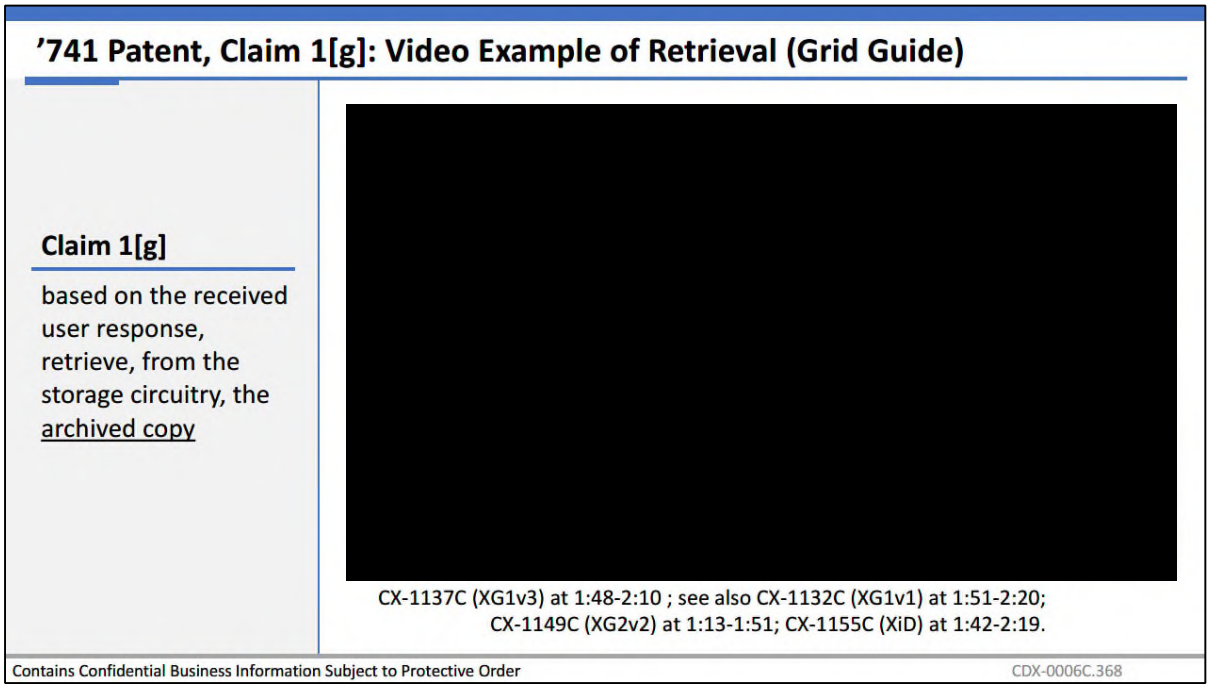

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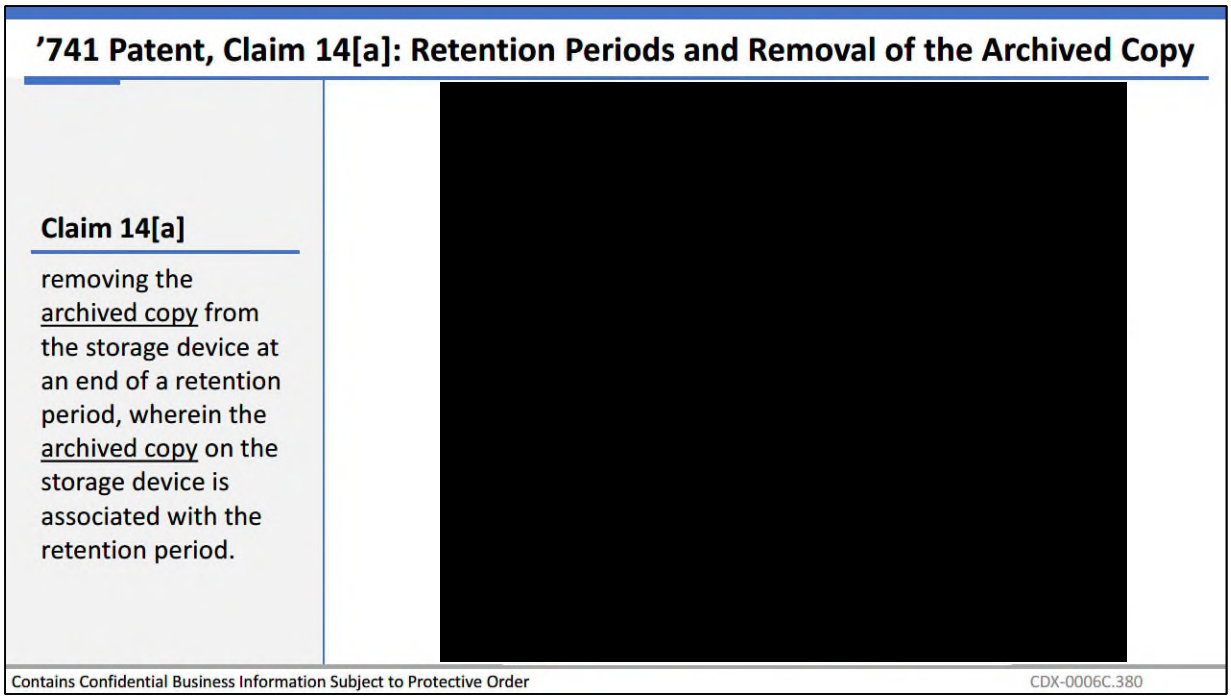

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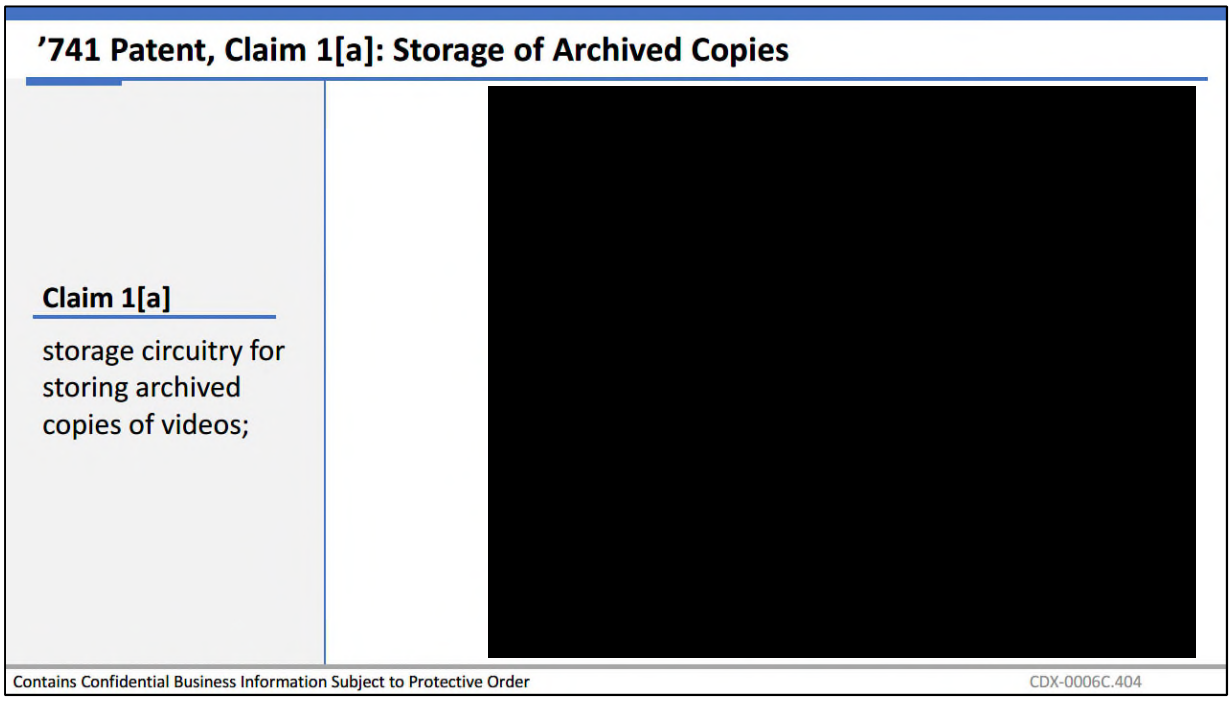

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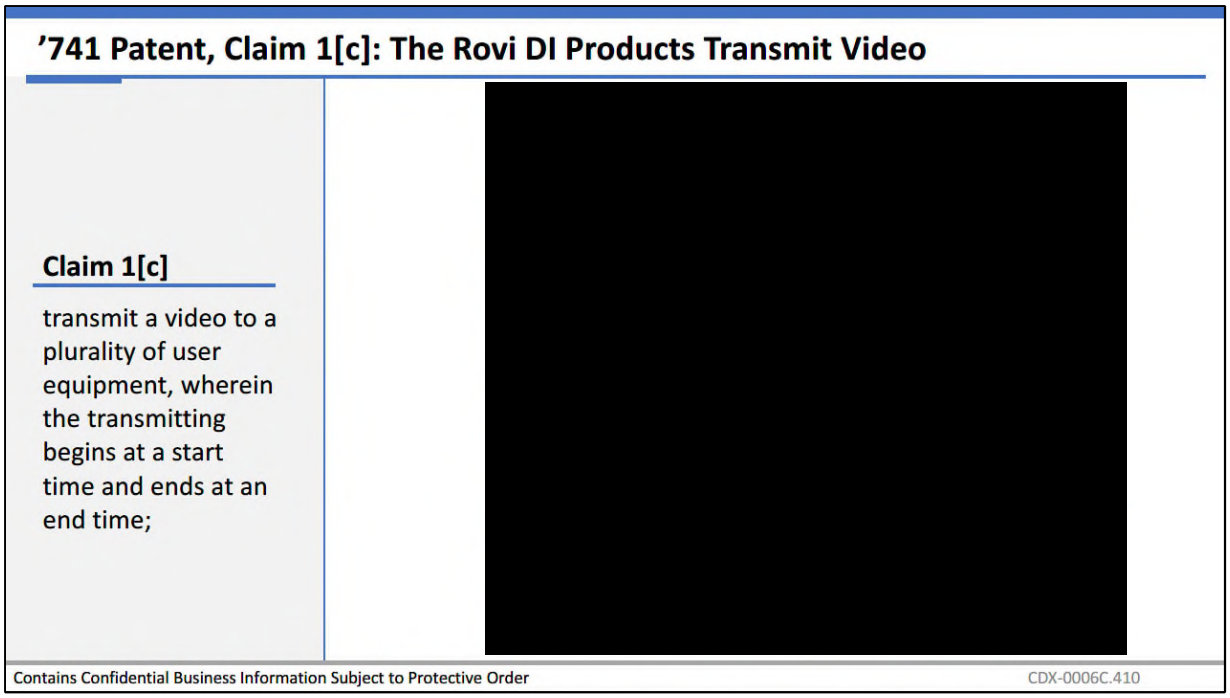

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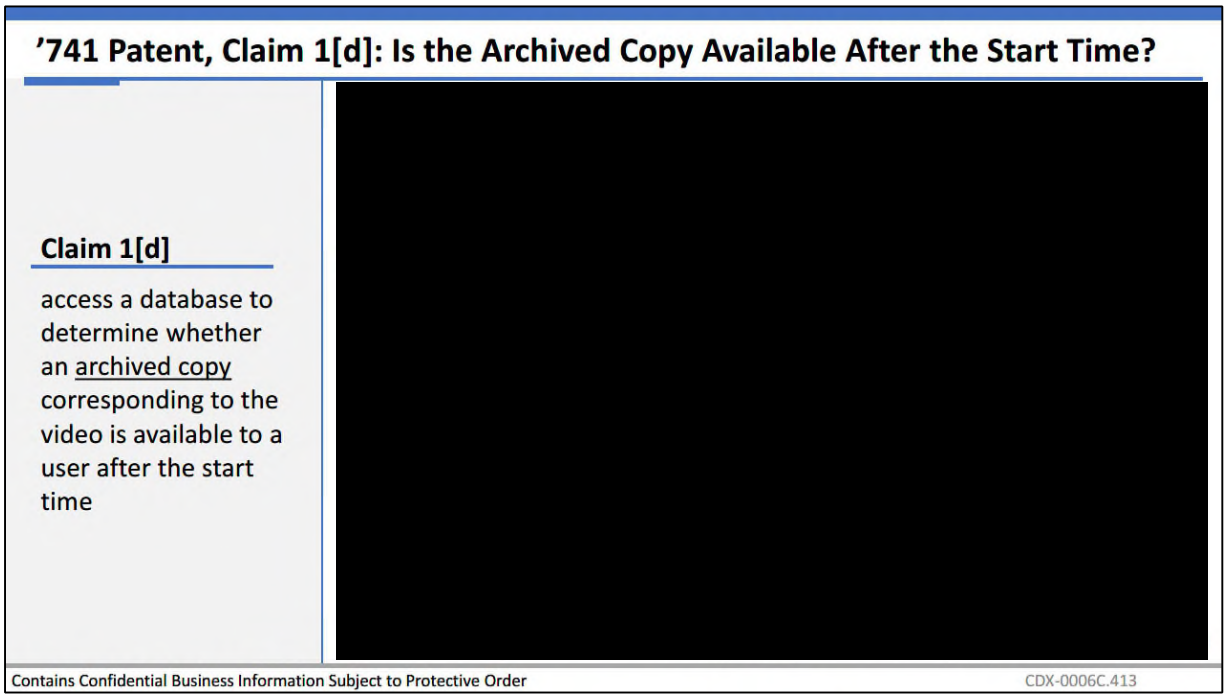

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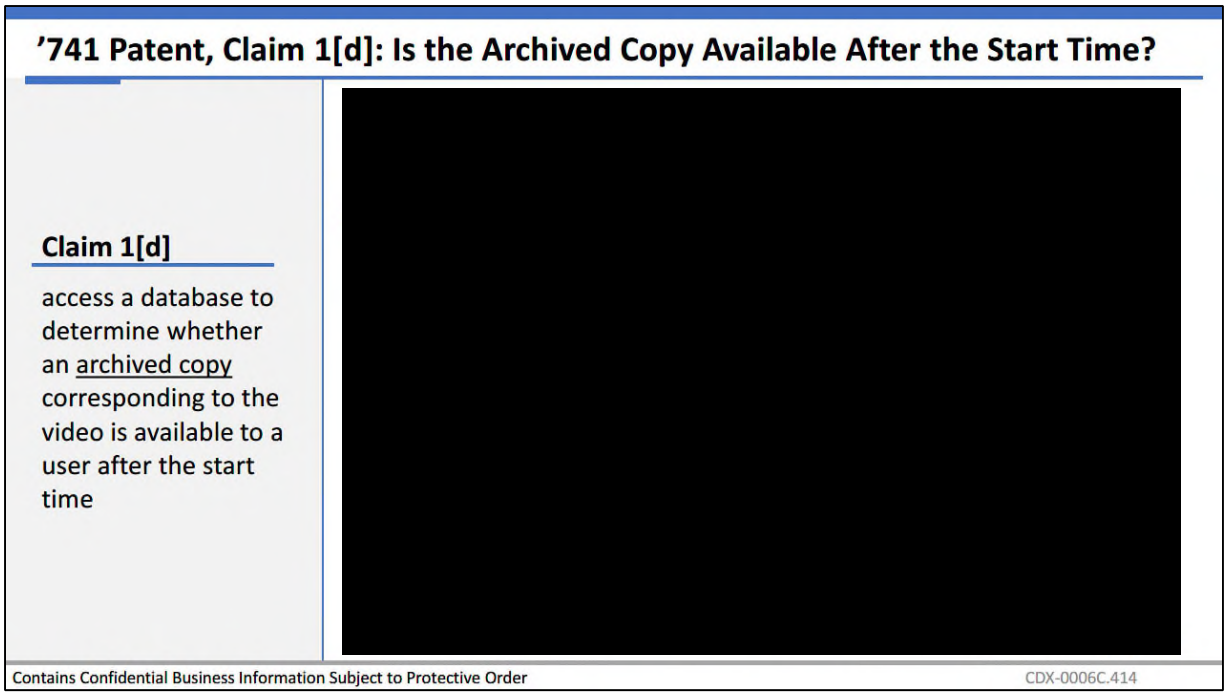

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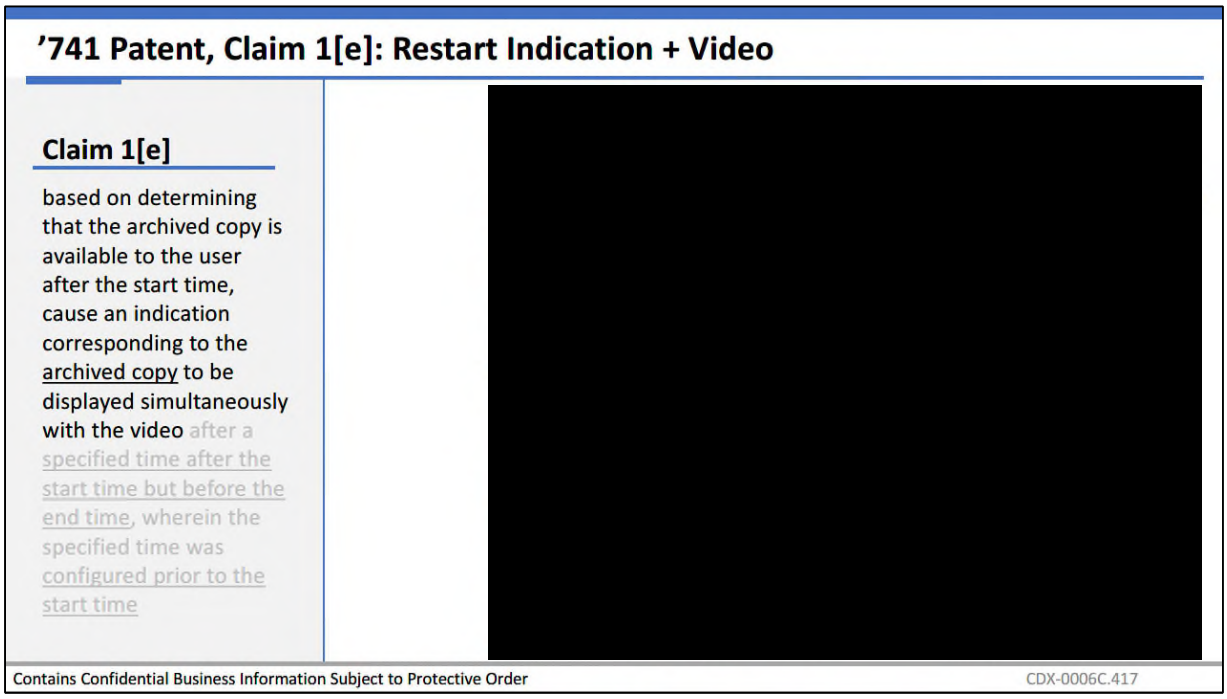

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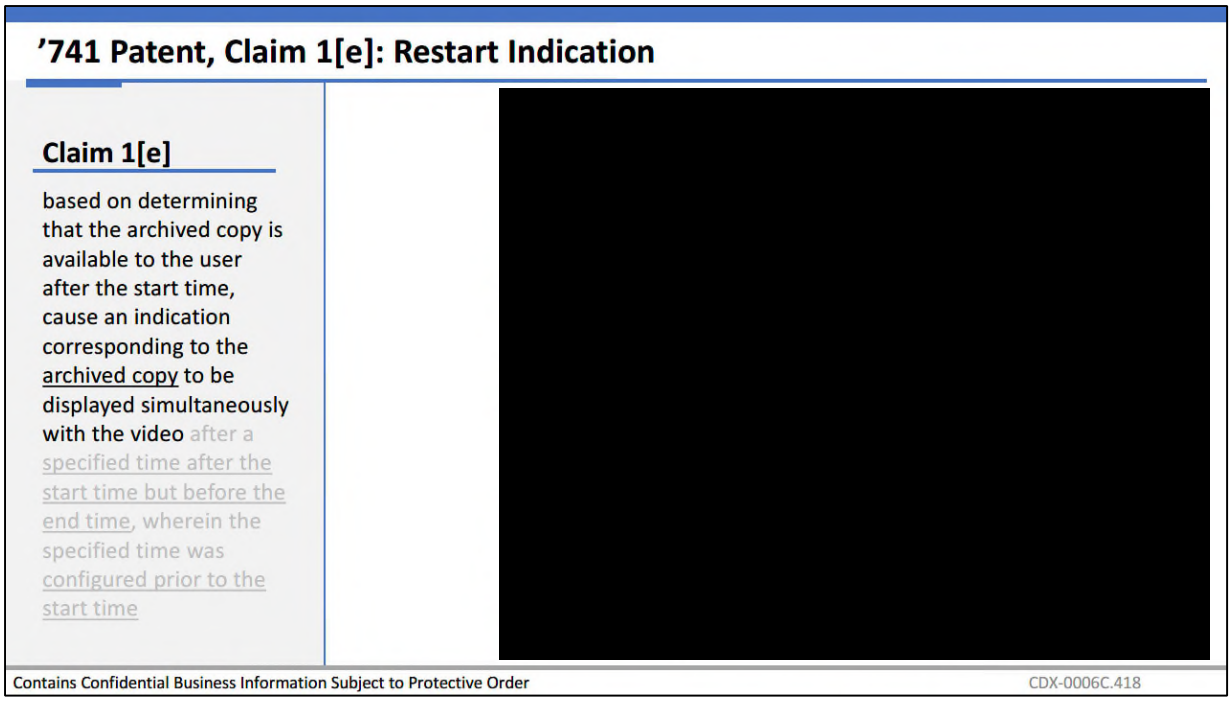

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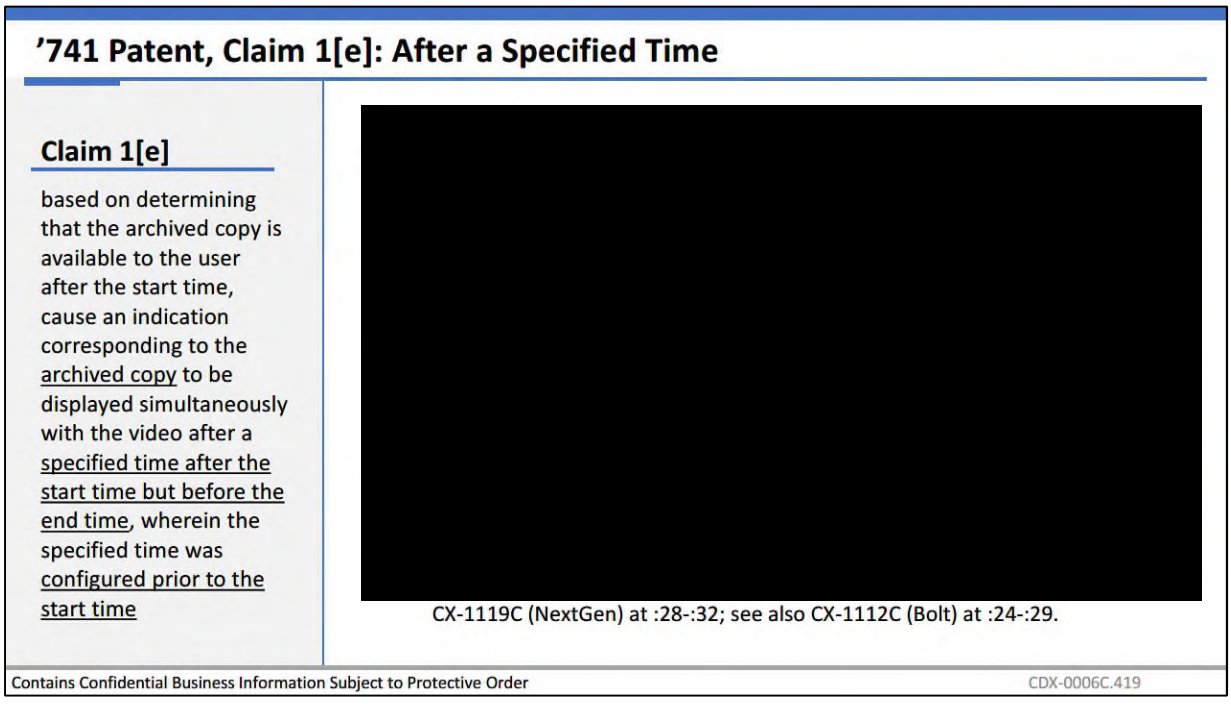

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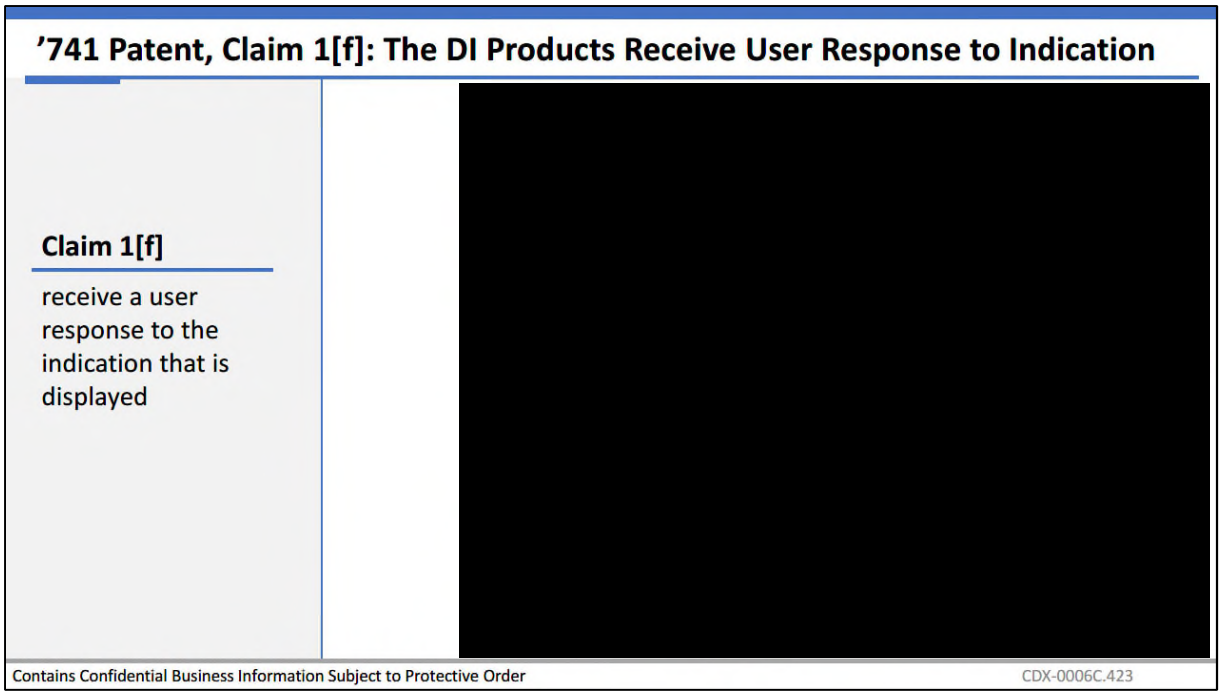

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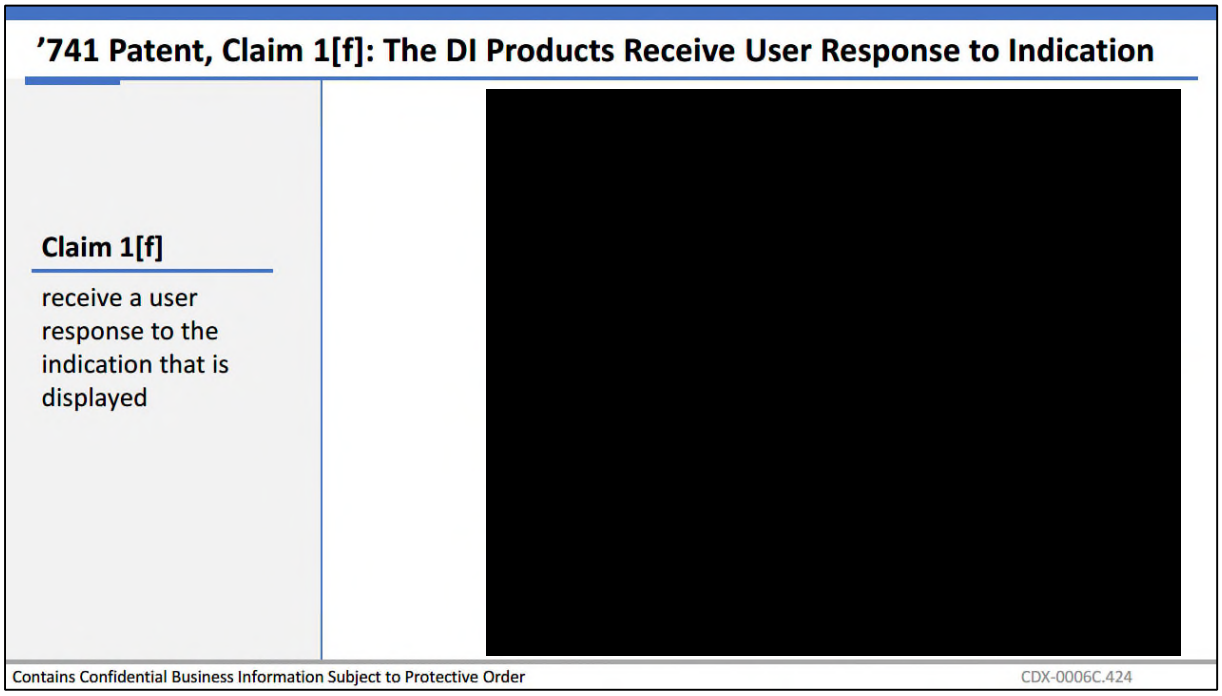

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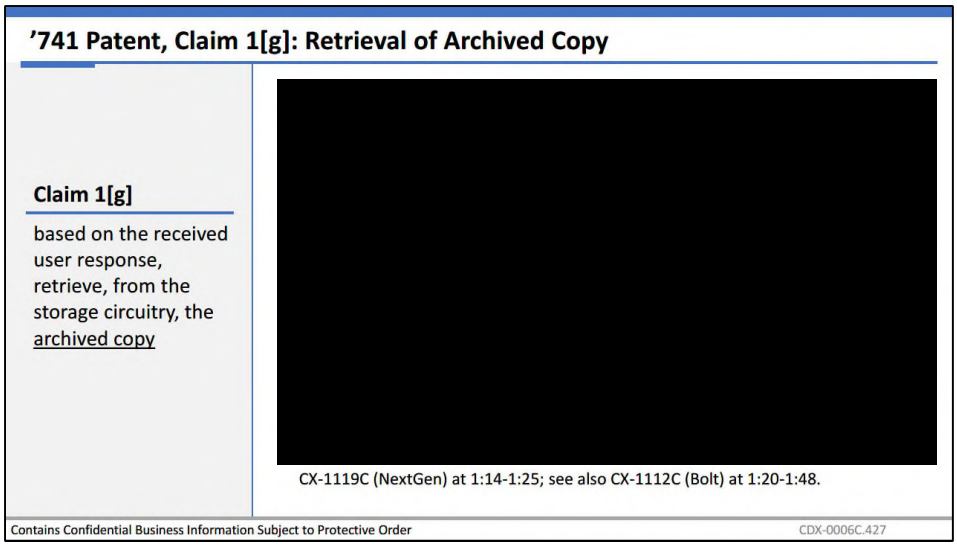

28. ’741 Patent Attachment 28:

29. ’741 Patent Attachment 29:

30. ’741 Patent Attachment 30:

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31. ’741 Patent Attachment 31:

32. ’741 Patent Attachment 32:

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CERTIFICATE OF SERVICE

The undersigned certifies that, on December 7, 2018, she caused the foregoing Public Version of Rovi's Corrected Post Hearing Brief to be served upon the following parties as indicated below:

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The Honorable MaryJoan McNamara Administrative Law Judge U.S. International Trade Commission 500 E Street, S.W., Room 317 Washington, DC 20436 Michael Buckler, Esq. Jae Lee, Esq. Attorney Advisor U.S. International Trade Commission 500 E Street, S.W., Room 317 Washington, DC 20436	☒ Via Hand Delivery ☐ Via First Class Mail ☐ Via Overnight Delivery ☐ Via Electronic Service: ☐ Via Hand Delivery ☐ Via First Class Mail ☐ Via Overnight Delivery ☒ Via Electronic Service: Michael.Buckler@usitc.gov Jae.Lee@usitc.gov
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Date: December 7, 2018