

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

DISH NETWORK CORPORATION, DISH NETWORK L.L.C., AND DISH
NETWORK SERVICE L.L.C.,

Petitioners

v.

ENTROPIC COMMUNICATIONS, LLC,

Patent Owner.

PTAB Case No. IPR 2023-00393

Patent No. 8,792,008

**PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 8,792,008**

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EXHIBIT LIST

Ex. 1001	U.S. Patent No. 8,792,008 (“’008 patent”)
Ex. 1002	Declaration and Curriculum Vitae of Dr. Daniel Schonfeld (“Schonfeld”)
Ex. 1003	File History of U.S. Patent 8,792,008
Ex. 1004	U.S. Provisional Patent Application 61/532,098
Ex. 1005	U.S. Patent No. 5,808,671 (“Maycock”)
Ex. 1006	U.S. Patent No. 7,394,871 (“Zhang”)
Ex. 1007	U.S. Patent Application Publication No. 2010/0253557 (“Kidambi”)
Ex. 1008	U.S. Patent Application Publication No. 2007/0286311 (“Coyne”)
Ex. 1009	U.S. Patent Application Publication No. 2004/0073916 (“Petrovic”)
Ex. 1010	Suzanne Foster, <i>Cable and Satellite Set-Top Boxes</i> , NATURAL RESOURCES DEFENSE COUNCIL (2005).
Ex. 1011	Stanley M. Besen & Robert W. Crandall, <i>The Deregulation of Cable Television</i> , 44 LAW & CONTEMP. PROBS. 77 (1981).
Ex. 1012	Joseph J. Carr, Ch. 12, EMI to Television, Cable TV, and VCR Equipment, in THE TECHNICIAN’S EMI HANDBOOK: CLUES AND SOLUTIONS (2000).
Ex. 1013	Leon W. Couch II, Ch. 4, Bandpass Signaling Techniques and Components, in DIGITAL AND ANALOG COMMUNICATION SYSTEMS (3rd ed., 1990).
Ex. 1014	Leon W. Couch II, Ch. 5, Bandpass Communication Systems, in DIGITAL AND ANALOG COMMUNICATION SYSTEMS (3rd ed., 1990).
Ex. 1015	Walt Kester, <i>A Brief History of Data Conversion: A Tale of Nozzles, Relays, Tubes, Transistors, and CMOS</i> , IEEE SOLID-STATE CIRCUITS MAGAZINE (2015).
Ex. 1016	NASA Content Administrator, <i>July 12, 1962: The Day Information Went Global</i> , NASA (Jan. 30, 2018).
Ex. 1017	Dan Logan, <i>The Scoop on the Dish</i> , LOS ANGELES TIMES (Sept. 7, 1996).

Ex. 1018	Stephen P. Dulac & John P. Godwin, <i>Satellite Direct-to-Home</i> , 94 PROCS. OF THE IEEE 158, (Jan. 2006).
Ex. 1019	Tim Hentschel, et al., <i>The Digital Front-End of Software Radio Terminals</i> , IEEE PERS. COMMC'NS 6 (Aug. 1999).
Ex. 1020	Lee Pucker, <i>Channelization Techniques for Software Defined Radio</i> , PROC. OF THE SDR 03 TECH. CONF. AND PROD. EXPOSITION (2003).
Ex. 1021	U.S. Patent Application Publication No. 2002/0154055 (“Davis”)
Ex. 1022	U.S. Patent No. 8,582,675 (“Harris”)
Ex. 1023	U.S. Patent No. 8,611,483 (incorporated by reference into '008 patent)
Ex. 1024	U.S. Patent No. 9,991,847 (incorporated by reference into '008 patent)
Ex. 1025	U.S. Patent No. 9,026,118 (incorporated by reference into '008 patent)
Ex. 1026	U.S. Patent Application Publication 2008/0207136 (“Tang”)
Ex. 1027	U.S. Patent Application Publication 2006/0256884 (“Tomioka”)
Ex. 1028	Walt Kester (ed.), Ch. 1, Data Converter History, in ANALOG-DIGITAL CONVERSION, (2004).
Ex. 1029	U.S. Patent No. 6,791,995 (“Azenkot”)
Ex. 1030	U.S. Patent No. 6,061,393 (“Tsui”)
Ex. 1031	Rajendra Kumar et al., <i>Signal Processing Techniques for Wideband Communication Systems</i> , MILCOM 1999, IEEE MILITARY COMMS. CONF. PROCS. 452 (1999).

Petitioners DISH Network Corporation, DISH Network L.L.C., and Dish Network Service L.L.C. (collectively, “DISH” or “Petitioners”) respectfully request *inter partes* review (“IPR”) of claims 1-18 of U.S. Patent No. 8,792,008 (“the ’008 patent”).

I. INTRODUCTION

The ’008 patent’s scant disclosure describes a simple and obvious alleged invention—signal monitoring of a wideband television system. But this invention was known by at least 2008, more than three years before the earliest priority date of the ’008 patent. The claims of the ’008 patent merely recite: (a) digitizing received signals; (b) concurrently outputting a first portion of the digitized signal to a signal monitor to measure signal characteristics and a second portion of that signal to a data processor; and (c) reporting feedback about the signal quality to the signal’s source. Because these elements were well-known both individually and in combination, the alleged signal monitoring invention was obvious to a person of ordinary skill in the art (“POSITA”). Petitioners request that the Board cancel claims 1-18.

II. MANDATORY NOTICES

A. Real Party-in-Interest

DISH Network Corporation, DISH Network L.L.C., and Dish Network Service L.L.C., are the real parties-in-interest for this Petition.

B. Related Matters

Patent Owner asserts that Petitioners infringe the '008 patent along with two others, U.S. Patent Nos. 7,130,576 (“’576 patent”) and 7,542,715 (“’715 patent”), in a district court lawsuit captioned *Entropic Communications, LLC v. DISH Network Corp. et al*, No. 2:22-cv-07959-JWH-JEM (C.D. Cal.) (transferred from No. 2:22-cv-75 (E.D. Tex.) on November 3, 2022; consolidated from No. 2:22-cv-07959 (C.D. Cal.) on December 13, 2022).

The current Petition seeks cancelation of all claims of the '008 patent—specifically, claims 1-18. Petitioners are also filing petitions for *inter partes* review challenging both the '576 and '715 patents in IPR 2023-00391 and IPR 2023-00392, respectively.

C. Notice of Counsel and Service Information

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Petitioners consent to electronic service. All services and communications to the attorneys listed above may be sent to PerkinsDishIPRs@perkinscoie.com. A Power of Attorney is concurrently filed with this Petition.

III. REQUIREMENTS FOR *INTER PARTES* REVIEW

A. Grounds for Standing

Petitioners certify that the '008 patent is available for IPR and that Petitioners are not barred or estopped from requesting IPR challenging the claims of the '008 patent on the grounds presented here. This Petition is filed less than one year after DISH was served with a complaint alleging infringement.

B. Overview of Challenges and Requested Relief

Pursuant to Rules 42.22(a)(1) and 42.104(b)(1)-(2), Petitioners requests cancelation of claims 1-18 of the '008 patent under pre-AIA 35 U.S.C. § 103.

1. Identification of Prior Art

In this Petition, Petitioners rely on the references listed in the Table of the Exhibits, including:

Exhibit No.	Prior Art
Ex. 1005: (Maycock) U.S. Patent No. 5,808,671	Maycock issued on September 15, 1998 and is prior art at least under pre-AIA 35 U.S.C. § 102(b).
Ex. 1006: (Zhang) U.S. Patent No. 7,394,871	Zhang issued on July 1, 2008 and is prior art at least under pre-AIA 35 U.S.C. § 102(b).
Ex. 1007: (Kidambi) U.S. Patent Pub. No 2010/0253557	Kidambi published on October 7, 2010 and is prior art at least under pre-AIA 35 U.S.C. § 102(a).
Ex. 1008: (Coyne) U.S. Patent Pub. No. 2007/0286311	Coyne published on December 13, 2007 and is prior art at least under pre-AIA 35 U.S.C. § 102(b).
Ex. 1009: (Petrovic) U.S. Patent Pub. No. 2004/0073916	Petrovic published on April 15, 2004 and is prior art at least under pre-AIA 35 U.S.C. § 102(b).

None of the prior art used as grounds in this Petition was of record during the prosecution of the '008 patent and, accordingly, the '008 patent's Examiner did not cite to or discuss any such prior art.

2. Grounds for Challenge

The table below summarizes the grounds challenging the independent and dependent claims:

Grounds for Challenge		
Ground 1	Ind. claims 1, 3, and 11 Dep. claims 2, 4-10, and 12-18	Obvious over Maycock in view of Zhang, and further in view of the general knowledge of a POSITA
Ground 2	Ind. claim 1 Dep. claim 2	Obvious over Maycock in view of Kidambi, and further in view of the general knowledge of a POSITA

Ground 3	Ind. claims 3, 11 Dep. claims 4, 5, 10, 12-13, and 18	Obvious over Coyne in view of Petrovic, and further in view of the general knowledge of a POSITA
Ground 4	Ind. claim 1 Dep. claims 2, 6-9, and 14-17	Obvious over Coyne in view of Petrovic and Zhang, and further in view of the general knowledge of a POSITA

This Petition is supported by the declaration of Dr. Dan Schonfeld (“Ex.1002-Schonfeld”), which is attached as Ex. 1002 and demonstrates a reasonable likelihood that Petitioners will prevail with respect to the cancelation of at least one challenged claim. *See* 35 U.S.C. § 314(a).

IV. OVERVIEW OF THE ’008 PATENT

A. The Alleged Invention

The ’008 patent describes cable and satellite television systems that monitor a received signal to assess whether signal quality falls within acceptable parameters. (Ex.1001-’008 patent, 3:33-60.) The ’008 patent explains that “[c]onventional methods and apparatuses for monitoring network parameters” were “too costly and impractical for use in customer-premises equipment (CPE).” (Ex.1001-’008 patent, 1:42-45.) To solve this alleged problem, the ’008 patent proposes using known mechanisms, including wideband analog-to-digital conversion, to enable a low-cost monitoring solution.

Figure 1A of the ’008 patent illustrates an example cable television

communication system, including conventional components, such as a headend 108 and a hybrid fiber-coaxial (“HFC”) network 118, for distributing television signals to customers’ premises. The system illustrated in Figure 1A does not depict core features of the claims of the ’008 patent, but instead illustrates a known cable television system.

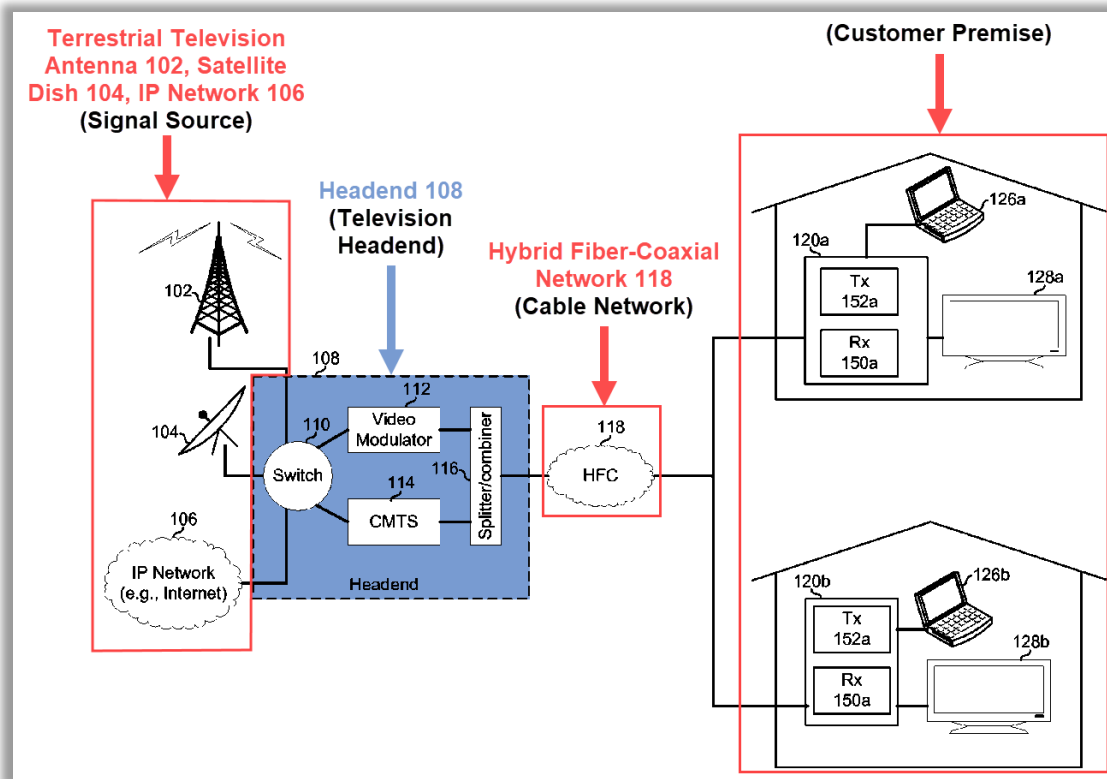


Figure 1A - '008 Patent's Example Prior Art Cable Television System (Ex.1001)

Figure 1B depicts the spectrum analysis components of the invention, including RF receive front-end 158, channelizer 152, monitoring unit 154, and data processing unit 156, all of which are located at a customer's premise. (Ex.1001-'008 patent, Figure 1B, 3:5-4:10.)

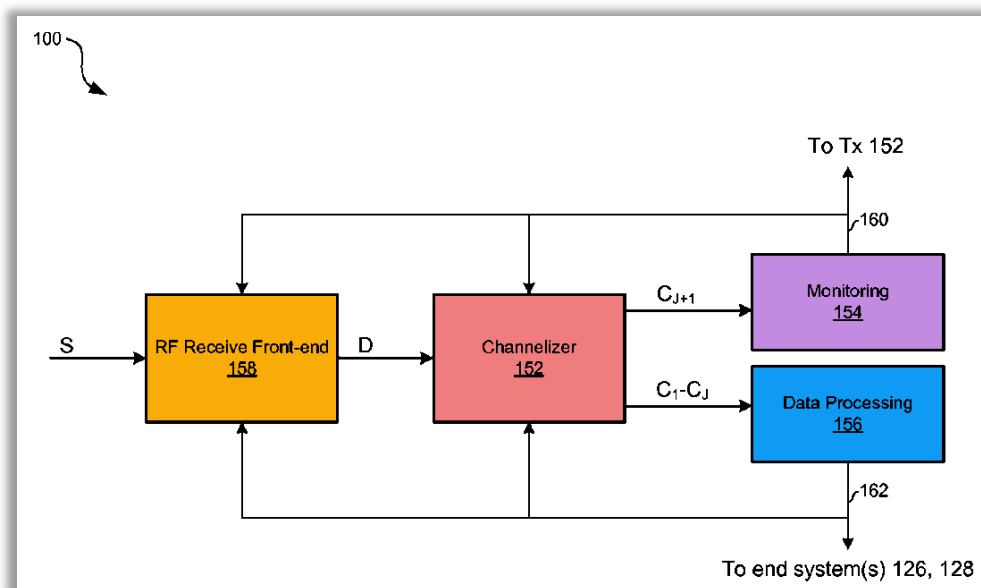


Figure 1B - The '008 Patent's Spectrum Monitoring System (Ex.1001)

RF receive front-end 158 includes an analog-to-digital converter (“ADC”) to digitize the received signal before transmitting the signal to channelizer 152. (Ex.1001-'008 patent, 3:11-16, Figure 2B, element 256.) Upon receiving analog signals, the ADC in RF receive front-end 158 converts the signals to a multi-channel digital signal. (Ex.1001-'008 patent, 6:21-27.) Channelizer 152, located at an output of RF receive front-end 158, receives the digitized signal and divides it into a plurality of channels. (Ex.1001-'008 patent, 6:27-28.) Channelizer 152 then selects portions of the channelized signal—specifically C_{J+1} and C_1-C_J —and transmits a first selected portion (C_{J+1}) to monitoring module 154 where it is analyzed to determine signal characteristics, such as signal-to-noise ratio (“SNR”). (Ex.1001-'008 patent, 3:20-23, 3:57-60, 4:26-50, 6:27-31.) Channelizer 152 concurrently transmits a second selected portion (C_1-C_J) to data processing module 156, where

the second selected portion is processed to recover encoded data. (Ex.1001-'008 patent, 4:45-47, 6:28-30.) Figure 4 of the '008 patent illustrates this process flow.

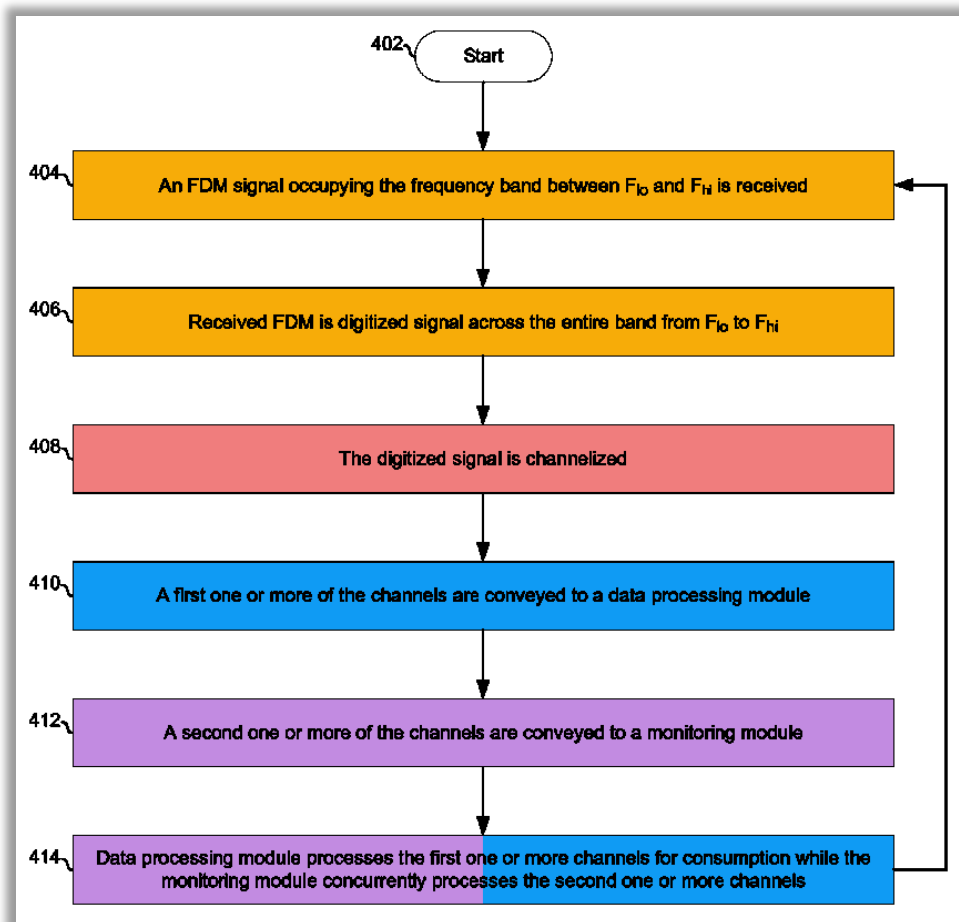


Figure 4 - The '008 Patent's Spectrum Analysis Process (Ex.1001)

B. The Prosecution History

Prosecution of the '008 patent was relatively uneventful and has little impact on this Petition. In a non-final Office action, the Examiner found the claims allowable if amended to include the signal analysis and reporting limitations: “*analyzing said first portion to determine a characteristic of said received signal*” and “*reporting said determined characteristic to a source of said received signal.*”

(Ex.1003-FH, 21-25, 62-65, 75-80.) Applicant incorporated the proposed amendments, and the '008 patent then issued.

C. Priority Date of the '008 Patent

The '008 patent issued from a U.S. patent application filed on September 10, 2012, that claims priority to a provisional application dated September 8, 2011. Petitioners do not concede that the '008 patent is entitled to the September 8, 2011, provisional filing date. However, for purposes of this Petition only, the priority date of the '008 patent is assumed to be September 8, 2011.¹ In the related litigation, Patent Owner contends that the inventors had conceived the invention of the '008 patent as of February 25, 2011. Even if Patent Owner establishes a February 25, 2011, conception date, which Petitioners do not concede, the art relied on in this Petition still applies as all references pre-date February 25, 2011.

V. CLAIM CONSTRUCTION

Petitioners interpret the claim terms according to their plain and ordinary meaning as understood by a POSITA at the time of the invention in view of the specification and the prosecution history. 37 C.F.R. 42.100(b); *Phillips v. AWH Corp.*, 415 F.3d 1302, 1312-12 (Fed. Cir. 2005). In the co-pending litigation, Patent

¹ Petitioners do not concede that the provisional application includes written description necessary to support the challenged claims.

Owner also contends that each claim term deserves its plain and ordinary meaning. Petitioners reserve the right to construe terms in the litigation and/or to respond to any constructions that Patent Owner presents in this proceeding.

Petitioners note, however, that the '008 patent claims recite two terms where clarification is beneficial to avoid confusion. While the terms do not require a construction per se because they can be understood by a POSITA and their meanings are not likely to be disputed, explanation nevertheless may be helpful to the Board.

- A. “*a received signal spanning an entire television spectrum*” (Claim 1) / “*receiving a signal having a bandwidth that spans from a first frequency, F_{lo} , to a second frequency, F_{hi}* ” (Claims 3 and 11)

Independent claim 1 recites digitizing “*a received signal spanning an entire television spectrum*” while independent claims 3 and 11 require digitizing “*a received signal having a bandwidth that spans from a first frequency, F_{lo} , to a second frequency, F_{hi}* .” Considering the '008 specification, a POSITA would understand that these received signals differ and have different meanings.

In the context of receiving a signal “*spanning an entire television spectrum*,” the '008 patent discloses an RF receive front-end that is capable of “full-spectrum” capture, *e.g.*, of all received television signal(s), and that an “RF front-end of a receiver [is] operable to perform spectrum monitoring.” (Ex.1001-'008 patent, 5:41-47.) The '008 patent further explains that the received television signal(s) are ultimately provided to an analog-to-digital converter (*e.g.*, ADC 256) and may

comprise the “entire cable downstream,” for cable television, or “the received signal at the input of the LNB, and/or the down-converted signal ... at the output by an LNB” for satellite television. (Ex.1001-’008 patent, 5:60-65.) A POSITA would have understood that the phrase “a received signal spanning an entire television spectrum” refers to all received television signals. (Ex.1002-Schonfeld, ¶¶99-100.) This interpretation is consistent with the plain and ordinary meaning of the phrase. (Ex.1002-Schonfeld, ¶100.)

In contrast, claims 3 and 11 recite “*a received signal having a bandwidth that spans from a first frequency F_{lo} , to a second frequency, F_{hi} .*” Unlike claim 1, here the claim language requires—and a POSITA would have understood—that a received signal “[*spanning a bandwidth*] from a first frequency F_{lo} , to a second frequency, F_{hi} ” is simply a received signal consisting of any continuous frequencies between a low frequency F_{lo} and a high frequency F_{hi} , and not necessarily all received television signals (Ex.1002-Schonfeld, ¶101.) For example, the ’008 patent states that “[i]n an example embodiment, signal S may be a cable television signal with F_{lo} =55MHz, F_{hi} =1002MHz. In another embodiment, signal S may be a MoCA signal with with [*sic*] F_{lo} =1150Mhz and F_{hi} = 2100MHZ.” (Ex.1001-’008 patent, 4:11-15.) The ’008 specification further explains that the front-end may receive one or more television signals, as well as other signals, including DOCSIS or MoCA signals. (Ex.1001-’008 patent, 3:12-15, 4:11-15.) As such, the “signal S may be the

result of a plurality of television and/or DOCSIS channels being frequency division multiplexed into a signal and that signal S may occupy a frequency range from F_{lo} to F_{hi} .” (Ex.1001-’008 patent, 3:12-15.) Thus, unlike “*entire television spectrum*” this signal would not necessarily be all received television signals but rather received signal having a continuous range of frequencies from a high frequency to a low frequency—which may include television and/or data signals. (Ex.1002-Schonfeld, ¶101.)

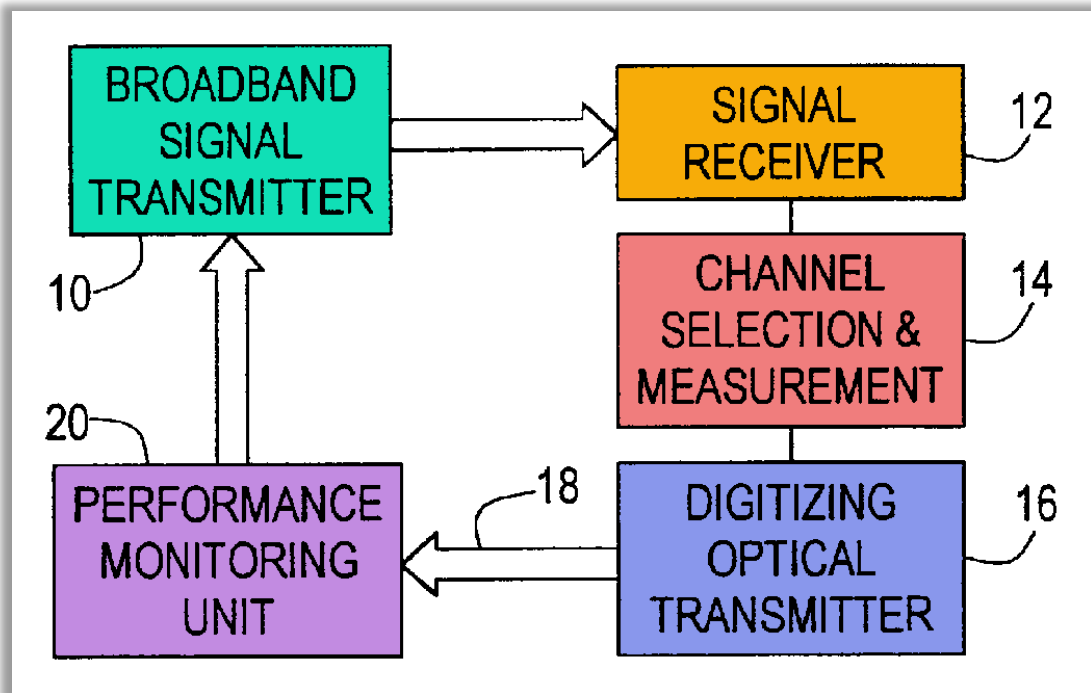
VI. LEVEL OF ORDINARY SKILL

As of the alleged February 25, 2011 priority date, a POSITA is a person having at least: i) a bachelor-level degree in electrical engineering or a related subject and three or more years of experience working in the field of cable and/or satellite signal processing and communication systems; ii) a master’s-level degree in electrical engineering or a related subject and one or more years of experience working in the field of cable and/or satellite television signal processing and communication systems; or iii) a Ph.D.-level degree in electrical engineering or a related subject and at least some experience working in the field of cable and/or satellite television signal processing and or communication systems. Additional education may substitute for professional experience, and significant work experience may substitute for formal education. (Ex.1002-Schonfeld, ¶102.)

VII. DESCRIPTION OF THE PRIOR ART

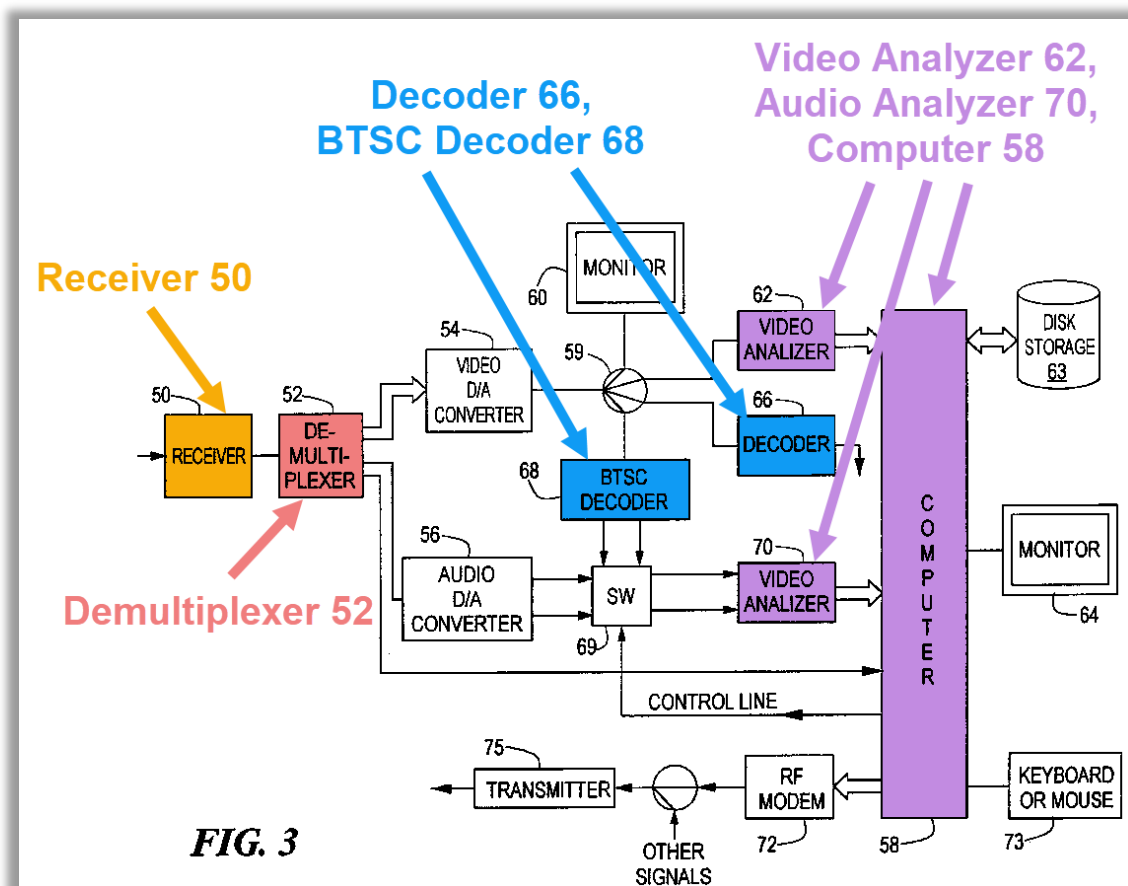
A. Maycock (Ex. 1005)

Maycock addresses and solves the same problem as the '008 patent—how to remotely monitor video signals. (Ex.1005-Maycock, Title, Abstract, 1:6-9, 2:20-23.) But Maycock did it over a decade before the '008 patent.



Maycock - Figure 1 (Ex.1005)

In Maycock's system, received broadband video signals are processed by channel selector 14, labeled in Figure 1 as "channel selection & measurement," which measures parameters of the signals and then selects a channel for further analysis. (Ex.1005-Maycock, 3:9-16, 3:30-50.) A selected channel is transmitted to performance monitoring unit 20, which performs the functionality described below with respect to Figure 3.



Maycock - Figure 3 (Ex.1005)

At monitoring unit 20, Maycock explains that a digitized signal is received at receiver 50. (Ex.1005-Maycock, 5:65-6:7.) Receiver 50 outputs the digitized signal to demultiplexer 52, where it separates the digitized signal into three outputs and sends those outputs to computer 58, video digital-to-analog converter 54, and audio digital-to-analog converter 56. (Ex.1005-Maycock, 6:2-7.) The video portion of demultiplexer's 52 output is analyzed—to measure signal quality parameters—at video analyzer 62 and is decoded to demodulate information contained in the video signal. (Ex.1005-Maycock, 6:24-29, 6:38-43.) Similarly, the audio portion of the

output from demultiplexer 52 is analyzed at audio analyzer 70 and decoded at BTSC decoder 68 to process the audio for stereo output. (Ex.1005-Maycock, 6:45-60.) Computer 58 operates both to store measured information and to monitor information output from demultiplexer 52. (Ex.1005-Maycock, 6:2-7, 6:62-67, 7:21-35.)

B. Zhang (Ex. 1006)

Zhang teaches television system including a high-speed analog-to-digital converter for performing wideband ADC conversion by converting an “entire signal band” from the analog domain to a digital domain. (Ex.1006-Zhang, 3:15-19, 3:60-63.)

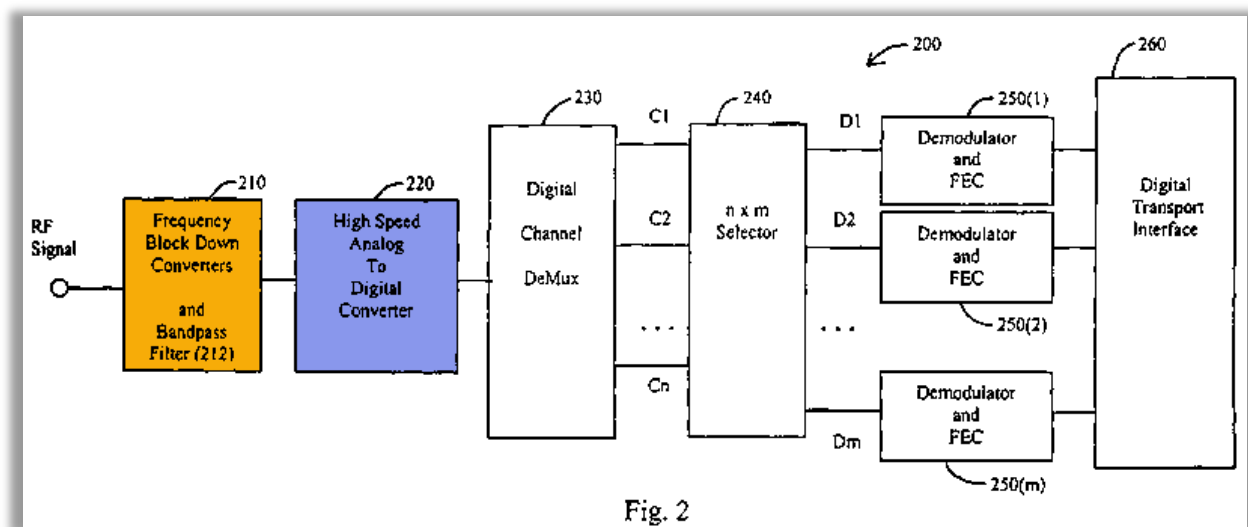


Figure 2 - Zhang's Circuitry for Digitizing an Entire Spectrum (Ex.1006)

Zhang's Figure 2 depicts frequency-block down-converter 210 that receives one or more analog television channels and outputs the one or more analog television channels to high-speed ADC 220, where a digitization of multiple channels occurs.

(Ex.1006-Zhang, 3:13-63.)

C. Kidambi (Ex.1007)

Kidambi teaches digitizing an entire bandwidth of an incoming television system at a set-top box prior to performing error correction. (Ex.1007-Kidambi, [0082]-[0084].) To do so, Kidambi teaches using a specialized wideband ADC called an M-channel time-interleaved analog-to-digital converter (MCTIADC) and then correcting offset, gain, and timing errors in the digital signal. (Ex.1007-Kidambi, Title, Abstract, [0005].)

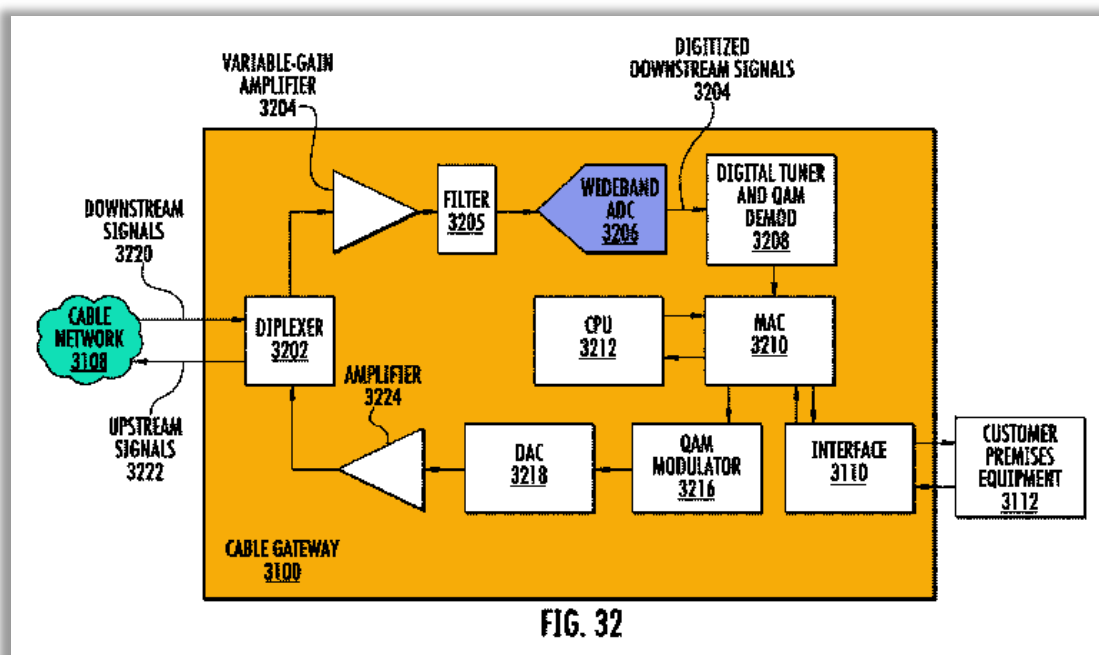


Figure 32 - Kidambi's Circuitry for Digitizing an Entire Spectrum (Ex.1007)

Kidambi's Figure 32 depicts cable gateway 3100 using a wideband, multi-channel, time-interleaved, analog-to-digital converter 3206 to digitize signals (e.g., all of the signals) received from cable network 3108. (Ex.1007-Kidambi, [0084].)

Kidambi emphasizes that the entire received bandwidth is digitized, so that the system can tune to multiple channels in the digital domain rather than in the analog domain. (Ex.1007-Kidambi, [0082], [0084].)

D. Coyne (Ex. 1008)

Coyne relates to a multi-channel channelized receiver in a communications system. (Ex.1008-Coyne, Title, Abstract, [0006].) Coyne explains that the detection/collection of a wide range of electromagnetic signals has several uses in commercial applications. (Ex.1008-Coyne, [0003].) To detect signals across multiple RF channels 210A-210n, Coyne discusses combining these signals at receiver/adaptor 201 using combiner 220. (Ex.1008-Coyne, [0020]-[0022], Figure 2.) Once combined, the output of combiner 220 is routed to wideband ADC 230, which creates a digital representation of the signal. (Ex.1008-Coyne, [0022], [0029]-[0030], Figure 2.) This digital signal is fed into channelizer 240, where the combined digital signal is separated into different channel outputs. (Ex.1008-Coyne, [0030]-[0031].)

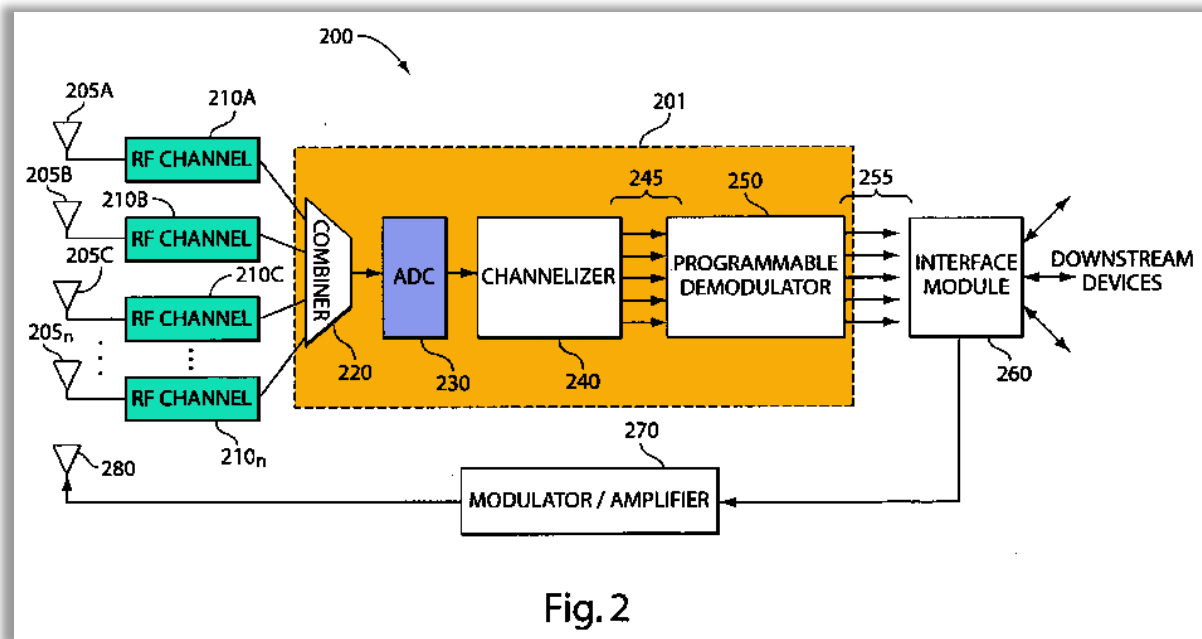
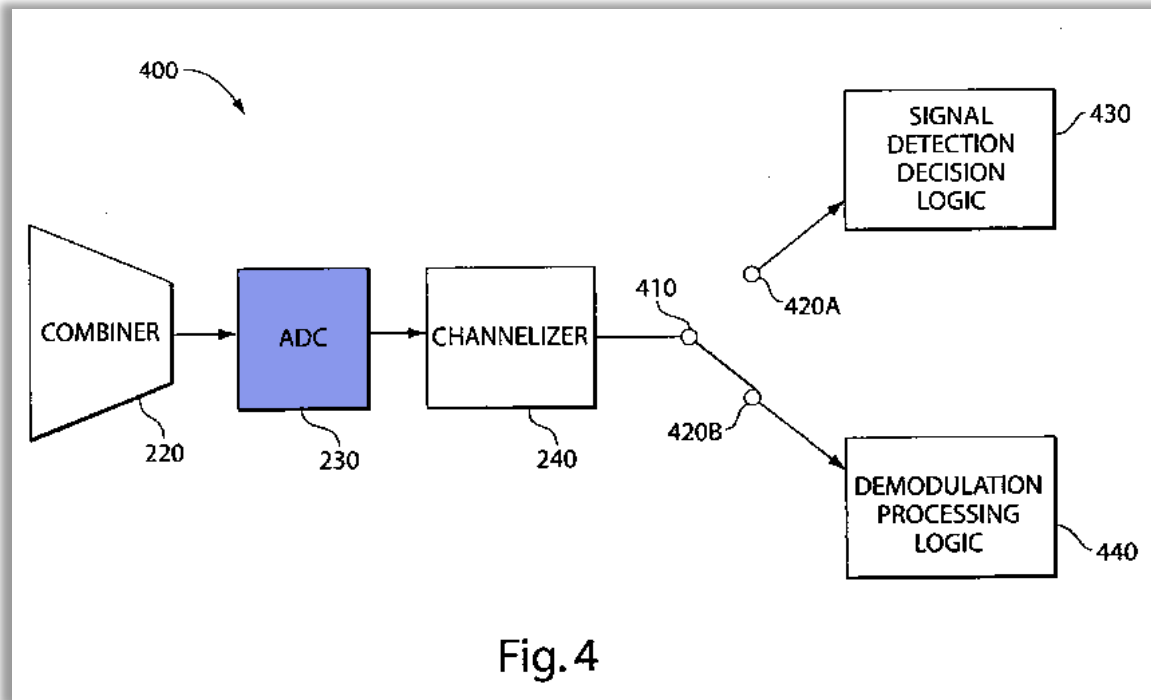


Figure 2 - Coyne (Ex.1008)

Coyne further explains that portions of channelizer 240 output is outputted to at least two different locations including (1) signal detection decision logic 430 and (2) demodulation processing logic 440. (Ex.1008-Coyne, [0044], Figure 4.) Signal detection decision logic 430 identifies whether certain channels of the digitized combined signal contain a signal that should be selected for further processing. (Ex.1008-Coyne, [0005], [0044].) Demodulation processing logic 440 extracts communications data from the digitized incoming combined signal. (Ex.1008-Coyne, [0044].) Coyne additionally teaches switch 410, which rapidly establishes connections between channelizer 240, signal detection decision logic 430, and demodulation processing logic 440. (Ex.1008-Coyne, [0044]-[0045].) In some configurations, switch 410 is controlled such that signal detection decision logic 430

and demodulation processing logic 440 receive signals concurrently. (Ex.1008-Coyne, [0045].)



Coyne - Figure 4 (Ex.1008)

E. Petrovic (Ex. 1009)

Petrovic also discloses a system for monitoring transmissions of television content across a spectrum to obtain and report data regarding the use of the content. (Ex.1009-Petrovic, Abstract, [0002].) Petrovic teaches obtaining different types of transmission data including data regarding “quality” of the television content or data regarding various channel characteristics, *e.g.*, SNR. (Ex.1009-Petrovic, [0003], [0011].) Petrovic discloses that the source of “transmissions” can be satellite, cable television, and/or radio. (Ex.1009-Petrovic, [0011], [0038].)

Petrovic's system monitors signals at the national, regional, and/or local levels of distribution and can detect any signal ultimately received by the public. (Ex.1009-Petrovic, [0015], [0038], [0040].) The monitoring sites, also referred to as Event Airplay Receivers ("EARs") are preferably situated on premises of independent contractors remote from the broadcaster. (Ex.1009-Petrovic, [0015], [0038], [0040].) Petrovic further discloses that each EAR can monitor multiple channels, typically between 8 to 80 channels. (Ex.1009-Petrovic, [0043].) Specifically, the EARs can monitor SNR for all incoming signals, such as audio signals, at the signal reception sites. (Ex.1009-Petrovic, [0058]-[0059].)

Figures 1 and 2 of Petrovic, below, depict the entire system, including an EAR.

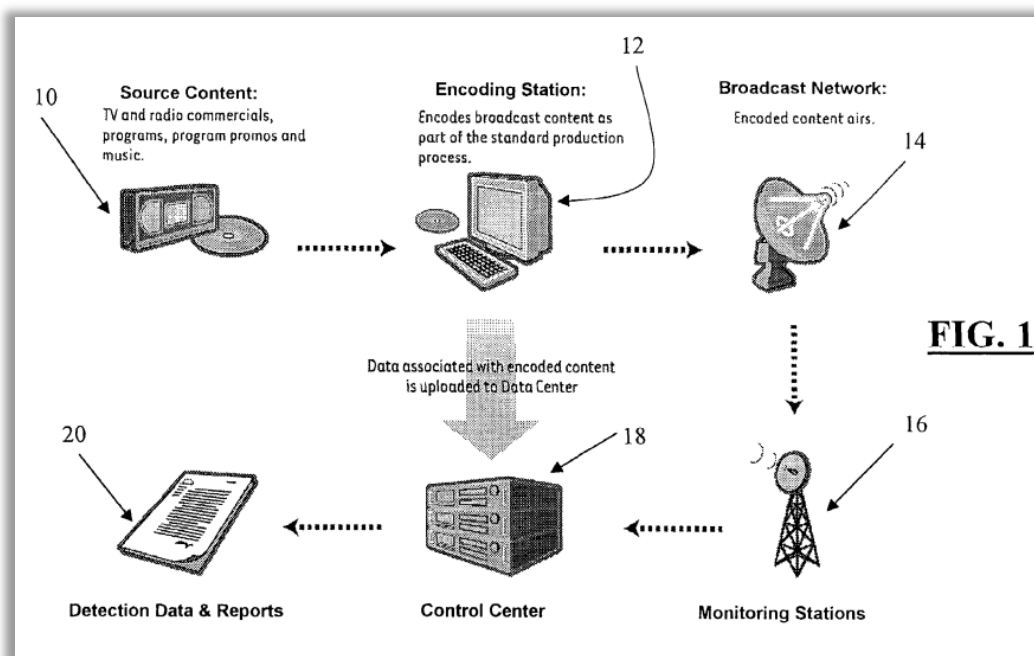


Figure 1 - General Monitoring Network Connectivity Framework (Ex.1009)

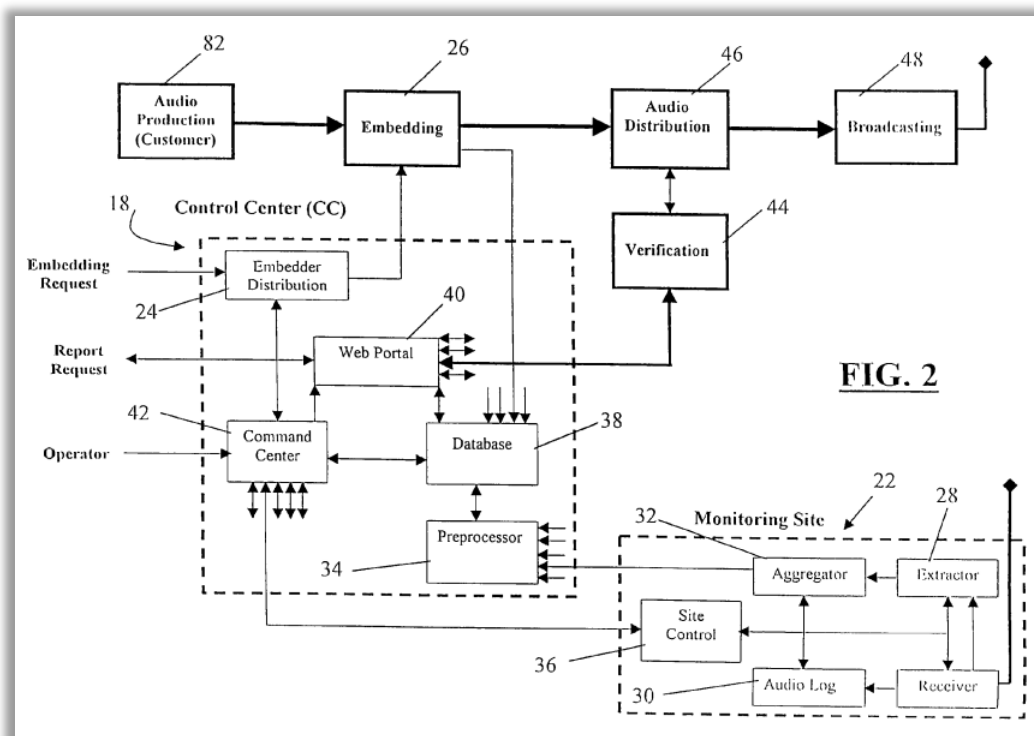


Figure 2 - Petrovic's Preferred Monitoring System (Ex.1009)

Each of the EARs has site control module 36 that generates alarms communicated to the control center. These alarms inform control center personnel of potential problems with signal quality, based on, for example, the SNR. (Ex.1009-Petrovic, [0056]-[0057], [0060].) Petrovic also teaches sending transmitted content to both the consumers and EARs in parallel. (Ex.1009-Petrovic, [0037]-[0038].)

VIII. GROUNDS FOR CHALLENGE

A. Ground 1: Claims 1-18 are Obvious over Maycock and Zhang, and in further view of the General Knowledge of a POSITA

1. Motivation to Combine Maycock and Zhang

A POSITA would be motivated to combine Maycock and Zhang to incorporate Zhang's wideband capture and digitization into Maycock's signal

monitoring system. Maycock and Zhang are in the same field, and both disclose systems for transmitting and receiving television signals. (Ex.1005-Maycock, 4:1-6; Ex.1006-Zhang, 3:15-18.) Like the '008 patent, Maycock's system monitors television signals to ensure high-quality television services are provided to their customers. (Ex.1005-Maycock, 1:31-44, 2:20-29, 3:2-16, 7:21-25, 7:41-53.) While Maycock teaches monitoring one channel at a time, Maycock expressly recommends performing multiple, successive signal monitoring processes to collect data for multiple television channels. (Ex.1005-Maycock, 7:27-29, 8:1-25 ("All Channels").) Maycock also discloses using an analog-to-digital converter 38 to convert a selected channel for digitization before monitoring the signal "so as not to degrade the performance of the received signal." (Ex.1005-Maycock, 4:28-30; *see* Ex.1002-Schonfeld, ¶¶53-74.)

Zhang expressly teaches wideband digitization, including allowing simultaneous reception of multiple content streams while enabling wideband return communications in satellite and cable systems. (Ex.1006-Zhang, 6:52-61.) Zhang also explains that conventional systems with one analog tuner per RF channel results in "the cost, power consumption, and complexity go[ing] up as the required number of RF channels goes up." (Ex.1006-Zhang, 1:66-2:2.) Zhang goes on to describe an improved system with a wideband ADC converter to digitize multiple channels at once. (Ex.1006-Zhang, 6:38-61.)

A POSITA would be motivated to incorporate Zhang's wideband ADC into Maycock's signal monitoring system because it would increase the ability to monitor multiple (or all) channels simultaneously, thereby increasing the efficacy of monitoring. (Ex.1002-Schonfeld, ¶¶67, 75-85, 119.) By incorporating Zhang's disclosure of wideband capture and digitization, a POSITA would understand that digitizing the entire wideband spectrum would provide the benefit of having a more efficient digital processing system with reduced complexity by avoiding multiple digital conversions for specific RF channels, with only a slight expense of a relatively small initial computational cost. Digitizing multiple RF channels at a time is especially advantageous as the required number of RF channels increases. (Ex.1002-Schonfeld, ¶¶53-74, 75-85, 119.) Digitizing multiple (or all) channels also allows for faster channel switching because the system already has a digital representation to provide to a display without delays caused by changing the frequency of a tuner. (Ex.1002-Schonfeld, ¶69.)

As Dr. Schonfeld explains, by 2011 wideband ADCs were ubiquitous and their incorporation into electronic systems is simply a design choice intended to balance the inherent tradeoffs between early versus later digitization. (Ex.1002-Schonfeld, ¶¶64-74.) The advantages of early digitization of electronic systems were clear: (a) the precise reproducibility of digital signals is achieved throughout the system; and (b) the flexibility of digital design provided by hardware and software

options that can be easily enhanced in the future. These benefits, however, are attained at the expense of the high sampling rate needed when applied to a wideband signal because (according to the Nyquist rate) the sampling rate is proportional to its highest frequency component. (Ex.1002-Schonfeld, ¶¶121.)

An alternative design option relies on digitization in the later stages by first decomposing wideband signals to multiple narrowband signals in the analog domain, and only then proceeding to digitization of the narrowband analog components. This approach still has the benefits of digital systems (*i.e.*, precise reproducibility and flexible hardware/software design) but only requires a modest sampling rate applied to each of the narrowband components. To achieve these benefits, the later-stage digitization approach sacrifices: (a) the complex analog electronics required to filter a plurality of narrowband components of the wideband signal; and (b) the loss in fidelity incurred using analog filters in the initial processing of the wideband signal. (Ex.1002-Schonfeld, ¶¶122.)

As the sampling technology matured and ultra-high sampling rates were achieved by commercially available analog-to-digital converters (ADCs) (Ex.1002-Schonfeld, ¶¶64-74), digital system designers naturally transitioned the digitization process into the earliest possible stage of electronic systems. The increased sampling rate of ADCs was a result of the steady improvement in digitization technology since its infancy and by the early 2000s—and most certainly by 2011—improved

digitization technology reached ultra-high sampling rates that could accommodate the digitization of wideband analog signals. (Ex.1002-Schonfeld, ¶¶64-74.)

Additionally, a POSITA would also know how to incorporate Zhang’s wideband, high-speed ADC into Maycock’s signal monitoring system with a reasonable expectation of success to achieve predictable results. (Ex.1002-Schonfeld, ¶120.) Specifically, a POSITA would know how to incorporate Zhang’s high-speed ADC 220 (or, equivalently, ADCs 620a and 620b) to receive the wideband analog input signal of Maycock and digitize the entire signal at the outset, rather than incorporating the individual A/D converter(s) 38 in Maycock designed to digitize only a single channel at a time. (Ex.1005-Maycock, Figure 2.) Such a shift in the position (and sampling rate) of the ADC is a standard and routine design choice in digital signal processing systems for receipt of analog input signals. (Ex.1002-Schonfeld, ¶120-23.)

2. Independent Claim 1

The combination of Maycock’s signal monitoring system and Zhang’s wideband ADC renders claim 1 obvious under the plain and ordinary meaning of “*a received signal spanning an entire television spectrum*”—explained by Dr. Schonfeld to be all received television signals. And even if the Patent Owner argues that “entire television spectrum” is broader and requires digitizing all received signals, the claims are still rendered obvious by the combination of Maycock and

Zhang. *See* §V, *supra*.

I[pre] “A system comprising:”

To the extent that it is limiting, Maycock discloses a “video signal transmission monitoring system.” (Ex.1005-Maycock, 2:52-54, claim 13.)

Maycock’s Figure 1 depicts its exemplary video signal transmission monitoring system.

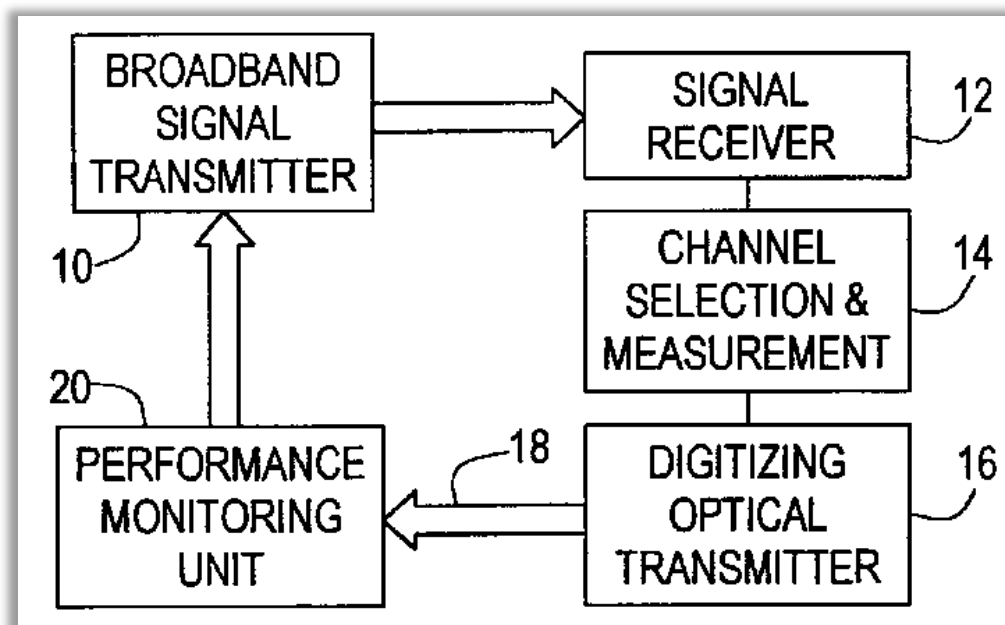


Figure 1 - Maycock’s “Video Signal Transmission Monitoring System” 2:52-54
(Ex.1005)

I[a] “an analog-to-digital converter operable to digitize a received signal spanning an entire television spectrum comprising a plurality of television channels, said digitization resulting in a digitized signal;”

Zhang discloses wideband analog-to-digital converter(s) that digitizes received signals spanning an entire television spectrum comprising a plurality of television channels to generate a digitized signal. (Ex.1006-Zhang, 3:60-63, 6:3-35.)

As Dr. Schonfeld explains, a POSITA would understand how to incorporate Zhang's wideband ADC(s) into Maycock's signal monitoring system to digitize the received signal spanning the entire television spectrum as required by limitation 1[a]. (See §VIII.A.1, *supra*; Ex.1002-Schonfeld, ¶¶126-32.)

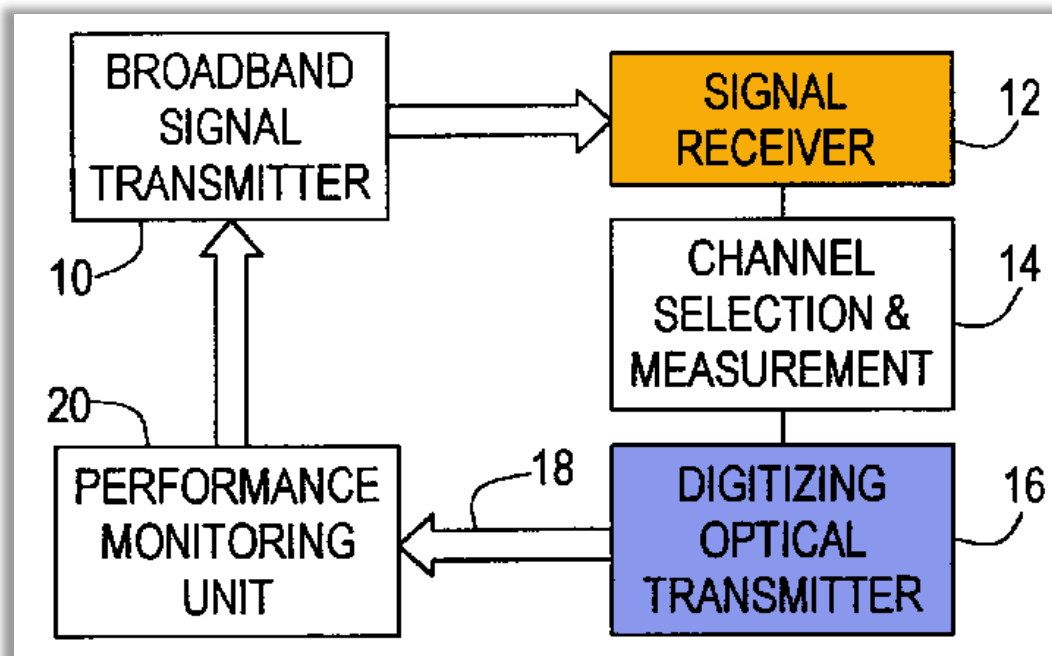


Figure 1 - Maycock's "Video Signal Transmission Monitoring System" 2:52-54
(Ex.1005)

Turning first to Maycock, Figure 1 depicts signal receiver 12 that receives multiple broadband analog video and audio channels, spanning a "useable frequency range" from a broadband signal transmitter (*e.g.*, cable headend, etc.). (Ex.1005-Maycock, 3:2-16.) Signal receiver 12 is "an optical receiver, an antenna, or any other device which enables the capture of a broadband signal." (Ex.1005-Maycock, 3:5-9.) Maycock further teaches that channel selection & measurement 14, also depicted in Maycock's Figure 2 as channel selector 14a, selects an individual analog channel

from the multi-channel input and outputs the analog channel to ADCs (*e.g.*, ADCs 38, 37a, 37b) for digitizing the channel. (Ex.1005-Maycock, 3:60-61, 4:25-58, Figure 2.) Multiple digitized signal components are thereby created, combined into one digital signal at multiplexer 43, and transmitted to a performance monitoring unit for analysis. (Ex.1005-Maycock, 5:23-35, 5:38-47, Figures 3 and 4.) Maycock, therefore, teaches an ADC operable to digitize a received signal as recited in limitation 1[a].

Limitation 1[a] further requires the “*received signal spanning an entire television spectrum comprising a plurality of television channels.*” As explained above, a POSITA would understand the phrase “*a received signal spanning the entire television spectrum*” to include all received television signals. See §V.A, *supra*. The claim further requires that the received signal “*compris[es] a plurality of television channels.*” Zhang discloses and/or renders obvious this limitation. Zhang teaches using a “high-speed ADC” to digitize “an entire signal band with n channels” as depicted in Figure 2. (Ex.1006-Zhang, 3:62-63.)

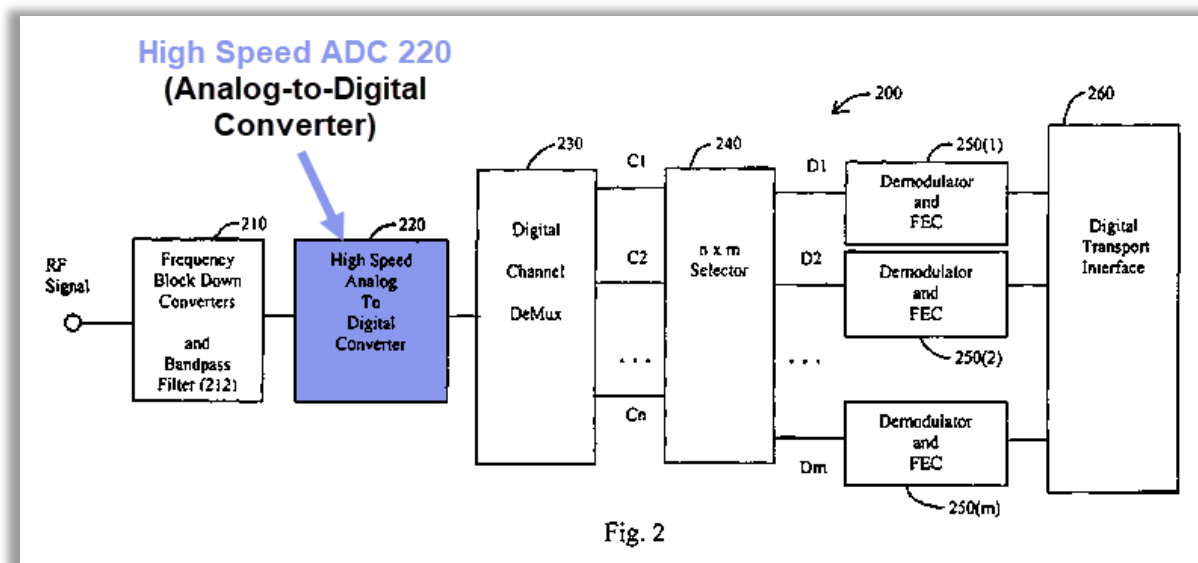


Figure 2 - Zhang's "Multi-Channel Demodulator" 2:56-58 (Ex.1006)

Zhang explained that a single ADC could be used to digitize incoming television signals. (Ex.1006-Zhang, 3:49-53.) Specifically, Zhang's ADC "receives [a] multi-channel analog RF signal ... and converts the multi-channel analog RF signal to a multi-channel digital RF signal." (Ex.1006-Zhang, 2:14-17.) Put another way, Zhang's multi-channel ADC is operable to digitize an incoming signal, corresponding to the entirety of a received television signal, and containing multiple television channels. (Ex.1006-Zhang, 3:13-19, 3:60-64, Ex.1002-Schonfeld, ¶¶126-32.)

If an incoming television signal surpasses the capabilities of a single ADC, Zhang ensures that the entirety of an incoming television signal is digitized by using multiple ADCs. (Ex.1006-Zhang, 6:3-35, 6:52-61.) Therefore, a POSITA would understand that Zhang's "High Speed Analog to Digital Converter 220" or the

multiple ADCs (620a, 620b) are operable to digitize all the received television signals, resulting in a digitized signal for processing as described with respect to Maycock's monitoring system (Ex.1002-Schonfeld, ¶¶131.) Therefore, the combination of Maycock and Zhang renders limitation *I[a]* obvious.

If Patent Owner argues that the phrase "*a received signal spanning an entire television spectrum*" is broader and requires digitization of all received signals (and not just television signals), the combination of Maycock and Zhang still renders limitation *I[a]* obvious because Zhang's discloses an embodiment where an incoming multi-channel analog RF signal in the 540-750 range is down-converted to the 20-130 MHz range and each portion of the down-converted signal is digitized. (Ex.1006-Zhang, 6:10-19, Figure 6.) (Ex.1002-Schonfeld, ¶132.)

I[b] "a signal monitor operable to:"

Maycock discloses a signal monitor. For example, Maycock's Figure 1 broadly depicts "performance monitoring unit 20" for analyzing "both for audio and video content and [comparing] the measurement data ... with reference data stored." (Ex.1005-Maycock, 3:18-20.)

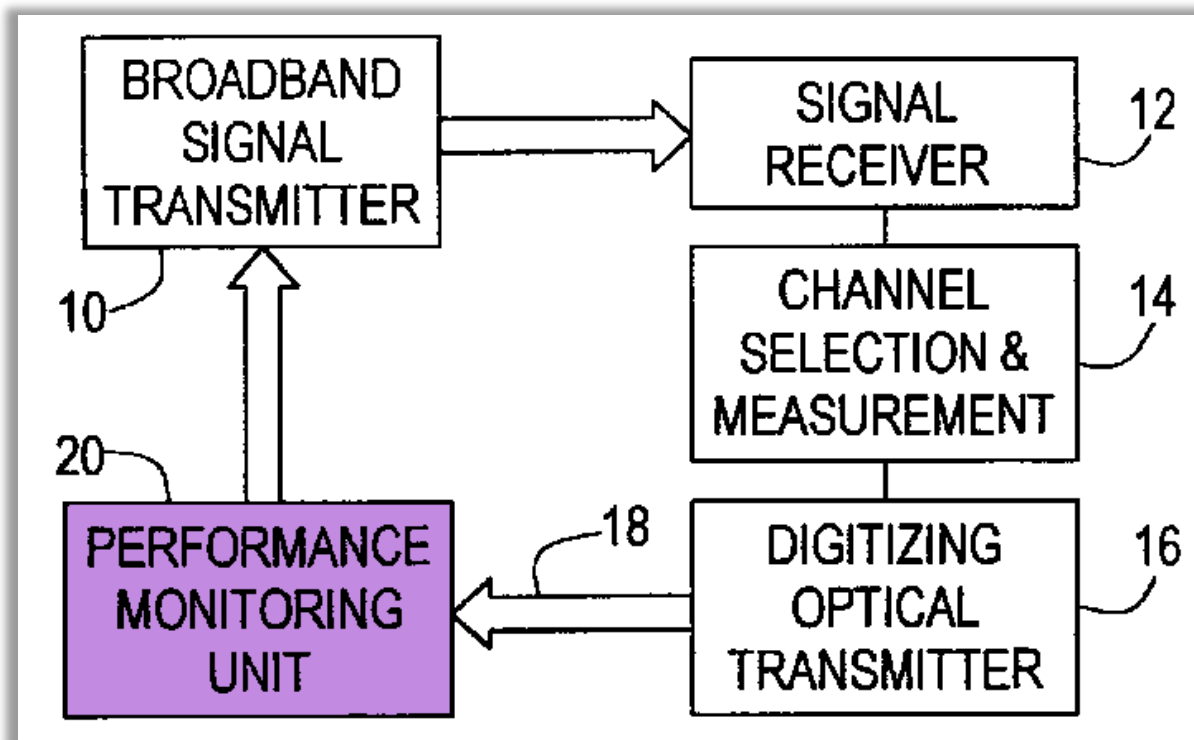


Figure 1 - Maycock's "Video Signal Transmission Monitoring System" (Ex.1005)

Maycock's Figure 3 depicts in detail the components and functionality of the disclosed monitoring unit. (Ex.1005-Maycock, 5:65-7:20.) Specifically, video analyzer 62, audio analyzer 70, and computer 58 analyze the signal, determine the signal characteristics, and provide the reporting as required by limitation 1/[b] and therefore comprise the claimed "system monitor."

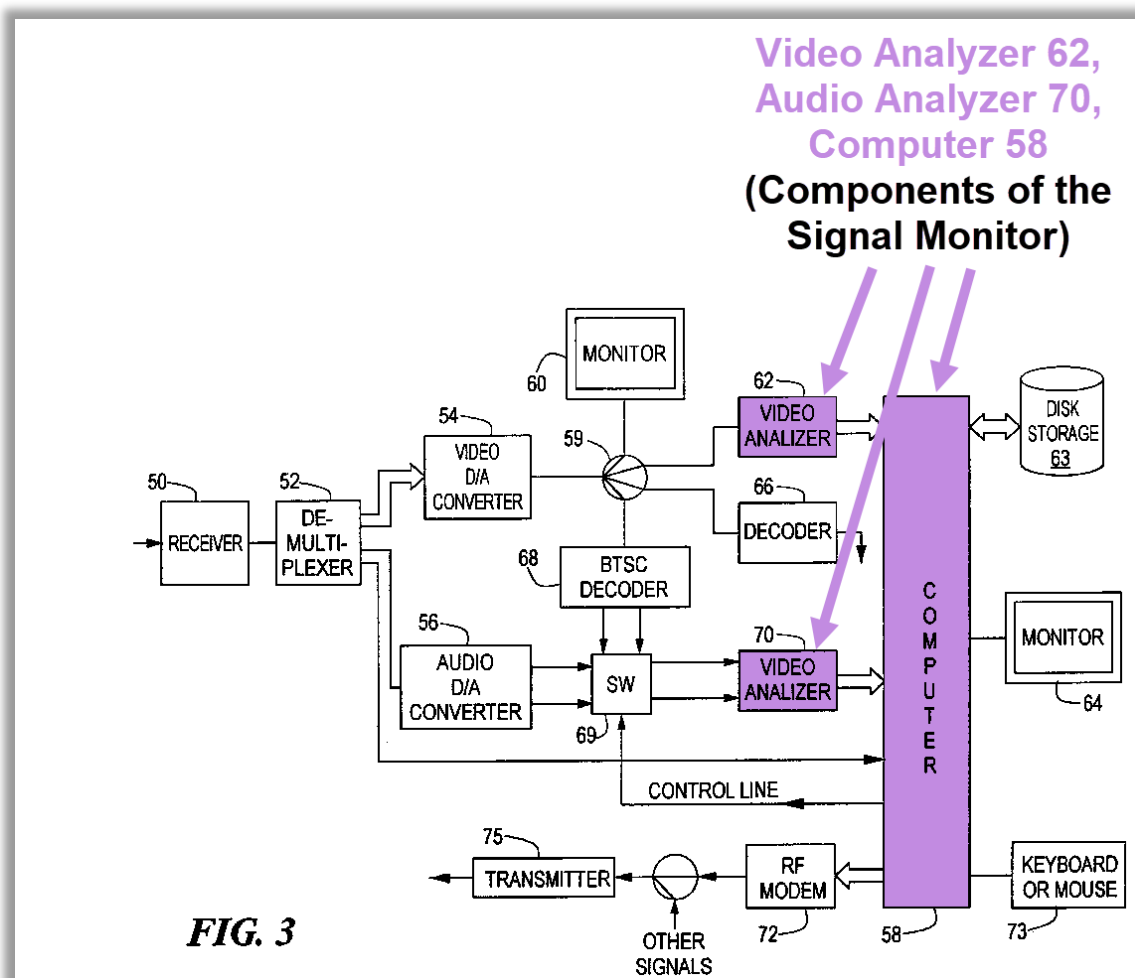


Figure 3 - Maycock's Monitoring System² (Ex.1005)

Maycock's "video analyzer 62 measures signal quality parameters such as signal-to-noise ratio, differential gain, differential phase and other video parameters" while "audio analyzer 70 performs measurements of parameters such as signal-to-

² Element 70 in Maycock's Figure 3 is labeled as a "video analyzer." This appears to be a typographical error as the patent specification refers to this element as an "audio analyzer." (Ex.1005-Maycock, 6:55.)

noise ratio and harmonic distortion.” (Ex.1005-Maycock, 6:55-57, 6:23-26.) Likewise, computer 58 acts to analyze the outputs of video analyzer 62 and audio analyzer 70 and monitors a portion of a digital signal output from demultiplexer 52 (“a third data bit bus”) “for analysis of the digitized performance information.” (Ex.1005-Maycock, 6:4-7.) All of these components, therefore, operate as a signal monitor, meeting the language of element 1[b]. (Ex.1002-Schonfeld, ¶¶133-35.)

1[b][1] “analyze said digitized signal to determine a characteristic of said digitized signal; and”

Maycock’s Figure 3 illustrates the “components of [Maycock’s] monitoring unit 20” and shows receiver 50 receiving a digitized signal and transmitting that signal to demultiplexer 52. (Ex.1005-Maycock, 5:39-42, 5:65-6:2.)

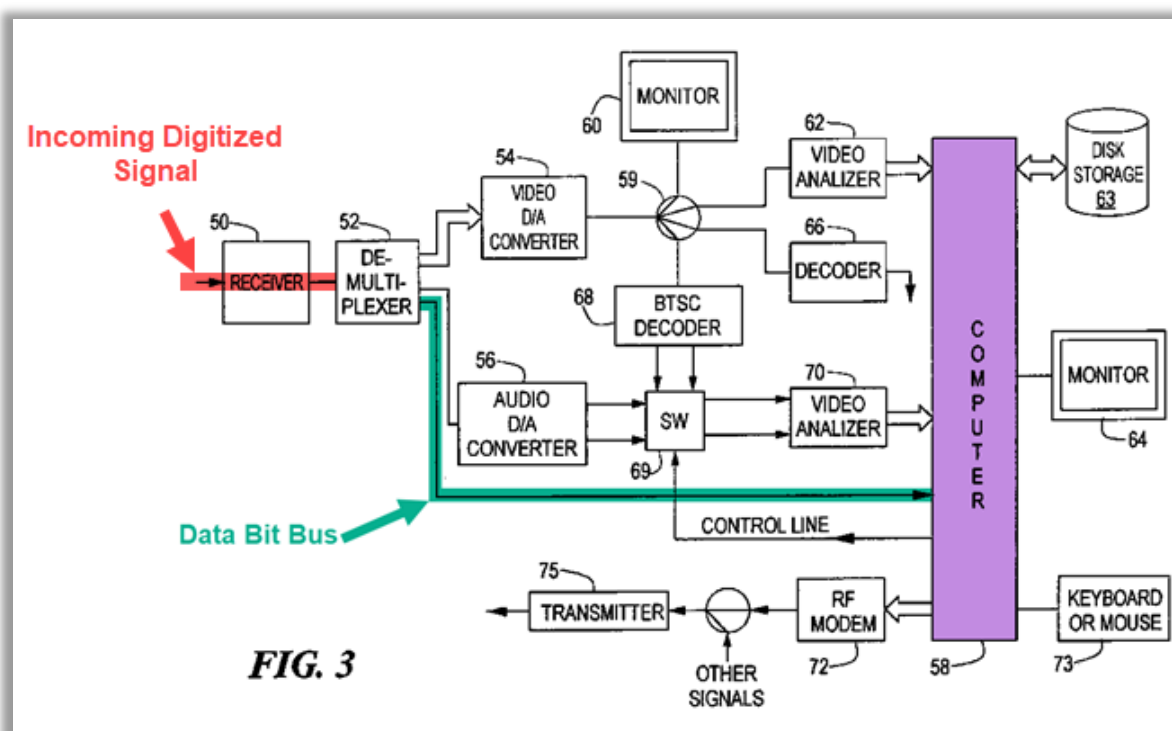


Figure 3 - Components of Maycock’s Monitoring System (Ex.1005)

Demultiplexer 52 separates the 10-bit digitized signal into three different signal parts: 8 video bits are transmitted to video digital-to-analog converter 54, a single audio bit is transmitted to audio digital-to-analog converter 56, and a bit is transmitted directly to control computer 58 “for analysis of the digitized performance information.” (Ex.1005-Maycock, 6:2-7.)

The 8 video bits are converted to analog by video D/A converter 54 and then analyzed by video analyzer 62, which measures various signal quality parameters including but not limited to “[s]ignal-to-noise ratio, differential gain, differential phase and other video parameters” (Ex.1005-Maycock, 6:23-26.) Similarly, the audio bit is converted to analog by audio D/A converter 56 and then analyzed by audio analyzer 70, which measures “parameters such as signal-to-noise ratio and harmonic distortion,” as well as “digitized performance information” (Ex.1005-Maycock, 6:55-57.) Maycock’s signal quality parameters (*e.g.*, SNR, differential gain, and harmonic distortion) are the same examples of “a characteristic” as the characteristics described in the ’008 patent. (*Compare with* ’008 patent, 3:33-45 (identifying “characteristics” such as SNR and various frequency functions).)

Limitation 1/[b]/[1] simply requires “analyz[ing] said digitized signal to determine a characteristic of said digitized signal.” The limitation does not impart a temporal requirement and thus the signal need not be in a digitized form when the signal analysis occurs. Rather, the claim simply requires that the signal monitor

receives a digitized signal and performs signal analysis to determine a signal characteristic regardless of whether the signal varies between analog and digital form. (Ex.1002-Schonfeld, ¶139.)

Maycock's performance monitoring unit 20 receives a 10-bit digitized signal, performs various processing techniques, and analyzes this digital signal. Hypothetically, if performance monitoring unit 20 was a black box, a POSITA would understand that a digitized signal is the input and that the unit outputs signal characteristics to computer 58. (Ex.1002-Schonfeld, ¶140; *see also* Ex.1005-Maycock, 5:65-6:2, 7:4-13, 7:21-35.) Therefore, Maycock's performance monitoring unit 20 analyzes and determines characteristics of the incoming digitized signal, as determined by the video analyzer 62, the audio analyzer 70, and/or the computer 58.

If Patent Owner argues that the monitoring must be performed exclusively on a digital signal, Maycock's performance monitoring unit 20 still meets this requirement. Maycock explains that demultiplexer 52 creates a "third data bit bus" from an incoming digitized signal and transmits a third data bit bus "directly to a control computer 58 for analysis of the digitized performance information." (Ex.1005-Maycock, 6:4-7.) Maycock further describes that this digitized performance information includes "digital carriers derived from the microprocessor" (*e.g.*, microprocessor 30, *see* Ex.1005-Maycock, 5:13-16) that "contain information

such as video level, video carrier frequency, audio carrier level, audio carrier frequency plus other digitally encoded information,” corresponding to “characteristics,” as claimed in limitation 1[b][1]. (Ex.1005-Maycock, 6:62-67; Ex.1002-Schonfeld, ¶¶136-41.) Maycock discloses limitation 1[b][1].

1[b][2] “report said determined characteristic to a source of said received signal;”

Maycock, alone or in view of the general knowledge of a POSITA, discloses reporting a determined characteristic to a source of a received signal. As shown in Maycock’s Figure 1, transmission head-end 10 operates as the source of the received signal at the monitoring unit. (Ex.1005-Maycock, 3:2-5.)

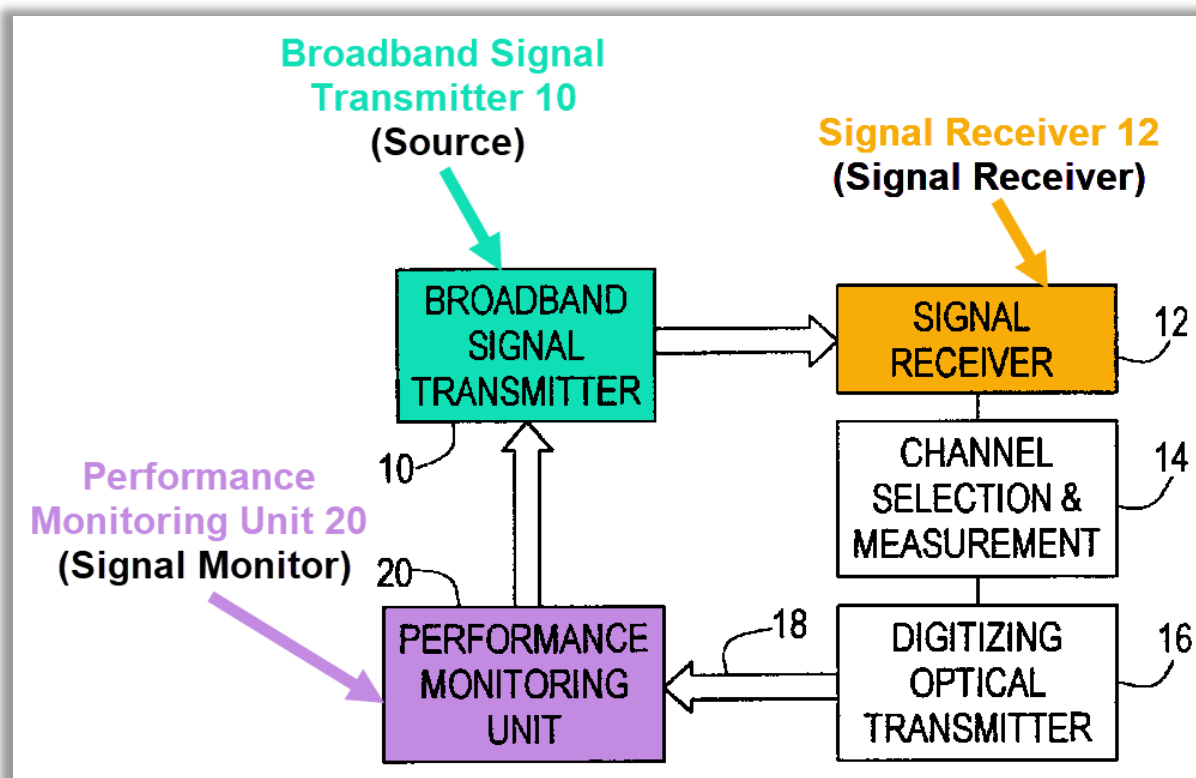


Figure 1 - Maycock’s “Video Signal Transmission Monitoring System” (Ex.1005)

As Maycock described, the goal of its system was to provide performance and

signal quality monitoring as the signal passed through a single point in the system, as opposed to monitoring the status of equipment at numerous points along the signal's transmission path, as was done by conventional systems. (Ex.1005-Maycock, 1:31-44.) This “performance monitoring,” as opposed to “status monitoring,” enabled a signal operator (*e.g.*, a controller of a source broadband signal like a cable television provider) to identify whether a signal itself was of poor quality. (Ex.1005-Maycock, 1:14-23.) Maycock's Figure 1 expressly shows a signal path from performance monitoring unit 20 to video head-end 10. A POSITA would understand that providing feedback about the signal's quality to signal's source (the cable operator) is clearly disclosed in Maycock from Figure 1 and at least in part because its utility in allowing the operator to modify outgoing signal metrics and/or take other corrective action to preemptively fix issues and keep its television customers happy. (Ex.1002-Schonfeld, ¶75.)

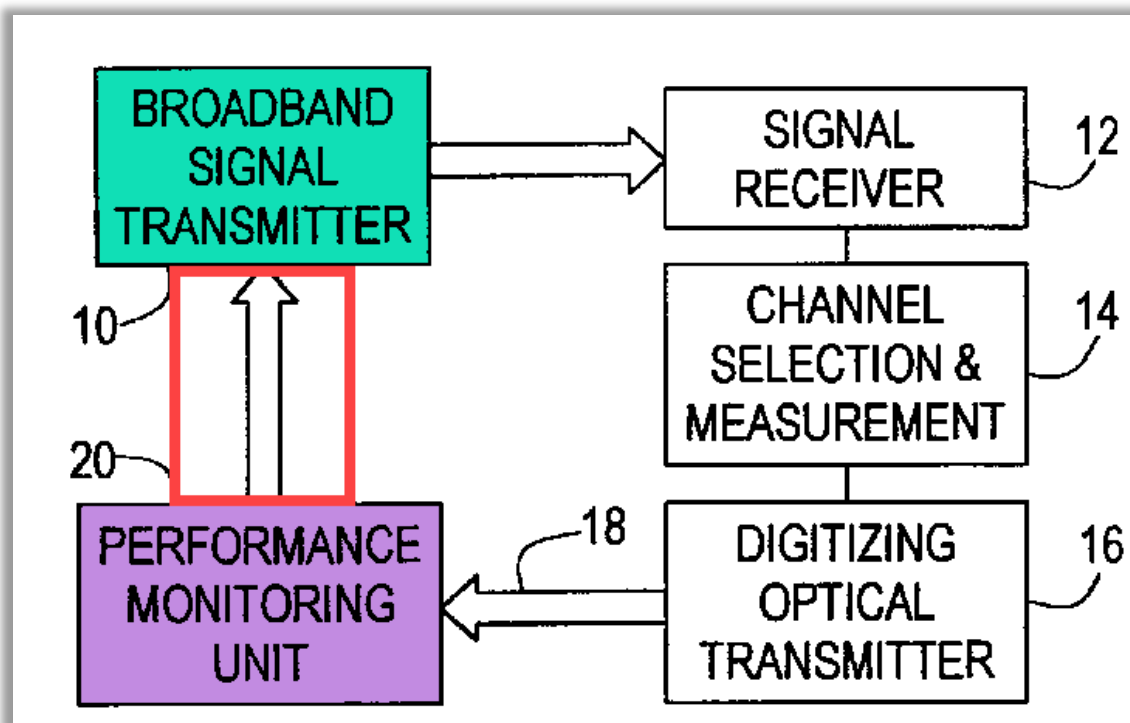


Figure 1 - Maycock's System - Annotated to Show Communication from Monitoring Unit to Signal Source (Ex.1005)

While Maycock does not explicitly state that its reporting is sent to “the signal’s source,” Maycock’s own figures show that this is the case. Maycock’s Figure 1 depicts an arrow clearly showing that performance monitoring unit 20 (the signal monitor) transmits information back to broadband signal transmitter 10 (the source). A POSITA would rightly assume that the transmitted information relates to signal quality and are the claimed “measured characteristics.” (Ex.1002-Schonfeld, ¶¶144-45.)

Second, Maycock discloses using its collected data in a “sequence for initializing the measurements and collecting the results in the computer 58.” (Ex.1005-Maycock, 7:21-25, Figure 5 (“History File” & “Disk Storage”).) A

POSITA would understand that this constitutes the collection/storage of data including measured characteristics data, where such collection/storage of data is used to prepare a report for the source's use to maintain signal quality. (Ex.1002-Schonfeld, ¶145.) Lastly, using common sense, a POSITA would know that a system developed to monitor signal quality is useless unless results are shared to take corrective action. In sum, Maycock in view of the general knowledge of a POSITA discloses all limitations of element 1[b][2].

1[c] “a data processor operable to process a television channel to recover content carried on the television channel; and”

Maycock explains that certain components, such as a BTSC decoder 68 and a decoder 66, process a television channel to recover content, *e.g.*, extracting the data carried on the television channel. A POSITA would understand that the phrase “to recover content carried on the television channel” to be extracting the information carried on the television channel. (Ex.1002-Schonfeld, ¶147.) At least decoder 66 extracts information carried by the signal when it “demodulate[s] information encoded in the video signal, for example channel insertion (used for advert deletion and substitution), scrambler and set top information.” (Ex.1005-Maycock, 6:38-41.) A POSITA would read this description and understand that decoder 66 processes a television channel to recover content. (Ex.1002-Schonfeld, ¶147.)

Further, regarding BTSC decoder 68, Maycock teaches that “a baseband signal output which contains both video and audio information ... is split by a splitter

59 into four paths” and that one of those paths “is fed to a BTSC stereo audio decoder 68 which recreates the left and right audio channel from the BTSC standard signal.” (Ex.1005-Maycock, 6:9-14, 6:45-47.) From this description, a POSITA would understand that BTSC decoder 68 processes the television channel to recover content (i.e., right and left audio channel content) from the channel. (Ex.1002-Schonfeld, ¶¶146-47.)

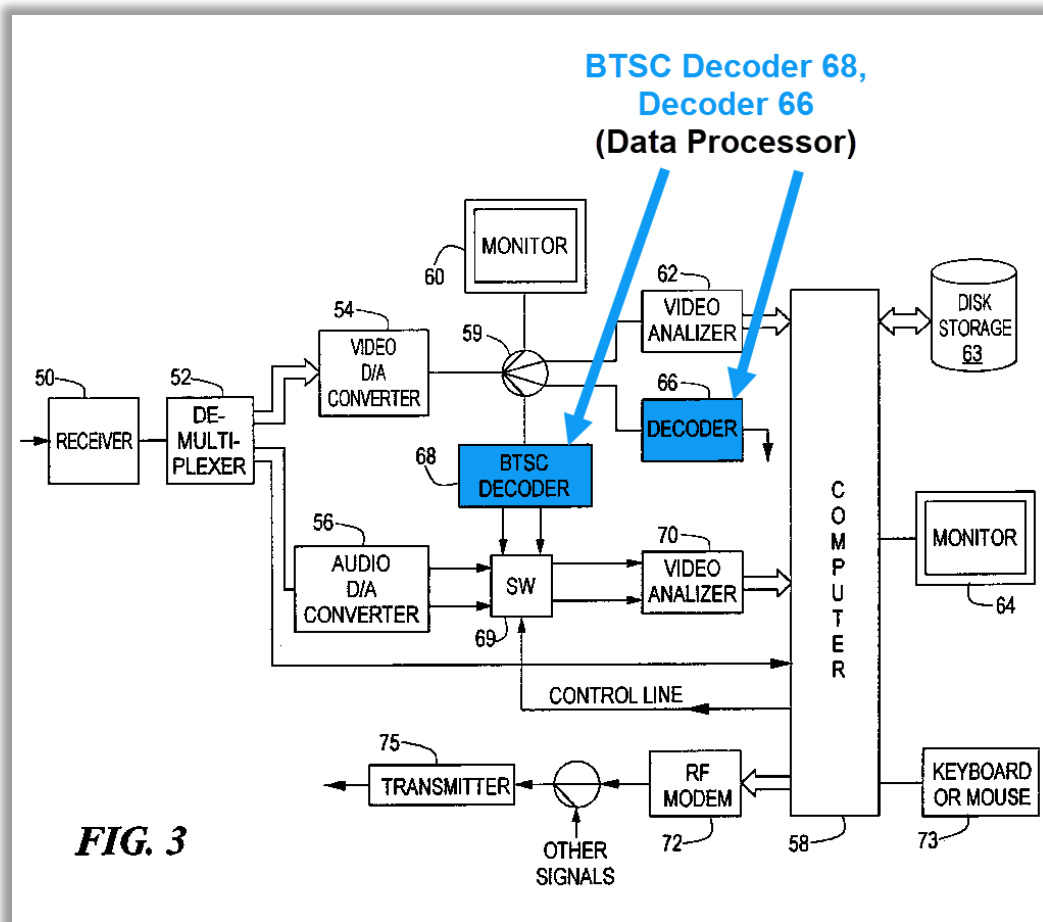


Figure 3 - Maycock's Data Processor(s) (Ex.1005)

Maycock therefore discloses all limitations of element 1[c].

1[d] “a channelizer operable to:”

Maycock discloses a channelizer. Maycock explains that certain components, such as demultiplexer 52 and splitter 59, operate to separate portions of incoming signals into channels. Specifically, Maycock explains that demultiplexer 52 operates to output 10 bits, with “[e]ight bits ... go[ing] to a video digital-to-analog converter 54 to reconstitute the video signal and its sub-carriers,” “[a]n audio bit bus go[ing] to an audio digital-to-analog converter 56,” and “a third data bit bus go[ing] directly to a control computer 58” (Ex.1005-Maycock, 6:2-7.) Maycock additionally explains that splitter 59 outputs four legs (“four paths”) going to the various locations as illustrated in Figure 3. (Ex.1005-Maycock, 6:12-14, Figure 3.) A POSITA would understand both demultiplexer 52 and splitter 59 operate as channelizers, as they create multiple channel outputs from a single incident signal. (Ex.1002-Schonfeld, ¶149.)

to audio D/A converter 56, are the selected second portion of the digitized signal.
(Ex.1002-Schonfeld, ¶151.)

1[d][3] “concurrently output said first portion of said digitized signal to said signal monitor and said second portion of said digitized signal to said data processor.”

Maycock’s demultiplexer 52 outputs one bit of a 10-bit bus to control computer 58 for analysis, as discussed above. Additionally, also explained above, control computer 58 acts as a signal monitor, or a component thereof, because it analyses digitized performance information. (Ex.1005-Maycock, 6:6-7, Figure 3.)

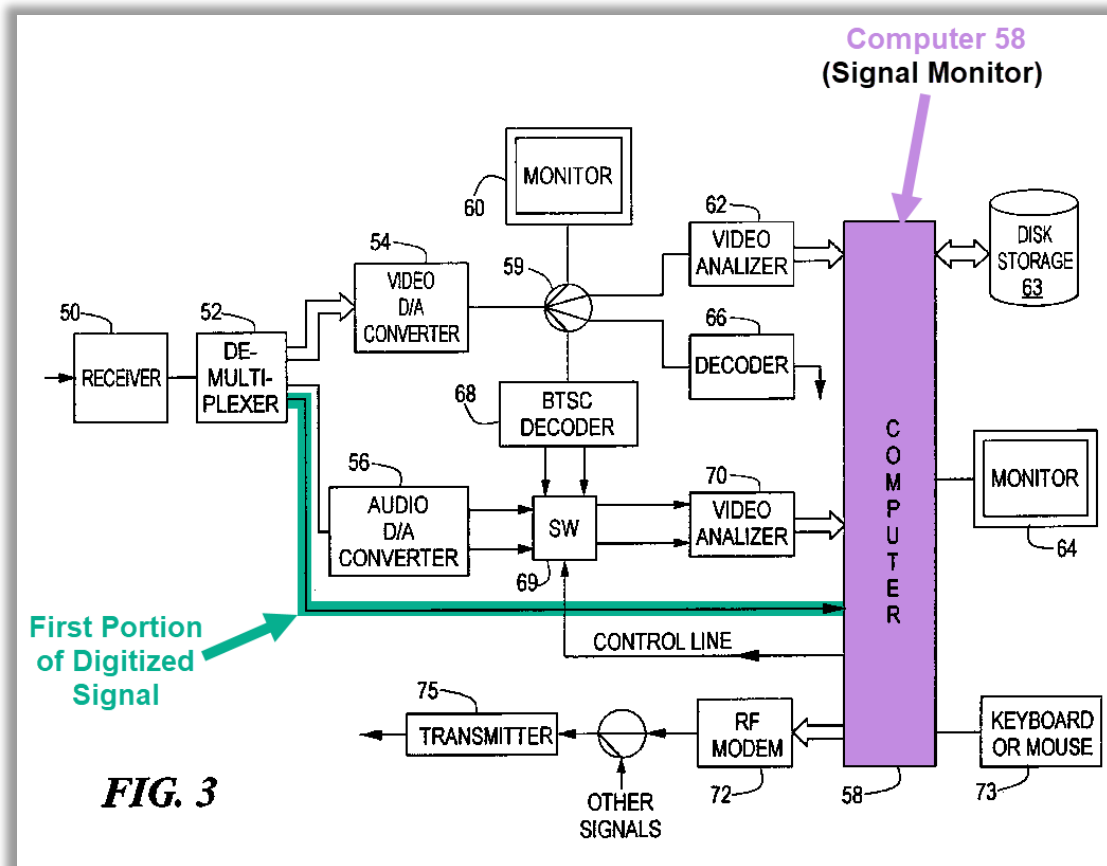
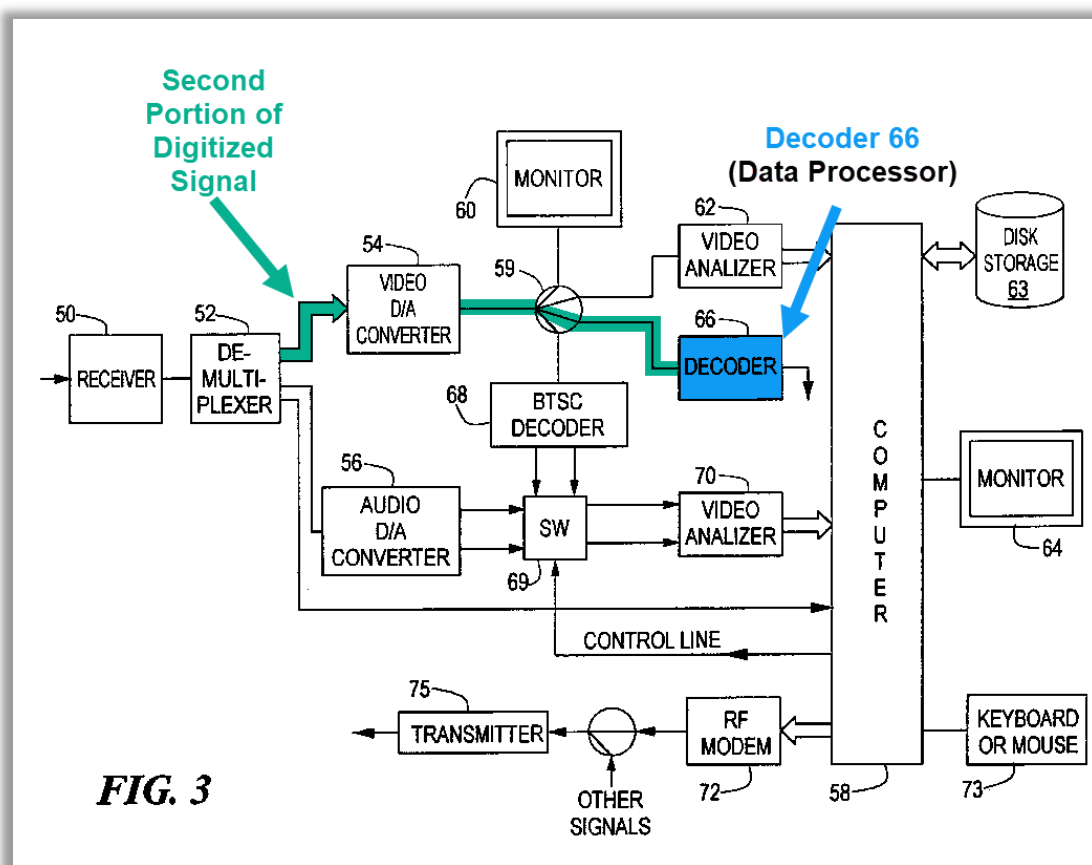


Figure 3 - Maycock (Ex.1005)

As further described above, demultiplexer 52 outputs eight bits of a 10-bit bus to video D/A converter 54, then to decoder 66 after being split at splitter 59. (Ex.1005-Maycock, 6:2-4, 6:38-41.) Decoder 66 is an exemplary data processor, at least because it “demodulate[s] information encoded in the video signal, for example channel insertion (used for advert deletion and substitution), scrambler and set top information.” (Ex.1005-Maycock, 6:38-41.)



Maycock - Figure 3 (Ex.1005)

As for “concurrently,” demultiplexer 52 separates an incoming signal into multiple portions, and these multiple portions are outputted concurrently or simultaneously. As Dr. Schonfeld explains, a POSITA would understand that the

output of the demultiplexer 52 (*i.e.*, the first portion of the digitized signal and the second portion of the digitized signal) are outputted concurrently (10 bits at a time). (Ex.1002-Schonfeld, ¶154.) In sum, the combination of Maycock and Zhang, in further view of the general knowledge of a POSITA, renders independent claim 1 obvious.

3. Dependent Claim 2

The system of claim 1, wherein said first portion of said digitized signal spans said entire television spectrum.

As disclosed in Maycock, the so-called “first portion” of the digitized signal is transmitted from demultiplexer 52 to computer 58. (*See element 1[d][3], supra.*) Maycock explains that the final bit (corresponding to the “first portion”) contains “digital data information ... [comprising] digitally encoded information comprising signal quality data indicative of the quality of the selected channel.” (Ex.1005-Maycock, 4:59-63.) This portion comprises (“spans”) information for the entire received signal (*e.g.*, the entire signal received by the signal monitor illustrated in Figure 3). (Ex.1005-Maycock, 6:4-7; Ex.1002-Schonfeld, ¶¶155-56.)

Zhang’s wideband ADC allows for the digitization of the “entire television spectrum,” as discussed above. Since Maycock discloses transmitting a first portion spanning an entire received signal to a signal monitor, a POSITA would understand that the combination of Maycock and Zhang renders obvious a situation where a signal spanning an “entire television spectrum” (*i.e.*, all received television signals)

is transmitted to a signal monitor. The disclosure of Maycock already considers monitoring all channels and, in light of Zhang, it would be obvious to monitor all channels at once to increase analysis efficiency. (Ex.1002-Schonfeld, ¶¶155-56; Ex.1005-Maycock, 8:1-25.) The combination of Maycock and Zhang in further view of the general knowledge of a POSITA therefore renders claim 2 obvious.

4. Independent Claim 3

3[pre] “*A method comprising:*”

To the extent that it is limiting, Maycock describes a method and more specifically a “*method of monitoring the transmission of an analog video signal through a video signal transmission channel.*” (Ex.1005-Maycock, Abstract (emphasis added), claim 18.) Maycock discloses element 3[pre].

3[a] “*performing by one or more circuits: receiving a signal having a bandwidth that spans from a first frequency, F_{lo} , to a second frequency, F_{hi} , wherein said signal carries a plurality of channels;*”

Maycock, in view of Zhang, discloses limitation 3[a]. Maycock discloses receiving a signal with a bandwidth from F_{lo} , to F_{hi} , carrying multiple channels. (Ex.1005-Maycock, Figures 1, 1A, 2, 3, 1:12-15, 1:47-50, 7:28-30, 8:1-25.) Zhang also describes circuitry for receiving a multi-channel RF signal by frequency-block down-converters 210. (Ex.1006-Zhang, 3:15-19 (“A frequency-block down-converter 210 receives one or more multi-channel analog RF signals ...”), 3:20-22

(“For the purposes of this description, a multi-channel RF signal is an RF signal in a given frequency band that carries multiple RF channels.”).)

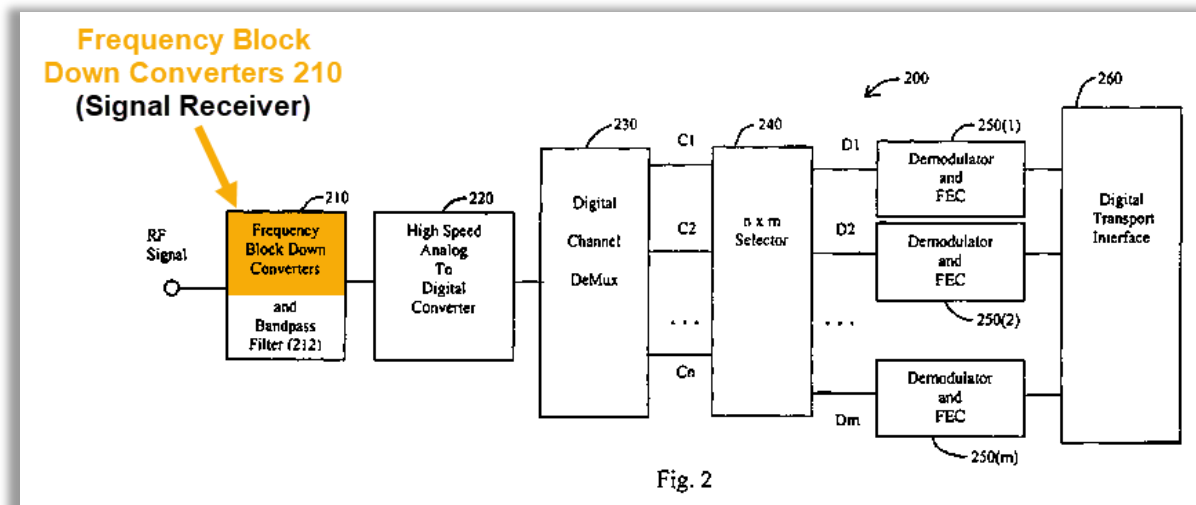


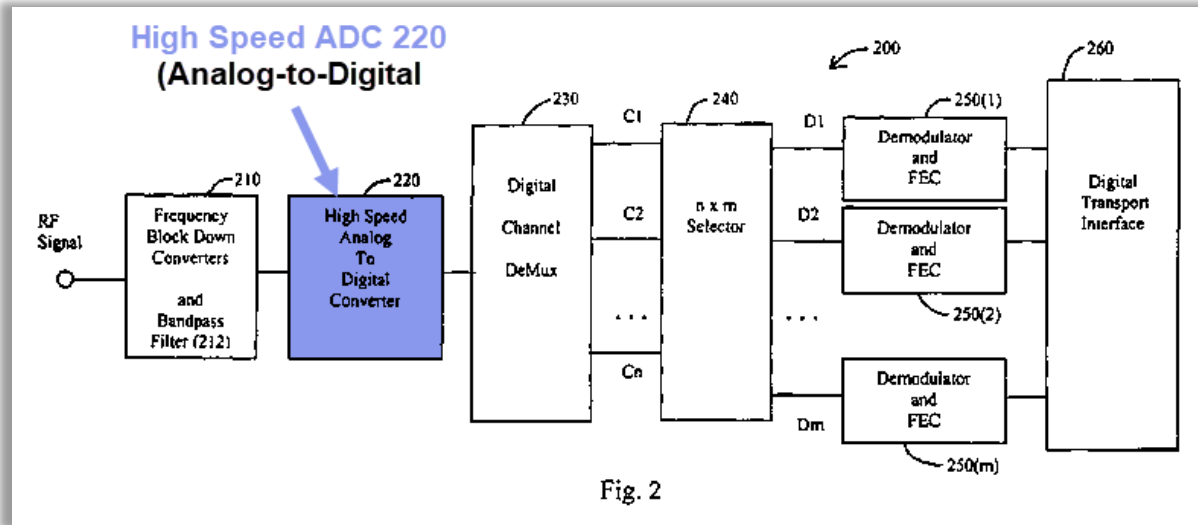
Figure 2 - Zhang's Multi-Channel Demodulator (Ex.1006)

Zhang explicitly discloses that the received signal carries multiple television channels and is in a given frequency band. (Ex.1006-Zhang, 2:10-14, 3:20-22.) For example, Zhang states that “[t]he frequencies of the incoming RF signal can vary from very low frequencies to tremendously high frequencies.” (Ex.1006-Zhang, 3:22-24, 6:12-19.) As explained above, a POSITA would understand that “a received signal having a bandwidth that spans from a first frequency F_{lo} to a second frequency, F_{hi} ” is a signal having a continuous range of frequencies between a low frequency F_{lo} and a high frequency F_{hi} . Zhang further explains that “an entire signal band with n channels can be [digitized],” further cementing that Zhang’s digitized frequency band is continuous. (Ex.1006-Zhang, 3:62-63.) While Zhang does disclose filtering out frequencies at down-converter 210, this filtering only affects

portions of the signal outside the lower frequency band, which means that the remaining portion transmitted to the ADC is still a continuous signal. (Ex.1006-Zhang, 3:40-43.) A POSITA would understand that Zhang’s “multi-channel analog RF signal” spans from a first frequency, F_{lo} , to a second frequency, F_{hi} , at both ends of the frequency band. (Ex.1002-Schonfeld, ¶¶158-59.) Zhang, therefore, discloses the limitations of 3[a].

3[b] “digitizing said received signal from F_{lo} to F_{hi} to generate a digitized signal;”

Zhang discloses the use of a “high-speed ADC” that digitizes “an entire signal band with n channels” (*i.e.*, a band of channels from a low frequency to a high frequency). (Ex.1006-Zhang, 3:62-63.) Zhang further emphasizes that at least the system illustrated in Figure 2, receives a multi-channel RF signal that “carries multiple RF channels,” where each RF channel “can carry one or more content channels.” (Ex.1006-Zhang, 3:15-35.) A POSITA would understand that “High Speed Analog to Digital Converter 220,” is an ADC in that digitizes a signal spanning from F_{lo} to F_{hi} and that the ADC’s output is a digitized signal. (Ex.1006-Zhang, 3:60-63 (“An ADC 220 then converts the down-converted multi-channel analog RF signal to a multi-channel digital RF signal.”).)



Zhang - Figure 2 (Ex.1009)

Maycock also discloses digitizing a received signal and, as Dr. Schonfeld explains, a POSITA would have known to replace Maycock’s ADC with Zhang’s high-speed ADC to digitize a signal spanning from F_{lo} to F_h more efficiently. (See VIII.A.2, element 1[a].) The combination of Maycock and Zhang, therefore, meets limitation 3[b]. (Ex.1002-Schonfeld, ¶¶160-61.)

3[c] “selecting a first portion of said digitized signal;”

See VIII.A.2, limitation 1[d][1], *supra*.

3[d] “selecting a second portion of said digitized signal;
and”

See VIII.A.2, limitation 1[d][2], *supra*.

3[e] “concurrently outputting said selected first portion and said selected second portion, wherein:”

See VIII.A.2, limitation 1[d][3], *supra*.

3[f][1] “said selected first portion is output to a signal analyzer which analyzes said selected first portion to determine one or more characteristics of the received signal,”

See VIII.A.2, limitations 1[b][1] and 1[d], *supra*. A POSITA would understand that a signal analyzer and a signal monitor refer to the same device. (Ex.1002-Schonfeld, ¶165.)

3[f][2] “and which reports said determined one or more characteristics to a source of said received signal; and”

See VIII.A.2, limitation 1[b][2], *supra*.

3[g] “said selected second portion is output to a data processor for recovery of data carried on one or more of said plurality of channels.”

See VIII.A.2, limitations 1[b][2], 1[c], and 1[d], *supra*.

5. Dependent Claim 4

The method of claim 3, wherein said first portion comprises all of said received signal from F_{lo} to F_{hi} .

See VIII.A.2, claim 2, *supra*. As discussed, the first portion as disclosed in Maycock contains information that spans the entire incoming signal from F_{lo} to F_{hi} .

6. Dependent Claim 5

The method of claim 3, wherein said one or more characteristics is one of: signal power vs. frequency, phase vs. frequency, signal-to-noise ratio, peak-to-average ratio, noise levels, bit error rate, and symbol error rate.

This limitation would be obvious in view of Maycock. Maycock discloses that one measured characteristic, as detected by the computer 58, video analyzer 62,

and/or audio analyzer 70 (signal analyzer), is SNR. (Ex.1005-Maycock, 6:24-29, 6:55-57.) Maycock further discloses that the digital data information on the third bit line comprises information such as “signal quality information indicative of the quality of the selected channel” and that this comprises power level, frequency, temperature, and other local status information. (Ex.1005-Maycock, 4:59-5:16.) Although the signal quality information does not expressly include SNR or measuring power vs. frequency, it would have been obvious in view of Maycock’s disclosure of measuring SNR to include SNR data as part of the quality information in the “digital data information.” (Ex.1002-Schonfeld, ¶169.)

7. Dependent Claim 6

The method of claim 3, wherein: said received signal is a cable television signal; and said plurality of channels comprises a plurality of television channels.

Maycock discloses that its apparatus relates to cable or satellite systems. (Ex.1005-Maycock at 1:5-9.) Zhang also discloses that the received signal is a cable television signal output by a low noise block downconverter. Zhang discloses a “frequency-block down-converter 210” (low noise block downconverter) that receives a multi-channel RF signal and that outputs the processed signal to an ADC 220. (Ex.1006-Zhang, 3:15-19, 3:54-61.) Zhang describes the signal as a cable signal (Ex.1006-Zhang, 3:49) and that the signal comprises a plurality of television channels (Ex.1006-Zhang, 3:26-35).

8. Dependent Claim 7

The method of claim 3, wherein: said received signal is a satellite television signal output by a low noise block downconverter; and said plurality of channels comprises a plurality of television channels.

Maycock discloses that its apparatus relates to cable or satellite systems. (Ex.1005-Maycock, 1:5-9). Zhang’s system is also described as a as a cable system or a satellite system and therefore comprises a plurality of television channels. (Ex.1006-Zhang, 3:15-19, 3:45-53.) Zhang additionally describes a low noise block downconverter. (Ex.1006-Zhang, 3:15-19.)

9. Dependent Claim 8

The method of claim 3, wherein said one or more circuits reside in a customer premises satellite reception assembly.

Zhang discloses that the one or more circuits could reside in a number of different applications, such as “digital set-top boxes, PVRs, home gateways and home media centers.” (Ex.1006-Zhang, 6:52-54.) Zhang further discloses that the system may be a “home media server.” (Ex.1006-Zhang, 6:57.) A POSITA would understand that Zhang describes the one or more circuits residing in a customer premises satellite reception assembly. (Ex.1002-Schonfeld, ¶172.)

10. Dependent Claim 9

The method of claim 3, wherein said one or more circuits reside in a customer premises gateway.

Zhang discloses that the one or more circuits could reside in several

applications, such as “digital set-top boxes, PVRs, *home gateways* and home media centers.” (Ex.1006-Zhang, 6:52-54 (emphasis added).) A POSITA would understand that a “home gateway” is another name for a customer premises gateway. (Ex.1002-Schonfeld, ¶173.)

11. Dependent Claim 10

The method of claim 3, wherein a bandwidth and/or center frequency of said selected first portion is configurable during operation of said one or more circuits.

Zhang discloses digital selector 240 which receives a digital RF signal and “then selects one or more of the RF channels ... that are selected or used by a subscriber.” (Ex.1006-Zhang, 4:3-8.) Dr. Schonfeld explains that, as understood by a POSITA, this refers to changing a bandwidth and/or center frequency of a selected portion of a digital signal. (Ex.1002-Schonfeld, ¶174.) That is, the digital selector 240 selects signals by configuring a bandwidth and/or center frequency, as is well understood by POSITAs for channel selection processes. (Ex.1002-Schonfeld, ¶174.)

12. Independent Claim 11

11[pre] “A system comprising: one or more circuits that are operable to:”

See claim 3[pre], supra.

11[a] “receive a signal having a bandwidth that spans from a first frequency, F_{lo} , to a second frequency, F_{hi} , wherein said signal carries a plurality of channels;”

See VIII.A.4, limitation 3[a], supra.

11[b] “digitize said received signal from F_{lo} , to F_{hi} to generate a digitized signal;”

See VIII.A.4, limitation 3[b], supra.

11[c] “select a first portion of said digitized signal;”

See VIII.A.4, limitation 3[c], supra.

11[d] “select a second portion of said digitized signal; and”

See VIII.A.4, limitation 3[d], supra.

11[e] “concurrently output said selected first portion and said selected second portion, wherein:”

See VIII.A.4, limitation 3[e], supra.

11[f.1] “said selected first portion is output to a signal analyzer that is operable to analyze said first portion to determine one or more characteristics of said first portion,”

See VIII.A.4, limitation 3[f][1], supra.

11[f.2] “and that is operable to report said determined one or more characteristics to a source of said received signal; and”

See VIII.A.4, limitation 3[f][2], supra.

11[g] “said selected second portion is output to a data processor for recovery of data carried on one or more of said plurality of channels.”

See VIII.A.4, limitation 3[g], supra.

13. Dependent Claim 12

The system of claim 11, wherein said first portion comprises all of said received signal from F_{lo} to F_{hi} .

See VIII.A.5, claim 4, supra.

14. Dependent Claim 13

The system of claim 11, wherein said one or more characteristics is one of: signal power vs. frequency, phase vs. frequency, signal-to-noise ratio, peak-to-average ratio, noise levels, bit error rate, and symbol error rate.

See VIII.A.6, claim 5, supra.

15. Dependent Claim 14

The system of claim 11, wherein: said received signal is a cable television signal; and said plurality of channels comprises a plurality of television channels.

See VIII.A.7, claim 6, supra.

16. Dependent Claim 15

The system of claim 11, wherein: said received signal is a satellite television signal output by a low noise block downconverter; and said plurality of channels comprises a plurality of television channels.

See VIII.A.8, claim 7, supra.

17. Dependent Claim 16

The system of claim 15, wherein said one or more circuits reside in a customer premises satellite reception assembly.

See VIII.A.9, claim 8, supra.

18. Dependent Claim 17

The system of claim 11, wherein said one or more circuits reside in a customer premises gateway.

See VIII.A.10, claim 9, supra.

19. Dependent Claim 18

The system of claim 11, wherein a bandwidth and/or center frequency of said selected first portion is configurable during operation of said one or more circuits.

See VIII.A.11, claim 10, supra.

B. Ground 2: Claims 1 and 2 are Obvious over Maycock and Kidambi, and in Further View of the General Knowledge of a POSITA

If the Patent Owner argues that the plain and ordinary meaning of “entire television spectrum” requires digitization of all received signals, then the combination of Maycock and Kidambi renders claim 1 obvious because Kidambi expressly discloses digitizing an all received signals. (Ex.1007-Kidambi, [0082]-[0083].) Additionally, if Patent Owners contend that Zhang falls short of meeting this definition because down conversion results in signal filtering such that all signals are not received (which Petitioners do not concede is proper), the combination of Maycock and Kidambi teaches digitizing the entirety of a received signal. (Ex.1007-Kidambi, [0082], [0084] (“[T]he cable gateway 3100 ... uses a wideband ... analog-to-digital converter ... to digitize signals received from the cable network”).)

1. Motivation to Combine Maycock and Kidambi

See VIII.A.1, *supra*. A POSITA would be motivated to combine Maycock and Kidambi for many of the same reasons described above regarding the combination of Maycock and Zhang. First, Maycock and Kidambi disclose systems for transmitting and receiving television signals. (Ex.1005-Maycock, 4:1-6; Ex.1007-Kidambi, [0081]-[0082].) Maycock explains television providers monitor audio and video signal quality to provide high-quality that television to their end-users. (Ex.1005-Maycock, 1:31-44.) To this end, Maycock teaches monitoring television signals on a channel-by-channel basis. (Ex.1005-Maycock, 2:20-29, 3:2-16.) Upon collecting channel quality data from the television signal, Maycock teaches 1) storing the data; and 2) warning the television provider if the stored data indicates poor signal quality. (Ex.1005-Maycock, 7:21-25, 7:41-53.) This is the same type of signal monitoring discussed in the '008 patent. (*Compare* '008 patent, 3:33-45 (monitoring signals for “characteristics” such as SNR and various frequency functions) *with* Ex.1005-Maycock, 3:17-20, 6:23-29, 6:62-67 (monitoring signals for “signal quality parameters,” such as SNR, and “performance information.”).)

While Maycock discusses monitoring one channel at a time, Maycock recommends performing multiple, successive signal monitoring processes to collect data for multiple television channels. (Ex.1005-Maycock, 7:27-29, 8:1-25 (“All Channels”).) Maycock also teaches using an analog-to-digital converter 38 to

convert a selected channel for digitization (before signal monitoring), with a carefully chosen resolution “so as not to degrade the performance of the received signal.” (Ex.1005-Maycock, 4:28-30.)

Kidambi, on the other hand, emphasizes the need for wideband digitization (*e.g.*, digitizing many channels simultaneously even though it requires a “very high sampling rate.” (Ex.1007-Kidambi, [0082]-[0084]).) Kidambi details digitization using a wideband ADC 3206. (Ex.1007-Kidambi, [0084].)

Second, a POSITA would have been motivated to incorporate Kidambi’s wideband ADCs into television systems, particularly where multiple channels are monitored and/or provided to a customer for viewing. In fact, Kidambi expressly described the benefits of simultaneously digitizing multiple channels instead of single-channel digitization. (Ex.1007-Kidambi, [0082].) Dr. Schonfeld describes why a POSITA would know how to incorporate Kidambi’s wideband ADC shown in Figure 32 into Maycock’s signal monitoring system with a reasonable expectation of success. (Ex.1002-Schonfeld, ¶¶192-96.) By incorporating Kidambi’s wideband digitization, a POSITA would understand that, at the expense of a relatively small initial computational cost for digitizing the entire wideband spectrum, one gains to benefit by having more efficient digital processing system and reduced complexity by avoiding the need for single-channel digitization, which is especially advantageous when digitizing multiple channels. (Ex.1002-Schonfeld, ¶¶192-96.)

Third, the combination of Maycock and Kidambi would allow a POSITA to capture an entire television bandwidth at once and, based on Maycock, to analyze/monitor the entire television bandwidth at once. This would be obvious because it provides increased efficiency and accuracy of signal analysis and monitoring. (Ex.1002-Schonfeld, ¶¶192-96; §VIII.A.1, *supra*.)

Moreover, a POSITA would be motivated to incorporate Kidambi’s wideband ADC into to the wideband analog input signal of Maycock. Such incorporation of a wideband ADC is a standard and routine design choice in digital signal processing systems that receive analog input signals. (Ex.1002-Schonfeld, ¶196.)

2. Independent Claim 1

1[pre] “A system comprising:”

To the extent the preamble is limiting, it is taught by Maycock. Maycock is clearly directed to a “system.” (See §VIII.A.2, element *1[pre]*.)

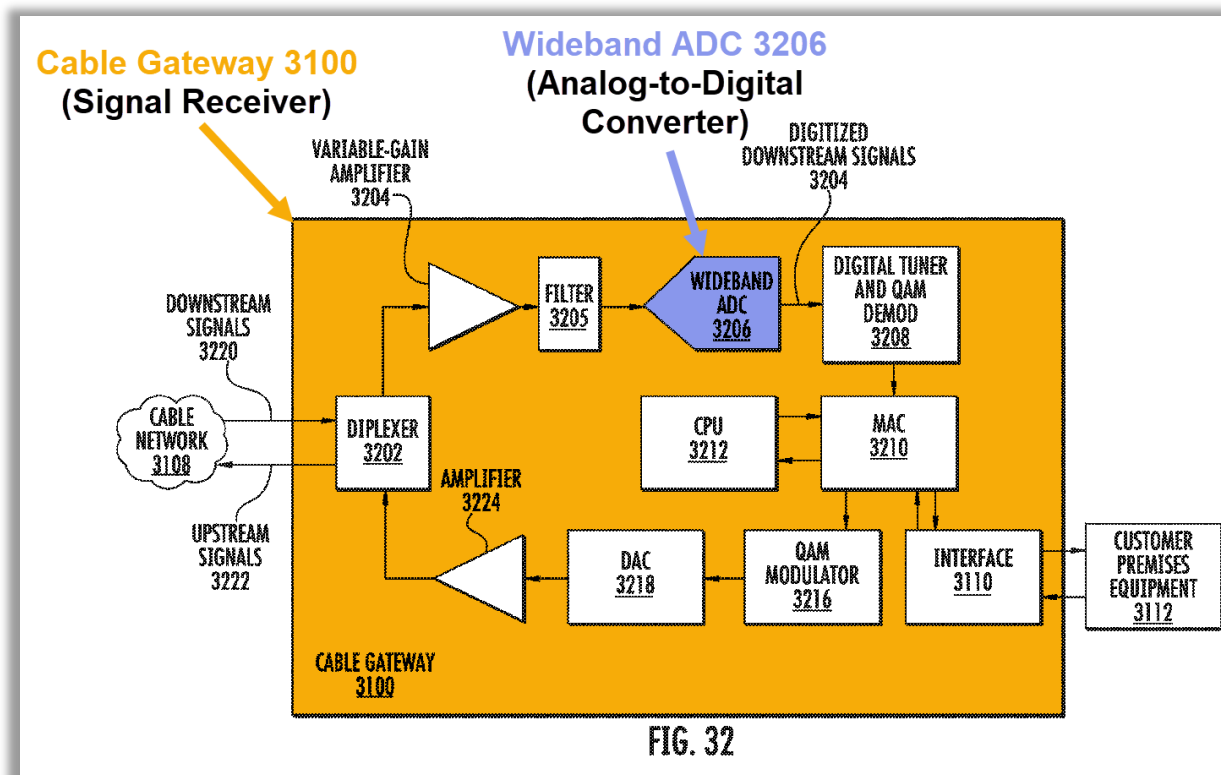
1[a] “an analog-to-digital converter operable to digitize a received signal spanning an entire television spectrum comprising a plurality of television channels, said digitization resulting in a digitized signal;”

See VIII.A.2, element *1[a]*.

Kidambi discloses a wideband capture technique where an “entire bandwidth of [a] cable system” is digitized at once. (Ex.1007-Kidambi, [0082].) If “entire television spectrum” is broadly interpreted to mean the entire spectrum received at a front-end, Kidambi expressly teaches digitizing everything that is received by a

front-end. Kidambi explains that conventional cable and/or set-top-box systems had a tuner for each individual channel where low speed ADCs could digitize a single channel at a time. (Ex.1007-Kidambi, [0081].) As high-speed ADCs became feasible, Kidambi teaches that it became possible to digitize many channels at once, providing the benefit reducing the incremental cost of adding additional channels. (Ex.1007-Kidambi, [0082].)

Referring to Figure 32, Kidambi discusses a cable gateway 3100 that receives television signals from a cable network 3108. (Ex.1007-Kidambi, [0083].) The received signals are sent to a wideband analog-to-digital converter 3206 which “digitizes the received signal” and transmits the digitized signal downstream to customer premises equipment 3112. (Ex.1007-Kidambi, [0085], Figure 32). Wideband ADC 3206 digitizes the “entire bandwidth of the cable system,” which is useful to tune multiple channels at the same time. (Ex.1007-Kidambi, [0082]-[0083].)



Kidambi - Figure 32 (Ex.1007)

Both Maycock and Kidambi disclose digitizing a received analog television signal to generate a digitized signal. Kidambi expressly discloses digitizing/converting an entire bandwidth of a television (e.g., cable) system, which corresponds to digitizing an “entire television spectrum comprising a plurality of television signals.” (Ex.1002-Schonfeld, ¶¶198-201.) A POSITA therefore would understand that the combination of Maycock and Kidambi discloses all limitations of element 1[a]. (Ex.1002-Schonfeld, ¶¶198-201.)

1[b] “a signal monitor operable to:”

See VIII.A.2, limitation 1[b], *supra*.

1[b][1] “analyze said digitized signal to determine a characteristic of said digitized signal; and”

See VIII.A.2, limitation 1[b][1], supra.

1[b][2] “report said determined characteristic to a source of said received signal;”

See VIII.A.2, limitation 1[b][2], supra.

1[c] “a data processor operable to process a television channel to recover content carried on the television channel; and”

See VIII.A.2, limitation 1[c], supra.

1[d] “a channelizer operable to:”

See VIII.A.2, limitation 1[d], supra.

1[d][1] “select a first portion of said digitized signal;”

See VIII.A.2, limitation 1[d][1], supra.

1[d][2] “select a second portion of said digitized signal; and”

See VIII.A.2, limitation 1[d][2], supra.

1[d][3] “concurrently output said first portion of said digitized signal to said signal monitor and said second portion of said digitized signal to said data processor.”

See VIII.A.2, limitation 1[d][3], supra.

3. Dependent Claim 2

The system of claim 1, wherein said first portion of said digitized signal spans said entire television spectrum.

See VIII.A.2 limitations 1[d][1] and 1[d][3], 2, supra.

C. Ground 3: Claims 3-5, 10-13, and 18 are Obvious over Coyne and Petrovic and in further view of the General Knowledge of a POSITA

1. Motivation to Combine Coyne and Petrovic

See VIII.A.1, *supra*. A POSITA would be motivated to combine Coyne and Petrovic to incorporate signal monitoring and reporting of an entire spectrum, as disclosed in Petrovic and Coyne. Both Coyne and Petrovic disclose systems for transmitting and receiving satellite signals. (Ex.1008-Coyne, [0023]; Petrovic, 7:3-8.) Moreover, Coyne and Petrovic expressly relate to processing digitizing received video signals. (Ex.1008-Coyne, [0030]; Ex.1009-Petrovic, 17:46-61.)

Coyne discusses a multichannel channelizer system used for electronic surveillance monitoring. Figure 2 of Coyne shows the use of a modulator/amplifier 270 and an antenna 280 that transmits signals after those signals are digitized at ADC 230. (Ex.1008-Coyne, [0040].)

Similarly, Petrovic discusses a monitoring system for monitoring media content. (Ex.1009-Petrovic, Abstract.) Petrovic considers a monitoring station 16, which monitors airwaves in search of encoded content. (Ex.1009-Petrovic, 7:13-14.) Petrovic additionally discloses generating a report from received signals for the purpose of measuring signal quality. (Ex.1009-Petrovic, 4:19-35.)

It would be obvious in view of Coyne's and Petrovic's teachings to apply Coyne's receiver with Petrovic's monitoring and reporting in satellite communications systems. Coyne expressly teaches that its "invention relate[s]

generally to communication systems, and particularly to digital signal processing” (Ex.1008-Coyne, [0002]) and cable and satellite television systems indeed are communications systems involving DSP. (Ex.1002-Schonfeld, ¶¶211-14.) It would have been obvious to add the monitoring and reporting functions disclosed by Petrovic, to, for example, provide the source of the signals received by Coyne with signal quality data to allow to correct for insufficient signal strength, for example by increasing transmission strength or the direction of transmission and/or to retransmit data. (Ex.1002-Schonfeld, ¶¶211-14.)

2. Independent Claim 3

3[pre] *“A method comprising: performing by one or more circuits:”*

To the extent that it is limiting, Coyne depicts and describes a method, with respect to the structure illustrated in Coyne’s various Figures. (Ex.1008-Coyne, Abstract, Figures 1-4, claim 1.) Coyne additionally discloses the use of “one or more circuits,” as claimed. (Ex.1008-Coyne, Figures 2 and 4.)

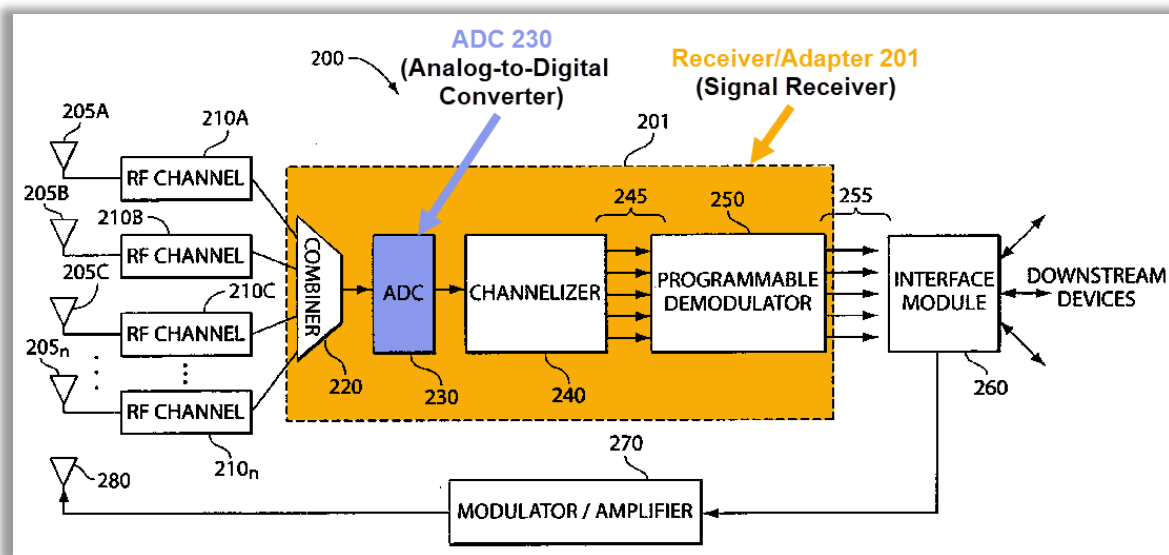
3[a] *“receiving a signal having a bandwidth that spans from a first frequency, F_{lo} , to a second frequency, F_{hi} , wherein said signal carries a plurality of channels;”*

Coyne discloses an analog-to-digital converter that digitizes a received signal comprising a plurality of channels to generate a digitized signal of the combined signals/channels using an ADC (element 230 in Figures 2 and 4). (Ex.1008-Coyne, [0022].)

As Coyne discusses with respect to Figure 2, a receiver/adaptor 201 receives incoming radio frequency (RF) signals 210A-210n from multiple antennas. (Ex.1008-Coyne, [0020]-[0021].) These RF signals are then combined into a wideband or ultra-wideband spectral space at combiner 220. (Ex.1008-Coyne, [0022].) A POSITA would understand that the incoming RF signals span from a first frequency to a second frequency, as is inherent in the incoming RF signals spanning multiple channels, and therefore *spans from a first frequency, F_{lo} , to a second frequency, F_{hi} .*

3[b] “digitizing said received signal from F_{lo} to F_{hi} to generate a digitized signal;”

Coyne discloses digitizing the received signal, spanning from a high to a low frequency. After multiple RF signals (channels) are combined at a combiner 220, the combiner 220 outputs the combined, multi-channel signal to an analog-to-digital converter (ADC 230), which digitizes (“provides a digital representation of”) the combined signal. (Ex.1008-Coyne, [0022].)

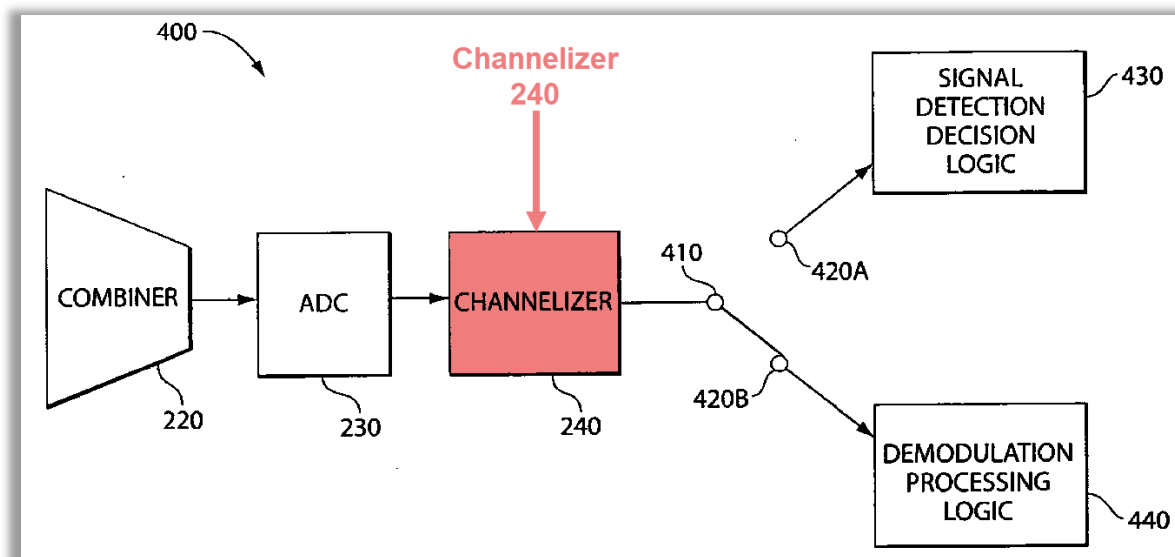


Coyne - Figure 2 (Ex.1008)

Since the digitized signal spans multiple channels combined with combiner 220 from RF channels 210A-210n, a POSITA would understand that a signal from a low to a high frequency is digitized. (Ex.1002-Schonfeld, ¶¶218-19.)

3[c] “selecting a first portion of said digitized signal;”

Coyne discloses selecting a first portion of a digitized signal. For example, Coyne discloses a channelizer 240 that channelizes the digitized signal into different channel outputs and has at least two possible output paths: one through path 420A to signal detection decision logic 430 and the other through path 420B to demodulation processing logic 440. Coyne’s channelizer sends a first portion of the digitized output of the channelizer 240 to the signal detection decision logic 430 when the switch 410 makes the connection across path 420A. (Ex.1008-Coyne, [0044], Figure 4.)



Coyne - Figure 4 (Ex.1008)

*3[d] “selecting a second portion of said digitized signal;
and”*

Coyne discloses selecting a second portion of a digitized signal. Coyne’s channelizer sends a second portion of the digitized output of the channelizer 240 to the demodulation processing logic 440 when the switch 410 makes the connection across path 420B. (Ex.1008-Coyne, [0044].)

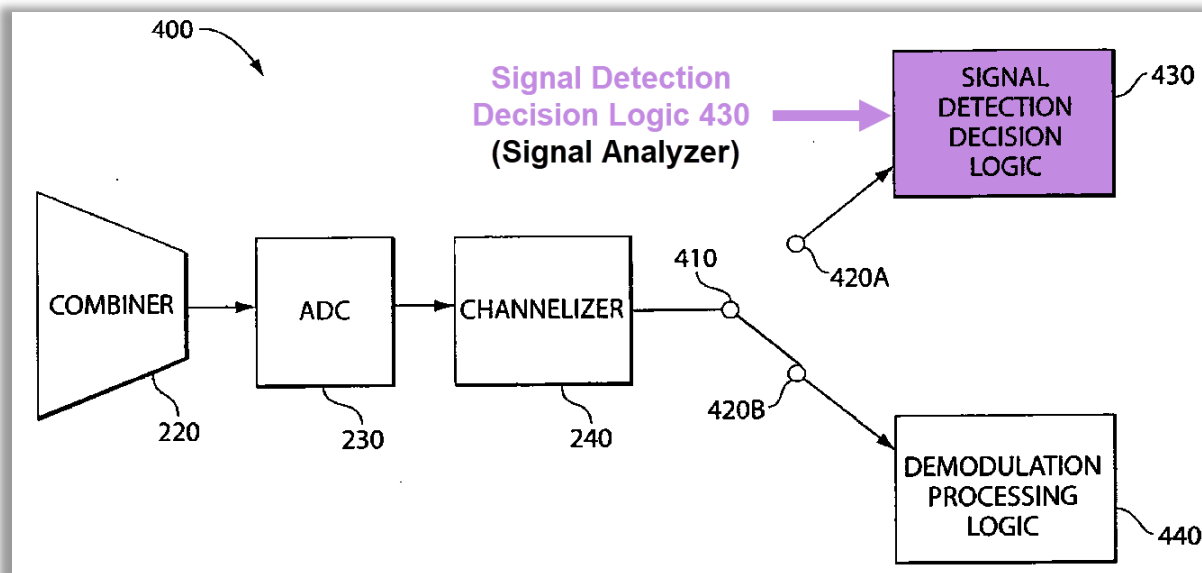
*3[e] “concurrently outputting said selected first portion and said
selected second portion, wherein:”*

Coyne discloses concurrently outputting a first portion of the digitized signal and a second portion of the digitized signal. Coyne discloses a switch 410 that can be used to send a portion of a signal to demodulation processing logic 440 or signal detection logic 430. Coyne additionally describes configurations where both signals are sent simultaneously through the use of a rapidly toggling switch. For example,

Coyne explains that “some configurations may enable the system to perform as both a receiver [*e.g.*, path 420A] and a communications adaptor [*e.g.*, path 420B] *simultaneously*.” (Ex.1008-Coyne, [0045] (emphasis added).) A POSITA would understand that a rapidly toggling switch, as depicted in Figure 4, or providing parallel output paths would allow the channelizer to concurrently output a first portion of a signal and a second portion of the signal. (Ex.1002-Schonfeld, ¶222.)

3[f][1] “said selected first portion is output to a signal analyzer which analyzes said selected first portion to determine one or more characteristics of the received signal,”

Coyne discloses that the selected first portion is output to a signal analyzer that analyzes the first portion to determine one or more characteristics of the signal. Specifically, Coyne discloses “decision logic 140” which “processes the outputs to identify whether certain of the channels contains a signal that should be selected for further processing.” (Ex.1008-Coyne, [0005].) As understood by a POSITA, Coyne’s processing of the outputs is an example signal monitoring process. (Ex.1002-Schonfeld, ¶¶223-26.) Coyne further discloses “signal detection decision logic 430,” as illustrated in Figure 4, which Coyne analogizes to decision logic 140 (*e.g.*, signal detection decision logic 430 can perform the same function as decision logic 140). (Ex.1008-Coyne, [0044], Figure 4.)

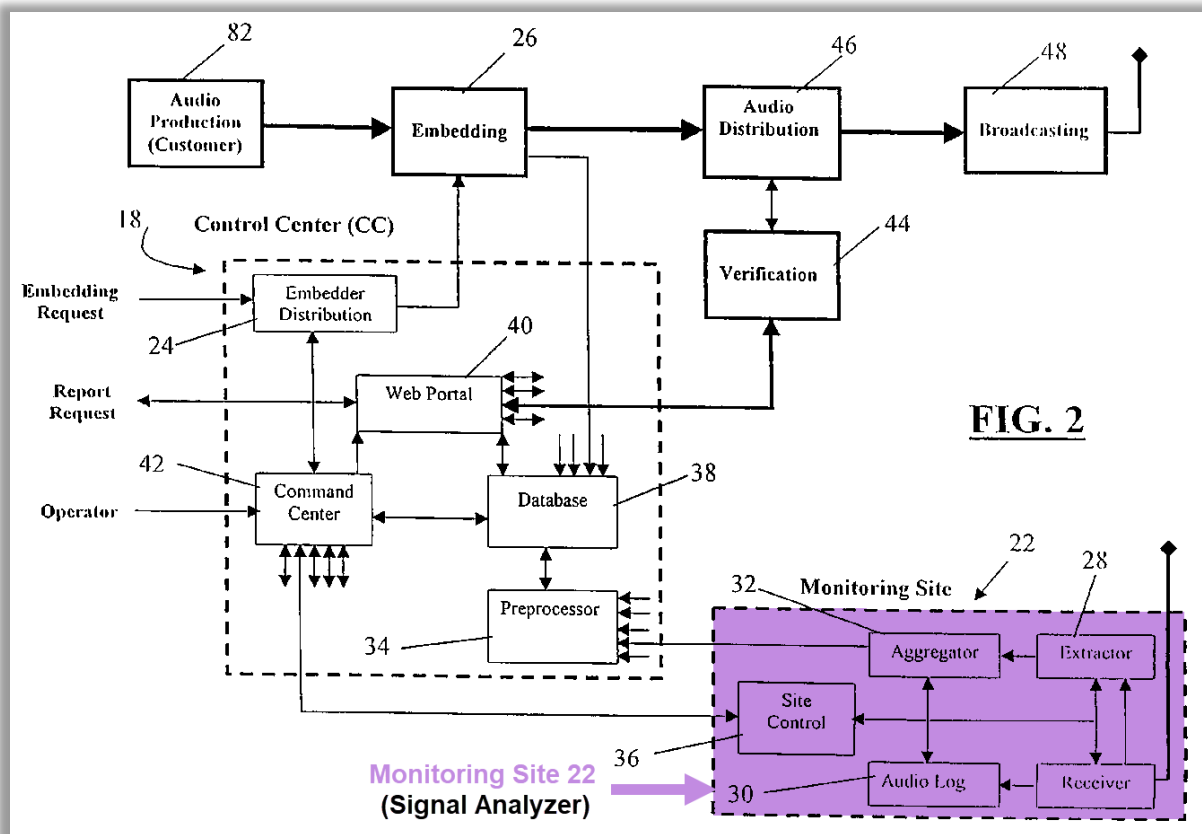


Coyne - Figure 4

Coyne further discloses analyzing a digitized signal to determine a characteristic of the digitalized signal. (Ex.1008-Coyne, [0047].) With respect to signal detection decision logic 430 and decision logic 140, Coyne discloses processing an input (*i.e.*, a digitized signal output from ADC 230) to see if the signal strength is such that it can “identify whether certain of the channels contains a signal.” (Ex.1008-Coyne, [0005].) A POSITA would understand that identifying a signal within a channel is an example “characteristic,” as the term is used in element 1[b][1]. (Ex.1002-Schonfeld, ¶¶223-26.)

Additionally, or alternatively, Petrovic discloses a monitoring site 22 that measures characteristics of incoming signals, including signal strength metrics, such as SNR. Petrovic explains that “[m]onitoring sites 22 are capable of measuring the SNR for all incoming audio signals at the signal reception sites.” (Ex.1009-Petrovic,

13:23-33.) A POSITA would understand that SNR is an example “characteristic” as the term is used in this element. (Ex.1002-Schonfeld, ¶¶223-26.)



Petrovic - Figure 2 (Ex.1009)

3[f][2] “and which reports said determined one or more characteristics to a source of said received signal; and”

Petrovic discloses reporting a determined characteristic to a source of a received signal. As discussed above with respect to element 3[f][1], Petrovic discloses a monitoring site 22 which measures SNR values from an incoming signal. Petrovic further explains that, at the monitoring side, “the RF power of the incoming broadcast signal is continually measured to ensure that it is within acceptable bounds.” (Ex.1009-Petrovic, 13:14-17.) Petrovic explains that such measurements

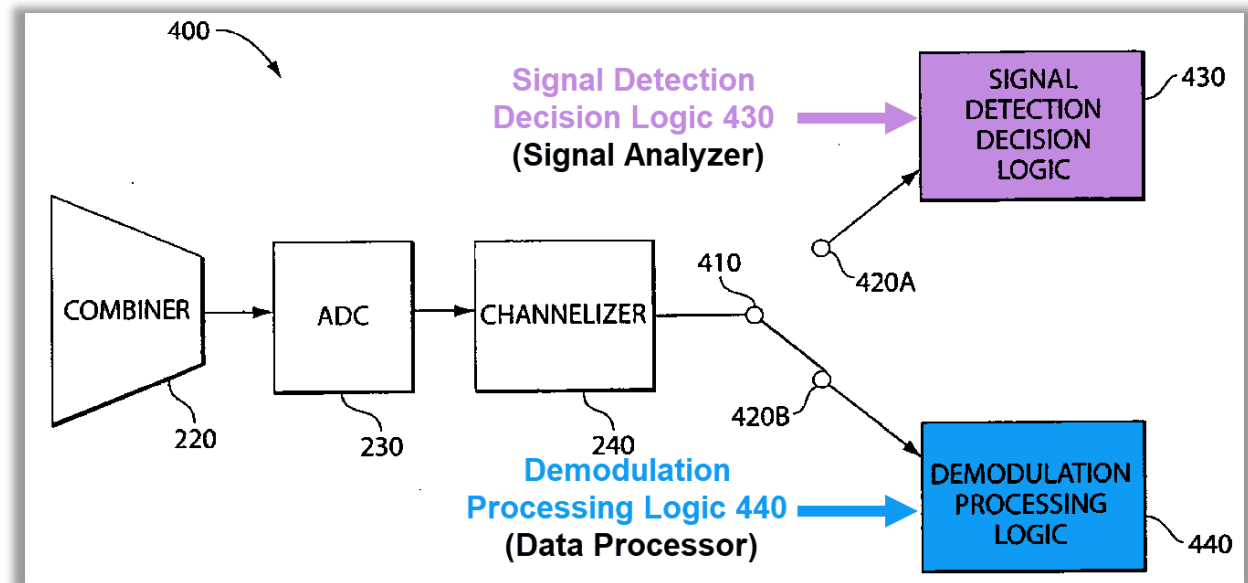
provide “valuable information regarding the quality of [an] audio signal.” (Ex.1009-Petrovic, 13:18-21.) Petrovic further discusses the generation of a report that, includes the collected data. For example, Petrovic states that “it is possible to continually monitor and log the quality of different audio stations” and that “the channel quality information for each geographical location may be shared with the customers and broadcasters.” (Ex.1009-Petrovic, 13:51-67.) From the disclosure of Petrovic, a POSITA would understand that Petrovic discloses sharing collected information (*characteristics*) with broadcasters (*source of a signal*) for the purpose of improving broadcast quality. (Ex.1002-Schonfeld, ¶227.) It would have been obvious to incorporate signal monitoring and reporting functionality disclosed by Petrovic into the channelized receiver of Coyne to provide feedback to the signal source to correct for insufficient received signal strength. (Ex.1002-Schonfeld, ¶227.)

3[g] “said selected second portion is output to a data processor for recovery of data carried on one or more of said plurality of channels.”

Coyne discloses a data processor operable to process a channel to recover data carried on the channel, *e.g.*, to extract the data carried on the one or more plurality of channels.

Coyne discloses a system where an output from an ADC can be transmitted to signal detection decision logic 430 (*e.g.*, decision logic 140) and/or to

demodulation processing logic 440 (e.g., programmable demodulator 250).
(Ex.1008-Coyne, [0044], [0047], Figure 4.)



Coyne - Figure 4

Coyne explains that the demodulation processing logic 440 (which can be equivalent to programmable demodulator 250) operates to “process[] each channel output to extract any communications data provided therein, as is well-known to those skilled in the art.” (Ex.1008-Coyne, [0032].) From the clear disclosure of Coyne, a POSITA would understand that Coyne’s demodulation processing logic 440 operates as a data processor to recover data and therefore meets the proper claim construction set forth above. (Ex.1002-Schonfeld, ¶¶228-29.)

3. Dependent Claim 4

The method of claim 3, wherein said first portion comprises all of said received signal from F_{lo} to F_{hi} .

Coyne explains that the first portion (i.e., the portion sent to the signal

analyzer) comprises all of the received signal from a low to a high frequency. Coyne explains that, in some embodiments, the disclosed system may operate simultaneously as both a receiver and a communications adaptor. (Ex.1008-Coyne, [0045].) A POSITA would understand this to mean that all of the received signal, from a low to a high frequency, is transmitted to both the signal detection decision logic 430 (*signal analyzer*) and demodulation processing logic 440 (*data processor*). (Ex.1002-Schonfeld, ¶¶230-31.)

Alternatively, Coyne explains that both signal detection decision logic 430 and demodulation processing logic 440 “may be provided by a single component.” (Ex.1008-Coyne, [0047].) A POSITA would understand that this single component may receive the entire digitized signal. (Ex.1002-Schonfeld, ¶¶230-31.)

4. Dependent Claim 5

The method of claim 3, wherein said one or more characteristics is one of: signal power vs. frequency, phase vs. frequency, signal-to-noise ratio, peak-to-average ratio, noise levels, bit error rate, and symbol error rate.

As discussed above, Petrovic discloses that one of the characteristics is a signal-to-noise ratio. (Ex.1009-Petrovic, 13:23-33 (“Monitoring sites 22 are capable of measuring the SNR for all incoming audio signals at the signal reception sites.”).) Coyne further describes monitoring the signal, *e.g.*, the signal strength, to determine if a signal is present on the particular channel. (Ex.1008-Coyne, Figures 2 and 4, [0003]-[0005], [0016], [0044]-[0047].) This limitation is disclosed by Coyne or,

alternatively, is obvious over Coyne in view of Petrovic's explicit disclosure of SNR monitoring. (Ex.1002-Schonfeld, ¶¶232.)

5. Dependent Claim 10

The method of claim 3, wherein a bandwidth and/or center frequency of said selected first portion is configurable during operation of said one or more circuits.

Coyne discloses that a bandwidth and/or center frequency of a multi-channel signal is configurable during operation. Coyne discloses the use of switch 410 to transmit information to either terminal 420A or terminal 420B. (Ex.1008-Coyne, [0044].) A POSITA would understand that a practitioner could control an operation of the switch 410, thereby allowing a bandwidth and/or a center frequency of the selected first portion to be configurable. (Ex.1002-Schonfeld, ¶233.)

6. Independent Claim 11

11[pre] "A system comprising: one or more circuits that are operable to:"

See VIII.C.2, limitation 1[pre], VIII.C.4, limitation 3[pre].

11[a] "receive a signal having a bandwidth that spans from a first frequency, F_{lo} , to a second frequency, F_{hi} , wherein said signal carries a plurality of channels;"

See VIII.C.2, limitation 3[a], supra.

11[b] "digitize said received signal from F_{lo} to F_{hi} to generate a digitized signal;"

See VIII.C.2, limitation 3[b], supra.

11[c] “select a first portion of said digitized signal;”

See VIII.C.2, limitation 3[c], *supra*.

11[d] “select a second portion of said digitized signal;
and”

See VIII.C.2, limitation 3[d], *supra*.

11[e] “concurrently output said selected first portion and said
selected second portion, wherein:”

See VIII.C.2, limitation 3[e], *supra*.

11[f.1] “said selected first portion is output to a signal analyzer
that is operable to analyze said first portion to determine one or
more characteristics of said first portion,”

See VIII.C.2, limitation 3[f][1].

11[f.2] “and that is operable to report said determined one or
more characteristics to a source of said received signal; and”

See VIII.C.2, limitation 3[f][2], *supra*.

11[g] “said selected second portion is output to a data processor
for recovery of data carried on one or more of said plurality of
channels.”

See VIII.C.2, limitation 3[g], *supra*.

7. Dependent Claim 12

*The system of claim 11, wherein said first portion comprises all of said
received signal from F_{lo} to F_{hi} .*

See VIII.C.3, claim 4, *supra*.

8. Dependent Claim 13

*The system of claim 11, wherein said one or more characteristics is one
of: signal power vs. frequency, phase vs. frequency, signal-to-noise*

ratio, peak-to-average ratio, noise levels, bit error rate, and symbol error rate.

See VIII.C.4, claim 5, *supra*.

9. Dependent Claim 18

The system of claim 11, wherein a bandwidth and/or center frequency of said selected first portion is configurable during operation of said one or more circuits.

See VIII.C.5, claim 10, *supra*.

D. Ground 4: Claims 1, 2, 6-9, and 14-17 Are Obvious over Coyne, Petrovic, and Zhang, and in further view of the General Knowledge of a POSITA

1. Motivation to Combine Coyne, Petrovic, and Zhang

See VIII.A.1, *supra*. A POSITA would be motivated to add Zhang to the combination of Coyne and Petrovic. From Coyne, a POSITA would know that many applications of Coyne's technology are possible, including to television because Coyne teaches that its invention relates generally to communication systems and specifically references satellite data. One such application is discussed in Zhang, which uses a similar multichannel ADC system in the context of cable and satellite television to users. (Ex.1006-Zhang, 3:13-35.) Petrovic also explicitly discloses that it is used in satellite and cable television systems. (Ex.1009-Petrovic, [0037].)

A POSITA would be motivated to modify Coyne in view of Petrovic to use it for the purpose of generating reports and sending those reports to a television signal operator. In this way, Coyne could be used to improve a signal quality of detected

signals, by informing signal operators of potential issues with outgoing signals. Further, as discussed above, a POSITA would be motivated to apply the multichannel receiver device of Coyne in a television context, as considered in Zhang. (Ex.1002-Schonfeld, ¶¶245-47.)

2. Independent Claim 1

1[pre] “A system comprising:”

See VIII.C.6, claim 11[pre], supra.

1[a] “an analog-to-digital converter operable to digitize a received signal spanning an entire television spectrum comprising a plurality of television channels, said digitization resulting in a digitized signal;”

Coyne discloses an ADC that digitizes the received signals comprising a plurality of channels, combines them, and digitizes them to generate a digitized signal, as discussed in § VIII.C.2, *supra*. Zhang additionally discloses an ADC that digitizes a received signal spanning an entire television spectrum and comprising a plurality of television channels.

Coyne explains that the disclosed system “may be employed in any setting in which a system adapted to perform both signal detection and communications functions is useful, such as for commercial and/or civilian uses.” (Ex.1008-Coyne, [0016].) Coyne does not explicitly discuss television systems, though it does disclose satellite systems and transmitting video and images. (Ex.1008-Coyne, [0014], [0016], [0023], [0030].) A POSITA would know that satellite communications are

commonly used for various applications, including television and military, especially in view of Petrovic's and Zhang's explicit disclosure of satellite and cable television systems. (Ex.1002-Schonfeld, ¶¶248-51.)

As discussed above in §VIII.A.2, *supra*, Zhang discusses a channelized receiver used in a cable television context, such that an ADC digitizes a received signal comprising one or more television signals received by a receiver circuit (*e.g.*, spanning an entire television spectrum). (Ex.1006-Zhang, 2:10-20, 3:45-53.) A POSITA, therefore, would understand that the combination of Coyne and Zhang discloses all limitations of element 1[a]. (Ex.1002-Schonfeld, ¶¶248-51.)

1[b] “a signal monitor operable to:”

See VIII.C.2, claim 3[c], supra.

1[b][1] “analyze said digitized signal to determine a characteristic of said digitized signal; and”

See VIII.C.2, claim 3[f], supra.

1[b][2] “report said determined characteristic to a source of said received signal;”

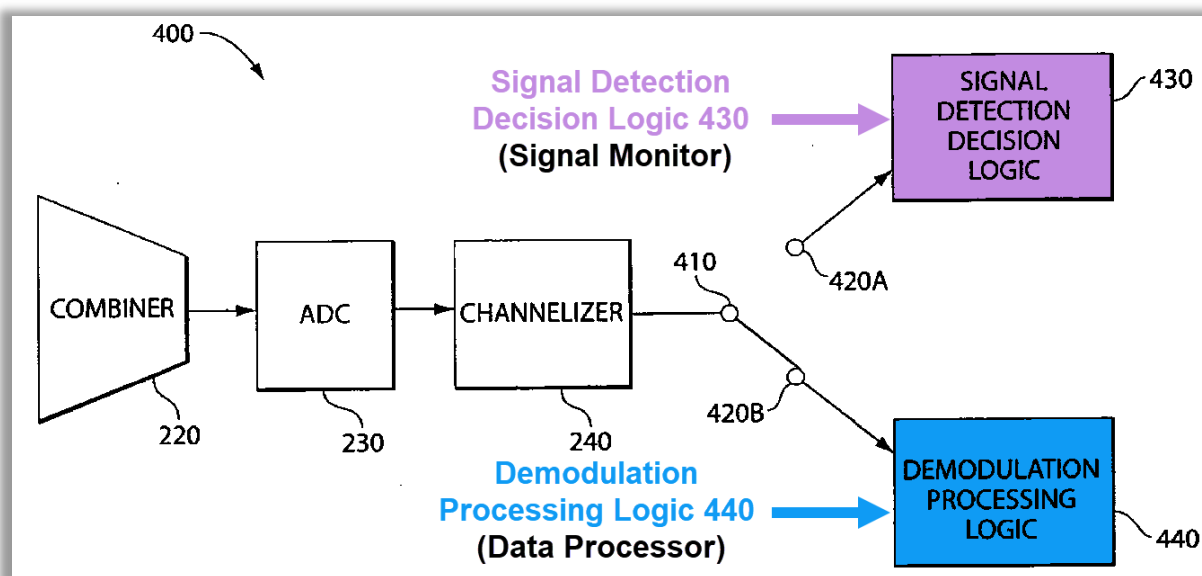
See VIII.C.2, claim 3[f], supra.

1[c] “a data processor operable to process a television channel to recover content carried on the television channel; and”

Coyne discloses a data processor operable to process a channel to recover data content carried on the channel. Zhang discloses a similar data processor operator to perform the same functionality as the data processor in Coyne, but specifically to

recover content carried on a television channel—in other words, extracting television data carried on the television channel.

Coyne discloses a system where an output from an ADC can be transmitted to signal detection decision logic 430 (e.g., decision logic 140) and/or to demodulation processing logic 440 (e.g., programmable demodulator 250). (Ex.1008-Coyne, [0044], [0047], Figure 4.)



Coyne - Figure 4 (Ex.1008)

Coyne explains that the demodulation processing logic 440 (which can be equivalent to programmable demodulator 250) operates to “process[] each channel output to extract any communications data provided therein, as is well-known to those skilled in the art.” (Ex.1008-Coyne, [0032].)

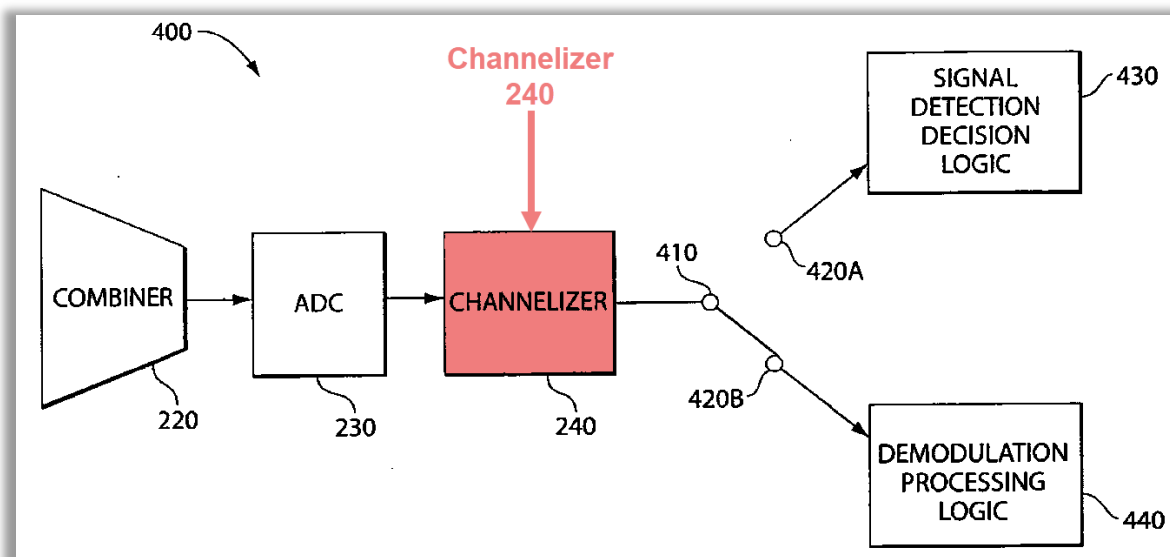
While Coyne considers several different applications for the disclosed channelized receiver, including satellite communications Ex.1008-Coyne, ([0002],

[0014], [0016], [0023]), Coyne does not explicitly identify a television system. Zhang, however, discloses a demodulator 250, which processes television channels. (Ex.1006-Zhang, 4:16-36.) As discussed above, Zhang's system is a television system that digitizes many television channels at once. The demodulator 250 disclosed in Zhang is an example of a conventional data processor in a television system. Petrovic also discloses monitoring signals in both satellite and cable television systems. (Ex.1009-Petrovic, [0037].)

A POSITA would understand that at least the combination of Coyne in view of Zhang and/or Petrovic discloses all the limitations of element $1[c]$. (Ex.1002-Schonfeld, ¶¶254-58.)

1[d] “a channelizer operable to:”

Coyne discloses a channelizer 240 that “is used to generate multiple channel outputs, each [of which] may span [] any desired portion of the entire frequency spectrum of interest.” (Ex.1008-Coyne, [0031].)



Coyne - Figure 4 (Ex.1009)

1[d][1] “select a first portion of said digitized signal;”

See VIII.C.2, claim 3[c], supra.

1[d][2] “select a second portion of said digitized signal; and”

See VIII.C.2, claim 3[d], supra.

1[d][3] “concurrently output said first portion of said digitized signal to said signal monitor and said second portion of said digitized signal to said data processor.”

See VIII.C.2, claim 3[e], supra.

3. Dependent Claim 2

The system of claim 1, wherein said first portion of said digitized signal spans said entire television spectrum.

The combination of Coyne and Zhang discloses the limitations of claim 2, where the first portion of the digitized signal spans the entire television spectrum.

As discussed with respect to elements *1[d][1]* and *1[d][3]* above, Coyne

discloses an ADC that digitizes many channels of information simultaneously. (Ex.1008-Coyne, [0022]). Although Coyne does not explicitly mention television, it discusses many military and civilian applications, including video applications. (Ex.1008-Coyne, [0016].) And, with respect to element 1[a] above, Zhang discloses methods and apparatuses for performing wideband analog-to-digital conversion so that “an entire signal band with n channels can be converted.” (Ex.1006-Zhang, 3:60-63.)

In light of the disclosure of Coyne and Zhang, a POSITA would be motivated to apply the teachings of Coyne to a television system, such as Zhang. (Ex.1002-Schonfeld, ¶¶263-66.) A combination of Coyne and Zhang would allow a POSITA to capture an entire television spectrum at once. Additionally, a POSITA would be motivated to make this combination in order to allow a customer to receive more channels without adding additional ADC elements. (Ex.1002-Schonfeld, ¶¶263-66.)

4. Dependent Claim 6

The method of claim 3, wherein: said received signal is a cable television signal; and said plurality of channels comprises a plurality of television channels.

Coyne in view of Petrovic renders obvious claim 3. *See* §VIII.C.2. Petrovic discloses monitoring in cable television systems. (Ex.1009-Petrovic, [0037].) Zhang also discloses that the received signal is a cable television signal output by a low noise block downconverter. Zhang discloses a “frequency-block down-converter

210” (low noise block downconverter) that receives a multi-channel RF signal and that outputs the processed signal to an ADC 220. (Ex.1006-Zhang, 3:15-19, 3:54-61.) Zhang additionally explains that the signal is a cable signal (Ex.1006-Zhang, 3:49) and that the signal comprises a plurality of television channels (Ex.1006-Zhang, 3:26-35). It would have been obvious to apply Coyne’s system in view of Zhang and/or Petrovic to cable and satellite television systems, as discussed for claim 1. Thus, claim 6 is obvious in view of Coyne and Petrovic and/or Zhang.

5. Dependent Claim 7

The method of claim 3, wherein: said received signal is a satellite television signal output by a low noise block downconverter; and said plurality of channels comprises a plurality of television channels.

Coyne in view of Petrovic renders obvious claim 3, as discussed in §VIII.C.2. Petrovic discloses monitoring in satellite television systems. (Ex.1009-Petrovic, [0037].) Zhang further discloses that the received signal is a satellite television signal output by a low noise block downconverter. Zhang states that the disclosed system may be a cable system or a satellite system. (Ex.1006-Zhang, 3:15-19, 3:45-53.) It would have been obvious to apply Coyne’s system in view of Zhang and/or Petrovic to cable and satellite television systems, as discussed above for claim 1. Thus, claim 7 is obvious in view of Coyne and Petrovic and/or Zhang.

6. Dependent Claim 8

The method of claim 3, wherein said one or more circuits reside in a customer premises satellite reception assembly.

Coyne in view of Petrovic renders obvious claim 3, as above in Section §VIII.C.2. Zhang additionally discloses that the one or more circuits could reside in a number of different applications, such as “digital set-top boxes, PVRs, home gateways and home media centers.” (Ex.1006-Zhang, 6:52-54.) Zhang further discloses that the system may be a “home media server.” (Ex.1006-Zhang, 6:57.) A POSITA would understand that this language of Zhang refers to the one or more circuits residing in a customer premises satellite reception assembly. (Ex.1002-Schonfeld, ¶269.) It would have been obvious to apply Coyne’s system in view of Zhang and/or Petrovic to cable and satellite television systems, including in a customer premises satellite reception assembly (*e.g.*, a receiver) as discussed above for claim 1. Thus, claim 8 is obvious in view of Coyne and Petrovic and/or Zhang.

7. Dependent Claim 9

The method of claim 3, wherein said one or more circuits reside in a customer premises gateway.

Coyne in view of Petrovic renders obvious claim 3, as discussed in §VIII.C.2. Petrovic discloses monitoring in satellite television systems. (Ex.1009-Petrovic, [0037].) Zhang discloses that the one or more circuits could reside in a number of different applications, such as “digital set-top boxes, PVRs, *home gateways* and home media centers.” (Ex.1006-Zhang, 6:52-54 (emphasis added).) A POSITA

would understand that a “home gateway” is another name for a customer premises gateway. (Ex.1002-Schonfeld, ¶270.) It would have been obvious to apply Coyne’s system in view of Zhang and/or Petrovic to cable and satellite television systems, including in a customer premises gateway (*e.g.*, a receiver) as discussed above for claim 1. Thus, claim 9 is obvious in view of Coyne and Petrovic and/or Zhang.

8. Dependent Claim 14

The system of claim 11, wherein: said received signal is a cable television signal; and said plurality of channels comprises a plurality of television channels.

See VIII.D.4, claim 6, supra.

9. Dependent Claim 15

The system of claim 11, wherein: said received signal is a satellite television signal output by a low noise block downconverter; and said plurality of channels comprises a plurality of television channels.

See VIII.D.5, claim 7, supra.

10. Dependent Claim 16

The system of claim 15, wherein said one or more circuits reside in a customer premises satellite reception assembly.

See VIII.D.6, claim 8, supra.

11. Dependent Claim 17

The system of claim 11, wherein said one or more circuits reside in a customer premises gateway.

See VIII.D.7, claim 9, supra.

IX. DISCRETIONARY DENIAL IS INAPPROPRIATE

A. Discretionary Denial Under 35 U.S.C. § 314(a) Is Inappropriate.

Consistent with the Director's June 21, 2002, Guidance, Petitioners agree not to proceed in the related district court litigation against the challenged claims on the same grounds included in the Petition or any grounds that could have reasonably been raised if the Petition is instituted.

X. CONCLUSION

For the above reasons, claims 1-18 are invalid and should be canceled.

Dated: February 6, 2023

Respectfully submitted,

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CERTIFICATE OF WORD COUNT UNDER 37 CFR § 42.24(d)

Under 37 C.F.R. § 42.24(d), the undersigned certifies that the word count for this *Petition for Inter Partes Review* totals 13,747, excluding the parts exempted by 37 C.F.R. § 42.24(a).

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Dated: February 6, 2023

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that true copies of this PETITION FOR INTER PARTES REVIEW OF U.S. PATENT NO. 8,792,008 and supporting materials (Exhibits 1001-1031 and Power of Attorney) have been served by FedEx® delivery service on Patent Owner at the correspondence address for the attorney of record for the '008 Patent shown in USPTO records:

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