

EXECUTIVE SUMMARY FOR THE SALE OF

HD Video Capture and Display Patent Portfolio

(Multi-Format, Inc.)

16 Assets Total
38 Claim Charts

7 US Patents, 2 Pending US Patent Applications
2 Canadian Patents; 3 Japanese Patents; 1 Chinese Patent
1 European Pending Patent Application

Patent Number	Title	Priority Date	Issue Date	Exp. Date	Bwd/ Fwd Citations
US Pat. No. 5,999,220 (see claim charts)	Multi-Format Audio/video Production System with Frame Rate Conversion	Apr 7, 1997	Dec 7, 1999	Apr 7, 2017	40/85
US Pat. No. 6,370,198 (see claim charts)	Wide Band Multi-Format Audio-Video Production System with Frame Rate Conversion (CIP of US Pat. No. 5,999,220)	Apr 7, 1997	Apr 9, 2002	Apr 7, 2017	10/74
US Pat. No. 7,474,696	Wide Band Multi-Format Audio-Video Production System with Frame-Rate Conversion (CIP of US Pat. No. 6,370,198)	Apr 7, 1997	Jan 6, 2009	Jul 15, 2019 (Extended by 831 days)	14/4
US Pat. No. 8,228,979	Wide Band Multi-Format Audio-Video Production System with Frame-Rate Conversion (CIP of US Pat. No. 7,474,696)	Apr 7, 1997	Jul 24, 2012	Apr 7, 2017	47/6
US Pat. No. 8,374,253 (see claim charts)	Wide Band Multi-Format Audio-Video Production System with Frame-Rate Conversion (Cont. Continuation of US Pat. No. 8,228,979)	Apr 7, 1997	Feb 12, 2013	Apr 7, 2017	25/0
US Pat. No. 8,842,727 (see claim charts)	Wide Band Multi-Format Audio-Video Production System with Frame-Rate Conversion (Cont. of US Pat. No. 8,228,979)	Apr 7, 1997	Sept. 23, 2014	Apr 7, 2017	32/0

Patent Number	Title	Priority Date	Issue Date	Exp. Date	Bwd/ Fwd Citations
US Pat. No. 8,873,640 (see claim charts)	Wide Band Multi-Format Audio-Video Production System with Frame-Rate Conversion (Cont. of US Pat. No. 8,374,253)	Apr 7, 1997	Oct. 28, 2014	Apr 7, 2017	33/0
US Pat. Appl. 14/493,291 (Unpublished)	Wide Band Multi-Format Audio-Video Production System with Frame-Rate Conversion (Cont. of US Pat. No. 8,842,727)	Apr 7, 1997	Pending/ Filed Sep 22, 2014		
US Pat. Appl. 14/525,142 (Unpublished)	Wide Band Multi-Format Audio-Video Recording and Production System with Frame-Rate Conversion (Cont. of US Pat. No. 8,873,640)	Apr 7, 1997	Pending/ Filed Oct 27, 2014		
CA Pat. No. 2,286,194	Multi-Format Audio/video Production System with Frame Rate Conversion (CA version of US Pat. No. 5,999,220)	Apr 7, 1997	January 10, 2006		
CA Pat. No. 2,332,049	Wide Band Multi-Format Audio-Video Production System with Frame Rate Conversion (CA version of US Pat. No. 6,370,198)	May 7, 1998	January 3, 2006		
EU Pat. Appl. 99922863.8	Wide Band Multi-Format Audio - Video Production System with Frame-Rate Conversion (EU version of US Pat. No. 6,370,198)	May 7, 1998	Pending/Filed May 7, 1999		
JP Pat. No. 4412744	Wide Band Multi-Format Audio-Video Production System with Frame Rate Conversion (Japanese version of US Pat. No. 5,999,220)	Apr 7, 1997	Nov. 27, 2009	Apr 7, 2018	N/A
JP Pat. No. 4485056	Wide Band Multi-Format Audio-Video Production System with Frame Rate Conversion (Japanese version of US Pat. No. 6,370,198)	Apr 7, 1997	Apr. 2, 2010	May 7, 2019	N/A
JP Pat. No. 4485496	Wide Band Multi-Format Audio-Video Production System with Frame Rate Conversion (Japanese version of US Pat. Nos. 7,474,696 and 8,228,979)	Apr 7, 1997	Feb 4, 2010	May 7, 2019	N/A
Chinese Pat No. 1127852C (filed as 998 07625.2)	Wide Band Multi-Format Audio-Video Production System with Frame Rate Conversion (Chinese version of US Pat. No. 6,370,198)	May 7, 1999	Nov 12, 2003	May 7, 2019	N/A

Evidence of Use: 38 Claim Charts on:

(**Instructions:** to access each claim chart separately, please click on hypertext links below. More details are provided in [Section 10 - "Evidence of Use"](#) - starting at page 17).

1. Industry-wide device categories:

- [Blu-Ray Players](#) (US Pat. No. 8,842,727)
- [HDTV/UHDTV](#) (US Pat. No. 8,842,727)
- [Smartphones](#) (US Pat. No. 8,873,640)
- [PCs/Laptops/Notebooks Supporting 24p Streaming with HDMI Output](#) (US Pat. No. 8,842,727)
- [PCs/Laptops with Blu-ray Disc Drives and HDMI Output](#) (US Pat. No. 8,842,727)

2. Specific manufacturer devices:

- **Canon**
 - [Canon EOS C300/C300PL Camera](#) (US Pat. No. 8,374,253)
 - [Canon EOS C300/C300PL Camera](#) (US Pat. No. 8,873,640)
 - [Canon EOS C300/C300PL Camera](#) (US Pat. No. 5,999,220)
- **HTC**
 - [One Smartphone](#) (US Pat. No. 8,374,253)
 - [One Smartphone](#) (US Pat. No. 8,873,640)
- **LG**
 - [Blu-ray Player](#) (US Pat. No. 8,842,727)
 - [Android Smartphones \(Slo-Motion\)](#) (US Pat. No. 8,873,640)
 - [UHDTV](#) (US Pat. No. 8,842,727)
- **Microsoft**
 - [Xbox 360](#) (US Pat. No. 6,370,198)
 - [XBox One Blu-ray & DVD](#) (US Pat. No. 6,370,198)
 - [XBox One Streaming](#) (US Pat. No. 6,370,198)
- **Nikon**
 - [D800 DSLR Camera](#) (US Pat. No. 5,999,220)
 - [D800/D800E DSLR Camera](#) (US Pat. No. 8,374,253)
 - [D800/D800E DSLR Camera](#) (US Pat. No. 8,873,640)
 - [D5300 DSLR Camera](#) (US Pat. No. 5,999,220)
- **Panasonic**
 - [UHDTV and HDTV](#) (US Pat. No. 8,842,727)

- **Samsung**
 - [UHDTV and HDTV with Auto Motion Plus](#) (US Pat. No. 6,370,198)
 - [BD-F5700 Blu-ray Player](#) (US Pat. No. 6,370,198)
 - [Galaxy S4 Smartphone](#) (US Pat. No. 8,374,253)
 - [Galaxy S4 Smartphone](#) (US Pat. No. 8,873,640)
 - [Galaxy S5 Smartphone](#) (US Pat. No. 8,374,253)
 - [Smartphone with Slo-motion](#) (US Pat. No. 8,873,640)
 - [UHDTV and HDTV](#) (US Pat. No. 8,842,727)
- **Sharp**
 - [UHDTV and HDTV](#) (US Pat. No. 8,842,727)
- **Sony**
 - [BDP-BX510 Blu-ray Player](#) (US Pat. No. 6,370,198)
 - [MotionFlow HDTV](#) (US Pat. No. 6,370,198)
 - [NEX-VG900 Camcorder](#) (US Pat. No. 8,374,253)
 - [NEX-VG900 Camcorder](#) (US Pat. No. 8,873,640)
 - [PlayStation 3 and PlayStation 4](#) (US Pat. No. 6,370,198)
 - [SLT-A99 Camera](#) (US Pat. No. 8,374,253)
 - [SLT-A99 Camera](#) (US Pat. No. 8,873,640)
- **Vizio**
 - [SmoothMotion HDTV](#) (US Pat. No. 6,370,198)
 - [UHDTV](#) (US Pat. No. 8,842,727)

Encumbrances: Only one US licensee. Information available under NDA. Licensee is NOT a target.

Pricing Guidance*: This portfolio is unique. Our pricing guidance reflects this and is set at **\$US mid 7 figures**. *The seller is also open to alternative deal structures that include some upfront payment and some backend revenue sharing.

Submission Deadline: None. Offers will be treated in the order they are received.

Important Disclaimer: This document includes information regarding the sale of a valuable patent portfolio. The information, data, and charts are provided only for each prospective buyers use in independently evaluating the portfolio. The discussion of the use or applicability of the portfolio is only for illustrative purposes. This document and any documents exchanged during the sales process are not intended to be, and should not be interpreted as being, a notice of infringement, any form of accusation of infringement, or any opinion regarding the actual use of the patent portfolio.

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EXECUTIVE SUMMARY

1. The Opportunity

Tangible IP, LLC is a leading patent brokerage firm focusing on high value, high quality portfolios with over 2000 assets sold since inception. We are the exclusive agent to divest all patent assets of **Multi-Format, Inc.** in the **high definition (HD) video capture and display** market. With this portfolio, we offer an unprecedented opportunity for interested parties. Commercial industry buyers can obtain strategic offensive and defensive positions with the portfolio. Institutional investors can monetize the portfolio through licensing programs that continue the asset's successful, revenue generation capability. The assets have been cited by others close to 200 times and cover a broad range of commercially successful technologies. They also map with a myriad of consumer devices (and categories of devices), as reflected by the **38 very detailed claim charts** that our experts were able to prepare, **including many mappings that apply to whole device categories such as PCs, laptops, notebooks, Blu-ray players, HDTVs and UHD TVs.**

This portfolio has its roots in filings made in the mid 90's and pertains to functionality that enables optimization of HD video quality, and more specifically to automatic video frame-rate conversion and resolution up-scaling. Historically, standard television content was broadcast in the US using the NTSC standard of 480 lines and 30 frames-per-second (fps) interlaced (referred to as both 30i and 60i), while film content was recorded at 24 fps with a much greater analog resolution. For years, DVD's, which were designed for viewing using a DVD player attached to a standard TV (480i), were produced with a Telecine machine (or computerized digital equivalent) using a 2:3 pulldown technique (also referred to as 3:2 pulldown) to convert progressive frames recorded at 24 fps to interlaced frames at 30i; producing an undesirable "judder" effect.

When Blu-ray disc content was first introduced in the US in 2006, HDTVs had had been in existence for several years, although most supported 1080i and 720p (both over-the-air HD broadcast standards). Manufacturers had introduced HDTVs that supported 1080p in hope that broadcasters would begin broadcasting content at 1080p, but this did not occur. The original Blu-ray disc content was recorded at full HD fidelity using progressive frames having a resolution of 1920x1080 pixels (1080p) at a frame-rate of 60fps (sometimes now referred to as 1080/60p). To accomplish this result, film content captured on film at 24fps was once again converted to 60p using a 2:3 pulldown scheme (using a resolution of 1920x1080 as opposed to the 704x480 resolution used for DVDs).

Around 2008, HDTV manufacturers started producing HDTVs with refresh rates of 120Hz, and subsequently 240 Hz (both are common today). 120Hz was chosen because it was the lowest common denominator for both 24 and 30. This enabled Blu-ray content to be encoded at its native 24fps, removing the judder effect. Blu-ray players were introduced that would generate an HDMI 1080/24p output that was received by the 120Hz HDTV and converted to a 120Hz refresh rate using 5:5 pulldown (basically repeating the same frame 5 times in a row). The playback mode still exists today, and is referred to as 24p “True Cinema” by Sony and similar names by other manufacturers (e.g., Real Cinema for LG, 24p Cinematic Playback for Panasonic, and 24p Cinema Smooth by Samsung.)

Today, the vast majority of Blu-ray disc content is encoded at 24p, although there are some TV shows on Blu-ray that are encoded at 60p (since they were shot at 60p to support 720p HDTV broadcasts). To support older HDTVs, today’s Blu-ray players perform a 24p to 60p (or 24p to 60i) conversion during playback for HDTVs that do not accept a 24p HDMI input signal.

In addition to 24p playback, various TV manufacturers, led by Sony, developed inter-frame interpolation technologies to “smooth” out content recorded at lower frame rates. This is also referred to as motion interpolation. These schemes generate and intersperse phantom or pseudo frames from real frames, with the objective of enhancing the smoothness of the playback, resulting in an increased frame rate. The motion smoothing modes reduce judder and visual artifacts when compared to playback of the original frames.

Today, HDTV (and UHDTV) manufacturers such as Sony and Samsung claim their HDTV motion interpolation technologies produce artificial frame rates that are much greater than even 240Hz. For example, both Sony and Samsung advertise effective frame rates of more than 1000fps. Regardless, this increased frame rates are obtained using inter-frame interpolation techniques.

More than a decade before Blu-ray players became available, inventor Kinja Washino recognized that since film was recorded at 24fps, this should be a universal format that could be used internally to produce output video signals at various frame rates and resolutions, wherein such output video signals could be played back on future TVs. At the time, the HDTV standards were still being defined (there were both analog and digital HDTV standards), and the first HDTV broadcast signal in the US had yet to occur. A native of Japan, Mr. Washino had been closely following the development of HDTV in Japan, which preceded its development in the US. In addition to using 24fps as his universal frame rate, Mr. Washino envisioned a digital format based on 24fps progressive content that could support both frame-rate changes and resolution up-scaling using

high-speed digital processing in combination with large capacity memory that supported asynchronous access.

2. Market Relevance

Today, the techniques covered by the patents in the Multi-format portfolio are widely practiced in a number of markets, including:

- i) “Smart TVs”, including HDTVs and UHDTVs capable of receiving streaming content;**
- ii) Streaming media devices including Blu-ray players and streaming media boxes;**
- iii) Gaming platforms;**
- iv) Portable video recording devices including camcorders;**
- v) DLSR cameras (including professional level cameras from large Japanese manufacturers);**
- vi) Smartphones supporting slow-motion video recording.**
- vii) Tablets; and,**
- viii) PCs and laptops capable of generating external HDTV signals (e.g., via an HDMI port or UML interface)**

In addition, the video conversion techniques taught by the patents are widely used to convert existing content to streaming content encoded at different frame rates and resolutions on large scales by **leading streaming companies**. The average US household owns [two streaming video devices](#), a 25% increase since mid-late 2013. The US market for streaming devices only is expected to grow [21% by end of 2014](#), hitting [\\$10.7 billion](#).

The relevant market corresponds with industries that ship approximately **2.05 billion units** per year. The sheer scale of the licensing market indicates extremely high licensing fee potential.

- i) Smart TVs: [123 million](#) units projected for 2014.**
 - HDTV: global market of [\\$14.2 billion](#).
 - UHD TV: global shipments to break [45 million](#) units per year in 2016.
 - Samsung UHD TV and HDTV alone: \$3,220,197,120 in global sales.
- ii) Streaming Media Devices:**
 - Streaming boxes. [11.6 million](#) units sold in 2013.
 - Blu-Ray players. [105 million](#) units projected to be sold globally in 2015.

- iii) **Gaming platforms.** [203 million](#) units sold in 2013.
 - Xbox 360: \$25,199,160,000 in global sales.
 - Xbox One: \$3,839,000,000 in global sales.
- iv) **Camcorders.** [17.5 million](#) units sold in 2013.
- v) **DLSR cameras.** [17.2 million](#) units sold in 2012.
- vi) **Smart Phones.** reached a \$150.3 billion global market in 2014.
 - HTC One: \$299,995,000 in global sales.
 - LG G3: \$4,999,900,000 in global sales.
 - Samsung Note 4: \$3,149,955,000 in global sales.
 - Samsung Galaxy 4: \$29,519,200,000 in global sales.
 - Samsung Galaxy 5: \$779,9880,000 in global sales.
- vii) **Tablets.** [263 million](#) units projected for 2014.
- viii) **PC and laptop** shipments hover around [300 million units](#) year after year and should remain fairly constant until 2018. Most models released in the past few years are capable of generating external HDTV signals (e.g., via an HDMI port or UML interface)

3. The Inventor

An inventor of all patents on offer, Kinya (“Ken”) Washino, is the epitome of the ingenuous tinkerer who used inventive skills and a deep understanding of the industry to resolve a long standing problem and succeeded where others had failed.

Ken was born in Aichi prefecture, Japan, on Feb. 21, 1953. His parents operated a small commercial farm in this rural area. He became interested in communications and electronics at an early age, acquiring an Amateur Ham Radio License by the time he was 13 years old. During his junior high school and high school years, he built a Transmitter and receiver from salvaged parts of an old tube TV. From such experiences, he learned the basics of analog communications.

In 1974, Ken found a position as an audio recording engineer with a Japanese documentary film company working in the US. This expanded to other production and post-production tasks. During

the years that Ken worked in this business, he gained a working knowledge of film production and of production and post-production processes.

After Ken returned to Japan he earned an Electronics Engineering degree from Nihon Kogakuin Technical College in Tokyo, Japan in 1979, and in 1981 acquired a First Class Broadcast Engineering license. By that time, Ken was already working as a camera design engineer for Ikegami, a Japanese manufacturer of high-end video cameras. In 1985 he was appointed Video Field Sales Engineer and sent to the US. This experience enabled Ken to acquire a deep insight into the competitive market for equipment and services and to appreciate the needs and problems of video professionals. Ken then decided to permanently establish himself in the US and formed his own video services company, focused on video production, post-production and video cassette duplication in New York City.

By late 1986, Ken had acquired the market knowledge, technical skills and financial resources to begin working on some ideas he had to improve efficiency and preserve quality in video field production. He identified the need for a universal camera control system and developed a prototype. Later experimentation with early digital video devices soon lead to his 1992 inventions for Video Field Production, Video Monitoring and Conferencing, and PC-Based Audio/Video Production. In 1989 he began working on high-speed video duplication and began working with colleague Barry Schwab on his first actual patent application, which was filed in 1993.

From then on, Schwab collaborated on fully developing Ken's earliest inventions, filing applications for them, and jointly developing a long series of inventions related to video production, post-production and signal distribution that could accommodate the coming digital and High-Definition "multiple format" future (Hence the name of his Company).

In 1995, having been granted several powerful patents, Ken formed Multi-Format, Inc. and began efforts to secure manufacturing partners or licensees for his inventions. Current licensees include two multi-billion-dollar international manufacturers and several smaller but notable firms in their fields. As of October, 2014, Ken has been granted 20 patents on inventions for which he is the inventor or co-inventor, and those patents have 14 foreign equivalents.

4. The Patent Portfolio on Offer

The patent portfolio consists of 7 issued US patents, 2 related US pending patent applications, 2 corresponding issued Canadian patents, 3 corresponding issued Japanese patents and 1 corresponding pending European patenting applications. **The US portfolio alone has 92 issued**

claims, including 18 independent claims and will count several more as the US pending applications continue to issue. Most of the patents have a very early priority date (1997), and include claims covering subject matter that was not introduced into worldwide markets until many years, if not more than a decade later. Together, **the patents have been cited over 170 times** by other applicants.

The technology was developed in the mid-1990s in anticipation of the emergence of multiple HD formats. By 1996-97, the technology was reduced to practice by the seller and has since been widely commercially implemented by the industry.

5. Detailed Portfolio Review

The full analysis of this portfolio and [all claim charts accessible below](#) were prepared by [Mr. Alan Burnett](#), a patent attorney with 30 years combined legal and engineering experience. Alan has spent the past ten years performing patent analysis and valuation work relating to hundreds of portfolios, resulting in over \$100M in acquisition transactions. He has also prepared and prosecuted over 400 patent applications in a wide variety of software, electrical, mechanical, and computer system arts. Alan's skills set combine a thorough understand of today's licensing and assertion considerations with a strong background in patent prosecution and a fundamental understanding of the underlying technology resulting from years of engineering practice.

Alan is formerly a Sr. Licensing Attorney and Portfolio Administrator for Intellectual Ventures (IV), where he was involved with acquisition and management of prosecution for IV's wireless, networking, and computer architecture portfolios, was a lead attorney for software licensing, and also provided licensing support for the wireless portfolio. Prior to IV, Alan was a partner with Blakely, Sokoloff, Taylor, and Zafman, one of the leading patent firms on the West coasts. Alan graduated from Washington State University with a B.S. in Mechanical Engineering. He received his Masters of Science in Mechanical Engineering from the University of Washington and his J.D. from the University Of Washington School Of Law.

US Patent Nos. 5,999,220: An audio/video production system that facilitates professional quality image manipulation and editing. A program input translates into a variety of graphics or television formats, including NTSC, PAL, SECAM and HDTV. The input is stored as data-compressed images, using methods such as Motion JPEG, MPEG. The images may be re-sized to produce a desired aspect ratio or dimensions using techniques such as pixel interpolation. Signals within the video data stream can control "pan/scan" operations at a receiving video display unit, where the unit would not have the same aspect ratio as the source signal.

Criteria like regional or geographical Information may restrict program material playback. Frame rate conversion to/from conventional formats is done by using the prevailing techniques employed for film-to-NTSC and film-to-PAL transfers, inter-frame interpolation or reproduction of the program

at a selected non-standard frame rate. By selecting optimal digitizing parameters, the system allows a user to establish an inter-related family of aspect ratios, resolutions, and frame rates, yet remain compatible with currently available and planned graphics and television formats.

US Patent Nos. 6,370,198, 7,474,696, 8,228,979, and 8,374,253, 8,842,727 and 8,873,640: A multi-format digital video production system that enables a user to process an input video program to produce an output version of the program in a format with a different frame rate or pixel dimensions. An internal production format of 24 fps can provide the greatest compatibility with existing and planned formats associated with HDTV standard 4:3 or widescreen 16:9 high-definition television and film. Images are re-sized horizontally and vertically by pixel interpolation, producing larger or smaller image dimensions. Frame rates are adapted by inter-frame interpolation or by traditional schemes like “3:2 pull-down” for 24-to-30 fps conversions. Frame-rate changes are performed using a program storage facility with asynchronous reading and writing capabilities, which facilitates inter-frame and intra-frame pixel manipulation in real-time. The step of converting the signal to HDTV format is preferably performed using a modified up-conversion process for wideband signals and a resizing to HDTV format frame dimensions in pixels.

US Patent No. 8,842,727: The ‘727 patent claims are directed to video apparatus that receive compressed video content from a source that is decompressed to generate uncompressed video content in an internal format having a frame rate of 24 fps comprising progressive frames of pixel image data having an original pixel resolution. The pixel image data is then processed to convert the frame rate to a higher frame rate and to output an HDTV video signal having the higher frame rate and a pixel resolution of at least 1920x1080 pixels. Video content that is originally encoded at 24 fps will result in a 24 fps decompressed format by default, thus the claims cover any device that receives or reads video content encoded at 24 fps and performs a frame rate conversion of that content to output an HDTV video signal having full HD resolution. The ‘727 claims further cover upscaling to 3840x3160 pixel (“4K”) resolution (employed by all UHD TVs that support streaming media), repeating frames to produce a frame rate that is an integer multiple of 24 fps (i.e., as practiced by HDTVs and UHD TVs that employ $n:n$ pulldown in “True Cinema” and similar modes), inter-frame interpolation (as practiced by HDTVs and UHD TVs supporting motion interpolation), use of sources including streaming media sources, cable and satellite broadcast sources, and reading video content stored on a DVD-type disk (e.g., a Blu-ray disc). Claim set 21 is specifically directed at Blu-ray disc players that support receipt and playback of streaming media encoded at 24 fps (e.g., 1080/24p streamed by Netflix and others) in addition to standard Blu-ray disc playback capabilities. 8,842,727 has a pending continuation (US Patent Appl. No. 14/493,921).

US Patent No. 8,873,640: The '640 patent claims are directed to portable video recording devices having an image sensor and high-capacity digital storage means supporting asynchronous access for recording and reproducing. An input video image is received at the image sensor and sampled using a sampling frequency of at least 30 megahertz to generate video image data having an internal format employing a first frame rate and having a first image dimension in pixels. A video program comprising video image data in the internal format is then recorded using the high-capacity digital storage means; and video image data in the internal format is manipulated on a selective basis to output video content in an output video format having a second frame rate different than the first frame rate and a selected image dimension in pixels. The '640 claims cover any portable video recording device that is capable of recording video content using a first frame rate, and outputting video content having a different frame rate at a selected resolution. Video recording at 720p and above, which is supported by all modern camcorders, DSLR cameras, and smartphones, requires sampling frequencies of greater than 30 megahertz. The dependent claims include coverage of portable video recording devices that employ a first frame rate of 24 fps and support video output of 1080/60p; 1080/30p; 1080/48p (new format used for "film" recording using digital camera equipment) and upscaling content to 3840x2160 pixel (4K) resolution. 8,873,640 has a pending continuation (US Patent Appl. No. 14/525,142)

Pending Applications: In order to keep the family alive in the US and cover more commercial scenarios, the seller has filed pending applications through continuations of patents '727 and '640 respectively. Below is the first independent claim for each pending application. The new claims for application '291 are targeted to any type of device that receives compressed video content in a first format and converts that format to a second format having a higher frame-rate than the first format. The new claims in the application '142 are targeted to devices that can record video content using a first frame rate while concurrently displaying the content on the device using a different frame rate, which is currently practiced by Smartphones that support slow-motion video. Both applications, when they issue, will further strengthen this portfolio and create the opportunity for additional mappings.

US Patent Appl. 14/493,291 (Cont. of US Patent No. 8,842,727)

Claim 1: *A method for converting the format of a video program, comprising:*

receiving compressed video content comprising a video program in an original compressed format;

decompressing the compressed video content to generate uncompressed video content in an internal format having a frame rate of 24 frames per second (fps) comprising progressive frames of pixel image data having an original pixel resolution;

buffering progressive frames of pixel image data in a high-capacity memory buffer supporting asynchronous random read and write access;

processing the progressive frames of pixel image data in the buffered progressive frames to perform a frame-rate conversion from 24 fps to a higher output frame rate to produce progressive frames of converted video content having an uncompressed format; and

storing the progressive frames of converted video content in a compressed video format to produce a converted video program having a converted frame rate in accordance with the higher output frame rate,

wherein the converted video content of the converted video program is configured to be processed by a video playback apparatus to generate a digital HDTV video signal configured to display the converted video program on an HDTV at the higher output frame rate, and wherein the digital HDTV video signal is a progressive signal having a pixel resolution of at least 1920x1080 pixels.

US Patent Appl. 14/525,142 (Cont. of US Patent No. 8,873,640)

Claim 1: *A method performed by a portable video image recording device including an image sensor and high-capacity digital storage means supporting asynchronous access for recording and reproducing, the method comprising:*

receiving an input video image at the image sensor;

sampling an output of the image sensor using a sampling frequency of at least 30 megahertz to generate frames of video image data employing a first frame rate and having a first image dimension in pixels;

recording a video program by processing the frames of video image data and storing video program content in a compressed progressive format using the high-capacity digital storage means; and

concurrent to recording the video program, performing manipulation of video image data in real-time on a selective basis to output video content in an output video format having a second frame rate different than the first frame rate.

6. Foreign Counterparts

Canada: Canadian Patent No. 2,286,194 includes claims that are identical to US Patent No. 5,999,220. Similarly, Canadian Patent No. 2,332,049 includes claims that are identical to US Patent No. 6,370,198. **Accordingly, all claim charts based on US Patent No. 6,370,198 will likewise apply to Canadian Patent No. 2,332,049 as the same devices are sold on the Canadian market.** This is important as sales of consumer devices such as the ones mapped in the various claim charts attached are structured for the North American market in general and, while Canada accounts for

only 10-15% of that market, Canadian courts are much less reluctant to issue injunctive relief against infringers, which can be extremely disruptive for the NA channel as a whole. Furthermore, patent litigation in Canada is significantly less expensive than in the US and a positive outcome there can be strategic in securing a broader solution.

Japan: Japanese Patent No. 4,485,496, entitled “*Method for Producing Video Program and Method for Mutually Transforming Video Scheme*” issued on 2010-06-23. This is extremely important as well, since **many of the devices mapped in the various claim charts attached (i.e. TVs, Camcorders, gaming platforms, DSLR cameras, etc.) are manufactured in Japan** and thus, could impact word wide distribution of such devices, both from a damages and injunctive relief standpoints.

China: Chinese Patent No. CH 1127852C, entitled “*Wide Band Multi-Format Audio-Video Production System with Frame Rate Conversion*” (Chinese version of US Pat. No. 6,370,198) “issued in 2003. This is also extremely important as well, since **many of the devices mapped in the various claim charts attached (i.e. UHDTVs, blu-ray players, game consoles, etc.) are manufactured in China** and thus, could impact word wide distribution of such devices, both from a damages and injunctive relief standpoints.

Europe: One corresponding applications was filed initially that correspond to US patent ‘198 but was left dormant by the seller given the already very broad and strategic coverage of issued patents in the US, Japan, China and Canada. It could be completed and arguably have the same reach on the European continent than its US counterpart entail.

7. Power Rankings

A. Detectability of Evidence of Use

[Excellent]. It is very easy to detect infringement for the patents on offer given the nature of the technology at stake. There is no need to perform basic reverse engineering as the main feature of the products that pertain to the portfolio are readily observable or described in the targets’ marketing and technical documentation. Please refer to the various claim charts attached to this document.

B. Lack of Prior Art

[Excellent]. The patents on offer have priority dates dating back to 1997, well before widespread commercialization, patenting and monetization of modern video technologies.

Therefore, it would be extremely unlikely to find prior art that may bring validity issues into play.

C. Commercial Maturity

[Excellent]. Video frame rate conversion is a mature area of technology that has now pervaded many major industries, as evidenced in this document. Consequently, the industry has and will continue to increasingly adopt the techniques covered by the patents on offer. The extent of commercial maturity is demonstrated in the forward patent citations by top firms in the video and media industry:

- US Patent No. 5,999,220 has been cited 10x by Sony, 8x by Apple, 7x by Nvidia.
- US Patent No. 6,370,198 has been cited 9x by Microsoft, 8x by Sony, 4x by Sony, 4x by Canon.
- US Patent No. 7,474,696 has been cited 3 times by Canon, Sanyo.

D. Available Alternatives

[Excellent]. The number of patent assets, their priority dates and forward citations indicate that firms would need to walk an extremely fine line to avoid infringing on claims covered by the portfolio. It would be extremely hard for firms commercializing HD video technology to avoid infringing the claims, and the numerous claim charts attached hereto tend to support this view.

8. Encumbrances

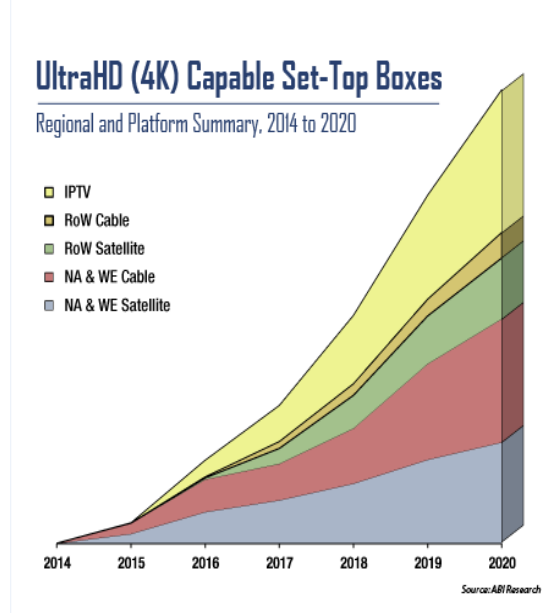
There are no security interests nor financial liens attached to the patent assets. There is **only one license** in place (with a US operating company) and details of the license can be provided under NDA to serious buyers. The license does not grant any sublicensing rights to the licensee and does not cover any of the various devices that are mapped via the numerous claim charts attached.

9. Market Trends

Manufacturers that develop products and services onto which the patent assets may read include those in the market for streaming media devices including Blu-ray disc players, smart HDTVs and UHD TVs, streaming media boxes, and gaming platforms; other devices capable of receiving streaming media and generating an external HDTV via signal, including PCs, laptops, smartphones, and tablets; portable video recording devices including camcorders, DSLR cameras, and

smartphones; and companies that employ large-scale streaming media format conversion, including Netflix, Hulu, and Amazon.

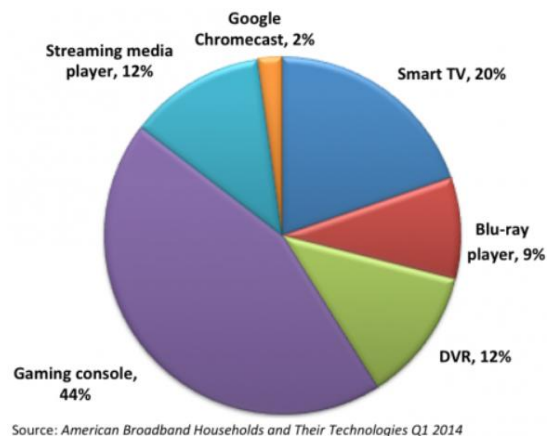
The streaming media device market has been growing at a rapid pace, and seemingly every Blu-ray player from a name manufacturer supports streaming video service from content providers such as Netflix and Hulu. Moreover, the same is true for the Smart HDTV market, which has seen penetration to even lower-end models that support streaming video input, while every 4K UHD TV supports streaming video input.



Recent projections by ABI research predict massive growth in 4K capable set-top boxes. By necessity, there would need to be similar growth in 4K UHD TVs. At the same time, the formatting of Blu-ray content and streaming media film content is not projected to change, so the need for conversion from 1080/24p to 4K at higher frame-rates than 24fps will parallel the increase in 4K UHD TVs. In addition, since streaming at 60p takes 2 ½ times as much bandwidth as streaming the same resolution content at 24p, 4K content (particularly film content) is projected to be streamed at 24p.

The digital camcorder and camera market is thriving with an estimated **\$65 billion** annual revenue by top manufacturers (see Evidence of Use below). Firms like Canon, Nikon and Sony are releasing products that appeal to consumer demand for portability, high definition/resolution, streaming capability and optical zoom power. Even with the wide availability of video and camera features in smartphones, consumers still spend on digital camcorder and camera technology to get the latest in high quality media.

The Microsoft Xbox One and 360 systems combined for a [62% market share](#) of 2014 holiday consumer game console purchases. The Xbox One alone had a [53% market share](#), while consoles from Sony and Nintendo only combined for 38% market share. The strength of Xbox sales boosts Microsoft in the streaming market as game consoles are the leading



streaming video devices of all connected household products at [44% market share](#), doubling the share of smart TVs.

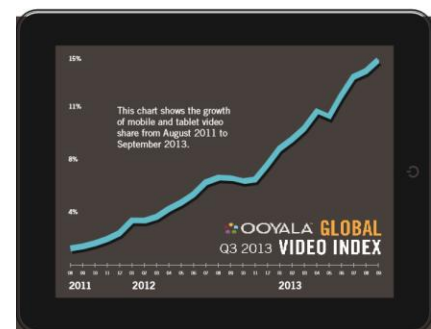
Popular streaming boxes like the AppleTV, Google Chromecast and Roku help consumers personalize media experiences by enabling TV consumption from online content stores, the Internet, as well as media from desktop and mobile devices. NetGear has entered the streaming box market with the NeoMediacast. Each product threatens to cut into revenues of the [\\$83 billion](#) cable industry. While Apple, Google and NetGear have multiple revenue channels from other products, Roku, which specializes in streaming technology, draws about [\\$190 million](#) in annual revenue. TiVo has also entered the streaming box market with [TiVo Stream](#), which allows users to stream Internet video content onto iOS devices like the iPhone and iPad. The Tivo Stream is part of TiVo's Hardware P&L, which draws in [\\$101.78 million](#) in annual revenue.



Streaming devices are important components of media ecosystems because they connect content and mobile devices to HDTVs. Thus, these devices provide a way for technology companies to move from the desktop and mobile space into the living room. By creating their own streaming boxes, firms like Apple and Amazon can offer consumers optimal integration between media content, mobile devices and TVs. These firms are also in excellent position with [media companies](#) to deliver more content selection.

Apple is reportedly ramping up efforts for Apple TV streaming device, after the product contributed over [\\$1 billion](#) to the firm's bottom line in 2013 and Apple released the second generation Apple TV in the spring-summer 2014. The Apple TV is part of Apple's media plan, consisting of iTunes, the iPhone and iPad. Similarly, Amazon offers consumers a media strategy that includes the new Fire TV and Fire TV Stick streaming devices, the Prime streaming video service and Kindle tablet.

Online gaming, which involves video streaming, is at the frontier of competition between Microsoft Xbox, Sony Playstation and Nintendo Wii gaming platforms. Microsoft may be pushing for more [revenues from Xbox Live](#), rather than console sales, in the future. Over two successive quarters in 2013, Xbox Live [revenue increased 20-25%](#), even as sales of the gaming console declined. Xbox Live has over [48 million](#) users worldwide. In addition to online gaming, the Xbox can serve as a streaming box for other media content and Skype.



Consumers use mobile devices like tablets and smartphones, for productivity as well as entertainment. These devices are increasingly used to stream video, through services like YouTube, Netflix, Hulu. Industry analysts [estimate](#) that mobile video viewing increased **133%** year-over-year to now account for **15%** of all streamed video. Firms like Apple, whose iPhone and iPad generated [\\$123.26 billion](#) in revenue in 2013, heavily market advanced [screen technology](#) in anticipation that consumers will use these products for streaming video. Other manufacturers are developing “phablets,” smartphones with large screens that are [optimized](#) for video consumption than traditional 4-inch phone screens. Within four years, analysts estimate phablet shipments will top [120 million](#) units per year.

10. Evidence of Use

The list below includes firms and products for which there is publicly available information suggesting that various technologies may be covered by the patents on offer. **The list is not exhaustive, and is only intended to give a snapshot of the possible coverage of the patent assets.** Similar mappings are expected to be found with respect to the two Canadian patents as most of the devices covered are sold in all of in North America as well as with many devices manufactured in Japan.

A) EoU on specific companies/devices:

[Canon](#) is a global firm that makes industrial and consumer imaging products. Canon’s Imaging System P&L, which accounts for [\\$13.5 billion](#) annual revenue, includes HD and high resolution camcorders. The Canon EOS C300 retails for [\\$14,718.19](#), while the EOS 300PL retails for [\\$13,999](#).

- [See Canon EOS C300-C300PL corresponding Claim Chart \(US Pat. No. 5,999,220\)](#)
- [See Canon EOS C300-C300PL corresponding Claim Chart \(US Pat. No. 8,374,253\)](#)
- [See Canon EOS C300-C300PL corresponding Claim Chart \(US Pat. No. 8,873,640\)](#)
- [*See also extensive list of other potentially infringing Canon products](#)

[HTC](#) draws revenue of almost [\\$10 billion](#) with mobile technology. The firm pioneered integration of Internet, entertainment, video and personal assistant functions in consumer devices. The HTC One retails for [\\$601.99](#).

- [See HTC One corresponding Claim Chart \(US Pat. No. 8,374,253\)](#)

- [See HTC One corresponding Claim Chart \(US Pat. No. 8,873,640\)](#)

LG Electronics is a global manufacturer of consumer electronics that generates [\\$55.8 billion](#) annual global revenue. LG UHD TVs retail for [\\$540.23-3748.90](#), smartphones for up to \$499.90 and Blu-ray players for up to [\\$169.90](#).

- [See LG UHD TV corresponding Claim Chart \(US Pat. No. 8,842,727\)](#)
 - [See LG Smart Phones Slo-motion corresponding Claim Chart \(US Pat. No. 8,873,640\)](#)
 - [See LG Blu-ray corresponding Claim Chart \(US Pat. No. 8,842,727\)](#)
- *See also LG Real Cinema 24p documentation*

Microsoft is the largest software firm in the world. HD and streaming video feature in multiple products and services, particularly in the Windows and Entertainment & Devices P&Ls that account for [\\$29.4 billion](#) in annual revenue. Microsoft Windows carries [Play To](#), which lets user's stream video between computers, smart TVs and mobile devices through home networks and the Internet. Microsoft also deploys video technology through Skype's video conferencing technology and Xbox game console

- [See Microsoft Xbox 360 corresponding Claim Chart \(US Pat. No. 6,370,198\)](#)
- [See Microsoft Xbox One Blu-ray & DVD corresponding Claim Chart \(US Pat. No. 6,370,198\)](#)
- [See Microsoft Xbox One Streaming corresponding Claim Chart \(US Pat. No. 6,370,198\)](#)

Nikon, a key competitor to Canon, makes imaging products, as well as optical materials and precision equipment. Nikon's camcorders roll up into the Imaging P&L, which draws in [\\$9.59 billion](#) annual revenue. The Nikon D800 retails for as much as [\\$2996.95](#).

- [See Nikon D800 corresponding Claim Chart \(US Pat. No. 5,999,220\)](#)
 - [See Nikon D800 corresponding Claim Chart \(US Pat. No. 8,374,253\)](#)
 - [See Nikon D800 corresponding Claim Chart \(US Pat. No. 8,873,640\)](#)
 - [See Nikon D5300 corresponding Claim Chart \(US Pat. No. 5,999,220\)](#)
- *See also extensive list of other potentially infringing Nikon products*

Panasonic is a global firm with [\\$8.11 billion annual revenue](#) in the US. Worldwide, the firm makes [\\$14.89 billion](#) from its AVC Networks P&L that includes smart TVs, Blu-ray players and camcorders. Panasonic UHD TV/HDTVs range from [\\$399.99-3800.00](#).

[See Panasonic UHDTV-HDTV Claim corresponding Chart \(US Pat. No. 8,842,727\)](#)

Samsung is a worldwide leader in the [smartphone](#), [tablet](#) and smart TV markets, in which it holds [47%](#), [19%](#) and [37%](#) worldwide market share, respectively. The firm makes over **\$187 billion** revenue per year. The Samsung LN46C610 46-Inch 1080p 120Hz LCD HDTV with Auto Motion Plus and Touch of Color Design retails for up to [\\$999](#), while the Galaxy S5 retails for [\\$749.99](#). The Galaxy S5 is one of the [bestselling](#) smartphones in the world, with [23.4 million](#) units shipped worldwide in its first quarter on the market.

- [See Samsung BD-F5700 corresponding Claim Chart \(US Pat. No. 6,370,198\)](#)
- [See Samsung Auto Motion Plus HDTV-UHDTV corresponding Claim Chart \(US Pat. No. 6,370,198\)](#)
- [See Samsung UHDTV-HDTV corresponding Claim Chart \(US Pat. No. 8,842,727\)](#)
- [See Samsung Galaxy S4 corresponding Claim Chart \(US Pat. No. 8,873,640\)](#)
- [See Samsung Galaxy S4 corresponding Claim Chart \(US Pat. No. 8,374,253\)](#)
- [See Samsung Galaxy S5 corresponding Claim Chart \(US Pat. No. 8,374,253\)](#)
- [See Samsung Smart Phone Slo-motion corresponding Claim Chart \(US Pat. No. 8,873,640\)](#)

Sharp Electronics is a leading manufacturer of UHDTV/HDTVs that belong to a P&L generating [\\$7.19 billion](#) worldwide revenue. Sharp UHDTV/HDTVs range from [\\$499.99-6133.99](#).

- [See Sharp UHDTV-HDTV corresponding Claim Chart \(US Pat. No. 8,842,727\)](#)
*[*See also Sharp HDTVs and UHTVs supplemental materials](#)*

Sony offers a comprehensive line-up of camcorders and DLRS cameras, as well as smart TVs and Blu-ray players that support streaming. Sony's Digital Imaging Products P&L accounts for [\\$43.3 billion](#) in annual revenue. Sony MotionFlow HDTVs can retail for up to [\\$3,199.99](#), NEX-VG900 video cameras up to [\\$3,298](#), SLT-A99 cameras up to [\\$2,299.95](#) and BDP Blu-ray players for up to \$119.99

- [See Sony MotionFlow HDTV corresponding Claim Chart \(US Pat. No. 6,370,198\)](#)
- [See Sony NEX-VG900 corresponding Claim Chart \(US Pat. No. 8,873,640\)](#)
- [See Sony NEX-VG900 corresponding Claim Chart \(US Pat. No. 8,374,253\)](#)
- [See Sony SLT-A99 corresponding Claim Chart \(US Pat. No. 8,873,640\)](#)
- [See Sony SLT-A99 corresponding Claim Chart \(US Pat. No. 8,374,253\)](#)
- [See Sony BDP-BX510 corresponding Claim Chart \(US Pat. No. 6,370,198\)](#)
*[*See also Sony Blu-ray player summary](#)*

*[*See also Sony HDTV summary](#)*

*[*See also Sony UHDTV summary](#)*

Vizio is a privately held American electronics company with approximately [\\$2.9 billion](#) annual revenue. The firm makes HDTVs and UHDTVs ranging from [\\$799.99-2499.99](#) that are potentially relevant to the portfolio.

- [See Vizio SmoothMotion HDTV corresponding Claim Chart \(US Pat. No. 6,370,198\)](#)
- [See Vizio UHDTV corresponding Claim Chart \(US Pat. No. 8,842,727\)](#)

B) EoU on Generic Device Categories:

In addition to Claim Charts on specific products, the following “generic” claim charts cover features that are widely used across product categories and shared by most manufacturers. These include:

Blu-ray players. Today’s Blu-ray players provide a means for playback of streaming media from content providers such as Netflix, Hulu, and dozens of others, as well as playback Blu-ray disc content. Nearly all Blu-ray content and streaming media content relating to film are encoded at 24p. This necessitates conversion to a different frame rate when a Blu-ray player is used with an HDTV/UHDTV that either does not support 24p input or is incompatible with the Blu-ray player. Over [100 million players are expected to be sold worldwide in 2015.](#)

- [See Generic Blu-ray Claim Chart \(US Pat. No. 8,842,727\)](#)

Smartphones supporting slow-motion video. A feature that has been recently added to most smartphones is support for slow-motion video recording and playback. The recording and playback of slow-motion video necessitates a frame-rate conversion, and the video content may be encoded at a different resolution than the native resolution of the smartphone’s display. The smartphone market is expected to reach \$150.3 billion globally in 2014, with such popular brands at HTC, LG and Samsung.

- [See Generic Smart Phone Slow-motion corresponding Claim Chart \(US Pat. No. 8,873,640\)](#)

SmartTVs supporting 24p streaming. Substantially all “SmartTVs” support playback of streaming media received from a content provider via the Internet. This includes playback of streaming content encoded at 24p, which is processed by the SmartTV using either $n:n$ pulldown or a motion smoothing mode to generate frames at a frame-rate that matches the SmartTV’s screen refresh rate (typically 120Hz or 240Hz). The HDTV and UHD TV global markets are expected to reach \$14.2 billion and 45 million units shipped by 2016, respectively.

- [See Generic HDTV/UHDTV 24p Streaming corresponding Claim Chart \(US Pat. No. 8,842,727\)](#)

PCs/laptops capable of generating external HDTV signals (e.g., via an HDMI port or UML interface) count for most shipments nowadays as the HDMI capability has become a standard feature in most devices. Substantially all PCs/laptops are capable of playing streaming media content provided by content providers such as Netflix, Amazon, and Hulu, much of which comprises 24p content, including most movie content. In 2015 alone, worldwide shipments are expected to hover around 300 million units and remain approximately at that level until at least 2018.

- [See Generic PC-Laptop 24P Streaming Claim Chart \(US Pat. No. 8,842,727\)](#)

PCs/laptops including Blu-ray Disc drives and capable of external HDTV signals. Blu-ray Disc content is generally encoded at 24p. To support HDTVs and external monitors that are not capable of displaying 24p content directly, a frame rate change from 24p to 60p is performed when Blu-ray Discs are played.

- [See PCs/Laptops/Notebooks Supporting 24p Streaming with HDMI Output](#) (US Pat. No. 8,842,727)
- [See PCs/Laptops with Blu-ray Disc Drives and HDMI Output](#) (US Pat. No. 8,842,727)

11. Other Potential Licensing Opportunities

The following firms may derive strategic value from the portfolio on offer, or commercialize products that may be found relevant to the patents upon further investigation.



12. Related Patent Assertion

Patent assertion in video technology entails the largest names in commercial industry as well as small firms and NPEs. The rise in NPE lawsuits involving video streaming patents since 2012 indicates a market undergoing extensive competition shaped by patent assertion.

In August 2014, Max Sound and Vedanti Systems [sued Google](#) over video compression patents that allegedly cover technology in popular video service YouTube, Google TV, the Android OS, Chrome and other Google products. The plaintiffs accuse Google of stealing video codec technology that optimizes large-scale streaming. The patent at issue is US Patent No. [7,974,339](#) (Optimized data transmission system and method). The lawsuit was filed only weeks after Google bought streaming service, Twitch, for [\\$1 billion](#).

In March 2013, Two-Way Media won a [\\$40 million](#) verdict against AT&T for infringing US Patent Nos.: 8,539,237 (Methods and systems for playing media), 7,266,686 (Multicasting method and apparatus), 6,434,622 (Multicasting method and apparatus). Two-Way had previously settled with Limelight and Akamai. In August 2014, Two-Way filed [new litigation](#) against Comcast and NBC Universal.

A snapshot of NPE patent assertion in technology markets potentially related to the portfolio on offer. One of the most extensive [portfolios asserted](#) for video streaming belongs to **VStream**

Technologies in Apr 2013. Defendants include Samsung, Sony, Nokia, ZTE, Sony, Nokia, LG, Pantech, LG, and GoPro.

VideoShare LLC sued Viddler Inc., Vimeo LLC, Google (YouTube) and Brightcove Inc. for allegedly infringing a dealing with [sharing streamed video](#). VideoShare holds [5 issued US patents](#) relating to video sharing.

Video Streaming Solutions has sued Microsoft, Arris Group, Inc, Motorola Solutions, Motorola Mobility and Cisco for patents related to [video compression and streaming technology](#). Kudelski bought OpenTV in 2010 and thereafter joined the streaming video market where it has filed a lawsuit against Netflix for US patents relating to [streaming content on demand](#). Digital CBT [sued](#) TiVo and AT&T Services Inc. over a patent related to video streaming to a computer.

Intertainer Inc. has sued Hulu LLC, Viacom and Discovery Communications for patents relating to interactive video programming. Intertainer holds [6 issued US patents](#).

Netflix is reportedly entangled in [32 patent lawsuits](#) that involve video streaming technology. Netflix holds at most [10 issued US patents](#) for streaming video, whereas potential competitors like Amazon hold at least [30 issued patents](#) in that technology space.

In 2012 Verizon Communications settled a patent lawsuit with TiVo by paying the firm [\\$250.4 million](#). The case concerned TiVo's US Patent Nos. [6,233,389](#) (Multimedia time warping system) and [7,529,465](#) (System for time shifting multimedia content streams). As part of the settlement, Verizon and TiVo are exploring future [Internet video distribution](#) as part of Verizon's joint venture with Redbox. Motorola and Cisco brought a declaratory action over the patents asserted against Verizon, which the parties settled by paying Tivo [\\$490 million](#).

13. Targeted Price

In light of the number of assets involved, early priority date of the most relevant assets, wide scope of applications and substantial evidence of use of the patent portfolio on a very wide spectrum of consumer devices sold in hundreds of millions of unit, we offer a price guidance of \$USD **mid seven figures** in an all cash sale. The seller is also open to alternative deal structures that include some upfront payment and some backend revenue sharing.

14. Sale Structure and Submission Deadline

The portfolio is only offer to a limited number of potential buyers. There are no formal submission deadlines. Offers will be treated in the order received in writing. Assets will be taken off the market once a PPA has been executed and buyers will be given a reasonable period to complete the closing.

15. Contact Information

For all inquiries, please contact **Louis Carbonneau**, CEO of Tangible IP, at:

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