Mr. Lipoff is president of IP Action Partners Inc, a consulting practice in TIME (telecommunications, information technology, media, electronics, and ebusiness) industries and technologies. He draws upon his 50+ years of experience in a wide variety of technologies and industries to assist clients with knowledge based consulting services involving complex business decisions and problem resolution.

Mr. Lipoff was employed 25 years by Arthur D Little, Inc (ADL) as VP and Director of Communications, Information Technology, and Electronics (CIE); 4 years by Bell & Howell Communications Company as a Section Manager, and 3 years by Motorola's Communications Division as a Project Engineer. At ADL he was responsible for the firm's global CIE practice in laboratory based contract engineering, product development, and technology based consulting. At both Bell & Howell and Motorola, he had project design responsibility for wireless communications and paging products.

Stuart Lipoff has Bachelor's Degrees in Electrical Engineering and in Engineering Physics, both from Lehigh University. He also has received a Masters Degree in Electrical Engineering from Northeastern University, and a MBA degree from Suffolk University.

Mr. Lipoff is a fellow of the IEEE Consumer Electronics, Communications, Computer, Circuits, and Vehicular Technology groups. He is a member of the IEEE Consumer Electronics Society National Board of Governors, and was the Boston Chapter Chairman of the IEEE Vehicular Technology Society. He served as 1996-7 President of the IEEE Consumer Electronics Society and as Chairman of the Consumer Electronics Society Technical Activities and Standards Committee, and as VP of Publications; he currently is VP of Industry and Standards Activities for The IEEE Consumer Electronics Society. He has also chaired the search committee for Sony supported Mazura Ibuka Award in consumer electronics. As Vice President and Standards Group Chairman of the Association of Computer Users, he served as the ACU representative to The ANSI X3 Standards group. For the Federal Communications Commission's Citizens advisory committee on CB radio (PURAC), he served as Chairman of the task group on user rule compliance. He has been elected to membership in the Society of Cable Television Engineers (SCTE), The Association of Computing Machinery (ACM) , and The Society of Motion Picture and Television Engineers (SMPTE).

Stuart Lipoff holds a FCC General Radiotelephone License and a Certificate in Data Processing (CDP) from the ACM supported Institute for the Certification of Computing Professionals (ICCP). He is a registered professional engineer (by examination) in The Commonwealth of Massachusetts and The State of Nevada.

Mr. Lipoff holds seven USA patents and has published articles in Electronics Design, Microwaves, EDN, The Proceedings of the Frequency Control Symposium, Optical Spectra, and numerous IEEE publications. He has presented papers at many IEEE and other meetings. In the fall of 2000, he served as general program chair for The IEEE Vehicular Technology Conference on advanced wireless communications technology. He has organized sessions at The

International Conference on Consumer Electronics and was the 1984 program chairman. He conducted an eight week IEEE sponsored short course on Fiber Optics Systems Design. In 1984, he was awarded IEEE's Centennial Medal and in 2000 IEEE's Millennium Metal.

He has served as a member of the USA advisory board to the National Science Museum of Israel and has presented a short course on international product development strategies as a faculty member of Technion Institute of Management in Israel. He also served as a member of the board of directors of The Massachusetts Future Problem Solving Program.

Mr Lipoff is internationally recognized as an authority and opinion leader in new economy related businesses and technology. Citations supporting his recognition can be found on his web site at http://www.ipaction.com .

Some examples of projects he has performed in speech recognition and processing include:

- For Texas Instruments he supported several projects for their semiconductor components division. The first project involved analysis of the market for advanced user interface speech input and output applications and the fit between these applications and TI's DSP products. The project produced technology and market forecasts by application. By matching the current state of the art of DSP speed-power products with the application requirements, he was able to recommend a timeline and roadmap for TI's target market planning for speech and speaker recognition

- For IBM's Thomas Watson Research Center he evaluated their speech to text typewriter test bed technology and applications plans. This project involved benchmarking IBM's technology to other large vocabulary connected speech research projects and suggesting a coordinated timeline matching expected performance and cost against present and future expected applications

- For Sprint's long distance telephone services, he assisted with the development of a speech and speaker recognition system designed to reduce fraud and improve customer convenience for dialup customers to Sprint's long distance telephone bypass service. Before equal access as used today, subscribers to discount long distance services had to first dial an access number, key in their account number, and then key in the number they wanted to call. By using this newly designed speech and speaker recognition system customer's could eliminate the need to key in their account number and merely speak it. Not only did the system recognize and validate the account number, the system also validated that the speaker was the authorized account holder. The system also included the ability to do voice dialing by speaking the number to be called.

- For BBN, he evaluated a prototype speaker recognition application using BBN's proprietary speech recognition technology. The prototype implemented a speaker independent system allowing remote remote users who dialed into the BBN system over conventional telephone lines to check airline flight schedules and make bookings. The system had unique features

that provided high quality, low error rate speech recognition in a dialup telephone environment with limited bandwidth and high background noise levels

Some examples of projects he has performed in the telecommunications sector include:

- Leadership of the project which developed the series of DOCSIS specifications for high speed residential cable modems. The scope of work included developing a roadmap and strategic framework for evolving the business from simple high speed internet services to multimedia broadband services combining telephony, data, and secure electronic content delivery. This project was performed under contract to the MCNS consortium of cable TV operators representing 85% of the subscriber base in North America and has since been adopted by the United Nations as a global telecommunications standard.

- For a consortium of the major cable TV operators consisting of Comcast, Time Warner, Cox, and Rogers; he developed models for prediction of reliability of alternative HFC architectures and their suitability to provide local exchange voice services competitive with ILECs. The project required understanding the reliability specifications employed in conventional local exchange carrier telephone plant and the contributions between hardware, power, and workmanship failures. Each of three alternative fiber optic architectures for cable delivered voice telephony were studied and modeled to develop reliability predictions and recommendations were made as to which aspects of the three alternatives were the best choice for cable delivered voice telephony.

- For Bellcore (now Telcordia division of SAIC), he evaluated the R&D portfolio of their Applied Research Group. The main components of this portfolio were speech recognition, DWDM technologies for long haul interLATA communications as well as optical multiplexing components for passive optical network applications in cable TV and advanced broadband residential services. I provided R&D planning assistance on the allocation of funding and priorities to the R&D efforts and identified opportunities for securing intellectual property rights to critical R&D efforts.

- For the ViaSat Division of Modern Times Group (Sweden) he developed business plans for the launch of a new service that bundled discounted long distance telephone services with direct to home satellite TV services and other interactive services including gambling via the set-top box.

- For Southern New England Telephone (SNET), he supported the launch of a video dial tone service. He contribution to the project included engineering and cost analysis of system alternatives as well as assisting with the preparing of RFPs for set-top-boxes and other network elements.

Some examples of projects he has performed in the electronic commerce and information processing sector include:

- For The Next Generation Network Architecture (NGNA) LLC (consortium of Comcast, Cox, and Time Warner) he lead the project that developed the advanced architecture needed by the cable industry to support eCommerce transactions, sale of content, and the associated rights management and security needed to support high value applications

- For a ViaSat (Swenden), he developed the global requirements for a consumer internet appliance designed to allow network access via a set-top box interfaced to a television receiver

- For The United States Postal Service, he has participated in several projects exploring roles for The Service in facilitating electronic commerce including directory services and public key certificate authority

- For IBM, he participated in a project to define the range of opportunities in electronic commerce for third party providers of systems and services and develop strategic and tactical plans to exploit eCommerce

- For Nielson Media (a firm that provides advertising measurement and information services), he developed strategies for participation in the buying and selling of advertising in an electronic marketplace

- For The MCNS consortium of cable system operators (Rogers, Comcast, Time Warner, TCI, and Cox), he supported the development of enhancements to the North American DOCSIS Specifications for cable modems and associated services providing for interactive and electronic commerce services to the home and small business

- For the grocery industry consortium of The Food Marketing Institute and The Grocery Manufacturers Association, he developed standards used by the industry for direct exchange electronic data interchange (DEX/UCS EDI)

- For Mastercard and Visa, he supported a project exploring the applications and security issues associated with the use of smart cards in eCommerce

- For a multiclient consortium of newspapers and information publishers, he participated in a project to understand opportunities for electronic home information and transaction services using both dedicated videotext terminals as well as home computers

- In support of a multiclient study of new opportunities for financial industry firms, he studied the security and encryption requirements to support electronic banking. This work involved consideration of counterfeit projection for media, physical security of systems, and the developed for security protocols for home banking videotex terminals.

Stuart J. Lipoff
Litigation Support Projects as a Disclosed Expert
Current as of April 2020

• Provided expert report, deposition testimony, and testified at ITC hearing as technical expert, retained by ONE WORLD in the case captioned below:

The United States International Trade Commission

Investigation No. 337-TA-1016 (Modification Proceeding)

In the Matter of–CERTAIN ACCESS CONTROL SYSTEMS AND

COMPONENTS THEREOF

Complainants: THE CHAMBERLAIN GROUP, INC
Respondents: ONE WORLD TECHNOLOGIES, INC. D/B/A TECHTRONIC INDUSTRIES POWER EQUIPMENT.

• Provided hearing testimony before The U.S. Court of International Trade on behalf of ONE WORLD TECHNOLOGIES relative to U.S. PATENT NO. 7,161,319 in the matter captioned below:

Court No. 18-00200

ONE WORLD TECHNOLOGIES, INC., :Plaintiff,

v.

UNITED STATES, UNITED STATES :

DEPARTMENT OF HOMELAND SECURITY, :

UNITED STATES CUSTOMS AND BORDER :

PROTECTION, and COMMISSIONER KEVIN K. MCALEENAN, Defendants. :

• Provided declarations in support of IPRs before The United States Patent Office Trial and Appeal Board

Client: SECURUS TECHNOLOGIES, INC.
Adverse Party: GLOBAL TEL*LINK
CORPORATION In the matters of: U.S. PATENT
No. 9,521,250

U.S. PATENT No.
9,307,386
U.S PATENT No.
9,094,500
U.S PATENT No.
8,929,525
U.S PATENT No.
7,248,685
U.S. PATENT No.
9,509,856

• Provided declarations and deposition testimony in support of IPRs before The United States Patent Office Trial and Appeal Board

Client: SECURUS TECHNOLOGIES, INC.
Adverse Party: GLOBAL TEL*LINK
CORPORATION In the matters of: U.S. PATENT
No. 8,855,280 and U.S PATENT No. 8,606,229

Stuart J. Lipoff
Litigation Support Projects as a Disclosed Expert
Current as of April 2020

• Provided declarations in support of an IPR before The United States Patent Office Trial and Appeal Board

Client: TCT MOBILE (US) INC. & TCT MOBILE, INC
Adverse Party: WIRELESS PROTOCOL INNOVATIONS, INC. In the matter of: U.S. PATENT NO. 9,125,051

• Provided declarations in support of a petition for petition for covered business method review before The United States Patent Office Trial and Appeal Board

Client: COMCAST CABLE COMMUNICATIONS, LLC, Petitioner
Adverse Party: PROMPTU SYSTEMS CORPORATION, Patent Owner.
In the matters of: U.S. Patent RE44,326
U.S. Patent 7,047,196

• Provided declarations and deposition testimony in support of IPRs before The United States Patent Office Trial and Appeal Board

Client: TCT MOBILE (US) INC. & TCT MOBILE, INC
Adverse Party: WIRELESS PROTOCOL INNOVATIONS, INC. In the matters of: U.S. PATENT NO. 8,565,256
U.S. PATENT NO. 8,274,991

• Provided expert report and testified at ITC hearing as technical expert, retained by ONE WORLD in the case captioned below:

The United States International Trade Commission
Investigation No. 337-TA-1016
In the Matter of–CERTAIN ACCESS CONTROL SYSTEMS AND COMPONENTS THEREOF
Complainants: THE CHAMBERLAIN GROUP, INC
Respondents: ONE WORLD TECHNOLOGIES, INC. D/B/A TECHTRONIC INDUSTRIES POWER EQUIPMENT.

• Provided declarations in support of IPRs before The United States Patent Office Trial and Appeal Board

Client: Comcast Cable Communications, LLC, Petitioner
Adverse Party: Adverse Party: OpenTV, Inc., Patent Owner
In the matters of: U.S. Patent 7,028,327
U.S. Patent 6,345,389

Stuart J. Lipoff
Litigation Support Projects as a Disclosed Expert
Current as of April 2020

• Provided declarations in support of IPRs before The United States Patent Office Trial and Appeal Board

Client: ONE WORLD TECHNOLOGIES, INC. D/B/A TECHTRONIC INDUSTRIES POWER EQUIPMENT
Adverse Party: THE CHAMBERLAIN GROUP, INC In the matters of: U.S. PATENT NO. 7,224,275
U.S. PATENT NO. 7,161,319
U.S. PATENT NO. 7,339,336
U.S. PATENT NO. 7,196,611
U.S. PATENT NO. 7,635,966
U.S. PATENT NO. 6,998,977

• Provided expert reports and deposition testimony on invalidity, retained by Google as a technical expert in the case captioned below:

In The United States District Court for the District of Delaware
Civil Action No. 13-429-SLR
Plaintiffs: HBAC MATCHMAKER MEDIA, INC Defendants: GOOGLE INC., et al
In the matter of U.S. PATENT NOS. 5,774,170 AND 6,002,393

• Provided declarations in support of IPRs before The United States Patent Office Trial and Appeal Board in the matter captioned below:

Client: GOOGLE ,INC., Petitioner,

Adverse Party: UNILOC USA,INC.and UNILOC LUXEMBOURG,S.A., Patent Owner.

In the matters of: U.S.Patent No.7,853,000
U.S.Patent No.7,804,948
U.S.Patent No.8,571,194

• Provided declarations in support of IPRs before The United States Patent Office Trial and Appeal Board

Client: LIVE PERSON, INC., PETITIONER
Adverse Party: 24/7 CUSTOMER, INC. 24/7 CUSTOMER INTERNATIONAL HOLDINGS, LTD., PATENT OWNER

In the matters of:
U.S. Patent 6,798,876
U.S. Patent 7,027,586
U.S. Patent 7,751,552
U.S. Patent 9,077,804

Stuart J. Lipoff
Litigation Support Projects as a Disclosed Expert
Current as of April 2020

• Provided declarations in support of IPRs before The United States Patent Office Trial and Appeal Board

Client: DTS, Inc. and Phorus, Inc., PETITIONER
Adverse Party: Broadcom Limited and Avago Technologies General IP (Singapore) Pte. Ltd., PATENT OWNER

In the matter of: U.S. Patent 6,684,060

• Provided expert reports and deposition testimony on invalidity, retained by DirecTV as a technical expert in the case captioned below:

In The United States District Court for the District of Delaware
Civil Action No. 13-432-SLR
Plaintiffs: HBAC MATCHMAKER MEDIA,
INC Defendant : THE DIRECTV GROUP, INC.

• Provided expert report and testified at ITC hearing as technical expert, retained by Samsung in the case captioned below:

The United States International Trade Commission
Investigation No. 337-TA-882
In the Matter of CERTAIN DIGITAL MEDIA DEVICES, INCLUDING TELEVISIONS, BLU-RAY DISC PLAYERS, HOME THEATER SYSTEMS, TABLETS AND MOBILE PHONES, COMPONENTS THEREOF AND ASSOCIATED SOFTWARE
Complainants: Black Hills Media, LLC
Respondents: Samsung Electronics Co. Ltd.

• Provided expert reports and deposition testimony on invalidity and rebuttal to infringement, retained by Comcast et al as a technical expert in the case captioned below:

The United States District Court, Eastern District of Texas, Marshall Division
Civil Action No. 2:11-CV-30 (DF)
In the Matter of United States Patent Number 5,563,883
Plaintiffs: C-Cation Technologies, LLC
Defendants: Comcast Corporation, Charter Communications, Inc., cequel Communications, LLC dba Suddenlink Communications, Cable One, Inc., Almega Cable Inc., Longview Cable Television Company, Inc., and Kilgore Video, Inc

Stuart J. Lipoff
Litigation Support Projects as a Disclosed Expert
Current as of April 2020

• Provided declaration in support of plaintiff Maxell, LTD's opposition to defendant's motion for judgment on the pleadings under Fed. R. Civ P. 12(c) as a technical expert in the case captioned below:

The United States District Court for the Central District of California
Case No. 2:17-cv-07534-AG-(SSx)

MAXELL, LTD., Plaintiff,
v.
FANDANGO MEDIA, LLC, Defendant.

FANDANGO MEDIA, LLC, Counter-Plaintiff,
v.
MAXELL, LTD., Counter-Defendant.

• Provided expert reports on invalidity and rebuttal to infringement, retained by Apple in the case captioned below:

The United States District Court, Eastern District of Texas, Tyler Division
Civil Action No. 6:10-cv-74-LED-JDL
In the Matter of Certain Digital Set-Top Boxes Components Thereof
Plaintiffs: Smartphone Technologies LLC
Defendants: LG Electronics Inc, LG Electronics USA, Inc, Apple Inc, and AT&T Mobility LLC

• Provided expert report and presented tutorial at ITC hearing as technical expert, retained by Apple in the case captioned below:

The United States International Trade Commission
Investigation No. 337-TA-808
In the Matter of Certain Electronic Devices with Communication Capabilities, Components Thereof, and Related Software
Complainants: HTC Corporation
Respondents: Apple Inc

• Provided expert report and testified at ITC hearing as technical expert, retained by Cablevision in the case captioned below:

The United States International Trade Commission
Investigation No. 337-TA-712
In the Matter of Certain Digital Set-Top Boxes Components Thereof
Complainants: Verizon Services Corporation and Verizon Communications Inc.
Respondents: Cablevision Systems Corporation

Stuart J. Lipoff
Litigation Support Projects as a Disclosed Expert
Current as of April 2020

• Provided declarations as a technical expert, retained by Comcast in the case captioned below:

The United States District Court for the Eastern District of Viginia, Norfolk Division

Civil Action No. 2:11 CV 103 RAJ/TEM

Plaintiffs: Bear Creek Technologies, Inc

Defendants: Comcast Corporation et al

• Provided declarations and expert report as technical expert, retained by Active Video in the case captioned below:

The United States District Court for The Eastern District of Virginia, Norfolk Division

Civil Action No. 2:10-cv-248 RAJ/FBS

Plaintiffs: Active Video Networks Inc

Defendants: Verizon Communications Inc., Verizon Services Corp. Verizon Virginia Inc. and Verizon South Inc.

• Provided expert report and deposition testimony as a technical and industry expert, retained by eleven member joint defense group in the case captioned below:

The United States District Court for The District of Maryland, Southern Division

Civil Action No.8:07-cv-03012-AW (D.Md.)

Plaintiffs: Technology Patents LLC

Defendants: Deutsche Telekom AG et al: AT&T Mobility LLC, Microsoft Corporation, Yahoo! Inc., Sprint Nextel Corporation, Motorola, Inc., Palm, Inc., Samsung Electronics Co., LTD., Samsung Telecommunications America LLP, LG Electronics Mobilecomm U.S.A., Inc., Helio, LLC, Clickatell (PTY) LTD., Cellco Partnership (d/b/a Verizon Wireless), and T-Mobile USA, Inc.)

• Provided declarations as a technical expert, retained by BigBand Networks in the case captioned below:

The United States District Court for The District of Delaware
Civil Action No. 07-351 (JJF) Plaintiffs:
BigBand Networks, Inc. Defendants:
Imagine Communications, Inc.

• Provided declarations as a technical expert, retained by Romek Figa in the case captioned below:

The United States District Court for The District of Massachusetts
Civil Action No. 08-cv-10304-NG
Plaintiffs: Romek Figa d/b/a Abraham & Son
Defendants: Apple Inc

Stuart J. Lipoff
Litigation Support Projects as a Disclosed Expert
Current as of April 2020

• Provided declarations as a technical and industry expert, retained by ODS Technologies in the case captioned below:

The United States District Court Central District of California, Western Division
Civil Action No. CV 07-03265 DDP (RCx)
Plaintiffs: ODS Technologies, L.P., d/b/a TVG Network, and ODS Properties, Inc
Defendants: Magna Entertainment Corporation; HRTV, LLC., ; and Xpressbet, Inc

• Provided expert report and declarations as a technical and industry expert, retained by Motorola in the case captioned below:

The United States District Court for the District of Delaware
Civil Action No. 07-752-GMS
Plaintiffs and Counter-Defendants: Motorola, Inc., ET AL
Defendants and Counter-Plaintiffs: Rembrandt Technologies, LP, ET AL

• Provided expert report and deposition testimony as a technical and industry expert, retained by Amino Communications in the case captioned below:

The United States District Court, Central District of California
Civil Action No. CV-07-1829
Plaintiffs: Amino Communications, LLC
Defendants: Guest-Tek Interactive Entertainment, LTD, Guest-Tek Inc, and DOES 1 through 10

• Provided expert report and deposition testimony as a liability industry expert, retained by JTMD and Ascion in the case captioned below:

The United States District Court, District of Massachusetts
Civil Action No. 07-CV-10207-RGS
Plaintiffs: L& P Property Management Company and Legget & Platt Incorporated
Defendant: JTMD, LLC d/b/a Reverie, and Ascion, LLC

• Provided deposition testimony as an liability expert, retained by National Semiconductor in the case captioned below:

The Superior Court of California, County of Santa Clara
Civil Action No. 1 -02-CV8 1 0872
Plaintiff: Itech Group, Inc.
Defendant: National Semiconductor Corporation

• Provided expert report, deposition, and trial testimony as a liability technical expert, retained by Charter Communications in the case captioned below:

The United States District Court, Eastern District of Texas, Marshall Division
Civil Action No. 2-05-CV-436
Plaintiff: Hybrid Patents Incorporated
Defendant: Charter Communications, Inc.

• Provided expert report and deposition testimony as a liability industry expert, retained by Lutron in the case captioned below:

The United States District Court, District of Utah
Case No. 2:03-CV-00488TC
Plaintiff-Counter defendant: Vantage Controls, Inc.
Defendant-Counter plaintiff: Lutron Electronics Co., Inc.

Stuart J. Lipoff
Litigation Support Projects as a Disclosed Expert
Current as of April 2020

• Provided expert report and trial and deposition testimony as a liability industry expert, retained by Telewizja Polska in the case captioned below:

The United States District Court, Illinois, Eastern Division
Civil Action No. 02-C-3293
Plaintiffs: Telewizja Polska USA
Defendant: EchoStar SateIlite

• Provided expert report and deposition testimony as a liability technical expert, retained by Broadcom in the case captioned below:

The United States District Court, Eastern District of Texas, Sherman Division
Civil Action No. 4:03CV159
Plaintiffs: Broadcom Corporation
Defendant: Microtune (Texas), L.P.

• Provided expert report, deposition testimony and trial testimony as a damages expert, retained by IPPV and MAAST in the case captioned below:

The United States District Court For the District of Delaware
Civil Action No. 99-577-RRM
Plaintiffs: IPPV Enterprises, LLC and MAAST, Inc.
Defendant: EchoStar Communications Corp

• Provide expert report and deposition testimony as a damages expert, retained by the TVJCOM in the case captioned below:

The United States District Court For the Middle District of Florida.
Case No. 3:OO-CV-1045-5-2 1 A
Plaintiffs: TVJCOM International, Inc.
Defendants: Mediaone of Greater Florida, Inc., Canal Plus Technologies, S.A., Canal Plus U.S. Technologies, Inc., and Societe Europeene de Controle D'Acces

• Provided expert report and deposition testimony as a liability expert, retained by Sony in the case captioned below:

The United States District Court for the Eastern District of New York
Civil Action No. 92-01 28-ARR (Consolidated), Civil Action No. 91 -5056-ARR
Plaintiffs: Loral Fairchild Corporation
Defendants: Sony Company of Japan, LTD.

• Provided expert report and deposition testimony as a liability expert, retained by General Instrument in the case captioned below:

The United States District Court for the Eastern District of Pennsylvania
General Instrument Corporation v. Scientific-Atlanta, Inc.
Civil Action No. 91 -6923
Plaintiffs: General Instrument Corporation
Defendants: Scientific-Atlanta, Inc.