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THOMAS A. GAFFORD

Gafford Technology

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SUMMARY OF QUALIFICATIONS

- Extensive knowledge of analog and digital electronic circuitry, digital computer technology, computer peripherals and computer system design, control systems, operating systems, and transaction processing software.
- Skilled articulation of technical material for both non-technical and technical audiences, with special attention to claim construction issues.
- In-depth analysis of electronic and computer apparatus and functionality.

EDUCATION

University of Washington Seattle, Washington
Earned Bachelor of Science in Electrical Engineering, 1972
Key areas of concentration included digital and analog circuit analysis and electromagnetics.

Stanford University Palo Alto, California
Enrolled in Master of Science in Electrical Engineering, 1972-73.
Coursework included logic, circuit and computer design, computer architecture, LISP and ALGOL programming, software algorithm design, and system programming.

PROFESSIONAL EXPERIENCE

1986- **Gafford Technology** Las Vegas, Nevada
Now *Founder and Owner*
Firm undertakes R&D projects, provides computer system-related services, and offers analysis and presentation services that clearly and concisely explain computer and electronic technology to assist clients in litigation efforts.

Specific services include consulting in computer system design, software selection, and network configuration; providing expert factual analysis, claim interpretation assistance, prior art investigation and testimony in patent and hardware / software systems litigation; conducting R&D projects in peripheral switch design and application of hardware design language tools to peripheral interconnection design. Firm has manufactured and sold peripheral switching equipment.

1983- **Softix, Incorporated** Campbell, California
1986 *Co-Founder and Head of Engineering*
Firm designed and produced reliable and easily maintained systems to control and sell entertainment tickets by ticket agencies and large arena complexes in the United States, Canada,

Australia, and Hong Kong. The firm was sold in 1987.

Responsibilities included co-managing software development efforts; developing architecture, design, sales, contracting, production, and field support of large-scale software and hardware systems; analyzing, debugging, and writing software application and driver programs for feature enhancements and system integration.

Also responsible for selection, evaluation, integration, installation, customer staff training, and repair support of all hardware components of dual minicomputer systems; for research into graphic printing systems suitable for ticket sales; for development of peripheral switch equipment for evolving system requirements; for the manufacture and sale of peripheral switching equipment.

1976- **G Systems** Santa Clara, California
1983 *Founder and Owner*
Firm managed hardware and software design and development of computer transaction processing systems for a variety of applications and customers, as well as consulting in other hardware design projects.

Projects included design of hardware and software interfaces for disk controller; co-design of mainframe computer and design of mainframe computer elements; design of replacement printer which substituted all traditionally hard-wired functions with software functionality in communication and mechanism controls; design of peripheral switches incorporated into system product; writing of communications software and device drivers. Assisted legal team in patent litigation as technical expert in disk control systems.

1973- **Stanford University Artificial Intelligence Laboratory** Palo Alto, California
1976 *Engineer*
Position was responsible for computer engineering projects including support of robotics research.

Duties included design, construction, and debugging motor controls and sensor electronics for a robotic arm and its computer interfaces; maintenance and enhancement of large assembly-language software system used for logic design and PC board layout; maintenance of hardware for mainframe timesharing system for lab staff, including ARPANET connection and Xerographic printing equipment.

1967- **United States Air Force** Tacoma, Washington
1970 **McChord Air Force Base**
Sergeant and Instructor
Maintenance technician for air defense computer system; electronics instructor in on-the-job training programs; specialist in analysis and repair of problems in areas beyond standard training and documentation.

PATENTS

United States Patent #5,621,899 August 15, 1997
Method for Operating a Repeater for Distributed Arbitration Digital Data Buses

United States Patent #5,684,966 November 4, 1997
Switch for Distributed Arbitration Digital Data Buses

United States Patent #5,758,109 May 26, 1998
Repeater/Switch for Distributed Arbitration Digital Data Buses

ADDITIONAL PROFESSIONAL ACTIVITIES

Institute of Electrical and Electronic Engineers Life Member

CASE EXPERIENCE

Cases are grouped into four areas. All cases listed required extensive research and technical analysis. Where expert testimony at trial also occurred, it is noted. The party who is my client is underlined. Cases marked 'trial' at the right margin included deposition unless specifically noted, cases marked 'arbitration testimony' do not.

CIRCUIT DESIGN

Experience in this area involves low-level analysis of electronic circuits, usually without regard for any larger system in which the circuits might be used.

<i>Date</i>	<i>Case</i>	
01/94 to 07/94	<u>Wang v. Mitsubishi</u> Patent litigation relating to memory modules.	<i>deposition, trial</i>
11/95 to 03/96	<u>Waffer v. Fritz Forwarding</u> Litigation involving value of computer monitors based on service history and construction quality.	<i>arbitration hearing</i>
11/96 to 12/97	<u>United Technology Automotive v. National Semiconductor</u> Patent litigation relating to power control integrated circuits.	
05/97 to 09/98	<u>Oneac v. Raychem</u> Patent litigation relating to circuits for telephone line surge suppression.	<i>deposition</i>
06/97 to 06/97	<u>Harris Semiconductor v. Hyundai</u> Patent litigation involving static ram IC circuitry.	
12/98 to 03/00	<u>Xerox v. Hewlett-Packard</u> Patent litigation relating to electrical circuitry of thermal inkjet printheads.	<i>deposition</i>
02/01 to 09/02	<u>ICS v. Realtek, ICS v. Cypress, Cypress v. ICS</u> Patent litigation involving clock generator IC circuits.	<i>deposition, tutorial, Markman</i>
05/01 to 07/01	<u>Altera v. Xilinx, Xilinx v. Altera</u> Patent litigation involving FPGA circuitry.	
05/11 to 04/12	<u>Cascades v. Hynix</u> Patent litigation involving DRAM circuitry.	

CASE EXPERIENCE

CONTROL OF SYSTEMS

Case experience in this area involves design of electronics that control other systems; the electronics may or may not include computers or software, since the emphasis is on the control design.

<i>Dates</i>	<i>Case</i>
11/85 to 01/87	<u>IJR v. Colt Industries</u> Patent litigation relating to circuitry controlling Electrical Discharge Machining equipment.
06/87 to 01/90	<u>BRC v. Shoup</u> Patent litigation relating to control of electronic voting machines.
02/88 to 10/89	<u>IJR v. Sodick</u> Further patent infringement litigation involving same technology as above, with emphasis on extensive analysis of software.
03/88 to 10/88	<u>Westek v. Tri-Lite</u> <i>deposition, trial</i> Patent infringement litigation relating to touch sensitive lamp dimmer modules. Managed creation of animated model of patented invention and accused infringing circuit.
02/90 to 01/93	<u>FMC v. Hennessy</u> Trade secret litigation involving technology of automotive wheel service equipment and associated electronics and optics.
09/90 to 02/93	<u>Telepanel v. Pricelink, ERS v. Telepanel</u> Patent infringement litigation involving retail shelf price electronic display systems.
11/90 to 03/91	<u>Astro Med. v. Western Graphtec</u> Patent infringement litigation in the area of thermal printing chart recorders.
07/91 to 01/93	<u>IGT v. Bally</u> <i>deposition</i> Patent infringement litigation involving microcomputer-controlled gaming machines.
08/91 to 07/92	<u>Intermedics v. Ventritex</u> Trade secret litigation involving analog and digital circuitry used in pacemaker and defibrillation devices.
01/92 to 05/92	<u>Qume v. Ultra-Stor</u> Trade secret litigation involving microcomputer disk drive controllers.
01/92 to 11/92	<u>Eswaran v. AT&T</u> <i>deposition</i> Patent infringement litigation involving microcomputer controlled telephone answering machines.
03/92 to 12/92	<u>Honeywell v. Seatt</u> <i>deposition</i> Patent infringement case involving microcomputer-controlled thermostats.
11/92 to 04/95	<u>Lemelson v. Mitsubishi</u> Patent litigation relating to machine vision and computer information storage and retrieval.

02/93 to 08/94	<u>Lockwood v. American Airlines</u> Patent infringement litigation involving transaction processing systems and terminals.	
08/93 to 06/94	<u>Maxtor v. NEC</u> Patent litigation relating to disk drive electronics.	
10/93 to 09/94	<u>Octel et al. v. Theis</u> Patent litigation relating to voice message storage and retrieval.	<i>trial</i>
04/94 to 01/95	<u>A&L Technologies v. Resound</u> Patent litigation involving electronics for the control of hearing aid amplifiers.	<i>deposition, trial</i>
05/94 to 05/95	<u>Fonar v. General Electric</u> Patent litigation involving the control of magnetic resonance imaging (MRI) equipment.	<i>deposition, trial</i>
7/94 to 12/94	<u>Golden Enterprises v. AT&T</u> Trade secret litigation involving the control of voice prompting systems.	<i>deposition</i>
10/94 to 04/96	<u>Golden Enterprises v. Rockwell</u> Patent litigation relating to the control of telephone announcement systems.	
12/94 to 02/95	<u>Midtronics v. Telecom Assistance Group</u> Patent litigation involving control electronics for battery chargers.	
03/95 to 11/95	<u>Worldtronics v. Black & Decker</u> Patent litigation relating to appliance timing and control.	<i>deposition</i>
03/95 to 10/95	<u>Tidel v. Mallory</u> Litigation relating to remote sensing of fluid storage and delivery systems.	
07/95 to 09/96	<u>Global Gaming v. IGT</u> Patent litigation involving computerized slot machine control technology.	<i>deposition, trial</i>
07/95 to 07/00	<u>Quantum Group v. American Sensors et al.</u> Patent litigation involving carbon monoxide detector control technology.	<i>deposition</i>
07/95 to 06/01	<u>Sudbury Systems v. Dictaphone</u> Patent litigation involving voice storage and retrieval control technology.	<i>deposition</i>
07/95 to 01/96	<u>Alevy v. Fairplan</u> Litigation relating to the value of appliance monitoring computers.	
06/96 to 08/00	<u>IMS v. Haas, et al.</u> Patent litigation in technology relating to machine tool controls.	<i>deposition, trial</i>
02/97 to 11/98	<u>Foxboro v. Honeywell</u> Patent and contract litigation in technology relating to industrial process control communication systems.	<i>deposition</i>
06/97 to 09/05	<u>Fulhorst v. UTA et al.</u> Patent litigation in technology relating to automobile alarm control circuits.	
06/97 to 01/98	<u>Card-Monroe v. Tuftco</u> Patent litigation in technology for carpet tufting machine controls.	<i>deposition</i>

07/97 to 03/99	<u>Worldtronics v. High Performance Appliances</u> Patent litigation in technology relating to appliance timing and control.	
01/98 to 08/98	<u>Quorum v. Emerson Electric</u> Patent litigation brought against Quorum International in technology relating to AC motor control.	
01/98 to 11/98	<u>Honeywell v. Foxboro</u> Patent litigation in technology relating to industrial process control sensor systems.	<i>deposition, trial</i>
01/99 to 05/99	<u>Relume v. Philips et al.</u> Patent litigation relating to control of LED traffic signal lamp power supplies.	
06/99 to 11/99	<u>Regent Lighting v. DESA</u> Patent litigation relating to control of motion sensitive outdoor lighting.	
03/99 to 03/00	<u>Midtronics v. Actron</u> Patent litigation relating to electronic control of automobile battery testing equipment.	
01/00 to 06/00	<u>UTA v. Praxair et al.</u> Insurance litigation involving value of instrumentation electronics.	
01/00 to 05/00	<u>Fonar v. Healthsouth</u> Patent litigation involving the control electronics of magnetic resonance imaging (MRI) equipment.	
03/00 to 07/00	<u>Dark Horse v. Sega</u> Patent litigation involving control of arcade game machines.	
03/00 to 06/00	<u>Lemelson v. Maxim</u> Patent litigation involving control of semiconductor process equipment.	
04/00 to 08/03	<u>Chamberlain v. Lynx</u> Patent litigation involving garage door controls.	
04/00 to 03/01	<u>Calabrese v. Bosch, et al.</u> Patent litigation involving industrial data communication system.	
05/00 to 06/03	<u>Snap-On v. Hunter, Hunter v. Snap-On</u> Patent litigation involving controls for automotive repair instruments.	<i>deposition</i>
10/00 to 10/01	<u>SSK v. Clapper Industries</u> Trade secret litigation involving gaming machine controls.	
11/00 to 04/02	<u>Beery v. Thomson C.F.</u> Patent litigation involving television channel selection systems.	<i>Markman</i>
02/01 to 06/01	<u>Laser Sight v. Visx, Visx v. Laser Sight</u> Patent litigation involving vision correction machine controls.	<i>deposition</i>
03/01 to 10/02	<u>Digi v. Stallion</u> Patent litigation involving serial communications controllers.	
06/01 to 06/01	<u>Phone-Tel</u> Negotiations over telecommunication system control patents with Verizon.	

06/01 to 06/02	<u>Soundview v. Sony et al.</u> Patent litigation involving parental control circuit for TV.	<i>deposition</i>
06/01 to 06/03	<u>Lear Automotive</u> Consulting for patent enforcement in automotive electronics related portfolio.	
09/01 to 05/03	<u>Schneider Automation v. Opto-22 Corp.</u> Patent litigation involving web accessible programmable controllers.	<i>deposition</i>
01/02 to 08/02	<u>Cacheflow et al. v. NCT</u> Patent litigation involving file caching system controls.	
01/02 to 04/02	<u>Emhart v. Bottero</u> Patent litigation involving control of glass bottle making machinery.	
01/02 to 03/03	<u>St. Clair v. Sony Corp.</u> Patent litigation involving digital camera software and hardware control apparatus.	<i>deposition, trial</i>
03/02 to 09/02	<u>Advanced Communication v. Premiere Retail</u> Patent litigation involving store promotion display media control systems.	
09/02 to 09/03	<u>Jackson v. Nortel et al.</u> Patent litigation involving telephone line remote control apparatus.	<i>deposition</i>
02/03 to 04/03	<u>Catalina v. Coolsavings</u> Patent litigation involving an automated sales coupon dispensing control system.	<i>Markman</i>
03/03 to 10/04	<u>St. Clair v. Casio et al.</u> Patent litigation involving digital camera software and hardware control apparatus.	<i>deposition, trial</i>
04/05 to 04/05	<u>Solaia v. Rockwell et al.</u> Patent litigation relating to interface between spreadsheet programs and industrial control systems.	<i>deposition</i>
08/05 to 09/05	<u>Guidant v. St. Jude</u> Patent litigation relating to control of cardiac pacemakers.	
09/05 to 01/11	<u>Midtronics v. DHC, WEL, Argus</u> Patent litigation relating to electronic control of automobile and stationary battery testing equipment.	<i>deposition, trial</i>
10/05 to 10/06	<u>Fortunet v. Planet Bingo and Melange</u> Patent litigation relating to control of gambling terminals.	<i>deposition</i>
01/06 to 05/06	<u>EMD v. Wi-Tronix</u> Trade secret litigation relating to control of locomotive data systems.	
04/06 to 10/08	<u>Positive Technologies v. Benq, et al.</u> Patent litigation involving to flat panel display control.	<i>deposition</i>
04/06 to 12/06	<u>In re NCT</u> Patent re-exam proceedings for claims involving file caching system controls.	
12/06 to 05/08	<u>St. Clair v. Kodak</u>	<i>deposition</i>

	Patent litigation involving digital camera software and hardware control apparatus.	
02/07 to 03/08	<u>Visto Corporation v. Good Technology, Research In Motion, Microsoft</u> Patent litigation involving network synchronization of handheld computers to servers	
06/08 to present	<u>Copper v. Sony, Nintendo</u> Patent litigation involving wireless control of apparatus	
07/08 to present	<u>Beery v. DirecTV et al.</u> Patent litigation involving television channel selection systems.	
07/08 to 09/08	<u>Cisco</u> Patent litigation involving control of power delivery over Ethernet	
11/08 to 4/10	<u>St. Clair v. Samsung, et al.</u> Patent litigation involving digital camera software and hardware control apparatus.	<i>deposition</i>
05/10 to 4/11	<u>Positive Technologies v. Sony, et al.</u> Patent litigation relating to flat panel display control.	
03/11 to 06/11	<u>Greatcall v. Dyna</u> Dispute submitted for arbitration involving design of cellular telephone terminals and systems.	<i>hearing</i>
03/11 to present	<u>Personalized Media Communications v. Echostar, et al.</u> Patent litigation involving control of satellite broadcast systems and components.	<i>deposition</i>
11/11 to present	<u>MyKey v. Guidance et al.</u> Patent litigation involving control of forensic storage apparatus	<i>deposition, markman, trial (ITC)</i>
04/12 to 12/12	<u>Patent Harbor v. Funai</u> Patent litigation involving control of DVD recorders	<i>deposition, trial</i>
04/12 to present	<u>Honeywell v. ICM Controls</u> Patent litigation involving control of HVAC equipment	
02/13 to present	<u>ICM Controls v. Honeywell</u> Patent litigation involving control of HVAC equipment	
05/13 to 01/14	<u>J2 v. Nextiva</u> Patent litigation involving control of fax server systems	
01/14 to present	<u>Pentair v. Hayward</u> Patent litigation involving control of pool pumps	

CASE EXPERIENCE

COMPUTER DESIGN

Case experience in this area involves design of the computer itself, usually without regard to how the computer may be used.

<i>Dates</i>	<i>Case</i>	
01/81 to 02/82	<u>Microcomputer Systems v. DEC</u>	<i>trial</i>
	Patent infringement litigation involving computer disk storage control apparatus.	
06/89 to 09/90	<u>Motorola v. Hitachi</u>	<i>trial</i>
	Patent and contract litigation involving microcomputer design. Assistance in preparation of industry leaders as testifying experts in issues involving microprocessor architecture and circuit design.	
08/91 to 02/93	<u>T.I. v. Daewoo</u>	<i>deposition</i>
	Patent infringement litigation involving personal computer and microprocessor design.	
03/93 to 12/94	<u>Lemelson v. Apple Computer</u>	<i>deposition</i>
	Patent litigation relating to computer image storage and retrieval apparatus.	
06/94 to 01/95	<u>T.I. v. AST</u>	
	Patent litigation involving design of personal computers.	
06/95 to 03/96	<u>MTI v. CMD, et al.</u>	
	Patent litigation involving RAID storage system design.	
08/95 to 08/98	<u>ACM v. LADWP</u>	
	Litigation relating to the value of used computer equipment.	
04/97 to 07/98	<u>Zeny v. Acer</u>	
	Trade secret litigation in technology of PC motherboard design.	
04/97 to 12/97	<u>Matra v. IBM</u>	
	Contract litigation in technology relating to PC motherboard design and manufacturing.	
06/00 to 07/03	<u>Orbsak v. General Instrument</u>	
	Patent litigation involving digital broadcast multiplexing apparatus.	
06/02 to 01/05	<u>Intergraph v. Hewlett Packard, et al.</u>	<i>deposition</i>
	Patent litigation relating to computer cache memory system design.	
05/05 to 04/06	<u>Ampex v. Kodak</u>	
	Patent litigation relating to an image manipulation system.	
07/05 to 06/06	<u>Optima v. Sonic Solutions, et al.</u>	
	Patent litigation relating to a CD writing system.	
10/05 to 10/07	<u>TPL v. NEC, et al.</u>	
	Patent litigation relating to microprocessor design.	
01/06 to 03/06	<u>Microlinc v. Intel et al.</u>	
	Patent investigation as to infringement of claims involving high speed bus design.	

01/06 to 01/07	<u>Orbsak</u> Prior art investigation involving digital broadcast multiplexing apparatus.	
07/08 to 04/10	<u>AMD v. Samsung, Samsung v. AMD</u> Patent litigation involving various computer system and circuit issues	
01/09 to 02/11	<u>Acqis v. Appro et al.</u> Patent infringement litigation regarding modular computer design	<i>deposition, trial</i>
09/10 to 03/11	<u>Xpoint v. AMD et al.</u> Patent infringement litigation relating to I/O system design	
10/12 to 04/13	<u>USEI v. Digi et al.</u> Patent infringement litigation relating to network controller design	
05/13 to 10/13	<u>HTC v. TPL et al.</u> Patent infringement litigation relating to CPU design	<i>deposition, trial</i>
07/13 to present	<u>Acqis v. Ericsson et al.</u> Patent infringement litigation regarding modular computer design	
01/14 to present	<u>Zenith et al. v. Viewsonic and Craig et al.</u> Patent infringement litigation regarding ATSC compliant TV receivers	

CASE EXPERIENCE

COMPUTER SOFTWARE

Case experience in this area emphasizes large software systems without regard to the computer on which they may run.

<i>Dates</i>	<i>Case</i>	
02/89 to 11/92	<u>U.S. v. Anthony Fairchild</u>	<i>trial</i>
	Issues related to destruction of data as a result of software installation and operation.	
10/91 to 07/92	<u>Maho v. Banner Aeronautical</u>	<i>deposition</i>
	Wrongful termination defense in issues related to shift from batch-type system design and operation procedures to current generation software system design and operational procedures.	
01/93 to 01/94	<u>CHA v. PCC</u>	
	Issues relating to computer media discovery.	
03/93 to 12/94	<u>Qantel v. Signature Systems, et al.</u>	
	Trade secret litigation relating to operating system, communication protocol design, and compiler development.	
11/93 to 01/94	<u>FMC v. Cowart</u>	<i>deposition</i>
	Trade secret litigation relating to image processing and database analysis systems.	
06/96 to 12/97	<u>Crane v. Durametallc, et al.</u>	
	Trade secret litigation involving gas seal analysis software.	
01/98 to 01/99	<u>Robertson Machine v. Serpa</u>	
	Trade secret litigation in matters relating to NC programming information.	
05/98 to 07/99	<u>Retrac v. ETM</u>	<i>deposition, trial</i>
	Trade secret litigation in matters relating to transaction processing software.	
05/98 to 10/03	<u>Power Quest v. V-Communications</u>	<i>deposition</i>
	Patent litigation in matters relating to disk partitioning software.	
07/98 to 08/98	<u>Interactive Systems v. DSL Transportation</u>	<i>deposition</i>
	Contract litigation in matters relating to software development practices.	
03/99 to 04/99	<u>Soft Art v. Microsoft</u>	
	Trade secret litigation relating to accessibility of spell checking software.	
07/99 to 06/01	<u>GEAC v. HCL</u>	<i>deposition</i>
	Software contract relating to completion and quality of a large commercial software project.	
10/00 to 12/00	<u>OAS v. Design Collection</u>	
	Software performance litigation.	
01/02 to 12/02	<u>Newport v. Waret</u>	<i>deposition</i>
	Trade secret litigation relating to web site software.	

12/03 to 07/04	<u>Default Proof v. Home Depot, et al.</u> Patent litigation relating to transaction processing and debit card systems	<i>deposition</i>
12/05 to 10/07	<u>Premier International v. Apple Computer</u> Patent litigation relating to electronic media organization, purchase and presentation	
08/10 to 03/11	<u>Datatern, Inc.</u> Assisted client in database software licensing campaign.	
08/11 to 05/12	<u>Kelora v. eBay et al.</u> Patent litigation relating to a client-server based searching method	
12/11 to 02/13	<u>Wellogix v. ADP, Inc.</u> Patent litigation relating to a method of managing project invoices	
10/12 to present	<u>Walker Digital v. Google et al.</u> Patent litigation relating to display of photos in vehicle guidance systems.	<i>deposition</i>
10/12 to present	<u>Tesson v. Oce</u> Patent litigation relating to a document printing system	
10/12 to 12/12	<u>Rovi v. Mitsubishi, LG et al.</u> Patent litigation relating to control of video on demand playback	
01/13 to 01/14	<u>CSG v. TOA</u> Patent litigation relating to a method of scheduling technician workload	