

Dirk Hartogs, Ph.D.
408-612-3400
hartogs@californiatechnologyexperts.com

P.O. Box 40
Morgan Hill, CA 95038

SUMMARY

For DSP/OFDM/communications/wireless technology and architecture, litigation support, creation, and acquisition of intellectual property. Strategic technology coordination within regulatory and standards groups. Testifying expert in Federal Court (and state and foreign courts and regulatory bodies).

Dr Hartogs has been involved in communications technologies in both engineering and litigation support roles for over 20 years. Ten of Dr. Hartogs twelve U.S. patents are communications based (the other two are coding/data storage), as are seven of his nine disclosed litigation support engagements.

Five of his communications patents form the early basis of OFDM. The OFDM technology he developed in the 1980s is now incorporated in both DSL and advanced 802.11 wireless technologies. His basic patents ('034, '706, '816, and '227) are each directly referenced by over 100 subsequent OFDM patents. His expertise extends to related concept and system areas (see below).

PROFESSIONAL EXPERIENCE

1996 to Present **californiatechnologyexperts.com (Vice President)**
1985 to 1990 **Page Associates (Vice President)**

Technologist supporting major intellectual property disputes, arising from patent, standards groups, and employee issues both in the United States and abroad. Technologies include DSP, OFDM, DSL, 802.11, ISDN, telephony, call-processing, voice and cable modems, embedded processing, VoIP, modulation, wireless and cell, spread spectrum, packet systems, LAN/WAN, networks, personal communication, data compression and coding. Efforts include all levels of signal processing, communications, and networking.

Contributions also include fast track technology creation, evaluation, and management as an individual system concept and algorithm contributor, as a senior member and manager of development teams, and as liaison to outside regulatory groups, such as PUC, ITC, standards bodies, and USPTO. Concept development for complex signal processing and communications products and design of associated systems for commercial and defense consulting clients.

1990 to 1996

**Canon Research
Director Systems Architecture/WAN Technology**

Directed the digital telecommunications development efforts for Canon Research, a multi-national quasi start-up. Responsible for the analysis, architecture, and implementation of emerging technologies, including ISDN and telecommunications networking. Embedded processing. Multiple patents.

Managed engineering teams, challenging PhDs at multiple levels in research, including technical reports, patents, and conference presentations. Negotiated key technology development contracts. Participated in technical sessions, conferences, and as a board member of California ISDN Users Group and before California Public Utilities Commission.

1983 to 1985

**Telebit Corporation
Director of Development**

Supervised, directly or indirectly, fifteen development engineers in exceptional software and hardware modem (two embedded processors) development team. Led a rapid and successful digital signal processing effort (over fifty thousand lines of code on Texas Instruments 320 DSP) that resulted in numerous Product of the Year awards. Initially contributed as an individual developer of the unique modem technology allowing a start-up (three people in a back room) to become a market leader against established competitors in less than two years. Key individual OFDM patents issued (four patents, each cited over 100 times by later modem, wireless, and DSL patents).

1981 to 1983

**Litton Applied Technology
Staff to Vice President, Engineering**

Responsible for the direction of the independent research and development effort which delivered integrated computer/receiver platforms to Defense Department. Overall effort involved ten simultaneous and distinct projects.

1979 to 1980

**Spatial Incorporated
Vice President**

1975 to 1979

**Probe Systems
Senior Engineering Specialist**

1969 to 1970

**Defense Intelligence Agency
Analyst/Programmer**

EDUCATION

Ph.D. Electrical Engineering (Communication Theory), Stanford University, 1975
M.S., Electrical Engineering (Statistics minor), Stanford University, 1971
A.B., Mathematics and Physics (With Honors) Dartmouth College, 1968

DISCLOSED LITIGATION SUPPORT EXPERIENCE

Dr Hartogs was a testifying/disclosed expert in the following closed matters:

Technology:	DSL
Case:	GlobespanVirata v Texas Instruments
Matter:	Patent Validity/Infringement
Responsibilities:	Testified as expert at trial and depositions, prepared declarations, conducted prior art and other research.
Date closed:	2006
Technology:	V.92 modem
Case:	Townshend v ESS Technology
Matter:	Patent Infringement/Validity
Responsibilities:	Conducted prior art and other research, made declaration as expert witness.
Date closed:	2006
Technology:	e-commerce and Internet/reservations technology
Case:	Marketel v. Priceline
Matter:	Trade secrets regarding patent ownership and e-commerce issues
Responsibilities:	Conducted research, made declaration and was deposed both as percipient and expert witness.
Date closed:	2002
Technology:	T1 installation methods
Case:	Kelley et al v. SBC
Matter:	Labor dispute regarding telecommunications issues
Responsibilities:	Conducted research and made declarations.
Date closed:	2001
Technology:	Prison phones with monitoring/conferencing
Case:	Gateway Technology v. T-netix and counter suit T-netix v. Gateway Technology
Matter:	Patent infringement/Patent validity
Responsibilities:	Conducted research and was deposed
Date closed:	1997

Technology: ISDN technology, implementation
Case: Compaq, Intel et al v. Pacific Bell
Matter: Public Utilities Commission monopolistic practices
Responsibilities: Testified and made declaration as expert before California PUC
Date closed: 1997

Technology: V.34 modem
Case: Rockwell v. Motorola
Matter: Patent infringement regarding modem technology
Responsibilities: Conducted research, prepared declaration and assisted in depositions
Date closed: 1997

Technology: DSP, Embedded processor (Sound card)
Case: Aztech v. Creative Labs
Matter: Trade secrets regarding “Sound Blaster” card
Responsibilities: Conducted research, prepared reports and testified at trial in Singapore
Date closed: 1997

Technology: DSP, Embedded processor (Sound card)
Case: Yamaha Corporation v. ESS Technology
Matter: Patent infringement regarding digital signal processing
Responsibilities: Conducted research, wrote reports and was deposed
Date closed: 1996

PATENTS

<u>Patent Number</u>	<u>Year Issued</u>	<u>Title</u>
6,111,935	2000	Adaptive Expansion Table in a Digital Telephone Receiver
5,854,829	1998	ISDN Fax Routing
5,657,381	1997	ISDN Fax Routing
5,652,782	1997	Digital Telephone Overcoming International Incompatibilities
5,495,485	1996	Transmission of Analog and Digital Information Across a Single Line

5,479,418	1995	Error and Loss Correction in a Data Base Stored on a Two Dimensional Medium and Method
5,296,693	1994	Ink Intrusion Resistant Digital Code
5,054,034	1991	Ensemble Modem Structure for Imperfect Transmission Media
4,833,706	1989	Ensemble Modem Structure for Imperfect Transmission Media
4,757,495	1988	Speech and Data Multiplexer Optimized for Use Over Impaired and Bandwidth Restricted Analog Channels
4,731,816	1988	Ensemble Modem Structure for Imperfect Transmission Media
4,679,227	1987	Ensemble Modem Structure for Imperfect Transmission Media

Numerous related foreign patents.

PROFESSIONAL AFFILIATIONS & AWARDS

Member, IEEE

Former Board Member, California Broadband Users Group (CALBUG)