

MICHAEL L. BEIGEL

SUMMARY

Michael L. Beigel has over 30 years of experience in electronic product development and technology consulting. He has been an independent consultant since 1978, serving businesses and performing projects throughout the U.S., Europe, Asia, and Antarctica.

Mr. Beigel's inventions and product designs have been on the cutting edge of technology in diverse industry segments throughout his career. He has brought many new products from conception to the marketplace since the 1970s. His technical specialties include inventions and patents, Radio Frequency Identification Systems (RFID), measurement and control systems, analog signal processing, musical products, system and circuit design, production and test fixtures, and forensic consulting.

Mr. Beigel has degrees in Electrical Engineering and Humanities from M.I.T. He is the inventor of 20 U.S. patents and corresponding international patents with more pending. He has published articles and technical papers in numerous trade and technical publications, and given presentations at diverse industry technical conferences.

PROJECTS

Radio Frequency Identification Systems - Patented and developed original systems and products involving ultraminiature implantable passive tags and reader units used in livestock identification, industrial ID systems, security access control systems and other applications. Provided technology consulting in RFID field.

Mr. Beigel's original work in 1979 has contributed to the formation and development of an international high growth industry.

Scientific Experimental Equipment: Computerized RFID "Weighbridge" for Antarctic Penguin Studies. Designed, built, installed on location in Antarctica, and optimized a solar powered computerized fixture to identify, weigh and determine travel direction of penguins in extreme Antarctic environment. Joint project by New Zealand Antarctic Programme and US National Science Foundation.

Smart Card Reader-Writer Product - Complete design of PC based smart card reader-writer product for new company in new field. (New York)

Solid-State Power Controllers - First all solid-state relay to be U.L. recognized for junction box mounting, patented, using novel design and production techniques, for Amprobe Instrument division of Core Industries, a publicly traded corporation. (New York)

Automated Test and Production Fixtures - Designed computer automated test fixture to conduct U.L. tests, with both fixture and test results accepted by U.L. (New York) Designed computerized laser sealing production fixture for RF-ID tags. (California)

Musical and Audio Products - Elcctro-Harmonix Q-TRON envelope controlled filter, Musitronics MU-TRON product line of sound modifiers (New Jersey), Beigel Sound Lab Envelope Controlled Filter (NewYork), St. Louis Music AUDIO-CENTRON Professional mixing

console (St. Louis), other synthesis, signal processing and power amplification products. (Indiana, Massachusetts)

Ultrasonic Measurement Systems - New product line of high-sensitivity ultrasonic detectors and signal generators for UE Systems, Inc. (New York)

Humidity & Temperature Measurement Instruments - Designed circuitry used in humidity measurement products by Phys-Chemical Scientific Corp., manufacturer in high-end equipment. (New York) Also designed production measurement equipment for humidity cell production.

Hard Disk Server for Apple Computers - Managed product design: Multiple Apple II computers access a common hard disk with this hardware/software product.

Computerized Marketing System - Selected and managed implementation of computerized lead tracking and sales automation software at Amprobe Instrument.

Thermodynamic Flow meter - Servo-controlled thermistor pair detects fluid or air flow, for small company. (New Jersey)

Production test & Calibration fixtures - For op amp gain and offset, humidity meter calibration, humidity cell production, consumer product production, musical products. (Numerous companies)

Baby Beeper - Battery powered sensor-transmitter, alarm-receiver (RF) product responds to baby cries (selectively) and alerts mother at remote location. Consumer product. (Ohio)

PATENTS ISSUED

6,414,543 B1	Rectifying Charge Storage Element
5,973,598	RFID Tag on Flexible Substrate
5,499,017	Multi-Memory Electronic ID Tag
6,249,212 B1	Universal Electronic ID Tag
EPO 748491 B1	European Patent
5,559,507	Signal Transmission and Tag Reading Circuit for an Inductive Reader
5,266,926	Signal Transmission and Tag Power Consumption Measurement Circuit for an Inductive Reader
5,257,011	Data Altering Means for Multi-Memory Electronic Identification Tag
5,235,326	Multi-Mode Identification System
5,214,409	Multi-Memory Electronic Identification Tag
Des. 318658	Electronic ID Tag Reader
5,003,192	AC Power Switching Device With Non-volatile Memory Unit
4,823,600	Ultrasonic Transducer and Current Loop Transmitter
4,751,401	Low Voltage Switch
4,333,072	Identification Device
4,316,401	Music Synthesizer
4,314,496	Music Synthesizer
4,291,605	Music Synthesizer
Des. 236212	Electronic Musical Accessory
3,911,776	Sound Effects Generator

Other patents pending , US and international

FORENSIC PROJECTS (Patent related)

Analysis of tablet digitizers, preparation of affidavit and laboratory demonstration for patent litigation.

Analysis of LCD display circuit, comparison to patent claims, for patent litigation

Investigation of "state of the art" video imaging technology for affidavit to Patent Office, regarding enabling disclosure of patent application.

Strategic consult to patent attorney regarding RFID technology.

Analysis of potentially infringing device technology in RFID case.

EDUCATION

Massachusetts Institute of Technology

B.S. Electrical Engineering, 1969

B.S. Humanities and Engineering, 1970

MEMBERSHIPS

Institute of Electrical and Electronics Engineers (I.E.E.E.)

Audio Engineering Society (A.E.S.)

American Association for the Advancement of Science

AFFILIATIONS

Beigel Technology Corporation (CA)

1995-present

Beigel Electronics, Inc. (CA, NY),

Measurement & Control Systems, Inc.

1988-1995

President/Owner:

Technology consulting, Contract services in electronic product development, automated test fixtures, manufacturing, inventions and patents, and technical marketing.

AVID Marketing Inc. (CA)

1991-1995

Director of Technology Development (as consultant)

Developed and directed development and manufacturing of RFID product line for animal and industrial identification. Extensive development of patents and intellectual property. Coordinated worldwide product engineering and manufacturing operations.

Beigel Consulting Services (NY)

1978-1988

President/Owner:

Consulting and contract engineering services in electronic product development.

Amprobe Instrument Division, Core Industries Inc. (NY)

1986-1990

Consultant

New product and new market development,
computerization of marketing functions,
management consulting, strategic planning,
and introduction of personal computers.

EPD Technology Corp. (NY)
President, Director

1984-1986

Research and Development company
providing contract services to manufacturers.

Musitronics Corp. (NJ)
Vice President R&D, Director

1972-1978

Manufacturer of musical products sold worldwide.
Co-founder and principal designer of the *Mu-Tron* sound
modification products.

Guild Musical Instruments. (NJ)
Consultant

1970-1972

Designed music synthesis equipment for this leading
musical products manufacturer.

Identic Data, Inc. (Cambridge, MA)
President

1970-1971

While still a student at MIT, operated a R&D
"think tank" company which generated inventions
and product designs.

PUBLICATIONS AND PRESENTATIONS

1. "Tagging Wild Animals" by William I. Boarman, Mike Beigel, Glenn C. Goodlett, Marc Sasaki
Global ID magazine
November 2001

2. "Dynamic Performance of Inductive RFID Systems"
ECCTD (European Conference on Circuit Theory and Design) 99 presentation
August 30, 1999 in Stresa, Italy

3. "A Passive Integrated Transponder System for Tracking Animal Movements"
Wildlife Society Bulletin, Vol. 26, Number 4, pgs. 886-891
Winter 1998

4. "An Automated System for Studying Movements of Animals in Isolated Environments"
Paper by William I. Boarman, Mike Beigel, Glenn C. Goodlett, Marc Sasaki
November 1995

5. "Objective Measurements for RFID System Performance: System Design and Evaluation
Criteria"
William I. Boarman. Michael Beigel
RFID Paper for Fisheries Conference

January 16, 1993

6. "Inside Digital Signal Processing; The DSP Chip"
Sound and Communication magazine, pgs. 31-34; 53, 74
March 1987

7. "Digital Audio Basics: Analog Digital Conversion"
Sound and Communication magazine, pgs. 14-15; 48-49
October 1986

8. "Digital Signal Processing"
Sound and Communication magazine, pgs. 14, 16; 49
November 14, 1986

9. "Instrument Controlled Synthesizers"
SOUND ARTS MERCHANDISING JOURNAL
August 13, 1980

10. "Instrument Controlled Synthesizers: Technology, Technique & Music"
Sound Arts Merchandising Journal, Vol. 3 No. 9, pgs. 32-36
October 1980

11. "Instrument Controlled Synthesizers: Technology, Technique & Music"
Sound Arts Merchandising Journal, Vol. 3 No. 10, pgs. 34-37
November 1980

12. "High Tech at the AES Convention"
Sound Arts Merchandising Journal, Vol. 1 No. 12, pgs. 34-36
January 1979

13. "A Chip Off the Old Circuit Block, Part II: Digitizing the Signal"
Sound Arts Merchandising Journal, Vol. 2 No. 4, pgs. 34-36
May 1979

14. "A Chip Off the Old Circuit Block, Part III: Digital Audio Applications"
Sound Art Merchandising Journals, Vol. 2 No. 5, pgs. 40-44
June 1979

15. "A Walk Through the Waldorf: Trends, Talks and Technology"
Sound Arts Merchandising Journal, Vol. 2 No. 11, pgs. 20-22
December 1979

16. "A Digital 'Phase Shifter' for Musical Applications, Using the Bell Labs (Alles-Fischer) Digital Filter Module"
AES
Presented at the 61st Convention in Warwick, New York
November 3-6, 1978

17. "More Than You Ever Wanted to Know About Phasors" by Fred Ridder & Mike Beigel
Musician's Guide, pgs. 16-31
September-October 1975

- Technical, trade and general-interest articles, scientific papers published in numerous industry magazines and journals since 1974.

- Lectures and presentations at Audio Engineering Society, Midwest Acoustics Conference, Pacific States Marine Fisheries Conference.