

SUMMARY OF EXPERIENCE AND CAPABILITIES

Circuit Design and Development	FPGA Software Development Using Verilog
Fully Equipped Laboratory— DC-26.5 GHz	Antenna Design, Development, Measurement
Circuit Board Layout using P-CAD & Accel	Training Services
RF and Microwave Design	VCO & Synthesizer Design and Development
Analog Design and Development	Technical Writing and Publication
Software Development	Proposal Consulting and Writing
Simulation and Analysis	Literature and Data Research and Retrieval
GPS Applications	DSP Design
Engineering Services	Fully Equipped RF and Analog Laboratory
Prototype Design and Development	Receiver Design and Development
Spread Spectrum Systems	Transmitter Design and Development
Custom Circuitry and Systems	Technical Business Consulting for M&A
Embedded Software for PIC processors	Digital Radio Design and Development
Antenna Site Analysis	Propagation Studies, Prediction, and Analysis

EXPERIENCE AND CAPABILITIES

Circuit Design and Development

- Power Amplifiers
 - 100 Watt 225-400 MHz
 - 2 Watt 903-928 MHz
 - 200 Watt DME pulse
 - Various amplifiers from 900 MHz to 11 GHz
- Low power and low noise amplifiers
 - 225-400 MHz
 - 902-928 MHz
 - 1830 MHz
 - 1575 MHz
 - 4.2 GHz
 - Various other amplifiers to 10 GHz

- VCO's and Synthesizers
 - 225 – 400 MHz VCO and synthesizer
 - Various 902-928 MHz VCO's and synthesizers
 - 1830 MHz VCO's and synthesizers
 - Broad-band electronic warfare equipment and associated synthesizers
 - Various other synthesizers & VCO's between 100 MHz and 3 GHz
- Direct Digital Synthesizer Development
- DSP systems and software development
- Extensive experience with troubleshooting and analysis (both on the bench and using simulation tools) of client-designed circuits and systems
- Components
 - Detectors and Limiter Detectors
 - Switches
 - Filters
 - Modulators
- Systems
 - Receivers
 - Transmitters
 - Transceivers
 - Extensive experience with frequency planning to achieve minimal complexity and minimal spurious emissions in broadband systems
 - High data rate digital microwave radio
 - Jammers
 - FCC Part 15 Spread Spectrum Devices
 - FCC Part 15 Electronic Article Surveillance Systems
- Antenna Design and Development 300 MHz to 11 GHz
 - Microstrip patch antennas and antenna arrays
 - Computerized antenna test range for small antennas
 - Various microstrip patch antennas designed and developed from 900 MHz to 11 GHz

Modern, Fully Equipped Laboratory

- Test Equipment covering DC - 26.5 GHz
- Agilent 8510C vector network analyzer with the time domain option (45 MHz – 26.5 GHz)
 - Device characterization
 - Load-pull measurements
- Computer automated antenna range for antenna analysis and measurement
- Agilent E-4433B ESG-D digital and analog modulation signal generator to support 3G and other wireless communications system development including DECT, GSM, NADC, CDMA, PDC, PHS, TETRA, W-CDMA, CDMA2000, etc.
- Spectrum Analysis
 - HP-8563E 30 Hz to 26.5 GHz spectrum analyzer with phase noise and spurious measurement personalities
- Time domain reflectometry
- General purpose test equipment
- Phase noise measurement

GPS Applications

- Navigation
- Differential GPS Application/Development
- Surveying
- Mapping and resource measurement
- Time-keeping and transfer

Software Design and Development

- Database program for mail-order distribution to amateur radio market
- Turbo-Pascal® program modification for computerized manufacturing application
- Software development and modification for IEEE-488 automated test stations
- Software development in Visual Basic®, Visual C++®, C, Turbo-C++®, Turbo-Pascal®, Turbo-Basic®, and Fortran
- Software development and hardware integration for an automated antenna range
- Software development in C for embedded PIC Microprocessors using Hi-Tech C
- Software development in Verilog for Xilinx FPGA's using FPGA Express

Simulation and Analysis Capabilities

- IsSpice/386 (non-linear, analog (SPICE) circuit simulation) (ICAPS/4)
- Prediction and analysis of coverage area for various tower/antenna combinations for various wireless applications including PCS, analog and digital cellular, and wireless internet
- Genesys (now Agilent) products (linear and non-linear circuit simulation and design, as well as filter design)
- Mathematica® (mathematical modeling, analysis, and graphics)
- Matlab
- Mathcad
- SystemView Linear and Non-Linear system simulation package with DSP, RF, Logic, and Communications toolkits
- DSP56002 Motorola DSP development toolkit

Engineering Services

- Circuit board design using P-CAD® and Accel EDA and Orcad
Specializing in high speed analog, high speed digital, and RF circuit board design
Very fast turnaround available
Schematic generation and capture
Board layout
Single-sided, double-sided, and multi-layer
Specializing in RF, microwave, and high frequency boards
Teflon®, G-10, GIL-Laminate, and Rogers boards
Close working relationship with board fabrication houses allowing quotation and delivery of boards from design through fabrication
Spectra (formerly CCT or Cooper & Chyan) autorouter
- 24 years experience in surface-mount technology

- CAM-350 Gerber Viewer and Modification tool for effective Gerber check plots
- Close working relationship with surface-mount contract manufacturers

Training Services

- Software
 - Genesys® (now Agilent) products
 - P-CAD® and Accel® circuit board layout software
 - Intusoft Spice
 - CAD Solutions CAM-350
- Computer Hardware

Documentation, Technical Publication, and Research

- Writing and production of product information
- Writing and production of technical manuals
- Article writing
- Proposal assistance, consulting, and writing
- Database, publication, and library research for industry and mergers and acquisitions research