



AEROSPACE CONSULTING

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SUMMARY OF EXPERIENCE AND CAPABILITIES

Circuit Design and Development	Embedded Linux Software for Gumstix
Fully Equipped Laboratory— DC-26.5 GHz	FPGA Software Development Using Verilog
Circuit Board Layout P-CAD, Accel, Altium	Antenna Design, Development, Measurement
RF and Microwave Design	Training Services
Analog Design and Development	VCO & Synthesizer Design and Development
Software Development	Technical Writing and Publication
Simulation and Analysis	Proposal Consulting and Writing
GPS Applications	Literature and Data Research and Retrieval
Engineering Services	DSP Design
Prototype Design and Development	Fully Equipped RF and Analog Laboratory
Spread Spectrum Systems	Receiver Design and Development
Custom Circuitry and Systems	Transmitter Design and Development
Embedded Software for PIC processors	Technical Business Consulting for M&A
Antenna Site Analysis	Digital Radio Design and Development
FCC Pre-Compliance Testing	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 2 MHz to 18 GHz
- Low power and low noise amplifiers
 - 1-50 MHz
 - 225-400 MHz
 - 902-928 MHz
 - 1830 MHz
 - 1575 MHz

4.2 GHz

Various other amplifiers to 18 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 3.6 GHz using conventional and fractional-n synthesizers
- 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
- Material characterization—using various software tools, basic theory, and an array of test equipment, Aerospace Consulting has performed various material characterizations, where the properties of a material, such as dielectric constant and loss tangent, had to be determined.
- Components
 - Detectors and Limiter Detectors
 - Switches
 - Filters (discrete LC filters, microstrip filters, and active filters)
 - Modulators (BPSK, QPSK, SOQPSK, etc.)
- Systems
 - Receivers
 - Downconverters
 - CW radar
 - 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 low power devices
 - FCC Part 15 Electronic Article Surveillance Systems
- Antenna Design and Development 300 MHz to 11 GHz
 - Microstrip patch antennas and antenna arrays
 - Aerospace Consulting has a computerized antenna test range for small antennas as well as various software products for antenna design and simulation.
 - 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 8753D vector network analyzer with the time domain option (100 kHz – 6 GHz)
 - Device characterization
 - Load-pull measurements
- Agilent 8510C vector network analyzer with the time domain option (45 MHz – 26.5 GHz)
 - Device characterization

- Load-pull measurements
- Agilent 8970B noise figure meter, Agilent 8971C harmonic converter, and Agilent 346C noise source allowing noise figure measurement from 10 MHz through 26.5 GHz
- Computer automated antenna range for small antenna analysis and measurement
- Agilent 34 GHz 4 channel digitizing oscilloscope
- 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 and Phase Noise Analysis
 - HP-8563E 30 Hz to 26.5 GHz spectrum analyzer with phase noise and spurious measurement personalities
- Time domain reflectometry using both network analyzers and high speed oscilloscopes
- General purpose test equipment including various RF signal, and arbitrary waveform, generators
- Oscilloscopes including Tektronix TDS744A 2 GSPS 4 channel digital scope
- Load pull equipment for device power and noise characterization from 500 MHz through 4 GHz
- Small milling machine for metal fabrication for test fixtures or prototype cases

GPS Applications

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

Software Design and Development

- 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 and Microchip's own C development platform
- Software development in Verilog for Xilinx FPGA's using Foundation
- Software development for embedded system using Linux on a Gumstix embedded Linux computer

Simulation and Analysis Capabilities

- IsSpice/386 (non-linear, analog (SPICE) circuit simulation) (ICAPS/4)
- Agilent Genesys products (linear and non-linear circuit simulation and design) (latest version)
 - Genesys Core for design, layout, data display, and linear simulation
 - Harbec for non-linear simulation and analysis
 - Spectrasys for system level simulation and analysis
 - Cayenne for non-linear time domain analysis

Filter for filter design

M/Filter for microwave filter design

A/Filter for active filter design

Equalize for filter equalization

Match for matching network synthesis

Oscillator for oscillator design and analysis

Advanced T/Line for transmission line synthesis and analysis

AMK, the advanced modeling kit, which allows for development of various linear and nonlinear circuits and systems where conventional models are not available or possible.

Testlink which allows for computer control and capture of data from various pieces of test equipment, such as oscilloscopes, spectrum analyzers, network analyzers, etc., for easy data capture, storage, and output for reports in various formats such as text files, jpg images, etc.

- Modelithics substrate independent libraries for Genesys platform for many manufacturers' inductors, capacitors, and resistors, including Murata Erie, ATC, and Johanson capacitors, Coilcraft inductors, and KOA Speer resistors
- Agilent SystemVue Linear and Non-Linear system simulation package with DSP, RF, Logic, and Communications toolkits (latest version)
 - This package is invaluable for performing system-level design and simulation of various RF and DSP systems from individual circuits through entire communications systems including the propagation channel. This is highly useful for all of the new digital communications modes, as well as the older, analog communication systems.
- Xilinx Foundation software for FPGA development and simulation
- Mathematica® (mathematical modeling, analysis, and graphics)
- Matlab
- Mathcad
- DSP56002 Motorola DSP development toolkit

Engineering Services

- Circuit board design using P-CAD® and Accel EDA, as well as latest version of Altium Designer
 - 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
- 29 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
 - Agilent Genesys® and SystemVue products
 - P-CAD® and Accel® circuit board layout software
 - Intusoft Spice

Documentation, Technical Publication, and Research

- Writing and production of product information
- Writing and production of technical manuals
- Article and white paper writing
- Proposal assistance, consulting, and writing
- Database, publication, and library research for industry and mergers and acquisitions research. Technical publication studies to determine current state-of-the-art, or current trends.