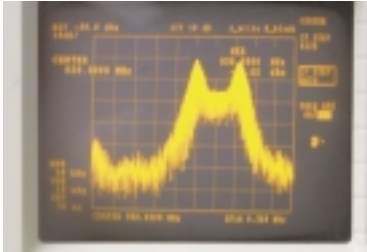


R.F. & WIRELESS DESIGN

Experience Makes The Difference

HWI's RF expertise includes product design, development, analysis, verification, compliance testing, prototyping and manufacturing. We have met the unique design challenges for a broad range of industries and applications, across a broad range of frequencies.



RF Circuit Analysis

Print-out of spectrum analyzer detail showing North American ISM Band FSK frequency modulation.

Design Innovation

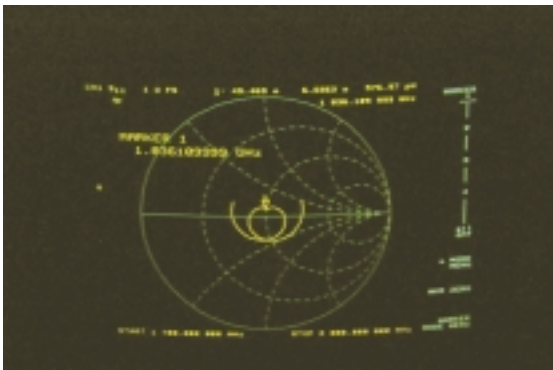
An innovative design approach is required to meet today's RF requirements. HWI's experienced personnel use a combination of sophisticated tools and broad applications knowledge to develop custom solutions for each customer project. HWI's cross-disciplined concurrent engineering approach includes EMI/RFI analysis, propagation studies, channel modeling, range prediction, BER analysis and delay spread measurements.

Manufacturing Excellence

HWI specializes in engineering run, prototype and first article manufacturing. The "Proof of Manufacturing" process is pivotal in HWI's overall service philosophy. These steps enable us to reliably validate the long-term, volume manufacturability of our designs.

Testing Sophistication

Test input is a vital part of the concurrent engineering development process at HWI. By involving the test engineers up front, HWI ensures reliable and effective test strategies for all customer products.



Smith Chart Analysis

HWI utilizes the Smith Chart as one of its tools to analyze the strength of the circuit at varying frequencies.

HALLECK - WILLARD INC



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R.F. & WIRELESS DESIGN

Design & Simulation Capabilities

- ▶ Diverse frequencies & applications
- ▶ Concurrent design methodology
- ▶ Digital baseband system design
 - ▶ Clock recovery
 - ▶ Antenna diversity
 - ▶ Radio control
- ▶ EMI/RFI design consideration
- ▶ ASIC design
- ▶ Propagation Studies
- ▶ Channel Modeling (Smith Chart Analysis)
- ▶ Antenna design (Planar/Wire)
- ▶ Verification testing

Design/Analytical Tools

- ▶ EagleWare Design, Simulation, Layout
- ▶ Cadence PSPICE for RF IC Design
- ▶ MathCAD
- ▶ MATLAB

Verification Equipment

- ▶ Network Analyzers
- ▶ Spectrum Analyzers
- ▶ Signal Generators
- ▶ Modulation Domain Analyzers
- ▶ Low Frequency FFT Analyzers



Testing Solutions

- ▶ Multi-element RF tuning
- ▶ Demodulation/un-modulated signal analysis
- ▶ 10 mHz standard for RF (standard time base)
- ▶ Transmitter amplitude, center frequency, bandwidth
- ▶ Receiver bandpass characterization, sensitivity, loss
- ▶ Harmonic, intermodulation testing
- ▶ Custom fixtures
 - ▶ Antennas
 - ▶ RF shielding
 - ▶ RF interfaces
- ▶ Technology-specific applications
 - ▶ GSM
 - ▶ ISM

Product Development Portfolio

- ▶ Wireless Vital Signs Monitor
- ▶ Personal Emergency Response Systems (PERS) (several different frequencies)
- ▶ GPS Systems
- ▶ Home Incarceration Systems
- ▶ ID Systems
- ▶ Security Systems
- ▶ Bluetooth Development Partner