The Stub Loaded Helix:
A Reduced Size Helical Antenna

R. Michael Barts

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Warren L. Stutzman, Chair
William A. Davis
Gary S. Brown
Ahmad Safaai-Jazi
Keith R. Carver

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(ABSTRACT)

This dissertation details the development of a novel reduced size axial mode helical antenna called the Stub Loaded Helix (SLH). The SLH achieves a significant reduction in helix size, both diameter and length, compared to the conventional axial mode helix antenna with only small compromises in performance. The SLH achieves this entirely through the use of a unique geometry. The performance characteristics of the SLH are explored through the use of computer simulations using NEC (Numerical Electromagnetics Code) to study the effects of design parameter variations. Based on those simulations, design guides are developed. The numerical simulations are verified though measurements of experimental prototypes. The program of experimental prototypes included the development of an appropriate impedance matching network for the SLH, which is also detailed.

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