

MASTER OF SCIENCE IN SYSTEMS ENGINEERING

THE CAPABILITIES, PROPAGATION EFFECTS, AND TARGETING OF COMPUTER SYSTEMS

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In this thesis a new Microsoft Word Macro computer virus is constructed and evaluated to determine its capabilities and effects. The Microsoft Word macro virus was selected because in the past two years, it has been the number one reported virus among systems and offers the potential of platform independence. The characteristics of computer systems and an understanding of what constitutes a computer virus are used to identify the particular functions that enable viral activity to occur. The construction of a new virus provides a test program for performing a vulnerability assessment of a computer system. The targeting capabilities of the computer virus are analyzed and an organizational model is presented to evaluate its potential impact. The end result is a systems approach to an Information Warfare problem with a method of attack and an assessment for understanding the impact of such an attack. The assessment of the organizational model can best be analyzed using simulation tools which can produce confidence levels on the impact of the computer virus through the networked organization.

DoD KEY TECHNOLOGY AREA: Other (Information Operations/Information Warfare)

KEYWORDS: Computer Viruses, Computer Security, Information Warfare, IW Attack Tools, Vulnerability Assessment

COMMUNICATIONS ANTENNA FOR A MICRO REMOTELY PILOTED VEHICLE (RPV)

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The objective of this research was to design a compact lightweight communications antenna for a micro remotely piloted vehicle (MRPV). Based on a computer simulation of four potential antenna configurations it was found that a monopole on a cylindrical end cap provides the lowest voltage standing wave ratio (VSWR) and a nearly hemispherical radiation pattern. The data was generated at frequencies near 1 GHz using two method of moments computational electromagnetic codes: PATCH and NEC-Win.

DoD KEY TECHNOLOGY AREAS: Air Vehicles, Electronic Warfare

KEYWORDS: RPV, PATCH, NEC-Win, and Antennas

MASTER OF SCIENCE IN SYSTEMS ENGINEERING

GRAPHICAL USER INTERFACE FOR AN ELECTROMAGNETIC SCATTERING PROGRAM

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The graphical user interface is a programming environment which can help guide a novice user step-by-step from data input through output display of a complicated computer program. This thesis presents an attempt in this direction by providing a graphical user interface to a program recently written at NPS for demonstrating the vanishing of on-axis backscattering of an anisotropically coated tubular cylinder.

DoD KEY TECHNOLOGY AREAS: Electronics, Sensors

KEYWORDS: Anisotropically Scattering, RCS, Axis Incidence, On-Axis Backscattering, GUI

