

ABSTRACT

This thesis discusses the ElectroScience Laboratory's new compact range radar measurement system. This high performance pulsed-CW system performs RCS and antenna measurements from 400 MHz to 100 GHz. This thesis contains an introduction to the compact range measurement system and the fundamentals of pulsed-CW radar. The function of the major subsystems is explained, as well as the operation of the system as a whole. An in-depth analysis of three of the system's microwave hardware subsystems is presented. The measurement performance in sensitivity, dynamic range, and compression is predicted using system performance spreadsheets.