CHAPTER 1

INTRODUCTION

1.1 THE TEXT ORGANIZATION

Chapter 2 is devoted to the principles of electromagnetic measurements that pertain to anechoic chamber design. The concept of plane waves, uniform fields, and uniform phase are given to establish the basis for determining the properties of a radiating or scattering device in free space. Also discussed is the impact of the measurement site itself on the accuracy of the measurements. For a later comparison, the principles involved in the design of outdoor test ranges are described. References specific to each chamber concept are included in the individual sections. General references applicable to the general field of electromagnetic test facilities are included in the Selected Bibliography.

Next, in Chapter 3, radio-frequency and microwave absorbing materials are described with detailed information on their performance and how they are used to establish controlled electromagnetic test environments within an indoor test facility.

Chapter 4 provides information on the chamber enclosure. If electromagnetic shielding is required, common available systems are described with references detailing their construction.

Chapters 5 through 8 detail the designs of the various test facilities broken down by the geometry of the test facility. These include the rectangular chamber, the compact range chamber, and those chambers where geometry is important in the design, including the tapered chamber, the double horn chamber, and the TEM cell.

Chapter 9 summarizes all the test procedures associated with electromagnetic acceptance testing of the various chambers and also the testing of absorber materials used in the construction of the chambers.

Chapter 10 provides a summary of the types of indoor test facilities that have been developed for the various electromagnetic measurements. These include chambers for testing antennas, radar cross section, electromagnetic compatibility, and electromagnetic systems. Extensive use of photographs has been used to illustrate these various anechoic chambers. A special insert of full-color photographs has been included to highlight the design concepts used in anechoic chamber design.

Appendix C provides a series of design and specification checklists for the various types of anechoic chambers.

A selected bibliography is given in support of the content of the book.

An extensive index is provided so that convenient reference can be made to any subject covered by the text.

REFERENCES

1. W. H. Emerson, Electromagnetic Wave Absorbers and Anechoic Chambers Through the Years, *IEEE Transactions on Antennas and Propagation,* Vol. AP-21, No. 4, July 1973.
2. B. F. Lawrence, Anechoic Chambers, Past and Present, *Conformity,* Vol. 6, No.4, pp. 54–56, April 2000.
3. IEEE Std 145-1983, *IEEE Standard Definitions of Terms for Antennas,* IEEE Press, New York, 1983.
4. ANSI C63.14: 1998, American National Standard Dictionary for Technologies of Electromagnetic Compatibility (EMC), Electromagnetic Pulse (EMP), and Electrostatic Discharge (ESD).
5. IEEE 100, *The Authoritative Dictionary of IEEE Standard Terms,* 7th edition, IEEE Press, New York, 2000.