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This technical report, Part I of a three-part supplement to the Department of Defense (DoD) World Geodetic System 1984 (WGS 84) Technical Report, DMA TR 8350.2, presents the methods, techniques, and data used in WGS 84 development. The development of WGS 84 was initiated for the purpose of providing the more accurate geodetic and gravitational data required by DoD navigation and weapon systems. The new system represents the Defense Mapping Agency's modeling of the earth from a geometric, geodetic, and gravitational standpoint using data, techniques, and technology available through early 1984.

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DEFENSE MAPPING AGENCY TECHNICAL REPORT 8350.2-A

Supplement to Department of Defense
World Geodetic System 1984 Technical Report:

Part I - Methods, Techniques, and Data
Used in WGS 84 Development

FOREWORD

1. This technical report, Part I of a three-part supplement to the Department of Defense (DoD) World Geodetic System 1984 (WGS 84) Technical Report, DMA TR 8350.2, presents the methods, techniques, and data used in WGS 84 development. WGS 84 was initiated to provide more accurate geodetic and gravitational data required by DoD navigation and weapon systems. The new system represents the Defense Mapping Agency's (DMA) geometric, geodetic, and gravitational modeling of the Earth using data, techniques, and technology available through early 1984.

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MARCUS J. BOYLE
Colonel, USAF
Chief of Staff

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PREFACE

This technical report is Part I of a three-part supplement to the Department of Defense (DoD) World Geodetic System 1984 (WGS 84) Technical Report, DMA TR 8350.2. The latter provides a brief discussion of WGS 84 and its relationships with local geodetic systems. This report (Part I of the supplement) discusses WGS 84 and the methods, techniques, and data used in developing the parameters and products that define it. Considerable space is devoted to the discussion of the WGS 84 Reference Frame, Ellipsoid, Ellipsoidal Gravity Formula, Earth Gravitational Model, Geoid, and methods and procedures for obtaining WGS 84 coordinates. Part II of the supplement contains final values for the WGS 84 defining parameters and products, their accuracies, and formulas relevant to the implementation. Most of Part II consists of graphical and tabular materials for converting 83 local geodetic systems to WGS 84. Part II is largely self-contained in that the contents, with a few exceptions, completely define WGS 84. Although WGS 84 is essentially an unclassified system, the associated Earth Gravitational Model (and its corresponding geoid) above degree (n) and order (m) 18 are CLASSIFIED. These materials comprise Part III of the supplement, the CLASSIFIED portion of WGS 84.

Requesters requiring additional information, data, or Part III of the supplement should forward their request to:

Director
Defense Mapping Agency
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Washington, DC 20305-3000

Similarly, requesters requiring the positioning of sites of interest directly in WGS 84 via Satellite Point Positioning utilizing ground-based

receivers should transmit their requirements to the above address. Other WGS 84-related requests or questions may also be referred there.

Considerable explanatory material has been included in this portion of the supplement (Part I) in an effort to make WGS 84 more understandable and usable by the numerous DoD personnel who are thrust each year into a mapping, charting, and geodetic (MC&G) environment and must accomplish MC&G tasks with little or no geodetic background. Although this explanatory material makes this publication lengthy and somewhat cumbersome, and is not needed by the practicing geodesist, the requirement of MC&G newcomers for such data is deemed paramount.

Since WGS 84 is comprised of a consistent set of parameters, organizations involved in a DoD application should not make a substitution for any of the WGS 84-related parameters in an attempt to improve the accuracy. Such a substitution may lead to less accurate WGS 84 products.

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