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Collana	Wiley series in microwave and optical engineering
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Soggetti	Global Positioning System Mobile geographic information systems
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Nota di contenuto	Fundamentals of Global Positioning System Receivers; Contents; Preface; Notations and Constants; Chapter 1 Introduction; 1.1 Introduction; 1.2 History of GPS Development; 1.3 A Basic GPS Receiver; 1.4 Approaches of Presentation; 1.5 Software Approach; 1.6 Potential Advantages of the Software Approach; 1.7 Organization of the Book; Chapter 2 Basic GPS Concept; 2.1 Introduction; 2.2 GPS Performance Requirements; 2.3 Basic GPS Concept; 2.4 Basic Equations for Finding User Position; 2.5 Measurement of Pseudorange; 2.6 Solution of User Position from Pseudoranges 2.7 Position Solution with More Than Four Satellites 2.8 User Position in Spherical Coordinate System; 2.9 Earth Geometry; 2.10 Basic Relationships in an Ellipse; 2.11 Calculation of Altitude; 2.12 Calculation of Geodetic Latitude; 2.13 Calculation of a Point on the Surface of the Earth; 2.14 Satellite Selection; 2.15 Dilution of Precision; 2.16 Summary; Chapter 3 Satellite Constellation; 3.1 Introduction; 3.2 Control Segment of the GPS System; 3.3 Satellite Constellation; 3.4 Maximum Differential Power Level from Different Satellites; 3.5 Sidereal Day; 3.6 Doppler Frequency Shift

3.7 Average Rate of Change of the Doppler Frequency; 3.8 Maximum Rate of Change of the Doppler Frequency; 3.9 Rate of Change of the Doppler Frequency Due to User Acceleration; 3.10 Kepler's Laws; 3.11 Kepler's Equation; 3.12 True and Mean Anomaly; 3.13 Signal Strength at User Location; 3.14 Summary; Chapter 4 Earth-Centered, Earth-Fixed Coordinate System; 4.1 Introduction; 4.2 Direction Cosine Matrix; 4.3 Satellite Orbit Frame to Equator Frame Transform; 4.4 Vernal Equinox; 4.5 Earth Rotation; 4.6 Overall Transform from Orbit Frame to Earth-Centered, Earth-Fixed Frame; 4.7 Perturbations; 4.8 Correction of GPS System Time at Time of Transmission; 4.9 Calculation of Satellite Position; 4.10 Coordinate Adjustment for Satellites; 4.11 Ephemeris Data; 4.12 Summary; Chapter 5 GPS C/A Code Signal Structure; 5.1 Introduction; 5.2 Transmitting Frequency; 5.3 Code Division-Multiple Access (CDMA) Signals; 5.4 P Code; 5.5 C/A Code and Data Format; 5.6 Generation of C/A Code; 5.7 Correlation Properties of C/A Code; 5.8 Navigation Data Bits; 5.9 Telemetry (TLM) and Hand Over Word (HOW); 5.10 GPS Time and the Satellite Z Count; 5.11 Parity Check Algorithm; 5.12 Navigation Data from Subframe 1; 5.13 Navigation Data from Subframes 2 and 3; 5.14 Navigation Data from Subframes 4 and 5-Support Data; 5.15 Ionospheric Model; 5.16 Tropospheric Model; 5.17 Selectivity Availability (SA) and Typical Position Errors; 5.18 Summary; Chapter 6 Receiver Hardware Considerations; 6.1 Introduction; 6.2 Antenna; 6.3 Amplification Consideration; 6.4 Two Possible Arrangements of Digitization by Frequency Plans; 6.5 First Component After the Antenna; 6.6 Selecting Sampling Frequency as a Function of the C/A Code Chip Rate; 6.7 Sampling Frequency and Band Aliasing for Real Data Collection; 6.8 Down-converted RF Front End for Real Data Collection

Sommario/riassunto

How to build and operate GPS receivers-a working resource for engineers While GPS receivers abound in numerous applications, much of the information on their design is scattered in disparate and hard-to-find places. This new work provides engineers who use and design GPS systems with a much-needed comprehensive reference on the operational principles guiding this important technology. With an emphasis on software-based signal processing-a cutting-edge approach expected to dominate future integration of GPS receivers into cellular phones-the book covers all aspects of receiver technology as w
