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Nota di contenuto	Fundamentals of Global Positioning System Receivers; Contents; Preface; Preface to the First Edition; 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; References; 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; References; 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; References; 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; References; 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; References; 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

Sommario/riassunto

All the expert guidance you need to understand, build, and operate GPS receivers The Second Edition of this acclaimed publication enables readers to understand and apply the complex operation principles of global positioning system (GPS) receivers. Although GPS receivers are widely used in everyday life to aid in positioning and navigation, this is the only text that is devoted to complete coverage of their operation principles. The author, one of the foremost authorities in the GPS field, presents the material from a software receiver viewpoint, an approach that helps readers
