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2.1.2 The 16F84A 2.1.3 A caution on upgrades; 2.2 An architecture overview of the 16F84A; 2.2.1 The Status register; 2.3 A review of memory technologies; 2.3.1 Static RAM (SRAM); 2.3.2 EPROM (Erasable Programmable Read-Only Memory); 2.3.3 EEPROM (Electrically Erasable Programmable Read-Only Memory); 2.3.4 Flash; 2.4 The 16F84A memory; 2.4.1 The 16F84A program memory; 2.4.2 The 16F84A data and Special Function Register memory ('RAM'); 2.4.3 The Configuration Word; 2.4.4 EEPROM; 2.5 Some issues of timing; 2.5.1 Clock oscillator and instruction cycle; 2.5.2 Pipelining; 2.6 Power-up and Reset
2.7 What others do - the Atmel AT89C2051 2.8 Taking things further - the 16F84A on-chip reset circuit; Summary; References; 3 Parallel ports, power supply and the clock oscillator; 3.1 The main idea - parallel input/output; 3.2 The technical challenge of parallel input/output; 3.2.1 Building a parallel interface; 3.2.2 Port electrical characteristics; 3.2.3 Some special cases; 3.3 Connecting to the parallel port; 3.3.1 Switches; 3.3.2 Light-emitting diodes; 3.4 The PIC 16F84A parallel ports; 3.4.1 The 16F84A Port B; 3.4.2 The 16F84A Port A; 3.4.3 Port output characteristics
3.5 The clock oscillator 3.5.1 Clock oscillator types; 3.5.2 Practical oscillator considerations; 3.5.3 The 16F84A clock oscillator; 3.6 Power supply; 3.6.1 The need for power, and its sources; 3.6.2 16F84A operating conditions; 3.7 The hardware design of the electronic ping-pong; Summary; References; 4 Starting to program - an introduction to Assembler; 4.1 The main idea - what programs do and how we develop them; 4.1.1 The problem of programming and the Assembler compromise; 4.1.2 The process of writing in Assembler; 4.1.3 The program development process
4.2 The PIC 16 Series instruction set, with a little more on the ALU

Sommario/riassunto

This book is a hands-on introduction to the principles and practice of embedded system design using the PIC microcontroller. Packed with helpful examples and illustrations, it gives an in-depth treatment of microcontroller design, programming in both assembly language and C, and features advanced topics such as networking and real-time operating systems. It is accompanied by a CD-ROM containing copies of all programs and software tools used in the text and a 'student' version of the C complier. Designing Embedded Systems with PIC Microcontrollers: Principles and Applications is i

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Gullstrand Metric; 6.6 Eddington-Finkelstein Coordinates; 6.7 Charged Black Holes; 6.8 Higher-Dimensional Spherical Black Holes; 7 Particles and Light Motion in Schwarzschild Spacetime; 7.1 Equations of Motion; 7.2 Particle Trajectories; 7.3 Kepler's Law; 7.4 Light Propagation
7.5 Ray-Tracing in Schwarzschild Spacetime7.6 Black Hole as a Gravitational Lens; 7.7 Radiation from an Object Moving Around the Black Hole; 7.8 Equations of Motion in 'Tilted' Spherical Coordinates; 7.9 Magnetized Schwarzschild Black Hole; 7.10 Particle and Light Motion Near Higher-Dimensional Black Holes; 8 Rotating Black Holes; 8.1 Kerr Spacetime; 8.2 Ergosphere. Horizon; 8.3 Particle and Light Motion in Equatorial Plane; 8.4 Spinning up the Black Hole; 8.5 Geodesics in Kerr Spacetime: General Case; 8.6 Light Propagation; 8.7 Hidden Symmetries of Kerr Spacetime
8.8 Energy Extraction from a Rotating Black Hole8.9 Black Holes in External Magnetic Field; 9 Classical and Quantum Fields near Black Holes; 9.1 Introduction; 9.2 Static Field in the Schwarzschild Spacetime; 9.3 Dimensional Reduction; 9.4 Quasinormal Modes; 9.5 Massless Fields in the Kerr Spacetime; 9.6 Black Hole in a Thermal Bath; 9.7 Hawking Effect; 9.8 Quantum Fields in the Rindler Spacetime; 9.9 Black Hole Thermodynamics; 9.10 Higher-Dimensional Generalizations; 10 Black Holes and All That Jazz; 10.1 Asymptotically Flat Spacetimes; 10.2 Black Holes: General Definition and Properties
10.3 Black Holes and Search for Gravitational Waves

Sommario/riassunto

What is a black hole? How many of them are in our Universe? Can black holes be created in a laboratory or in particle colliders? Can objects similar to black holes be used for space and time travel? This text discusses these and many other questions providing the reader with the tools required to explore the Black Hole Land independently.