

Design With Pic Microcontrollers

John B Peatman

Updated to reflect the latest advances in the field, the Sixth Edition of Fundamentals of Digital Logic and Microcontrollers further enhances its reputation as the most accessible introduction to the basic principles and tools required in the design of digital systems. Features updates and revision to more than half of the material from the previous edition Offers an all-encompassing focus on the areas of computer design, digital logic, and digital systems, unlike other texts in the marketplace Written with clear and concise explanations of fundamental topics such as number system and Boolean algebra, and simplified examples and tutorials utilizing the PIC18F4321 microcontroller Covers an enhanced version of both combinational and sequential logic design, basics of computer organization, and microcontrollers

Design with PIC Microcontrollers Pearson Education
Offering comprehensive coverage of the convergence of real-time embedded systems scheduling, resource access control, software design and development, and high-level system modeling, analysis and verification Following an introductory overview, Dr. Wang delves into the specifics of hardware components, including processors, memory, I/O devices and architectures, communication structures, peripherals, and characteristics of real-time operating systems. Later chapters are dedicated to real-time task scheduling

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algorithms and resource access control policies, as well as priority-inversion control and deadlock avoidance. Concurrent system programming and POSIX programming for real-time systems are covered, as are finite state machines and Time Petri nets. Of special interest to software engineers will be the chapter devoted to model checking, in which the author discusses temporal logic and the NuSMV model checking tool, as well as a chapter treating real-time software design with UML. The final portion of the book explores practical issues of software reliability, aging, rejuvenation, security, safety, and power management. In addition, the book:

- Explains real-time embedded software modeling and design with finite state machines, Petri nets, and UML, and real-time constraints verification with the model checking tool, NuSMV
- Features real-world examples in finite state machines, model checking, real-time system design with UML, and more
- Covers embedded computer programming, designing for reliability, and designing for safety
- Explains how to make engineering trade-offs of power use and performance
- Investigates practical issues concerning software reliability, aging, rejuvenation, security, and power management

Real-Time Embedded Systems is a valuable resource for those responsible for real-time and embedded software design, development, and management. It is also an excellent textbook for graduate courses in computer engineering, computer science, information technology, and software engineering on embedded and real-time software systems, and for undergraduate computer and software

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concludes with a step-by-step walk through a project based on the PIC microcontroller. The concise but clearly written text makes this an ideal book for electronics and IT students and a wide range of technicians and engineers, including IT systems support staff, and maintenance / service engineers. *Crisp's conversational style introduces the fundamentals of the micro (microprocessors, microcontrollers, systems on a chip) in a way that is utterly painless but technically spot-on: the talent of a true teacher. *Microprocessors and microcontrollers are covered in one book, reflecting the importance of embedded systems in today's computerised world. *Practical work and knowledge-check questions support a lively text to build a firm understanding of the subject.

A well-known statement says that the PID controller is the "bread and butter" of the control engineer. This is indeed true, from a scientific standpoint. However, nowadays, in the era of computer science, when the paper and pencil have been replaced by the keyboard and the display of computers, one may equally say that MATLAB is the "bread" in the above statement. MATLAB has become a de facto tool for the modern system engineer. This book is written for both engineering students, as well as for practicing engineers. The wide range of applications in which MATLAB is the working framework, shows that it is a powerful, comprehensive and easy-to-use environment for performing technical computations. The book includes various excellent applications in which MATLAB is employed: from pure algebraic computations to data acquisition in real-life

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experiments, from control strategies to image processing algorithms, from graphical user interface design for educational purposes to Simulink embedded systems. The Newnes Know It All Series takes the best of what our authors have written to create hard-working desk references that will be an engineer's first port of call for key information, design techniques and rules of thumb. Guaranteed not to gather dust on a shelf! Field Application engineers need to master a wide area of topics to excel. The Test and Measurement Know It All covers every angle including Machine Vision and Inspection, Communications Testing, Compliance Testing, along with Automotive, Aerospace, and Defense testing. A 360-degree view from our best-selling authors Topics include the Technology of Test and Measurement, Measurement System Types, and Instrumentation for Test and Measurement The ultimate hard-working desk reference; all the essential information, techniques and tricks of the trade in one volume

The advent of interactive design software has allowed the simulation of microcontrollers without having to build and debug hardware. Interfacing PIC Microcontrollers: Embedded Design by Interactive Simulation discusses microcontroller design and applications. The book is divided into three parts. Part 1 introduces the PIC 16F877 architecture, software, and simulation system. Part 2 discusses interfacing techniques. Part 3 discusses power outputs, serial communication, sensor interfacing, and the design of MCU-based systems. Each topic is illustrated by designs based on the 16F877. The Proteus

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design software by Labcenter Electronics is used throughout. The book is suited for more advanced readers with prior knowledge of the basics of microcontroller systems. *Comprehensive coverage of a topic not widely explored in the wealth of PIC books on the market, concentrating on the popular PIC16F877 device *Circuit simulation software allows step-by-step examples, supplied as assembly source code, to be run interactively – aiding student, technician and hobbyist learning. *A companion website will provide downloads of application files used in the book and links to associated manufacturers

The Ultimate Value for PIC Microcontroller Enthusiasts and Engineers Most engineers rely on a small core of books that are specifically targeted to their job responsibilities. These dog-eared volumes are used daily and considered essential. But budgets and space commonly limit just how many books can be added to your core library. The Newnes PIC Microcontroller Ultimate CD solves this problem. It contains seven of our best-selling titles, providing the "next level" of reference you will need for a fraction of the price of the hard-copy books purchased separately. The CD contains the complete PDF versions of the following Newnes titles: • The PIC Microcontroller: Your Personal Introductory Course 3e (Morton) 0750666641 • Interfacing PIC Microcontrollers (Bates) 0750680288 • PIC Basic Projects (Ibrahim) 0750668792 • PIC in Practice 2e (Smith) 0750668261 • Programming the PIC Microcontroller with MBASIC (Smith) 0750679468 • PIC Microcontrollers 2e (Bates) 0750662670 • Programming

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PIC Microcontrollers with PICBASIC (Hellebuyck)
1589950011 * Over 2200 pages of PIC Microcontroller material * Includes 7 title in full-function Adobe PDF format * Incredible value at a fraction of the cost of bound books

Beginner's guide to the popular PIC Microcontroller. Get all the advantages of the Basic Stamp, at one quarter the cost and one hundred times the speed with Microchips Company's 8-bit PIC computer-on-a-chip. The no assembly required PIC Microcontroller Project Book, by popular TAB author John Iovine, shows you how to program the PIC using Microchip's free MPLAB compiler and the BASIC programming language. Learn about the two most popular PIC chips, exploring architecture, registers, CPU, RISC, RAM, and ROM. This project-oriented guide gives you twelve complete projects, including: using transistors to control DC and AC motors and AC appliances...servo motors...liquid crystal display (LCD) output...reading resistive sensors with robotics applications...frequency generator, including tone generators, DTMF phone number logger and distinct ring detector and router...home automation using X-10 communications...digital oscilloscope...simulations of fuzzy logic and neural networks...and many other applications. -- Book Review Poptronics, October, 2000 Bound to spur the imagination and inspire plans for using PICs in new products and projects, this book answers the question: What can you do with PIC microcontrollers? Practically anything - from creating "photovore" robots that hunt light for their solar cells to making toasters announce "Your toast is ready!" These

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easy-to-use, low-cost, computers-in-a-chip let designers and hobbyists add intelligence and responsiveness to any electronic product or project - even faster than comparable Basic Stamps. Hands-on directions are supplied for putting Microchip's RISC-based chips - with up to 8k of memory - to work. Starting with simple projects and experiments, this book progresses gradually into sophisticated programming techniques. The author John Iovine, our "Amazing Science" columnist, guides enthusiasts into such projects as synthesizing human speech, controlling DC and stepper motors, adding sensing abilities to robots, and building in decision-making neural and "fuzzy logic" functions.

Here is an increasingly wide agreement among teachers, researchers, inspectors, advisers and policy-makers that both teaching and research will benefit from being brought closer together. But how can this be achieved? Hard-pressed practitioners cannot be expected to review a constant flow of conference papers, journals and other publications, even if such items were accessible and clearly understood. This unique book synthesizes relevant research findings for the professional practitioner and highlights their implications for the quality of teaching and learning. Whether you are a teacher looking to improve your practice through applying the latest thinking in your subject, or a researcher looking for a concise review of the literature, this book will prove to be a valuable acquisition.

This well-organized book is intended for the undergraduate students of Electrical, Electronics and Communications, Computer, Instrumentation and

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Instrumentation and Control Engineering; and postgraduate students of science in Electronics, Physics and Instrumentation. Data acquisition being the core of all PC-based measurements and control instrumentation systems engineering, this book presents detailed discussions on PC bus based data acquisition, remote data acquisition, GPIB data acquisition and networked data acquisition configurations. This book also describes sensors, signal-conditioning and principles of PC-based data acquisition. It provides several latest and advanced techniques. This book stresses the need for understanding the use of Personal Computers in measurement and control instrumentation applications.

KEY FEATURES :

- Provides several laboratory experiments to help the readers to gain hands-on experience in PC-based measurement and control.
- Provides a number of review questions/problems (with solutions to the odd numbered problems) and objective type questions with solutions.
- Presents a number of working circuits, design and programming examples.
- Presents comparison of properties, features and characteristics of different bus systems, interface standards, and network protocols.
- Includes the advanced techniques such as sigma–delta converter, RS-485, I2C bus, SPI bus, FireWire, IEEE-488.2, SCPI and Fieldbus standards.

The Newnes Know It All Series takes the best of what our authors have written to create hard-working desk references that will be an engineer's first port of call for key information, design techniques and rules of thumb. Guaranteed not to gather dust on a shelf! Electrical

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engineers need to master a wide area of topics to excel. The Electrical Engineering Know It All covers every angle including Real-World Signals and Systems, Electromagnetics, and Power systems. A 360-degree view from our best-selling authors Topics include digital, analog, and power electronics, and electric circuits The ultimate hard-working desk reference; all the essential information, techniques and tricks of the trade in one volume

Vols. 8-10 of the 1965-1984 master cumulation constitute a title index.

Provides a comprehensive overview of the basic concepts behind the application and designs of medical instrumentation This premiere reference on medical instrumentation describes the principles, applications, and design of the medical instrumentation most commonly used in hospitals. It places great emphasis on design principles so that scientists with limited background in electronics can gain enough information to design instruments that may not be commercially available. The revised edition includes new material on microcontroller-based medical instrumentation with relevant code, device design with circuit simulations and implementations, dry electrodes for electrocardiography, sleep apnea monitor, Infusion pump system, medical imaging techniques and electrical safety. Each chapter includes new problems and updated reference material that covers the latest medical technologies. Medical Instrumentation: Application and Design, Fifth Edition covers general concepts that are applicable to all instrumentation systems, including the static and

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dynamic characteristics of a system, the engineering design process, the commercial development and regulatory classifications, and the electrical safety, protection, codes and standards for medical devices. The readers learn about the principles behind various sensor mechanisms, the necessary amplifier and filter designs for analog signal processing, and the digital data acquisition, processing, storage and display using microcontrollers. The measurements of both cardiovascular dynamics and respiratory dynamics are discussed, as is the developing field of biosensors. The book also covers general concepts of clinical laboratory instrumentation, medical imaging, various therapeutic and prosthetic devices, and more. Emphasizes design throughout so scientists and engineers can create medical instruments Updates the coverage of modern sensor signal processing New material added to the chapter on modern microcontroller use Features revised chapters, descriptions, and references throughout Includes many new worked out examples and supports student problem-solving Offers updated, new, and expanded materials on a companion webpage Supplemented with a solutions manual containing complete solutions to all problems Medical Instrumentation: Application and Design, Fifth Edition is an excellent book for a senior to graduate-level course in biomedical engineering and will benefit other health professionals involved with the topic. Provides a comprehensive introduction to the design and analysis of unmanned aircraft systems with a systems perspective Written for students and engineers who are

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new to the field of unmanned aerial vehicle design, this book teaches the many UAV design techniques being used today and demonstrates how to apply aeronautical science concepts to their design. Design of Unmanned Aerial Systems covers the design of UAVs in three sections—vehicle design, autopilot design, and ground systems design—in a way that allows readers to fully comprehend the science behind the subject so that they can then demonstrate creativity in the application of these concepts on their own. It teaches students and engineers all about: UAV classifications, design groups, design requirements, mission planning, conceptual design, detail design, and design procedures. It provides them with in-depth knowledge of ground stations, power systems, propulsion systems, automatic flight control systems, guidance systems, navigation systems, and launch and recovery systems. Students will also learn about payloads, manufacturing considerations, design challenges, flight software, microcontroller, and design examples. In addition, the book places major emphasis on the automatic flight control systems and autopilots. Provides design steps and procedures for each major component Presents several fully solved, step-by-step examples at component level Includes numerous UAV figures/images to emphasize the application of the concepts Describes real stories that stress the significance of safety in UAV design Offers various UAV configurations, geometries, and weight data to demonstrate the real-world applications and examples Covers a variety of design techniques/processes such that the designer has freedom and flexibility to satisfy the

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design requirements in several ways Features many end-of-chapter problems for readers to practice Design of Unmanned Aerial Systems is an excellent text for courses in the design of unmanned aerial vehicles at both the upper division undergraduate and beginning graduate levels.

Microcontrollers exist in a wide variety of models with varying structures and numerous application opportunities. Despite this diversity, it is possible to find consistencies in the architecture of most microcontrollers. *Microcontrollers: Fundamentals and Applications with PIC* focuses on these common elements to describe the fundamentals of microcontroller design and programming. Using clear, concise language and a top-bottom approach, the book describes the parts that make up a microcontroller, how they work, and how they interact with each other. It also explains how to program medium-end PICs using assembler language. Examines analog as well as digital signals This volume describes the structure and resources of general microcontrollers as well as PIC microcontrollers, with a special focus on medium-end devices. The authors discuss memory organization and structure, and the assembler language used for programming medium-end PIC microcontrollers. They also explore how microcontrollers can acquire, process, and generate digital signals, explaining available techniques to deal with parallel input or output, peripherals, resources for real-time use, interrupts, and the specific characteristics of serial data interfaces in PIC microcontrollers. Finally, the book describes the acquisition and generation of

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analog signals either using resources inside the chip or by connecting peripheral circuits. Provides hands-on clarification Using practical examples and applications to supplement each topic, this volume provides the tools to thoroughly grasp the architecture and programming of microcontrollers. It avoids overly specific details so readers are quickly led toward design implementation. After mastering the material in this text, they will understand how to efficiently use PIC microcontrollers in a design process.

The Newnes Know It All Series takes the best of what our authors have written to create hard-working desk references that will be an engineer's first port of call for key information, design techniques and rules of thumb. Guaranteed not to gather dust on a shelf! Audio engineers need to master a wide area of topics in order to excel. The Audio Engineering Know It All covers every angle, including digital signal processing, power supply design, microphone and loudspeaker technology as well as audio compression. A 360-degree view from our best-selling authors Includes such topics as fundamentals, compression, and test and measurement The ultimate hard-working desk reference; all the essential information, techniques and tricks of the trade in one volume

* A much-needed clearinghouse for information on amateur and educational robotics, containing over 2,500 listings of robot suppliers, including mail order and local area businesses * Contains resources for both common and hard-to-find parts and supplies * Features dozens of "sidebars" to clarify essential robotics technologies *

Provides original articles on various robot-building topics
El Curso de Código Morse es el resultado de una iniciativa personal largamente esperada, una necesidad sentida de hacer "definitivamente" fácil el estudio de telegráfico. Así, tal como se presenta en la obra de Juan. J. Guillén, este estudio se puede realizar en cualquier lugar y hora, de forma autodidacta.

This book is developed around Microchip's latest family of parts, the PIC18FXXX family. It focuses on the PIC18F452, a new part brought to market in May 2002. It is intended that the reader will find a smooth path to the creative process of writing enhanced application code. This book attempts to organize and unify the development of these three capabilities: to understand and use components, to exploit powerful algorithmic processes, and to break down the complexity of an instrument or device so as to meet its specifications. The book is dedicated toward the development of creative design capability. Throughout this book, the approach taken is to introduce a template of assembly language code that encompasses a set of features of the PIC18F452 plus its interactions with some of the I/O devices resident on a small 4"x4" development board. For electrical engineers who work with the PIC18FXXX family.

This book guides a PIC user from their first sight of a PIC microcontroller to making the PIC work in the real world. Detailed examples show just how powerful and useful a PIC can be. Explanations are short and simple enough to let a reader get to grips with the PIC without fuss. Describing the use of displays in microcontroller based

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projects, the author makes extensive use of real-world, tested projects. The complete details of each project are given, including the full circuit diagram and source code. The author explains how to program microcontrollers (in C language) with LED, LCD and GLCD displays; and gives a brief theory about the operation, advantages and disadvantages of each type of display. Key features: Covers topics such as: displaying text on LCDs, scrolling text on LCDs, displaying graphics on GLCDs, simple GLCD based games, environmental monitoring using GLCDs (e.g. temperature displays) Uses C programming throughout the book – the basic principles of programming using C language and introductory information about PIC microcontroller architecture will also be provided Includes the highly popular PIC series of microcontrollers using the medium range PIC18 family of microcontrollers in the book. Provides a detailed explanation of Visual GLCD and Visual TFT with examples. Companion website hosting program listings and data sheets Contains the extensive use of visual aids for designing LED, LCD and GLCD displays to help readers to understand the details of programming the displays: screen-shots, tables, illustrations, and figures, as well as end of chapter exercises Using LEDs, LCDS, and GLCDs in Microcontroller Projects is an application oriented book providing a number of design projects making it practical and accessible for electrical & electronic engineering and computer engineering senior undergraduates and postgraduates. Practising engineers designing microcontroller based devices with LED, LCD or GLCD displays will also find the book of great use.

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John Morton offers a uniquely concise and practical guide to getting up and running with the PIC Microcontroller. The PIC is one of the most popular of the microcontrollers that are transforming electronic project work and product design, and this book is the ideal introduction for students, teachers, technicians and electronics enthusiasts. Assuming no prior knowledge of microcontrollers and introducing the PIC Microcontroller's capabilities through simple projects, this book is ideal for electronics hobbyists, students, school pupils and technicians. The step-by-step explanations and the useful projects make it ideal for student and pupil self-study: this is not just a reference book - you start work with the PIC microcontroller straight away. The revised third edition focuses entirely on the re-programmable flash PIC microcontrollers such as the PIC16F54, PIC16F84 and the extraordinary 8-pin PIC12F508 and PIC12F675 devices. * Demystifies the leading microcontroller for students, engineers and hobbyists * Emphasis on putting the PIC to work, not theoretical microelectronics * Simple programs and circuits introduce key features and commands through project work

The Newnes Know It All Series takes the best of what our authors have written over the past few years and creates a one-stop reference for engineers involved in markets from communications to embedded systems and everywhere in between. PIC design and development a natural fit for this reference series as it is one of the most popular microcontrollers in the world and we have several superbly authored books on the subject.

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This material ranges from the basics to more advanced topics. There is also a very strong project basis to this learning. The average embedded engineer working with this microcontroller will be able to have any question answered by this compilation. He/she will also be able to work through real-life problems via the projects contained in the book. The Newnes Know It All Series presentation of theory, hard fact, and project-based direction will be a continual aid in helping the engineer to innovate in the workplace.

Section I. An Introduction to PIC Microcontrollers

Chapter 1. The PIC Microcontroller Family

Chapter 2. Introducing the PIC 16 Series and the 16F84A

Chapter 3. Parallel Ports, Power Supply and the Clock Oscillator

Section II. Programming PIC Microcontrollers using Assembly Language

Chapter 4. Starting to Program—An Introduction to Assembler

Chapter 5. Building Assembler Programs

Chapter 6. Further Programming Techniques

Chapter 7. Prototype Hardware

Chapter 8. More PIC Applications and Devices

Chapter 9. The PIC 1250x Series (8-pin PIC microcontrollers)

Chapter 10. Intermediate Operations using the PIC 12F675

Chapter 11. Using Inputs

Chapter 12. Keypad Scanning

Chapter 13. Program Examples

Section III. Programming PIC Microcontrollers using PicBasic

Chapter 14. PicBasic and PicBasic Pro Programming

Chapter 15. Simple PIC Projects

Chapter 16. Moving On with the 16F876

Chapter 17. Communication

Section IV. Programming PIC Microcontrollers using MBasic

Chapter 18. MBasic Compiler and Development Boards

Chapter 19. The Basics—Output

Chapter 20. The Basics—Digital Input

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Chapter 21. Introductory Stepper Motors Chapter 22. Digital Temperature Sensors and Real-Time Clocks Chapter 23. Infrared Remote Controls Section V. Programming PIC Microcontrollers using C Chapter 24. Getting Started Chapter 25. Programming Loops Chapter 26. More Loops Chapter 27. NUMB3RS Chapter 28. Interrupts Chapter 29. Taking a Look under the Hood

Over 900 pages of practical, hands-on content in one book! Huge market - as of November 2006 Microchip Technology Inc., a leading provider of microcontroller and analog semiconductors, produced its 5 BILLIONth PIC microcontroller Several points of view, giving the reader a complete 360 of this microcontroller

Intelligent readers who want to build their own embedded computer systems-- installed in everything from cell phones to cars to handheld organizers to refrigerators-- will find this book to be the most in-depth, practical, and up-to-date guide on the market. Designing Embedded Hardware carefully steers between the practical and philosophical aspects, so developers can both create their own devices and gadgets and customize and extend off-the-shelf systems. There are hundreds of books to choose from if you need to learn programming, but only a few are available if you want to learn to create hardware. Designing Embedded Hardware provides software and hardware engineers with no prior experience in embedded systems with the necessary conceptual and design building blocks to understand the architectures of embedded systems. Written to provide the depth of coverage and real-world examples developers need, Designing Embedded Hardware also

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provides a road-map to the pitfalls and traps to avoid in designing embedded systems. Designing Embedded Hardware covers such essential topics as: The principles of developing computer hardware Core hardware designs Assembly language concepts Parallel I/O Analog-digital conversion Timers (internal and external) UART Serial Peripheral Interface Inter-Integrated Circuit Bus Controller Area Network (CAN) Data Converter Interface (DCI) Low-power operation This invaluable and eminently useful book gives you the practical tools and skills to develop, build, and program your own application-specific computers.

The book focuses on 8051 microcontrollers and prepares the students for system development using the 8051 as well as 68HC11, 80x96 and lately popular ARM family microcontrollers. A key feature is the clear explanation of the use of RTOS, software building blocks, interrupt handling mechanism, timers, IDE and interfacing circuits. Apart from the general architecture of the microcontrollers, it also covers programming, interfacing and system design aspects.

Designing Embedded Hardware steers a course between those books dedicated to writing code for particular microprocessors, and those that stress the philosophy of embedded system design without providing any practical information. Having designed 40 embedded computer systems of his own, author John Catsoulis brings a wealth of real-world experience to show readers how to design and create entirely new embedded devices and computerized gadgets, as well as how to customize and extend off-the-shelf systems.

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While there are books that tell readers how to run Linux on embedded hardware and books on how to build a Linux application, this volume is the first book to demonstrate how to merge the two to create a Linux appliance.

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