

Product Literature and Technical Training

In Brief . . .

With the pace of new semiconductor product introductions, the task of providing an effective and up-to-date perspective of available components is beyond the means of any single document. Hence, a comprehensive Motorola Literature System has been put in place to keep semiconductor users totally informed of all aspects of the Motorola product lines — from new product introductions, to applications, to major changes in directions.

The Motorola technical literature library and associated services consist of the following:

- An extensive library of Data Books, each containing a complete selection of data sheets associated with a particular product line.
- A series of User's Manuals and Design Manuals dealing with the application of highly complex products.
- A wide range of Application Notes and Article Reprints detailing the utilization of new and significant products.
- Instructor-led Training for: Digital Signal Processing (DSP) Family; M68000 Family; Embedded Controllers (EC); MC68360 QUIC; PowerPC; Microcontroller (MCU); RISC Family; plus the MC68302, MC68332, MC68340 and the MC68HC16.

These products and services are described on the following pages. However, because of different conditions and standards, some of these may not be available outside the USA.

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Technical Data Services

Motorola Semiconductor Master Selection Guide

For the identification and preliminary selection of components for circuit and system designs

For the design engineer, the Motorola Master Selection Guide is perhaps the most important single document for the identification and preliminary selection of components for circuit and system designs. Within its pages is a complete listing and description of Motorola semiconductor devices currently in general use, and those recommended for new designs. It serves two purposes:

1. It lists all standard products in the vast Motorola semiconductor inventory for rapid identification.
2. It divides this total product offering into a variety of major product categories, with sufficient technical information to permit an intelligent first-order evaluation as to the most suitable devices for a specific application.

“IMAGINE” SPS Customer Magazine

Innovative new developments from Motorola's Semiconductor Products Sector

This highly informative periodical is available to all semiconductor users on a free subscription basis. The magazine provides information on new semiconductor products and developments and provides a quick-scan insight into new-product offerings. Concise, informative articles discuss significant new product capabilities as well as newly introduced services. In short, it represents an overview of the latest and most important events at Motorola that influence the efficient implementation and most cost-effective use of semiconductor devices.

To receive “IMAGINE” Magazine, in the USA, please contact the Literature Distribution Center by calling 1-800-441-2447.

Mfax — Touch-Tone Fax

Mfax offers access to over 30,000 Motorola documents for faxing to customers worldwide. With menus and voice instruction, customers can request the documents needed using their own touch-tone telephones from any location 7 days a week and 24 hours a day.

A number of features are offered within the **Mfax** system, including HOT DOCS (4-digit code identifiers for currently referenced promotional or advertising material), product data sheets, application notes, engineering bulletins, article reprints, selector guides, Literature Order Forms, and Technical Training Information.

Motorola has a full time staff dedicated to supporting the Internet service as well as the **Mfax** Touch-Tone Faxing service.

How to reach us:

MFAX: RMFAX0@email.sps.com

or (602) 244-6609

or 1-800-774-1848 (U.S. and Canada)

Motorola SPS World Marketing Internet Server

Motorola SPS's Electronic Data Delivery organization has set up a World Wide Web Server to deliver Motorola SPS's technical data to the global Internet community.

Technical data such as the complete Master Selection Guide along with the OEM North American price book are available on the Internet server with full search capabilities. Other data on the server include abstracts of databooks, application notes, selector guides, and textbooks. All have easy text search capability. Ordering Literature from the Literature Distribution Center is available on line.

Other features of Motorola SPS's Internet server include the availability of a searchable press release database, technical training information with on-line registration capabilities, complete on-line access to the MFAX system for ordering faxes, an on-line technical support form to send technical questions and receive answers through email, information on product groups, full search capabilities of device models, a listing of the Domestic and International sales offices, and links directly to other Motorola world wide web servers.

After accessing the Internet, to locate the Motorola SPS World Marketing server, use the following URL:

<http://sps-mot.com>

For more information on Motorola SPS's Internet server you can request BR1307/D from MFAX.

Motorola Data and Application Literature

Complete technical data for the world's most comprehensive inventory of semiconductor components

To complement the industry's broadest line of semiconductor products, Motorola offers a complete library of Data books which detail the electrical characteristics of its products. These documents are supplemented by User's Manuals describing the capabilities of the products in circuit and system design.

Motorola attempts to fill the need for applications information concerning today's highly complex electronic components. Each year dozens of authors from colleges and

universities, and from the industry, add their individual contributions to the collective literature. From these, Motorola has selected a number of texts which add substantially to the comprehension and applications of some of the more complex products. By buying these in large quantities and providing them to customers at lower than retail cost, Motorola hopes to foster a more comprehensive acquaintance with these products at greatly reduced prices.

For complete summaries and prices, order BR101/D from the Literature Distribution Center.

Data Books and Handbooks

BR1333/D, Timing Solutions
BR1334/D, High Performance Frequency Control Products
DL110/D, RF Device Data
DL111/D, Bipolar Power Transistor Data
DL118/D, Optoelectronics Device Data
DL121/D, FAST and LS TTL Data
DL122/D, MECL Device Data
DL126/D, Small-Signal Transistors, FETs and Diodes Device Data
DL128/D, Analog/Interface ICs Device Data
DL129/D, High Speed CMOS Data
DL131/D, CMOS Logic Data
DL135/D, TMOS Power MOSFET Transistor Data
DL136/D, Communications Device Data
DL137/D, Thyristor Device Data
DL138/D, FACT Data
DL140/D, ECLinPS and ECLinPS Lite
DL150/D, TVS/Zener Device Data
DL151/D, Rectifier Device Data
DL155/D, Dynamic RAMs & Memory Modules Data
DL156/D, Fast Static RAM – Component and Module Data
DL158/D, Multimedia Device Data
DL159/D, LonWorks Technology Device Data
DL200/D, Pressure Sensor Device Data
DL201/D, FPGA Data: Field Programmable Gate Arrays
HB205/D, MECL System Design Handbook
HB214/D, Rectifier Applications Handbook
HB215/D, RF Application Reports

Selector Guides & Application Literature

BR101/D, Technical and Applications Literature Catalog
BR518/D, Reliability & Quality Handbook
BR729/D, Motorola 68K Source – Third Party Vendor Catalog
BR916/D, Packaging Manual for ASIC Arrays
BR923/D, Communications, Power & Signal Technologies Group – Reliability Audit Report
BR1100/D, Microprocessor and Memory Technologies Group: Reliability and Quality Report

Selector Guides & Application Literature (continued)

BR1112/D, M68HC05 & M68HC08 Family Customer Specified Integrated Circuit (CSIC) Microcontroller Unit (MCU) Literature
BR1133/D, HIPPO: High-Performance Internal Product Portfolio Overview
BR1137/D, The Motorola Explorer's Guide to the World of Embedded Control Solutions
BR1138/D, 68HC08 – Innovate, Migrate, Accelerate
BR1143/D, Fast Static RAM Cross Reference Guide
BR1202/D, Motorola Quality System Review Guidelines
BR1306/D, CATS – Customer Analysis Tracking System
BR1400/D, OACS (ASIC) – Open Architecture CAD System
BR3021/D, "IMAGINE" Magazine
CALCPSTG/D, Communications, Power and Signal Technologies Group: New Product Calendar
CMRQS/D, CSIC Microcontrollers: Reliability and Quality Monitor Report
CR100/D, Communications, Power and Signal Technologies Group: Through-Hole to Surface Mount Cross Reference
CR103/D, Transient Voltage Suppressors, General Instruments Cross Reference
CR104/D, General Instrument-to-Motorola Optoelectronics Cross Reference
DSPNEWSL/D, DSP News
MRQS/D, Advanced Microcontroller Division: Reliability and Quality Monitor Report
SG46/D, RF Products Selector Guide & Cross Reference
SG73/D, Master Selection Guide
SG96/D, Analog/Interface ICs Selector Guide & Cross Reference
SG140/D, SCANSWITCH Selector Guide
SG146/D, Digital Signal Processors Update
SG162/D, Sensor Products Division
SG165/D, CSIC Microcontrollers Update
SG166/D, Advanced Microcontroller Division Update
SG167/D, High Performance Embedded Systems Fact Sheet
SG169/D, Mixed Signal Solutions from MOS Digital-Analog Integrated Circuits Division

Motorola Data and Application Literature: (continued)

Selector Guides & Application Literature (continued)

SG171/D, Fast Static RAM Product Update
SG172/D, Dynamic Memory Update
SG173/D, CSIC Microcontrollers: Modular Development Tools
SG175/D, RISC Microprocessor Division: The PowerPC Microprocessor Family
SG265/D, Power MOSFETs Product Update
SG266/D, Bipolar Power Transistors Product Update
SG267/D, Rectifier Product Update
SG268/D, Thyristor Product Update
SG271/D, D²PAK Surface Mount Selector Guide
SG273/D, Optoelectronic Operations Selector Guide
SG274/D, Zener Operations Selector Guide
SG275/D, Small–Signal Operations: Surface Mount Packages
SG365/D, Timing Solutions Selector Guide
SG367/D, High–Performance Gate Arrays
SG370/D, Discrete Surface Mount Selector Guide
SG375/D, Silicon Solutions for Motion Control
SG417/D, Semiconductor Products for Wireless Communications
SG422/D, PowerPC Microprocessors Product Overview
SG423/D, TIGER: The Integrated Guide to European RAMs
SG424/D, EAGLES: European Analog Guide for Leading & Emerging Systems
SG425/D, Lamp Ballast Selector Guide
SG426/D, DINO: Discrete Innovation News Overview

User's Manuals

ADCRM/AD, Analog–to–Digital Converter Reference Manual
CPU08RM/AD, M68HC08 Central Processor Unit Reference Manual
CPU16RM/AD, M68HC16 Family Reference Manual
CPU32RM/AD, CPU32 Central Processor Unit Reference Manual
CTMRM/D, Configurable Timer Module Reference Manual
DSP56KFAMUM/AD, DSP56000 Digital Signal Processor Family Manual
DSP56000UM/AD, DSP56000/DSP56001 Digital Signal Processor User's Manual
DSP56002UM/AD, DSP56002 Digital Signal Processor User's Manual
DSP56003UM/AD, DSP56003/005 Digital Signal Processor User's Manual
DSP56004UM/AD, DSP56004 Digital Signal Processor User's Manual
DSP56100FM/AD, DSP56100 Digital Signal Processor Family Manual
DSP56156UM/AD, DSP56156 Digital Signal Processor User's Manual
DSP56166UM/AD, DSP56166 Digital Signal Processor User's Manual

User's Manuals (continued)

DSP56300FM/AD, DSP56300 24–Bit Digital Signal Processor Family Manual
DSP56301UM/AD, DSP56301 24–Bit Digital Signal Processor User's Manual
DSP96002UM/AD, DSP96002 IEEE Floating–Point Dual–Port Processor User's Manual
GPTRM/AD, Modular Microcontroller Family General Purpose Timer Reference Manual
H4CDM/D, H4C Series Design Reference Guide
H4CPDM/D, H4CPlus Series Design Reference Guide
HC711D3PGMR/AD1, M68HC711D3PGMR Programmer Board User's Manual
HDCDM/D, HDC Series Design Reference Guide
LONUG/AD, LonBuilder User's Guide
LP2/D, Portable Power: The Competitive Edge of the 68HC11 – Low Power Design Guidebook
M5CDM/D, M5C Series Design Reference Guide
M68CPU32BUG/D, CPU32BUG Debug Monitor User's Manual
M68HC05AG/AD, M68HC05 Applications Guide
M68HC08RG/AD, HC08 Family Reference Guide
M68HC11EVB/D1, M68HC11EVB Evaluation Board User's Manual
M68HC11EVBU/AD2, M68HC11EVBU Universal Evaluation Board User's Manual
M68HC11EVM/AD8, M68HC11EVM Evaluation Module User's Manual
M68HC11RM/AD, M68HC11 Reference Manual
M68PCBUG11/D2, M68HC11 PCbug11 User's Manual
M68PRM/D, M6800 Programming Reference Manual
M6809PM/AD, MC6809–MC6809E Microprocessor Programming Manual (1981)
M68000PM/AD, M68000 Family Programmer's Reference Manual
M68000UM/AD, M68000 8–/16–/32–bit Microprocessors User's Manual, Ninth Edition
M68020UM/AD, MC68020/MC68EC020 Microprocessors User's Manual
M68040UM/AD, MC68040, MC68040V, MC68LC040, MC68EC040, MC68EC040V Microprocessors User's Manual
M68060UM/AD, MC68060, MC68LC060, MC68EC060 Microprocessors User's Manual
M68332EVKEM/AD1, M68332EVB Evaluation Kit Exercise Manual
MC68EC030UM/AD, MC68EC030 32–bit Embedded Controller User's Manual
MC68F333UM/AD, MC68F333 User's Manual
MC68HC05CxRG/AD, MC68HC05Cx HCMOS Single–Chip Microcontrollers Programming Reference Guide
MC68HC11A8RG/AD, MC68HC11A8 Programming Reference Guide
MC68HC11C0RG/AD, MC68HC11C0 Programming Reference Guide

Motorola Data and Application Literature: (continued)

User's Manuals (continued)

MC68HC11D3RG/AD, MC68HC11D3/MC68HC711D3
Programming Reference Guide

MC68HC11ERG/AD, MC68HC11E Programming
Reference Guide

MC68HC11F1RG/AD, MC68HC11F1 Programming
Reference Guide

MC68HC11K4RG/AD, MC68HC11K4/MC68HC711K4
Programming Reference Guide

MC68HC11KA4RG/AD, MC68HC11KA4/MC68HC711KA4
Programming Reference Guide

MC68HC11L6RG/AD, MC68HCL6/MC68HC711L6
Programming Reference Guide

MC68HC11MRG/AD, M68HC11 M Series Programming
Reference Guide

MC68HC11NRG/AD, MC68HC11N Series Programming
Reference Guide

MC68HC16Y1UM/AD, MC68HC16Y1 User's Manual

MC68HC16Z2UM/AD, MC68HC16Z2 User's Manual

MC68MH36ORM/AD, MC68MH360 QUICC32 Quad
Integrated Multichannel Controller Reference Manual

MC68030UM/AD, MC68030 Enhanced 32-bit MPU User's
Manual, third edition

MC68302UM/AD, MC68302 Integrated Multiprotocol
Processor User's Manual

MC68306UM/AD, MC68306 Integrated EC000 Processor
User's Manual

MC68307UM/AD, MC68307 Integrated Multiple-Bus
Processor User's Manual

MC68322UM/AD, Bandit: MC68322 Integrated Printer
Processor User's Manual

MC68328UM/AD, MC68328 (Dragonball) Integrated
Processor User's Manual

MC68330UM/AD, MC68330 Integrated CPU32 Processor
Users Manual

MC68331UM/AD, MC68331 User's Manual

MC68332UM/AD, MC68332 User's Manual

MC68340UM/AD, MC68340 Integrated Processor User's
Manual

MC68341UM/AD, MC68341 Integrated Processor User's
Manual

MC68349UM/AD, MC68349 High Performance Integrated
Processor User's Manual

MC68356UM/AD, MC68356 Signal Processing
Communications Engine User's Manual

MC68360UM/AD, MC68360 Quad Integrated
Communications Controller User's Manual

MC68488UM/AD, MC68488 General Purpose Interface
Adapter User's Manual

MC68605UM/AD, MC68605 X.25 Protocol Controller User's
Manual

MC68606UM/AD, MC68606 Multi-Link LAPD Protocol
Controller User's Manual

MC68824UM/AD, MC68824 Token Bus Products User's
Manual

MC68836UM/AD, MC68836 FDDI User's Manual

MC68837UM/AD, MC68837 FDDI User's Manual

MC68838UM/AD, MC68838 FDDI User's Manual

MC68839UM/AD, MC68839 FDDI System Interface User's
Manual

MC68840UM/AD, MC68840 Integrated Fiber Distributed
Data Interface User's Manual

MC68847UM/AD, MC68847 Quad ELM FDDI User's
Manual

MC68851UM/AD, MC68851 Paged Memory Management
Unit User's Manual, second edition

MC68881UM/AD, MC68881/MC68882 Floating-Point
Coprocessor User's Manual, second edition

MC88100UM/AD, MC88100 RISC Microprocessor User's
Manual

MC88110/410DH/AD, MC88110/MC88410 Designer's
Handbook

MC88110UM/AD, MC88110 Second Generation RISC
Microprocessor User's Manual

MC88200UM/AD, MC88200 Cache/Memory Management
Unit User's Manual

MC88410UM/AD, MC88410 Secondary Cache Controller
User's Manual

MC92005UM/D, MC92005 SBus Slave Interface Controller
User's Manual

MCCIRM/AD, Multichannel Communication Interface
Reference Manual

MCF5102UM/AD, MCF5102 ColdFire User's Manual

MCF5200PRM/AD, ColdFire Programmer's Reference
Manual

MCUDEVTLDIR/D, Motorola Microcontroller Development
Tools Directory

MPCFPE/AD, PowerPC Microprocessor Family: The
Programming Environments

MPCTOOLBK/AD, PowerPC Tools – Development Tools
for PowerPC Microprocessors

MPC105UM/AD, PowerPC PCI Bridge/Memory Controller
User's Manual

MPC601UM/AD, PowerPC 601 – RISC Microprocessor
User's Manual

MPC603eUM/AD, PowerPC 603e RISC Microprocessor
User's Manual

MPC604UM/AD, PowerPC 604 RISC Microprocessor
User's Manual

QSMRM/AD, Queued Serial Module Reference Manual

RCPURM/AD, MPC500 Family: RCPURM Reference Manual

SCIMRM/AD, Single-Chip Integration Module Reference
Manual

SIMRM/AD, System Integration Module Reference Manual

SIURM/AD, MPC500 Family: System Integration Unit
Reference Manual

TIM08RM/AD, TIM08 Timer Interface Module Reference
Manual

TPURM/AD, M68300 Family Time Processor Unit
Reference Manual

Motorola Data and Application Literature: (continued)

Technical Data Services

DK105/D, Scattering Parameter Library
DK106/D, Scattering Parameter Plotting Utility
DK107/D, Impedance Matching Program
DK202/D, Spice Disk for AN1043/D 3.5 (Mac)
DK301/D, Spice Disk for AN1043/D 3.5 (MS-DOS)

DK305/D, PLL Frequency Planning
DK306/D, PLL Lock-in Time Analysis
SG73/D, Master Selection Guide
SEMIVID/D, Basic Semiconductor Videos
Dr. BuB, DSP Electronic Bulletin Board Freeware Line,
Microcontroller Electronic Bulletin Board

Motorola Application Literature

Semiconductors in theory and practice

Application Notes, Engineering Bulletins and Article Reprints are part of a total information system to define the characteristics and applications of semiconductor devices. Motorola's library consists of more than 300 such documents dealing with the applications of all types of semiconductors from discrete power transistors to the most complex microprocessors. All are described in an Application Note Catalog available from our Literature Distribution Center.

Individual application notes, application reports,

engineering bulletins and article reprints can also be ordered from our Literature Distribution Center.

Contact the Literature Distribution Center for ordering information. In addition, there may be an alternative document available in some countries, contact your local Motorola Sales Office.

For complete summaries: order BR101/D from the Literature Distribution Center.

Motorola Technical Training Courses

Dear Customer:

Our primary goal as an organization is to enhance the designer's effectiveness in implementing Motorola's offering of microprocessors and microcontrollers. This is accomplished by providing our customers with formalized training, including application examples reinforced with hands-on labs, to empower the designer with the tools to efficiently accomplish their design.

Teaming with our training partners, Ascent Technologies and Arnewsh, Inc., we continue to strive for excellence in our offering of quality instruction in the application of Motorola products. Motorola's Technical Training organization develops new training courses in cooperation with our applications engineers and product marketing resources very early in the new product cycle, thus assuring vital and timely training to assist with your design. We then certify our training partners to assure the best possible training experience for engineers/programmers.

Our technical training is structured to offer the best instruction in the semiconductor industry, and we look forward to providing training that will adequately serve your design and application needs.

Thank you for choosing Motorola.

Jay Nunez
Director
Technical Operations

Sherril A. Harmon
Manager
Technical Training

We can bring the training to your facility!

Courses listed in this brochure can be taught at your facility and can be tailored to fit your needs. For details and information please call one of the training providers: Motorola Technical Training (602) 302-8008, Arnewsh, Inc. (970) 223-1616, or Ascent Technologies (800) 410-3601.

Motorola Technical Training Courses (continued)

DSP561xx Family Microprocessor

Description: This is a four–day course in which the student (with digital signal processing design experience) learns to design with the DSP561xx digital signal processor. The course consists of lectures, labs, and exercises.

Prerequisites: The student must have knowledge of at least one microprocessor and its assembly language. A prior understanding of digital signal processing theory is important for those whose applications are DSP oriented.

DSP5600x Family Microprocessor (with intro to DSP563xx/6xx)

Description: This is a five–day course in which the student (with digital signal processing design experience) learns to design with the DSP5600x digital signal processor. The course consists of lectures, labs, and exercises.

Prerequisites: The student must have knowledge of at least one microprocessor and its assembly language. A prior understanding of digital signal processing theory is important for those whose applications are DSP oriented.

DSP563xx/6xx Family Digital Signal Processor

Description: This is a two or four–day course in which the student (with digital signal processing design experience) learns to design with the DSP563xx/6xx digital signal processor. Students who have DSP5600x experience may choose to attend the last two days only. The course consists of lectures, labs, and exercises.

Prerequisites: The student must have knowledge of at least one microprocessor and its assembly language. A prior understanding of digital signal processing theory is important for those whose applications are DSP oriented.

DSP568xx Family Digital Signal Processor

Description: This is a four–day course in which the student (with digital signal processing design experience) learns to design with the DSP568xx digital signal processor. The course consists of lectures, labs, and exercises.

Prerequisites: The student must have knowledge of at least one microprocessor and its assembly language. A prior understanding of digital signal processing theory is important for those whose applications are DSP oriented.

DSP96002 Microprocessor

Description: This course prepares the student for designing systems which include the DSP96002. The course consists of four days of lecture.

Prerequisites: This course assumes no prior knowledge of the DSP56001 device.

MC68HC05/08 Microcontroller

Description: This is a four–day introductory course to the 68HC08 microcontroller family. This course covers the major modules of the 68HC08 including discrete I/O, timer functions, serial communications interfaces, multiplex communications modules, and the exception related modules. Many application examples are included. If needed, or if the actual target platform is the HC05, there is one–day (optional) added to the beginning of the class.

Prerequisites: No prior MC68HC08 knowledge is assumed. Some basic understanding of embedded system operations and their target applications is helpful.

MC68HC11 Microcontroller Family

Description: This is a four–day introduction to the MC68HC microcontroller family which covers major features of this industry–standard microcontroller. Students will understand how to program and apply all the major subsystems of the MC68HC11 including discrete I/O, timer functions, serial communication interfaces, analog to digital conversion, and the computer operating properly (COP) watchdog timer. Many application examples are included.

Prerequisites: Students should have a basic understanding of embedded system operations and their target application.

MC68HC12 Microcontroller

Description: This three–day course is designed to help the student understand the MC68HC12 family and their applications. The student will write I/O routines to configure an entire system to meet application requirements.

Applications such as angle base engine control, anti–skid breaking system and serial communication will be discussed in detail.

Prerequisites: 8 or 16–bit microcontroller knowledge and design experience will be helpful.

MC68HC16 Microcontroller Family

Description: This is a four–day course in which the MC68HC16 family major features are covered, including the CPU16, general purpose timer, and analog–to–digital converter. In addition, the system integration module, single–chip integration module, queued serial module, standby RAM, multi–channel communications interface, and time processor unit will be covered. Lecture, labs and exercises are a major part of the learning process for this course.

Prerequisites: Knowledge of microprocessor fundamentals. Previous experience with either MC68HC05 or MC68HC11 is helpful.

Motorola Technical Training Courses (continued)

MC68332 Embedded Controller

Description: This is a five–day intensive introduction to the MC68332 embedded controller family. Students will understand how to program and apply all the major subsystems of the 68332, including discrete I/O, timer functions, serial communication interfaces, analog to digital conversion, computer operating properly (COP) watchdog timer. Many application examples are included.

Prerequisites: Students should have a basic understanding of embedded system operations and their target application.

MC68376 Microcontroller

Description: This is a five–day intensive introduction to the MC68376 microcontroller. Students will understand how to program and apply all the major sub–systems of the 68376, including discrete I/O, time processor unit, the configurable timer module, the queued analog to digital converter, the queued serial module, and the Toucan module. Application examples are included.

Prerequisites: Students should have a basic understanding of embedded systems operations and their target application.

ANSI C for Embedded Systems

Description: This four–day course is a fast–paced introduction to programming Motorola microcontrollers using the C language. The course covers all essential C language constructs their typical implementation on Motorola microcontrollers and how to strategically design embedded system C software. Particular attention is paid to unique embedded system issues such as compiler ROM and RAM usage and throughput minimization. Hands–on lab exercises reinforce all major topics and use commercially available cross–compilers and simulators.

Prerequisites: Students should have a basic understanding of the 68HC11 or 68332 microcontroller and embedded systems operation. No familiarity with C is assumed.

MC68EC/000 Microprocessor

Description: This is a four–day course which covers both the software and hardware aspects of the MC68EC/000 processor. The course will cover programming model, data types, instruction set, addressing modes, exception processing, signal function and characteristics.

Prerequisites: A basic understanding of microprocessor systems, digital logic and memory concepts is required.

MC68EC/000 Family Programming

Description: This is a three–day course which presents the software functionality of all the MC68/EC0x0 microprocessors. The course covers the programming model, data types,

instruction set, addressing modes, exception processing, and an overview of the caches and memory management unit in 020/030/040. The course consists of lectures, exercises, and labs.

Prerequisites: A basic understanding of microprocessor systems and assembly language is required.

MC68EC/040/060 Microprocessors

Description: This is a two–day course which covers all the hardware and system aspects of both the MC68040 and MC68060 members. The first one and a half days is used to cover the MC68040 and the common issues of the MC68060. The last half day is used to point out MC68060 differences and the new features.

Prerequisites: Students should have complete familiarity with the software aspects of the M68K family. Students who also need the software and programming background may attend the M68K family programming course offered in the same week.

MC68302 Integrated Multiprotocol Processor

Description: This is a four–day course in which students learn to design and write programs for the various chip submodules. This includes the MC68000 core, communication processor (CP) and system integration block (SIB). The course consists of lectures, exercises, and labs.

Prerequisites: Students need the software and hardware understanding of the MC68000 processor.

MC68360 QUICC–QUad Integrated Communication Controller

Description: This is a four–day course in which students learn to design and write programs for the various chip modules. This includes the CPU32+ core, communication processor module (CPM) and system integration module (SIM60). Labs are a major part of the learning process; lecture and exercises are also a part of the course.

Prerequisites: To benefit most from the course, a S/W and H/W understanding of the MC68000 microprocessor is a requirement.

MC6834x Family Integrated Processor ('330, '340, '341, '349)

Description: This is a three–day course in which students will learn to design with the CPU32/CPU32+, DMA channels, timers, serial I/O modules, and system integration module. The course consists of lectures, exercises, and labs.

Prerequisites: Students need the software and hardware understanding of the M68K processor family.

Motorola Technical Training Courses (continued)

PowerPC™ 6xx Family Microprocessor

Description: The MPC6xx is primarily targeted for the desktop marketplace. The PowerPC™ MPC6xx course is a four-day course that details all publicly announced MPC6xx implementations such as the MPC602, MPC603 and MPC604. This course contains lectures, labs, and exercises.

Prerequisites: The student must have advanced microprocessor and assembly language knowledge. An understanding of memory management, multi-processing/master, and cache concepts is also beneficial.

MPC505 PowerPC™ Microcontroller

Description: This is a three-day course in which the student learns to design with the embedded PowerPC™ core, system integration unit (SIU), and associated components of the MPC505. The course consists of lectures and exercises.

Prerequisites: The student must have advanced microprocessor and assembly language knowledge. PowerPC™ experience is not required.

MPC821 PowerPC™ Integrated Microcontroller

Description: This is a four-day course in which the student learns to design with the MPC821, i.e. the embedded PowerPC™ core, and the enhanced communications processor module. The course will contain lectures, labs, and exercises.

Prerequisites: The student must have advanced microprocessor and assembly language knowledge. The first day of this course is optional, intended for designers with no PowerPC™ background.

MPC860 Power QUICC–QUad Integrated Communication Controller

Description: This is a four-day course in which students learn to design and write programs for the various chip submodules. This includes the embedded PowerPC™ Core, the RISC communication processor module (CPM), and system integration unit. Labs are a major part of the learning process; lectures and exercises are also a part of the course.

Prerequisites: To benefit most from the course, some S/W and H/W understanding of the PowerPC™ RISC processor is a requirement. However, if students do not have this requirement, the first day is a must to attend. The first day will cover PowerPC™ basics and fundamentals.

TPU Microcode

Description: The TPU Microcode course is a three-day lab-intensive course in which the student learns how to write microcode functions for the TPU. The course is approximately 50% lecture and exercises and 50% lab time.

Prerequisite: The student must have advanced microprocessor experience.

ColdFire MCF5200

Description: This is a three-day course that covers the ColdFire family of microprocessors. This “variable length” RISC MPU is contrasted with traditional RISC and CSiC architectures, and the advantages of the ColdFire family are highlighted.

The software portion of this course covers the programming model, addressing modes, and instruction set. Code density, exception processing and program examples are also reviewed.

The hardware portion begins with the system integration module (SIM). The SIM includes the external bus interface and timing, chip select operation, DRAM controller, and system protection features.

The hardware portion also covers in detail the on-board debug module. The course will demonstrate to the student how to debug application programs using the advanced features of the background debug mode (BDM), including real-time trace and hardware breakpoints.

This course also covers the other ColdFire family resources, including on-chip caches, timers, uarts and the M-bus interface.

Each hardware topic includes a lab session and an application example is provided to insure the student has a clear understanding of the features of the ColdFire family.

Prerequisite: 32, 16 or 8-bit microprocessor/microcontroller knowledge or design experience.

Motorola Technical Training Courses (continued)

For information regarding the following courses, call (800) 262-5486. RTEK support and course information offered by Embedded System Product, Inc.

Please call (800) 262-5486 to speak with the RTEK Training Coordinator concerning course pricing, enrollment, or on-site training.

Use of the RTEK Kernel

Description: This is a three-day course in which the student receives an in-depth presentation of the RTEK kernel with reinforcement from extensive "hands-on" usage. The course covers all aspects of RTEK kernel usage beginning with an overview of real-time software architectures, a presentation of RTEK features, its kernel objects and services, system configuration and generation, and interrupt servicing concepts for device drivers. Lecture time is interspersed with lab exercises to achieve maximum benefit for the student. Each day ends with a question and answer session to cover application topics or items of special interest to the student.

Prerequisites: Prior knowledge or use of a real-time kernel

is not required but will benefit the student. Students should be familiar with the C language and a source level debugger.

RTEK Training Class Dates for 1997

January 14-16

February 11-13

March 18-20

April 8-10

May 13-15

June 17-19

July 15-17

August 12-14

September 16-18

October 14-16

November 11-13

December (No Scheduled Class)

All scheduled classes are held in Houston, TX at the Embedded System Products Training Center. Closed classes are available on-site by special arrangement.

Training Providers and Their Schedules

Please call one of the training providers above for details on providing classes at your facility

MOTOROLA Courses and Locations

Motorola Technical Training Center • 432 North 44th Street • Suite 175 (Classroom) • Phoenix, Arizona 85008
Call (602) 302-8008 for class pricing

FAX REGISTRATION FORM FAX (602) 302-8025

Please mark the class you will be attending and fax to **ATTENTION: REGISTRAR.**

- | | | |
|--|---|---|
| <input type="checkbox"/> DSP568xx, Phoenix, January 28 | <input type="checkbox"/> DSP563xx/6xx, Phoenix, February 18 | <input type="checkbox"/> MC68HC12, Phoenix, February 11 |
| <input type="checkbox"/> DSP568xx, Phoenix, March 11 | <input type="checkbox"/> DSP563xx/6xx, Ann Arbor, April 22 | <input type="checkbox"/> MC68HC12, Phoenix, March 4 |
| <input type="checkbox"/> DSP568xx, Ann Arbor, May 6 | <input type="checkbox"/> DSP563xx/6xx, Ann Arbor, June 17 | <input type="checkbox"/> MC68HC12, Phoenix, May 6 |

You can also register for Motorola taught courses by:

Email: R17994@email.sps.mot.com

Internet WWWeb, URLs:

Internal: <http://design-net.sps.mot.com/training/catalog/training.html>

External: <http://design-net.com/training/catalog/training.html>

Plan early as classes fill up rapidly and space is limited.

ARNEWSH, INC. Courses and Locations

P.O. Box 270352 • Fort Collins, Colorado 80527-0352 • (970) 223-1616
Call for class pricing

FAX REGISTRATION FORM FAX (970) 223-9573

Please mark the class you will be attending and fax to **ATTENTION: REGISTRAR.**

- | | | |
|--|--|---|
| <input type="checkbox"/> PowerPC™ 6xx, Phoenix, January 28 | <input type="checkbox"/> MC68302, Denver, April 8 | <input type="checkbox"/> MPC860, San Jose, June 10 |
| <input type="checkbox"/> PowerPC™ 6xx, Phoenix, April 29 | <input type="checkbox"/> MC68360, Phoenix, February 18 | <input type="checkbox"/> MPC821, Phoenix, March 11 |
| <input type="checkbox"/> PowerPC™ 6xx, San Jose, June 24 | <input type="checkbox"/> MC68360, San Jose, May 20 | <input type="checkbox"/> MC68EC/000, Denver, February 25 |
| <input type="checkbox"/> MCF520x ColdFire, Phoenix, March 25 | <input type="checkbox"/> MPC860, Phoenix, January 14 | <input type="checkbox"/> MC68EC/000 Family Programming,
Chicago, May 5 |
| <input type="checkbox"/> MC6834x, Denver, March 18 | <input type="checkbox"/> MPC860, Seattle, April 22 | <input type="checkbox"/> MC68EC/040/060, Chicago, May 8 |

ASCENT TECHNOLOGIES Courses and Locations

525 Avis Drive, Suite 15 • Ann Arbor, MI 48108 • (800) 410-3601
Call for class pricing

FAX REGISTRATION FORM FAX (313) 668-2735

Please mark the class you will be attending and fax to **ATTENTION: REGISTRAR.**

- | | | |
|--|---|--|
| <input type="checkbox"/> MC68HC11, Ann Arbor, March 11 | <input type="checkbox"/> MC68376, Phoenix, January 20 | <input type="checkbox"/> DSP5600x, Ann Arbor, June 2 |
| <input type="checkbox"/> MC68HC11, Ann Arbor, June 10 | <input type="checkbox"/> MC68376, Ann Arbor, March 17 | <input type="checkbox"/> TPU Microcode, Ann Arbor, February 25 |
| <input type="checkbox"/> MC68HC16, Ann Arbor, March 4 | <input type="checkbox"/> MC68376, Ann Arbor, April 28 | <input type="checkbox"/> ANSI C, Ann Arbor, January 21 |
| <input type="checkbox"/> MC68HC16, Ann Arbor, April 29 | <input type="checkbox"/> MC68HC05/HC08, Phoenix, February 3 | <input type="checkbox"/> ANSI C, Ann Arbor, February 18 |
| <input type="checkbox"/> MC6833x, Phoenix, February 24 | <input type="checkbox"/> MC68HC05/HC08, Ann Arbor, April 14 | <input type="checkbox"/> ANSI C, Ann Arbor, April 8 |
| <input type="checkbox"/> MC6833x, Ann Arbor, May 12 | <input type="checkbox"/> DSP5600x, Phoenix, February 10 | <input type="checkbox"/> ANSI C, Ann Arbor, May 20 |
| <input type="checkbox"/> MC6833x, Ann Arbor, June 16 | <input type="checkbox"/> DSP5600x, Phoenix, March 24 | |

**Call 1-800-774-1848 or 602-244-6609 to have the latest copy
of our Technical Training Catalog and class schedule faxed to you.
If you are outside of the USA, call your local Technical Training Center
or Sales Office and ask for BR348/D.**

Technical Training Centers

Regional Training Centers

Detroit
41700 Six Mile Road
Nothville, MI 48167
(313) 347-6800

Phoenix
432 N 44th Street
Phoenix, AZ 85008
(602) 302-8008

International Training Centers

Munich, Germany (49)-89-92103571
Velizy Villacoublay Cedex, France (33)-1-34635894
Aylesbury, United Kingdom (44)-1296-380304

Provide the following information when registering:

You can also register by:

Email: R17994@email.sps.mot.com

Internet WWWeb, URL: http://Design-NET.com

MOTOROLA

Technical Training • 432 North 44th Street • Suite 200 • Phoenix, AZ 85008

Voice: (602) 302-8008 • FAX: (602) 302-8025

ATTENTION: REGISTRAR

Contact's Name: _____ Email: _____ Fax Number: _____

Contact's Phone Number: _____ Company: _____

Street Address: _____ City: _____ State/Province: _____ Zip/Postal Code: _____

1. _____
Student's Name/Email Address Phone Fax

*Mail Stop *SS# *Dept.# *Badge# *Sector

2. _____
Student's Name/Email Address Phone Fax

*Mail Stop *SS# *Dept.# *Badge# *Sector

3. _____
Signature of Authorizing Manager Email Phone

*Required for all Motorola employees only

<ul style="list-style-type: none"> • Intended method of payment: Charge Card <input type="checkbox"/> Purchase Order <input type="checkbox"/> Check <input type="checkbox"/> • Motorolan's: Dept. # _____

Students will be contacted to confirm receipt of faxed registration and method of payment.