Off-the-shelf, on the money. The real-time operating system for real-world success.

RTEK™

Real-Time Kernel
for Motorola Microcontrollers

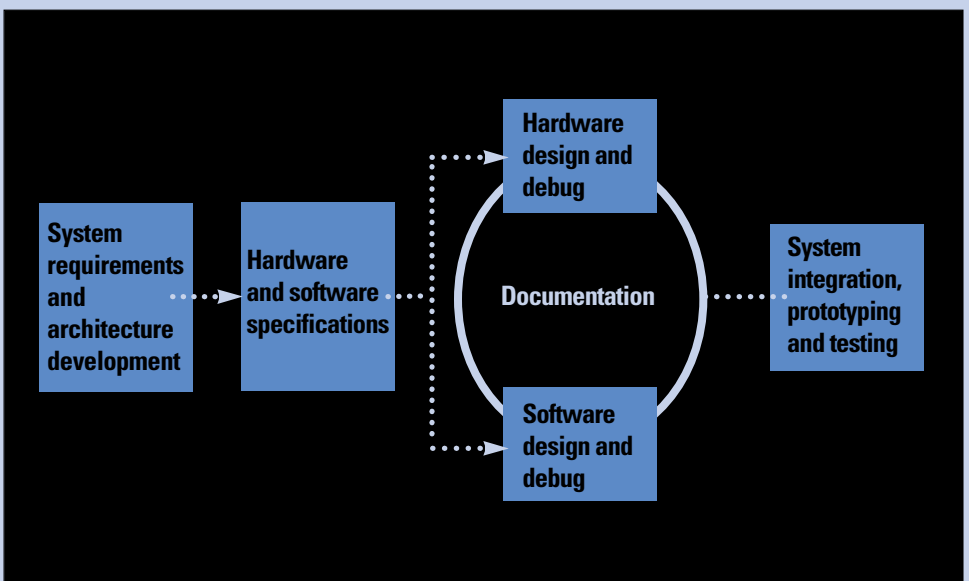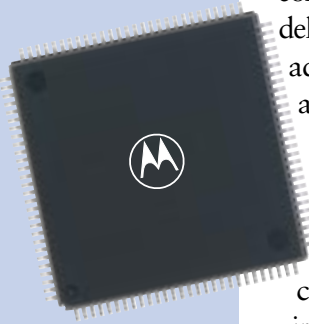*Something Real!*

Ⓜ **MOTOROLA**

Microcontroller Technologies Group

Controlled development costs, enhanced software quality, reliability, code re-use, migration, and scalability: RTOS benefits save you development time and money.

Using an RTOS saves time and money throughout the design process.

To market, to market. Fast. With a Motorola RTEK kernel.

Today's emerging and increasingly complex real-time applications are delivering the true promise of advanced technology to consumers around the globe. Real-time systems, defined as any application that provides immediate information processing and response to external events, are changing customer expectations in virtually every arena: digital cellular phones smoothly integrate call waiting, call forwarding, caller ID, and voice messaging; video cameras react to variations in lighting, depth, and background noise; sophisticated automotive engine controllers automatically respond to fluctuating road conditions and performance requirements; and automated process control systems optimize performance and efficiency over varying operating conditions.

Though diverse in the capabilities they offer, all real-time systems share one demanding characteristic: the precise synchronization of activities or tasks with event occurrences. Because these tasks vie for memory, execution time, peripheral devices, and other resources, a Real-Time Operating System (RTOS) is a critical component of efficient system management.

The old, expensive, and time-consuming solution of building a system from the ground up for each new real-time application is being eclipsed by a new breed of product that makes a real difference in both profit and performance: an off-the-shelf real-time operating system.

With an RTOS, you can leverage benefits that include reduced software development costs, enhanced software quality, proven reliability, software reuse, migration, and built-in scalability. Each RTOS advantage uniquely contributes toward the same end result: an early-to-market position that yields increased market share, profits, and buyer preference, as well as a sharper competitive edge for your company.

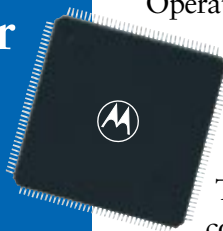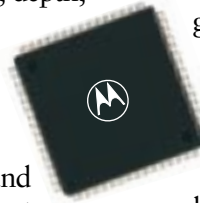So who's helping today's most successful companies leapfrog the competition and launch revenue-generating market-firsts? Motorola, of course, the world's leading supplier of microcontrollers. Motorola's RTEK™ kernel is a sophisticated, reliable, real-time kernel for Motorola's extensive family of microcontrollers.

Shave time. Save money. Improve quality.

A proven, off-the-shelf RTOS has what you need to get your product to market as quickly as possible. Benefits include:

Reduced software development costs.
The code needed to control a real-time application is built-in so you spend less time developing software. Using a proven kernel also saves you valuable testing time because the operating system tests have already been conducted. Furthermore, the needed documentation has already been carefully prepared and reviewed. Foolproof documentation improves future maintenance and facilitates extension of an application.

System designers are trending away from ad hoc software whenever possible in favor of proven software modules that help reduce time-to-market.

AUTOMOTIVE AND OTHER

HIGH-VOLUME

REAL-TIME APPLICATIONS

REQUIRE PRECISE

SYNCHRONIZATION OF TASKS WITH

EXTERNAL EVENTS.

THE RTEK KERNEL DELIVERS.
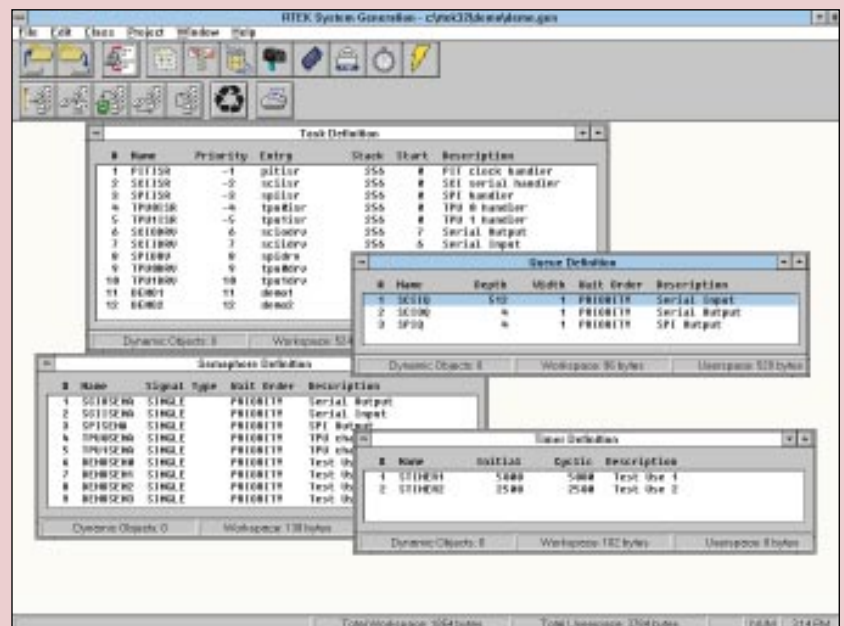
RTEKgen allows easy system configuration by giving designers a simple way to define the system architecture.

## Increased software integrity and system reliability.

Applications built on a fully tested foundation are reliable, resulting in enhanced software integrity. And, while a proprietary system may have unknown problems, system reliability is improved when you employ an RTOS with a proven track record.

Software re-use and migration.

Because embedded systems are growing in complexity and diversity, designers are using proven software modules to bring products to market quickly and reduce development costs. And because an RTOS naturally divides an application into a series of tasks, easy migration is facilitated when moving the application to another processor capable of running the same RTOS.

Scalability.

The scalability of an RTOS allows you to incorporate only the functions required by your application, thereby reducing the size of program memory and decreasing component costs.
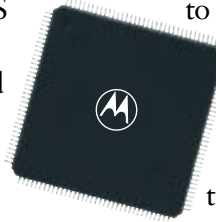
The real news: The RTEK kernel keeps Motorola customers ahead.

The RTEK kernel is a real-time, multi-tasking kernel that facilitates development of embedded applications for Motorola's industry-standard microcontrollers. If you're already a Motorola microcontroller customer, you've experienced the strengths of our broad-based product lineup. Now you can use the RTEK kernel to build on your success and enhance your existing investments. Plus, the RTEK kernel incorporates the same unsurpassed commitment to quality that is synonymous with the Motorola name.

RTEK kernel features and benefits.

The RTEK kernel offers a robust, real-time operating system framework for a broad range of embedded software applications. This full-functioned kernel supports both static and dynamic kernel objects, yielding extensive flexibility for designers.

The kernel provides three scheduling methods for maximum flexibility:
- Pre-emptive: causes higher-priority tasks in time-critical systems to pre-empt lower-priority tasks and ensures performance goals are achieved
- Round robin: runs tasks in sequence
- Time-slice: runs tasks for predetermined periods of time

The kernel also contains an extensive library of services that are invoked by the application program to help manage system resources such as the CPU, peripherals, memory, and time. Over 190 kernel services provide the functionality that is critical to the success of any real-time application. The RTEK kernel also enables a deterministic design in which the response time to an event is predictable.

The RTEK kernel's 190+ services are divided into the following eight classes:
- Tasks for organizing code into manageable pieces
- Semaphores for event synchronization
- Queues for data passing
- Mailboxes for message transmission
- Memory partitions for memory management
- Mutexes for exclusive access to system resources
- Timers for timed operation
- ISRs for interrupt processing

The RTEK kernel puts you in an early-to-market position that yields increased market share, profits, and buyer preference, plus a sharper competitive edge.
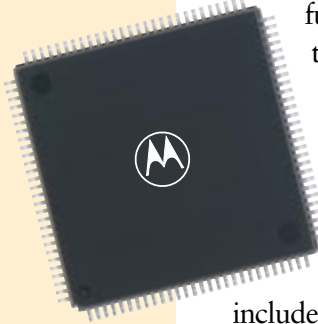
AN RTOS IS CRITICAL

TO THE SUCCESS

OF INDUSTRIAL APPLICATIONS

SUCH AS SECURITY AND

PROCESS CONTROL SYSTEMS THAT

REQUIRE PRECISE

TIME SYNCHRONIZATION.

Test-drive the RTEK kernel with Motorola's free Evaluation Kit.

The RTEK kernel provides a common application programming interface (API) for all related tasks. The RTEK API is a set of C functions easily called from the application program. The C functions enable developers to quickly understand code that has been designed using the RTEK kernel.

A graphical system generation program called RTEKgen is included. RTEKgen allows easy system configuration by giving designers a simple way to define the system architecture.

Software Development Kit and licensing.
The RTEK kernel Software Development Kit (SDK) includes kernel object code, the RTEKgen system generation utility, language interface libraries, source code for drivers and utilities, complete documentation, and authorization to produce five prototype units that contain the RTEK kernel. The RTEK SDK runs under Windows®95 and WindowsNT® for Motorola M68HC11, M68HC12, M68HC16, M68300, and MPC800 microcontroller architectures; the MPC500 Family version runs on Sun O/S™. Each SDK is licensed on a per-seat basis with multi-user licenses available. Right-to-use licenses are required to manufacture products containing the RTEK kernel.

Training, technical support, and documentation.
A three-day RTEK training course is available in Austin and other selected locations. On-site customer training is also available. For more information, contact the RTEK Support Center.

The RTEK kernel is backed by Motorola's worldwide network of regional offices and authorized distributors.

Motorola offers the first year of technical support and maintenance free to RTEK customers. After registration, SDK customers receive free telephone support, automatically shipped product updates, and notice of product enhancements. After the first year, customers can opt to purchase an annual maintenance agreement.

For additional technical information, please request the RTEK Kernel Product Profile (RTEK/D) and the RTEK Kernel Technical Summary (RTEKTS/D) from the RTEK Support Center at the number listed below.

Ready for cycle time savings? Order the RTEK kernel Evaluation Kit today.
For more information and a free test-drive of the RTEK kernel, contact the RTEK Support Center at (800) 262-5486 and order the RTEK Evaluation Kit (RTEKEVAL996). Complete information on the RTEK kernel is also available by visiting www.mot.com/rtek

Something Real!

Motorola's RTEK kernel is the real-time solution designed to slash your time-to-market. And keep you ahead in the real world.

The RTEK kernel's 190+ services enable functionality such as task synchronization with event occurrence and movement of chronological and prioritized data between tasks.

SAVE VALUABLE TIME

INSTEAD OF DEVELOPING

REAL-TIME OPERATING

SYSTEM CODE.

CHOOSE THE RTEK KERNEL.

Technical and Sales Support may be obtained by contacting:
RTEK Support Center: (800) 262-5486
Fax: (281) 530-1970
RTEK Web Site: www.mot.com/rtek
Technical support e-mail address: rtek@esphou.com
Mail: Motorola, Inc.
ATTN: MCTG Software and Development Tools Operation, OE45
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Austin, Texas 78735