



# PACE Soft Silicon\*: Taking Camcorder Technology to New Levels in Wireless Devices

## SOLUTION SUMMARY

### Challenge

PACE Soft Silicon\*, headquartered in Santa Clara, California, develops highly optimized video software solutions for mobile phones and PDAs. Their flagship product, SoftCorder, is a new class of application that turns PDAs and Smartphones into camcorders and allows users to share video clips with other mobile devices and PC's via e-mail or MMS.

With this advanced functionality, PACE's customers needed a high performance processor with the bandwidth to handle robust applications without compromising battery life in the devices.

### Solution

The Intel® PXA27x processor family with Intel® Wireless MMX™ technology and PACE's high-level algorithms proved to be an ideal combination. The Intel® Quick Capture camera interface allows OEMs to add the camera features to their devices, and the PACE software implements the camcorder and encoding features so consumers can capture audio and video clips they want to share with others.

### Key Features

- With Intel Wireless MMX technology, the PACE application is designed to deliver better resolution and a higher quality video experience than possible with previous technology.
- Intel Quick Capture technology delivers 4.0 megapixel resolution, and works with the vast majority of CCD and CMOS camera sensors available on the market.
- The higher core speed of the Intel PXA27x processor family provides additional headroom that helps PACE deliver faster frame rates today and in the future.
- The Development Kit for Intel PXA27x processor family provides a reference platform that facilitates early product development.

## Business Objectives

Most devices on the market today can only record video clips in low resolution, with a low frame rate. According to PACE director of Sales and Marketing, James Bruce, the low resolution and frame rates produce images that are difficult to see clearly. As a result, consumer demands for high-quality video in wireless devices were simply not being met.

PACE's software camcorder, which is primarily based on Microsoft\* Windows Mobile\* operating system, was optimized for Intel XScale® microarchitecture, and the Intel® StrongARM® processor. Intel XScale technology was developed to optimize low power consumption and high-performance processing for a wide range of wireless and networking applications and rich services.

While this initially allowed PACE to offer the best solution and take an early lead in this highly competitive market, they needed a more powerful processor to meet customer demands and grow their customer base. Having worked with a wide range of Intel processors to create a solution, the Intel Wireless MMX technology instruction set offered PACE the significant architectural enhancement they were looking for to provide the increased multimedia processing performance.

## Business Solution

"The combination of our software algorithms with Intel Wireless MMX technology in the new Intel PXA27x processor family, enabled PACE to deliver the higher quality product we've been working toward," said Bruce.

The SIMD instructions in the Intel Wireless MMX technology provide great performance gains, thanks to highly optimized code. Other features in the Intel PXA27x processor family have helped PACE take wireless video to a new level, from a 'not very useful' feature to real, practical usability.

"Intel Wireless MMX technology makes the SoftCorder applications look better and run more smoothly, which is exactly what we were looking for," said Bruce. "The advanced instructions

give us the power and performance we were looking for, without requiring the power normally needed to run this type of rich application.”

Intel Quick Capture Interface was another important feature in the PACE decision to adopt the Intel PXA27x processor family technology. Intel Quick Capture technology enables the live video and high-quality still images that SoftCorder is designed for.

In addition, the high core speeds provide the headroom so PACE can deliver faster frame rates, today and in the future.

“Our current version of the software utilizes 400–520MHz speeds, while the Intel PXA27x processor family supports core speeds up to 624MHz,” said Bruce. “This gives us confidence that we’ve got a long-term solution, as the Intel PXA27x processor family clearly delivers headroom we will need as new features and capabilities are added in the future.”

Intel’s technical support was critical throughout the product development cycle. By providing a Development Kit early in the product design stage, PACE engineers had a reference platform to work with and test their application.

“It’s definitely worth the effort to optimize on the Intel PXA27x processor family—we have the benefits of increased performance, decreased battery usage, and are able to implement features that we weren’t able to with the prior technology. We are also confident that this extra headroom will make a difference in forthcoming H.264 video implementations, which we are also currently delivering to the market segment.”

PACE has seen a 2X increase in performance in the SoftCorder platform since optimizing for the Intel PXA27x processor family, with 15+ fps QVGA on the encoding side, and 30 fps QVGA on the playback. This performance gain includes real high motion sports clips, delivering best-of-breed performance in this space.

“Intel is a major force in the mobile processor market. As an ISV working with Intel, we found the team to be very supportive and responded positively to the results we achieved using Intel Wireless MMX technology and the Intel PXA27x processor family.”

## The Intel Advantage

- **Market exposure**—our investment in optimizing our product for the Intel PXA27x processor family not only gave us an advantage in the market, but helped our business. When you develop innovative, cutting-edge solutions on the Intel platform, Intel is very helpful in terms of presenting the solution in trade shows and other business development environments.
- **Open standard**—because Intel® architecture is based on industry standards, it’s easy to port software solutions from one OS to another. This capability extends our market potential and enhances our competitive edge.
- **Intel® Personal Internet Client Architecture Developer Network**—having early access to development tools and the support we needed in developing our SoftCorder platform shortened our design time and helped us get our solution to market more quickly.

Intel’s end-to-end commitment to the mobile and wireless world helps you maximize mobility. With silicon and reference designs that provide the right combination of performance, reduced power and integrated packaging in platforms designed to accelerate time-to-market. Intel Wireless Solutions includes the new generation of hardware building blocks, software, development tools, and resources you need to provide the industry leading application performance, multimedia quality and client functionality that today’s mobile customers demand.

### For more information

[www.intel.com/go/wirelessmobility](http://www.intel.com/go/wirelessmobility)

## Intel Access

Developer Web Site

[developer.intel.com](http://developer.intel.com)

Intel® PCA Processors Home Page

[developer.intel.com/design/pca/applicationsprocessors/index.htm](http://developer.intel.com/design/pca/applicationsprocessors/index.htm)

Intel® Technical Documentation Center

[intel.com/go/techdoc](http://intel.com/go/techdoc)

800 548-4725 7 am–7 pm CST (USA and Canada)

General Information Hotline

800 628-8686 or 916 356-3104 5 am–5 pm PST

For more information, visit the Intel Web site at: [developer.intel.com](http://developer.intel.com)

### United States and Canada

Intel Corporation  
Robert Noyce Bldg.  
2200 Mission College Blvd.  
P.O. Box 58119  
Santa Clara, CA 95052-8119  
USA

### Europe

Intel Corporation (UK) Ltd.  
Pipers Way  
Swindon  
Wilshire SN3 1RJ  
UK

### Asia-Pacific

Intel Semiconductor Ltd.  
32/F Two Pacific Place  
88 Queensway, Central  
Hong Kong

### Japan

Intel Japan (Tsukuba HQ)  
5-6  
Tokodai Tsukuba-shi  
300-2635 Ibaraki-ken  
Japan

### South America

Intel Semicondutores do Brasil Ltda  
Av. Dr. Chucrí Zaidan, 940-10° andar  
04583 904 São Paulo, SP  
Brazil

INFORMATION IN THIS DOCUMENT IS PROVIDED IN CONNECTION WITH INTEL® PRODUCTS. EXCEPT AS PROVIDED IN INTEL'S TERMS AND CONDITIONS OF SALE FOR SUCH PRODUCTS, INTEL ASSUMES NO LIABILITY WHATSOEVER, AND INTEL DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY RELATING TO SALE AND/OR USE OF INTEL PRODUCTS, INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT, OR OTHER INTELLECTUAL PROPERTY RIGHT.


Intel may make changes to specifications, product descriptions, and plans at any time, without notice.

Intel Corporation may have patents or pending patent applications, trademarks, copyrights, or other intellectual property rights that relate to the presented subject matter. The furnishing of documents and other materials and information does not provide any license, express or implied, by estoppel or otherwise, to any such patents, trademarks, copyrights, or other intellectual property rights. Intel products are not intended for use in medical, life-saving, life-sustaining, critical control or safety systems, or in nuclear facility applications.

The Intel® PXA27x processor family may contain design defects or errors known as errata, which may cause the product to deviate from published specifications. Current characterized errata are available upon request.

Intel, the Intel logo, Intel Wireless MMX, and Intel XScale are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

\*Other names and brands may be claimed as the property of others.

Copyright © 2004 Intel Corporation. All rights reserved. 0904/MS/LK/MS/2K  Please Recycle

300876-002

