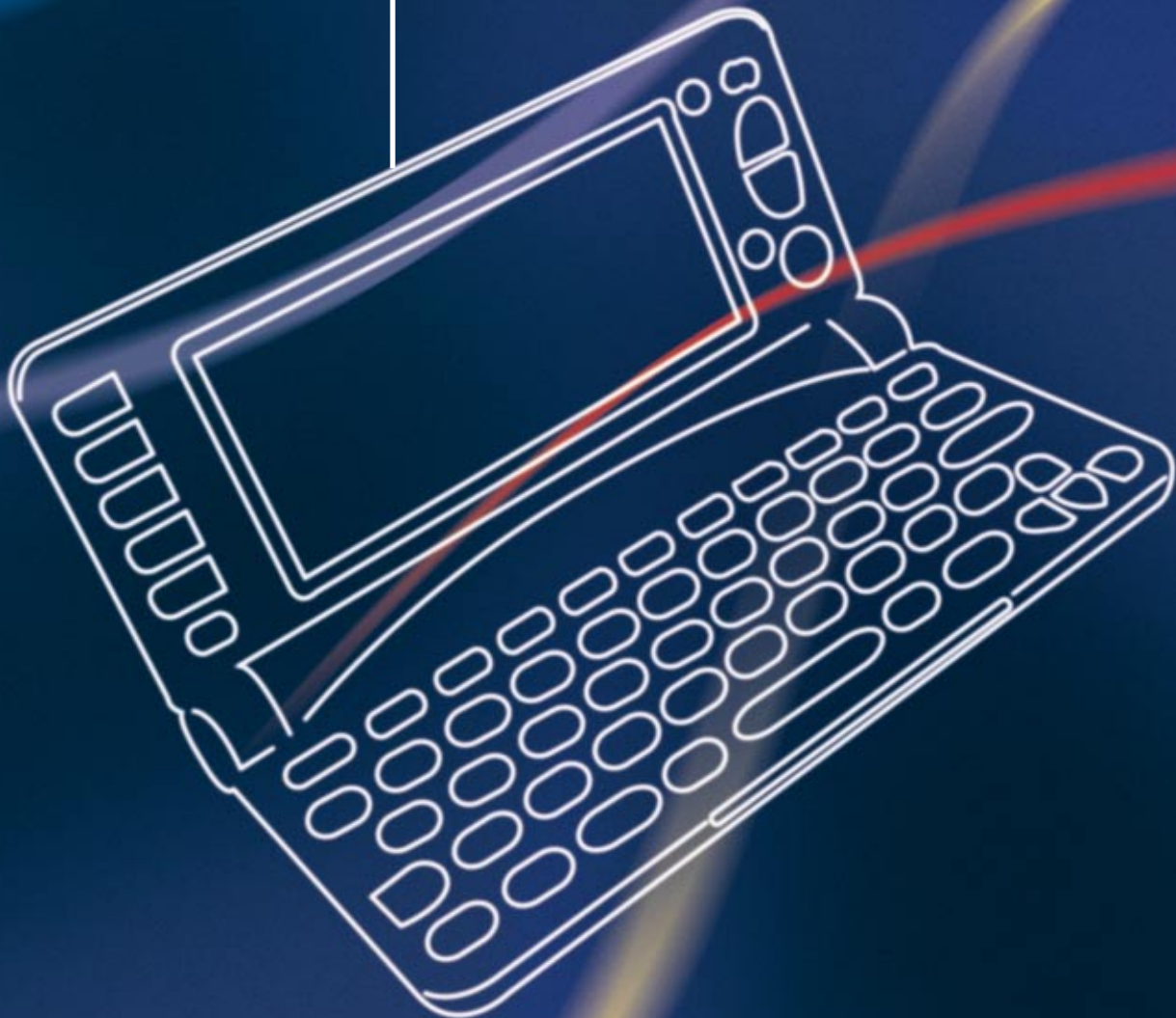


Customer Success Stories

**ARC's MetaWare Toolchain Equal to
Alphamosaic's Design Challenges**



Customer Success Stories

Alphamosaic is a Cambridge, UK-based fabless semiconductor company. Having developed the world's first mobile videophone and PDA, the founders of Alphamosaic, Steve Barlow and Robert Swann, were well aware of the "mobile video problems" including how to design video-enabled products with the huge volume of data to process the variety of software and hardware, the use of multiple chips and the impact these have on battery life.

They started Alphamosaic to make all these difficulties a thing of the past, to bring battery-efficiency and high-quality video not only to cellular phones but also to a multitude of different handheld or mobile devices.

Alphamosaic's Design Challenge

Alphamosaic's VideoCore® allows designers to easily add video capability to a variety of applications, including mobile phones, smart phones, PDAs, surveillance devices and camera modules. It is optimized to perform the most computationally intensive video processing tasks efficiently in software. However, to take advantage of the video processing power requires customized software development tools.

As VideoCore is the industry's first processor for mobile video devices, there were not a lot of robust, professionally supported tool chains that met Alphamosaic's high standards.

Traditional tool chains include: compilers, assemblers, linkers, debuggers, and instruction-set simulators that enable designers to write code and execute it under the control of a simulator. But to be able to handle the complex aspects related to on-chip peripherals and video processing is a challenge to the simulator's design.

A video processor has some other unique requirements. A normal debugger, for example, provides the developer with the ability to view memory locations for debugging purposes. Alphamosaic wanted to give designers the ability to see the images graphically represented. Additionally, Alphamosaic wanted a tool chain that would enable simulation of interrupts, camera interface, DMA, timers, UARTs, LCD interface and more.

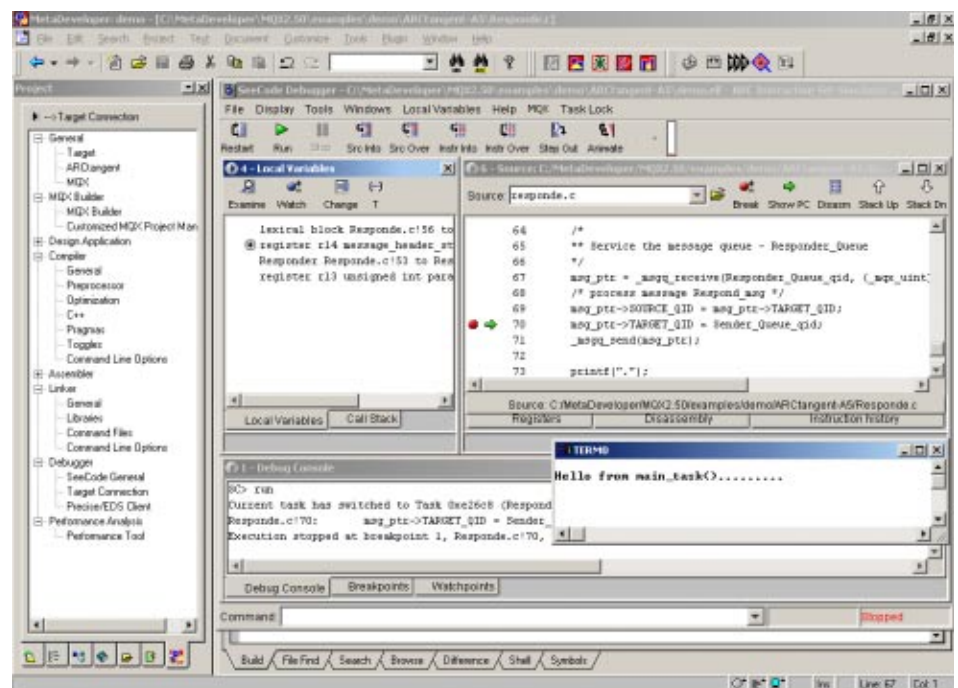
Solution: Comprehensive Software Development Tool Suite

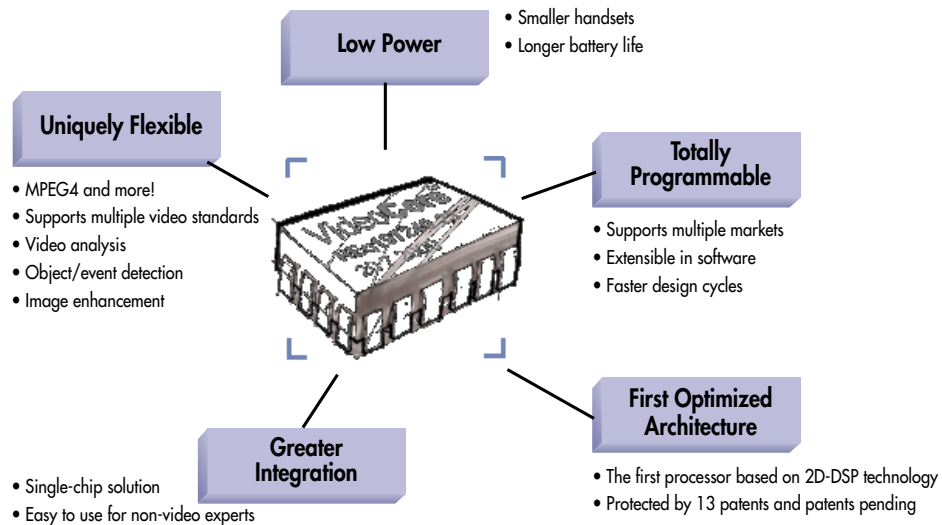
Although Alphamosaic had an internally developed tool chain, they wanted to partner with a company with complementary technology that would allow them to concentrate on their core business. They selected the software development tool suite from ARC International because it has the necessary robustness to meet their exacting needs.

The basic MetaWare® tool set included many of the pieces needed to exercise the video processor; a compiler, assembler, linker, run-time libraries,

debugger, and instruction-set simulator. Then design teams from both companies got together to customize these tools for the VideoCore.

"The MetaWare tool chain from ARC International, with its ability to simulate all the peripherals, makes the design cycle much easier," said Robert Swann, Vice President of Alphamosaic. "Normally a designer would have to do this in hardware and spend days or even weeks debugging. Designers can simulate really complex processes in software with the MetaDeveloper tool chain and speed up the process."





The Mobile Video Solution—VideoCore

Support for C-callable intrinsic functions was added to MetaWare’s C compiler to directly access the video instructions of the processor. Thus, developers can exploit the power of VideoCore’s video processor directly from C, without necessarily resorting to assembly-level programming.

ARC ported its compiler and assembler to the VideoCore platform early before the silicon was available. To accommodate design changes in the processor, the assembler, the compiler’s code generator, and the instruction-set simulator employed a table-driven design. The tables were generated automatically from a single instruction-set description. Moreover, the assembler’s test suite is also automatically generated from the description.

Additionally, the MetaWare linker was modified to support VideoCore’s self-relocating executables. This capability permits code to be loaded at arbitrary addresses after it has been built, which simplifies run-time memory management.

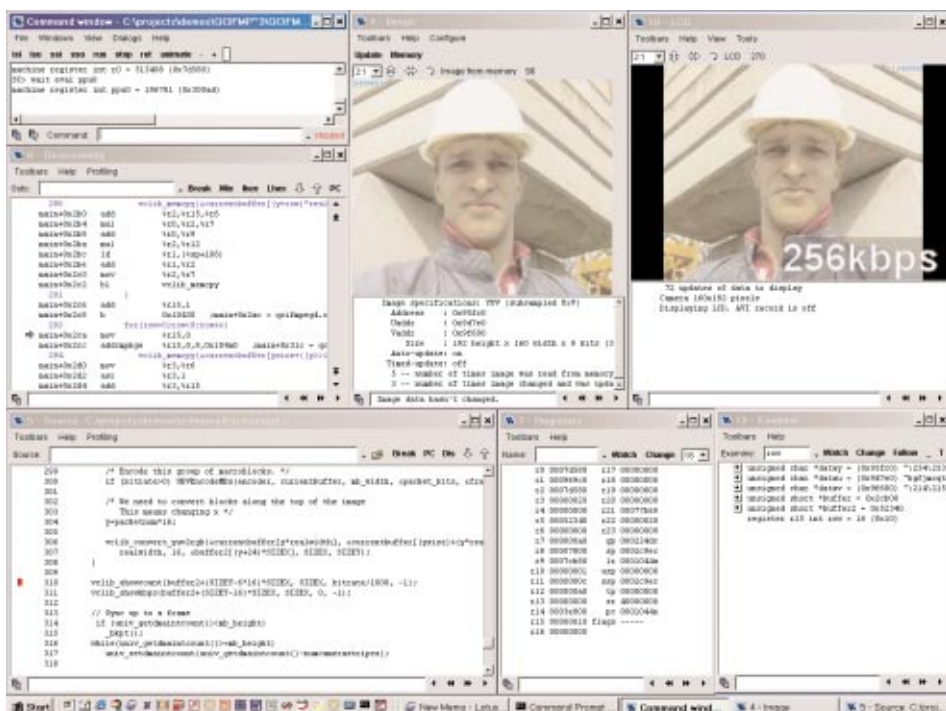
Because ARC’s MetaWare software development suite was designed with flexibility in mind, it was easy to add the video-specific features required by Alphamosaic. A more brute-force implementation would have cost many more man-weeks of development.

ARC provided a robust suite of software development tools that reduced the time it takes to develop software for the VideoCore.

Summary

“Our customers benefit because ARC International’s MetaWare software development tool chain makes their software writing easier. In turn, their customers benefit because they get phones and PDAs, for example, with better features.”

Robert Swann, Vice President, Alphamosaic.





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