



# Fast Footwork

Heeltoe's Notes on the Embedded World

Fall 2008

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## News...

Heeltoe worked on several PowerPC, NIOS and ARM projects in 2008. We wrote a NIOS simulator, brought up a PPC440epx dual CPU design with gigabit Ethernet and helped with an ARM/NIOS video camera design. We also worked on a DO-178B avionics design, adding new functionality and documentation.



ARM JTAG debugger

## Interesting New Hardware:

- AMCC PPC440epx
- Altera NIOS in Cyclone FPGA
- STM32 (cortex m3) arm

## Interesting New Software:

- NIOS simulator
- VISCA camera control protocol
- DO-178B Integrity O/S

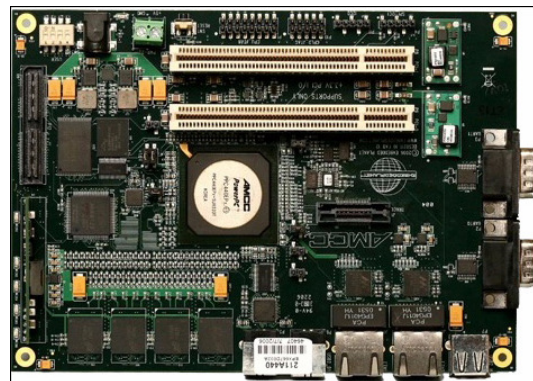
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## What we do...

Heeltoe Consulting provides hardware, software services and consulting for embedded systems. We specialize in

Linux on a variety of platforms and CPUs such as the Motorola PowerPC, Intel ARM, Altera NIOS, MIPS and Intel x86. We also design and develop using small microprocessors such as PIC and Atmel. Many of the designs we work on include a CPLD or FPGA, which require verilog simulation and synthesis experience.

Heeltoe uses flexible design and development teams with an interdisciplinary approach. We can help with any software and hardware design and system level issue.



AMCC PPC440 Evaluation Board

## What does 'Heeltoe' Mean?

The phrase "heel-toe" is a term used in automobile racing. It's a speed technique used to go fast. See our web site (<http://www.heeltoe.com>) for more details.

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## Recent Projects

- *AMCC PPC440EPx dual CPU platform*

We brought up new hardware platform, wrote diagnostics for it and ported the “u-boot” boot loader and the linux kernel. This included a basic file system. Once the kernel booted we debugged the custom fiber optic transceivers for gigabit Ethernet.

- *NIOS generation, verilog simulation, behavioral simulator on linux*

We participated in a Cyclone design which included an NIOS CPU. We helped with the generation of the CPU while writing and debugging all of the firmware. To help verify the firmware we wrote a NIOS-II CPU instruction set simulator and added a behavioral model for the FPGA. This allowed us to simulate the hardware and test the firmware quickly.

- *NIOS Firmware, VISCA protocol, STM32 debugging*

We participated in a Cyclone design which included a NIOS CPU. As before, we used a custom NIOS instruction set simulator to create a behavioral model for the FPGA and test the firmware. In addition some code was written for the Cortex M3 ARM CPU (STM32) which implemented the VISCA camera control protocol.

- *DO-178B avionics design with Integrity operating system*

An extensive software and documentation project for a DO-178B avionics design. We added specific functionality to an existing Integrity design, debugged the functionality and completed all of the DO-178B documentation and testing. The product has since completed FAA certification.

*YOUR PROJECT HERE*

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### Contact Information:

*Embedded Hardware and Software Solutions featuring Linux:*

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