

Introduction to ARM

(Advanced RISC Machine)

By BiPOM Electronics, Inc.
2010

ARM History

- Originally designed in 1983 by UK-based Acorn which eventually became ARM Ltd.
- It started as more powerful replacement to 6502 (found in BBC computers and the Commodore 64)
- As of 2007, 98% of new cell phones sold had an ARM processor
- As of 2009, 90% of all embedded 32-bit processors was an ARM
- Licensed by ARM Ltd. as IP to chip makers such as ATMEL, Freescale, LG, NEC, NXP (former Philips), Samsung, Sharp, ST, Texas Instruments

ARM Versions

- All 32-bit
- ARM7, ARM9, ARM11, Cortex
- What is the difference between ARM7 and ARM9 ?
 - ARM9 has Harvard architecture with separate instruction and data bus
 - ARM9 faster than ARM7
 - ARM9 is more suitable for high-level operating systems
- What is Cortex?
 - Faster, more power efficient
 - Cortex-A for Applications (iPad uses Cortex-A8)
 - Cortex-R for Real-Time
 - Cortex-M for Microcontroller

Upgrade to ARM

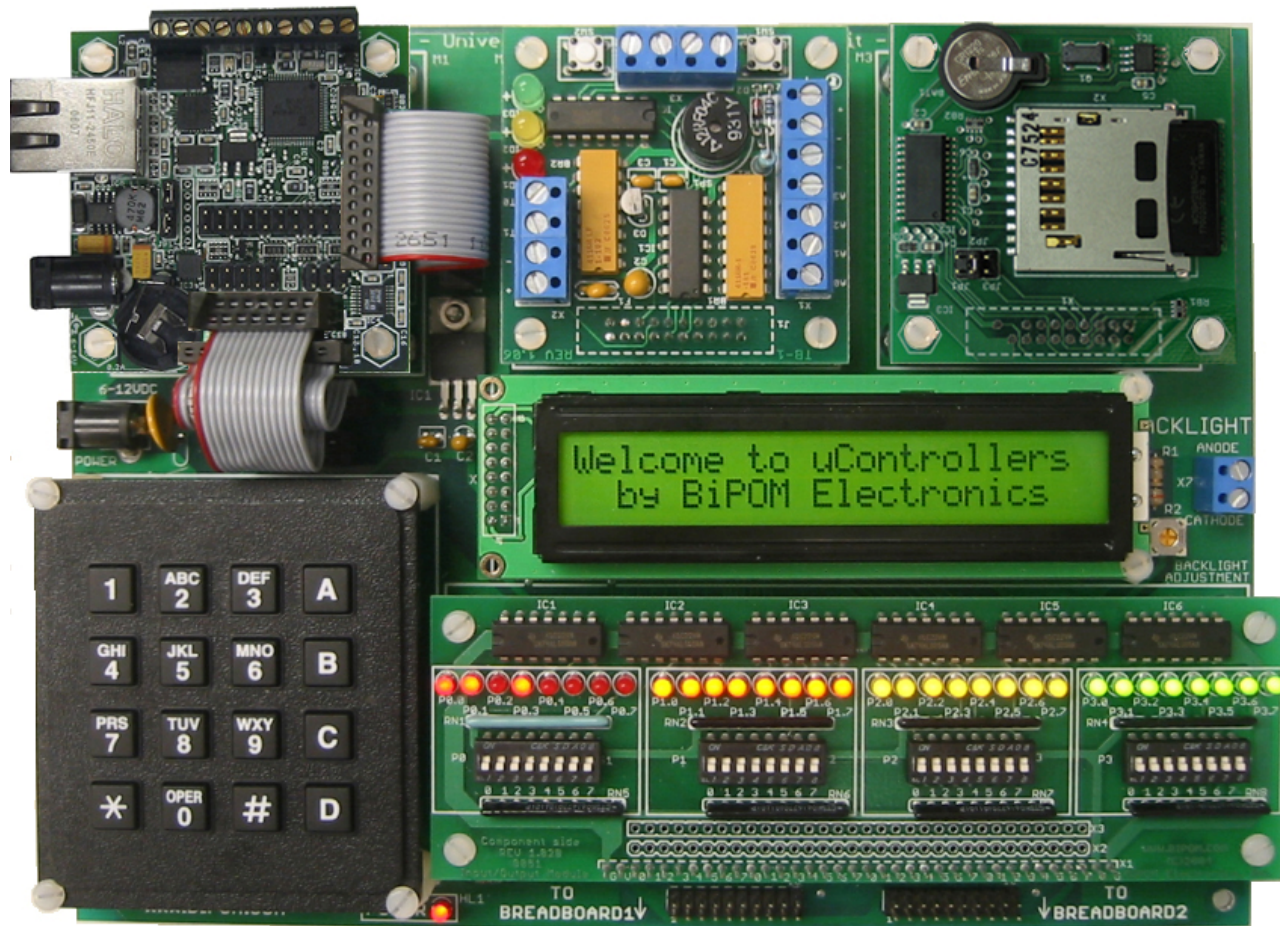
- Why would you use an ARM (versus 8-bit processors such as 8051, AVR and PIC) ?
- Pros:
 - 32-bit performance compared to 8-bit
 - Comparable price
 - Wealth of peripherals
 - Larger memory
 - High level operating system support (Linux, Android, Windows CE)
 - USB host support
 - Advanced development tools
 - Advanced debugging
- Cons:
 - Surface Mount package
 - Low voltage I/O (typically 3.3V or 1.8V)
 - More stringent power requirements

ARM Development Tools

- C compilers: GCC (free from BiPOM), Keil, IAR
- Flowcode for ATMEL ARM7's (AT91SAM7 family)
- Linux tools for ARM9

ARM Development and Training Kits

Customized MicroTRAK platforms



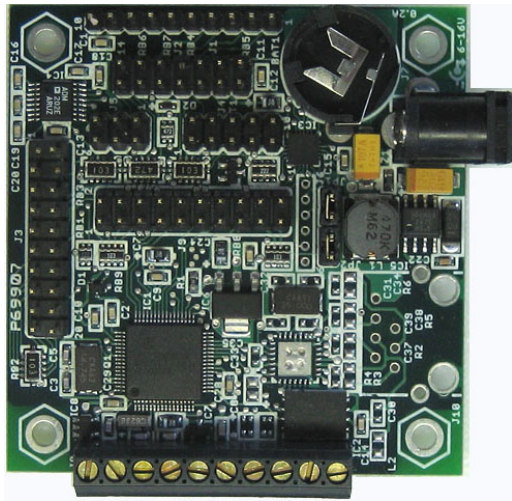
MicroTRAK/ARM-E Complete (shown here) is based on ARM7

Frequently Asked Questions

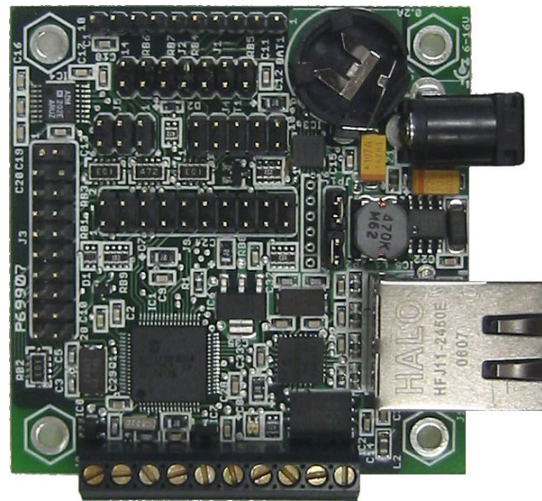
- Why can ARM9 not run Windows ?
 - There are too many ARM variants. Microsoft has to add support. Windows CE (Windows Mobile) runs on ARM.
- What is QEMU ?
 - It is a machine emulator. It allows to run ARM code on a PC and vice versa.
- Does BiPOM offer ARM design services ?
 - Yes, we are a certified ATMEL consultant



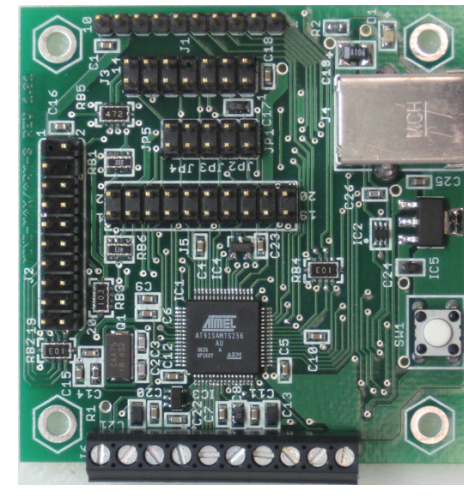
BiPOM ARM7 Support



MINI-MAX/ARM-C
Low power,
Philips LPC2138



MINI-MAX/ARM-E
Ethernet,
Philips LPC2138



MINI-MAX/ARM-S
USB,
ATMEL
AT91SAM7S256

BiPOM ARM7 Support

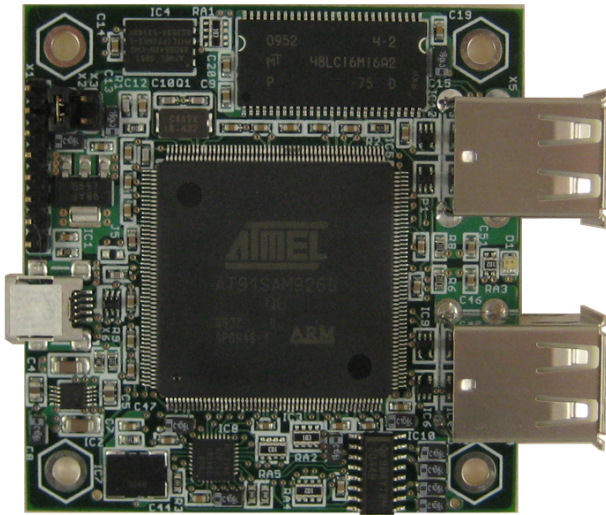
WebCatPlus

Small, Efficient, Flexible Web Server

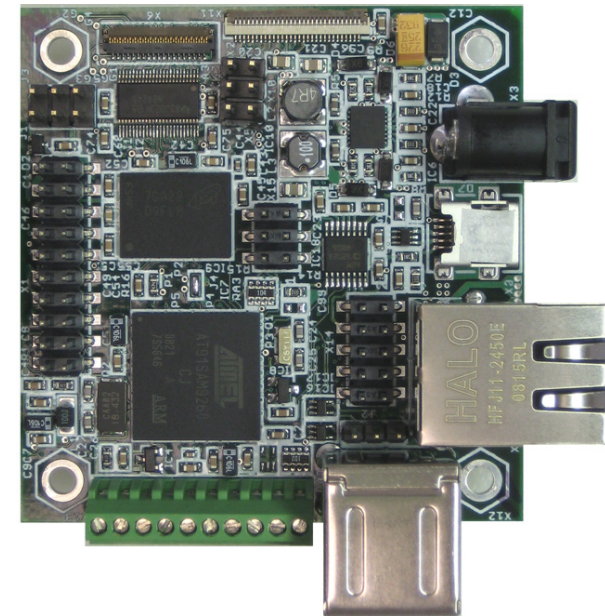
- Based on BiPOM's [MINI-MAX/ARM-E board](#)
- 32-bit ARM7 microcontroller
- Second 8-bit AVR CPU (ATTINY2313, 8 MHz)
- 512KB Flash, 32KB RAM, 1MB DataFlash Expansion
- bus interface to low-cost peripherals
- JTAG programming interface
- LCD connector
- 10Mbit (10Base-T) Ethernet port
- Current consumption 110 mA
- Dimensions: 2.4" x 2.35" x 1.2"
- 31 Digital I/O's
- Two RS-232 Serial port
- I2C (2-wire) bus



BiPOM ARM9 Support



GadgetPC
5 USB ports,
ATMEL AT91SAM9260



MINI-MAX/ARM9260-E
Ethernet, 2 USB ports,
ATMEL AT91SAM9260



Future BiPOM ARM Support

- Robot board with motor controller, Wi-Fi and Webcam using Freescale ARM i.MX53
- WebCatPlus based on Cortex-M3
- Version of GadgetPC with display port