



CYPRESS

iMac Development for the EZ-USB Family

Introduction

Apple Computer's iMac has been receiving great market response since its introduction in August of 1998. The machine won top market share in both the United States and in Japan. With iMac now available in five new colors and the new PowerMac G3 for professional users, should result in a surge in demand for more USB peripheral products. With the iMac architecture being completely dependent on the USB port for peripheral connection (there is no serial or parallel port), USB has shot into the forefront of the consumer market. This presents a new opportunity for your company's USB products. USB peripherals which support both the iMac and the Windows environment will be the eventual winners.

Cypress's EZ-USB microcontroller family provides an ideal environment for supporting the iMac for high-speed peripherals. It is the ONLY USB microcontroller that allows the peripheral developer to utilize different firmware for the iMac platform versus the Windows platform. With this additional flexibility, USB peripheral manufacturers can be assured that operational differences between multiple platforms can be accommodated without constraints on firmware or drivers.

Apple is agnostic with regards to recommendation of chip vendors for USB implementation. However, they are using Cypress's EZ-USB microcontrollers to demonstrate USB programming capability in Apple's Developer Kitchen seminars. These Developer Kitchen programming seminars are designed to help peripheral engineers understand how USB works on the Mac OS platform, so that they can port existing products to the Macintosh.

In the seminars, Apple provides equipment, development environment, and on-the-spot technical support. This is a free event—just send in your USB engineers along with your hardware device and software driver source code, so that they can do programming work during this time. To get more information on schedule and location for these Developer Kitchen seminars, please contact Jai Chulani.

Apple Contacts

The Manager for USB Developer Relations for Apple is Jai Chulani. The following is his contact information.

Jai Chulani
chulani@apple.com
(408) 974-7908

Other contacts at Apple who can provide technical guidance are:

Craig Keithley keithley@apple.com (408) 974-7423
Russ Winsper russw@apple.com (408) 974-5067

iMac Development Environment

The recommended toolset for Macintosh development is "Metrowerks CodeWarrior". Details about this environment can be found at:

<http://www.metrowerks.com>

The CodeWarrior development environment is cross platform; you can use PCs to write Mac drivers. You'll still need to debug on a Macintosh (or iMac), but editing and compiling can be done on a PC.

There are several debugging choices available.

For one, you can use something called "MacsBug", which is a very low level debugger, somewhat similar to SoftICE. MacsBug is available free from Apple. It's hard for a beginning Mac developer to use, and you may want to consider using the "Power Macintosh Debugger".

The other choice, the Power Macintosh Debugger, is a "two machine debugger", in which the host communicates with the target via a serial cable. The nice thing about this is that it supports "source level debugging". You see your source code, and can set break points within the source code. Please be aware that this debugger isn't currently supported by Apple. Also keep in mind out that the iMac does not have a serial port. You'll need to get two older Macintoshes that have serial ports, as well as some USB PCI cards. It's more expensive than using MacsBug, but you may find source level debugging worth the expense. (Note: Used Macintoshes with the serial ports can be bought for US \$500–\$1000, so you may not find it too expensive.)

If you need further guidance on USB driver development on Apple platforms, Apple has a web page at:

<http://usb.apple.com>

Buried within there is another page:

<http://developer.apple.com/hardware/usb/USBDriverTech-note/USBDriversTechnote.html>

The Tech Note page has some additional information which may be of assistance.

If you are developing drivers that interface through a network protocol you should be aware that, although Macs and PCs both do TCP/IP, Macintosh file servers use a different protocol than the PC. You may wish to look into "copstalk", which lets PCs see Mac filesystems. Details can be found at:

<http://www.copstalk.com>

If you'd prefer that the Mac be able to see the PC network, then check out Thursby Software at

<http://www.thursby.com>

EZ-USB Firmware Source Code for the iMac

Apple has developed source code for supporting Cypress's EZ-USB firmware download feature. The sample driver developed by Apple is for the Cypress EZ-USB development board. It's simply an example, which developers will need to modify for their particular implementation. As Cypress devices require two drivers (one to do the download of the firmware, the other actually does the peripheral function), you will not only

need to modify the Cypress example, you'll also need to write your own driver.

The best way to get the source code for this download firmware code is to contact Craig Keithley. His email address is keithley@apple.com. He can send you the file, but to use it you will need to get Aladdin Expander for the PC (available for free at: <http://www.aladdinsys.com>).

If you have questions regarding the driver structure for serial-to-USB conversion please contact Russ Winspo. While they may be able to provide some driver guidance, the peripheral manufacturer will need to generate firmware that corresponds to the driver specifications.

Additional Notes on the iMac

The current operating system version of the iMac, 8.5, only supports USB bulk transfers. Apple is expected to release an operating system upgrade in Q2 1999 which will then support USB isochronous transfers, opening the door for USB video and audio peripherals.