重庆大学本科学生毕业设计（论文）

基于ARM的EPOS操作系统的移植



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**Graduation Design (Thesis) of Chongqing University**

**Transplantation of EPOS operating system based on ARM**



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# **摘 要**

随着开源硬件在嵌入式领域的广泛使用，越来越多基于ARM体系结构的开发板产品也随之诞生，其中比较流行的一款开源硬件—Raspberry PI(树莓派)，其体积仅信用卡大小，搭载ARM架构处理器，运算性能和智能手机相仿。本文将EPOS操作移植到Raspberry PI开发板上。

本文是将X86体系结构下的EPOS操作系统移植到以Broadcom BCM2835 ARMv6 为处理器的开源硬件Raspberry PI B+上，主要是将EPOS由X86系统结构修改成ARM体系结构，大致修改内容包括引导项(Bootloader)、内存管理单元(MMU)、中断处理、系统定时器、多线程的切换以及PI开发板上的UART驱动。

本文实现的功能为：将EPOS操作系统编译后生成kernel.img文件，将kernel.img文件拷贝到FAT文件格式的SD卡中，将SD卡插入Raspberry PI B+卡槽内，开启电源后，通过UART串口向PC机发送一条消息，同时初始化多任务。

关键词：嵌入式， Bootloader，UART，MMU，Raspberry PI B+

# ABSTRACT

With the widely use of the open source hardware in the embedded field, more and more based on ARM architecture development board products emerge, which more popular a open source hardware - Raspberry PI (raspberry pi), the volume of only credit card size, equipped with ARM processor architecture, the computational performance and smart phones similar。In this paper, the EPOS operation is transplanted to the PI Raspberry development board.

In this paper, the x86 architecture of EPOS operating system transplantation by Broadcom BCM2835 armv6 processors of open source hardware raspberry PI B +, mainly is the EPOS by x86 system structure modified to arm architecture, roughly modified content includes a guide (bootloader), memory management unit (MMU), interrupt processing, system timer, multi thread switching and PI development board UART driver.

In this paper, the realization of the function is: EPOS operating system compiler generated after kernel.img file, kernel.img files are copied to the SD card fat file format in, SD card into the raspberry PI B + card slot, after power is turned on, through the UART serial port to the PC sends a message. Meanwhile, the initial of multi task.

**Key words：**Embedded, Bootloader, UART, MMU, Raspberry PI B+