INTRODUCTION

We constructed a Malay language learning kit including:

1. A Malay to English dictionary

2. A Malay hangman game

3. A Malay vocabulary builder for English speakers (learning mode)

The inspiration of the learning kit are:

· there is currently no reasonably priced electronic version of a Malay–English dictionary (this is the **second** electronic Malay–English dictionary in the world, the only other one available costs $180 each)

· from our childhood experience, games make learning language much more fun

· it is a useful project, and one that we can use in our everyday life.

The kit comprises of several components, including a full–blown 48–keys keyboard (alpha–numeric and special keys) and LCD displays. The whole unit is run stand–alone. We tried adding an 2–serial line EEPROM without much success, and as such have limited ourselves with less vocabulary using the available Flash ROM on our microcontroller.

The microcontroller we used is the Atmel AT90S8515 MCU. The LED we used is an Optrex with a built–in Hitachi–compatible controller. The keyboard was made from raw wires and push buttons. The whole unit can be ran stand–alone independent from any computer. With an external oscillator, we can run the dictionary without the STK200 starter kit.