

## Loading Pcode onto the E9 Chip Revision 2

### Introduction

The Pcode loader written by Randy Sargent, a former student at MIT in Course 6.270, only loads the Pcode onto the *Motorola 68HC11 A Series* microcontrollers. This application note illustrates how to load the Pcode onto the *E9* using a custom loader (*icloader.boo*), thus, enabling the use of IC with the *EVBU* board. The process takes two phases. First, change the *CONFIG* register to disable internal EEPROM and ROM (\$0C). This step need only be completed once. (In order to use *BUFFALO*, the *CONFIG* register must be changed back to its original state of \$0F). The second phase involves using a binary talker to load the Pcode.

### Procedure

#### Phase 1: Changing the *CONFIG* register.

The following sequence of operations assumes the user is running *PCBUG11*.

PCBUG OP	Comment
ms \$1035 \$00	Turn EEPROM and <i>CONFIG</i> Protection off
EEPROM \$103F	Define changeable EEPROM range
EEPROM ERASE	Prepare \$103F for writing. (Erase before write)
ms \$103F \$0C	“\$0C” Disable ROM and EEROM in <i>CONFIG</i>

After changing the *CONFIG* register in the last line, *PCBUG11* states *Bad Memory*. This occurs because the *CONFIG* register is implemented as EEPROM but read from a static latch set on reset. If the board is power-cycled, that is, power is turned off and then reapplied, the *CONFIG* location will hold the programmed value. Note that other members of the HC11 will not always report the true *CONFIG* register value when you read form \$103F. This occurs because other chips, the E2 and F1 most notably, automatically turn on their EEPROM via the *EEON* bit in the *CONFIG* register when booting in Bootstrap Mode which is used by *PCBUG11*.

#### Phase 2: Loading and Running IC from a DOS prompt.

You will need the following files in your IC directory:

File	Description
E9.BAT	Batch file to configure COM port and send talker
ICLOADER.BOO	Binary bootstrap talker
PCODERWL.S19	Pcoder for Interactive C

After pressing *RESET* with the board in Bootstrap Mode type “E9 X” where X is the COM port number on the computer.

```
C:\IC> E9 1 <Load IC Pcoder to EVBU board in Bootstrap Mode connected to COM 1>
```

The batch file will eventually display the following messages:

```
RESET BOARD IN EXPANDED MULTIPLEXED TO RUN IC.
```

Once the last message is received, switch the board into Expanded Multiplexed Mode and press *RESET*. You can now run Interactive C by typing “IC”.