

# Motorola Semiconductor Engineering Bulletin

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## EB185

### Simplify MC68HC711E9EPROM Programming with PCbug11 and the M68HC711EPGMR Board

By John Bodnar  
Austin, Texas

#### Introduction

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The PCbug11 software, needed along with the M68HC711EPGMR board to program MC68HC711E9 devices, is available from the download section of the Microcontroller Worldwide Web site [www.mcu.motsps.com](http://www.mcu.motsps.com).

Retrieve the file `pcbug342.exe` (a self-extracting archive) from the MCU11 directory.

**NOTE:** For specific information about any of the PCbug11 commands, see the appropriate sections in the PCbug11 User's Manual (part number M68PCBUG11/D2), which is available from the Motorola Literature Distribution Center, as well as the Worldwide Web at [www.mcu.motsps.com](http://www.mcu.motsps.com). The file is also on the software download system and is called `pcbug11.pdf`.

Some Motorola evaluation board products also are shipped with PCbug11.



## To Execute the Program

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Once you have obtained PCbug11, use this step-by-step procedure to program your MC68HC711E9 part.

### Step 1

- Before applying power to the programmer board, connect the M68HC711E9PGMR serial port P2 to one of your PC COM ports with a standard 25-pin RS-232 cable. Do not use a null modem cable or adapter which swaps the transmit and receive signals between the connectors at each end of the cable.
- Place a blank MC68HC711E9 part in the PLCC socket on your board.
- Insert the part upside down with the notched corner pointing toward the red power LED.
- Make sure both S1 and S2 switches are turned off.
- Apply +5 volts to +5-V, +12 volts (at most +12.5 volts) to  $V_{PP}$ , and ground to GND on your programmer board's power connector, P1. The remaining TXD/PD1 and RXD/PD0 connections are not used in this procedure. They are for gang programming MC68HC711E9 devices, which is discussed in the M68HC711E9PGMR Manual. You cannot gang program with PCbug11.

### Step 2

Apply power to your programmer board by moving the +5-V switch to the ON position. The  $V_{PP}$  switch should be off.

From a DOS command line prompt, start PCbug11 this way:

```
C:\PCBUG11\ > PCBUG11 -E PORT = 1  
with the E9PGMR connected to COM1, or  
C:\PCBUG11\ > PCBUG11 -E PORT = 2  
with the E9PGMR connected to COM2
```

PCbug11 only supports COM ports 1 and 2. If the proper connections are made and you have a high quality cable, you should quickly get a PCbug11 command prompt. If you do receive a Comms fault error,

check your cable and board connections. Most PCbug11 communications problems can be traced to poorly made cables or bad board connections.

**Step 3** PCbug11 defaults to base 10 for its input parameters.

Change this to hexadecimal by typing

```
CONTROL BASE HEX
```

**Step 4** Declare the addresses of the EPROM array to PCbug11.

To do so, type

```
EPROM D000 FFFF
```

**Step 5** You are now ready to download your program into the EPROM. Apply the programming voltage to your part by moving the  $V_{PP}$  switch to the ON position.

At the PCbug11 command prompt, type

```
LOADS C:\MYPROG\ISHERE.S19
```

Substitute the name of your program into the command above. Use a full path name if your program is not located in the same directory as PCbug11.

**Step 6** After the programming operation is complete, PCbug11 displays this message:

```
Total bytes loaded: $xxxx
```

```
Total bytes programmed: $yyyy
```

A pair of these lines will be displayed for each block of code in your S-record file. Or more specifically, each ORG directive in your assembly language source will cause a pair of these lines to be generated. For this operation, \$yyyy will be incremented by the size of each block of code programmed into the EPROM of the MC68HC711E9.

**NOTE:** *PCbug11 will display the above message whether or not the programming operation was successful.*

As a precaution, you should have PCbug11 verify your code.


At the PCbug11 command prompt, type

```
VERF C:\MYPROG\ISHERE.S19.
```

Substitute the name of your program into the command above. Use a full path name if your program is not located in the same directory as PCbug11. If the verify operation fails, a list of addresses which were not programmed correctly is displayed.

Should this occur:

- You probably need to erase your part completely.
  - Allow the MC68HC711E9 windowed part to sit for 45 minutes under an ultraviolet light source.
- Attempt the programming operation again.
  - If you have purchased devices in plastic packages (one-time-programmable parts), you will need to try again with a new, unprogrammed device.

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