

# Motorola Semiconductor Engineering Bulletin

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## EB296

## Programming MC68HC711E9 Devices with PCbug11 and the M68HC11EVBU

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### Introduction

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The PCbug1 software, needed along with the M68HC11EVBU 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.

Some Motorola evaluation board products also are shipped with PCbug11.

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`.



## Programming Procedure

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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 EVBU, remove the jumper from J7 and place it across J3 to ground the MODB pin.
- Place a jumper across J4 to ground the MODA pin. This will force the EVBU into special bootstrap mode on power up.
- Remove the resident MC68HC11E9 MCU from the EVBU.
- Place your MC68HC711E9 in the open socket with the notched corner of the part aligned with the notch on the PLCC socket.
- Connect the EVBU to one of your PC COM ports. Apply +5 volts to  $V_{DD}$  and ground to GND on the power connector of your EVBU.

Also take note of P4 connector pin 18. In step 5, you will connect a +12-volt (at most +12.5 volts) programming voltage through a 100- $\Omega$  current limiting resistor to the XIRQ pin. Do not connect this programming voltage until you are instructed to do so in step 5.

### Step 2

- From a DOS command line prompt, start PCbug11 with
  - C:\PCBUG11\> PCBUG11 –E PORT = 1  
with the EVBU connected to COM1
  - C:\PCBUG11\> PCBUG11 –E PORT = 2  
with the EVBU connected to COM2

PCbug11 only supports COM ports 1 and 2. If you have made the proper connections and 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
- You must declare the addresses of the EPROM array to PCbug11. To do this, type

EPROM D000 FFFF

Step 5

You are now ready to download your program into the EPROM.

- Connect +12 volts (at most +12.5 volts) through a 100-Ω current limiting resistor to P4 connector pin 18, the XIRQ\* pin.
- 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 8

After the programming operation is complete, PCbug11 will display this message

Total bytes loaded: \$xxxx

Total bytes programmed: \$yyyy

- You should now remove the programming voltage from P4 connector pin 18, the XIRQ\* pin.

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.


- 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 did not program correctly is displayed. Should this occur, you probably need to erase your part more completely. To do so, allow the MC68HC711E9 to sit for at least 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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