

**Jonathan Valvano**, valvano@mail.utexas.edu, January 7, 2004

First, you need to install Metrowerks CodeWarrior for HC(S)12. You can go to the Metrowerks web site <http://www.metrowerks.com/MW/download/default.asp> get the CodeWarrior for the 6812 (you can download it or request a CD in the mail). Follow the Metrowerks instructions about downloading, installing and registering the application. Second, you put the 12K learning edition "license.dat" file in your Metrowerks folder. The first few lines look like

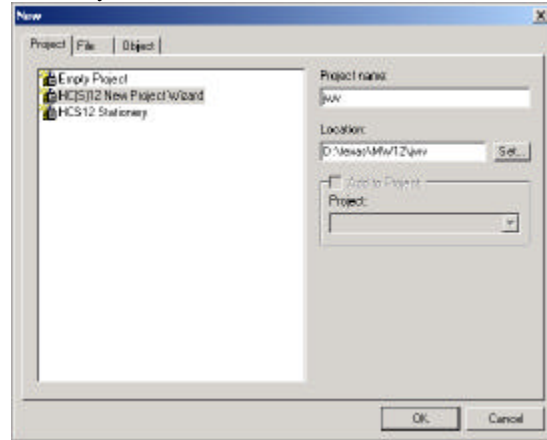
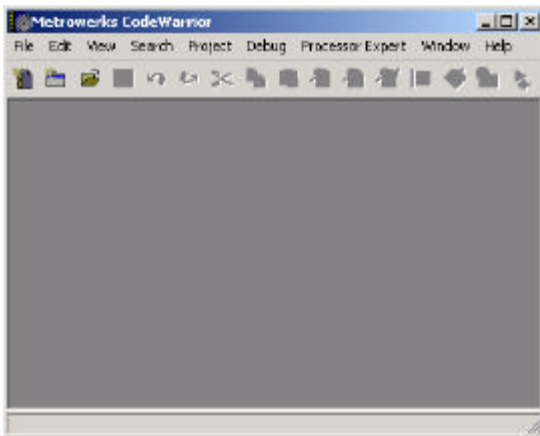
```
FEATURE Win32_CWIDE_Limited metrowerks 5.5 permanent uncounted 2589EF7E8174 HOSTID=ANY
#####
# ( 436): HC12 Special Edition for V3.x
# IDE: learning edition (max 32 files, no subprojects).
# Build/Debug: Unlimited Assembly/Hex/S19. C code up to 12K. ELF/Dwarf object file format.
```

**A) To open an existing Metrowerks project**

- 1) Start Metrowerks CW12 3.0
- 2) Execute File->Open, navigate to an existing \*.mcp file, and click "OK"

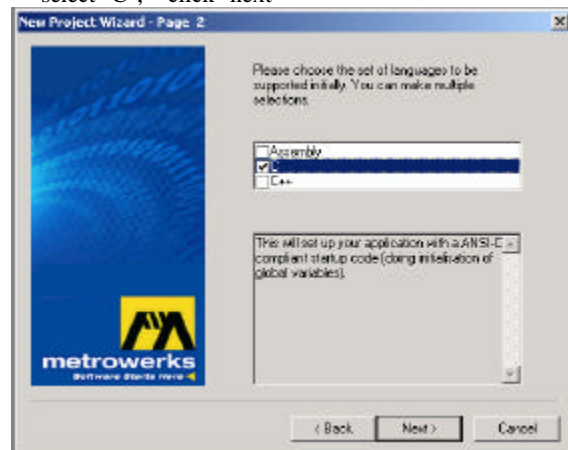
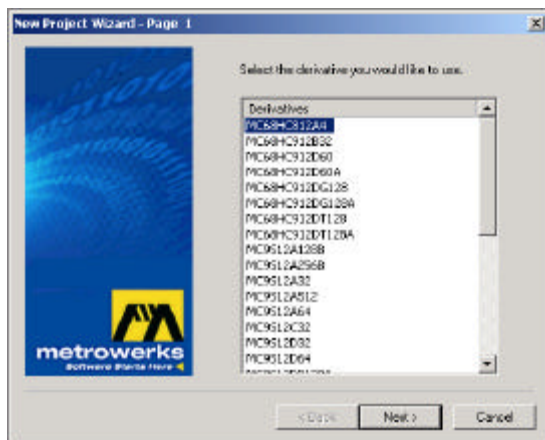
**B) How to create a new Metrowerks project**

- 1) Start Metrowerks CW12 3.0
- 2) Execute File->New, click "Project" Tab select "HC(S)12 New Project Wizard" specify the "Project name" verify its "Location", click "OK"

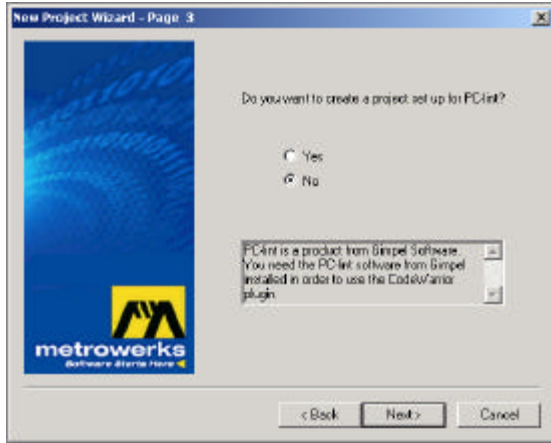


- 3) Select the derivative you want to use "MC68HC812A4", click "next"

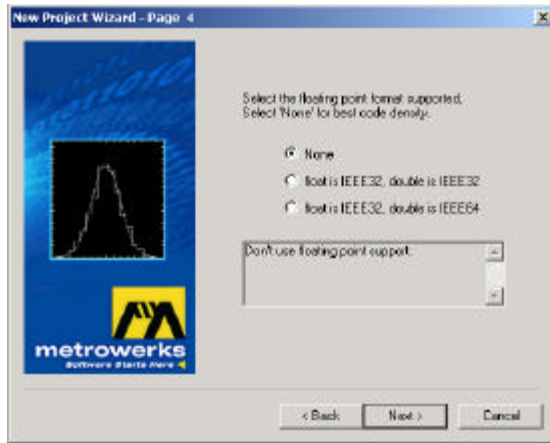
- 4) Choose the set of languages supported select "C", click "next"



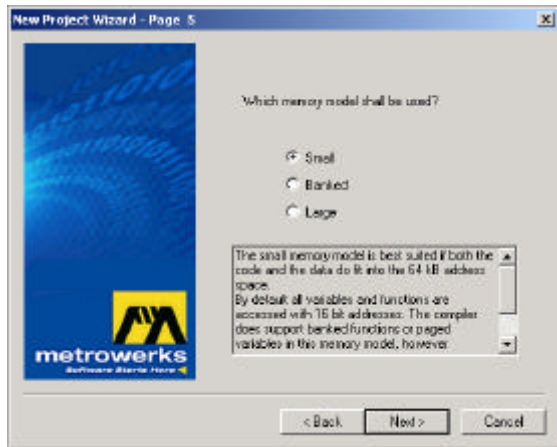
5) Do you want to create a setup for PC-lint select "no", click "next"



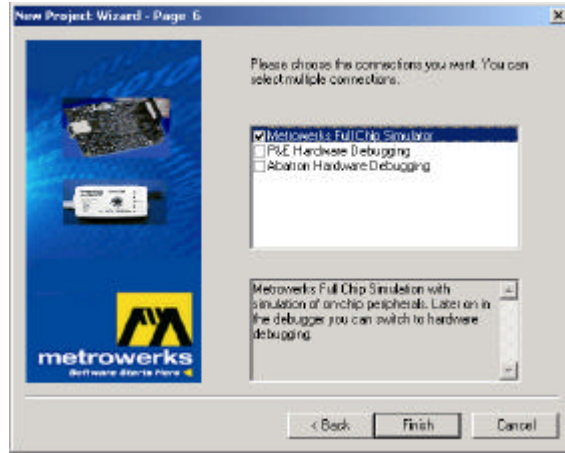
6) Select the floating point format supported select "None", click "next"



7) Which memory model should be used? select "Small" click "next"



8) Please choose the connections you want select "Metrowerks Full Chip simulator" click "Finish"



9) Create or copy program files \*.c and \*.h place them into the "Sources" directory of your project

10) Copy TExaS files from a similar example into the "Bin" directory of your project. The Microcomputer file (\*.UC) is always necessary. The Input/output file (\*.io) is usually needed. The Oscilloscope file (\*.scp) is optional and provides support for a scope or logic analyzer. The Plot file (\*.plt) is optional and provides support stepper motor robot map.

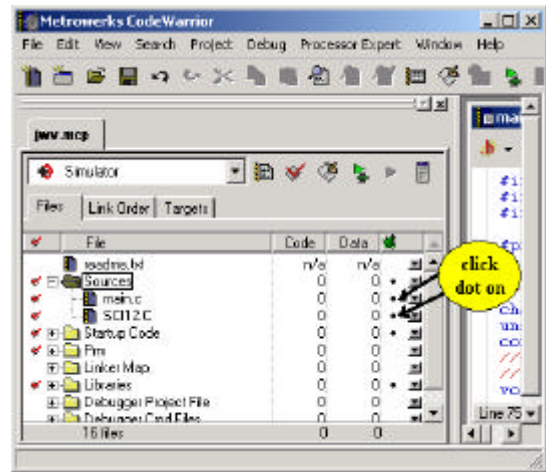
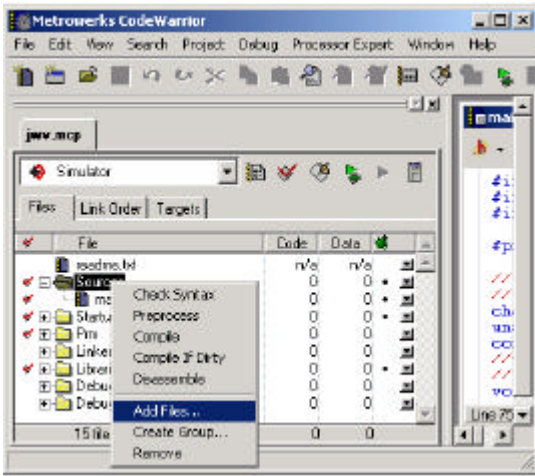
It is best to copy TExaS files from another MW12 example, rename the files, and modify them to suit the needs of the project, rather than to create TExaS files from scratch.

11) Copy these files into the "Bin" directory of your project

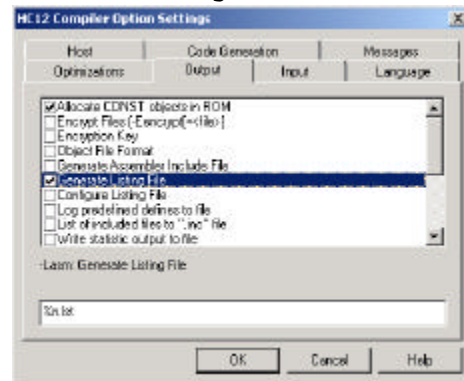
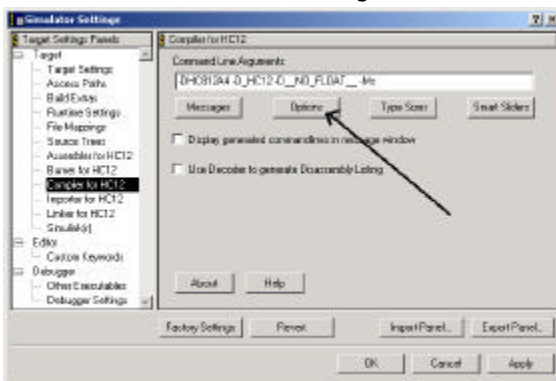
Converter program S19.exe  
Kevin Ross BDM B.Bat dl12.exe

12) Add the necessary C files to project click on Sources in the "mcp" window right click and execute "Add Files..."

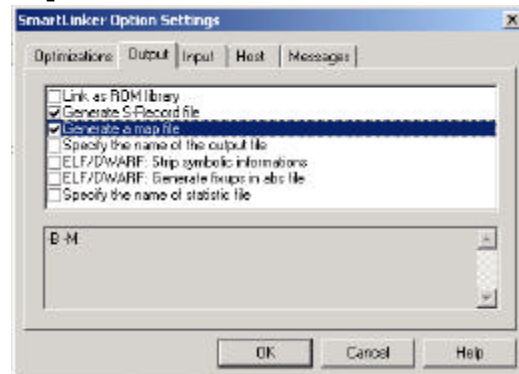
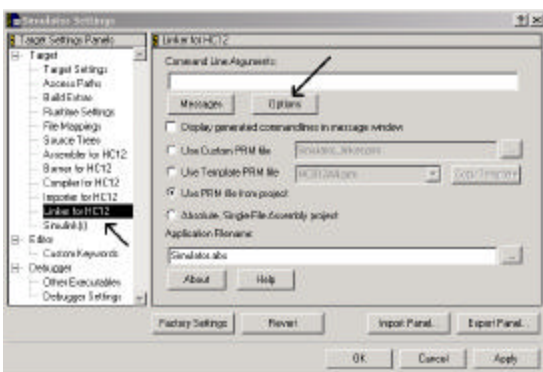
"click dot on" in the field associated all C source files under the "bug" icon



- 13) Change compiler/linker options
- click the right-most toolbar ICON called "Simulator settings"
- click "Compiler for HC12" choice
- click "Options"
- click "Output" tab
- select "Allocate CONST objects in ROM" and "Generate Listing File"



- click "Linker for HC12" choice
- click "Options"
- click "Output" tab
- select "Generate S-Record" and "Generate a map file"



**C) How to simulate Metrowerks-generated code on TExaS**

*Do this once*

1) In TExaS, open the microcomputer file. E.g., "SCI12.UC" file

*For each edit/compile/run cycle*

1) In Metrowerks, perform editing to source code

2) In Metrowerks, compile/Link

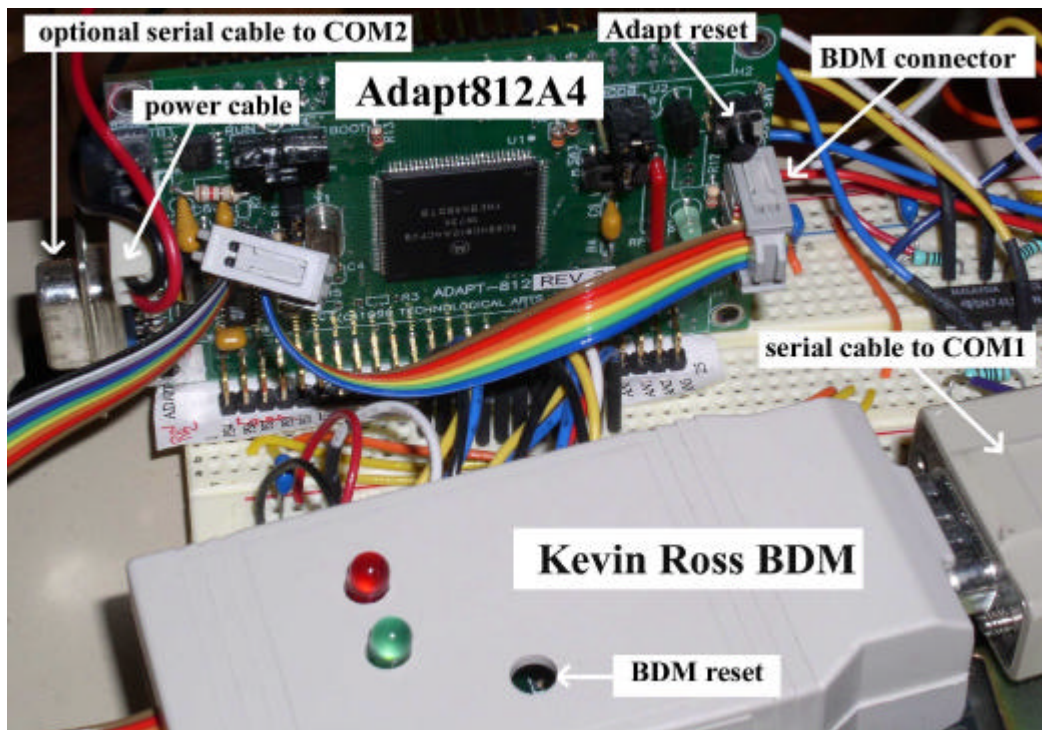
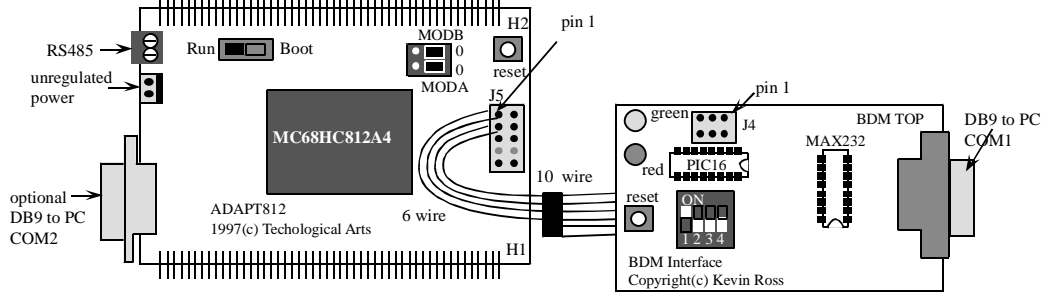
Execute **Project->Make**

3) In TExaS, execute **Action->OpenS19**

select the **simulator.sx** S19 file in your "Bin" directory

4) In TExaS, **Action->Run (F12)**

**D) How to run Metrowerks on the Real Adapt812A4 board**



*Do this once*

1) Connect PC-COM1 to Kevin Ross BDM, (mandatory)

Connect 6-wire Kevin Ross BDM cable to Adapt812A4 BDM, (mandatory)

Notice the direction and orientation of the 6-wire Adapt connection in the figures

Connect PC-COM2 to Adapt812A4, (needed if your software accesses SCI port)

Connect power to Adapt812A4. (mandatory)

The Kevin Ross BDM green light should be on (good). If the Kevin Ross BDM red error light is on (bad), quit Kevin Ross BDM software, turn off the power off to the BDM, check all cables, turn the power back on, and restart the BDM software.

- 2) Execute **B.BAT** (starts Kevin Ross BDM software)
- 3) Execute **STATUS**, verify status is "C0"

***For each edit/compile/run cycle***

- 1) In Metrowerks, perform editing to source code
- 2) In Metrowerks, compile/Link  
Execute **Project->Make**
- 3) Double click **s19.exe** (converts **simulator.sx** into **out.s19**)  
strips off first line, which is a **s0** record that Kevin Ross BDM can't interpret
- 4) In Kevin Ross BDM, execute  
**load out.s19**
- 5) Hit Adapt812A4 reset button

**Kevin Ross BDM commands**

<b>b</b>	break into background mode. This halts the 6812 execution
<b>d</b>	dump memory using last address and size
<b>db 0800</b>	dump a block of 8-bit memory bytes starting at hexadecimal 0x0800
<b>db 0810 081F</b>	dump 8-bit memory bytes from address 0x0810 to 0x081F
<b>dW 0800</b>	dump a block of 16-bit memory words starting at hexadecimal 0x0800
<b>dW 0810 081E</b>	dump 16-bit memory words from address 0x0810 to 0x081E
<b>eb 0800 55</b>	edit byte, change 8-bit memory byte at address 0x0800 to value 0x55
<b>er a 56</b>	edit register A, change register A to value 0x56
<b>er b 78</b>	edit register B, change register B to value 0x78
<b>er cr 40</b>	edit register CCR, change condition codes to value 0x40
<b>er d 1234</b>	edit register D, change register D to value 0x1234
<b>er x 1234</b>	edit register X, change register X to value 0x1234
<b>er y 1234</b>	edit register Y, change register Y to value 0x1234
<b>er sp 0C00</b>	edit register S, change stack pointer to value 0x0c00
<b>er pc F000</b>	edit register PC, change program counter to value 0xF000
<b>ew 0800 1234</b>	edit word, change 16-bit memory word at address 0x0800 to value 0x1234
<b>firm</b>	enable firmware commands
<b>g F000</b>	go, start execution at location 0xF000
<b>help</b>	help, list all BDM commands
<b>load out.s19</b>	erase EEPROM, download S19 files, burn into EEPROM
<b>quit</b>	quit the Kevin Ross BDM software
<b>r</b>	registers, display 6812 registers (6812 must be stopped)
<b>reset</b>	reset 6812 into special mode
<b>status</b>	display 6812 status register, should be C0
<b>t</b>	trace, execute one instruction