

## Demo Day Activities

1) Download the first example from internet (you can try the other two later)

There are some simple examples to begin with

1) This example is a squarewave output on PP7, with the time delay implemented as a loop.

[http://users.ece.utexas.edu/~valvano/Starterfiles/Simple\\_DP512asm.zip](http://users.ece.utexas.edu/~valvano/Starterfiles/Simple_DP512asm.zip)

2) This example is a not gate, with PT7 input, PP7 output

[http://users.ece.utexas.edu/~valvano/Starterfiles/NotGate\\_DP512asm.zip](http://users.ece.utexas.edu/~valvano/Starterfiles/NotGate_DP512asm.zip)

3) Another more complicated example implements a squarewave using the TCNT timer delay

[http://users.ece.utexas.edu/~valvano/Starterfiles/Square\\_DP512asm.zip](http://users.ece.utexas.edu/~valvano/Starterfiles/Square_DP512asm.zip)

2) Cut out sheet of paper

3) Plug board into protoboard, lining the paper up with the pins (see pins 1,25,26,50)

4) Connect RS232 cable between the 9S12 and the PC (this is COM1 in ACA1.106)

5) Switch in LOAD mode

6) Power applied to 9S12 (notice the polarized power plug)



9S12DP512	
1	50
PS4	Gnd
PS5	Gnd
PS6	PS0
PS7	+5
PS1	PE1
PT7	PE0
PT6	Reset*
PT5	PE7
PT4	PH0
PT3	PH1
PT2	PH2
PT1	PH3
PT0	PH4
PP7	PH5
PP6	PH6
PP5	PH7
PP4	PS2
PP3	PE4
PP2	PS3
PP1	VRL
PP0	VRH
PAD0	PAD4
PAD1	PAD5
PAD2	PAD6
PAD3	PAD7
25	26

7) Start TExaS

8) Open the file **SimpleDP512.UC**

9) Place the system in *Simulation* mode, assemble, and run. Observe the Scope and IO.

10) Place the system in *Real 9S12* mode. Is your board connected? The IO and Scope windows can be closed or hidden; they are not needed in *Real 9S12* mode

11) Assemble the program, notice that it also downloads code to 9S12DP512

12) Run the program and notice the lights flash (type **F5** to get a snapshot of execution)

13) Experiment with single stepping features

### Reset

**Single step** until Register Y decrements twice

Notice that **BreakMode** is selected in the **Mode** menu

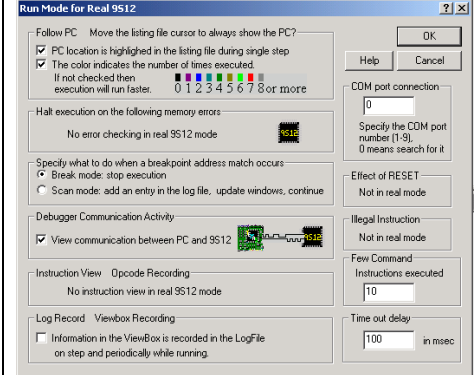
In the list file, first left click on the **eora** instruction, then right click **RuntoCursor**

This **Delay** subroutine takes over 150,000 instructions to execute, so it will not be appropriate to use **StepOver** or **StepOut** commands for this example. However, for most subroutines, the **StepOver** command will single step through, executing the entire subroutine. The **StepOut** command can be used once a subroutine is started to single step through the remaining instructions of the subroutine. (**StepOut** actually executes until the SP gets bigger).

14) Explain the **Mode->RunMode...** settings

Click **Mode** menu, roll mouse over **RunMode...** command and type **F1**

Click the green **Real 9S12** link in the first line

	<ul style="list-style-type: none"> <li>- COM port defines the serial port on the PC COM=0 will search all COM ports for a 9S12 In ACA1.106, COM=0 or COM=1 can be used Some USB to serial links use COM=3</li> <li>- PC location is highlighted and colored Highlighting is good for single step</li> <li>- Breakpoint/Scanpoint mode selection</li> <li>- View communication shows low-level messages</li> <li>- Few Command is F11</li> <li>- Time out delay should be 100 msec</li> </ul>
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15) Experiment with *Breakpoints*

**Reset** (Recall that **BreakMode** is selected in the **Mode** menu)

In the list file, first left click on the **eora** instruction, then right click **BreakatCursor**

**Run** and observe the program halts at or near the **eora** instruction

16) Experiment with *Scanpoints*

**Reset** (Recall that **Breakpoint** is set at the **eora** instruction)

Execute **Mode->BreakMode** and deselect **BreakMode** (this is *Scanpoint* mode)

**Run** and observe the program dumps the ViewBox at or near the **eora** instruction

17) Experiment with *Screen Update Mode*

**Reset**

Remove the breakpoints (click RemoveAll in the Break/Scan box)

Execute **Mode->ScreenUpdatePeriod** and select 1 second updates

**Run** and observe the program dumps the ViewBox every 1 second

**To run in embedded mode**

0) Disconnect power to the 9S12DP512 board

1) Disconnect the serial cable because it is not needed

2) Set the Run/Load switch to Run mode,

3) Apply power to the 9S12DP512 board

The 9S12DP512 runs at 8 MHz if you do not modify the PLL.

You can adjust the E clock rate by configuring the PLL

**Things you can do with the power on**

Hit the reset button

Move the Run/Load switch

Touch/release buttons on the board or protoboard

Connect/disconnect voltmeter to system

Plug and unplug the RS232 cable

**Things you should not do with the power on (the \$115 learning experience)**

Plug/unplug the board into/from the protoboard

Connect/disconnect cables to external devices

Insert/remove wires resistors or chips from the protoboard

Touch bare wires or pins with your fingers