



Objective: Using simple stimulus w/ simulator

- Asynchronous Stimulus
- Pin/Register Action Stimulus

• Open MPLAB IDE

- Double-click MPLAB icon on desktop
- Bring up Lab 1 workspace
 - Select menu item "*File>Open Workspace...*"
 - Choose "c:\masters\11014\Lab1\Lab1.mcw"
 - Select menu "Project>Make" to make the project



- Bring up the Stopwatch window
 - Select menu item "<u>Debugger>Stopwatch</u>"
- Bring up the watch window
 - Select menu item "<u>View>Watch</u>"
 - In the "Add SFR" dropdown box, select PORTA, then click the "Add SFR" button
 - Add TMR0 and PORTB in a similiar manner
- Set the animation speed to 500 ms
 - Select menu item "Debugger>Settings"
 - Choose "Animation/Realtime Update" tab
 - Set Animation step time to 500 msec. Click OK.



Open Stimulus Window: Add Asynchronous Stimulus to T0CKI

- Select "<u>Debugger>Stimulus>New Workbook</u>"
- Click on the last tab that says "Asynch"
- In the grid, add the following 2 stimuli:

Fire	Pin / SFR	Action	Width	Units	Comments / Message
>	RA0	Toggle			
>	ТОСКІ	Pulse High	3	сус	

- Leave the Stimulus window open
- Hint: Do not let Stimulus Window cover Output Window and the editor window



• Test the Asynchronous Stimulus to RA0

- Click "Reset" <a>The debug toolbar
- Click "Animate" **ID** on the toolbar
- Click the "Fire" button for the <u>RA0 stimulus</u> during simulation and see PORTA changes in the watch

Test the Asynchronous Stimulus to T0CKI

- Continue the animation
- Click the "Fire" button for the <u>TOCKI stimulus</u> during simulation, observe change in PORTA and TMR0
- If necessary, fire T0CKI again and observe again
- <u>Question</u>: Can you explain what has happened?
- Click "Halt" <a>Im
 to stop the simulation



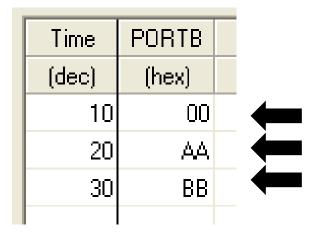
• Add Synchronous Stimulus

- Select the stimulus window
- Select the "Pin/Register Action" tab at the top
- Select "cyc" from the Time Unit dropdown
- Make sure the "Repeat" checkbox is unchecked
- Click on the "Click here to add signals" area on the title bar of the table to bring up "Add/Remove Pin/Register" window
- Scroll to middle of the long list of signals on the left, select PORTB, then click the "Add =>" button to add it to our select list
- Click OK to close "Add/Remove Pin/Register" window



• Add Stimulus data for PORTB

Enter data to the table as shown below



- Click on the "Apply" button at the bottom
- Output window should say: "Synchronous stimulus applied successfully."
- Leave the Stimulus window opened



• Testing the Synchronous Stimulus to PORTB

- Pay attention to stopwatch, output, & watch windows
- − Click "Reset" Ithen "Animate" ▶
- **Question**: Does PORTB changes @ cycle 10, 20, 30?
- Click "Halt"
 to stop the simulation



• "Repeat" stimulus

- We will modify our stimulus slightly
- Go to the "Pin/Register Action" tab (1st tab)
- Check the "Repeat" box
- Enter a "after" value of 10, leave "Restart at" blank
- Click on the "Apply" button (VERY IMPORTANT)
- Testing the "Repeat" stimulus
 - Click "Reset"¹ then "Animate"
 - Watch the stopwatch and watch windows as it runs
 - Take note when PORTB changes (after cycle 30)
 - Click "Halt" I to stop the simulation



• "Repeat" some stimuli

- Have the "Repeat" box checked and after = 10 cycles
- Select 20 from the "Restart at" dropdown box
- Click on the "Apply" button (VERY IMPORTANT)
- Testing the "Repeat" stimulus
 - − Click "Reset" then "Animate" ▶
 - Watch the stopwatch and watch windows as it runs
 - Take note when PORTB changes (after cycle 30)
 - PORTB should change like 00 AA BB AA BB
 - Click "Halt" I to stop the simulation



• Close Workspace

- Select "<u>File>Close Workspace</u>"
- Save everything if being asked