



Assignment #1

Due date: _____

Communicating with the BOE-BOT

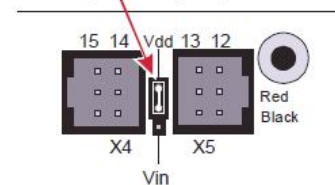
Reading Assignment:

1. Refer to the following sections in Robotics Version 2.2 (instructor's webpage or online at www.parallax.com)
 - a. Chapter 1, Activity 3 – Setting Up the Hardware and Testing the System (pp 13 - 22)
 - b. Chapter 1, Activity 4 – Your First Program (pp 22 - 30)
 - c. Chapter 2, Activity 2 – Tracking Time and Repeating Actions With a Circuit (pp 45 – 58)
2. Refer to various sections of BASIC Stamp Syntax and Reference Manual, Version 2.1 for information of PBASIC commands (instructor handout or available online at www.parallax.com)

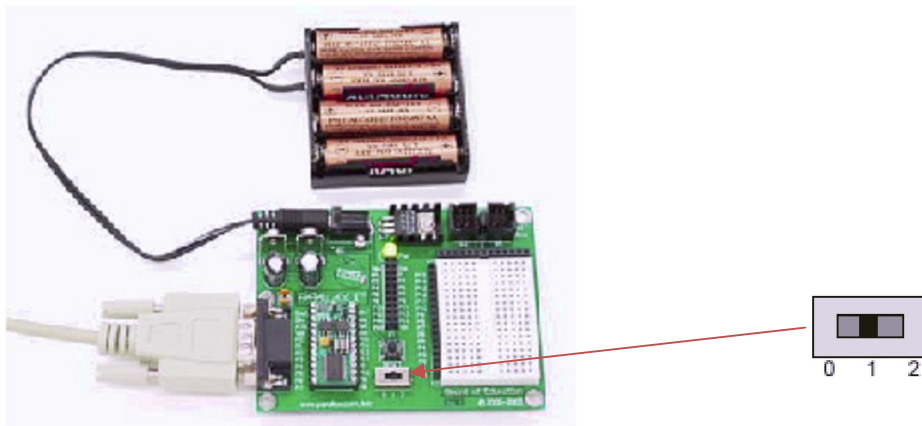
Work Assignment:

- 1) Setting Up the Hardware and Testing the System
 - A) Obtain a BOE-BOT from the instructor. Record the number on the BOE-BOT box. Include this number on the title page of all reports involving the BOE-BOT. Be sure that you use the same BOEBOT each class.
 - B) Use care when handling the BOE-BOT board!**
 - C) Connect the serial cable from the computer to the BOE-BOT board.

Select Vdd if you are using a DC supply that plugs into an AC outlet (AC adapter).



- D) Ensure Vdd jumper pin is correct, see page 60 – 61 of manual
- E) Connect the power source transformer to the BOE-BOT (disconnect this at the end of the class.)



- F) Turn the BOE on (move the slide switch to position 1 or 2).
- G) Launch the BASIC Stamp Editor.
- H) Select **Run – Identify** from the main menu in the BASIC Stamp Editor. A window like the one shown below should indicate that a BASIC Stamp 2 was found on COM1 on your computer. Check with the instructor if this does not work properly.

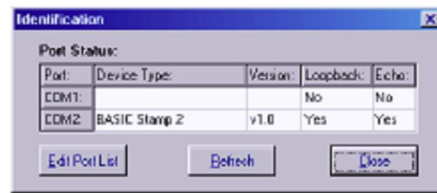


Figure 1-33
Identification
Window

Example: BASIC Stamp 2 found on COM2.

2) Your First Program

A) Program 2A – Sending a message from the BOE-BOT to the computer screen

- Launch the BASIC Stamp Editor.
- Insert directives in your program:
 1. Specifying a **BASIC 2** Stamp
 2. Specifying **PBASIC 2.5** as the programming language
 3. Specifying **COM1** as the communications port
- Write a program similar to the one shown on p. 25 of Robotics, Version 2.2 (shown below) except make the following changes:

```
' Robotics with the Boe-Bot - HelloBoeBot.bs2
' BASIC Stamp sends a text message to your PC/laptop.

' {$STAMP BS2}
' {$PBASIC 2.5}

DEBUG "Hello, this is a message from your Boe-Bot."

END
```

- Include comments specifying:
 1. course code and subject title
 2. team number
 3. BOE-BOT number
 4. the program number (Program 2A, etc)
 5. the filename (last initial-first name-related project) Example: b-joe-boebot-2a.bs2
- Change the greeting to “Hello Group N, this is a message from BOE-BOT M”, where N is your group number and M is your bot #.
- Run the program and verify that it works properly.
- Demonstrate proper operation of the program to the instructor.
- Save the appropriate file name.bs2 and text file for handing in.

B) Program 2B – Sending the result of a calculation from the BOE-BOT to the computer screen

- Make additions to Program 2A above like those on p. 29 of Robotics, Version 2.2 (shown below)
 - Run the program and verify that it works properly.
 - Demonstrate proper operation of the program to the instructor.
 - Save the appropriate file name.bs2 and text file for handing in.

```
' Robotics with the Boe-Bot - HelloBoeBotYourTurn.bs2
' BASIC Stamp does simple math, and sends the results
' to the Debug Terminal.

' {$STAMP BS2}
' {$PBASIC 2.5}

DEBUG "Hello, this is a message from your Boe-Bot."
DEBUG CR, "What's 7 X 11?"
DEBUG CR, "The answer is: "
DEBUG DEC 7 * 11

END
```



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3) Tracking Time and Repeating Actions With a Circuit

A) Program 3A – Printing a message from the BOE-BOT once per second to the computer screen

- Write a program like the one on p. 43 of Robotics, Version 2.2 (shown below) except:

```
' Robotics with the Boe-Bot - TimedMessages.bs2
' Show how the PAUSE command can be used to display messages at human speeds.

' {$STAMP BS2}
' {$PBASIC 2.5}

DEBUG "Start timer..."

PAUSE 1000
DEBUG CR, "One second elapsed..."

PAUSE 2000
DEBUG CR, "Three seconds elapsed..."

DEBUG CR, "Done."

END
```

- Include initial comments as in previous programs.
- Add additional comments to explain different PBASIC commands that are used
- Modify the program so that it displays:

Start timer ...
One second elapsed ...
Two seconds elapsed ...
.
.
Ten seconds elapsed ...
Done

- Run the program and verify that it works properly.
- Demonstrate proper operation of the program to the instructor.
- Save the appropriate file name.bs2 and text file for handing in.

B) Program 3B – Turning ON and OFF an LED

- Write a program like the one on p. 50 of Robotics, Version 2.2 (shown below) except:

```
' Robotics with the Boe-Bot - HighLowLed.bs2
' Turn the LED connected to P13 on/off once every second.

' {$STAMP BS2}
' {$PBASIC 2.5}

DEBUG "The LED connected to Pin 13 is blinking!"

DO
HIGH 13
PAUSE 500
LOW 13
PAUSE 500
LOOP
```

- Include initial comments as in previous programs.
- Add additional comments to explain different PBASIC commands that are used
- Use the output pin corresponding to your group number.
- Run the program and verify that it works properly.
- Demonstrate proper operation of the program to the instructor.
- Save the appropriate file name.bs2 and text file for handing in.



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C) Program 3C – Turning ON and OFF two LEDs (alternating)

- Write a program like the second one on p. 53 of Robotics, Version 2.2 (shown below) except:

```
DO
  HIGH 12
  HIGH 13
  PAUSE 500
  LOW 12
  LOW 13
  PAUSE 500
LOOP
```

- Include initial comments as in previous programs.
 - Add additional comments to explain different PBASIC commands that are used
 - Use the output pin corresponding to your group number and the next higher pin.
 - Modify the program so that the first LED is on for two seconds while the second LED is off and then the second LED is on for two seconds while the first is off (i.e., the LED's alternate blinking indefinitely).
 - Run the program and verify that it works properly.
 - Demonstrate proper operation of the program to the instructor.
 - Save the appropriate file name.bs2 and text file for handing in.
- ## D) Program 3D – Simulating a traffic light using red, yellow, and green LEDs

- Write a program to control green, yellow, and red LEDs like a traffic signal. The green light should come on for 10 seconds, followed by the yellow for 1 second, and then the red for 7 seconds. The program should loop indefinitely.
- Include initial comments as in previous programs.
- Add additional comments to explain different PBASIC commands that are used
- Use any three output pins.
- Run the program and verify that it works properly.
- Demonstrate proper operation of the program to the instructor and Save the appropriate file name.bs2 and text file for handing in.

E) Program 3E – Turning ON and OFF an LED using the PULSOUT command

- Write a program like the second one on p. 55 of Robotics, Version 2.2 (shown below) except:

```
' Robotics with the Boe-Bot - PulseP13Led.bs2
' Send a 0.13 second pulse to the LED circuit connected to P13 every 2 s

' {$STAMP BS2}
' {$PBASIC 2.5}

DEBUG "Program Running!"

DO
  PULSOUT 13, 65000
  PAUSE 2000
LOOP
```

- Include initial comments as in previous programs.
- Add additional comments to explain different PBASIC commands that are used
- Use the output corresponding to your group number.
- The program should turn on the LED for 0.1 seconds and turn it off for N seconds, where N is your group number. The program should loop indefinitely.
- Run the program and verify that it works properly.
- Demonstrate proper operation of the program to the instructor and save the appropriate file name.bs2 and text file for handing in.



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Name _____

Report for Assignment Work Task #1

Organize your results into a report and submit a single report for the instructor by the assigned due date. The report should consist of:

- A **title page** with information as listed below.
- Your Name:
- Date:
- Due Date:
- Course code: TEJ201
- Course Name: Computer Technology - Robotics
- Assignment #1
- Group #N (your group number)
- Group Names

Demonstration of Programs

Program	Successfully Demonstrated
2A	
2B	
3A	
3B	
3C	
3D	
3E	

Below here, show your programs separated by a dashed ruler.