



Clinton Bolinger  
cbolinger@gmail.com  
810.394.3273

## Grand Blanc High School Robotics Team 2015 Programming Deliverable Intermediate Tele-Op Programming Challenge



Brandi Bolinger  
bbolinger@gmail.com  
248.249.1983

Mentors to ask if you have questions about this Challenge: Clinton Bolinger, Robin Barrie or Sean Lynch

*IMPORTANT NOTE: if you will be completing this task in the lunchroom, Team Members are required to sit so ALL laptop screens are visible from the lunchroom entrance.*

### Gather the following Materials:

1. Team Programming laptop with RobotC installed. (or one of the 3 PCs in the back room)
2. Logitech Dual Action Joystick. (These should be located in a box by the deliverables milk crate)

### Prerequisites:

1. Ensure you have completed the beginning level telop programming challenges as this challenge will build upon the work you did within those challenge.

### Challenge Instructions:

1. Connect the Logitech joystick to the laptop or desktop USB port. The joystick will look like the below with or without colored buttons.



2. Open Robot C Robot Virtual Worlds-VEX 4.x
3. Click on "Open File"
4. Navigate to Z:\Students\*your name*\VEX Curriculum\Programming\.
5. Open the "Vex\_Competition\_Includes\_2337\_Beginning\_Telop\_Complete." file you saved at the end of the Intermediate level challenge. We will use this file to complete this challenge.
6. **IMPORTANT!!!!** Save the file as "Vex\_Competition\_Includes\_2337\_Intermediate\_Telop\_Complete"
7. Click on "Download to Robot" to open the Virtual World Curriculum Companion.
8. Log in as guest
9. Select the "ROBOTS" tab and select "VEX Clawbot".
10. Switch to the virtual world Joystick Control window.
11. Validate Logitech Dual Action is chosen as the default joystick. If it is not, use the steps from the beginning auton challenge.

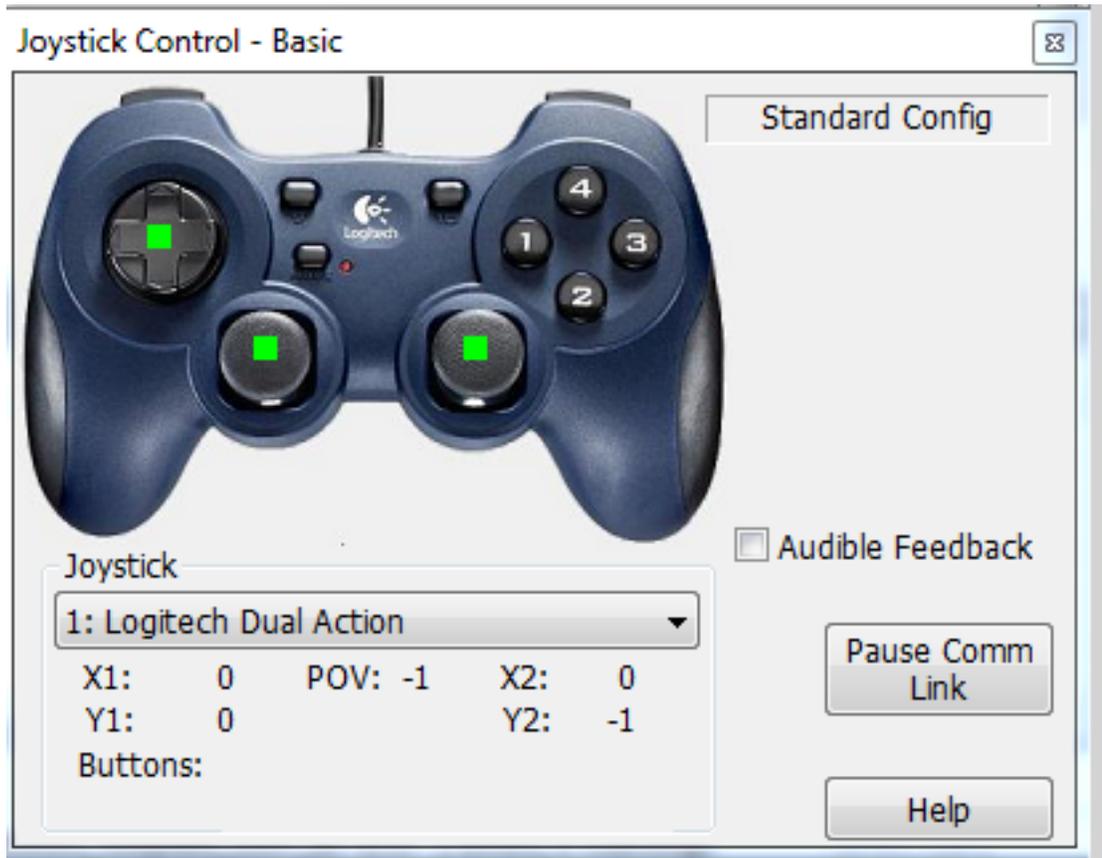


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- If you do not see the Logitech Joystick chosen, click on the drop down menu and choose Refresh to refresh the list. Choose the Logitech if the list is repopulated with that choice. If you still do not see the Logitech as an option troubleshoot the joystick connectivity.
12. Ensure the Auton Code is still commented out from the previous challenge.  
\*/NOTE: This will prevent the autonomous code from making your robot move, but **virtual worlds will still run autonomous mode for 20 seconds.**
  13. Open RobotC and go to Robot->Motors and Sensor Setup and setup the touch sensor and encoders as follows.



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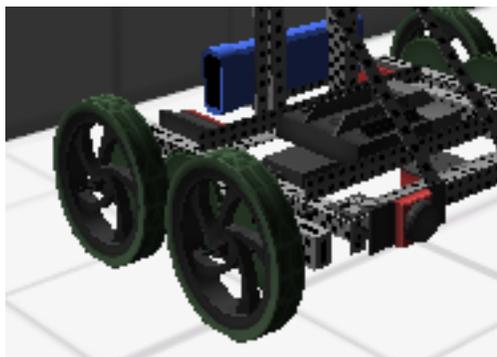
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Standard Models	Serial Ports	Motors	PID Settings	VEX 2.0 Analog Sensors 1-8	VEX Cortex Digital
	Port	Name		Sensor Type	
	dgtl1	rightEncoder		Quadrature Encoder	
	dgtl2			Quad Encoder 2nd Port	
	dgtl3	leftEncoder		Quadrature Encoder	
	dgtl4			Quad Encoder 2nd Port	
	dgtl5			No Sensor	
	dgtl6	touchSensor		Touch	
	dgtl7			No Sensor	
	dgtl8			No Sensor	

14. Program the touch sensor to close the claw when the sensor is activated. You can use the following link for more information on programming the touch sensor. Ensure you are stopping the motor after it is closed so you do not burn out the motor.

[http://www.vexrobotics.com/wiki/Bumper\\_Switch](http://www.vexrobotics.com/wiki/Bumper_Switch)

NOTE: The touch sensor is a red square with a grey button located at the front of the robot as shown in the picture below.



15. You can use the RoboWriter field under Remote Control to test your code by running into the side of the field.

16. Once complete, program the robot to move forward at half speed while the encoders have a value of less than 500 and close the claw at the same time.

NOTE: Make sure you reset the encoders when the robot is initialized.

You can use the following link for more information on configuring the encoders

[http://www.vexrobotics.com/wiki/Optical\\_Shaft\\_Encoder](http://www.vexrobotics.com/wiki/Optical_Shaft_Encoder)



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17. Use the RoboWriter field under Remote Control to test your code. While you are testing, bring up the debugger window for sensors in RobotC Go to Robot->Debugger Windows and choose sensors. Watch the encoder values in the sensor window as you run the program.

### Engineering Notebook Entry Instructions:

Write an entry in your engineering notebook, USE COMPLETE SENTENCES:

1. While you are working, detail your observations and document your process
2. Document the programming variables for each of the joystick buttons and joysticks. You can use the Joystick Control window to determine the variables.
  1. Tip: You may want to print or download a picture of the VEX joysticks on the Internet and note the programming variables on the picture.
3. Answer the following questions:
4. What problems or frustrations did you encounter while trying to write and/or deploy your code?
  1. Did you enjoy this programming task? Why or why not?
  - 2.
  3. What did you notice about the value of the encoders when the robot stopped?
  4. Did you encounter any issues in resetting the encoder values?
    1. If so, what did you need to do in order to correct the issue?

### To Complete Your Challenge:

1. Print a copy of your code (use the EngiPRINTER), and add it to your Engineering Notebook entry (scissors and glue sticks are available for use while in the conference room),
2. Ensure that your Engineering Notebook entry is complete, and all required questions have been answered,
3. Open the laptop (or PC) you used to write the code, with RobotC visible and running. Ensure that your code has been deployed and is "working",
4. Ask Clinton, Sean, or Robin to approve your Engineering Notebook entry and have your deliverables checklist validated,
5. Put the laptop, charger, and mouse away in the designated backpack, and return the bag to the appropriate bin in the conference room (if used),
6. Put all of the materials and resources back in the designated bin in the conference room,
7. Return this document to the Programming binder, in the green bin, in the conference room.
8. Leave your workspace cleaner than it was when you found it.