Button Control of a Speed Controller

Introduction

The following document is a brief guide to controlling a speed controller or other PWM device with a button instead of a joystick. Joysticks usually control speed controllers and other PWM devices, since joysticks provide linear (not ON/OFF) output and speed controllers provide linear output. The most powerful motors in your kit require Victor 883 speed controllers for safe operation, however, a joystick is not always the best way to control the motors.

Reasons for controlling a speed controller with a button are:

- Not enough joysticks available
- Joystick control would be awkward for the particular application
- The pilot or co-pilot already has their hands full with other joystick controls
- Variable control is not necessary, common when controlling a slow moving mechanism

Changing the Default Software

Changing software in the Robot Controller is not complicated. The Control System Users Manual describes the process in depth. The default code provided by Innovation First already contains all the basic code needed. Many teams only make small additions and changes to the default code. The default code is available at www.innovationfirst.com. It is not necessary to start from scratch!

Convert Button to PWM Code

A simple code addition to the default code in the Robot Controller is all that is needed.

The Robot Controller software interprets button inputs as bits. Example: `p1_sw_trig` is 0 when OFF and 1 when ON.

The Robot Controller uses a byte to control a PWM channel. Example: a byte is a number from 0 to 254. The approximate values for PWM control of a speed controller are:

0 - 36	reverse
37 - 116	proportional reverse
117 - 130	neutral (center ~ 127)
131 - 222	proportional forward
223 - 254	full forward

The following code is an example for using of using `p1_sw_trig, p1_sw_top` (Joystick #1 buttons) to control PWM12. You will need to declare the `PWM12` variable. You will also need to add `PWM12` to the appropriate place in the `Serout` command at the end of the default code.

```
PWM12 = 127 + (p1_sw_trig * 127) – (p1_sw_top * 127)
```

Code additions that effect the PWM channels should be added in the code just before the "`OUTPUT DATA`" section in the default code.