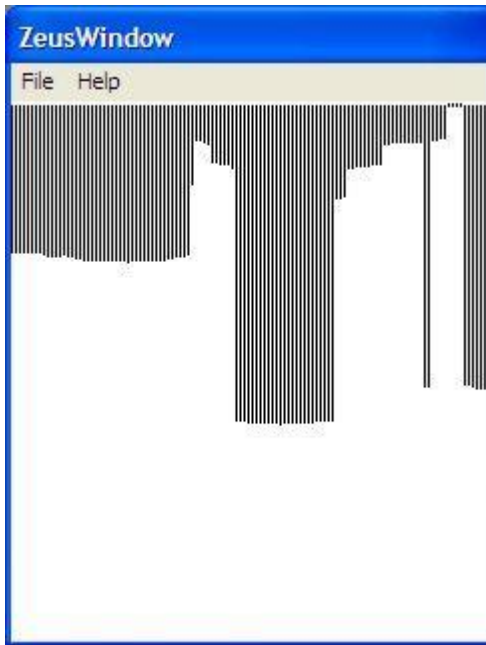


Sonar Scan V1.1



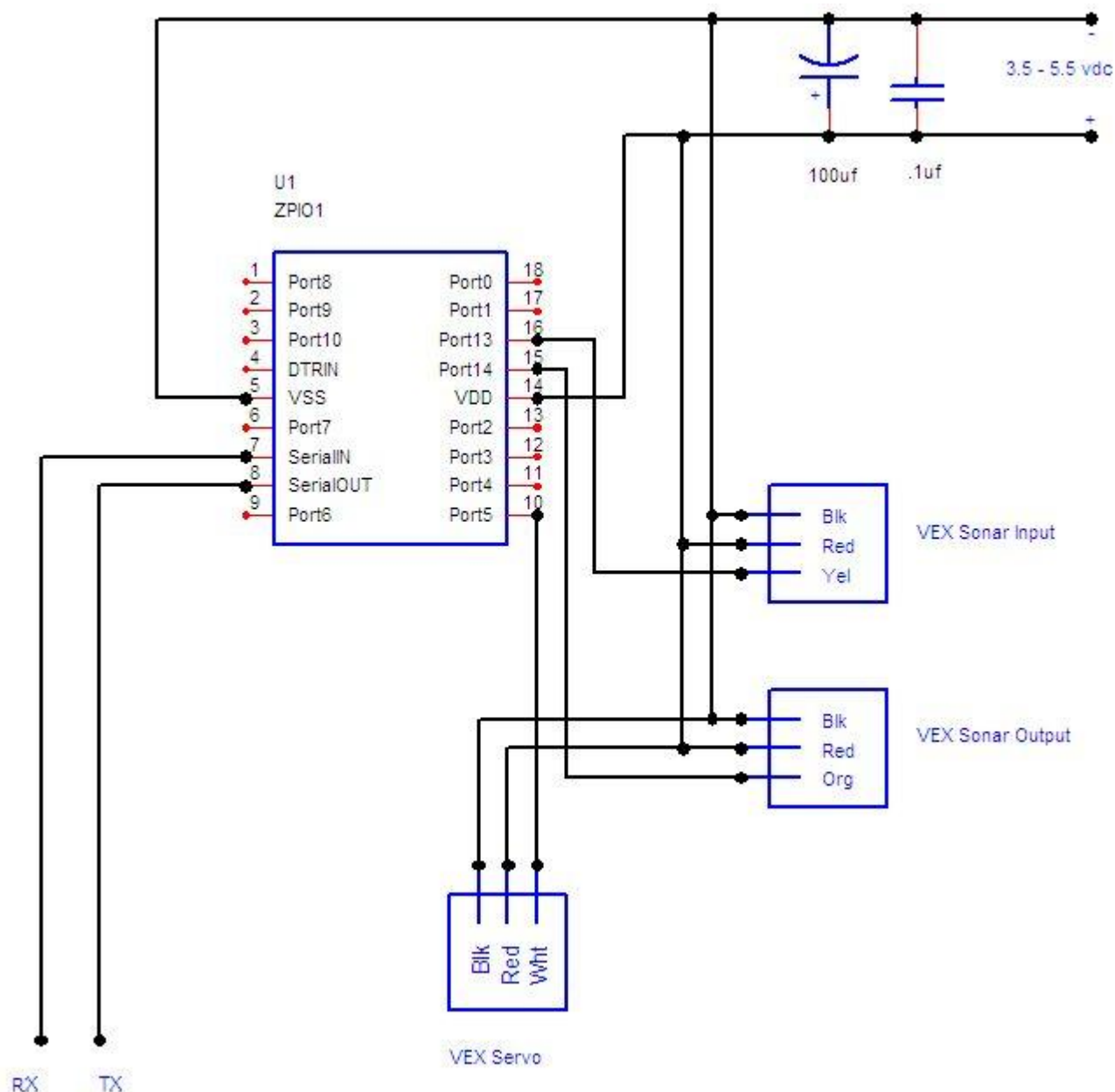
Sonar Scan is a cool little program that allows Zeus to use one of the new ZPIO1 chips. It doesn't do much; it simply rotates a servo and takes sonar readings. The readings are translated into graphic lines to create a shadow of the area.

This project actually began as the Cat Scat project I created to keep our cats off the kitchen table.

The heart of the project is the VEX Sonar sensor and a VEX Servo motor. You will need one of each for this project. You will also need a copy of Zeus Pro. The double-buffered graphics are not supported by other versions of Zeus.

With Zeus Pro you can create both a Pocket PC version and Desktop version of the scanner.

Lets start with the Schematic.



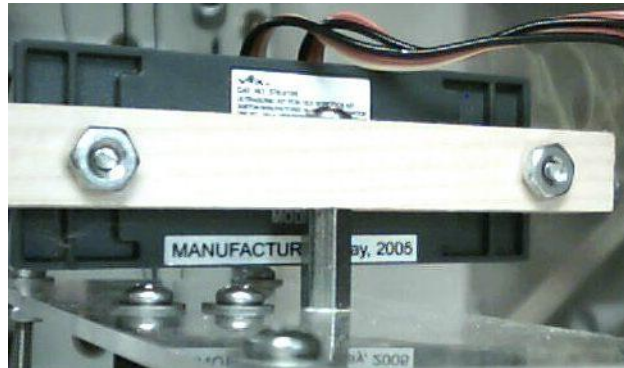
Note that you will need some sort of RS232 driver such as the EZ232 driver if you dont use one of the Workboards. If you find that the VEX servo pulls too much power and resets the ZPIO1 chip you can place a 2 ohm resistor in series with the red lead. This will provide enough power for the servo to operate but will keep it from killing the ZPIO chip.

The ZPIOchips does not provide servo output but it does provide a pulseout command that will work in most situations. The pulseout command is available on ports 2, 3, 4, and 5. We are going to place a servo on port 5 and use the pulseout command to move that servo.

On top of the servo we will place the VEX Sonar sensor.

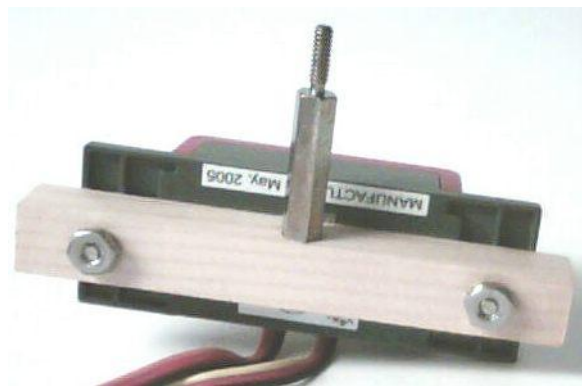
Construction

First I mounted a 1/2 x 1/2 x 3-3/4" piece of pine on to the back of the VEX Sonar Sensor.

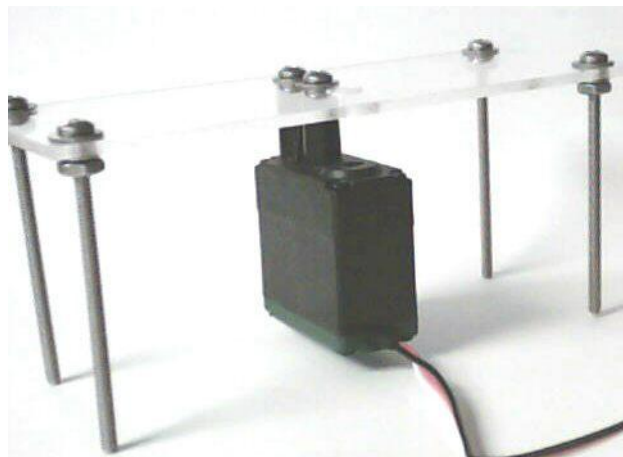


A couple, 3/4" #6 machine screws, lock washers and nuts works fine for this mounting.

A 1" #6 standoff needs to be attached to the center of the wood block as shown. The male end will actually be screwed into the VEX Servo.



The servo is mounted to a piece of Lexan with 2, 1/2" #6 machine screws and lock washers. The Lexan is supported with 4, 2-1/2" #6 machine screws with lock washers and nuts.



You will need to drill a hole in the lexan large enough for the standoff.



Program

'VEX Sonar Scan
'Note that this program requires Zeus Pro and ZPI O1

```
func main()  
  const ServoPort 5  
  dim x as integer  
  dim Ping as integer  
  dim t(300) as integer  
  dim Cal as integer  
  Cal = 0  
  
  ZPI nitInterface(1,8)  
  ZPI nitSonar()  
  ZPPortOutput(ServoPort)  
  ZPPortLow(servoPort)  
  FormUpdateAutoOff()
```

Loop:

```
  FormCls()  
  For x = 80 to 200 step 1  
    pause(20)  
    Ping = ZPPingSonar()  
    PlotPing(x,Ping)  
    ZPPulseout(ServoPort,x)  
  next  
  
  FormCls()
```

```

For x = 200 to 80 step -1
  pause(20)
  Ping = ZPPingSonar()
  PlotPing(x,Ping)
  ZPPulseout(ServoPort,x)
next

goto Loop

endfunc

func PlotPing(x,Ping)
  dim NX as integer
  dim NY as integer
  NX = 240 - ((x-80) * 2)
  NY = Ping/10

  FormLine(NX,1,NX,268-NY)
  FormUpdate()

  'print NX,NY
endfunc

include "+Lib\ZPI O1.Lib"

```

The program may look complicated but it is actually quite simple. It simply advances the servo then takes a reading from the sensor.

Final Thoughts

The VEX Sonar sensor is slow and needs at least a 20ms delay between calls or it will fail.