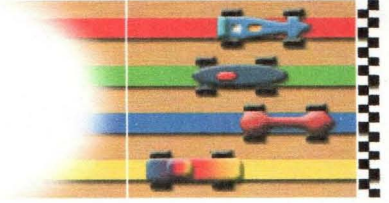


GrandPrix Race Central



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Solenoid Activated Start Gate

The goal of any race should be to make the race as fair as possible, which means removing as much of the "human" factor as possible. Using a solenoid activated starting gate will help ensure that the start gate is released the exact same way every time and is only activated when your computer operator and/or finish line judges are ready.

Plans

Follow the link to a website that has simple plans for a [solenoid activated starting gate](#). Most of the parts come from the corner Radio Shack.

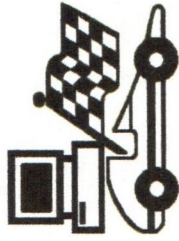
Solenoid Activation

Once you have your system built, you can activate the solenoid in a couple of different ways:

- **Manual Switch** - You can wire a switch so the solenoid can be activated manually. However, if you go through all the trouble to build this system, you might as well take it the next step and control it by software, but you may want to have a switch for testing purposes.
- **Software** - You can use your solenoid activated starting gate with the [GrandPrix Race Manager](#) software, as long as it is wired to a serial port connector on pin from 4 or 7 (of a 9 pin connector), with pin 5 as ground.

Construction Notes

- **Remove Capacitor C2** - It is possible to remove this capacitor, if you use the [GrandPrix Race Manager](#) software, since the software will keep the solenoid from immediately springing back (spring back type solenoids only). If you do not use this software, you may need C2, to keep the solenoid triggered long enough for the start gate to properly release.
- **Finding a Solenoid** - You may have difficulty finding a Solenoid, since Grainger doesn't seem to want to sell to the general public. An alternative is Part# 24F886 from Newark. You can order at the previously mentioned phone number or website.



Obsolescent, applies to Rev 3.xx and 4.xx only

Note: SuperTimer II ALREADY INCLUDES a pre-wired solenoid start system!

Techie Corner:

Hi! We don't understand why our web logs show that this is an enormously popular destination, especially with Australians! If you have a moment, please let us know. Do you have a Pinewood Derby equivalent? Please reply to webmaster@supertimer.com

Solenoid Activated Start Gate Schematic

The software senses the S or G and sets serial COM2 Data Terminal Ready (DTR) to TRUE (from about -12 volts to about +12 volts). This signal will not supply any appreciable load, but it can be amplified to trigger a solenoid.

Be sure the electronic components are all near the solenoid with minimum practical lead lengths. The wire pair (DTR and Ground) to the computer can be nearly anything. COM2 can be a 25-pin or 9-pin connector depending on the computer, so be sure you buy the right part for your computer and wire to the right pins. COM1 is not used because many systems have a mouse or modem on COM1.

If you wish, this can be modified to have the racers start the race once the computer is ready. Simple momentary pushbutton switches placed in series between the computer and D5 will do the trick. For example, the computer operator pushes S or G as soon as the race screen appears, the start supervisor pushes and holds his/her switch when the cars are ready, then the racer in Lane 1 pushes his switch to start the race!

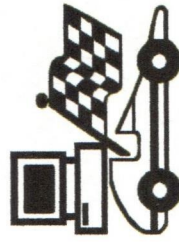
This information is provided as a service to our users who have requested it. We do not supply a kit of parts.

Parts List

Component Number	Component Type	Component Value	Vendor	Vendor's Part Number
R1	Resistor	100 K Ohms	Radio Shack	271-1347
C1	Capacitor	220 microFarads	Radio Shack	272-1048
C2	Capacitor	10 microFarads	Radio Shack	272-1013
D1-6	Diode		Radio Shack	276-1102
J1	DB25 Connector		Radio Shack	276-1548
J2	DB9 Connector		Radio Shack	276-1538
Q1	FET	IRF510	Radio Shack	276-2072
S1	Solenoid		Grainger (800)323-0620	2A170
T1	Transformer		Radio Shack	273-1366

Please send all comments to webmaster@supertimer.com

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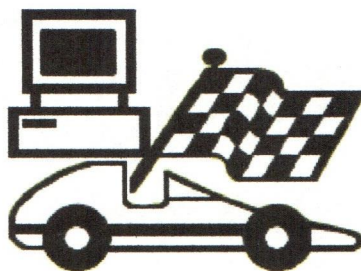
Obsolescent, applies to Rev 3.xx and 4.xx only

Note: SuperTimer II ALREADY INCLUDES a pre-wired solenoid start system!

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Solenoid Activated Start Gate Schematic



Obsolescent, applies to Rev 3.xx and 4.xx only

SuperTimer II includes a solenoid starting system.

Techie Corner:

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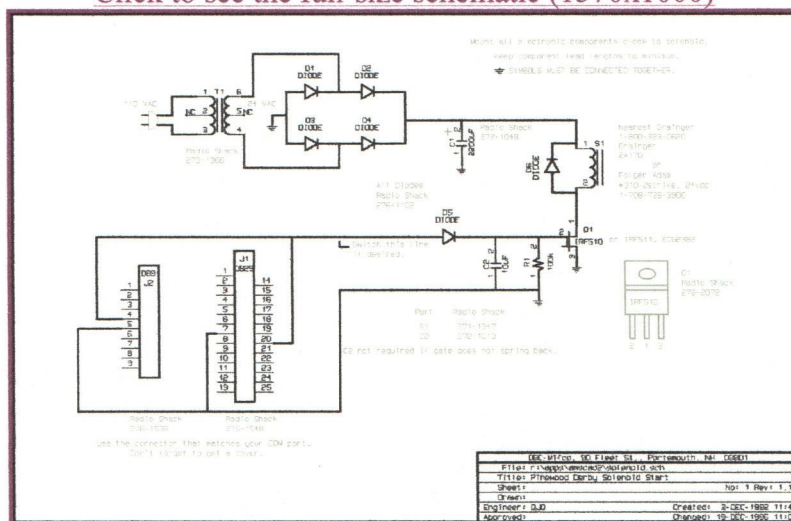
Using a Solenoid Activated Start Gate

(not available at Rev 4.00 or later)

The following does not appear on the screen, but it is implemented in the software and is compatible with manual operation.

You will have to purchase and wire the parts shown in the [schematic](#) or [Parts List](#) and devise the mechanical interface between the solenoid and the starting mechanism.

[Click to see the full-size schematic \(1570x1000\)](#)



When you are in the Ready To Race screen, simply push the letter S or G--for Start or Go (either upper or lower case will work).

Option Explicit

```

Dim MyForm As FRMSIZE
Dim DesignX As Integer
Dim DesignY As Integer
Dim vbGold As Variant
Public intWinner As Integer ' Winner number

```

Private Sub btnTest_Click()

```

Randomize
lblGold.Caption = Left(Str((9 * Rnd) + 1), 6)
lblWhite.Caption = Left(Str((9 * Rnd) + 1), 6)
lblRed.Caption = Left(Str((9 * Rnd) + 1), 6)
lblYellow.Caption = Left(Str((9 * Rnd) + 1), 6)
If (Val(lblGold.Caption) > 2 And Val(lblGold.Caption) < Val(lblBestTime.Caption)) _
    Or lblBestTime.Caption = "0.000" Then
    lblBestTime.Caption = lblGold.Caption
End If

If (Val(lblWhite.Caption) > 2 And Val(lblWhite.Caption) < Val(lblBestTime.Caption)) _
    Or lblBestTime.Caption = "0.000" Then
    lblBestTime.Caption = lblWhite.Caption
End If

If (Val(lblRed.Caption) > 2 And Val(lblRed.Caption) < Val(lblBestTime.Caption)) _
    Or lblBestTime.Caption = "0.000" Then
    lblBestTime.Caption = lblRed.Caption
End If

If (Val(lblYellow.Caption) > 2 And Val(lblYellow.Caption) < Val(lblBestTime.Caption)) _
    Or lblBestTime.Caption = "0.000" Then
    lblBestTime.Caption = lblYellow.Caption
End If
End Sub

```

Private Sub Form_Load()

```

Dim ScaleFactorX As Single, ScaleFactorY As Single ' Scaling factors
' Size of Form in Pixels at design resolution
vbGold = lblGold.ForeColor 'Set Gold color as a variable
intWinner = 0 'Initialize intWinner Value
DesignX = 800
DesignY = 600
RePosForm = True ' Flag for positioning Form
DoResize = False ' Flag for Resize Event
' Set up the screen values
Xtwips = Screen.TwipsPerPixelX
Ytwips = Screen.TwipsPerPixelY
Ypixels = Screen.Height / Ytwips ' Y Pixel Resolution
Xpixels = Screen.Width / Xtwips ' X Pixel Resolution

' Determine scaling factors
ScaleFactorX = (Xpixels / DesignX)
ScaleFactorY = (Ypixels / DesignY)
ScaleMode = 1 ' twips
'Exit Sub ' uncomment to see how Form1 looks without resizing
Resize For Resolution ScaleFactorX, ScaleFactorY, Me
lblGold.Caption = "0.000"
lblWhite.Caption = "0.000"
lblRed.Caption = "0.000"
lblYellow.Caption = "0.000"
'Label1.Caption = "Current resolution is " & Str$(Xpixels) + _
" by " & Str$(Ypixels)
MyForm.Height = Me.Height ' Remember the current size
MyForm.Width = Me.Width

```

```

Dim intFileCount As Integer
Dim intCommPort As Integer ' Variable for retrieval from File
Dim strSettings As String ' Comm settings i.e. 9600 baud, 8, n, 1

```

```

intFileCount = FreeFile() 'Get an available file number
On Error GoTo FileOrPort_Error 'If no port is specified or if specified port or file cant be open
ed
Open "settings.dat" For Input As #intFileCount
Input #intFileCount, intCommPort, strSettings
MSComm1.CommPort = intCommPort
MSComm1.Settings = strSettings
Close #intFileCount
MSComm1.PortOpen = True
frmPack.Show (vbModal)
Exit Sub
FileOrPort_Error:
If Err.Number = 53 Then 'If file can't be found/opened
    MsgBox ("Cannot find current configuratiion file.")
Else
    MsgBox ("Could not open COM" & Trim(Str(MSComm1.CommPort)) & ":")
End If
Close
frmComm.Show (vbModal)

End Sub

Private Sub Form_Resize()
    Dim ScaleFactorX As Single, ScaleFactorY As Single

    If Not DoResize Then ' To avoid infinite loop
        DoResize = True
        Exit Sub
    End If

    RePosForm = False
    ScaleFactorX = Me.Width / MyForm.Width ' How much change?
    ScaleFactorY = Me.Height / MyForm.Height
    Resize_For_Resolution ScaleFactorX, ScaleFactorY, Me
    MyForm.Height = Me.Height ' Remember the current size
    MyForm.Width = Me.Width
End Sub

Private Sub Form_Terminate()
    Close
End
End Sub

Private Sub Form_Unload(Cancel As Integer)
    Close
End
End Sub

Private Sub mnuBufferString_Click()
    If lblString.Visible = False Then
        lblString.Visible = True
    Else
        lblString.Visible = False
    End If
End Sub

Private Sub mnuCommSetup_Click()
    frmComm.Show (vbModal)
End Sub

Private Sub mnuExit_Click()
    If MsgBox("Exit Application?", vbQuestion + vbYesNo, "Exit Application") = vbYes Then End
End Sub

Private Sub mnuNewPack_Click(Index As Integer)
    frmPack.Show (vbModal)
End Sub

Private Sub MSComm1_OnComm()

```

```
MSComm1.RTSEnable = False 'Stop event from firing until this one has cleared
```

```
Static Buffer As String
```

```
'Reset Timer Event and Color Flashing Events
```

```
Timer1.Enabled = False
```

```
lblGold.BackColor = vbBlack
```

```
lblGold.ForeColor = vbGold
```

```
pctGold.Visible = False
```

```
lblRed.BackColor = vbBlack
```

```
lblRed.ForeColor = vbRed
```

```
pctRed.Visible = False
```

```
lblWhite.BackColor = vbBlack
```

```
lblWhite.ForeColor = vbWhite
```

```
pctWhite.Visible = False
```

```
lblYellow.BackColor = vbBlack
```

```
lblYellow.ForeColor = vbYellow
```

```
pctYellow.Visible = False
```

```
' Create 1 second pause to allow serial read to catch up
```

```
Dim i As Long, j As Long
```

```
    i = Timer
```

```
    ' MsgBox i
```

```
    Do
```

```
        j = i - Timer
```

```
        ' MsgBox j
```

```
        If j < 0 Then
```

```
            j = 64000 + j
```

```
        End If
```

```
    Loop Until j > 0
```

```
Buffer = MSComm1.Input
```

```
lblString.Caption = Buffer
```

```
'MsgBox (Buffer)
```

```
If Mid$(Buffer, 1, 1) = "@" Then 'Check for @ symbol first since its not always the first char
```

```
    If Len(Buffer) < 2 Then 'If the race starts and only the @ symbol is issued change times to 0.0
```

```
        If lblGold.Caption <> "0.000" Or lblWhite.Caption <> "0.000" Or lblRed.Caption <> "0.000" _
```

```
        Or lblYellow.Caption <> "0.000" Then
```

```
            lblGoldOld.Caption = lblGold.Caption
```

```
            lblWhiteOld.Caption = lblWhite.Caption
```

```
            lblRedOld.Caption = lblRed.Caption
```

```
            lblYellowOld.Caption = lblYellow.Caption
```

```
            lblGold.Caption = "0.000"
```

```
            lblWhite.Caption = "0.000"
```

```
            lblRed.Caption = "0.000"
```

```
            lblYellow.Caption = "0.000"
```

```
        End If
```

```
Else
```

```
    If Mid$(Buffer, 2, 1) = "A" Then
```

```
        Buffer = Mid$(Buffer, 2, (Len(Buffer) - 1)) 'Clean up string for formatting
```

```
        ' If not all 0s Update Last Race Results
```

```
        If lblGold.Caption <> "0.000" Or lblWhite.Caption <> "0.000" Or lblRed.Caption <> "0.000" _
```

```
        Or lblYellow.Caption <> "0.000" Then
```

```
            lblGoldOld.Caption = lblGold.Caption
```

```
            lblWhiteOld.Caption = lblWhite.Caption
```

```
            lblRedOld.Caption = lblRed.Caption
```

```
            lblYellowOld.Caption = lblYellow.Caption
```

```
        End If
```

```
        lblGold.Caption = Mid$(Buffer, 3, 5) 'Update New Results
```

```
        If Mid$(Buffer, 8, 1) = "!" Then
```

```
            intWinner = 1 'Check for winner symbol
```

```
            If (Val(lblGold.Caption) > 2 And Val(lblGold.Caption) < Val(lblBestTime.Caption)) _
```

```
                Or lblBestTime.Caption = "0.000" Then
```

```
                lblBestTime.Caption = lblGold.Caption
```

```
            End If
```

```
        End If
```

```
        lblWhite.Caption = Mid$(Buffer, 12, 5)
```

```
        If Mid$(Buffer, 17, 1) = "!" Then
```

```
            intWinner = 2 'Check for winner symbol
```

```
            If (Val(lblWhite.Caption) > 2 And Val(lblWhite.Caption) < Val(lblBestTime.Caption)) _
```

```
                Or lblBestTime.Caption = "0.000" Then
```

```

        lblBestTime.Caption = lblWhite.Caption
    End If
End If
lblRed.Caption = Mid$(Buffer, 21, 5)
If Mid$(Buffer, 26, 1) = "!" Then
    intWinner = 3 'Check for winner symbol
    If (Val(lblRed.Caption) > 2 And Val(lblRed.Caption) < Val(lblBestTime.Caption)) _
        Or lblBestTime.Caption = "0.000" Then
        lblBestTime.Caption = lblRed.Caption
    End If
End If
lblYellow.Caption = Mid$(Buffer, 30, 5)
If Mid$(Buffer, 35, 1) = "!" Then
    intWinner = 4 'Check for winner symbol
    If (Val(lblYellow.Caption) > 2 And Val(lblYellow.Caption) < Val(lblBestTime.Caption)) _
        Or lblBestTime.Caption = "0.000" Then
        lblBestTime.Caption = lblYellow.Caption
    End If
End If
Timer1.Enabled = True
End If
Else
    If Mid$(Buffer, 1, 1) = "A" Then ' If no @ symbol check to ensure it is a race string
        If lblGold.Caption <> "0.000" Or lblWhite.Caption <> "0.000" Or lblRed.Caption <> "0.000" _
            Or lblYellow.Caption <> "0.000" Then
            lblGoldOld.Caption = lblGold.Caption
            lblWhiteOld.Caption = lblWhite.Caption
            lblRedOld.Caption = lblRed.Caption
            lblYellowOld.Caption = lblYellow.Caption
        End If
        lblGold.Caption = Mid$(Buffer, 3, 5) 'Update New Results
        If Mid$(Buffer, 8, 1) = "!" Then
            intWinner = 1 'Check for winner symbol
            If (Val(lblGold.Caption) > 2 And Val(lblGold.Caption) < Val(lblBestTime.Caption)) _
                Or lblBestTime.Caption = "0.000" Then
                lblBestTime.Caption = lblGold.Caption
            End If
        End If
        lblWhite.Caption = Mid$(Buffer, 12, 5)
        If Mid$(Buffer, 17, 1) = "!" Then
            intWinner = 2 'Check for winner symbol
            If (Val(lblWhite.Caption) > 2 And Val(lblWhite.Caption) < Val(lblBestTime.Caption)) _
                Or lblBestTime.Caption = "0.000" Then
                lblBestTime.Caption = lblWhite.Caption
            End If
        End If
        lblRed.Caption = Mid$(Buffer, 21, 5)
        If Mid$(Buffer, 26, 1) = "!" Then
            intWinner = 3 'Check for winner symbol
            If (Val(lblRed.Caption) > 2 And Val(lblRed.Caption) < Val(lblBestTime.Caption)) _
                Or lblBestTime.Caption = "0.000" Then
                lblBestTime.Caption = lblRed.Caption
            End If
        End If
        lblYellow.Caption = Mid$(Buffer, 30, 5)
        If Mid$(Buffer, 35, 1) = "!" Then
            intWinner = 4 'Check for winner symbol
            If (Val(lblYellow.Caption) > 2 And Val(lblYellow.Caption) < Val(lblBestTime.Caption)) _
                Or lblBestTime.Caption = "0.000" Then
                lblBestTime.Caption = lblYellow.Caption
            End If
        End If
        Timer1.Enabled = True
    Else
        Buffer = ""
        MSComm1.InBufferCount = 0
    End If
End If
MSComm1.InBufferCount = 0
MSComm1.RTSEnable = True

```

End Sub

Private Sub Timer1_Timer()

 Select Case intWinner

 Case 1 ' Gold Winner

 If lblGold.BackColor = vbBlack Then

 lblGold.BackColor = vbGold

 Else

 lblGold.BackColor = vbBlack

 End If

 If lblGold.ForeColor = vbGold Then

 lblGold.ForeColor = vbBlack

 Else

 lblGold.ForeColor = vbGold

 End If

 If pctGold.Visible = False Then

 pctGold.Visible = True

 Else

 pctGold.Visible = False

 End If

 Case 2 ' White Winner

 If lblWhite.BackColor = vbBlack Then

 lblWhite.BackColor = vbWhite

 Else

 lblWhite.BackColor = vbBlack

 End If

 If lblWhite.ForeColor = vbWhite Then

 lblWhite.ForeColor = vbBlack

 Else

 lblWhite.ForeColor = vbWhite

 End If

 If pctWhite.Visible = False Then

 pctWhite.Visible = True

 Else

 pctWhite.Visible = False

 End If

 Case 3 ' Red Winner

 If lblRed.BackColor = vbBlack Then

 lblRed.BackColor = vbRed

 Else

 lblRed.BackColor = vbBlack

 End If

 If lblRed.ForeColor = vbRed Then

 lblRed.ForeColor = vbBlack

 Else

 lblRed.ForeColor = vbRed

 End If

 If pctRed.Visible = False Then

 pctRed.Visible = True

 Else

 pctRed.Visible = False

 End If

 Case 4 ' Yellow Winner

 If lblYellow.BackColor = vbBlack Then

 lblYellow.BackColor = vbYellow

 Else

 lblYellow.BackColor = vbBlack

 End If

 If lblYellow.ForeColor = vbYellow Then

 lblYellow.ForeColor = vbBlack

 Else

 lblYellow.ForeColor = vbYellow

 End If

 If pctYellow.Visible = False Then

 pctYellow.Visible = True

 Else

frmMain - 6

```
    pctYellow.Visible = False  
End If
```

```
End Select
```

```
End Sub
```

frmComm - 1

Option Explicit

Private Sub CancelButton_Click()

End Sub

Private Sub cmdCancelButton_Click()

frmComm.Hide

End Sub

Private Sub cmdOKButton_Click()

' Write configuration to settings.dat file

Dim intFileCount As Integer

intFileCount = FreeFile() ' Get available File #

If lstComm.SelCount > 0 Then

On Error GoTo Port_Error

If frmMain.MSComm1.PortOpen = False Then frmMain.MSComm1.PortOpen = True

On Error GoTo File_Error

Open "settings.dat" For Output As #intFileCount

Write #intFileCount, frmMain.MSComm1.CommPort, frmMain.MSComm1.Settings 'Writing settings to file directly from Comm control.

Close #intFileCount

frmComm.Hide

Exit Sub

Else

If lstComm.ListCount > 0 Then

MsgBox ("You must select a COM: port.")

Else

MsgBox ("There are no available COM: ports!")

End If

Exit Sub

End If

File_Error:

MsgBox ("Error writing to configuration file!")

MsgBox (Err.Description)

Exit Sub

Port_Error:

MsgBox ("Error opening COM" & Trim(Str(frmMain.MSComm1.CommPort)) & ":")

End Sub

Private Sub Form_Load()

' On Error GoTo Err_CommPort

lblStatus.Caption = "" 'Set Port Status Message

Dim i As Integer

Dim j As Integer

Dim bSkip As Boolean

Dim intCommPortOrg As Integer

' intCommPortOrg = frmMain.MSComm1.CommPort 'Save Default Comm port Setting

' If frmMain.MSComm1.PortOpen = True Then frmMain.MSComm1.PortOpen = False

' For i = 1 To 9 'Enumerate up to 9 comm ports to list lstComm

' bSkip = False

' With frmMain

' .MSComm1.CommPort = i

' .MSComm1.PortOpen = True 'See if opening port generates an error

' If Not bSkip Then

' .MSComm1.PortOpen = False 'If not close and add it to list

' lstComm.AddItem ("COM" & Trim(Str(i)) & ":")

' End If

' End With

' Next

' frmMain.MSComm1.CommPort = intCommPortOrg 'Restore Default Comm port

' Select Default Comm Port in list

For j = 0 To lstComm.ListCount

If Val(Mid\$(lstComm.List(j), 4, 1)) = frmMain.MSComm1.CommPort Then 'Extract Actual port value from list string

lstComm.Selected(j) = True

End If

Next

frmComm - 2

```
' On Error Resume Next
' If frmMain.MSComm1.PortOpen = False Then
'     frmMain.MSComm1.PortOpen = True
'     Exit Sub
' End If
' Exit Sub
'Err_CommPort:
' MsgBox (i)
' bSkip = True
' Resume Next
End Sub
```

```
Private Sub Frame1_DragDrop(Source As Control, X As Single, Y As Single)
```

```
End Sub
```

```
Private Sub lstComm_Click()
    If lstComm.SelCount > 0 Then
        On Error GoTo Port_Error
        With frmMain
            If .MSComm1.PortOpen = True Then .MSComm1.PortOpen = False
            .MSComm1.CommPort = Val(Mid$(lstComm.Text, 4, 1)) 'Extract actual port number from list s
tring
            .MSComm1.PortOpen = True
            lblStatus.Caption = "Port Available"
        End With
    End If
    Exit Sub
Port_Error:
    lblStatus.Caption = Err.Description
End Sub
```

```
Public Xtwips As Integer, Ytwips As Integer
Public Xpixels As Integer, Ypixels As Integer
```

```
Type FRMSIZE
    Height As Long
    Width As Long
End Type
```

```
Public RePosForm As Boolean
Public DoResize As Boolean
```

```
Sub Resize_For_Resolution(ByVal SFX As Single, _
    ByVal SFY As Single, MyForm As Form)
    Dim I As Integer
    Dim SFFont As Single
```

```
SFFont = (SFX + SFY) / 2 ' average scale
' Size the Controls for the new resolution
On Error Resume Next ' for read-only or nonexistent properties
With MyForm
    For I = 0 To .Count - 1
        If TypeOf .Controls(I) Is ComboBox Then ' cannot change Height
            .Controls(I).Left = .Controls(I).Left * SFX
            .Controls(I).Top = .Controls(I).Top * SFY
            .Controls(I).Width = .Controls(I).Width * SFX
        Else
            .Controls(I).Move .Controls(I).Left * SFX, _
                .Controls(I).Top * SFY, _
                .Controls(I).Width * SFX, _
                .Controls(I).Height * SFY
        End If
        ' Be sure to resize and reposition before changing the FontSize
        .Controls(I).FontSize = .Controls(I).FontSize * SFFont
    Next I
    If RePosForm Then
        ' Now size the Form
        .Move .Left * SFX, .Top * SFY, .Width * SFX, .Height * SFY
    End If
End With
End Sub
```

frmPack - 1

Option Explicit

```
Private Sub CancelButton_Click()  
    frmPack.Hide  
End Sub
```

```
Private Sub OKButton_Click()  
    If IsEmpty(Trim(txtPack.Text)) Then  
        MsgBox ("Please Enter a Pack Number.")  
    Else  
        frmMain.lblPack = "PACK: " & Trim(txtPack.Text)  
    End If  
    frmPack.Hide  
End Sub
```

Reset Gate

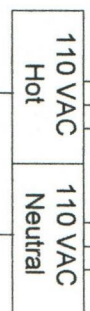
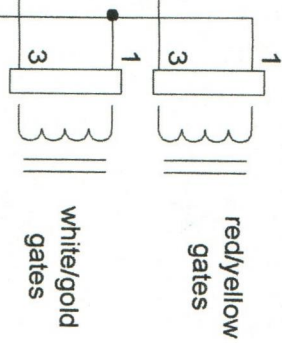
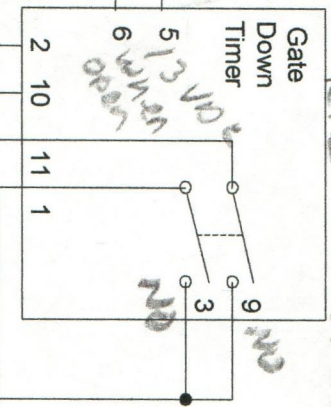
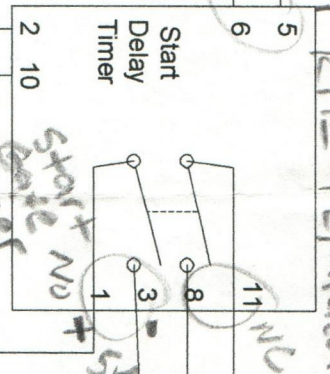
PTE - P21-AC120V

Pack 1220

Pinewood Derby Wiring Diagram

(December 2005)

Left start switch
Right start switch



Reset Gate

Serial Cable to Computer (optional)

