

修平科技大學四年制機械工程系
專題製作報告

氣壓乙級圖形監控
_以第一題為例

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摘要

本專題利用 VB 作動以模擬氣壓乙級題目，來達成協助老師教導的學生，讓學生可以透過模擬的方式來讓學生更清楚其作動方式及其動作原理。並藉此加深同學興趣，讓學生看到乙級題目，就有興致的學習氣壓。

一般我們家裡不可能會有氣壓乙級的元件，所以我們先用 Solid Works 2007 來繪製 1 比 1 的氣壓元件以後用 VB6.0 來寫程式。

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第一章 前言

研究動機

在以往在教學中，使用圖片或是投影片是相當普遍，這都是靜態資料的展示。而現今電腦軟、硬體的快速發展下，可以用 Solid Works 來繪製出與實務相近的圖片，並且用 VB6.0 的程式來寫氣壓乙級動作。是為了讓學生可以很快的了解氣壓乙級的標準動作。

研究目的

在製作這個專題是為了以後的老師在上課使用或者是學生在家也可以學習。

第二章 動作流程與製作設備

2-1. 製作流程



2-2. 製作設備

設備	名稱	數量	備註
	游標卡尺	3	量元件尺寸
	電腦	5	用程式
程式	Solid Works 2007		畫氣壓元件
程式	Visual Basic 6.0		寫氣壓動作
	氣壓乙級第一題元件	1 組	

第三章 製作方法

3-1. SolidWorks 電腦繪圖

- 一、利用游標卡尺來量測實際氣壓元件的尺寸。
- 二、利用 SolidWorks 繪圖軟體，來繪製出 3D 立體 1:1 的零件。
- 三、將畫好各部位氣壓件的零件，命名並存檔。
- 四、利用組合方式將氣壓件的零件組合起來，並用一個資料夾將檔案分類整理。
- 五、將組合好的各種氣壓元件，再利用組合的方式，組合成氣壓乙級技術士檢定的題目。

3-2. VB6.0 程式

主程式：

```
Public c0_flag As Integer
Public c1_flag As Integer
Public c2_flag As Integer
Public Sub CY_CA() ' 上升
For I = 1 To 120000000
I = I + 1
Select Case I
Case 24000000
c0 = 0
Picture3.Picture = LoadPicture(App.Path & "\C 缸 09. jpg")
Case 48000000
Picture3.Picture = LoadPicture(App.Path & "\C 缸 08. jpg")
Case 72000000
Picture3.Picture = LoadPicture(App.Path & "\C 缸 07. jpg")
Case 96000000
Picture3.Picture = LoadPicture(App.Path & "\C 缸 06. jpg")
Case 120000000
Picture3.Picture = LoadPicture(App.Path & "\C 缸 05. jpg")
c1 = 1
End Select
Next
End Sub

=====

Public Sub CY_CAA()
For I = 1 To 120000000
I = I + 1
Select Case I
Case 24000000
c1 = 0
Picture3.Picture = LoadPicture(App.Path & "\C 缸 05. jpg")
Case 48000000
Picture3.Picture = LoadPicture(App.Path & "\C 缸 04. jpg")
Case 72000000
Picture3.Picture = LoadPicture(App.Path & "\C 缸 03. jpg")
```

```

Case 96000000
Picture3.Picture = LoadPicture(App.Path & "\C 缸 02. jpg")
Case 120000000
Picture3.Picture = LoadPicture(App.Path & "\C 缸 01. jpg")
c0 = 1
End Select
Next
End Sub

=====

Public Sub CY_CB() ' 下降
For I = 1 To 120000000
Select Case I
Case 24000000
c2 = 0
Picture3.Picture = LoadPicture(App.Path & "\C 缸 01. jpg")
Case 48000000
Picture3.Picture = LoadPicture(App.Path & "\C 缸 02. jpg")
Case 72000000
Picture3.Picture = LoadPicture(App.Path & "\C 缸 03. jpg")
Case 96000000
Picture3.Picture = LoadPicture(App.Path & "\C 缸 04. jpg")
Case 120000000
Picture3.Picture = LoadPicture(App.Path & "\C 缸 05. jpg")
c1 = 1
End Select
Next
End Sub

Public Sub CY_CBB()
For I = 1 To 120000000
I = I + 1
Select Case I
Case 24000000
c0 = 0: c1 = 0: c2 = 0
Picture3.Picture = LoadPicture(App.Path & "\C 缸 05. jpg")
Case 48000000
Picture3.Picture = LoadPicture(App.Path & "\C 缸 06. jpg")
Case 72000000
Picture3.Picture = LoadPicture(App.Path & "\C 缸 07. jpg")

```

```

Case 96000000
Picture3.Picture = LoadPicture(App.Path & "\C缸 08. jpg")
Case 120000000
Picture3.Picture = LoadPicture(App.Path & "\C缸 09. jpg")
c2 = 1
End Select
Next
End Sub

=====

Public Sub CY_BA()
For I = 1 To 6000000
I = I + 1
Select Case I
Case 1200000
Picture1.Picture = LoadPicture(App.Path & "\氣壓缸 05. jpg")
a1 = 0
Case 2400000
Picture1.Picture = LoadPicture(App.Path & "\氣壓缸 04. jpg")
Case 3600000
Picture1.Picture = LoadPicture(App.Path & "\氣壓缸 03. jpg")
Case 4800000
Picture1.Picture = LoadPicture(App.Path & "\氣壓缸 02. jpg")
Case 6000000
Picture1.Picture = LoadPicture(App.Path & "\氣壓缸 01a. jpg")
a0 = 1
End Select
Next
End Sub

=====

Public Sub CY_BB()
For I = 1 To 6000000
I = I + 1
Select Case I
Case 1200000
Picture2.Picture = LoadPicture(App.Path & "\氣壓缸 05. jpg")
b1 = 0
Case 2400000
Picture2.Picture = LoadPicture(App.Path & "\氣壓缸 04. jpg")

```

```

Case 3600000
Picture2.Picture = LoadPicture(App.Path & "\氣壓缸 03. jpg")
Case 4800000
Picture2.Picture = LoadPicture(App.Path & "\氣壓缸 02. jpg")
Case 6000000
Picture2.Picture = LoadPicture(App.Path & "\氣壓缸 01a. jpg")
b0 = 1
End Select
Next
End Sub

=====

Public Sub CY_FA()
For I = 1 To 6000000
I = I + 1
Select Case I
Case 1200000
Picture1.Picture = LoadPicture(App.Path & "\氣壓缸 01a. jpg")
a0 = 0
Case 2400000
Picture1.Picture = LoadPicture(App.Path & "\氣壓缸 02. jpg")
Case 3600000
Picture1.Picture = LoadPicture(App.Path & "\氣壓缸 03. jpg")
Case 4800000
Picture1.Picture = LoadPicture(App.Path & "\氣壓缸 04. jpg")
Case 6000000
Picture1.Picture = LoadPicture(App.Path & "\氣壓缸 05. jpg")
a1 = 1
End Select
Next
End Sub

=====

Public Sub CY_FB()
For I = 1 To 6000000
I = I + 1
Select Case I
Case 1200000
Picture2.Picture = LoadPicture(App.Path & "\氣壓缸 01a. jpg")
b0 = 0

```

```

Case 2400000
Picture2.Picture = LoadPicture(App.Path & "\氣壓缸 02. jpg")
Case 3600000
Picture2.Picture = LoadPicture(App.Path & "\氣壓缸 03. jpg")
Case 4800000
Picture2.Picture = LoadPicture(App.Path & "\氣壓缸 04. jpg")
Case 6000000
Picture2.Picture = LoadPicture(App.Path & "\氣壓缸 05. jpg")
b1 = 1
End Select
Next
End Sub

=====

Private Sub Command1_Click(Index As Integer)
Dim sAddr_X As String      'single bit-address-X
If Index < 10 Then
sAddr_X = "040" + CStr(Index)
Else
keyascii = 55 + Index
sAddr_X = "040" + Chr(keyascii)
End If
'Print "sAddr_X=", sAddr_X, Index
Call Bit_Set(MSComm1, sAddr_X)
End Sub

Private Sub Command2_Click()
If Timer1.Enabled = False Then
Timer1.Enabled = True
Command2.BackColor = QBColor(4)
Else
Timer1.Enabled = False
Command2.BackColor = QBColor(8)
' =====

For I = 0 To 7
Shape1(I).BackColor = QBColor(15)
Shape1(I + 8).BackColor = QBColor(15)
Shape2(I).BackColor = QBColor(15)
Shape2(I + 8).BackColor = QBColor(15)
Next

```

```

End If
End Sub

=====

Private Sub Command3_Click(Index As Integer)
Dim sAddr_Y As String 'single-address-Y
Dim XB1_IN As String
Dim XB2_IN As String
Dim XB1_addr As String
Dim XB2_addr As String
Dim TX1(8) As String
Dim TX2(8) As String

Dim YB1_OUT As String
Dim YB2_OUT As String
Dim YB1_addr As String
Dim YB2_addr As String
Dim TY1(0 To 7) As String
Dim TY2(0 To 7) As String
If Index < 10 Then
sAddr_Y = "050" + CStr(Index)
Else
keyascii = 55 + Index
sAddr_Y = "050" + Chr(keyascii)
End If
XB1_addr = "0080"
XB2_addr = "0081"
YB1_addr = "00A0"
YB2_addr = "00A1"
XB1_IN = Byte_Read(MSComm1, XB1_addr)
XB2_IN = Byte_Read(MSComm1, XB2_addr)
YB1_OUT = Byte_Read(MSComm1, YB1_addr)
YB2_OUT = Byte_Read(MSComm1, YB2_addr)
If Index < 8 Then
TY1(Index) = Mid(YB1_OUT, 8 - Index, 1)
If CInt(TY1(Index)) = 1 Then
Call Bit_Rst(MSComm1, sAddr_Y)
ElseIf CInt(TY1(Index)) = 0 Then
Call Bit_Set(MSComm1, sAddr_Y)

```

```

End If
ElseIf Index >= 8 Then
    TY2(Index - 8) = Mid(YB2_OUT, 16 - Index, 1)
If CInt(TY2(Index - 8)) = 1 Then
    Call Bit_Rst(MSComm1, sAddr_Y)
ElseIf CInt(TY2(Index - 8)) = 0 Then
    Call Bit_Set(MSComm1, sAddr_Y)
End If
End If
End Sub

=====

Private Sub Command4_Click()
Dim YB1_addr As String
Dim YB2_addr As String
Dim DataWrite As Integer
YB1_addr = "00A0"
YB2_addr = "00A1"
DataWrite = 0
Call Byte_Write(MSComm1, YB1_addr, DataWrite)
Call Byte_Write(MSComm1, YB2_addr, DataWrite)
End Sub

=====

Private Sub Form_Activate()
Text1.Text = ""
Text1.SetFocus
Text2.Text = ""
End Sub

=====

Private Sub Text1_Change()
If Text1.Text = "A+" Then
Call CY_FA
ElseIf Text1.Text = "A-" Then
Call CY_BA
ElseIf Text1.Text = "B-" Then
Call CY_BB
ElseIf Text1.Text = "B+" Then
Call CY_FB
End If

```

```

End Sub

Private Sub Text2_Change()
If Text2.Text = "C+" Then
Call CY_CA
ElseIf Text2.Text = "C++" Then
Call CY_CAA
ElseIf Text2.Text = "C-" Then
Call CY_CB
ElseIf Text2.Text = "C--" Then
Call CY_CBB
End If
End Sub

=====

Private Sub Timer1_Timer()
Dim XB1_IN As String
Dim XB2_IN As String
Dim XB1_addr As String
Dim XB2_addr As String
Dim TX1(8) As String
Dim TX2(8) As String
Dim YB1_OUT As String
Dim YB2_OUT As String
Dim YB1_addr As String
Dim YB2_addr As String
Dim TY1(8) As String
Dim TY2(8) As String
Dim CY_index As Integer
Dim CX_index As Integer
Dim a0 As Integer
Dim a1 As Integer
Dim b0 As Integer
Dim b1 As Integer
Dim c0 As Integer
Dim c1 As Integer
Dim c2 As Integer
Dim PB_st As Integer
Dim PB_stop As Integer
Dim PB_EMS As Integer

```



```

Dim PB_rest As Integer
Dim RST_RUN As Integer
Dim PB_step As Integer
Dim PB_single As Integer
Dim PB_recur As Integer
Dim CY_dir As Integer
Dim A_BAC As Integer
Dim B_BAC As Integer
Dim C_DOWN As Integer
Dim A_FORW As Integer
Dim B_FORW As Integer
Dim C_UP As Integer
Dim C_P_TOP As Integer
Dim C_P_BOT As Integer
XB1_addr = "0080"
XB2_addr = "0081"
YB1_addr = "00A0"
YB2_addr = "00A1"
XB1_IN = Byte_Read(MSComm1, XB1_addr)
XB2_IN = Byte_Read(MSComm1, XB2_addr)
YB1_OUT = Byte_Read(MSComm1, YB1_addr)
YB2_OUT = Byte_Read(MSComm1, YB2_addr)
For I = 8 To 1 Step -1
TX1(I) = Mid(XB1_IN, I, 1)
If CInt(TX1(I)) = 1 Then
Shape2(8 - I).BackColor = QBColor(4)
Else
Shape2(8 - I).BackColor = QBColor(15)
End If
Next
PB_st = CInt(Mid(XB1_IN, 8, 1))
PB_stop = CInt(Mid(XB1_IN, 7, 1))
PB_ENS = CInt(Mid(XB1_IN, 6, 1))
PB_rest = CInt(Mid(XB1_IN, 5, 1))
RST_RUN = CInt(Mid(XB1_IN, 4, 1))
PB_step = CInt(Mid(XB1_IN, 3, 1))
PB_single = CInt(Mid(XB1_IN, 2, 1))
PB_recur = CInt(Mid(XB1_IN, 1, 1))

```

```

'Print a0, a1, b0, b1
For I = 8 To 1 Step -1
TX2(I) = Mid(XB2_IN, I, 1)
If CInt(TX2(I)) = 1 Then
'Print TY1, YB1_OUT
Shape2(16 - I).BackColor = QBColor(4)
Else
Shape2(16 - I).BackColor = QBColor(15)
End If
Next
a0 = CInt(Mid(XB2_IN, 8, 1))
a1 = CInt(Mid(XB2_IN, 7, 1))
b0 = CInt(Mid(XB2_IN, 6, 1))
b1 = CInt(Mid(XB2_IN, 5, 1))
c0 = CInt(Mid(XB2_IN, 4, 1))
c1 = CInt(Mid(XB2_IN, 3, 1))
c2 = CInt(Mid(XB2_IN, 2, 1))

```

```

For I = 8 To 1 Step -1
TY2(I) = Mid(YB2_OUT, I, 1)
If CInt(TY2(I)) = 1 Then
'Print TY1, YB1_OUT
Shape1(16 - I).BackColor = QBColor(4)
Else
Shape1(16 - I).BackColor = QBColor(15)
End If
Next
For I = 8 To 1 Step -1
TY1(I) = Mid(YB1_OUT, I, 1)
If CInt(TY1(I)) = 1 Then
Shape1(8 - I).BackColor = QBColor(4)
Else
Shape1(8 - I).BackColor = QBColor(15)
End If
Next
A_BAC = CInt(Mid(YB1_OUT, 7, 1))

```

```

A_FORW = CInt(Mid(YB1_OUT, 8, 1))
B_BAC = CInt(Mid(YB1_OUT, 5, 1))
B_FORW = CInt(Mid(YB1_OUT, 6, 1))
C_DOWN = CInt(Mid(YB1_OUT, 3, 1))
C_UP = CInt(Mid(YB1_OUT, 4, 1))
'Print C_UP
If c1 = 1 Then
    c1_flag = 1
End If
If c2 = 1 Then
    c2_flag = 1
    c1_flag = 0
    c0_flag = 0
End If
If c0 = 1 Then
    c2_flag = 0
    c1_flag = 0
    c0_flag = 1
End If
C_P_TOP = c0_flag * c1_flag + c2_flag * (1 - c1_flag)

C_P_BOT = c0_flag * (1 - c1_flag) + c2_flag * c1_flag
'Print C_P_BOT, c0_flag, c1_flag, c2_flag
If (C_DOWN = 1) Then
    If (C_P_TOP = 1) Then
        Text2.Text = "C-"
    ElseIf (C_P_BOT = 1) Then
        Text2.Text = "C--"
    End If
End If
If (C_UP = 1) Then
    If (C_P_TOP = 1) Then
        Text2.Text = "C++"
    ElseIf (C_P_BOT = 1) Then
        Text2.Text = "C+"
    ElseIf (C_P_BOT = 0) And (C_P_TOP = 0) Then
        Text2.Text = "C++"
    End If

```

```

End If
If (A_BAC = 1) And (a0 <> 1) Then
    Text1.Text = "A-"
    End If
If (A_FORW = 1) And (a1 <> 1) Then
Picture4.Picture = LoadPicture(App.Path & "\五口二位雙向電磁組合 02. jpg")
    Text1.Text = "A+"
    End If
If (B_BAC = 1) And (b0 <> 1) Then
Picture5.Picture = LoadPicture(App.Path & "\五口二位雙向電磁組合 03. jpg")
    Text1.Text = "B-"
    End If
If (B_FORW = 1) And (b1 <> 1) Then
Picture5.Picture = LoadPicture(App.Path & "\五口二位雙向電磁組合 02. jpg")
    Text1.Text = "B+"
    End If
If A_BAC = 0 And A_FORW = 0 Then
    Picture4.Picture = LoadPicture(App.Path & "\五口二位雙向電磁組合 01. jpg")
ElseIf A_BAC = 0 And A_FORW = 1 Then
    Picture4.Picture = LoadPicture(App.Path & "\五口二位雙向電磁組合 02. jpg")
ElseIf A_BAC = 1 And A_FORW = 0 Then
    Picture4.Picture = LoadPicture(App.Path & "\五口二位雙向電磁組合 03. jpg")
ElseIf A_BAC = 1 And A_FORW = 1 Then
    Picture4.Picture = LoadPicture(App.Path & "\五口二位雙向電磁組合 04. jpg")
End If
If B_BAC = 0 And B_FORW = 0 Then
    Picture5.Picture = LoadPicture(App.Path & "\五口二位雙向電磁組合 01. jpg")
ElseIf B_BAC = 0 And B_FORW = 1 Then
    Picture5.Picture = LoadPicture(App.Path & "\五口二位雙向電磁組合 02. jpg")
ElseIf B_BAC = 1 And B_FORW = 0 Then
    Picture5.Picture = LoadPicture(App.Path & "\五口二位雙向電磁組合 03. jpg")
ElseIf B_BAC = 1 And B_FORW = 1 Then
    Picture5.Picture = LoadPicture(App.Path & "\五口二位雙向電磁組合 04. jpg")
End If
If C_DOWN = 1 And C_UP = 1 Then
Picture6.Picture = LoadPicture(App.Path & "\真空常壓單邊快速電磁閥 2. jpg")
Picture7.Picture = LoadPicture(App.Path & "\真空常壓單邊快速電磁閥 2. jpg")
ElseIf C_DOWN = 1 And C_UP = 0 Then

```

```

Picture6.Picture = LoadPicture(App.Path & "\真空常壓單邊快速電磁閥 2.jpg")
Picture7.Picture = LoadPicture(App.Path & "\真空常壓單邊快速電磁閥 1.jpg")
ElseIf C_DOWN = 0 And C_UP = 1 Then
Picture6.Picture = LoadPicture(App.Path & "\真空常壓單邊快速電磁閥 1.jpg")
Picture7.Picture = LoadPicture(App.Path & "\真空常壓單邊快速電磁閥 2.jpg")
ElseIf C_DOWN = 0 And C_UP = 0 Then
Picture6.Picture = LoadPicture(App.Path & "\真空常壓單邊快速電磁閥 1.jpg")
Picture7.Picture = LoadPicture(App.Path & "\真空常壓單邊快速電磁閥 1.jpg")
End If
End Sub

```

副程式 1:

```

Public Function Byte_Read(Comm As MSComm, sAddr As String) As String
    Dim STX As String
    Dim Cmd As String
    Dim Addr As String
    Dim ByteNum As String
    Dim ETX As String
    Dim CheckString As String
    Dim CheckSum As String
    Dim CmdCode As String
    Dim Sum As Integer
    Dim n As Integer
    Dim tmp As String
    STX = Chr(2)
    Cmd = "0"
    ' Addr = "0080"
    Addr = UCase(sAddr)
    ByteNum = "01"
    ETX = Chr(3)
    CheckString = Cmd + Addr + ByteNum + ETX
    For n = 1 To Len(CheckString)
        Sum = Sum + Asc(Mid$(CheckString, n, 1))
    Next n
    CheckSum = Right$(Hex(Sum), 2)
    CmdCode = STX + Cmd + Addr + ByteNum + ETX + CheckSum
    Comm.PortOpen = True
    Comm.Output = CmdCode

```

```

Do While Len(tmp) < 6
    tmp = tmp + Comm.Input
    n = n + 1
    If n >= 6000 Then
        Comm.PortOpen = False
        Exit Function
    End If
Loop
tmp = Mid$(tmp, 2, 2)
Byte_Read = Hex2Bin(tmp)
Comm.PortOpen = False
End Function

=====

Public Function Byte_Write(Comm As MSComm, sAddr As String, sDataWrite As Integer) As
String
    Dim STX As String
    Dim Cmd As String
    Dim Addr As String
    Dim ByteNum As String
    Dim DataWrite As String
    Dim ETX As String
    Dim CheckString As String
    Dim CheckSum As String
    Dim CmdCode As String
    Dim Sum As Integer
    Dim n As Integer
    STX = Chr(2)
    Cmd = "1"
    Addr = UCase(sAddr)
    ByteNum = "01"
    DataWrite = Hex(sDataWrite)
    If Len(DataWrite) < 2 Then
        Do While Len(DataWrite) < 2
            DataWrite = "0" + DataWrite
        Loop
    Else
        DataWrite = Right$(DataWrite, 2)
    End If

```

```

ETX = Chr(3)
CheckString = Cmd + Addr + ByteNum + DataWrite + ETX
For n = 1 To Len(CheckString)
    Sum = Sum + Asc(Mid$(CheckString, n, 1))
Next n
Checksum = Right$(Hex(Sum), 2)
CmdCode = STX + Cmd + Addr + ByteNum + DataWrite + ETX + CheckSum
Comm.PortOpen = True
Comm.Output = CmdCode
Do While Len(tmp) < 1
    tmp = tmp + Comm.Input
    n = n + 1
    If n >= 6000 Then
        Comm.PortOpen = False
        Exit Function
    End If
Loop
Byte_Write = Hex(Asc(tmp))
Comm.PortOpen = False
End Function

```

副程式 2:

```

Public Function Hex2Bin(strHex As String) As String
    Dim strTmp As String
    Dim lngTmp As Long
    Dim intLen As Integer
    Dim strBin As String
    Dim n1 As Integer
    Dim n2 As Integer
    intLen = Len(strHex)
    For n1 = 1 To intLen
        strTmp = Mid(strHex, n1, 1)
        Select Case Asc(strTmp)
            Case 48 To 57
                lngTmp = Val(strTmp)
            Case 65 To 70
                lngTmp = Asc(strTmp) - 55
            Case Else

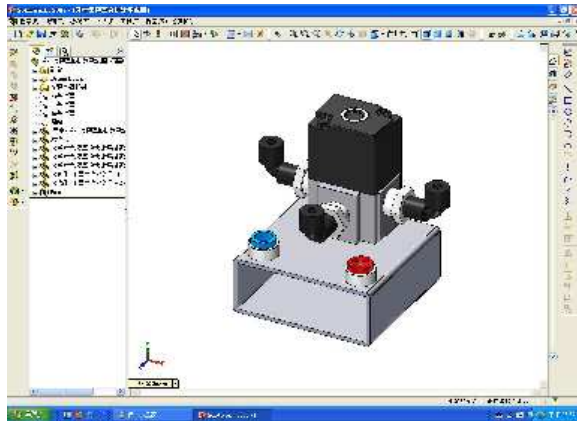
```

```

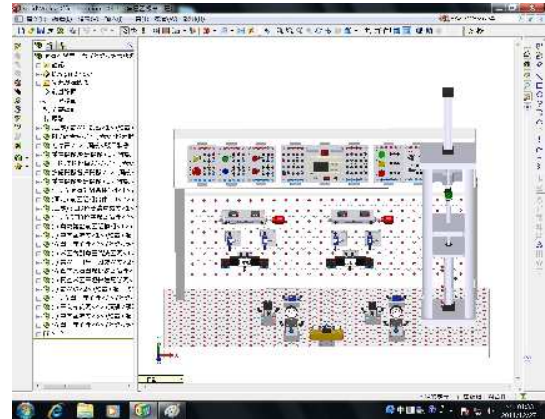
        Hex2Bin = ""
    Exit Function
End Select
strTmp = ""
For n2 = 1 To 4
    strTmp = lngTmp Mod 2 & strTmp
    lngTmp = Int(lngTmp / 2)
Next n2
strBin = strBin + strTmp
Next n1
Hex2Bin = strBin
End Function

```

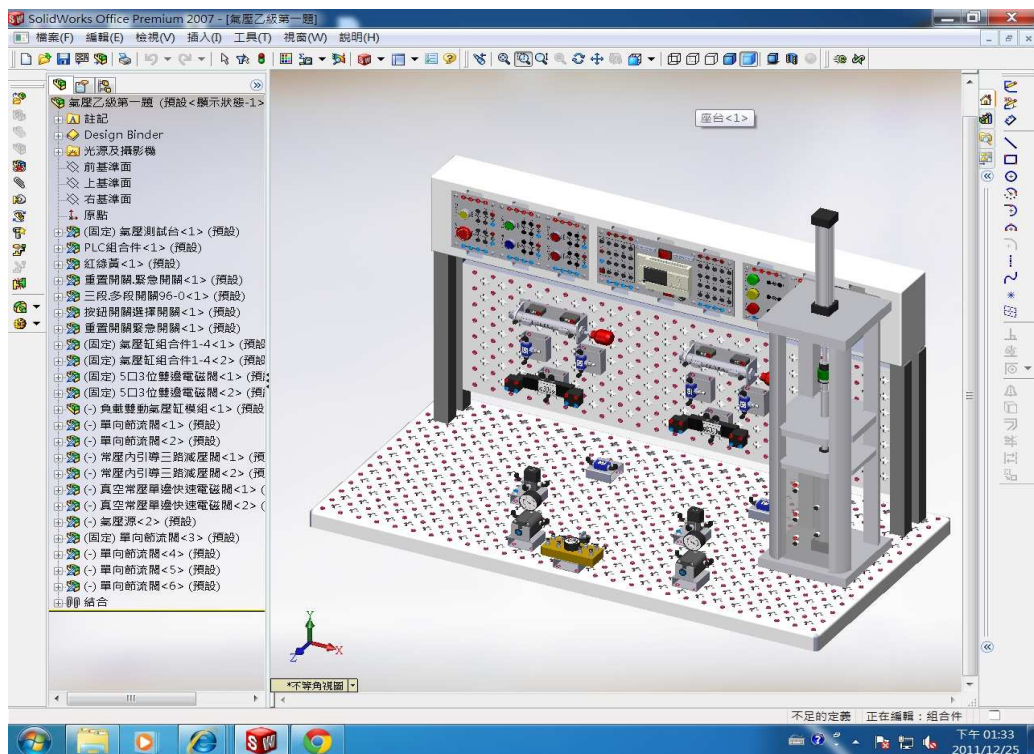

第四章 成品圖



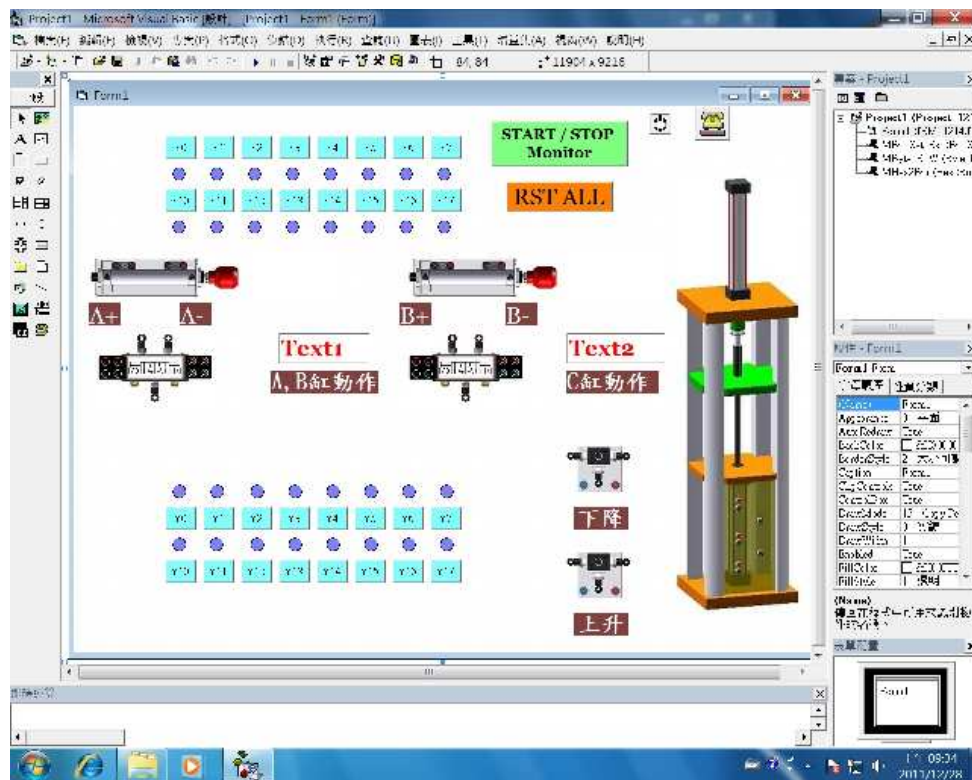
(圖 1) 真空常壓單邊快速電磁閥



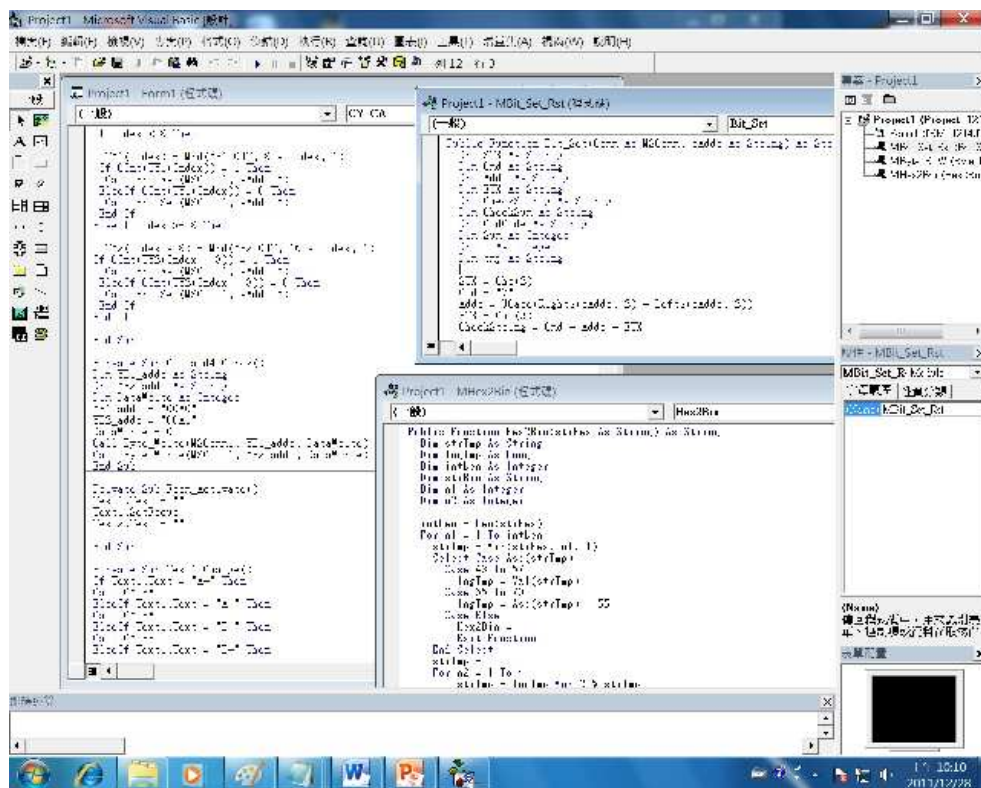
(圖 2) 氣壓乙級第一題前視



(圖 3) 氣壓乙級第一題不等角視



(圖 4) 圖片排列位置



(圖 5) 程式碼

第五章 問題與討論

問題一：在零件面變透明無法選取以及配色？

解決問題：

在零件圖上配顏色沒辦法配的時候，是因為在配顏色的時候不小心選到透明。Shift 鍵 按住 選取要選擇的透明面「即可選取」。半透明狀態請壓住 TAB。

問題二：在組合氣壓乙級的組合圖的時候會跑掉？

解決問題：

因為組合圖中的零件名稱有重複到所以關掉程式的時，在打開組合圖而組合圖中的零件會跑掉。因此只要把零件圖的名稱修改成不一樣的名稱。

問題三：組合圖讀取時不順利，有時候會當掉，停止反應，無回應？

解決問題：

利用優化軟體優化及穩定作業系統，也希望學校能買繪圖專用的繪圖顯示卡，以增進繪圖的效率及穩定性。

問題四：組合過程繁瑣複雜，易出錯？

解決問題：

因為組合圖所包含的零件檔案太凌亂，導致當機以及組合時容易搞混，所以要把組合圖會用到的零件檔案集中在同一個資料夾中，讓電腦讀取不會因為資料分散太凌亂，導致讀取過久而當掉。

第六章 結論

6-1. 結語

這次的專題，讓我們了解到氣壓元件的構造和零件的功能的用途還有零件運動時的方式，也讓初學者可以很快了解這些零件介紹功用，然後用 Solid Works 組合起來的仿真，可以讓初學者很快的了解到運動方式，而且又可以節省過長的配線時間，也可以讓每個人都能在電腦前測試模擬自己的配線概念，不會像過去以前一樣機台少而人多造成只有少數人在配線，而其他人在旁邊看，並且在家裡也可學習氣壓元件的運動方式。

6-2. 工作分配

廖建盈(BA97109)繪製氣油壓元件零件圖

組合氣壓元件組合圖

氣壓元件組合圖配色

書面報告內容製作

寫 VB 程式

鄭國盛(BA97104)繪製氣油壓元件零件圖

組合氣壓元件組合圖

書面報告內容製作

李昆錡(BA97082)繪製氣油壓元件零件圖

組合氣壓元件組合圖

書面報告內容製作

陳冠杰(BA97115)繪製氣油壓元件零件圖

組合氣壓元件組合圖

氣壓元件組合圖配色

寫 VB 程式

許竣智(BA97501)繪製氣油壓元件零件圖

上台報告

6-3. 參考資料

Solid Works 工業製圖電腦製圖電腦繪圖

<http://www.cctc.com.tw/demo/b3-4-solidworks.asp>

深入淺出零件設計 SolidWorks 2010

作者：郭宏賓、江俊顯、柴在屏、郭彥君

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作者：鍾隆嘉

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VB6.0 中文版易學易用專輯

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6-4. Solid Works 介紹

由視窗環境下發展出來的 3D 實體模型建構系統，提供產品設計師與工程師們一套節省時間的高效率電腦輔助設計工具，協助各產業提升機械設計自動化，以最少的時間完成創新的產品設計，取得產品上市先機及競爭優勢。

Solid Works 採參變數合併運用並以特徵化的方式進行實體模型的建構工作，其中含有零件建構、組合件裝配、與工程圖製作三部份基本模組，所有幾何資料透過單一資料庫可以達到雙向的資料溝通與傳遞更新，完全符合同步工程的設計要求。

完整的實體建構功能，除提供零件檔的「分離實體」之功能外還可直接輸入多個外部檔案做布林運算（聯、交、差）集。完整的曲面功能除充分提供各項複雜曲面功能之外，不論曲面的複製、搬移、鏡射、延伸、修剪，無不讓設計者再次完美表現設計意念的最佳工具。

可自訂的大型組件閥值，一旦達到設定值系統即以大組件模式運作，效率即時提昇。從組合件內設計出零組件並且輕易地進行規格變更，藉由此功能可以確認最佳化的組合方式。

將零件與特徵在空間中透過簡潔迅速的拖曳與置放，如此無與倫比的簡易操作方式與效能迅速完成組合件的設計作業。

以標準多視圖範本的設定，更加快速與輕易地產生成品所需的工程圖，更可以即時進行設計變更，無論是在工程圖或是 3D 模型上所進行的每項變更都會立即反映在您整個設計上，如此您就可以確保其工程視圖的精確與永遠擁有最新的資料。而透過「大型組件」的自動去除隱藏零件，大組件的工程圖迅速產生；工程視圖的「塗彩」功能增加了模型的可識性。

使用折邊、凸折、邊緣凸緣等進階的鈑金實體建構功能，更支援上下異形之鈑件功能更加強化設計的品質，採行單一資料庫的鈑金特徵可以適時更新任何修改，包括各項衝壓成形工具均可以拖曳置放的方式來使用，如果使用 Solid Works，您會很確切地知道您所設計的板金零件是可以被精確地製造出來。

使用組合件的模型組態功能，可以很快地開發出新的產品線，並且進行設計變更。模型組態是一項可以允許從事組合件或是次組合件上無限變化組合的資料庫控制功能。雙向的設計表格自動生成更讓多樣的產品線產生於須臾之間，而模型組態的「預覽」功能讓使用者再最短時間開啟所需的產品檔案。