

修平科技大學四年制機械工程系

專題製作報告

氣壓乙級數位化教學教材製作

_以第一題為例

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第一章 前言

1.1 研究目的

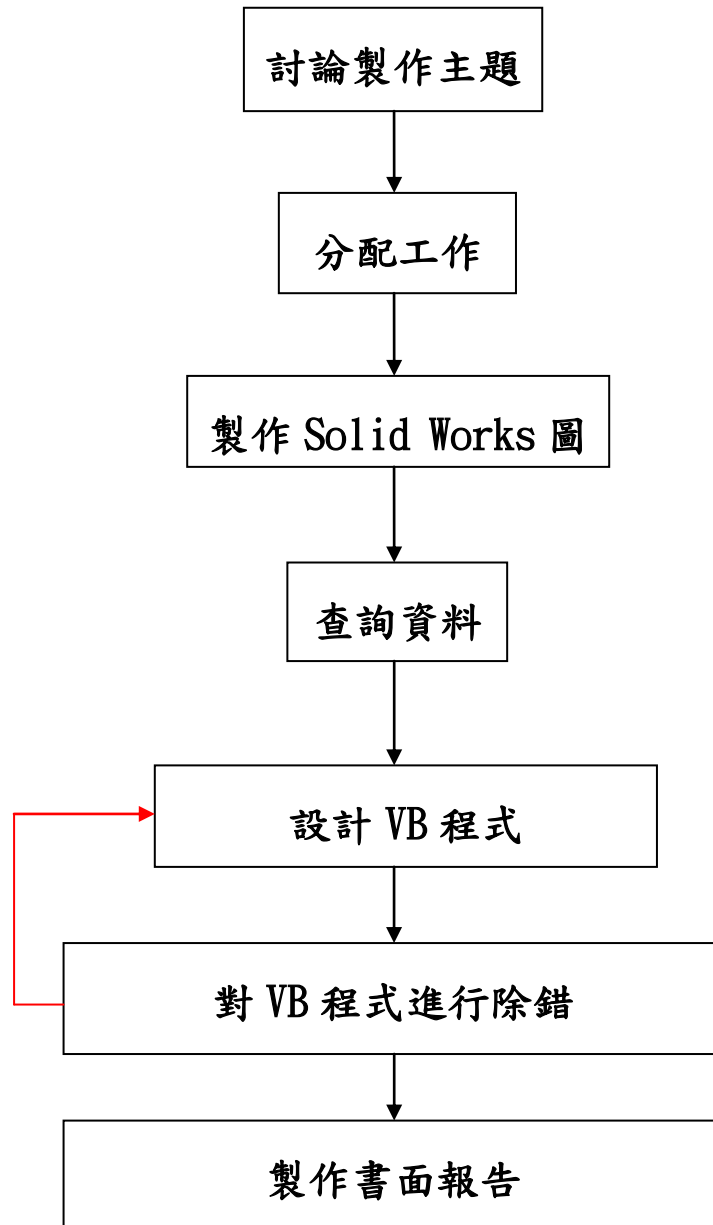
氣壓乙級題目所要求的動作，相當的複雜，對於題目文字敘述的了解，讓初學者往往必須花費很多時間理解，而且對於所規定的動作，往往做不同的解讀，以致花費很多時間在於撰寫錯誤的程式並修改它。

1.2 研究動機

為了解決以上的問題，所以我們寫了這套程式讓它能夠完整的呈現題目需求的動作，讓同學不用花費那麼多時間去理解題目。

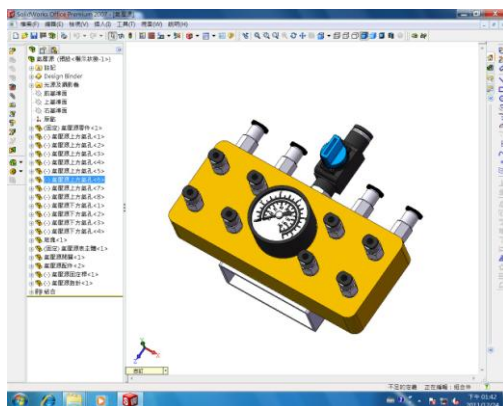
第二章 製作過程

2-1. 製作流程

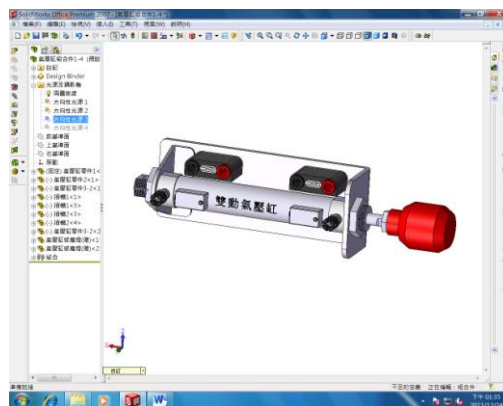


2-2 步驟說明_製作 SolidWorks 圖檔

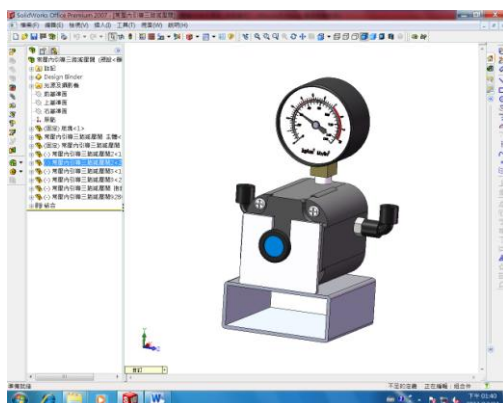
氣壓乙級所需要的元件數量太過龐大所以我們花了很多時間在準備。



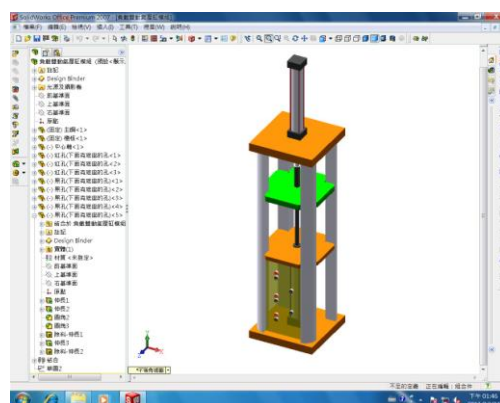
(氣壓源)



(雙動氣壓缸)



(常壓內引導三路減壓閥)



(負載雙動氣壓缸模組)

第三章 成果

3-1 程式碼

```
Public Sub limitA_RN()
```

```
Picture18.Picture = LoadPicture(App.Path & "\電器輓輪極限開關(完成版).jpg")
```

```
End Sub
```

```
Public Sub limitA_LN()
```

```
Picture17.Picture = LoadPicture(App.Path & "\電器輓輪極限開關(完成版).jpg")
```

```
End Sub
```

```
Public Sub limitA_L()
```

```
Picture17.Picture = LoadPicture(App.Path & "\電器輓輪極限開關(左邊完成版).jpg")
```

```
End Sub
```

```
Public Sub limitA_R()
```

```
Picture18.Picture = LoadPicture(App.Path & "\電器輓輪極限開關(右邊完成版).jpg")
```

```
End Sub
```

```
Public Sub limitB_RN()
```

```
Picture20.Picture = LoadPicture(App.Path & "\電器輓輪極限開關(完成版).jpg")
```

```
End Sub
```

```
Public Sub limitB_LN()
```

```
Picture19.Picture = LoadPicture(App.Path & "\電器輓輪極限開關(完成版).jpg")
```

```
End Sub
```

```
Public Sub limitB_L()
```

```
Picture19.Picture = LoadPicture(App.Path & "\電器輓輪極限開關(左邊完成版).jpg")
```

```
End Sub
```

```
Public Sub limitB_R()
```

```
Picture20.Picture = LoadPicture(App.Path & "\電器輓輪極限開關(右邊完成版).jpg")
```

```
End Sub
```

```
Public Sub A52_N()
```

```
Picture4.Picture = LoadPicture(App.Path & "\五口二位雙向電磁組合 01.jpg")
```

```
End Sub
```

```
-----  
Public Sub B52_N()  
Picture5.Picture = LoadPicture(App.Path & "\五口二位雙向電磁組合 01.jpg")  
End Sub
```

```
-----  
Public Sub A52_L()  
Picture4.Picture = LoadPicture(App.Path & "\五口二位雙向電磁組合 02.jpg")  
End Sub
```

```
-----  
Public Sub A52_R()  
Picture4.Picture = LoadPicture(App.Path & "\五口二位雙向電磁組合 03.jpg")  
End Sub
```

```
-----  
Public Sub B52_L()  
Picture5.Picture = LoadPicture(App.Path & "\五口二位雙向電磁組合 02.jpg")  
End Sub
```

```
-----  
Public Sub B52_R()  
Picture5.Picture = LoadPicture(App.Path & "\五口二位雙向電磁組合 03.jpg")  
End Sub
```

```
-----  
Public Sub CY_FA()  
For i = 1 To 800  
i = i + 1  
a = i \ 200  
Select Case a  
Case 1  
Picture1.Picture = LoadPicture(App.Path & "\氣壓缸 02.jpg")  
Case 2  
Picture1.Picture = LoadPicture(App.Path & "\氣壓缸 03.jpg")  
Case 3  
Picture1.Picture = LoadPicture(App.Path & "\氣壓缸 04.jpg")  
Case 4  
Picture1.Picture = LoadPicture(App.Path & "\氣壓缸 05.jpg")  
End Select  
Next  
End Sub
```

```
-----  
Public Sub CY_FB()
```



```
For i = 1 To 800
i = i + 1
b = i \ 200
Select Case b
Case 1
Picture2.Picture = LoadPicture(App.Path & "\氣壓缸 02.jpg")
Case 2
Picture2.Picture = LoadPicture(App.Path & "\氣壓缸 03.jpg")
Case 3
Picture2.Picture = LoadPicture(App.Path & "\氣壓缸 04.jpg")
Case 4
Picture2.Picture = LoadPicture(App.Path & "\氣壓缸 05.jpg")
End Select
Next
End Sub
```

```
Public Sub CY_BA()
For i = 1 To 1200
i = i + 1
e = i \ 200
Select Case e
Case 1
Picture1.Picture = LoadPicture(App.Path & "\氣壓缸 05.jpg")
Case 2
Picture1.Picture = LoadPicture(App.Path & "\氣壓缸 06.jpg")
Case 3
Picture1.Picture = LoadPicture(App.Path & "\氣壓缸 07.jpg")
Case 4
Picture1.Picture = LoadPicture(App.Path & "\氣壓缸 08.jpg")
Case 5
Picture1.Picture = LoadPicture(App.Path & "\氣壓缸 09.jpg")
Case 6
Picture1.Picture = LoadPicture(App.Path & "\氣壓缸 01.jpg")
End Select
Next
End Sub
```

```
Public Sub CY_BB()
For i = 1 To 1200
```

```
i = i + 1
f = i \ 200
Select Case f
Case 1
Picture2.Picture = LoadPicture(App.Path & "\氣壓缸 05.jpg")
Case 2
Picture2.Picture = LoadPicture(App.Path & "\氣壓缸 06.jpg")
Case 3
Picture2.Picture = LoadPicture(App.Path & "\氣壓缸 07.jpg")
Case 4
Picture2.Picture = LoadPicture(App.Path & "\氣壓缸 08.jpg")
Case 5
Picture2.Picture = LoadPicture(App.Path & "\氣壓缸 09.jpg")
Case 6
Picture2.Picture = LoadPicture(App.Path & "\氣壓缸 01.jpg")
End Select
Next
End Sub
```

```
Public Sub CY_down()
For i = 1 To 250
i = i + 1
c = i \ 50
Select Case c
Case 1
Picture3.Picture = LoadPicture(App.Path & "\負載雙動氣壓缸模組 1.jpg")
Case 2
Picture3.Picture = LoadPicture(App.Path & "\負載雙動氣壓缸模組 2.jpg")
Case 3
Picture3.Picture = LoadPicture(App.Path & "\負載雙動氣壓缸模組 3.jpg")
Case 4
Picture3.Picture = LoadPicture(App.Path & "\負載雙動氣壓缸模組 4.jpg")
Case 5
Picture3.Picture = LoadPicture(App.Path & "\負載雙動氣壓缸模組 5.jpg")
End Select
Next
End Sub
```

```
Public Sub CY_down2()
```

```
For i = 1 To 250
i = i + 1
d = i \ 50
Select Case d
Case 1
Picture3.Picture = LoadPicture(App.Path & "\負載雙動氣壓缸模組 5.jpg")
Case 2
Picture3.Picture = LoadPicture(App.Path & "\負載雙動氣壓缸模組 6.jpg")
Case 3
Picture3.Picture = LoadPicture(App.Path & "\負載雙動氣壓缸模組 7.jpg")
Case 4
Picture3.Picture = LoadPicture(App.Path & "\負載雙動氣壓缸模組 8.jpg")
Case 5
Picture3.Picture = LoadPicture(App.Path & "\負載雙動氣壓缸模組 9.jpg")
End Select
Next
End Sub
```

```
Public Sub CY_up()
For i = 1 To 250
i = i + 1
g = i \ 50
Select Case g
Case 1
Picture3.Picture = LoadPicture(App.Path & "\負載雙動氣壓缸模組 9.jpg")
Case 2
Picture3.Picture = LoadPicture(App.Path & "\負載雙動氣壓缸模組 8.jpg")
Case 3
Picture3.Picture = LoadPicture(App.Path & "\負載雙動氣壓缸模組 7.jpg")
Case 4
Picture3.Picture = LoadPicture(App.Path & "\負載雙動氣壓缸模組 6.jpg")
Case 5
Picture3.Picture = LoadPicture(App.Path & "\負載雙動氣壓缸模組 5.jpg")
End Select
Next
End Sub
```

```
Public Sub CY_up2()
For i = 1 To 250
```

```
i = i + 1
h = i \ 50
Select Case h
Case 1
Picture3.Picture = LoadPicture(App.Path & "\負載雙動氣壓缸模組 5.jpg")
Case 2
Picture3.Picture = LoadPicture(App.Path & "\負載雙動氣壓缸模組 4.jpg")
Case 3
Picture3.Picture = LoadPicture(App.Path & "\負載雙動氣壓缸模組 3.jpg")
Case 4
Picture3.Picture = LoadPicture(App.Path & "\負載雙動氣壓缸模組 2.jpg")
Case 5
Picture3.Picture = LoadPicture(App.Path & "\負載雙動氣壓缸模組 1.jpg")
End Select
Next
End Sub
```

```
Private Sub Command1_Click()
```

```
Text1 = UCase(Text1)
```

```
Text2 = UCase(Text2)
```

```
Text3 = UCase(Text3)
```

```
Text4 = UCase(Text4)
```

```
If Option1.Value = True Then
```

```
Call tempstr1
```

```
ElseIf Option2.Value = True Then
```

```
Call tempstr1
```

```
If Option5.Value = True Then
```

```
Call tempstr2
```

```
End If
```

```
If Option6.Value = True Then
```

```
Call tempstr3
```

```
End If
```

```
Call tempstr4
```

```
ElseIf Option3.Value = True Then
```

```
Call tempstr1
```

```
Call tempstr2
```

```
Call tempstr3
```

```
Call tempstr4
```

```
ElseIf Option4.Value = True Then
```

```
Call tempstr1
```

```
If Check1.Value = 1 Then
```

```
Call tempstr2
```

```
End If
```

```
Call tempstr4
```

```
End If
```

```
End Sub
```

```
Private Sub Option1_Click()
```

```
MsgBox "請輸入動作!", vbOKCancel + vbInformation, "簡單"
```

```
Text1.Text = ""
```

```
Text1.Top = 720
```

```
Text1.Width = 3700
```

```
Text2.Visible = False
```

```
Text3.Visible = False
```

```
Text4.Visible = False
```

```
Option5.Visible = False
```

```
Option6.Visible = False
```

```
Check1.Visible = False
```

```
End Sub
```

```
Private Sub Option2_Click()
```

```
MsgBox "請輸入動作!", vbOKCancel + vbInformation, "分歧"
```

```
Text1.Text = ""
```

```
Text2.Text = ""
```

```
Text3.Text = ""
```

```
Text4.Text = ""
```

```
Text1.Width = 1332
```

```
Text2.Width = 1572
```

```
Text2.Visible = True
Text2.Height = 372
Text2.Left = 1320
Text2.Top = 240
Text3.Visible = True
Text3.Height = 372
Text3.Left = 1320
Text3.Top = 1320
Text3.Width = 1572
Text4.Visible = True
Text4.Height = 372
Text4.Left = 2400
Text4.Top = 720
Text4.Width = 1452
Option5.Visible = True
Option6.Visible = True
Check1.Visible = False
End Sub
```

```
Private Sub Option3_Click()
MsgBox "請輸入動作!", vbOKCancel + vbInformation, "並進"
Text1.Text = ""
Text2.Text = ""
Text3.Text = ""
Text4.Text = ""
Text2.Visible = True
Text3.Visible = True
Text4.Visible = True
Text1.Width = 1332
Text2.Height = 372
Text2.Left = 1320
Text2.Top = 240
Text2.Width = 1572
Text3.Height = 372
Text3.Left = 1320
Text3.Top = 1320
Text3.Width = 1572
Text4.Height = 372
Text4.Left = 2400
```

```
Text4.Top = 720
Text4.Width = 1452
Option5.Visible = False
Option6.Visible = False
Check1.Visible = False
End Sub
```

```
Private Sub Option4_Click()
MsgBox "請輸入動作!", vbOKCancel + vbInformation, "跳躍"
Text1.Text = ""
Text2.Text = ""
Text4.Text = ""
Text2.Visible = True
Text4.Visible = True
Text1.Top = 720
Text1.Width = 1150
Text2.Height = 372
Text2.Top = 720
Text2.Width = 1150
Text2.Left = 1350
Text3.Visible = False
Text4.Width = 750
Text4.Top = 720
Text4.Width = 1150
Text4.Left = 2600
Option5.Visible = False
Option6.Visible = False
Check1.Visible = True
End Sub
```

```
Public Sub tempstr1()
tempstr = Split(Text1, " ")

    For k = 0 To UBound(tempstr)

        If tempstr(k) = "A+" Then Call A52_L
        If tempstr(k) = "A+" Then Call CY_FA
        If tempstr(k) = "A+" Then Call limitA_LN
        If tempstr(k) = "A+" Then Call limitA_R
```

```

If tempstr(k) = "B+" Then Call B52_L
If tempstr(k) = "B+" Then Call CY_FB
If tempstr(k) = "B+" Then Call limitB_LN
If tempstr(k) = "B+" Then Call limitB_R
If tempstr(k) = "A-" Then Call A52_R
If tempstr(k) = "A-" Then Call CY_BA
If tempstr(k) = "A-" Then Call limitA_RN
If tempstr(k) = "A-" Then Call limitA_L
If tempstr(k) = "A-" Then Call A52_N
If tempstr(k) = "B-" Then Call B52_R
If tempstr(k) = "B-" Then Call CY_BB
If tempstr(k) = "B-" Then Call limitB_RN
If tempstr(k) = "B-" Then Call limitB_L
If tempstr(k) = "B-" Then Call B52_N
If tempstr(k) = "C+" Then Call CY_up
If tempstr(k) = "C++" Then Call CY_up2
If tempstr(k) = "C-" Then Call CY_down
If tempstr(k) = "C--" Then Call CY_down2
Next
End Sub

```

```

Public Sub tempstr2()
tempstr = Split(Text2, " ")

```

```

    For k = 0 To UBound(tempstr)

If tempstr(k) = "A+" Then Call A52_L
    If tempstr(k) = "A+" Then Call CY_FA
    If tempstr(k) = "A+" Then Call limitA_LN
    If tempstr(k) = "A+" Then Call limitA_R
    If tempstr(k) = "B+" Then Call B52_L
    If tempstr(k) = "B+" Then Call CY_FB
    If tempstr(k) = "B+" Then Call limitB_LN
    If tempstr(k) = "B+" Then Call limitB_R
    If tempstr(k) = "A-" Then Call A52_R
    If tempstr(k) = "A-" Then Call CY_BA
    If tempstr(k) = "A-" Then Call limitA_RN
    If tempstr(k) = "A-" Then Call limitA_L
    If tempstr(k) = "A-" Then Call A52_N

```



```
If tempstr(k) = "B-" Then Call B52_R
If tempstr(k) = "B-" Then Call CY_BB
If tempstr(k) = "B-" Then Call limitB_RN
If tempstr(k) = "B-" Then Call limitB_L
If tempstr(k) = "B-" Then Call B52_N
If tempstr(k) = "C+" Then Call CY_up
If tempstr(k) = "C++" Then Call CY_up2
If tempstr(k) = "C-" Then Call CY_down
If tempstr(k) = "C--" Then Call CY_down2
Next
End Sub
```

```
Public Sub tempstr3()
```

```
tempstr = Split(Text3, " ")
```

```
For k = 0 To UBound(tempstr)
```

```
If tempstr(k) = "A+" Then Call A52_L
If tempstr(k) = "A+" Then Call CY_FA
If tempstr(k) = "A+" Then Call limitA_LN
If tempstr(k) = "A+" Then Call limitA_R
If tempstr(k) = "B+" Then Call B52_L
If tempstr(k) = "B+" Then Call CY_FB
If tempstr(k) = "B+" Then Call limitB_LN
If tempstr(k) = "B+" Then Call limitB_R
If tempstr(k) = "A-" Then Call A52_R
If tempstr(k) = "A-" Then Call CY_BA
If tempstr(k) = "A-" Then Call limitA_RN
If tempstr(k) = "A-" Then Call limitA_L
If tempstr(k) = "A-" Then Call A52_N
If tempstr(k) = "B-" Then Call B52_R
If tempstr(k) = "B-" Then Call CY_BB
If tempstr(k) = "B-" Then Call limitB_RN
If tempstr(k) = "B-" Then Call limitB_L
If tempstr(k) = "B-" Then Call B52_N
If tempstr(k) = "C+" Then Call CY_up
If tempstr(k) = "C++" Then Call CY_up2
If tempstr(k) = "C-" Then Call CY_down
If tempstr(k) = "C--" Then Call CY_down2
```

```
Next  
End Sub
```

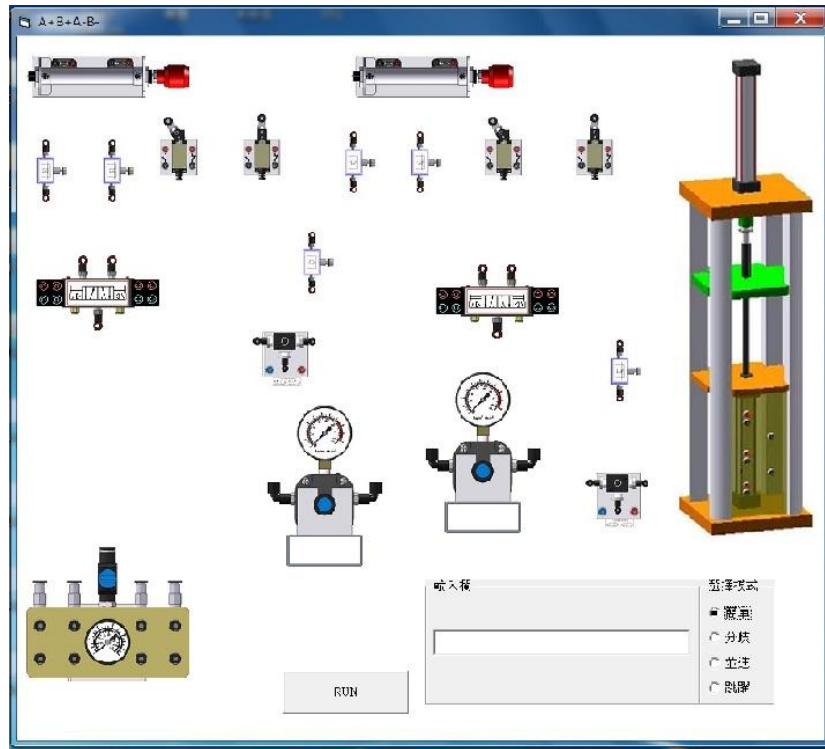
```
Public Sub tempstr4()  
tempstr = Split(Text4, " ")
```

```
    For k = 0 To UBound(tempstr)
```

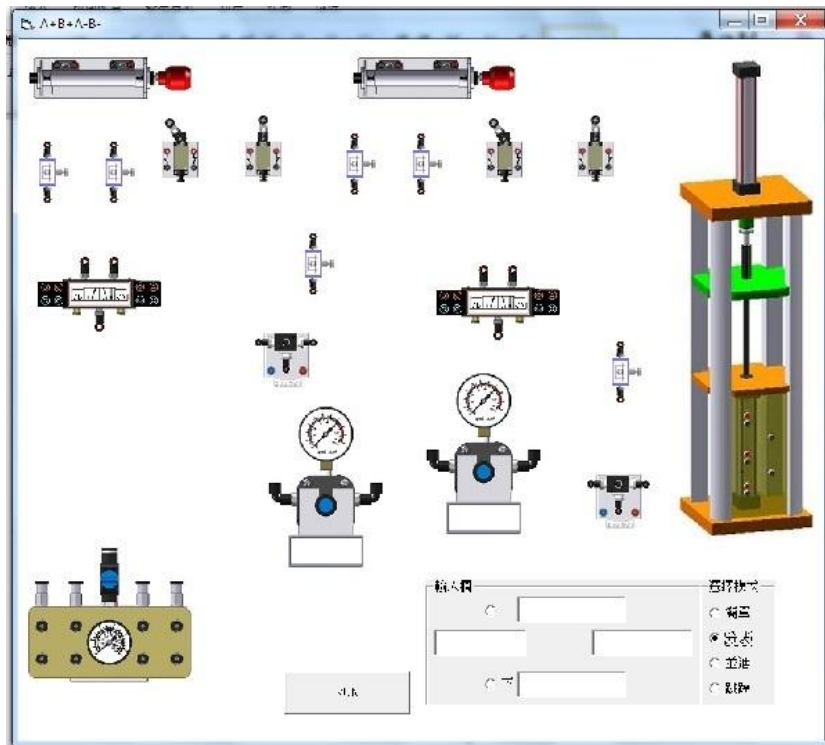
```
        If tempstr(k) = "A+" Then Call A52_L  
            If tempstr(k) = "A+" Then Call CY_FA  
            If tempstr(k) = "A+" Then Call limitA_LN  
            If tempstr(k) = "A+" Then Call limitA_R  
            If tempstr(k) = "B+" Then Call B52_L  
            If tempstr(k) = "B+" Then Call CY_FB  
            If tempstr(k) = "B+" Then Call limitB_LN  
            If tempstr(k) = "B+" Then Call limitB_R  
            If tempstr(k) = "A-" Then Call A52_R  
            If tempstr(k) = "A-" Then Call CY_BA  
            If tempstr(k) = "A-" Then Call limitA_RN  
            If tempstr(k) = "A-" Then Call limitA_L  
            If tempstr(k) = "A-" Then Call A52_N  
            If tempstr(k) = "B-" Then Call B52_R  
            If tempstr(k) = "B-" Then Call CY_BB  
            If tempstr(k) = "B-" Then Call limitB_RN  
            If tempstr(k) = "B-" Then Call limitB_L  
            If tempstr(k) = "B-" Then Call B52_N  
            If tempstr(k) = "C+" Then Call CY_up  
            If tempstr(k) = "C++" Then Call CY_up2  
            If tempstr(k) = "C-" Then Call CY_down  
            If tempstr(k) = "C--" Then Call CY_down2
```

```
    Next  
End Sub
```

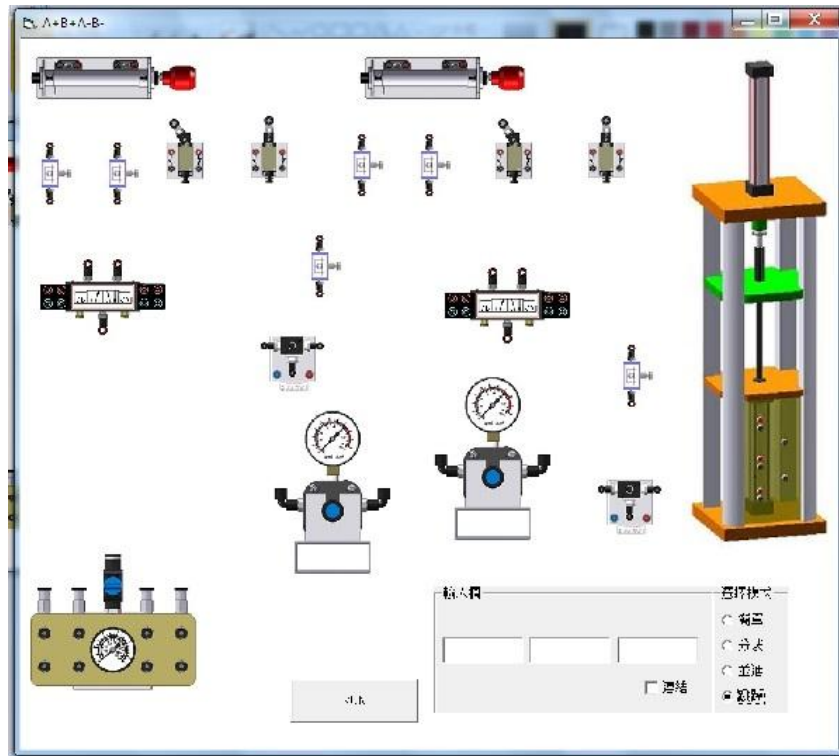
3-2. 成果照片



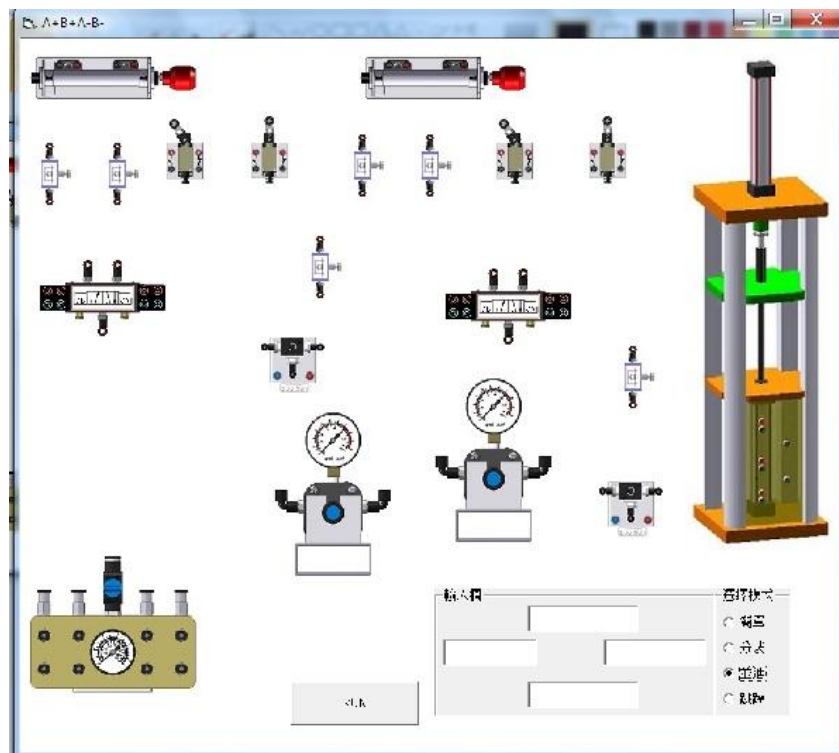
(成果圖 - 單一)



(成果圖 - 分歧)



(成果圖 - 跳躍)



(成果圖 - 並進)

第四章 問題與討論

4-1. 製作過程遇到的問題及解決辦法

<問題一>

無法在 VB 圖片上畫線? :

原先在 Picture Box 中無法畫線畫在圖面使圖與圖連接來代表氣壓管路，之後不用 Picture Box 而改用 Image 後才可解決無法畫在圖面上的問題。

<問題二>

分歧程式編寫上如何選擇分歧點的先後順序?

解決方法 :

在編寫這個部份的時候，我們讓使用者分別在四個 Text Box 裡輸入執行動作，但是遇到沒有辦法讓使用者自由選擇是要先執行上分歧還是下分歧;但最後我們是以『Option Button』作為解答，這個功能讓它的分歧點受到限制讓它可以依使用者的選擇去執行是要上執行或是下執行的動作。

<問題三>

跳躍如何解決選擇不跳躍而連結所有輸入動作？

解決方法：

在跳躍這部分我們設計使用者在執行時點選『跳躍模式』時表單上的 Textbox 會由四個變成三個並行的 Textbox，在其上面輸入指令動作。

動作重點在於程式執行時第一指令與第三指令會做動作，而忽略第二指令。

為了讓使用者能夠選擇是否執行第二指令，

我們用「連結」這個做為觸發條件，點選時它會強制執行第二指令而不是將其忽略，其原理跟分期相同。

第五章 結論

5-1. 結語

經過這次的專題我們做出這個尚未完成的教材，還有許多可以改善的地方，也尚有許多 Idea 在萌芽中，相信這個教材可以給予許多教授老師們很大的方便，也可以使學生們有更大的興趣來學習這套軟體。

5-2. 工作分配

項目	負責人員
Solid Works 繪圖	全員
VB 程式設計	陳家弘、簡盟家
文書製作	林忠慶、謝宗旻
資料查詢	全員
報告	蕭博雅、簡盟家

5-3. 參考資料

作者	書名	出版社
ACE 工作室	Visual Basic 實用教材	全華科技圖書股份有限公司
李 天 啟	VB6.0 中文版易學易用專輯	碁峰資訊股份有限公司
許 華 青	Visual Basic 6.0 程式設計	高立圖書有限公司

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在氣液壓實驗室的學習過程，老師的教導幫助和同學們的鼓勵打氣，一直是我前進最大的動力。若不是有同學們的互相勉勵和支持，這篇論文將無法完成，感謝你們。

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