ANEXO I

♦ Código fuente del programa

A continuación se detalla la totalidad del código fuente utilizado para cada uno de los formularios y módulos que componen el programa.

En total, el programa realizado en lenguaje Visual Basic 6.0, está dividido en 24 formularios y 2 módulos.

- Begin VB.Form **CalcErrInterpol**

```
   Caption         =   "Interpolación"
   ClientHeight    =   1335
   ClientLeft      =   8175
   ClientTop       =   6615
   ClientWidth     =   3420
   LinkTopic       =   "Form1"
   MaxButton       =   0   'False
   MinButton       =   0   'False
   Moveable        =   0   'False
   ScaleHeight     =   1335
   ScaleWidth      =   3420
   StartUpPosition =   2  'CenterScreen
   Begin VB.Frame Frame1
      Caption         =   "Calculando"
      Height          =   825
      Left            =   180
      TabIndex        =   0
      Top             =   180
      Width           =   3045
      Begin VB.Label Label1
         Caption         =   "Calculando errores de interpolación..."
         Height          =   225
         Left            =   180
         TabIndex        =   1
         Top             =   330
         Width           =   2730
      End
   End
End
Attribute VB_Name = "CalcErrInterpol"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
```

- Begin VB.Form **GraficosErroresInt**

```
   AutoRedraw      =   -1  'True
   Caption         =   "Errores de interpolación"
   ClientHeight    =   8460
   ClientLeft      =   6870
   ClientTop       =   1065
   ClientWidth     =   11145
   LinkTopic       =   "Form1"
   MaxButton       =   0   'False
   ScaleHeight     =   8460
   ScaleWidth      =   11145
   Begin VB.Frame Frame1
      Caption         =   "Gráficos de errores de interpolación para
cada eje de medición"
      Height          =   8145
      Left            =   150
      TabIndex        =   0
      Top             =   75
      Width           =   10740
      Begin MSChart20Lib.MSChart MSChart3
         DragMode        =   1  'Automatic
         Height          =   2505
         Left            =   180
         OleObjectBlob   =   "ErroresInt2.frx":0000
         TabIndex        =   1
         Top             =   5550
         Width           =   10410
      End
      Begin MSChart20Lib.MSChart MSChart2
         DragMode        =   1  'Automatic
         Height          =   2505
         Left            =   180
         OleObjectBlob   =   "ErroresInt2.frx":2386
         TabIndex        =   2
         Top             =   2955
         Width           =   10410
      End
      Begin MSChart20Lib.MSChart MSChart1
         DragMode        =   1  'Automatic
         Height          =   2505
         Left            =   180
         OleObjectBlob   =   "ErroresInt2.frx":470C
         TabIndex        =   3
         Top             =   285
         Width           =   10410
      End
   End
   Begin VB.Menu mnuOp
      Caption         =   "Opciones"
      Begin VB.Menu mnuDatAsociados
         Caption         =   "Datos numéricos"
      End
      Begin VB.Menu mnuSalir
         Caption         =   "Salir"
      End
   End
End
Attribute VB_Name = "GraficosErroresInt"
Attribute VB_GlobalNameSpace = False
```

```
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Private Sub mnuDatAsociados_Click()
DatosNumDeErrInt.Show
End Sub
Private Sub mnuSalir_Click()
GraficosErroresInt.Visible = False
DatosNumDeErrInt.Visible = False
End Sub
```

- Begin VB.Form **AbrirOrigen**

```
  Caption         =   "Selección de fichero de puntos medidos"
ClientHeight    =   5430
ClientLeft      =   3585
ClientTop       =   3450
ClientWidth     =   8790
LinkTopic       =   "Form13"
MaxButton       =   0   'False
MinButton       =   0   'False
ScaleHeight     =   5430
ScaleWidth      =   8790
StartUpPosition =   2  'CenterScreen
Begin VB.CommandButton Command1
   Caption         =   "Aceptar"
   Height          =   495
   Left            =   165
   TabIndex        =   4
   Top             =   4740
   Width           =   1005
End
Begin VB.CommandButton Command2
   Caption         =   "Salir"
   Height          =   495
   Left            =   7545
   TabIndex        =   5
   Top             =   4740
   Width           =   1005
End
Begin VB.Frame Frame2
   Caption         =   "Ruta y nombre del fichero origen de puntos"
   Height          =   1110
   Left            =   165
   TabIndex        =   10
   Top             =   3480
   Width           =   8385
   Begin VB.TextBox Text1
      Height          =   330
      Left            =   2205
      TabIndex        =   3
      Top             =   405
      Width           =   5670
   End
   Begin VB.Label Label4
      Caption         =   "Fichero seleccionado:"
      Height          =   270
      Left            =   615
      TabIndex        =   11
      Top             =   450
```

```
         Width           =   1635
      End
   End
   Begin VB.Frame Frame1
      Caption         =   "Situación del fichero de puntos tomados con
máquina medidora de coordenadas"
      Height          =   3360
      Left            =   165
      TabIndex        =   6
      Top             =   120
      Width           =   8385
      Begin VB.FileListBox File1
         Height          =   2625
         Hidden          =   -1  'True
         Left            =   5115
         Pattern         =   "*.mea"
         TabIndex        =   2
         Top             =   525
         Width           =   3030
      End
      Begin VB.DirListBox Dir1
         Height          =   2565
         Left            =   1380
         TabIndex        =   1
         Top             =   525
         Width           =   3495
      End
      Begin VB.DriveListBox Drive1
         Height          =   315
         Left            =   105
         TabIndex        =   0
         Top             =   525
         Width           =   1200
      End
      Begin VB.Label Label1
         Caption         =   "Unidad de disco"
         Height          =   210
         Left            =   105
         TabIndex        =   9
         Top             =   225
         Width           =   1200
      End
      Begin VB.Label Label2
         Caption         =   "Árbol de directorio: "
         Height          =   210
         Left            =   1380
         TabIndex        =   8
         Top             =   225
         Width           =   3465
      End
      Begin VB.Label Label3
         Caption         =   "Nombre de fichero de extensión ""mea""
:"
         Height          =   210
         Left            =   5070
         TabIndex        =   7
         Top             =   225
         Width           =   3015
      End
   End
```

```
End
Attribute VB_Name = "AbrirOrigen"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Public origen As String
Public n As Integer
Private Sub Command1_Click()
If Text1.Text = "" Then
    MsgBox "Seleccionar fichero de puntos", vbCritical, "Fichero
origen de puntos"
    AbrirOrigen.Show
Else
    AbrirOrigen.Visible = False
    Presentacion.mnuFicheroSinCompensar.Enabled = True
    Presentacion.mnuCompensacion.Enabled = True
    Presentacion.mnuInterpolacion.Enabled = True
End If
End Sub
Private Sub Command2_Click()
AbrirOrigen.Visible = False
End Sub
Private Sub Dir1_Change()
File1.Path = Dir1.Path
End Sub
Private Sub Drive1_Change()
Dir1.Path = Drive1.Drive
End Sub
Private Sub File1_dblClick()
origen$ = Dir1.Path + "\" + File1.FileName
ParametrosCompensacion.Combo1.Text = "Medición en ejes Y,Z"
Text1.Text = origen$
Command1.SetFocus
End Sub
Private Sub file1_keypress(keyascii As Integer)
If keyascii = 13 Then
    origen$ = Dir1.Path + "\" + File1.FileName
    ParametrosCompensacion.Combo1.Text = "Medición en ejes Y,Z"
    Text1.Text = origen$
    Command1.SetFocus
End If
End Sub
```

- Begin VB.Form **ParametrosCompensacion**

```
      Caption         =   "Parámetros de compensación"
   ClientHeight    =   4425
   ClientLeft      =   3315
   ClientTop       =   4500
   ClientWidth     =   4980
   LinkTopic       =   "Form15"
   MaxButton       =   0   'False
   ScaleHeight     =   4425
   ScaleWidth      =   4980
   StartUpPosition =   2  'CenterScreen
   Begin VB.Frame Frame4
      Caption         =   "Ejes de medición usados en la toma de
puntos"
      Height          =   1000
```

```
      Left            =   210
      TabIndex        =   9
      Top             =   1400
      Width           =   4560
      Begin VB.ComboBox Combo1
         Height          =   315
         ItemData        =   "Form15.frx":0000
         Left            =   2295
         List            =   "Form15.frx":000D
         Style           =   2  'Dropdown List
         TabIndex        =   1
         Top             =   375
         Width           =   2010
      End
      Begin VB.Label Label1
         Caption         =   "Seleccionar ejes de medición:"
         Height          =   270
         Left            =   165
         TabIndex        =   10
         Top             =   420
         Width           =   2175
      End
   End
   Begin VB.Frame Frame2
      Caption         =   "Radio de la punta de la herramienta"
      Height          =   1000
      Left            =   210
      TabIndex        =   6
      Top             =   200
      Width           =   4560
      Begin VB.TextBox Text2
         Height          =   285
         Left            =   3375
         TabIndex        =   0
         Text            =   "1"
         Top             =   405
         Width           =   750
      End
      Begin VB.Label Label2
         Caption         =   "Introducir el radio de la punta de
herramienta:"
         Height          =   225
         Left            =   165
         TabIndex        =   8
         Top             =   435
         Width           =   3240
      End
      Begin VB.Label Label3
         Caption         =   "mm"
         Height          =   255
         Left            =   4155
         TabIndex        =   7
         Top             =   465
         Width           =   285
      End
   End
   Begin VB.Frame Frame1
      Caption         =   "Crear fichero de puntos compensados"
      Height          =   1000
      Left            =   210
```

```
      TabIndex        =   5
      Top             =   2600
      Width           =   4560
      Begin VB.CheckBox Check1
         Caption         =   "Crear fichero de puntos compensados al
realizar la compensación de puntos tomados"
         Height          =   360
         Left            =   285
         TabIndex        =   2
         Top             =   390
         Value           =   1  'Checked
         Width           =   4020
      End
   End
   Begin VB.CommandButton Command1
      Caption         =   "Cancelar"
      Height          =   495
      Left            =   3750
      TabIndex        =   4
      Top             =   3800
      Width           =   1005
   End
   Begin VB.CommandButton Command2
      Caption         =   "Aceptar"
      Height          =   495
      Left            =   180
      TabIndex        =   3
      Top             =   3800
      Width           =   1005
   End
End
Attribute VB_Name = "ParametrosCompensacion"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Private Sub Command1_Click()
ParametrosCompensacion.Visible = False
End Sub
Private Sub Command2_Click()
If ParametrosCompensacion.Text2.Text = "" Then
    MsgBox "Introducir valor del RADIO de la punta de herramienta",
vbExclamation, "Parametros de compensación"
    ParametrosCompensacion.Text2.SetFocus
Else
    ParametrosCompensacion.Visible = False
    If Check1.Value = 1 Then
        NombreCompensada.Show
        Presentacion.mnuHacerComp.Enabled = False
    End If
    If Check1.Value = 0 Then
        Presentacion.mnuHacerComp.Enabled = True
        Presentacion.mnuHacerComp.Caption = "Hacer compensación"
    End If
End If
End Sub
Private Sub Form_Load()
Text2.SelStart = 0
Text2.SelLength = 20
End Sub
```

```
Private Sub text2_keypress(keyascii As Integer)
If keyascii = 13 Then Combo1.SetFocus
End Sub
Private Sub Combo1_keypress(keyascii As Integer)
If keyascii = 13 Then Check1.SetFocus
End Sub
Private Sub check1_keypress(keyascii As Integer)
If keyascii = 13 Then Command2.SetFocus
End Sub
```

- Begin VB.Form **NombreInforme**

```
   Caption         =   "Guardar como..."
ClientHeight    =   4935
ClientLeft      =   9720
ClientTop       =   5520
ClientWidth     =   4245
LinkTopic       =   "Form16"
MaxButton       =   0   'False
MinButton       =   0   'False
ScaleHeight     =   4935
ScaleWidth      =   4245
Begin VB.CommandButton Command2
   Caption         =   "Salir"
   Height          =   495
   Left            =   3090
   TabIndex        =   7
   Top             =   4275
   Width           =   1005
End
Begin VB.Frame Frame2
   Caption         =   "Fichero de INFORME"
   Height          =   3890
   Left            =   165
   TabIndex        =   1
   Top             =   150
   Width           =   3945
   Begin VB.TextBox Text2
      Height          =   285
      Left            =   1575
      TabIndex        =   4
      Top             =   3420
      Width           =   1890
   End
   Begin VB.DirListBox Dir1
      Height          =   2790
      Left            =   1350
      TabIndex        =   3
      Top             =   600
      Width           =   2370
   End
   Begin VB.DriveListBox Drive1
      Height          =   315
      Left            =   255
      TabIndex        =   2
      Top             =   600
      Width           =   1095
   End
   Begin VB.Label Label4
      Caption         =   "Árbol de directorio:"
```

```
         Height          =   225
         Left            =   1350
         TabIndex        =   9
         Top             =   330
         Width           =   2025
      End
      Begin VB.Label Label1
         Caption         =   "Unidad:"
         Height          =   225
         Left            =   255
         TabIndex        =   8
         Top             =   330
         Width           =   840
      End
      Begin VB.Label Label2
         Caption         =   ".txt"
         Height          =   240
         Left            =   3450
         TabIndex        =   6
         Top             =   3450
         Width           =   300
      End
      Begin VB.Label Label3
         Caption         =   "Nombre del fichero: "
         Height          =   240
         Left            =   165
         TabIndex        =   5
         Top             =   3420
         Width           =   1440
      End
   End
   Begin VB.CommandButton Command1
      Caption         =   "Guardar"
      Height          =   495
      Left            =   165
      TabIndex        =   0
      Top             =   4275
      Width           =   1005
   End
End
Attribute VB_Name = "NombreInforme"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Public inf As String
Private Sub Command1_Click()
inf$ = Dir1.Path + "\" + Text2.Text + Label2.Caption
If NombreInforme.Text2.Text = "" Then
    MsgBox "No ha introducido ningún nombre.", vbCritical, "Crear
fichero"
    NombreInforme.Show
End If
INFORME_FINAL
MsgBox "Archivo guardado", vbExclamation, "Guardar"
NombreInforme.Visible = False
Presentacion.mnuVI.Enabled = True
End Sub
Private Sub Command2_Click()
NombreInforme.Visible = False
```

```
End Sub
Private Sub Drive1_Change()
Dir1.Path = Drive1.Drive
End Sub
Private Sub text2_keypress(keyascii As Integer)
If keyascii = 13 Then
    Command1.SetFocus
End If
End Sub
```

- Begin VB.Form **NombreSinCompensar**

```
  Caption         =   "Crear fichero"
ClientHeight    =   4935
ClientLeft      =   9720
ClientTop       =   5520
ClientWidth     =   4245
LinkTopic       =   "Form1"
MaxButton       =   0   'False
MinButton       =   0   'False
ScaleHeight     =   4935
ScaleWidth      =   4245
Begin VB.CommandButton Command2
   Caption         =   "Salir"
   Height          =   495
   Left            =   3090
   TabIndex        =   7
   Top             =   4275
   Width           =   1005
End
Begin VB.Frame Frame1
   Caption         =   "Fichero de puntos SIN COMPENSAR"
   Height          =   3990
   Left            =   165
   TabIndex        =   1
   Top             =   150
   Width           =   3945
   Begin VB.DriveListBox Drive1
      Height          =   315
      Left            =   255
      TabIndex        =   4
      Top             =   600
      Width           =   1095
   End
   Begin VB.DirListBox Dir1
      Height          =   2565
      Left            =   1350
      TabIndex        =   3
      Top             =   600
      Width           =   2370
   End
   Begin VB.TextBox Text1
      Height          =   285
      Left            =   1575
      TabIndex        =   2
      Top             =   3420
      Width           =   1890
   End
   Begin VB.Label Label4
      Caption         =   "Árbol de directorio:"
```

```
         Height          =   225
         Left            =   1350
         TabIndex        =   9
         Top             =   330
         Width           =   2025
      End
      Begin VB.Label Label3
         Caption         =   "Unidad:"
         Height          =   225
         Left            =   255
         TabIndex        =   8
         Top             =   330
         Width           =   840
      End
      Begin VB.Label Label2
         Caption         =   ".txt"
         Height          =   240
         Left            =   3450
         TabIndex        =   6
         Top             =   3450
         Width           =   300
      End
      Begin VB.Label Label1
         Caption         =   "Nombre del fichero: "
         Height          =   240
         Left            =   165
         TabIndex        =   5
         Top             =   3420
         Width           =   1440
      End
   End
   Begin VB.CommandButton Command1
      Caption         =   "Aceptar"
      Height          =   495
      Left            =   165
      TabIndex        =   0
      Top             =   4295
      Width           =   1005
   End
End
Attribute VB_Name = "NombreSinCompensar"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Public sc As String
Private Sub Command1_Click()
sc$ = Dir1.Path + "\" + Text1.Text + Label2.Caption
If NombreSinCompensar.Text1.Text <> "" Then
    PUNTOS_TOMADOS
    MATRICES_XYZ
    GUARDAR_MATRICES_XYZ
    NombreSinCompensar.Visible = False
    Presentacion.mnuVMSC.Enabled = True
End If
If NombreSinCompensar.Text1.Text = "" Then
    MsgBox "No ha introducido ningún nombre.", vbCritical, "Crear
fichero"
    NombreSinCompensar.Show
    NombreSinCompensar.Text1.SetFocus
```

```
End If
End Sub
Private Sub Command2_Click()
NombreSinCompensar.Visible = False
End Sub
Private Sub text1_keypress(keyascii As Integer)
If keyascii = 13 Then
    Command1.SetFocus
End If
End Sub
Private Sub Drive1_Change()
Dir1.Path = Drive1.Drive
End Sub
```

- Begin VB.Form **NombreCompensada**

```
Caption         =   "Crear fichero"
ClientHeight    =   4935
ClientLeft      =   9720
ClientTop       =   5520
ClientWidth     =   4245
LinkTopic       =   "Form1"
MaxButton       =   0   'False
MinButton       =   0   'False
ScaleHeight     =   4935
ScaleWidth      =   4245
Begin VB.CommandButton Command2
   Caption         =   "Salir"
   Height          =   495
   Left            =   3090
   TabIndex        =   2
   Top             =   4275
   Width           =   1005
End
Begin VB.Frame Frame1
   Caption         =   "Fichero de puntos COMPENSADOS"
   Height          =   3990
   Left            =   165
   TabIndex        =   3
   Top             =   150
   Width           =   3945
   Begin VB.TextBox Text1
      Height          =   285
      Left            =   1575
      TabIndex        =   0
      Top             =   3420
      Width           =   1890
   End
   Begin VB.DirListBox Dir1
      Height          =   2790
      Left            =   1350
      TabIndex        =   5
      Top             =   600
      Width           =   2370
   End
   Begin VB.DriveListBox Drive1
      Height          =   315
      Left            =   255
      TabIndex        =   4
      Top             =   600
```

```
         Width           =   1095
      End
      Begin VB.Label Label4
         Caption         =   "Árbol de directorio:"
         Height          =   225
         Left            =   1350
         TabIndex        =   9
         Top             =   300
         Width           =   2025
      End
      Begin VB.Label Label3
         Caption         =   "Unidad:"
         Height          =   225
         Left            =   255
         TabIndex        =   8
         Top             =   300
         Width           =   840
      End
      Begin VB.Label Label1
         Caption         =   "Nombre del fichero: "
         Height          =   240
         Left            =   165
         TabIndex        =   7
         Top             =   3420
         Width           =   1440
      End
      Begin VB.Label Label2
         Caption         =   ".txt"
         Height          =   240
         Left            =   3450
         TabIndex        =   6
         Top             =   3450
         Width           =   300
      End
   End
   Begin VB.CommandButton Command1
      Caption         =   "Aceptar"
      Height          =   495
      Left            =   165
      TabIndex        =   1
      Top             =   4275
      Width           =   1005
   End
End
Attribute VB_Name = "NombreCompensada"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Public compensado As String
Private Sub Command2_Click()
NombreCompensada.Visible = False
End Sub
Private Sub Drive1_Change()
Dir1.Path = Drive1.Drive
End Sub
Private Sub text1_keypress(keyascii As Integer)
If keyascii = 13 Then
    Command1.SetFocus
End If
```

```
End Sub
Private Sub Command1_Click()
compensado$ = Dir1.Path + "\" + Text1.Text + Label2.Caption
If NombreCompensada.Text1.Text = "" Then
    MsgBox "No ha introducido ningún nombre.", vbCritical, "Crear
fichero"
    NombreCompensada.Show
End If
MATRICES_COMPENSADAS
NombreCompensada.Visible = False
MsgBox "Compensación de puntos realizada.", vbInformation, "Realizar
compensación"
Presentacion.mnuFicheroCompensado.Enabled = True
End Sub
```

- Begin VB.Form **CalculandoInterpolacion**

```
   AutoRedraw      =   -1  'True
Caption         =   "Realizar interpolación de puntos"
ClientHeight    =   1650
ClientLeft      =   7305
ClientTop       =   7395
ClientWidth     =   5145
LinkTopic       =   "Form1"
MaxButton       =   0   'False
MinButton       =   0   'False
ScaleHeight     =   1650
ScaleMode       =   0  'User
ScaleWidth      =   5145
StartUpPosition =   2  'CenterScreen
Begin VB.Frame Frame1
   Caption         =   "Realizando interpolación"
   Height          =   1380
   Left            =   135
   TabIndex        =   0
   Top             =   135
   Width           =   4935
   Begin MSComctlLib.ProgressBar ProgressBar1
      DragMode        =   1  'Automatic
      Height          =   240
      Left            =   195
      TabIndex        =   1
      Top             =   570
      Width           =   4515
      _ExtentX        =   7964
      _ExtentY        =   423
      _Version        =   393216
      BorderStyle     =   1
      Appearance      =   0
      Scrolling       =   1
   End
   Begin VB.Label Label2
      BorderStyle     =   1  'Fixed Single
      DragMode        =   1  'Automatic
      Height          =   255
      Left            =   4260
      MousePointer    =   1  'Arrow
      TabIndex        =   3
      Top             =   915
      Width           =   465
```

```
         WordWrap        =   -1  'True
      End
      Begin VB.Label Label1
         Caption         =   "Calculando puntos..."
         Height          =   210
         Left            =   195
         TabIndex        =   2
         Top             =   285
         Width           =   2535
      End
   End
End
Attribute VB_Name = "CalculandoInterpolacion"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
```
Attribute VB_Exposed = Fals

- Begin VB.Form **NombreInterpolados**

```
      Caption         =   "Crear fichero"
   ClientHeight    =   4935
   ClientLeft      =   9720
   ClientTop       =   5520
   ClientWidth     =   4245
   LinkTopic       =   "Form1"
   MaxButton       =   0   'False
   MinButton       =   0   'False
   ScaleHeight     =   4935
   ScaleMode       =   0  'User
   ScaleWidth      =   4440.692
   Begin VB.CommandButton Command2
      Caption         =   "Salir"
      Height          =   495
      Left            =   3120
      TabIndex        =   7
      Top             =   4245
      Width           =   961
   End
   Begin VB.Frame Frame2
      Caption         =   "Fichero de puntos INTERPOLADOS"
      Height          =   3890
      Left            =   158
      TabIndex        =   1
      Top             =   150
      Width           =   3945
      Begin VB.DriveListBox Drive1
         Height          =   315
         Left            =   255
         TabIndex        =   4
         Top             =   600
         Width           =   1095
      End
      Begin VB.DirListBox Dir1
         Height          =   2790
         Left            =   1350
         TabIndex        =   3
         Top             =   600
         Width           =   2370
      End
```

```
      Begin VB.TextBox Text2
         Height          =   285
         Left            =   1575
         TabIndex        =   2
         Top             =   3420
         Width           =   1890
      End
      Begin VB.Label Label4
         Caption         =   "Árbol de directorio:"
         Height          =   225
         Left            =   1350
         TabIndex        =   9
         Top             =   330
         Width           =   2025
      End
      Begin VB.Label Label1
         Caption         =   "Unidad:"
         Height          =   225
         Left            =   255
         TabIndex        =   8
         Top             =   330
         Width           =   840
      End
      Begin VB.Label Label3
         Caption         =   "Nombre del fichero: "
         Height          =   240
         Left            =   165
         TabIndex        =   6
         Top             =   3420
         Width           =   1440
      End
      Begin VB.Label Label2
         Caption         =   ".txt"
         Height          =   240
         Left            =   3450
         TabIndex        =   5
         Top             =   3450
         Width           =   300
      End
   End
   Begin VB.CommandButton Command1
      Caption         =   "Aceptar"
      Height          =   495
      Left            =   158
      TabIndex        =   0
      Top             =   4275
      Width           =   961
   End
End
Attribute VB_Name = "NombreInterpolados"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Public interpolado As String
Private Sub Drive1_Change()
Dir1.Path = Drive1.Drive
End Sub
Private Sub text2_keypress(keyascii As Integer)
If keyascii = 13 Then Command1.SetFocus
```

```
End Sub
Private Sub Command1_Click()
interpolado$ = Dir1.Path + "\" + Text2.Text + Label2.Caption
If NombreInterpolados.Text2.Text = "" Then
    MsgBox "No ha introducido ningún nombre.", vbCritical, "Crear
fichero"
    NombreInterpolados.Show
End If
NombreInterpolados.Visible = False
Presentacion.mnuVMI.Enabled = True
Presentacion.mnuFicheroErroresInterpolacion.Enabled = True
INTERPOLACION
End Sub
```

- Begin VB.Form **NombreErrores**

```
Caption         =   "Crear fichero"
ClientHeight    =   4935
ClientLeft      =   9720
ClientTop       =   5520
ClientWidth     =   4245
LinkTopic       =   "Form1"
MaxButton       =   0   'False
MinButton       =   0   'False
ScaleHeight     =   4935
ScaleWidth      =   4245
Begin VB.CommandButton Command2
   Caption         =   "Salir"
   Height          =   495
   Left            =   3090
   TabIndex        =   2
   Top             =   4275
   Width           =   1005
End
Begin VB.Frame Frame1
   Caption         =   "Fichero de ERRORES DE COMPENSACIÓN"
   Height          =   3990
   Left            =   165
   TabIndex        =   3
   Top             =   150
   Width           =   3945
   Begin VB.TextBox Text1
      Height          =   285
      Left            =   1575
      TabIndex        =   0
      Top             =   3420
      Width           =   1890
   End
   Begin VB.DriveListBox Drive1
      Height          =   315
      Left            =   255
      TabIndex        =   5
      Top             =   600
      Width           =   1095
   End
   Begin VB.DirListBox Dir1
      Height          =   2790
      Left            =   1350
      TabIndex        =   4
      Top             =   600
```

```
         Width           =   2370
      End
      Begin VB.Label Label4
         Caption         =   "Árbol de directorio:"
         Height          =   225
         Left            =   1350
         TabIndex        =   9
         Top             =   330
         Width           =   2025
      End
      Begin VB.Label Label3
         Caption         =   "Unidad:"
         Height          =   225
         Left            =   255
         TabIndex        =   8
         Top             =   330
         Width           =   840
      End
      Begin VB.Label Label1
         Caption         =   "Nombre del fichero: "
         Height          =   240
         Left            =   165
         TabIndex        =   7
         Top             =   3420
         Width           =   1440
      End
      Begin VB.Label Label2
         Caption         =   ".txt"
         Height          =   240
         Left            =   3450
         TabIndex        =   6
         Top             =   3450
         Width           =   300
      End
   End
   Begin VB.CommandButton Command1
      Caption         =   "Aceptar"
      Height          =   495
      Left            =   165
      TabIndex        =   1
      Top             =   4275
      Width           =   1005
   End
End
Attribute VB_Name = "NombreErrores"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Public errores As String
Private Sub Command2_Click()
NombreErrores.Visible = False
End Sub
Private Sub Drive1_Change()
Dir1.Path = Drive1.Drive
End Sub
Private Sub text1_keypress(keyascii As Integer)
If keyascii = 13 Then
    Command1.SetFocus
End If
```

```
End Sub
Private Sub Command1_Click()
errores$ = Dir1.Path + "\" + Text1.Text + Label2.Caption
If NombreErrores.Text1.Text = "" Then
    MsgBox "No ha introducido ningún nombre.", vbCritical, "Crear
fichero"
    NombreErrores.Show
End If
If NombreErrores.Text1.Text <> "" Then
    MATRICES_COMPENSADAS_Y_ERRORES
    Presentacion.mnuVMEC.Enabled = True
    NombreErrores.Visible = False
End If
End Sub
```

- Begin VB.Form **NombreErroresInterpol**

```
  Caption         =   "Crear fichero"
   ClientHeight    =   4935
   ClientLeft      =   9720
   ClientTop       =   5520
   ClientWidth     =   4245
   LinkTopic       =   "Form1"
   MaxButton       =   0   'False
   MinButton       =   0   'False
   ScaleHeight     =   4935
   ScaleWidth      =   4245
   Begin VB.Frame Frame1
      Caption         =   "Fichero de ERRORES DE INTERPOLACIÓN"
      Height          =   3990
      Left            =   165
      TabIndex        =   2
      Top             =   150
      Width           =   3945
      Begin VB.TextBox Text1
         Height          =   285
         Left            =   1575
         TabIndex        =   5
         Top             =   3420
         Width           =   1890
      End
      Begin VB.DirListBox Dir1
         Height          =   2790
         Left            =   1350
         TabIndex        =   4
         Top             =   600
         Width           =   2370
      End
      Begin VB.DriveListBox Drive1
         Height          =   315
         Left            =   255
         TabIndex        =   3
         Top             =   600
         Width           =   1095
      End
      Begin VB.Label Label4
         Caption         =   "Árbol de directorio:"
         Height          =   225
         Left            =   1350
         TabIndex        =   9
```

```
         Top             =   330
         Width           =   2025
      End
      Begin VB.Label Label3
         Caption         =   "Unidad:"
         Height          =   225
         Left            =   255
         TabIndex        =   8
         Top             =   330
         Width           =   840
      End
      Begin VB.Label Label1
         Caption         =   "Nombre del fichero: "
         Height          =   240
         Left            =   165
         TabIndex        =   7
         Top             =   3420
         Width           =   1440
      End
      Begin VB.Label Label2
         Caption         =   ".txt"
         Height          =   240
         Left            =   3450
         TabIndex        =   6
         Top             =   3450
         Width           =   300
      End
   End
   Begin VB.CommandButton Command1
      Caption         =   "Aceptar"
      Height          =   495
      Left            =   165
      TabIndex        =   0
      Top             =   4295
      Width           =   1005
   End
   Begin VB.CommandButton Command2
      Caption         =   "Salir"
      Height          =   495
      Left            =   3090
      TabIndex        =   1
      Top             =   4295
      Width           =   1005
   End
End
Attribute VB_Name = "NombreErroresInterpol"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Public erroresInterpol As String
Private Sub Command1_Click()
erroresInterpol$ = Dir1.Path + "\" + Text1.Text + Label2.Caption
If NombreErroresInterpol.Text1.Text = "" Then
    MsgBox "No ha introducido ningún nombre.", vbCritical, "Crear
fichero"
    NombreErroresInterpol.Show
    NombreErroresInterpol.Text1.SetFocus
End If
If NombreErroresInterpol.Text1.Text <> "" Then
```

```
    NombreErroresInterpol.Visible = False
    Presentacion.mnuVMEI.Enabled = True
    CalcErrInterpol.Show
    INTERPOLACION
    End If
End Sub
Private Sub Command2_Click()
NombreErroresInterpol.Visible = False
End Sub
Private Sub text1_keypress(keyascii As Integer)
If keyascii = 13 Then
    Command1.SetFocus
End If
End Sub
Private Sub Drive1_Change()
Dir1.Path = Drive1.Drive
End Sub
```

- Begin VB.Form **MatrizErrInt**

```
   Caption         =   "Errores de interpolación"
   ClientHeight    =   8040
   ClientLeft      =   210
   ClientTop       =   765
   ClientWidth     =   4110
   LinkTopic       =   "Form1"
   MaxButton       =   0   'False
   MinButton       =   0   'False
   ScaleHeight     =   8040
   ScaleWidth      =   4110
   StartUpPosition =   2  'CenterScreen
   Begin VB.CommandButton Command2
      Caption         =   "Ver detalles>>"
      Height          =   495
      Left            =   2970
      TabIndex        =   0
      Top             =   7450
      Width           =   1005
   End
   Begin VB.Frame Frame1
      Caption         =   "Fichero de errores de interpolación"
      Height          =   7260
      Left            =   90
      TabIndex        =   2
      Top             =   90
      Width           =   3930
      Begin VB.TextBox Text1
         Height          =   6945
         Left            =   105
         MultiLine       =   -1  'True
         OLEDragMode     =   1  'Automatic
         OLEDropMode     =   2  'Automatic
         ScrollBars      =   3  'Both
         TabIndex        =   3
         Top             =   225
         Width           =   3690
      End
   End
   Begin VB.CommandButton Command1
      Caption         =   "Cerrar"
```

```
      Height          =   495
      Left            =   90
      TabIndex        =   1
      Top             =   7450
      Width           =   1005
   End
End
Attribute VB_Name = "MatrizErrInt"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Private Sub Command1_Click()
MatrizErrInt.Visible = False
End Sub
Private Sub Command2_Click()
GraficosErroresInt.Show
End Sub
```

- Begin VB.Form **DatosNumDeErrInt**

```
     Caption         =   "Datos numéricos asociados a errores de
interpolación"
   ClientHeight    =   3555
   ClientLeft      =   675
   ClientTop       =   7935
   ClientWidth     =   10050
   LinkTopic       =   "Form1"
   MaxButton       =   0   'False
   MinButton       =   0   'False
   ScaleHeight     =   3555
   ScaleWidth      =   10050
   StartUpPosition =   2  'CenterScreen
   Begin VB.Frame Frame3
      Caption         =   "Número de puntos generados"
      Height          =   720
      Left            =   7620
      TabIndex        =   35
      Top             =   2100
      Width           =   2340
      Begin VB.TextBox Text7
         BeginProperty Font
            Name            =   "MS Sans Serif"
            Size            =   8.25
            Charset         =   0
            Weight          =   700
            Underline       =   0   'False
            Italic          =   0   'False
            Strikethrough   =   0   'False
         EndProperty
         Height          =   300
         Left            =   555
         TabIndex        =   36
         Top             =   240
         Width           =   1185
      End
   End
   Begin VB.Frame Frame2
      Caption         =   "Número de puntos medidos"
      Height          =   720
```

```
      Left            =   5325
      TabIndex        =   33
      Top             =   2100
      Width           =   2190
      Begin VB.TextBox Text5
         Height          =   300
         Left            =   480
         TabIndex        =   34
         Top             =   240
         Width           =   1185
      End
   End
   Begin VB.CommandButton Command1
      Caption         =   "Cerrar"
      Height          =   495
      Left            =   8940
      TabIndex        =   0
      Top             =   2955
      Width           =   1005
   End
   Begin VB.Frame Frame1
      Caption         =   "Valores mínimos y máximos en la matriz de
errores de interpolación"
      Height          =   3330
      Left            =   135
      TabIndex        =   8
      Top             =   105
      Width           =   5100
      Begin VB.TextBox Text2
         Height          =   285
         Left            =   1650
         TabIndex        =   32
         Top             =   2820
         Width           =   1400
      End
      Begin VB.TextBox Text12
         Height          =   285
         Left            =   1650
         TabIndex        =   31
         Top             =   2370
         Width           =   1400
      End
      Begin VB.TextBox Text16
         Height          =   285
         Left            =   1650
         TabIndex        =   30
         Top             =   1755
         Width           =   1400
      End
      Begin VB.TextBox Text15
         Height          =   285
         Left            =   1650
         TabIndex        =   29
         Top             =   1305
         Width           =   1400
      End
      Begin VB.TextBox Text19
         Height          =   285
         Left            =   3885
         TabIndex        =   28
```

```
   Top             =   2820
   Width           =   1020
End
Begin VB.TextBox Text10
   Height          =   285
   Left            =   3885
   TabIndex        =   26
   Top             =   2370
   Width           =   1020
End
Begin VB.TextBox Text8
   Height          =   285
   Left            =   3885
   TabIndex        =   22
   Top             =   1755
   Width           =   1020
End
Begin VB.TextBox Text6
   Height          =   285
   Left            =   3885
   TabIndex        =   20
   Top             =   1305
   Width           =   1020
End
Begin VB.TextBox Text4
   Height          =   285
   Left            =   3885
   TabIndex        =   16
   Top             =   780
   Width           =   1020
End
Begin VB.TextBox Text14
   Height          =   285
   Left            =   1650
   TabIndex        =   14
   Top             =   780
   Width           =   1400
End
Begin VB.TextBox Text1
   Height          =   285
   Left            =   3885
   TabIndex        =   13
   Top             =   330
   Width           =   1020
End
Begin VB.TextBox Text13
   Height          =   285
   Left            =   1650
   TabIndex        =   12
   Top             =   330
   Width           =   1400
End
Begin VB.Label Label7
   Caption         =   "en punto"
   Height          =   240
   Left            =   3195
   TabIndex        =   27
   Top             =   2835
   Width           =   645
End
```

```
Begin VB.Label Label6
   Caption         =   "en punto"
   Height          =   240
   Left            =   3195
   TabIndex        =   25
   Top             =   2385
   Width           =   645
End
Begin VB.Label Label5
   Caption         =   "Valor máximo de Z:"
   Height          =   225
   Left            =   250
   TabIndex        =   24
   Top             =   2835
   Width           =   1380
End
Begin VB.Label Label4
   Caption         =   "Valor mínimo de Z:"
   Height          =   225
   Left            =   250
   TabIndex        =   23
   Top             =   2385
   Width           =   1380
End
Begin VB.Line Line2
   X1              =   150
   X2              =   4995
   Y1              =   2205
   Y2              =   2205
End
Begin VB.Label Label22
   Caption         =   "en punto"
   Height          =   240
   Left            =   3210
   TabIndex        =   21
   Top             =   1770
   Width           =   645
End
Begin VB.Label Label21
   Caption         =   "en punto"
   Height          =   240
   Left            =   3210
   TabIndex        =   19
   Top             =   1320
   Width           =   645
End
Begin VB.Label Label20
   Caption         =   "Valor máximo de Y:"
   Height          =   225
   Left            =   255
   TabIndex        =   18
   Top             =   1770
   Width           =   1380
End
Begin VB.Label Label19
   Caption         =   "Valor mínimo de Y:"
   Height          =   225
   Left            =   255
   TabIndex        =   17
   Top             =   1320
```

```
         Width           =   1380
      End
      Begin VB.Line Line1
         X1              =   150
         X2              =   4995
         Y1              =   1170
         Y2              =   1170
      End
      Begin VB.Label Label14
         Caption         =   "en punto"
         Height          =   240
         Left            =   3200
         TabIndex        =   15
         Top             =   800
         Width           =   645
      End
      Begin VB.Label Label13
         Caption         =   "en punto"
         Height          =   240
         Left            =   3200
         TabIndex        =   11
         Top             =   350
         Width           =   645
      End
      Begin VB.Label Label3
         Caption         =   "Valor máximo de X:"
         Height          =   225
         Left            =   250
         TabIndex        =   10
         Top             =   800
         Width           =   1380
      End
      Begin VB.Label Label2
         Caption         =   "Valor mínimo de X:"
         Height          =   225
         Left            =   250
         TabIndex        =   9
         Top             =   350
         Width           =   1380
      End
   End
   Begin VB.Frame Frame4
      Caption         =   "Desviación típica de los errores de
compensación"
      Height          =   1860
      Left            =   5325
      TabIndex        =   1
      Top             =   105
      Width           =   4635
      Begin VB.TextBox Text17
         Height          =   315
         Left            =   2925
         TabIndex        =   4
         Top             =   330
         Width           =   1400
      End
      Begin VB.TextBox Text18
         Height          =   315
         Left            =   2925
         TabIndex        =   3
```

```
         Top             =   780
         Width           =   1400
      End
      Begin VB.TextBox Text3
         Height          =   315
         Left            =   2925
         TabIndex        =   2
         Top             =   1230
         Width           =   1400
      End
      Begin VB.Label Label11
         Height          =   225
         Left            =   195
         TabIndex        =   7
         Top             =   400
         Width           =   2610
      End
      Begin VB.Label Label12
         Height          =   225
         Left            =   195
         TabIndex        =   6
         Top             =   850
         Width           =   2610
      End
      Begin VB.Label Label1
         Height          =   225
         Left            =   195
         TabIndex        =   5
         Top             =   1300
         Width           =   2610
      End
   End
End
Attribute VB_Name = "DatosNumDeErrInt"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Private Sub Command1_Click()
DatosNumDeErrInt.Visible = False
End Sub
```

- Begin VB.Form **PuntosInterpolados**

```
  Caption         =   "Fichero de puntos interpolados"
   ClientHeight    =   8220
   ClientLeft      =   1935
   ClientTop       =   1875
   ClientWidth     =   4140
   LinkTopic       =   "Form7"
   MaxButton       =   0   'False
   MinButton       =   0   'False
   ScaleHeight     =   8220
   ScaleWidth      =   4140
   Begin VB.CommandButton Command1
      Caption         =   "Cerrar"
      Height          =   495
      Left            =   1440
      TabIndex        =   0
      Top             =   7545
```

```
      Width           =   1005
   End
   Begin VB.Frame Frame1
      Caption         =   "Fichero de puntos interpolados"
      Height          =   7215
      Left            =   120
      TabIndex        =   1
      Top             =   150
      Width           =   3930
      Begin VB.TextBox Text1
         Height          =   6840
         Left            =   105
         MultiLine       =   -1  'True
         ScrollBars      =   3  'Both
         TabIndex        =   2
         Top             =   225
         Width           =   3690
      End
   End
End
Attribute VB_Name = "PuntosInterpolados"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Private Sub Command1_Click()
PuntosInterpolados.Visible = False
End Sub
```

- Begin VB.Form **Grafico**

```
  AutoRedraw      =   -1  'True
   BorderStyle     =   1  'Fixed Single
   Caption         =   "Grafico"
   ClientHeight    =   10395
   ClientLeft      =   1455
   ClientTop       =   900
   ClientWidth     =   16755
   KeyPreview      =   -1  'True
   LinkTopic       =   "Form8"
   ScaleHeight     =   10395
   ScaleMode       =   0  'User
   ScaleWidth      =   18552.54
   StartUpPosition =   2  'CenterScreen
   WindowState     =   2  'Maximized
   Begin VB.Frame Frame6
      Caption         =   "Ángulo de elevación"
      Height          =   1485
      Left            =   12465
      TabIndex        =   22
      Top             =   7320
      Width           =   4185
      Begin VB.TextBox Text5
         Height          =   285
         Left            =   1740
         TabIndex        =   26
         Text            =   "0"
         Top             =   1005
         Width           =   765
      End
```

```
      Begin VB.HScrollBar HScroll2
         Height          =   345
         LargeChange     =   10
         Left            =   315
         Max             =   270
         TabIndex        =   24
         Top             =   570
         Width           =   3705
      End
      Begin VB.Label Label6
         Caption         =   "°"
         Height          =   255
         Left            =   2535
         TabIndex        =   28
         Top             =   1005
         Width           =   165
      End
      Begin VB.Label Label4
         Caption         =   "Grados de rotación"
         Height          =   240
         Left            =   315
         TabIndex        =   25
         Top             =   1020
         Width           =   1425
      End
      Begin VB.Label Label3
         Caption         =   "Elevación"
         Height          =   210
         Left            =   315
         TabIndex        =   23
         Top             =   315
         Width           =   720
      End
   End
   Begin VB.Frame Frame5
      Caption         =   "Ángulo de rotación"
      Height          =   1515
      Left            =   12405
      TabIndex        =   17
      Top             =   5535
      Width           =   4260
      Begin VB.TextBox Text4
         Height          =   285
         Left            =   1740
         TabIndex        =   21
         Text            =   "0"
         Top             =   990
         Width           =   765
      End
      Begin VB.HScrollBar HScroll1
         Height          =   345
         LargeChange     =   10
         Left            =   315
         Max             =   180
         TabIndex        =   19
         Top             =   555
         Width           =   3705
      End
      Begin VB.Label Label5
         Caption         =   "°"
```

```
      Height          =   255
      Left            =   2535
      TabIndex        =   27
      Top             =   990
      Width           =   165
   End
   Begin VB.Label Label2
      Caption         =   "Grados de rotación"
      Height          =   240
      Left            =   315
      TabIndex        =   20
      Top             =   1005
      Width           =   1425
   End
   Begin VB.Label Label1
      Caption         =   "Rotación"
      Height          =   210
      Left            =   315
      TabIndex        =   18
      Top             =   300
      Width           =   720
   End
End
Begin VB.Frame Frame2
   Caption         =   "Número de puntos medidos"
   Height          =   885
   Left            =   12330
   TabIndex        =   15
   Top             =   2595
   Width           =   2385
   Begin VB.TextBox Text1
      Height          =   300
      Left            =   630
      TabIndex        =   16
      Top             =   330
      Width           =   1185
   End
End
Begin VB.Frame Frame4
   Caption         =   "Número de puntos generados"
   Height          =   885
   Left            =   12330
   TabIndex        =   13
   Top             =   3690
   Width           =   2385
   Begin VB.TextBox Text3
      BeginProperty Font
         Name            =   "MS Sans Serif"
         Size            =   8.25
         Charset         =   0
         Weight          =   700
         Underline       =   0   'False
         Italic          =   0   'False
         Strikethrough   =   0   'False
      EndProperty
      Height          =   300
      Left            =   630
      TabIndex        =   14
      Top             =   330
      Width           =   1185
```

```
   End
End
Begin VB.Frame Frame3
   Caption         =   "Valores máximos y mínimos en milimetros"
   Height          =   2200
   Left            =   12330
   TabIndex        =   3
   Top             =   210
   Width           =   4290
   Begin VB.TextBox Text2
      Height          =   350
      Left            =   2700
      TabIndex        =   9
      Top             =   1550
      Width           =   1400
   End
   Begin VB.TextBox Text12
      Height          =   350
      Left            =   225
      TabIndex        =   8
      Top             =   1550
      Width           =   1400
   End
   Begin VB.TextBox Text13
      Height          =   350
      Left            =   225
      TabIndex        =   7
      Top             =   450
      Width           =   1400
   End
   Begin VB.TextBox Text14
      Height          =   350
      Left            =   2700
      TabIndex        =   6
      Top             =   450
      Width           =   1400
   End
   Begin VB.TextBox Text15
      Height          =   350
      Left            =   225
      TabIndex        =   5
      Top             =   1000
      Width           =   1400
   End
   Begin VB.TextBox Text16
      Height          =   350
      Left            =   2700
      TabIndex        =   4
      Top             =   1000
      Width           =   1400
   End
   Begin VB.Label Label8
      Caption         =   "< Z <"
      BeginProperty Font
         Name            =   "Courier New"
         Size            =   12
         Charset         =   0
         Weight          =   400
         Underline       =   0   'False
         Italic          =   0   'False
```

```
            Strikethrough   =   0   'False
         EndProperty
         Height          =   315
         Left            =   1800
         TabIndex        =   12
         Top             =   1580
         Width           =   885
      End
      Begin VB.Label Label9
         Caption         =   "< Y <"
         BeginProperty Font
            Name            =   "Courier New"
            Size            =   12
            Charset         =   0
            Weight          =   400
            Underline       =   0   'False
            Italic          =   0   'False
            Strikethrough   =   0   'False
         EndProperty
         Height          =   315
         Left            =   1800
         TabIndex        =   11
         Top             =   1030
         Width           =   795
      End
      Begin VB.Label Label10
         Caption         =   "< X <"
         BeginProperty Font
            Name            =   "Courier New"
            Size            =   12
            Charset         =   0
            Weight          =   400
            Underline       =   0   'False
            Italic          =   0   'False
            Strikethrough   =   0   'False
         EndProperty
         Height          =   315
         Left            =   1800
         TabIndex        =   10
         Top             =   480
         Width           =   870
      End
   End
   Begin VB.CommandButton Command1
      Caption         =   "Cerrar"
      Height          =   435
      Left            =   12330
      TabIndex        =   0
      Top             =   4830
      Width           =   1365
   End
   Begin VB.Frame Frame1
      Caption         =   "Representación gráfica de puntos
interpolados"
      Height          =   10080
      Left            =   255
      TabIndex        =   1
      Top             =   210
      Width           =   11790
      Begin MSChart20Lib.MSChart MSChart1
```

```
         DragMode        =   1  'Automatic
         Height          =   9570
         Left            =   105
         OleObjectBlob   =   "Form8.frx":0000
         TabIndex        =   2
         Top             =   300
         Width           =   11535
      End
   End
   Begin VB.Menu mnuOpciones
      Caption         =   "Opciones"
      Begin VB.Menu mnuCopiar
         Caption         =   "Copiar gráfico"
         Shortcut        =   ^C
      End
      Begin VB.Menu mnuSalir
         Caption         =   "Salir"
      End
   End
End
Attribute VB_Name = "Grafico"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Private Sub Command1_Click()
Grafico.Visible = False
Presentacion.mnuCompensacion.Enabled = False
Presentacion.mnuHacerComp.Enabled = False
Presentacion.mnuFicheroCompensado.Enabled = False
Presentacion.mnuInterpolacion.Enabled = False
Presentacion.mnuInterpol.Enabled = False
Presentacion.mnuFicheroErroresInterpolacion.Enabled = False
End Sub
Private Sub Form_Load()
MSChart1.Plot.View3d.Rotation = 0
MSChart1.Plot.View3d.Elevation = 0
End Sub
Private Sub HScroll1_Change()
MSChart1.Plot.View3d.Rotation = HScroll1.Value
Text4.Text = HScroll1.Value
End Sub
Private Sub HScroll2_Change()
MSChart1.Plot.View3d.Elevation = HScroll2.Value
Text5.Text = HScroll2.Value
End Sub
Private Sub mnuCopiar_Click()
MSChart1.EditCopy
MsgBox "El gráfico se ha copiado en el portapapeles", vbInformation,
"Copiar"
Command1.SetFocus
End Sub
Private Sub mnuSalir_Click()
Eleccion = MsgBox("¿Salir del programa?", vbOKCancel, "Salir")
If Eleccion = 1 Then End
If Eleccion = 2 Then
    Unload Grafico
    Presentacion.mnuResultados.Enabled = False
End If
End Sub
```

- Begin VB.Form **Informe**

```
      Caption         =   "Resultados"
   ClientHeight    =   8415
   ClientLeft      =   60
   ClientTop       =   450
   ClientWidth     =   10170
   LinkTopic       =   "Form9"
   MaxButton       =   0   'False
   MinButton       =   0   'False
   ScaleHeight     =   8415
   ScaleWidth      =   10170
   StartUpPosition =   2  'CenterScreen
   Begin VB.CommandButton Command1
      Caption         =   "Cerrar"
      Height          =   400
      Left            =   3960
      TabIndex        =   2
      Top             =   7800
      Width           =   1600
   End
   Begin VB.Frame Frame1
      Caption         =   "Informe final de puntos interpolados"
      Height          =   7545
      Left            =   135
      TabIndex        =   0
      Top             =   75
      Width           =   9885
      Begin VB.TextBox Text1
         Height          =   7155
         Left            =   75
         MultiLine       =   -1  'True
         ScrollBars      =   3  'Both
         TabIndex        =   1
         Top             =   240
         Width           =   9705
      End
   End
End
Attribute VB_Name = "Informe"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Private Sub Command1_Click()
Informe.Visible = False
End Sub
```

- Begin VB.Form **Presentacion**

```
     BackColor       =   &H80000013&
   Caption         =   "Integración de la máquina de coordenadas en
entornos CAD/CAM"
   ClientHeight    =   3015
   ClientLeft      =   5205
   ClientTop       =   3885
   ClientWidth     =   8760
   ControlBox      =   0   'False
```

```
   FontTransparent =   0   'False
   Icon            =   "PROG1.frx":0000
   LinkTopic       =   "Form1"
   MaxButton       =   0   'False
   Moveable        =   0   'False
   ScaleHeight     =   3015
   ScaleMode       =   0  'User
   ScaleWidth      =   8760
   StartUpPosition =   2  'CenterScreen
   Visible         =   0   'False
   Begin MSComctlLib.StatusBar StatusBar1
      Align           =   2  'Align Bottom
      Height          =   255
      Left            =   0
      Negotiate       =   -1  'True
      TabIndex        =   5
      Top             =   2760
      Width           =   8760
      _ExtentX        =   15452
      _ExtentY        =   450
      Style           =   1
      _Version        =   393216
      BeginProperty Panels {8E3867A5-8586-11D1-B16A-00C0F0283628}
         NumPanels       =   1
         BeginProperty Panel1 {8E3867AB-8586-11D1-B16A-00C0F0283628}
         EndProperty
      EndProperty
   End
   Begin VB.TextBox Text1
      Enabled         =   0   'False
      Height          =   450
      Left            =   1800
      TabIndex        =   1
      Text            =   "Text1"
      Top             =   4080
      Visible         =   0   'False
      Width           =   600
   End
   Begin VB.Timer Timer1
      Interval        =   100
      Left            =   975
      Top             =   4380
   End
   Begin VB.PictureBox Picture1
      AutoSize        =   -1  'True
      Height          =   2385
      Left            =   420
      Picture         =   "PROG1.frx":0442
      ScaleHeight     =   2325
      ScaleWidth      =   2325
      TabIndex        =   0
      Top             =   210
      Width           =   2385
   End
   Begin VB.Label Label1
      BackStyle       =   0  'Transparent
      Caption         =   "Departamento de Ingeniería de Materiales y
Fabricación"
      BeginProperty Font
         Name            =   "Arial Narrow"
```

```
         Size            =   9.75
         Charset         =   0
         Weight          =   400
         Underline       =   0   'False
         Italic          =   0   'False
         Strikethrough   =   0   'False
      EndProperty
      Height          =   285
      Left            =   3600
      TabIndex        =   6
      Top             =   870
      Width           =   4050
   End
   Begin VB.Label Label7
      BackStyle       =   0  'Transparent
      BorderStyle     =   1  'Fixed Single
      Caption         =   "Programa realizado por Sebastián Ginés Picó
Vicente"
      Height          =   270
      Left            =   2910
      TabIndex        =   4
      Top             =   2350
      Width           =   3855
   End
   Begin VB.Label Label6
      Alignment       =   2  'Center
      BackStyle       =   0  'Transparent
      Caption         =   "Escuela Técnica Superior de Ingeniería
Industrial"
      BeginProperty Font
         Name            =   "Garamond"
         Size            =   12
         Charset         =   0
         Weight          =   700
         Underline       =   0   'False
         Italic          =   0   'False
         Strikethrough   =   0   'False
      EndProperty
      Height          =   285
      Left            =   2910
      TabIndex        =   3
      Top             =   450
      Width           =   5580
   End
   Begin VB.Label Label5
      BackStyle       =   0  'Transparent
      Caption         =   "UNIVERSIDAD POLITÉCNICA DE CARTAGENA"
      BeginProperty Font
         Name            =   "Garamond"
         Size            =   12
         Charset         =   0
         Weight          =   700
         Underline       =   0   'False
         Italic          =   0   'False
         Strikethrough   =   0   'False
      EndProperty
      Height          =   285
      Left            =   2910
      TabIndex        =   2
      Top             =   210
```

```
      Width           =   5580
   End
   Begin VB.Menu mnuFichero
      Caption         =   "Datos iniciales"
      Begin VB.Menu mnuAbrirOrigen
         Caption         =   "Seleccionar fichero origen"
      End
      Begin VB.Menu mnuFicheroSinCompensar
         Caption         =   "Crear fichero matriz sin compensar"
         Enabled         =   0   'False
      End
      Begin VB.Menu mnuVMSC
         Caption         =   "Ver matriz sin compensar"
         Enabled         =   0   'False
      End
      Begin VB.Menu mnuSalir
         Caption         =   "Salir"
      End
   End
   Begin VB.Menu mnuCompensacion
      Caption         =   "Compensación"
      Enabled         =   0   'False
      Begin VB.Menu mnuParametrosCompensacion
         Caption         =   "Parametros de compensación"
      End
      Begin VB.Menu mnuHacerComp
         Caption         =   "Realizar compensación"
         Enabled         =   0   'False
      End
      Begin VB.Menu mnuVMC
         Caption         =   "Ver matriz compensada"
         Enabled         =   0   'False
      End
      Begin VB.Menu mnuFicheroCompensado
         Caption         =   "Crear matriz de errores de compensación"
         Enabled         =   0   'False
      End
      Begin VB.Menu mnuVMEC
         Caption         =   "Ver matriz de errores de compensación"
         Enabled         =   0   'False
      End
   End
   Begin VB.Menu mnuInterpolacion
      Caption         =   "Interpolación"
      Enabled         =   0   'False
      Begin VB.Menu mnuParametrosInterpolacion
         Caption         =   "Parametros de interpolación"
      End
      Begin VB.Menu mnuInterpol
         Caption         =   "Realizar interpolación"
         Enabled         =   0   'False
      End
      Begin VB.Menu mnuVMI
         Caption         =   "Ver matriz interpolada"
         Enabled         =   0   'False
      End
      Begin VB.Menu mnuFicheroErroresInterpolacion
         Caption         =   "Crear matriz de errores de
interpolación"
         Enabled         =   0   'False
```

```
      End
      Begin VB.Menu mnuVMEI
         Caption         =   "Ver matriz de errores de interpolación"
         Enabled         =   0   'False
      End
   End
   Begin VB.Menu mnuResultados
      Caption         =   "Representación gráfica"
      Enabled         =   0   'False
      Begin VB.Menu mnuGrafico
         Caption         =   "Vista Isométrica"
         Enabled         =   0   'False
      End
   End
   Begin VB.Menu mnuInforme
      Caption         =   "Informe"
      Enabled         =   0   'False
      Begin VB.Menu mnuFicheroInforme
         Caption         =   "Guardar como..."
      End
      Begin VB.Menu mnuVI
         Caption         =   "Informe"
         Enabled         =   0   'False
      End
   End
End
Attribute VB_Name = "Presentacion"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Private Sub Form_Load()
Presentacion.BackColor = &H80000013
Label1.Font = "Arial Narrow"
Label1.FontSize = 10
Picture1.Width = 2385
Picture1.Top = 210
Picture1.Left = 420
Picture1.Height = 2385
Label1.Width = 4050
Label1.Top = 870
Label1.Left = 3600
Label1.Height = 285
Label5.Width = 5580
Label5.Top = 210
Label5.Left = 2910
Label5.Height = 285
Label6.Width = 5580
Label6.Top = 450
Label6.Left = 2910
Label6.Height = 285
Label7.Width = 3855
Label7.Top = 2350
Label7.Left = 2910
Label7.Height = 270
End Sub
Private Sub mnuAbrirOrigen_Click()
AbrirOrigen.Show
End Sub
Private Sub mnuVMC_Click()
```

```
If ParametrosCompensacion.Check1.Value = 1 Then
    MatrizCompensada.Show
    Open NombreCompensada.compensado For Input As #2
    MatrizCompensada.Text1.Text = Input(LOF(2), #2)
    Close #2
End If
If ParametrosCompensacion.Check1.Value = 0 Then
    MsgBox "No se ha creado ningún fichero de puntos compensados.",
vbInformation, "Compensación"
End If
End Sub
Private Sub mnuParametrosInterpolacion_Click()
If ParametrosCompensacion.Combo1.Text = "Medición en ejes X,Y" Then
    ParametrosXY.Show
End If
If ParametrosCompensacion.Combo1.Text = "Medición en ejes X,Z" Then
    ParametrosXZ.Show
End If
If ParametrosCompensacion.Combo1.Text = "Medición en ejes Y,Z" Then
    ParametrosYZ.Show
End If
End Sub
Private Sub mnuFicheroSinCompensar_Click()
NombreSinCompensar.Show
End Sub
Private Sub mnuVMI_Click()
    TEXTO_PUNTOS_INTERPOLADOS
End Sub
Private Sub mnuVMSC_Click()
    MatrizSinCompensar.Show
    Open NombreSinCompensar.sc For Input As #4
    MatrizSinCompensar.Text1.Text = Input(LOF(4), #4)
    Close #4
End Sub
Private Sub mnuGrafico_Click()
Grafico.Height = 11175
Grafico.Left = 1410
Grafico.Top = 165
Grafico.Width = 16845
Grafico.Show
End Sub
Public Sub mnuHacerComp_Click()
If ParametrosCompensacion.Combo1.Text = "" Then
    MsgBox "No ha seleccionado archivo origen de puntos palpados",
vbExclamation, "ERROR DE ENTRADA"
    AbrirOrigen.Show
End If
If ParametrosCompensacion.Check1.Value = 1 Then
    NombreCompensada.Show
Else
    MATRICES_COMPENSADAS
    MsgBox "Compensación de puntos realizada.", vbInformation,
"Realizar compensación"
    Presentacion.mnuFicheroCompensado.Enabled = True
End If
End Sub
Public Sub mnuInterpol_Click()
If Presentacion.mnuInterpol.Caption = "Hacer interpolación" Then
    INTERPOLACION
End If
```

```
Presentacion.mnuFicheroErroresInterpolacion.Enabled = True
End Sub
Private Sub mnuVMEC_Click()
MatrizErrores.Show
MatrizErrores.Width = 3850
MatrizErrores.Top = 3630
MatrizErrores.Left = 2340
MatrizErrores.Height = 5430
Open NombreErrores.errores For Input As #3
    MatrizErrores.Text1.Text = Input(LOF(3), #3)
Close #3
End Sub
Private Sub mnuParametrosCompensacion_Click()
ParametrosCompensacion.Show
End Sub
Private Sub mnuSalir_Click()
End
End Sub
Private Sub mnuVI_Click()
    Informe.Show
    Open NombreInforme.inf For Input As #3
    Informe.Text1.Text = Input(LOF(3), #3)
    Close #3
End Sub
Private Sub mnuFicheroInforme_click()
NombreInforme.Show
End Sub
Private Sub mnuFicheroCompensado_click()
NombreErrores.Show
End Sub
Private Sub mnuFicheroErroresInterpolacion_click()
NombreErroresInterpol.Show
End Sub
Private Sub mnuVMEI_click()
MatrizErrInt.Width = 4215
MatrizErrInt.Show
    Open NombreErroresInterpol.erroresInterpol For Input As #33
    MatrizErrInt.Text1.Text = Input(LOF(33), #33)
    Close #33
End Sub
Private Sub Timer1_Timer()
StatusBar1.SimpleText = "Hora actual: " & Time
End Sub
```

- Begin VB.Form **MatrizSinCompensar**

```
Caption         =   "Matriz sin compensar"
ClientHeight    =   5235
ClientLeft      =   9360
ClientTop       =   3120
ClientWidth     =   4440
LinkTopic       =   "Form10"
MaxButton       =   0   'False
MinButton       =   0   'False
ScaleHeight     =   5235
ScaleWidth      =   4440
StartUpPosition =   2  'CenterScreen
Begin VB.CommandButton Command1
   Caption         =   "Cerrar"
   Height          =   495
```

```
      Left            =   1710
      TabIndex        =   0
      Top             =   4635
      Width           =   1005
   End
   Begin VB.Frame Frame1
      Caption         =   "Matriz de puntos sin compensar"
      Height          =   4320
      Left            =   90
      TabIndex        =   2
      Top             =   195
      Width           =   4215
      Begin VB.TextBox Text1
         BorderStyle     =   0  'None
         Height          =   3885
         Left            =   135
         MultiLine       =   -1  'True
         ScrollBars      =   3  'Both
         TabIndex        =   1
         Top             =   210
         Width           =   3960
      End
   End
End
Attribute VB_Name = "MatrizSinCompensar"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Private Sub Command1_Click()
MatrizSinCompensar.Visible = False
End Sub
```

- Begin VB.Form **ParametrosXZ**

```
      Caption         =   "Parámetros de interpolación en X y Z"
   ClientHeight    =   3795
   ClientLeft      =   8880
   ClientTop       =   4035
   ClientWidth     =   5685
   LinkTopic       =   "Form11"
   MaxButton       =   0   'False
   MinButton       =   0   'False
   ScaleHeight     =   3795
   ScaleWidth      =   5685
   StartUpPosition =   2  'CenterScreen
   Begin VB.Frame Frame2
      Caption         =   "Crear fichero de puntos interpolados"
      Height          =   840
      Left            =   120
      TabIndex        =   18
      Top             =   2130
      Width           =   5430
      Begin VB.CheckBox Check1
         Caption         =   "Crear fichero de puntos interpolados al
realizar la interpolación"
         Height          =   360
         Left            =   435
         TabIndex        =   19
         Top             =   300
```

```
      Width           =   4710
   End
End
Begin VB.CommandButton Command1
   Caption         =   "Cancelar"
   Height          =   495
   Left            =   4530
   TabIndex        =   4
   Top             =   3100
   Width           =   1005
End
Begin VB.CommandButton Command2
   Caption         =   "Continuar"
   Height          =   495
   Left            =   120
   TabIndex        =   3
   Top             =   3100
   Width           =   1005
End
Begin VB.TextBox Text1
   Height          =   345
   Left            =   5325
   TabIndex        =   17
   Text            =   "Text1"
   Top             =   4620
   Visible         =   0   'False
   Width           =   630
End
Begin VB.TextBox Text5
   Height          =   315
   Left            =   5955
   TabIndex        =   16
   Text            =   "Text5"
   Top             =   4635
   Visible         =   0   'False
   Width           =   705
End
Begin VB.TextBox Text6
   Height          =   330
   Left            =   6660
   TabIndex        =   15
   Text            =   "Text6"
   Top             =   4635
   Visible         =   0   'False
   Width           =   735
End
Begin VB.TextBox Text7
   Height          =   330
   Left            =   5280
   TabIndex        =   14
   Text            =   "Text7"
   Top             =   5025
   Visible         =   0   'False
   Width           =   675
End
Begin VB.TextBox Text8
   Height          =   315
   Left            =   5940
   TabIndex        =   13
   Text            =   "Text8"
```

```
      Top             =   5025
      Visible         =   0   'False
      Width           =   735
   End
   Begin VB.TextBox Text9
      Height          =   390
      Left            =   6690
      TabIndex        =   12
      Text            =   "Text9"
      Top             =   4980
      Visible         =   0   'False
      Width           =   705
   End
   Begin VB.TextBox Text10
      Height          =   330
      Left            =   5265
      TabIndex        =   11
      Text            =   "Text10"
      Top             =   5445
      Visible         =   0   'False
      Width           =   660
   End
   Begin VB.TextBox Text11
      Height          =   375
      Left            =   5955
      TabIndex        =   10
      Text            =   "Text11"
      Top             =   5430
      Visible         =   0   'False
      Width           =   705
   End
   Begin VB.TextBox Text12
      Height          =   375
      Left            =   6690
      TabIndex        =   9
      Text            =   "Text12"
      Top             =   5400
      Visible         =   0   'False
      Width           =   705
   End
   Begin VB.Frame Frame1
      Caption         =   "Datos iniciales de entrada para la
generación de puntos interpolados"
      Height          =   1845
      Left            =   120
      TabIndex        =   5
      Top             =   150
      Width           =   5430
      Begin VB.TextBox Text2
         Height          =   285
         Left            =   3270
         TabIndex        =   0
         Text            =   "40"
         Top             =   315
         Width           =   750
      End
      Begin VB.TextBox Text3
         Height          =   285
         Left            =   3255
         TabIndex        =   1
```

```
         Text            =   "40"
         Top             =   810
         Width           =   750
      End
      Begin VB.TextBox Text4
         Height          =   285
         Left            =   3255
         TabIndex        =   2
         Text            =   "2"
         Top             =   1320
         Width           =   750
      End
      Begin VB.Label Label6
         Caption         =   "Numero de puntos a interpolar en X:"
         Height          =   300
         Left            =   555
         TabIndex        =   8
         Top             =   360
         Width           =   2655
      End
      Begin VB.Label Label7
         Caption         =   "Numero de puntos a interpolar en Z:"
         Height          =   255
         Left            =   555
         TabIndex        =   7
         Top             =   840
         Width           =   2640
      End
      Begin VB.Label Label8
         Caption         =   "Parametro de interpolacion (1-10):"
         Height          =   240
         Left            =   555
         TabIndex        =   6
         Top             =   1350
         Width           =   2520
      End
   End
End
Attribute VB_Name = "ParametrosXZ"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Private Sub Command1_Click()
ParametrosXZ.Visible = False
End Sub
Private Sub Form_Load()
Text2.SelStart = 0
Text2.SelLength = 50
End Sub
Private Sub Command2_Click()
Select Case Text2.Text
    Case ""
    MsgBox "Introducir valor numérico en parámetro X", vbCritical,
"Error en la entrada de datos"
    Text2.SetFocus
    Case IsNumeric(Text2.Text) = False
    MsgBox "Introducir valor numérico en parámetro X", vbCritical,
"Error en la entrada de datos"
    Text2.SetFocus
```

```
    Case Val(Text2.Text) <= 0
    MsgBox "Introducir valores positivos", vbCritical, "Error:
parámetro de interpolación X"
    Text2.SetFocus
    Case Val(Text3.Text) > Int(32767 / Val(Text2.Text))
    MsgBox "El valor introducido en parámetro Z debe ser menor que " &
Int(32767 / Val(Text2.Text)), vbCritical, "Parámetro de interpolación
X: desbordamiento"
    Text2.SetFocus
End Select
Select Case Text3.Text
    Case ""
    MsgBox "Introducir valor numérico en parámetro Z", vbCritical,
"Error en la entrada de datos"
    Text3.SetFocus
    Case IsNumeric(Text3.Text) = False
    MsgBox "Introducir valor numérico en parámetro Z", vbCritical,
"Error en la entrada de datos"
    Text3.SetFocus
    Case Val(Text3.Text) <= 0
    MsgBox "Introducir valores positivos", vbCritical, "Error:
parámetro de interpolación Z"
    Text3.SetFocus
    Case Val(Text2.Text) > Int(32767 / Val(Text3.Text))
    MsgBox "El valor introducido en parámetro X debe ser menor que " &
Int(32767 / Val(Text3.Text)), vbCritical, "Parámetro de interpolación
Z: desbordamiento"
    Text3.SetFocus
End Select
Select Case Text4.Text
    Case ""
    MsgBox "Introducir valores numéricos en parámetro p", vbCritical,
"Error en la entrada de datos"
    Text4.SetFocus
    Case IsNumeric(Text4.Text) = False
    MsgBox "Introducir valores numéricos en parámetro p", vbCritical,
"Error en la entrada de datos"
    Text4.SetFocus
    Case Val(Text4.Text) < 1
    MsgBox "Introducir valor comprendido entre 1 y 10", vbCritical,
"Error: parámetro de interpolación"
    Text4.SetFocus
    Case Val(Text4.Text) > 10
    MsgBox "Introducir valor comprendido entre 1 y 10", vbCritical,
"Error: parámetro de interpolación"
    Text4.SetFocus
End Select
If IsNumeric(Text2.Text) = True Then
    If IsNumeric(Text3.Text) = True Then
        If IsNumeric(Text4.Text) = True Then
            ParametrosXZ.Visible = False
            Presentacion.mnuInterpol.Enabled = True
            If Check1.Value = 1 Then
                Presentacion.mnuInterpol.Enabled = False
                NombreInterpolados.Show
            End If
            If Check1.Value = 0 Then
                Presentacion.mnuInterpol.Enabled = True
                Presentacion.mnuInterpol.Caption = "Hacer
interpolación"
```

```
            End If
         End If
      End If
End If
End Sub
Private Sub text2_keypress(keyascii As Integer)
If keyascii = 13 Then
Text3.SetFocus
Text3.SelStart = 0
Text3.SelLength = 50
End If
End Sub
Private Sub text3_keypress(keyascii As Integer)
If keyascii = 13 Then
Text4.SetFocus
Text4.SelStart = 0
Text4.SelLength = 50
End If
End Sub
Private Sub text4_keypress(keyascii As Integer)
If keyascii = 13 Then Command2.SetFocus
End Sub
```

- Begin VB.Form **ParametrosYZ**

```
   Caption         =   "Parámetros de interpolación en Y y Z"
   ClientHeight    =   3795
   ClientLeft      =   8880
   ClientTop       =   3885
   ClientWidth     =   5685
   LinkTopic       =   "Form12"
   MaxButton       =   0   'False
   MinButton       =   0   'False
   ScaleHeight     =   3795
   ScaleWidth      =   5685
   StartUpPosition =   2  'CenterScreen
   Begin VB.Frame Frame2
      Caption         =   "Crear fichero de puntos interpolados"
      Height          =   840
      Left            =   120
      TabIndex        =   18
      Top             =   2130
      Width           =   5430
      Begin VB.CheckBox Check1
         Caption         =   "Crear fichero de puntos interpolados al
realizar la interpolación"
         Height          =   360
         Left            =   435
         TabIndex        =   19
         Top             =   300
         Width           =   4710
      End
   End
   Begin VB.CommandButton Command2
      Caption         =   "Continuar"
      Height          =   495
      Left            =   120
      TabIndex        =   3
      Top             =   3100
      Width           =   1005
```

```
End
Begin VB.CommandButton Command1
   Caption         =   "Cancelar"
   Height          =   495
   Left            =   4530
   TabIndex        =   4
   Top             =   3100
   Width           =   1005
End
Begin VB.TextBox Text1
   Height          =   345
   Left            =   5625
   TabIndex        =   17
   Text            =   "Text1"
   Top             =   4770
   Visible         =   0   'False
   Width           =   630
End
Begin VB.TextBox Text5
   Height          =   315
   Left            =   6255
   TabIndex        =   16
   Text            =   "Text5"
   Top             =   4785
   Visible         =   0   'False
   Width           =   705
End
Begin VB.TextBox Text6
   Height          =   330
   Left            =   6960
   TabIndex        =   15
   Text            =   "Text6"
   Top             =   4785
   Visible         =   0   'False
   Width           =   735
End
Begin VB.TextBox Text7
   Height          =   330
   Left            =   5580
   TabIndex        =   14
   Text            =   "Text7"
   Top             =   5175
   Visible         =   0   'False
   Width           =   675
End
Begin VB.TextBox Text8
   Height          =   315
   Left            =   6240
   TabIndex        =   13
   Text            =   "Text8"
   Top             =   5175
   Visible         =   0   'False
   Width           =   735
End
Begin VB.TextBox Text9
   Height          =   390
   Left            =   6990
   TabIndex        =   12
   Text            =   "Text9"
   Top             =   5130
```

```
      Visible         =   0   'False
      Width           =   705
   End
   Begin VB.TextBox Text10
      Height          =   330
      Left            =   5565
      TabIndex        =   11
      Text            =   "Text10"
      Top             =   5595
      Visible         =   0   'False
      Width           =   660
   End
   Begin VB.TextBox Text11
      Height          =   375
      Left            =   6255
      TabIndex        =   10
      Text            =   "Text11"
      Top             =   5580
      Visible         =   0   'False
      Width           =   705
   End
   Begin VB.TextBox Text12
      Height          =   375
      Left            =   6990
      TabIndex        =   9
      Text            =   "Text12"
      Top             =   5550
      Visible         =   0   'False
      Width           =   705
   End
   Begin VB.Frame Frame1
      Caption         =   "Datos iniciales de entrada para la
generación de puntos interpolados"
      Height          =   1845
      Left            =   120
      TabIndex        =   5
      Top             =   150
      Width           =   5430
      Begin VB.TextBox Text2
         Height          =   285
         Left            =   3255
         TabIndex        =   0
         Text            =   "40"
         Top             =   315
         Width           =   750
      End
      Begin VB.TextBox Text3
         Height          =   285
         Left            =   3255
         TabIndex        =   1
         Text            =   "40"
         Top             =   810
         Width           =   750
      End
      Begin VB.TextBox Text4
         Height          =   285
         Left            =   3255
         TabIndex        =   2
         Text            =   "2"
         Top             =   1320
```

```
         Width           =   750
      End
      Begin VB.Label Label6
         Caption         =   "Numero de puntos a interpolar en Y:"
         Height          =   300
         Left            =   555
         TabIndex        =   8
         Top             =   360
         Width           =   2655
      End
      Begin VB.Label Label7
         Caption         =   "Numero de puntos a interpolar en Z:"
         Height          =   255
         Left            =   555
         TabIndex        =   7
         Top             =   840
         Width           =   2640
      End
      Begin VB.Label Label8
         Caption         =   "Parametro de interpolacion (1-10):"
         Height          =   240
         Left            =   555
         TabIndex        =   6
         Top             =   1350
         Width           =   2520
      End
   End
End
Attribute VB_Name = "ParametrosYZ"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Private Sub Command1_Click()
ParametrosYZ.Visible = False
End Sub
Private Sub Form_Load()
Text2.SelStart = 0
Text2.SelLength = 50
End Sub
Private Sub Command2_Click()
Select Case Text2.Text
    Case ""
    MsgBox "Introducir valor numérico en parámetro Y", vbCritical,
"Error en la entrada de datos"
    Text2.SetFocus
    Case IsNumeric(Text2.Text) = False
    MsgBox "Introducir valor numérico en parámetro Y", vbCritical,
"Error en la entrada de datos"
    Text2.SetFocus
    Case Val(Text2.Text) <= 0
    MsgBox "Introducir valores positivos", vbCritical, "Error:
parámetro de interpolación Y"
    Text2.SetFocus
    Case Val(Text3.Text) > Int(32767 / Val(Text2.Text))
    MsgBox "El valor introducido en parámetro Z debe ser menor que " &
Int(32767 / Val(Text2.Text)), vbCritical, "Parámetro de interpolación
Y: desbordamiento"
    Text2.SetFocus
End Select
```

```
Select Case Text3.Text
    Case ""
    MsgBox "Introducir valor numérico en parámetro Z", vbCritical,
"Error en la entrada de datos"
    Text3.SetFocus
    Case IsNumeric(Text3.Text) = False
    MsgBox "Introducir valor numérico en parámetro Z", vbCritical,
"Error en la entrada de datos"
    Text3.SetFocus
    Case Val(Text3.Text) <= 0
    MsgBox "Introducir valores positivos", vbCritical, "Error:
parámetro de interpolación Z"
    Text3.SetFocus
    Case Val(Text2.Text) > Int(32767 / Val(Text3.Text))
    MsgBox "El valor introducido en parámetro Y debe ser menor que " &
Int(32767 / Val(Text3.Text)), vbCritical, "Parámetro de interpolación
Z: desbordamiento"
    Text3.SetFocus
End Select
Select Case Text4.Text
    Case ""
    MsgBox "Introducir valores numéricos en parámetro p", vbCritical,
"Error en la entrada de datos"
    Text4.SetFocus
    Case IsNumeric(Text4.Text) = False
    MsgBox "Introducir valores numéricos en parámetro p", vbCritical,
"Error en la entrada de datos"
    Text4.SetFocus
    Case Val(Text4.Text) < 1
    MsgBox "Introducir valor comprendido entre 1 y 10", vbCritical,
"Error: parámetro de interpolación"
    Text4.SetFocus
    Case Val(Text4.Text) > 10
    MsgBox "Introducir valor comprendido entre 1 y 10", vbCritical,
"Error: parámetro de interpolación"
    Text4.SetFocus
End Select
If IsNumeric(Text2.Text) = True Then
    If IsNumeric(Text3.Text) = True Then
        If IsNumeric(Text4.Text) = True Then
            ParametrosYZ.Visible = False
            Presentacion.mnuInterpol.Enabled = True
            If Check1.Value = 1 Then
                Presentacion.mnuInterpol.Enabled = False
                NombreInterpolados.Show
            End If
            If Check1.Value = 0 Then
                Presentacion.mnuInterpol.Enabled = True
                Presentacion.mnuInterpol.Caption = "Hacer
interpolación"
            End If
        End If
    End If
End If
End Sub
Private Sub text2_keypress(keyascii As Integer)
If keyascii = 13 Then
Text3.SetFocus
Text3.SelStart = 0
Text3.SelLength = 50
```

```
End If
End Sub
Private Sub text3_keypress(keyascii As Integer)
If keyascii = 13 Then
Text4.SetFocus
Text4.SelStart = 0
Text4.SelLength = 50
End If
End Sub
Private Sub text4_keypress(keyascii As Integer)
If keyascii = 13 Then Command2.SetFocus
End Sub
```

- Begin VB.Form **MatrizErrores**

```
   Caption         =   "Errores de compensación"
   ClientHeight    =   4920
   ClientLeft      =   2400
   ClientTop       =   4080
   ClientWidth     =   14685
   LinkTopic       =   "Form5"
   MaxButton       =   0   'False
   ScaleHeight     =   4920
   ScaleWidth      =   14685
   Begin MSChart20Lib.MSChart MSChart1
      DragMode        =   1  'Automatic
      Height          =   2280
      Left            =   8220
      OleObjectBlob   =   "PROG13.frx":0000
      TabIndex        =   21
      Top             =   105
      Width           =   6405
   End
   Begin MSChart20Lib.MSChart MSChart2
      DragMode        =   1  'Automatic
      Height          =   2280
      Left            =   8220
      OleObjectBlob   =   "PROG13.frx":23A4
      TabIndex        =   20
      Top             =   2460
      Width           =   6400
   End
   Begin VB.CommandButton Command3
      Caption         =   "Ocultar detalles<<"
      Height          =   495
      Left            =   7170
      TabIndex        =   1
      Top             =   4260
      Width           =   1005
   End
   Begin VB.Frame Frame4
      Caption         =   "Desviación típica de los errores de
compensación"
      Height          =   1470
      Left            =   3750
      TabIndex        =   15
      Top             =   2670
      Width           =   4395
      Begin VB.TextBox Text17
         Height          =   315
```

```
         Left            =   2700
         TabIndex        =   17
         Top             =   345
         Width           =   1400
      End
      Begin VB.TextBox Text18
         Height          =   315
         Left            =   2700
         TabIndex        =   16
         Top             =   855
         Width           =   1400
      End
      Begin VB.Label Label11
         Height          =   300
         Left            =   225
         TabIndex        =   19
         Top             =   420
         Width           =   2445
      End
      Begin VB.Label Label12
         Height          =   300
         Left            =   225
         TabIndex        =   18
         Top             =   930
         Width           =   2490
      End
   End
   Begin VB.Frame Frame2
      Caption         =   "Valores máximos en la matriz de errores de
compensación"
      Height          =   2200
      Left            =   3750
      TabIndex        =   5
      Top             =   105
      Width           =   4395
      Begin VB.TextBox Text2
         Height          =   350
         Left            =   2700
         TabIndex        =   11
         Top             =   1550
         Width           =   1400
      End
      Begin VB.TextBox Text12
         Height          =   350
         Left            =   225
         TabIndex        =   10
         Top             =   1550
         Width           =   1400
      End
      Begin VB.TextBox Text13
         Height          =   350
         Left            =   225
         TabIndex        =   9
         Top             =   450
         Width           =   1400
      End
      Begin VB.TextBox Text14
         Height          =   350
         Left            =   2745
         TabIndex        =   8
```

```
   Top             =   450
   Width           =   1400
End
Begin VB.TextBox Text15
   Height          =   350
   Left            =   225
   TabIndex        =   7
   Top             =   1000
   Width           =   1400
End
Begin VB.TextBox Text16
   Height          =   350
   Left            =   2700
   TabIndex        =   6
   Top             =   1000
   Width           =   1400
End
Begin VB.Label Label8
   Caption         =   "< Z <"
   BeginProperty Font
      Name            =   "Courier New"
      Size            =   12
      Charset         =   0
      Weight          =   400
      Underline       =   0   'False
      Italic          =   0   'False
      Strikethrough   =   0   'False
   EndProperty
   Height          =   315
   Left            =   1800
   TabIndex        =   14
   Top             =   1580
   Width           =   885
End
Begin VB.Label Label9
   Caption         =   "< Y <"
   BeginProperty Font
      Name            =   "Courier New"
      Size            =   12
      Charset         =   0
      Weight          =   400
      Underline       =   0   'False
      Italic          =   0   'False
      Strikethrough   =   0   'False
   EndProperty
   Height          =   315
   Left            =   1800
   TabIndex        =   13
   Top             =   1030
   Width           =   795
End
Begin VB.Label Label10
   Caption         =   "< X <"
   BeginProperty Font
      Name            =   "Courier New"
      Size            =   12
      Charset         =   0
      Weight          =   400
      Underline       =   0   'False
      Italic          =   0   'False
```

```
            Strikethrough   =   0   'False
         EndProperty
         Height          =   315
         Left            =   1800
         TabIndex        =   12
         Top             =   480
         Width           =   870
      End
   End
   Begin VB.CommandButton Command2
      Caption         =   "Ver detalles>>"
      Height          =   495
      Left            =   2625
      TabIndex        =   0
      Top             =   4260
      Width           =   1005
   End
   Begin VB.CommandButton Command1
      Caption         =   "Cerrar"
      Height          =   495
      Left            =   60
      TabIndex        =   2
      Top             =   4260
      Width           =   1005
   End
   Begin VB.Frame Frame1
      Caption         =   "Matriz de errores"
      Height          =   4065
      Left            =   60
      TabIndex        =   3
      Top             =   60
      Width           =   3570
      Begin VB.TextBox Text1
         Height          =   3750
         Left            =   120
         MultiLine       =   -1  'True
         ScrollBars      =   3  'Both
         TabIndex        =   4
         Top             =   210
         Width           =   3345
      End
   End
End
Attribute VB_Name = "MatrizErrores"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Private Sub Command1_Click()
MatrizErrores.Visible = False
End Sub
Private Sub Command2_Click()
Width = 14900
Command3.SetFocus
End Sub
Private Sub Command3_Click()
Width = 3850
Command2.SetFocus
End Sub
```

- Begin VB.Form **ParametrosXY**

```
   Caption         =   "Parámetros de interpolación en X e Y"
   ClientHeight    =   3795
   ClientLeft      =   8880
   ClientTop       =   3885
   ClientWidth     =   5685
   LinkTopic       =   "Form4"
   MaxButton       =   0   'False
   MinButton       =   0   'False
   ScaleHeight     =   3795
   ScaleWidth      =   5685
   StartUpPosition =   2  'CenterScreen
   Begin VB.Frame Frame2
      Caption         =   "Crear fichero de puntos interpolados"
      Height          =   840
      Left            =   120
      TabIndex        =   18
      Top             =   2130
      Width           =   5430
      Begin VB.CheckBox Check1
         Caption         =   "Crear fichero de puntos interpolados al
realizar la interpolación"
         Height          =   360
         Left            =   435
         TabIndex        =   19
         Top             =   300
         Width           =   4710
      End
   End
   Begin VB.CommandButton Command2
      Caption         =   "Continuar"
      Height          =   495
      Left            =   120
      TabIndex        =   3
      Top             =   3100
      Width           =   1005
   End
   Begin VB.CommandButton Command1
      Caption         =   "Cancelar"
      Height          =   495
      Left            =   4530
      TabIndex        =   4
      Top             =   3100
      Width           =   1005
   End
   Begin VB.TextBox Text12
      Height          =   375
      Left            =   3000
      TabIndex        =   17
      Text            =   "Text12"
      Top             =   5850
      Visible         =   0   'False
      Width           =   705
   End
   Begin VB.TextBox Text11
      Height          =   375
      Left            =   2265
      TabIndex        =   16
      Text            =   "Text11"
```

```
      Top             =   5880
      Visible         =   0   'False
      Width           =   705
   End
   Begin VB.TextBox Text10
      Height          =   330
      Left            =   1575
      TabIndex        =   15
      Text            =   "Text10"
      Top             =   5895
      Visible         =   0   'False
      Width           =   660
   End
   Begin VB.TextBox Text9
      Height          =   390
      Left            =   3000
      TabIndex        =   14
      Text            =   "Text9"
      Top             =   5430
      Visible         =   0   'False
      Width           =   705
   End
   Begin VB.TextBox Text8
      Height          =   315
      Left            =   2250
      TabIndex        =   13
      Text            =   "Text8"
      Top             =   5475
      Visible         =   0   'False
      Width           =   735
   End
   Begin VB.TextBox Text7
      Height          =   330
      Left            =   1590
      TabIndex        =   12
      Text            =   "Text7"
      Top             =   5475
      Visible         =   0   'False
      Width           =   675
   End
   Begin VB.TextBox Text6
      Height          =   330
      Left            =   2970
      TabIndex        =   11
      Text            =   "Text6"
      Top             =   5085
      Visible         =   0   'False
      Width           =   735
   End
   Begin VB.TextBox Text5
      Height          =   315
      Left            =   2265
      TabIndex        =   10
      Text            =   "Text5"
      Top             =   5085
      Visible         =   0   'False
      Width           =   705
   End
   Begin VB.TextBox Text1
      Height          =   345
```

```
      Left            =   1635
      TabIndex        =   9
      Text            =   "Text1"
      Top             =   5070
      Visible         =   0   'False
      Width           =   630
   End
   Begin VB.Frame Frame1
      Caption         =   "Datos iniciales de entrada para la
generación de puntos interpolados"
      Height          =   1845
      Left            =   120
      TabIndex        =   5
      Top             =   150
      Width           =   5430
      Begin VB.TextBox Text4
         Height          =   285
         Left            =   3255
         TabIndex        =   2
         Text            =   "2"
         Top             =   1320
         Width           =   750
      End
      Begin VB.TextBox Text3
         Height          =   285
         Left            =   3255
         TabIndex        =   1
         Text            =   "40"
         Top             =   810
         Width           =   750
      End
      Begin VB.TextBox Text2
         Height          =   285
         Left            =   3255
         TabIndex        =   0
         Text            =   "40"
         Top             =   315
         Width           =   750
      End
      Begin VB.Label Label8
         Caption         =   "Parametro de interpolacion (1-10):"
         Height          =   240
         Left            =   555
         TabIndex        =   8
         Top             =   1350
         Width           =   2520
      End
      Begin VB.Label Label7
         Caption         =   "Numero de puntos a interpolar en Y:"
         Height          =   255
         Left            =   555
         TabIndex        =   7
         Top             =   840
         Width           =   2640
      End
      Begin VB.Label Label6
         Caption         =   "Numero de puntos a interpolar en X:"
         Height          =   300
         Left            =   555
         TabIndex        =   6
```

```
         Top             =   360
         Width           =   2655
      End
   End
End
Attribute VB_Name = "ParametrosXY"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Private Sub Command1_Click()
ParametrosXY.Visible = False
End Sub
Private Sub Command2_Click()
Select Case Text2.Text
    Case ""
    MsgBox "Introducir valor numérico en parámetro X", vbCritical,
"Error en la entrada de datos"
    Text2.SetFocus
    Case IsNumeric(Text2.Text) = False
    MsgBox "Introducir valor numérico en parámetro X", vbCritical,
"Error en la entrada de datos"
    Text2.SetFocus
    Case Val(Text2.Text) <= 0
    MsgBox "Introducir valores positivos", vbCritical, "Error:
parámetro de interpolación X"
    Text2.SetFocus
    Case Val(Text3.Text) > Int(32767 / Val(Text2.Text))
    MsgBox "El valor introducido en parámetro Y debe ser menor que " &
Int(32767 / Val(Text2.Text)), vbCritical, "Parámetro de interpolación
X: desbordamiento"
    Text2.SetFocus
End Select
Select Case Text3.Text
    Case ""
    MsgBox "Introducir valor numérico en parámetro Y", vbCritical,
"Error en la entrada de datos"
    Text3.SetFocus
    Case IsNumeric(Text3.Text) = False
    MsgBox "Introducir valor numérico en parámetro Y", vbCritical,
"Error en la entrada de datos"
    Text3.SetFocus
    Case Val(Text3.Text) <= 0
    MsgBox "Introducir valores positivos", vbCritical, "Error:
parámetro de interpolación Y"
    Text3.SetFocus
    Case Val(Text2.Text) > Int(32767 / Val(Text3.Text))
    MsgBox "El valor introducido en parámetro X debe ser menor que " &
Int(32767 / Val(Text3.Text)), vbCritical, "Parámetro de interpolación
Y: desbordamiento"
    Text3.SetFocus
End Select
Select Case Text4.Text
    Case ""
    MsgBox "Introducir valores numéricos en parámetro p", vbCritical,
"Error en la entrada de datos"
    Text4.SetFocus
    Case IsNumeric(Text4.Text) = False
    MsgBox "Introducir valores numéricos en parámetro p", vbCritical,
"Error en la entrada de datos"
```

```
    Text4.SetFocus
    Case Val(Text4.Text) < 1
    MsgBox "Introducir valor comprendido entre 1 y 10", vbCritical,
"Error: parámetro de interpolación"
    Text4.SetFocus
    Case Val(Text4.Text) > 10
    MsgBox "Introducir valor comprendido entre 1 y 10", vbCritical,
"Error: parámetro de interpolación"
    Text4.SetFocus
End Select
If IsNumeric(Text2.Text) = True Then
    If IsNumeric(Text3.Text) = True Then
        If IsNumeric(Text4.Text) = True Then
            ParametrosXY.Visible = False
            If Check1.Value = 1 Then
                Presentacion.mnuInterpol.Enabled = False
                NombreInterpolados.Show
            End If
            If Check1.Value = 0 Then
                Presentacion.mnuInterpol.Enabled = True
                Presentacion.mnuInterpol.Caption = "Hacer
interpolación"
            End If
        End If
    End If
End If
End Sub
Private Sub Form_Load()
Text2.SelStart = 0
Text2.SelLength = 50
End Sub
Private Sub text2_keypress(keyascii As Integer)
If keyascii = 13 Then
Text3.SetFocus
Text3.SelStart = 0
Text3.SelLength = 50
End If
End Sub
Private Sub text3_keypress(keyascii As Integer)
If keyascii = 13 Then
Text4.SetFocus
Text4.SelStart = 0
Text4.SelLength = 50
End If
End Sub
Private Sub text4_keypress(keyascii As Integer)
If keyascii = 13 Then Command2.SetFocus
End Sub
```

- Begin VB.Form **MatrizCompensada**

```
  Caption         =   "Matriz compensada"
   ClientHeight    =   5400
   ClientLeft      =   9630
   ClientTop       =   3435
   ClientWidth     =   4785
   LinkTopic       =   "Form6"
   MaxButton       =   0   'False
   MinButton       =   0   'False
   ScaleHeight     =   5400
```

```
   ScaleWidth      =   4785
   StartUpPosition =   2  'CenterScreen
   Begin VB.Frame Frame1
      Caption         =   "Matriz de puntos compensados"
      Height          =   4440
      Left            =   90
      TabIndex        =   1
      Top             =   195
      Width           =   4575
      Begin VB.TextBox Text1
         Height          =   4035
         Left            =   75
         MultiLine       =   -1  'True
         ScrollBars      =   3  'Both
         TabIndex        =   2
         Top             =   300
         Width           =   4410
      End
   End
   Begin VB.CommandButton Command1
      Caption         =   "Cerrar"
      Height          =   495
      Left            =   1935
      TabIndex        =   0
      Top             =   4755
      Width           =   1005
   End
End
Attribute VB_Name = "MatrizCompensada"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Private Sub Command1_Click()
MatrizCompensada.Visible = False
End Sub
```

- Attribute VB_Name = "**Module1**"

```
Dim A As String 'Caracter utilizado para contar el numero de puntos
palpados
Public i As Integer
'VARIABLES DE BÚSQUEDA DE CARACTERES Y VALORES CORRESPONDIENTES
'{
Public TEXTO As String 'Llamo "TEXTO" al texto del archivo origen
Public Const caracterX = "X"
Public Const caracterY = "Y"
Public Const caracterZ = "Z"
Public Const caracter = "#"
Public Const LONGITUD_INICIAL = 1 'Posición inicial de búsqueda
Public posCaracter As Integer 'Posición del caracter #
Public posX As Integer 'Posición del caracter X
Public posY As Integer 'Posición del caracter Y
Public posZ As Integer 'Posición del caracter Z
Public posC As Integer 'Posición del caracter # después de pasar por
el caracter Z
Public p4 As Integer 'Posición del caracter # correspondiente a posC
Public n As Integer 'Numeros de puntos palpados
'}
'VARIABLES DE COMPENSACIÓN
```

```
'{
Dim Num1 As Double
Dim Num2 As Double
Dim Num3 As Double
Dim Den1 As Double
Dim Den2 As Double
Dim nXX As Double
Dim nYY As Double
Dim nZZ As Double
Dim NormalX As Double 'Componente del vector normal x
Dim NormalY As Double 'Componente del vector normal y
Dim NormalZ As Double 'Componente del vector normal z
Dim Modulo As Double 'Módulo del vector normal
Dim Pendiente As Double
Dim CoordenadaXc As Double
Dim CoordenadaYc As Double
Dim CoordenadaZc As Double

Public vnijx As Double
Public vnijy As Double ' Componente del vector normal para puntos
intermedios
Public vnijz As Double
Public mvij As Double 'Módulo del vector normal de puntos intermedios

Public nx As Double
Public ny As Double 'Relación entre la componente del vector normal y
el módulo
Public nz As Double

'Las variables ax,ay,az se usan en todos los puntos compensados
Public ax As Double 'COMPONENTE x DEL PUNTO COMPENSADO
Public ay As Double 'COMPONENTE y DEL PUNTO COMPENSADO
Public az As Double 'COMPONENTE z DEL PUNTO COMPENSADO
'}

'VARIABLES ESTADÍSTICAS
'{
Public Const U = 0.001 'Incertidumbre del aparacto de medida en mm
Public qq As Double 'Relación U/k con k=2 porque conozco tolerancia de
la máquina
Public qas As Double
Public qass As Double
'***Medias
Private media1 As Double 'Relación entre sumatorio de valores de
MatrizX y numero de puntos n
Private media2 As Double 'Relación entre sumatorio de valores de
MatrizY y numero de puntos n
Private media3 As Double 'Relación entre sumatorio de valores de Z y
numero de puntos n
'***Sumatorios
Private c1 As Double 'Sumatorio de (MatrizX(i,1)-media1)^2
Private c2 As Double
Private c3 As Double
'***Desviaciones típicas
Private desvtipica1 As Double 'Desviación típica de puntos
compensados, relación c1/(n-1)
Private desvtipica2 As Double
Private desvtipica3 As Double
'***Medias de Ui/n
```

```
Private mediaUX1 As Double 'Relación entre sumatorio de valores de UX
y numero de puntos n
Private mediaUY1 As Double 'Relación entre sumatorio de valores de UY
y numero de puntos n
Private mediaUZ1 As Double 'Relación entre sumatorio de valores de UZ
y numero de puntos n
'***Sumatorio de (Ui(i,1)-mediaUi1)^2
Private cUX1 As Double
Private cUY1 As Double
Private cUZ1 As Double
'***Desviaciones típicas de matrices
Private desvtipicaUX1 As Double 'Desviación típica sobre la matriz de
errores UX
Private desvtipicaUY1 As Double 'Desviación típica sobre la matriz de
errores UY
Private desvtipicaUZ1 As Double 'Desviación típica sobre la matriz de
errores UZ
'}

'DEFINICIÓN DE MATRICES
'{
Global X() 'Matriz de valores de X tomados del fichero origen
Global Y() 'Matriz de valores de Y tomados del fichero origen
Global Z() 'Matriz de valores de Z tomados del fichero origen
Global MatrizX() 'Matriz de puntos compensados en X
Global MatrizY() 'Matriz de puntos compensados en Y
Global MatrizZ() 'Matriz de puntos compensados en Z
Global UX() 'Matriz de errores en X
Global UY() 'Matriz de errores en Y
Global UZ() 'Matriz de errores en Z
Private E1() 'Matriz que contiene las desviaciones tipicas de los
errores de interpolacion en X
Private E2() 'Matriz que contiene las desviaciones tipicas de los
errores de interpolacion en Y
Private E3() 'Matriz que contiene las desviaciones tipicas de los
errores de interpolacion en Z
Global UIX() 'Matriz de errores de interpolacion en X
Global UIY() 'Matriz de errores de interpolacion en Y
Global UIZ() 'Matriz de errores de interpolacion en Z
Global W()
Global XP() 'Matriz de puntos interpolados en X
Global YP() 'Matriz de puntos interpolados en Y
Global ZP() 'Matriz de puntos interpolados en Z
'}
Public XMIN As Single 'Valor mínimo de la coordenada X
Public YMIN As Single 'Valor mínimo en la coordenada Y
Public ZMIN As Single 'Valor mínimo de la coordenada Z
Public XMAX As Single  'Valor máximo de la coordenada X
Public YMAX As Single 'Valor máximo de la coordenada Y
Public ZMAX As Single 'Valor máximo de la coordenada Z
Public UYMIN As Single
Public UYMAX As Single
Public UZMIN As Single
Public UZMAX As Single
Public UXMIN As Single
Public UXMAX As Single

Dim IX As Integer 'Parámetro de interpolación en X
Dim IY As Integer 'Parámetro de interpolación en Y
Dim IZ As Integer 'Parámetro de interpolación en Z
```

```
Public p As Integer 'Parámetro de interpolación
Dim DX As Single 'Relación (XMAX-XMIN)/IX
Dim DY As Single 'Relación (YMAX-YMIN)/IY
Dim DZ As Single 'Relación (ZMAX-ZMIN)/IZ
Public j As Integer
Public k As Integer
Dim AC As Single
Public JM As Integer 'Número de puntos totales generados en la
interpolación
Public AA As Double
Public BB As Double
Public mnw As Long

Dim a0 As Double
Dim a1 As Double
Dim a2 As Double
Dim a21 As Double
Dim a212 As Double
Dim a22 As Double
Dim a23 As Double
Dim a24 As Double
Dim termino2 As Double
Public Sub PUNTOS_TOMADOS()
10 Open AbrirOrigen.origen For Input As #1 'Apertura del fichero MEA
para lectura en memoria #1
20 n = 0
30 A = Input(1, 1)
40 If A = caracter Then n = n + 1
50 If EOF(1) Then GoTo 60 Else GoTo 30
60 Close #1
End Sub
Public Sub MATRICES_XYZ()
ReDim X(n, 1)
ReDim Y(n, 1)
ReDim Z(n, 1)
Open AbrirOrigen.origen For Input As #2
    TEXTO = Input(LOF(2), #2)
    i = 0
    posCaracter = InStr(LONGITUD_INICIAL, TEXTO, caracter)
    Do
        posX = InStr(posCaracter + p4, TEXTO, caracterX)
        X(i, 1) = CStr(Mid(TEXTO, CStr(posX) + 9, 11))
        posY = InStr(posCaracter + p4, TEXTO, caracterY)
        Y(i, 1) = CStr(Mid(TEXTO, CStr(posY) + 9, 11))
        posZ = InStr(posCaracter + p4, TEXTO, caracterZ)
        Z(i, 1) = CStr(Mid(TEXTO, CStr(posZ) + 9, 11))
        posC = InStr(posX, TEXTO, caracter)
        p4 = CStr(posC)
        i = i + 1
    Loop Until i = n
Close #2
End Sub
Public Sub GUARDAR_MATRICES_XYZ()
Open NombreSinCompensar.sc For Output As #4
    i = -1
    Do
        i = i + 1
        Print #4, X(i, 1); " "; Y(i, 1); " "; Z(i, 1)
    Loop Until i = n
Close #4
```

```
End Sub
Public Sub GUARDAR_MATRICES_COMPENSADAS_XY()
If ParametrosCompensacion.Check1.Value = 1 Then
    Open NombreCompensada.compensado For Output As #4
        i = -1
        Do
            i = i + 1
            Print #4, Round(MatrizX(i, 1), 6); " "; Round(MatrizY(1,
i), 6); " "; Z(i, 1)
        Loop Until i = n - 1
    Close #4
    Presentacion.mnuVMC.Enabled = True
End If
End Sub
Public Sub GUARDAR_MATRICES_COMPENSADAS_XZ()
If ParametrosCompensacion.Check1.Value = 1 Then
    Open NombreCompensada.compensado For Output As #4
        i = -1
        Do
            i = i + 1
            Print #4, Round(MatrizX(i, 1), 6); " "; Y(i, 1); " ";
Round(MatrizZ(1, i), 6)
        Loop Until i = n - 1
    Close #4
    Presentacion.mnuVMC.Enabled = True
End If
End Sub
Public Sub GUARDAR_MATRICES_COMPENSADAS_YZ()
If ParametrosCompensacion.Check1.Value = 1 Then
    Open NombreCompensada.compensado For Output As #4
    i = -1
    Do
        i = i + 1
        Print #4, X(i, 1); " "; Round(MatrizY(i, 1), 6); " ";
Round(MatrizZ(1, i), 6)
    Loop Until i = n - 1
    Close #4
    Presentacion.mnuVMC.Enabled = True
End If
End Sub
Public Sub ERRORES_DE_COMPENSACION_XY()
ReDim UX(n, 1)
ReDim UY(1, n)
Dim r As Single
r = Val(ParametrosCompensacion.Text2.Text)
i = -1
Do
    i = i + 1
    qq = (U / 2) ^ 2
    'Punto inicial
    If i = 0 Then
        CNS0 = Val(Y(i + 1, 1)) - Val(Y(i, 1))
        CNS1 = Val(X(i + 1, 1)) - Val(X(i + 2, 1))
        CNS2 = Val(X(i + 2, 1)) - Val(X(i + 1, 1))
        CNS3 = Val(X(i + 1, 1)) ^ 2 - Val(X(i, 1)) ^ 2
        CNS4 = Val(X(i + 2, 1)) ^ 2 - Val(X(i + 1, 1)) ^ 2
        CNS5 = Val(Y(i + 1, 1)) ^ 2 - Val(Y(i, 1)) ^ 2
        CNS6 = Val(Y(i + 2, 1)) ^ 2 - Val(Y(i + 1, 1)) ^ 2
        CNS7 = Val(Y(i + 2, 1)) - Val(Y(i, 1))
        CNS8 = Val(Y(i + 2, 1)) - Val(Y(i + 1, 1))
```

```
        Denominador = 2 * (CNS1 * CNS0) - 2 * ((-CNS1) * CNS8)
        Parcial0 = 1 + r * ((-2 * Val(X(i, 1)) * CNS8) / Denominador -
1)
        Parcial1 = r * (((2 * CNS8 + 2 * CNS0) * Val(X(i + 1, 1)) /
Denominador) - ((CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 *
CNS4) / Denominador ^ 2) * 2 * CNS7)
        Parcial2 = r * ((-2 * CNS0 * Val(X(i + 2, 1)) / Denominador) -
((CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 * CNS4) / Denominador
^ 2) * (-2) * CNS7)
        Parcial3 = r * (((-2) * Val(Y(i, 1)) * CNS8 + CNS6 + CNS4) /
Denominador - ((CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 * CNS4)
/ Denominador ^ 2) * 2 * CNS2)
        Parcial4 = r * (2 * Val(Y(i + 1, 1)) * CNS8 + Val(Y(i, 1)) ^ 2
+ Val(X(i, 1)) ^ 2 + 2 * Val(Y(i + 1, 1)) * CNS0 - Val(Y(i + 2, 1)) ^
2 - Val(X(i + 2, 1))) / Denominador
        Parcial5 = r * ((CNS5 + CNS3 - 2 * Val(Y(i + 2, 1)) * CNS0) /
Denominador - ((CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 * CNS4)
/ Denominador ^ 2) * (-2) * CNS2)
        Parcial6 = (CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 *
CNS4) / Denominador - Val(X(i, 1))
        uuu = (Parcial0 ^ 2 + Parcial1 ^ 2 + Parcial2 ^ 2 + Parcial3 ^
2 + Parcial4 ^ 2 + Parcial5 ^ 2) * qq + Parcial6 ^ 2 * (0.000001 / 2)
^ 2
        UX(i, 1) = 3 * Sqr(uuu)
        Parcial00 = 1 - r
        Parcial33 = r * (UX(i, 1) / CNS8 - Val(X(i + 1, 1)) / CNS8)
        Parcial44 = r * (-UX(i, 1) / CNS8 - Val(X(i + 2, 1)) / CNS8)
        Parcial55 = r * ((Val(X(i + 1, 1)) - Val(X(i + 2, 1))) / CNS1)
        Parcial66 = (CNS1 / CNS8) * UX(i, 1) + CNS8 / 2 + CNS4 / (2 *
CNS8) - Val(Y(i, 1))
        UY(1, i) = 3 * Sqr((Parcial00 ^ 2 + Parcial33 ^ 2 + Parcial44
^ 2 + Parcial55 ^ 2) * qq + Parcial66 ^ 2 * uuu)
    End If
    'Puntos intermedios
    If i >= 1 Then
        If i < n - 1 Then
            d2 = ((Val(Y(i + 1, 1)) - Val(Y(i - 1, 1))) ^ 2 + (Val(X(i
- 1, 1)) - Val(X(i + 1, 1))) ^ 2) ^ (3 / 2)
            t11 = (Val(ParametrosCompensacion.Text2.Text) / d2 ^ (1 /
3)) + (Val(ParametrosCompensacion.Text2.Text) * (Val(Y(i + 1, 1)) -
Val(Y(i - 1, 1))) ^ 2 / d2)
            t12 = -t11
            t13 = (-Val(ParametrosCompensacion.Text2.Text) * (Val(Y(i
+ 1, 1)) - Val(Y(i - 1, 1))) * (Val(X(i - 1, 1)) - Val(X(i + 1, 1))) /
d2)
            t14 = -t13
            t15 = 1
            t16 = ((Val(Y(i + 1, 1)) - Val(Y(i - 1, 1))) / d2 ^ (1 /
3))
            UX(i, 1) = 3 * Sqr((t11 ^ 2 + t12 ^ 2 + t13 ^ 2 + t14 ^ 2
+ t15 ^ 2 + t16 ^ 2) * qq)
            t17 = t14
            t18 = 1
            t19 = ((Val(X(i - 1, 1)) - Val(X(i + 1, 1))) / d2 ^ (1 /
3))
            t20 = (Val(ParametrosCompensacion.Text2.Text) / d2 ^ (1 /
3)) + (Val(ParametrosCompensacion.Text2.Text) * (Val(X(i - 1, 1)) -
Val(X(i + 1, 1))) ^ 2 / d2)
            t21 = -t20
            t22 = -t16
```

```
            UY(1, i) = 3 * Sqr((t17 ^ 2 + t18 ^ 2 + t19 ^ 2 + t20 ^ 2
+ t21 ^ 2 + t22 ^ 2) * qq)
        End If
    End If
    'Punto final
    If i = n - 1 Then
        CNS0 = Val(Y(i - 1, 1)) - Val(Y(i - 2, 1))
        CNS1 = Val(X(i - 1, 1)) - Val(X(i, 1))
        CNS2 = Val(X(i, 1)) - Val(X(i - 1, 1))
        CNS3 = Val(X(i - 1, 1)) ^ 2 - Val(X(i - 2, 1)) ^ 2
        CNS4 = Val(X(i, 1)) ^ 2 - Val(X(i - 1, 1)) ^ 2
        CNS5 = Val(Y(i - 1, 1)) ^ 2 - Val(Y(i - 2, 1)) ^ 2
        CNS6 = Val(Y(i, 1)) ^ 2 - Val(Y(i - 1, 1)) ^ 2
        CNS7 = Val(Y(i, 1)) - Val(Y(i - 2, 1))
        CNS8 = Val(Y(i, 1)) - Val(Y(i - 1, 1))
        Denominador = 2 * (CNS1 * CNS0) - 2 * ((-CNS1) * CNS8)
        Parcial0 = 1 + r * ((-2 * Val(X(i - 2, 1)) * CNS8) /
Denominador - 1)
        Parcial1 = r * (((2 * CNS8 + 2 * CNS0) * Val(X(i - 1, 1)) /
Denominador) - ((CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 *
CNS4) / Denominador ^ 2) * 2 * CNS7)
        Parcial2 = r * ((-2 * CNS0 * Val(X(i, 1)) / Denominador) -
((CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 * CNS4) / Denominador
^ 2) * (-2) * CNS7)
        Parcial3 = r * (((-2) * Val(Y(i - 2, 1)) * CNS8 + CNS6 + CNS4)
/ Denominador - ((CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 *
CNS4) / Denominador ^ 2) * 2 * CNS2)
        Parcial4 = r * (2 * Val(Y(i - 1, 1)) * CNS8 + Val(Y(i - 2, 1))
^ 2 + Val(X(i - 2, 1)) ^ 2 + 2 * Val(Y(i - 1, 1)) * CNS0 - Val(Y(i,
1)) ^ 2 - Val(X(i, 1))) / Denominador
        Parcial5 = r * ((CNS5 + CNS3 - 2 * Val(Y(i, 1)) * CNS0) /
Denominador - ((CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 * CNS4)
/ Denominador ^ 2) * (-2) * CNS2)
        Parcial6 = (CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 *
CNS4) / Denominador - Val(X(i - 2, 1))
        uuu = (Parcial0 ^ 2 + Parcial1 ^ 2 + Parcial2 ^ 2 + Parcial3 ^
2 + Parcial4 ^ 2 + Parcial5 ^ 2) * qq + Parcial6 ^ 2 * (0.000001 / 2)
^ 2
        UX(i, 1) = 3 * Sqr(uuu)
        Parcial00 = 1 - r
        Parcial33 = r * (UX(i, 1) / CNS8 - Val(X(i - 1, 1)) / CNS8)
        Parcial44 = r * (-UX(i, 1) / CNS8 - Val(X(i, 1)) / CNS8)
        Parcial55 = r * ((Val(X(i - 1, 1)) - Val(X(i, 1))) / CNS1)
        Parcial66 = (CNS1 / CNS8) * UX(i, 1) + CNS8 / 2 + CNS4 / (2 *
CNS8) - Val(Y(i - 2, 1))
        UY(1, i) = 3 * Sqr((Parcial00 ^ 2 + Parcial33 ^ 2 + Parcial44
^ 2 + Parcial55 ^ 2) * qq + Parcial66 ^ 2 * uuu)
    End If
Loop Until i = n - 1
Open NombreErrores.errores For Output As #15
    Print #15, "Error en X      Error en Y"
    i = -1
        Do
            i = i + 1
            Print #15, Format(UX(i, 1), "scientific"), Format(UY(1,
i), "scientific")
        Loop Until i = n - 1
Close #15
If Val(UX(0, 1)) > 0 Then UXMIN = Val(UX(0, 1))
If Val(UX(0, 1)) < 0 Then UXMAX = Val(UX(0, 1))
```

```
If Val(UY(1, 0)) > 0 Then UYMIN = Val(UY(1, 0))
If Val(UY(1, 0)) < 0 Then UYMAX = Val(UY(1, 0))
i = 0
Do 'Bucle cerrado en linea 570
    i = i + 1 'Comienza la comparación en UY(1,1),UZ(1,1)
490 If UX(i, 1) < UXMIN Then GoTo 500 Else GoTo 510
500 UXMIN = UX(i, 1)
510 If UX(i, 1) > UXMAX Then GoTo 520 Else GoTo 530
520 UXMAX = UX(i, 1)
530 If UY(1, i) < UYMIN Then GoTo 540 Else GoTo 550
540 UYMIN = UY(1, i)
550 If UY(1, i) > UYMAX Then GoTo 560 Else GoTo 570
560 UYMAX = UY(1, i)
570 Loop Until i = n - 1
MatrizErrores.Text2.Text = 0
MatrizErrores.Text12.Text = 0
MatrizErrores.Text13.Text = Format(UXMIN, "scientific")
MatrizErrores.Text14.Text = Format(UXMAX, "scientific")
MatrizErrores.Text15.Text = Format(UYMIN, "scientific")
MatrizErrores.Text16.Text = Format(UYMAX, "scientific")
Dim ve1 As Double
i = 0
ve1 = UX(i, 1)
Do
    i = i + 1
    ve1 = ve1 + UX(i, 1)
Loop Until i = n - 1
mediaUX1 = ve1 / n
i = 0
cUX1 = (UX(i, 1) - mediaUX1) ^ 2
Do
    i = i + 1
    cUX1 = cUX1 + (UX(i, 1) - mediaUX1) ^ 2
Loop Until i = n - 1
desvtipicaUX1 = Sqr(cUX1 / (n - 1))
MatrizErrores.Label11.Caption = "Desviación típica para columna X:"
MatrizErrores.Text17.Text = Format(desvtipicaUX1, "scientific")
Dim ve2 As Double
i = 0
ve2 = UY(1, i)
Do
    i = i + 1
    ve2 = ve2 + UY(1, i)
Loop Until i = n - 1
mediaUY1 = ve2 / n
i = 0
cUY1 = (UY(1, i) - mediaUY1) ^ 2
Do
    i = i + 1
    cUY1 = cUY1 + (UY(1, i) - mediaUY1) ^ 2
Loop Until i = n - 1
desvtipicaUY1 = Sqr(cUY1 / (n - 1))
MatrizErrores.Label12.Caption = "Desviación típica para columna Y:"
MatrizErrores.Text18.Text = Format(desvtipicaUY1, "scientific")
'Definición de matrices para la representación gráfica de errores
'---------------------------------------------------------------
ReDim G1(n, 1) 'Matriz columna que contiene los valores redondeados a
15 decimales de la matriz UX()
ReDim G2(n, 1) 'Matriz columna que contiene los valores redondeados a
15 decimales de la matriz UY()
```

```
For i = 0 To (n - 1)
    G1(i, 1) = Round(UX(i, 1), 15)
Next i
'Representación gráfica de los valores resultantes del error cometido
en la interpolación
'-------------------------------------------------------------------
------------------
MatrizErrores.MSChart1.Plot.Axis(VtChAxisIdY).ValueScale.Minimum =
UXMIN
MatrizErrores.MSChart1.Plot.Axis(VtChAxisIdY2).ValueScale.Minimum =
UXMIN
MatrizErrores.MSChart1.Plot.Axis(VtChAxisIdY).ValueScale.Maximum =
UXMAX
MatrizErrores.MSChart1.Plot.Axis(VtChAxisIdY2).ValueScale.Maximum =
UXMAX
MatrizErrores.MSChart1.ChartData = G1
MatrizErrores.MSChart1.TitleText = "Errores de la columna X"
MatrizErrores.MSChart1.RowCount = n
For j = 0 To (n - 1)
    G2(j, 1) = Round(UY(1, j), 15)
Next j
MatrizErrores.MSChart2.ChartData = G2
MatrizErrores.MSChart2.TitleText = "Errores de la columna Y"
MatrizErrores.MSChart2.RowCount = n
MatrizErrores.MSChart2.Plot.Axis(VtChAxisIdY).ValueScale.Minimum =
UYMIN
MatrizErrores.MSChart2.Plot.Axis(VtChAxisIdY2).ValueScale.Minimum =
UYMIN
MatrizErrores.MSChart2.Plot.Axis(VtChAxisIdY).ValueScale.Maximum =
UYMAX
MatrizErrores.MSChart2.Plot.Axis(VtChAxisIdY2).ValueScale.Maximum =
UYMAX
End Sub
Public Sub ERRORES_DE_COMPENSACION_XZ()
ReDim UX(n, 1)
ReDim UZ(1, n)
i = -1
Do
    i = i + 1
    qq = (U / 2) ^ 2
    'Punto inicial
    If i = 0 Then
        CNS0 = Val(Z(i + 1, 1)) - Val(Z(i, 1))
        CNS1 = Val(X(i + 1, 1)) - Val(X(i + 2, 1))
        CNS2 = Val(X(i + 2, 1)) - Val(X(i + 1, 1))
        CNS3 = Val(X(i + 1, 1)) ^ 2 - Val(X(i, 1)) ^ 2
        CNS4 = Val(X(i + 2, 1)) ^ 2 - Val(X(i + 1, 1)) ^ 2
        CNS5 = Val(Z(i + 1, 1)) ^ 2 - Val(Z(i, 1)) ^ 2
        CNS6 = Val(Z(i + 2, 1)) ^ 2 - Val(Z(i + 1, 1)) ^ 2
        CNS7 = Val(Z(i + 2, 1)) - Val(Z(i, 1))
        CNS8 = Val(Z(i + 2, 1)) - Val(Z(i + 1, 1))
        Denominador = 2 * (CNS1 * CNS0) - 2 * ((-CNS1) * CNS8)
        Parcial0 = 1 + r * ((-2 * Val(X(i, 1)) * CNS8) / Denominador -
1)
        Parcial1 = r * (((2 * CNS8 + 2 * CNS0) * Val(X(i + 1, 1)) /
Denominador) - ((CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 *
CNS4) / Denominador ^ 2) * 2 * CNS7)
        Parcial2 = r * ((-2 * CNS0 * Val(X(i + 2, 1)) / Denominador) -
((CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 * CNS4) / Denominador
^ 2) * (-2) * CNS7)
```

```
        Parcial3 = r * (((-2) * Val(Z(i, 1)) * CNS8 + CNS6 + CNS4) /
Denominador - ((CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 * CNS4)
/ Denominador ^ 2) * 2 * CNS2)
        Parcial4 = r * (2 * Val(Z(i + 1, 1)) * CNS8 + Val(Z(i, 1)) ^ 2
+ Val(X(i, 1)) ^ 2 + 2 * Val(Z(i + 1, 1)) * CNS0 - Val(Z(i + 2, 1)) ^
2 - Val(X(i + 2, 1))) / Denominador
        Parcial5 = r * ((CNS5 + CNS3 - 2 * Val(Z(i + 2, 1)) * CNS0) /
Denominador - ((CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 * CNS4)
/ Denominador ^ 2) * (-2) * CNS2)
        Parcial6 = (CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 *
CNS4) / Denominador - Val(X(i, 1))
        uuu = (Parcial0 ^ 2 + Parcial1 ^ 2 + Parcial2 ^ 2 + Parcial3 ^
2 + Parcial4 ^ 2 + Parcial5 ^ 2) * qq + Parcial6 ^ 2 * (0.000001 / 2)
^ 2
        UX(i, 1) = 3 * Sqr(uuu)
        Parcial00 = 1 - r
        Parcial33 = r * (UX(i, 1) / CNS8 - Val(X(i + 1, 1)) / CNS8)
        Parcial44 = r * (-UX(i, 1) / CNS8 - Val(X(i + 2, 1)) / CNS8)
        Parcial55 = r * ((Val(X(i + 1, 1)) - Val(X(i + 2, 1))) / CNS1)
        Parcial66 = (CNS1 / CNS8) * UX(i, 1) + CNS8 / 2 + CNS4 / (2 *
CNS8) - Val(Z(i, 1))
        UZ(1, i) = 3 * Sqr((Parcial00 ^ 2 + Parcial33 ^ 2 + Parcial44
^ 2 + Parcial55 ^ 2) * qq + Parcial66 ^ 2 * uuu)
    End If
    'Puntos intermedios
    If i >= 1 Then
        If i < n - 1 Then
            d2 = ((Val(Z(i + 1, 1)) - Val(Z(i - 1, 1))) ^ 2 + (Val(X(i
- 1, 1)) - Val(X(i + 1, 1))) ^ 2) ^ (3 / 2)
            t11 = (Val(ParametrosCompensacion.Text2.Text) / d2 ^ (1 /
3)) + (Val(ParametrosCompensacion.Text2.Text) * (Val(Z(i + 1, 1)) -
Val(Z(i - 1, 1))) ^ 2 / d2)
            t12 = -t11
            t13 = (-Val(ParametrosCompensacion.Text2.Text) * (Val(Z(i
+ 1, 1)) - Val(Z(i - 1, 1))) * (Val(X(i - 1, 1)) - Val(X(i + 1, 1))) /
d2)
            t14 = -t13
            t15 = 1
            t16 = ((Val(Z(i + 1, 1)) - Val(Z(i - 1, 1))) / d2 ^ (1 /
3))
            UX(i, 1) = 3 * Sqr((t11 ^ 2 + t12 ^ 2 + t13 ^ 2 + t14 ^ 2
+ t15 ^ 2 + t16 ^ 2) * qq)
            t17 = t14
            t18 = 1
            t19 = ((Val(X(i - 1, 1)) - Val(X(i + 1, 1))) / d2 ^ (1 /
3))
            t20 = (Val(ParametrosCompensacion.Text2.Text) / d2 ^ (1 /
3)) + (Val(ParametrosCompensacion.Text2.Text) * (Val(X(i - 1, 1)) -
Val(X(i + 1, 1))) ^ 2 / d2)
            t21 = -t20
            t22 = -t16
            UZ(1, i) = 3 * Sqr((t17 ^ 2 + t18 ^ 2 + t19 ^ 2 + t20 ^ 2
+ t21 ^ 2 + t22 ^ 2) * qq)
        End If
    End If
    'Punto final
    If i = n - 1 Then
        CNS0 = Val(Z(i - 1, 1)) - Val(Z(i - 2, 1))
        CNS1 = Val(X(i - 1, 1)) - Val(X(i, 1))
        CNS2 = Val(X(i, 1)) - Val(X(i - 1, 1))
```

```
        CNS3 = Val(X(i - 1, 1)) ^ 2 - Val(X(i - 2, 1)) ^ 2
        CNS4 = Val(X(i, 1)) ^ 2 - Val(X(i - 1, 1)) ^ 2
        CNS5 = Val(Z(i - 1, 1)) ^ 2 - Val(Z(i - 2, 1)) ^ 2
        CNS6 = Val(Z(i, 1)) ^ 2 - Val(Z(i - 1, 1)) ^ 2
        CNS7 = Val(Z(i, 1)) - Val(Z(i - 2, 1))
        CNS8 = Val(Z(i, 1)) - Val(Z(i - 1, 1))
        Denominador = 2 * (CNS1 * CNS0) - 2 * ((-CNS1) * CNS8)
        Parcial0 = 1 + r * ((-2 * Val(X(i - 2, 1)) * CNS8) /
Denominador - 1)
        Parcial1 = r * (((2 * CNS8 + 2 * CNS0) * Val(X(i - 1, 1)) /
Denominador) - ((CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 *
CNS4) / Denominador ^ 2) * 2 * CNS7)
        Parcial2 = r * ((-2 * CNS0 * Val(X(i, 1)) / Denominador) -
((CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 * CNS4) / Denominador
^ 2) * (-2) * CNS7)
        Parcial3 = r * (((-2) * Val(Z(i - 2, 1)) * CNS8 + CNS6 + CNS4)
/ Denominador - ((CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 *
CNS4) / Denominador ^ 2) * 2 * CNS2)
        Parcial4 = r * (2 * Val(Z(i - 1, 1)) * CNS8 + Val(Z(i - 2, 1))
^ 2 + Val(X(i - 2, 1)) ^ 2 + 2 * Val(Z(i - 1, 1)) * CNS0 - Val(Z(i,
1)) ^ 2 - Val(X(i, 1))) / Denominador
        Parcial5 = r * ((CNS5 + CNS3 - 2 * Val(Z(i, 1)) * CNS0) /
Denominador - ((CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 * CNS4)
/ Denominador ^ 2) * (-2) * CNS2)
        Parcial6 = (CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 *
CNS4) / Denominador - Val(X(i - 2, 1))
        uuu = (Parcial0 ^ 2 + Parcial1 ^ 2 + Parcial2 ^ 2 + Parcial3 ^
2 + Parcial4 ^ 2 + Parcial5 ^ 2) * qq + Parcial6 ^ 2 * (0.000001 / 2)
^ 2
        UX(i, 1) = 3 * Sqr(uuu)
        Parcial00 = 1 - r
        Parcial33 = r * (UX(i, 1) / CNS8 - Val(X(i - 1, 1)) / CNS8)
        Parcial44 = r * (-UX(i, 1) / CNS8 - Val(X(i, 1)) / CNS8)
        Parcial55 = r * ((Val(X(i - 1, 1)) - Val(X(i, 1))) / CNS1)
        Parcial66 = (CNS1 / CNS8) * UX(i, 1) + CNS8 / 2 + CNS4 / (2 *
CNS8) - Val(Z(i - 2, 1))
        UZ(1, i) = 3 * Sqr((Parcial00 ^ 2 + Parcial33 ^ 2 + Parcial44
^ 2 + Parcial55 ^ 2) * qq + Parcial66 ^ 2 * uuu)
    End If
Loop Until i = n - 1
Open NombreErrores.errores For Output As #15
    Print #15, "Error en X        Error en Z"
    i = -1
    Do
        i = i + 1
        Print #15, Format(UX(i, 1), "scientific"), Format(UZ(1, i),
"scientific")
    Loop Until i = n - 1
Close #15
If Val(UX(0, 1)) > 0 Then UXMIN = Val(UX(0, 1))
If Val(UX(0, 1)) < 0 Then UXMAX = Val(UX(0, 1))
If Val(UZ(1, 0)) > 0 Then UZMIN = Val(UZ(1, 0))
If Val(UZ(1, 0)) < 0 Then UZMAX = Val(UZ(1, 0))
i = 0
Do
    i = i + 1 'Comienza la comparación en UY(1,1),UZ(1,1)
490     If UX(i, 1) < UXMIN Then GoTo 500 Else GoTo 510
500     UXMIN = UX(i, 1)
510     If UX(i, 1) > UXMAX Then GoTo 520 Else GoTo 530
520     UXMAX = UX(i, 1)
```

```
530     If UZ(1, i) < UZMIN Then GoTo 540 Else GoTo 550
540     UZMIN = UZ(1, i)
550     If UZ(1, i) > UZMAX Then GoTo 560 Else GoTo 570
560     UZMAX = UZ(1, i)
570 Loop Until i = n - 1
MatrizErrores.Text15.Text = 0
MatrizErrores.Text16.Text = 0
MatrizErrores.Text13.Text = Format(UXMIN, "scientific")
MatrizErrores.Text14.Text = Format(UXMAX, "scientific")
MatrizErrores.Text12.Text = Format(UZMIN, "scientific")
MatrizErrores.Text2.Text = Format(UZMAX, "scientific")
Dim ve3 As Double
i = 0
ve3 = UX(i, 1)
Do
    i = i + 1
    ve3 = ve3 + UX(i, 1)
Loop Until i = n - 1
mediaUX1 = ve3 / n
i = 0
cUX1 = (UX(i, 1) - mediaUX1) ^ 2
Do
    i = i + 1
    cUX1 = cUX1 + (UX(i, 1) - mediaUX1) ^ 2
Loop Until i = n - 1
desvtipicaUX1 = Sqr(cUX1 / (n - 1))
MatrizErrores.Label11.Caption = "Desviación típica para columna X:"
MatrizErrores.Text17.Text = Format(desvtipicaUX1, "scientific")
Dim ve4 As Double
i = 0
ve4 = UZ(1, i)
Do
    i = i + 1
    ve4 = ve4 + UZ(1, i)
Loop Until i = n - 1
mediaUZ1 = ve4 / n
i = 0
cUZ1 = (UZ(1, i) - mediaUZ1) ^ 2
Do
    i = i + 1
    cUZ1 = cUZ1 + (UZ(1, i) - mediaUZ1) ^ 2
Loop Until i = n - 1
desvtipicaUZ1 = Sqr(cUZ1 / (n - 1))
MatrizErrores.Label12.Caption = "Desviación típica para columna Z:"
MatrizErrores.Text18.Text = Format(desvtipicaUZ1, "scientific")
'Definición de matrices para la representación gráfica de errores
'---------------------------------------------------------------
ReDim G1(n, 1)
ReDim G2(n, 1)
For i = 0 To (n - 1)
    G1(i, 1) = Round(UX(i, 1), 15)
Next i
'Representación gráfica de los valores resultantes del error cometido
en la interpolación
'-------------------------------------------------------------------
------------------
MatrizErrores.MSChart1.Plot.Axis(VtChAxisIdY).ValueScale.Minimum =
UXMIN
MatrizErrores.MSChart1.Plot.Axis(VtChAxisIdY2).ValueScale.Minimum =
UXMIN
```

```
MatrizErrores.MSChart1.Plot.Axis(VtChAxisIdY).ValueScale.Maximum =
UXMAX
MatrizErrores.MSChart1.Plot.Axis(VtChAxisIdY2).ValueScale.Maximum =
UXMAX
MatrizErrores.MSChart1.ChartData = G1
MatrizErrores.MSChart1.TitleText = "Errores de la columna X"
MatrizErrores.MSChart1.RowCount = n
For j = 0 To (n - 1)
    G2(j, 1) = Round(UZ(1, j), 15)
Next j
MatrizErrores.MSChart2.ChartData = G2
MatrizErrores.MSChart2.TitleText = "Errores de la columna Z"
MatrizErrores.MSChart2.RowCount = n
MatrizErrores.MSChart2.Plot.Axis(VtChAxisIdY).ValueScale.Minimum =
UZMIN
MatrizErrores.MSChart2.Plot.Axis(VtChAxisIdY2).ValueScale.Minimum =
UZMIN
MatrizErrores.MSChart2.Plot.Axis(VtChAxisIdY).ValueScale.Maximum =
UZMAX
MatrizErrores.MSChart2.Plot.Axis(VtChAxisIdY2).ValueScale.Maximum =
UZMAX
End Sub
Public Sub ERRORES_DE_COMPENSACION_YZ()
ReDim UY(n, 1)
ReDim UZ(1, n)
i = -1
Do
    i = i + 1
    qq = (U / 2) ^ 2
    'Punto inicial
    If i = 0 Then
        CNS0 = Val(Z(i + 1, 1)) - Val(Z(i, 1))
        CNS1 = Val(Y(i + 1, 1)) - Val(Y(i + 2, 1))
        CNS2 = Val(Y(i + 2, 1)) - Val(Y(i + 1, 1))
        CNS3 = Val(Y(i + 1, 1)) ^ 2 - Val(Y(i, 1)) ^ 2
        CNS4 = Val(Y(i + 2, 1)) ^ 2 - Val(Y(i + 1, 1)) ^ 2
        CNS5 = Val(Z(i + 1, 1)) ^ 2 - Val(Z(i, 1)) ^ 2
        CNS6 = Val(Z(i + 2, 1)) ^ 2 - Val(Z(i + 1, 1)) ^ 2
        CNS7 = Val(Z(i + 2, 1)) - Val(Z(i, 1))
        CNS8 = Val(Z(i + 2, 1)) - Val(Z(i + 1, 1))
        Denominador = 2 * (CNS1 * CNS0) - 2 * ((-CNS1) * CNS8)
        Parcial0 = 1 + r * ((-2 * Val(Y(i, 1)) * CNS8) / Denominador -
1)
        Parcial1 = r * (((2 * CNS8 + 2 * CNS0) * Val(Y(i + 1, 1)) /
Denominador) - ((CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 *
CNS4) / Denominador ^ 2) * 2 * CNS7)
        Parcial2 = r * ((-2 * CNS0 * Val(Y(i + 2, 1)) / Denominador) -
((CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 * CNS4) / Denominador
^ 2) * (-2) * CNS7)
        Parcial3 = r * (((-2) * Val(Z(i, 1)) * CNS8 + CNS6 + CNS4) /
Denominador - ((CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 * CNS4)
/ Denominador ^ 2) * 2 * CNS2)
        Parcial4 = r * (2 * Val(Z(i + 1, 1)) * CNS8 + Val(Z(i, 1)) ^ 2
+ Val(Y(i, 1)) ^ 2 + 2 * Val(Z(i + 1, 1)) * CNS0 - Val(Z(i + 2, 1)) ^
2 - Val(Y(i + 2, 1))) / Denominador
        Parcial5 = r * ((CNS5 + CNS3 - 2 * Val(Z(i + 2, 1)) * CNS0) /
Denominador - ((CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 * CNS4)
/ Denominador ^ 2) * (-2) * CNS2)
        Parcial6 = (CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 *
CNS4) / Denominador - Val(Y(i, 1))
```

```
        uuu = (Parcial0 ^ 2 + Parcial1 ^ 2 + Parcial2 ^ 2 + Parcial3 ^
2 + Parcial4 ^ 2 + Parcial5 ^ 2) * qq + Parcial6 ^ 2 * (0.000001 / 2)
^ 2
        UY(i, 1) = 3 * Sqr(uuu)
        Parcial00 = 1 - r
        Parcial33 = r * (UX(i, 1) / CNS8 - Val(Y(i + 1, 1)) / CNS8)
        Parcial44 = r * (-UX(i, 1) / CNS8 - Val(Y(i + 2, 1)) / CNS8)
        Parcial55 = r * ((Val(Y(i + 1, 1)) - Val(Y(i + 2, 1))) / CNS1)
        Parcial66 = (CNS1 / CNS8) * UX(i, 1) + CNS8 / 2 + CNS4 / (2 *
CNS8) - Val(Z(i, 1))
        UZ(1, i) = 3 * Sqr((Parcial00 ^ 2 + Parcial33 ^ 2 + Parcial44
^ 2 + Parcial55 ^ 2) * qq + Parcial66 ^ 2 * uuu)
    End If
    'Puntos intermedios
    If i >= 1 Then
        If i < n - 1 Then
            d2 = ((Val(Z(i + 1, 1)) - Val(Z(i - 1, 1))) ^ 2 + (Val(Y(i
- 1, 1)) - Val(Y(i + 1, 1))) ^ 2) ^ (3 / 2)
            t11 = (Val(ParametrosCompensacion.Text2.Text) / d2 ^ (1 /
3)) + (Val(ParametrosCompensacion.Text2.Text) * (Val(Z(i + 1, 1)) -
Val(Z(i - 1, 1))) ^ 2 / d2)
            t12 = -t11
            t13 = (-Val(ParametrosCompensacion.Text2.Text) * (Val(Z(i
+ 1, 1)) - Val(Z(i - 1, 1))) * (Val(Y(i - 1, 1)) - Val(Y(i + 1, 1))) /
d2)
            t14 = -t13
            t15 = 1
            t16 = ((Val(Z(i + 1, 1)) - Val(Z(i - 1, 1))) / d2 ^ (1 /
3))
            UY(i, 1) = 3 * Sqr((t11 ^ 2 + t12 ^ 2 + t13 ^ 2 + t14 ^ 2
+ t15 ^ 2 + t16 ^ 2) * qq)
            t17 = t14
            t18 = 1
            t19 = ((Val(Y(i - 1, 1)) - Val(Y(i + 1, 1))) / d2 ^ (1 /
3))
            t20 = (Val(ParametrosCompensacion.Text2.Text) / d2 ^ (1 /
3)) + (Val(ParametrosCompensacion.Text2.Text) * (Val(Y(i - 1, 1)) -
Val(Y(i + 1, 1))) ^ 2 / d2)
            t21 = -t20
            t22 = -t16
            UZ(1, i) = 3 * Sqr((t17 ^ 2 + t18 ^ 2 + t19 ^ 2 + t20 ^ 2
+ t21 ^ 2 + t22 ^ 2) * qq)
        End If
    End If
    'Punto final
    If i = n - 1 Then
        CNS0 = Val(Z(i - 1, 1)) - Val(Z(i - 2, 1))
        CNS1 = Val(Y(i - 1, 1)) - Val(Y(i, 1))
        CNS2 = Val(Y(i, 1)) - Val(Y(i - 1, 1))
        CNS3 = Val(Y(i - 1, 1)) ^ 2 - Val(Y(i - 2, 1)) ^ 2
        CNS4 = Val(Y(i, 1)) ^ 2 - Val(Y(i - 1, 1)) ^ 2
        CNS5 = Val(Z(i - 1, 1)) ^ 2 - Val(Z(i - 2, 1)) ^ 2
        CNS6 = Val(Z(i, 1)) ^ 2 - Val(Z(i - 1, 1)) ^ 2
        CNS7 = Val(Z(i, 1)) - Val(Z(i - 2, 1))
        CNS8 = Val(Z(i, 1)) - Val(Z(i - 1, 1))
        Denominador = 2 * (CNS1 * CNS0) - 2 * ((-CNS1) * CNS8)
        Parcial0 = 1 + r * ((-2 * Val(Y(i - 2, 1)) * CNS8) /
Denominador - 1)
```

```
        Parcial1 = r * (((2 * CNS8 + 2 * CNS0) * Val(Y(i - 1, 1)) /
Denominador) - ((CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 *
CNS4) / Denominador ^ 2) * 2 * CNS7)
        Parcial2 = r * ((-2 * CNS0 * Val(Y(i, 1)) / Denominador) -
((CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 * CNS4) / Denominador
^ 2) * (-2) * CNS7)
        Parcial3 = r * (((-2) * Val(Z(i - 2, 1)) * CNS8 + CNS6 + CNS4)
/ Denominador - ((CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 *
CNS4) / Denominador ^ 2) * 2 * CNS2)
        Parcial4 = r * (2 * Val(Z(i - 1, 1)) * CNS8 + Val(Z(i - 2, 1))
^ 2 + Val(Y(i - 2, 1)) ^ 2 + 2 * Val(Z(i - 1, 1)) * CNS0 - Val(Z(i,
1)) ^ 2 - Val(Y(i, 1))) / Denominador
        Parcial5 = r * ((CNS5 + CNS3 - 2 * Val(Z(i, 1)) * CNS0) /
Denominador - ((CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 * CNS4)
/ Denominador ^ 2) * (-2) * CNS2)
        Parcial6 = (CNS5 * CNS8 + CNS8 * CNS3 - CNS6 * CNS0 - CNS0 *
CNS4) / Denominador - Val(Y(i - 2, 1))
        uuu = (Parcial0 ^ 2 + Parcial1 ^ 2 + Parcial2 ^ 2 + Parcial3 ^
2 + Parcial4 ^ 2 + Parcial5 ^ 2) * qq + Parcial6 ^ 2 * (0.000001 / 2)
^ 2
        UY(i, 1) = 3 * Sqr(uuu)
        Parcial00 = 1 - r
        Parcial33 = r * (UX(i, 1) / CNS8 - Val(Y(i - 1, 1)) / CNS8)
        Parcial44 = r * (-UX(i, 1) / CNS8 - Val(Y(i, 1)) / CNS8)
        Parcial55 = r * ((Val(Y(i - 1, 1)) - Val(Y(i, 1))) / CNS1)
        Parcial66 = (CNS1 / CNS8) * UX(i, 1) + CNS8 / 2 + CNS4 / (2 *
CNS8) - Val(Z(i - 2, 1))
        UZ(1, i) = 3 * Sqr((Parcial00 ^ 2 + Parcial33 ^ 2 + Parcial44
^ 2 + Parcial55 ^ 2) * qq + Parcial66 ^ 2 * uuu)
    End If
Loop Until i = n - 1
Open NombreErrores.errores For Output As #15
    Print #15, "Error en Y     Error en Z"
    i = -1
    Do
        i = i + 1
        Print #15, Format(UY(i, 1), "scientific"), Format(UZ(1, i),
"scientific")
    Loop Until i = n - 1
Close #15
If Val(UY(0, 1)) > 0 Then UYMIN = Val(UY(0, 1))
If Val(UY(0, 1)) < 0 Then UYMAX = Val(UY(0, 1))
If Val(UZ(1, 0)) > 0 Then UZMIN = Val(UZ(1, 0))
If Val(UZ(1, 0)) < 0 Then UZMAX = Val(UZ(1, 0))
i = 0
Do
    i = i + 1 'Comienza la comparación en UY(1,1),UZ(1,1)
490     If UY(i, 1) < UYMIN Then GoTo 500 Else GoTo 510
500     UYMIN = UY(i, 1)
510     If UY(i, 1) > UYMAX Then GoTo 520 Else GoTo 530
520     UYMAX = UY(i, 1)
530     If UZ(1, i) < UZMIN Then GoTo 540 Else GoTo 550
540     UZMIN = UZ(1, i)
550     If UZ(1, i) > UZMAX Then GoTo 560 Else GoTo 570
560     UZMAX = UZ(1, i)
570 Loop Until i = n - 1
MatrizErrores.Text13.Text = 0
MatrizErrores.Text14.Text = 0
MatrizErrores.Text15.Text = Round(UYMIN, 8)
MatrizErrores.Text16.Text = Round(UYMAX, 8)
```

```
MatrizErrores.Text12.Text = Round(UZMIN, 8)
MatrizErrores.Text2.Text = Round(UZMAX, 8)
Dim ve5 As Double
i = 0
ve5 = UY(i, 1)
Do
    i = i + 1
    ve5 = ve5 + UY(i, 1)
Loop Until i = n - 1
mediaUY1 = ve5 / n
i = 0
cUY1 = (UY(i, 1) - mediaUY1) ^ 2
Do
    i = i + 1
    cUY1 = cUY1 + (UY(i, 1) - mediaUY1) ^ 2
Loop Until i = n - 1
desvtipicaUY1 = Sqr(cUY1 / (n - 1))
MatrizErrores.Label11.Caption = "Desviación típica para columna Y:"
MatrizErrores.Text17.Text = Format(desvtipicaUY1, "scientific")
Dim ve6 As Double
i = 0
ve6 = UZ(1, i)
Do
    i = i + 1
    ve6 = ve6 + UZ(1, i)
Loop Until i = n - 1
mediaUZ1 = ve6 / n
i = 0
cUZ1 = (UZ(1, i) - mediaUZ1) ^ 2
Do
    i = i + 1
    cUZ1 = cUZ1 + (UZ(1, i) - mediaUZ1) ^ 2
Loop Until i = n - 1
desvtipicaUZ1 = Sqr(cUZ1 / (n - 1))
MatrizErrores.Label12.Caption = "Desviación típica para columna Z:"
MatrizErrores.Text18.Text = Format(desvtipicaUZ1, "scientific")
'Definición de matrices para la representación gráfica de errores
'---------------------------------------------------------------
ReDim G1(n, 1)
ReDim G2(n, 1)
For i = 0 To (n - 1)
    G1(i, 1) = Round(UY(i, 1), 15)
Next i
'Representación gráfica de los valores resultantes del error cometido
en la interpolación
'-----------------------------------------------------------------------
-------------------
MatrizErrores.MSChart1.Plot.Axis(VtChAxisIdY).ValueScale.Minimum =
UYMIN
MatrizErrores.MSChart1.Plot.Axis(VtChAxisIdY2).ValueScale.Minimum =
UYMIN
MatrizErrores.MSChart1.Plot.Axis(VtChAxisIdY).ValueScale.Maximum =
UYMAX
MatrizErrores.MSChart1.Plot.Axis(VtChAxisIdY2).ValueScale.Maximum =
UYMAX
MatrizErrores.MSChart1.ChartData = G1
MatrizErrores.MSChart1.TitleText = "Errores de la columna Y"
MatrizErrores.MSChart1.RowCount = n
For j = 0 To (n - 1)
    G2(j, 1) = Round(UZ(1, j), 15)
```

```
Next j
MatrizErrores.MSChart2.ChartData = G2
MatrizErrores.MSChart2.TitleText = "Errores de la columna Z"
MatrizErrores.MSChart2.RowCount = n
MatrizErrores.MSChart2.Plot.Axis(VtChAxisIdY).ValueScale.Minimum =
UZMIN
MatrizErrores.MSChart2.Plot.Axis(VtChAxisIdY2).ValueScale.Minimum =
UZMIN
MatrizErrores.MSChart2.Plot.Axis(VtChAxisIdY).ValueScale.Maximum =
UZMAX
MatrizErrores.MSChart2.Plot.Axis(VtChAxisIdY2).ValueScale.Maximum =
UZMAX
End Sub
Public Sub INTERPOLACION_XY()
If Val(MatrizX(0, 1)) > 0 Then XMIN = Val(MatrizX(0, 1))
If Val(MatrizX(0, 1)) < 0 Then XMAX = Val(MatrizX(0, 1))
If Val(MatrizY(1, 0)) > 0 Then YMIN = Val(MatrizY(1, 0))
If Val(MatrizY(1, 0)) < 0 Then YMAX = Val(MatrizY(1, 0))
If Val(Z(0, 1)) > 0 Then ZMIN = Val(Z(0, 1))
If Val(Z(0, 1)) < 0 Then ZMAX = Val(Z(0, 1))
i = 0
Do
490 If Val(MatrizX(i, 1)) < XMIN Then GoTo 500 Else GoTo 510
500 XMIN = MatrizX(i, 1)
510 If Val(MatrizX(i, 1)) > XMAX Then GoTo 520 Else GoTo 530
520 XMAX = MatrizX(i, 1)
530 If Val(MatrizY(1, i)) < YMIN Then GoTo 540 Else GoTo 550
540 YMIN = MatrizY(1, i)
550 If Val(MatrizY(1, i)) > YMAX Then GoTo 560 Else GoTo 561
560 YMAX = MatrizY(1, i)
561 If Val(Z(i, 1)) < ZMIN Then GoTo 565 Else GoTo 566
565 ZMIN = Val(Z(i, 1))
566 If Val(Z(i, 1)) > ZMAX Then GoTo 567 Else GoTo 570
567 ZMAX = Val(Z(i, 1))
570 i = i + 1
571 Loop Until i = n
Grafico.Text1.Text = n 'Puntos palpados
DatosNumDeErrInt.Text5.Text = n
Grafico.Text13.Text = Format(XMIN, "scientific") 'Limite inferior para
X
Grafico.Text14.Text = Format(XMAX, "scientific") 'Limite superior para
X
IX = Val(ParametrosXY.Text2.Text) 'Numero de puntos a interpolar en X
Grafico.Text15.Text = Format(YMIN, "scientific") 'Limite inferior para
Y
Grafico.Text16.Text = Format(YMAX, "scientific") 'Limite superior para
Y
Grafico.Text12.Text = Format(ZMIN, "scientific") 'Limite inferior para
Z
Grafico.Text2.Text = Format(ZMAX, "scientific") 'Limite superior para
Z
IY = Val(ParametrosXY.Text3.Text) 'Numero de puntos a interpolar en y
p = Val(ParametrosXY.Text4.Text) 'Paramertro de interpolacion
AC = XMAX - XMIN
DX = (XMAX - XMIN) / IX
AC = YMAX - YMIN
DY = (YMAX - YMIN) / IY
ReDim XP(IX, 1)
ReDim XPS(IX, 1) As String
ReDim YP(IY, 1)
```

```
ReDim YPS(IY, 1) As String
ReDim ZP(IX, IY)
ReDim ZPS(IX, IY) As String
JM = IX * IY
ReDim G(n, 1)
ReDim h(n, 1)
ReDim W(n, 1)
ReDim UIX(JM, 1)
ReDim UIY(JM, 1)
ReDim UIZ(JM, 1)
XP(0, 1) = XMIN
YP(0, 1) = YMIN
XPS(0, 1) = Str(XP(0, 1))
XPS(0, 1) = Mid(XPS(0, 1), 2)
YPS(0, 1) = Str(YP(0, 1))
YPS(0, 1) = Mid(YPS(0, 1), 2)
CalculandoInterpolacion.ProgressBar1.Min = 0
CalculandoInterpolacion.ProgressBar1.Max = IX
CalculandoInterpolacion.ProgressBar1.Value = 0
If CalculandoInterpolacion.ProgressBar1.Value <= IX Then
    i = 0
    Do
        i = i + 1
        XP(i, 1) = XP(i - 1, 1) + DX
        XPS(i, 1) = Str(XP(i, 1))
        XPS(i, 1) = Mid(XPS(i, 1), 2)
    Loop Until i = IX - 1
    j = 0
    Do
        j = j + 1
        YP(j, 1) = YP(j - 1, 1) + DY
        YPS(j, 1) = Str(YP(j, 1))
        YPS(j, 1) = Mid(YPS(j, 1), 2)
    Loop Until j = IY - 1
    If NombreInterpolados.Text2.Text <> "" Then
        Open NombreInterpolados.interpolado For Output As #9
    End If
    If NombreErroresInterpol.Text1.Text <> "" Then
        mnw = 0
        Open NombreErroresInterpol.erroresInterpol For Output As #55
    End If
    i = -1
    j = -1
    Do
        i = i + 1
        j = -1
        Do
            j = j + 1
            AA = 0
            BB = 0
            k = -1
            Do
                k = k + 1
                G(k, 1) = (MatrizX(k, 1) - XP(i, 1)) ^ 2
                h(k, 1) = (MatrizY(1, k) - YP(j, 1)) ^ 2
                W(k, 1) = (G(k, 1) + h(k, 1)) ^ (-0.5 * p)
                AA = AA + W(k, 1) * Val(Z(k, 1))
                BB = BB + W(k, 1)
            Loop Until k = n - 1
            ZP(i, j) = AA / BB
```

```
            'Errores de interpolación de la columna X
            '{
            If NombreErroresInterpol.Text1.Text <> "" Then
                a0 = (U / 2) ^ 2 'Primera derivada
                a1 = (W(k, 1) / (BB + W(k, 1))) ^ 2 'Incertidumbre
asociada a la primera derivada
                a2 = (-(AA * BB / (BB + W(k, 1)) ^ 2)) ^ 2 'Segunda
derivada
                a21 = ((-0.5 * p * W(k, 1) * (-2 * Val(MatrizX(k, 1))
+ 2 * Val(XP(i, 1)))) / ((Val(MatrizX(k, 1)) - Val(XP(i, 1))) +
Val((MatrizY(1, k))) - YP(j, 1))) ^ 2
                a212 = (U / 3) ^ 2
                a22 = ((-0.5 * p * W(k, 1) * (-2 * Val(MatrizY(1, k))
+ 2 * Val(YP(j, 1)))) / ((Val(MatrizX(k, 1)) - Val(YP(i, 1))) +
Val(MatrizY(1, k)) - YP(j, 1))) ^ 2
                a23 = ((-0.5 * p * W(k, 1) * (2 * Val(MatrizX(k, 1)) -
2 * Val(XP(i, 1)))) / ((Val(MatrizX(k, 1)) - Val(YP(i, 1))) +
Val(MatrizY(1, k)) - YP(j, 1))) ^ 2
                a24 = ((-0.5 * p * W(k, 1) * (2 * Val(MatrizY(1, k)) -
2 * Val(YP(j, 1)))) / ((Val(MatrizX(k, 1)) - Val(YP(i, 1))) +
Val(MatrizY(1, k)) - YP(j, 1))) ^ 2
                termino2 = a23 * a0 + a24 * a0 + a21 * a212 + a22 *
a212
                UIZ(mnw, 1) = 3 * Sqr(a0 * a1 + a2 * termino2)
                '}
                'Errores de columna Y y Z
                '{
                Dim ty1 As Double
                Dim tz1 As Double
                ty1 = 2 * ((1 / IX) ^ 2 * a0)
                tz1 = 2 * ((1 / IY) ^ 2 * a0)
                UIX(mnw, 1) = 2 * Sqr(a0 + ty1)
                UIY(mnw, 1) = 2 * Sqr(a0 + tz1)
                '}
                Print #55, Round(UIX(mnw, 1), 8); ""; Round(UIY(mnw,
1), 8); ""; Round(UIZ(mnw, 1), 8); ";"
                mnw = mnw + 1
            End If
            ZPS(i, j) = Str(ZP(i, j))
            If NombreInterpolados.Text2.Text <> "" Then
                Print #9, XPS(i, 1); " , "; YPS(j, 1); " , "; ZPS(i,
j); ";"
            End If
        Loop Until j = IY - 1
        CalculandoInterpolacion.ProgressBar1.Value =
CalculandoInterpolacion.ProgressBar1.Value + 1
        DoEvents
        CalculandoInterpolacion.Label2.Caption =
Int((CalculandoInterpolacion.ProgressBar1.Value /
CalculandoInterpolacion.ProgressBar1.Max) * 100) & "%"
    Loop Until i = IX - 1
    If NombreInterpolados.Text2.Text <> "" Then
        Close #9
    End If
    If NombreErroresInterpol.Text1.Text <> "" Then
        Close #55
    End If
    Grafico.Text3.Text = JM
    DatosNumDeErrInt.Text7.Text = JM
End If
```

```
DESV_TIPICA_DE_ERRORES_DE_INTERPOLACION
ReDim M(0 To IX, 0 To IY)
Dim Mmax As Single
Dim Mmin As Single
If Val(ZPS(0, 0)) > 0 Then Mmin = Val(ZPS(0, 0))
If Val(ZPS(0, 0)) < 0 Then Mmax = Val(ZPS(0, 0))
For i = 0 To (IX - 1)
     For j = 0 To (IY - 1)
        M(i, j) = Round(Val(ZPS(i, j)), 10)
        If Val(ZPS(i, j)) < Mmin Then GoTo 2500 Else GoTo 2510
2500    Mmin = Round(Val(ZPS(i, j)), 3)
2510    If Val(ZPS(i, j)) > Mmax Then GoTo 2520 Else GoTo 2530
2520    Mmax = Round(Val(ZPS(i, j)), 3)
2530 Next j
Next i
If NombreErroresInterpol.Text1.Text <> "" Then
GRAFICOS_ERRORES_DE_INTERPOLACION
Grafico.MSChart1.ChartData = M
Grafico.MSChart1.ColumnCount = IY
Grafico.MSChart1.RowCount = IX
Grafico.MSChart1.Plot.Axis(VtChAxisIdX).ValueScale.Maximum = XMAX
Grafico.MSChart1.Plot.Axis(VtChAxisIdX).ValueScale.Minimum = XMIN
Grafico.MSChart1.Plot.Axis(VtChAxisIdY).ValueScale.Maximum = Mmax +
(Mmax / 600)
Grafico.MSChart1.Plot.Axis(VtChAxisIdY).ValueScale.Minimum = Mmin -
(Mmin / 600)
Grafico.MSChart1.Plot.Axis(VtChAxisIdY2).ValueScale.Maximum = Mmax +
(Mmax / 600)
Grafico.MSChart1.Plot.Axis(VtChAxisIdY2).ValueScale.Minimum = Mmin -
(Mmin / 600)
Grafico.MSChart1.Plot.Axis(VtChAxisIdZ).ValueScale.Maximum = ZMAX
Grafico.MSChart1.Plot.Axis(VtChAxisIdZ).ValueScale.Minimum = ZMIN
Grafico.MSChart1.SeriesType = VtChSeriesType3dLine
Grafico.MSChart1.TitleText = "Distribución de puntos interpolados para
una malla de " & IX & "x" & IY
End Sub
Public Sub INTERPOLACION_XZ()
If MatrizX(0, 1) > 0 Then XMIN = MatrizX(0, 1)
If MatrizX(0, 1) < 0 Then XMAX = MatrizX(0, 1)
If Val(Y(0, 1)) > 0 Then YMIN = Val(Y(0, 1))
If Val(Y(0, 1)) < 0 Then YMAX = Val(Y(0, 1))
If MatrizZ(1, 0) > 0 Then ZMIN = MatrizZ(1, 0)
If MatrizZ(1, 0) < 0 Then ZMAX = MatrizZ(1, 0)
i = 0
Do
490 If Val(MatrizX(i, 1)) < XMIN Then GoTo 500 Else GoTo 510
500 XMIN = MatrizX(i, 1)
510 If Val(MatrizX(i, 1)) > XMAX Then GoTo 520 Else GoTo 530
520 XMAX = MatrizX(i, 1)
530 If Val(Y(i, 1)) < YMIN Then GoTo 540 Else GoTo 550
540 YMIN = Val(Y(i, 1))
550 If Val(Y(i, 1)) > YMAX Then GoTo 560 Else GoTo 561
560 YMAX = Val(Y(i, 1))
561 If Val(MatrizZ(1, i)) < ZMIN Then GoTo 565 Else GoTo 566
565 ZMIN = MatrizZ(1, i)
566 If Val(MatrizZ(1, i)) > ZMAX Then GoTo 567 Else GoTo 570
567 ZMAX = MatrizZ(1, i)
570 i = i + 1
571 Loop Until i = n
Grafico.Text1.Text = n 'Puntos palpados
```

```
DatosNumDeErrInt.Text5.Text = n
Grafico.Text13.Text = Format(XMIN, "scientific") 'Limite inferior para
X
Grafico.Text14.Text = Format(XMAX, "scientific") 'Limite superior para
X
IX = Val(ParametrosXZ.Text2.Text) 'Numero de puntos a interpolar en X
Grafico.Text15.Text = Format(YMIN, "scientific") 'Limite inferior para
Y
Grafico.Text16.Text = Format(YMAX, "scientific") 'Limite superior para
Y
Grafico.Text12.Text = Format(ZMIN, "scientific") 'Limite inferior para
Z
Grafico.Text2.Text = Format(ZMAX, "scientific") 'Limite superior para
Z
IZ = Val(ParametrosXZ.Text3.Text) 'Numero de puntos a interpolar en Z
p = Val(ParametrosXZ.Text4.Text) 'Paramertro de interpolacion
AC = XMAX - XMIN
DX = (XMAX - XMIN) / IX
AC = ZMAX - ZMIN
DZ = (ZMAX - ZMIN) / IZ
ReDim XP(IX, 1)
ReDim XPS(IX, 1) As String
ReDim YP(IX, IZ)
ReDim YPS(IX, IZ) As String
ReDim ZP(IZ, 1)
ReDim ZPS(IZ, 1) As String
JM = IZ * IX
ReDim G(n, 1)
ReDim h(n, 1)
ReDim W(n, 1)
ReDim UIX(JM, 1)
ReDim UIY(JM, 1)
ReDim UIZ(JM, 1)
XP(0, 1) = XMIN
ZP(0, 1) = ZMIN
XPS(0, 1) = Str(XP(0, 1))
XPS(0, 1) = Mid(XPS(0, 1), 2)
ZPS(0, 1) = Str(ZP(0, 1))
ZPS(0, 1) = Mid(ZPS(0, 1), 2)
CalculandoInterpolacion.ProgressBar1.Min = 0
CalculandoInterpolacion.ProgressBar1.Max = IX
CalculandoInterpolacion.ProgressBar1.Value = 0
If CalculandoInterpolacion.ProgressBar1.Value <= IX Then
    i = 0
    Do
        i = i + 1
        XP(i, 1) = XP(i - 1, 1) + DX
        XPS(i, 1) = Str(XP(i, 1))
        XPS(i, 1) = Mid(XPS(i, 1), 2)
    Loop Until i = IX - 1
    j = 0
    Do
        j = j + 1
        ZP(j, 1) = ZP(j - 1, 1) + DZ
        ZPS(j, 1) = Str(ZP(j, 1))
        ZPS(j, 1) = Mid(ZPS(j, 1), 2)
    Loop Until j = IZ - 1
    If NombreInterpolados.Text2.Text <> "" Then
        Open NombreInterpolados.interpolado For Output As #9
    End If
```

```
    If NombreErroresInterpol.Text1.Text <> "" Then
        mnw = 0
        Open NombreErroresInterpol.erroresInterpol For Output As #55
    End If
    i = -1
    j = -1
    Do
        i = i + 1
        j = -1
        Do
            j = j + 1
            AA = 0
            BB = 0
            k = -1
            Do
                k = k + 1
                G(k, 1) = (MatrizX(k, 1) - XP(i, 1)) ^ 2
                h(k, 1) = (MatrizZ(1, k) - ZP(j, 1)) ^ 2
                W(k, 1) = (G(k, 1) + h(k, 1)) ^ (-0.5 * p)
                AA = AA + W(k, 1) * Val(Y(k, 1))
                BB = BB + W(k, 1)
            Loop Until k = n - 1
            YP(i, j) = AA / BB
            'Errores de interpolación de la columna X
            '{
            If NombreErroresInterpol.Text1.Text <> "" Then
                a0 = (U / 2) ^ 2 'Primera derivada
                a1 = (W(k, 1) / (BB + W(k, 1))) ^ 2 'Incertidumbre
asociada a la primera derivada
                a2 = (-(AA * BB / (BB + W(k, 1)) ^ 2)) ^ 2 'Segunda
derivada
                a21 = ((-0.5 * p * W(k, 1) * (-2 * Val(MatrizX(k, 1))
+ 2 * Val(XP(i, 1)))) / ((Val(MatrizX(k, 1)) - Val(XP(i, 1))) +
Val(MatrizZ(1, k)) - ZP(j, 1))) ^ 2
                a212 = (U / 3) ^ 2
                a22 = ((-0.5 * p * W(k, 1) * (-2 * Val(MatrizZ(1, k))
+ 2 * Val(ZP(j, 1)))) / ((Val(MatrizX(k, 1)) - Val(XP(i, 1))) +
Val(MatrizZ(1, k)) - ZP(j, 1))) ^ 2
                a23 = ((-0.5 * p * W(k, 1) * (2 * Val(MatrizX(k, 1)) -
2 * Val(XP(i, 1)))) / ((Val(MatrizX(k, 1)) - Val(XP(i, 1))) +
Val(MatrizZ(1, k)) - ZP(j, 1))) ^ 2
                a24 = ((-0.5 * p * W(k, 1) * (2 * Val(MatrizZ(1, k)) -
2 * Val(ZP(j, 1)))) / ((Val(MatrizX(k, 1)) - Val(XP(i, 1))) +
Val(MatrizZ(1, k)) - ZP(j, 1))) ^ 2
                termino2 = a23 * a0 + a24 * a0 + a21 * a212 + a22 *
a212
                UIY(mnw, 1) = 3 * Sqr(a0 * a1 + a2 * termino2)
                '}
                'Errores de columna Y y Z
                '{
                Dim ty1 As Double
                Dim tz1 As Double
                ty1 = 2 * ((1 / IX) ^ 2 * a0)
                tz1 = 2 * ((1 / IZ) ^ 2 * a0)
                UIX(mnw, 1) = 2 * Sqr(a0 + ty1)
                UIZ(mnw, 1) = 2 * Sqr(a0 + tz1)
                '}
                Print #55, Round(UIX(mnw, 1), 8); ""; Round(UIY(mnw,
1), 8); ""; Round(UIZ(mnw, 1), 8); ";"
                mnw = mnw + 1
```

```
            End If
            YPS(i, j) = Str(YP(i, j))
            If NombreInterpolados.Text2.Text <> "" Then
                Print #9, XPS(i, 1); " , "; YPS(i, j); " , "; ZPS(j,
1); ";"
            End If
        Loop Until j = IZ - 1
        CalculandoInterpolacion.ProgressBar1.Value =
CalculandoInterpolacion.ProgressBar1.Value + 1
        DoEvents
        CalculandoInterpolacion.Label2.Caption =
Int((CalculandoInterpolacion.ProgressBar1.Value /
CalculandoInterpolacion.ProgressBar1.Max) * 100) & "%"
    Loop Until i = IX - 1
    If NombreInterpolados.Text2.Text <> "" Then
        Close #9
    End If
    If NombreErroresInterpol.Text1.Text <> "" Then
        Close #55
    End If
    Grafico.Text3.Text = JM
    DatosNumDeErrInt.Text7.Text = JM
End If
DESV_TIPICA_DE_ERRORES_DE_INTERPOLACION
ReDim M(0 To IX, 0 To IZ)
Dim Mmax As Single
Dim Mmin As Single
If Val(YPS(0, 0)) > 0 Then Mmin = Val(YPS(0, 0))
If Val(YPS(0, 0)) < 0 Then Mmax = Val(YPS(0, 0))
For i = 0 To (IX - 1)
    For j = 0 To (IZ - 1)
        M(i, j) = Round(Val(YPS(i, j)), 10)
        If Val(YPS(i, j)) < Mmin Then GoTo 2500 Else GoTo 2510
2500    Mmin = Round(Val(YPS(i, j)), 3)
2510    If Val(YPS(i, j)) > Mmax Then GoTo 2520 Else GoTo 2530
2520    Mmax = Round(Val(YPS(i, j)), 3)
2530 Next j
Next i
If NombreErroresInterpol.Text1.Text <> "" Then
GRAFICOS_ERRORES_DE_INTERPOLACION
Grafico.MSChart1.ChartData = M
Grafico.MSChart1.SeriesType = VtChSeriesType3dLine
Grafico.MSChart1.ColumnCount = IZ
Grafico.MSChart1.RowCount = IX
Grafico.MSChart1.Plot.Axis(VtChAxisIdX).ValueScale.Maximum = XMAX
Grafico.MSChart1.Plot.Axis(VtChAxisIdX).ValueScale.Minimum = XMIN
Grafico.MSChart1.Plot.Axis(VtChAxisIdY).ValueScale.Maximum = Mmax +
(Mmax / 600)
Grafico.MSChart1.Plot.Axis(VtChAxisIdY).ValueScale.Minimum = Mmin -
(Mmin / 600)
Grafico.MSChart1.Plot.Axis(VtChAxisIdY2).ValueScale.Maximum = Mmax +
(Mmax / 600)
Grafico.MSChart1.Plot.Axis(VtChAxisIdY2).ValueScale.Minimum = Mmin -
(Mmin / 600)
Grafico.MSChart1.Plot.Axis(VtChAxisIdZ).ValueScale.Maximum = ZMAX
Grafico.MSChart1.Plot.Axis(VtChAxisIdZ).ValueScale.Minimum = ZMIN
Grafico.MSChart1.TitleText = "Distribución de puntos interpolados para
una malla de " & IX & "x" & IZ
End Sub
Public Sub INTERPOLACION_YZ()
```

```
If Val(X(0, 1)) > 0 Then XMIN = Val(X(0, 1))
If Val(X(0, 1)) < 0 Then XMAX = Val(X(0, 1))
If MatrizY(0, 1) > 0 Then YMIN = MatrizY(0, 1)
If MatrizY(0, 1) < 0 Then YMAX = MatrizY(0, 1)
If MatrizZ(1, 0) > 0 Then ZMIN = MatrizZ(1, 0)
If MatrizZ(1, 0) < 0 Then ZMAX = MatrizZ(1, 0)
i = 0
Do
490 If Val(X(i, 1)) < XMIN Then GoTo 500 Else GoTo 510
500 XMIN = Val(X(i, 1))
510 If Val(X(i, 1)) > XMAX Then GoTo 520 Else GoTo 530
520 XMAX = Val(X(i, 1))
530 If Val(MatrizY(i, 1)) < YMIN Then GoTo 540 Else GoTo 550
540 YMIN = MatrizY(i, 1)
550 If Val(MatrizY(i, 1)) > YMAX Then GoTo 560 Else GoTo 561
560 YMAX = MatrizY(i, 1)
561 If Val(MatrizZ(1, i)) < ZMIN Then GoTo 565 Else GoTo 566
565 ZMIN = MatrizZ(1, i)
566 If Val(MatrizZ(1, i)) > ZMAX Then GoTo 567 Else GoTo 570
567 ZMAX = MatrizZ(1, i)
570 i = i + 1
571 Loop Until i = n
Grafico.Text1.Text = n 'Puntos palpados
DatosNumDeErrInt.Text5.Text = n
Grafico.Text13.Text = Format(XMIN, "scientific") 'Limite inferior para
X
Grafico.Text14.Text = Format(XMAX, "scientific") 'Limite superior para
X
IY = Val(ParametrosYZ.Text2.Text) 'Numero de puntos a interpolar en X
Grafico.Text15.Text = Format(YMIN, "scientific") 'Limite inferior para
Y
Grafico.Text16.Text = Format(YMAX, "scientific") 'Limite superior para
Y
Grafico.Text12.Text = Format(ZMIN, "scientific") 'Limite inferior para
Z
Grafico.Text2.Text = Format(ZMAX, "scientific") 'Limite superior para
Z
IZ = Val(ParametrosYZ.Text3.Text) 'Numero de puntos a interpolar en Z
p = Val(ParametrosYZ.Text4.Text) 'Paramertro de interpolacion
AC = YMAX - YMIN
DY = (YMAX - YMIN) / IY
AC = ZMAX - ZMIN
DZ = (ZMAX - ZMIN) / IZ
ReDim YP(IY, 1)
ReDim YPS(IY, 1) As String
ReDim XP(IY, IZ)
ReDim XPS(IY, IZ) As String
ReDim ZP(IZ, 1)
ReDim ZPS(IZ, 1) As String
JM = IY * IZ
ReDim G(n, 1)
ReDim h(n, 1)
ReDim W(n, 1)
ReDim UIX(JM, 1)
ReDim UIY(JM, 1)
ReDim UIZ(JM, 1)
YP(0, 1) = YMIN
ZP(0, 1) = ZMIN
YPS(0, 1) = Str(YP(0, 1))
YPS(0, 1) = Mid(YPS(0, 1), 2)
```

```
ZPS(0, 1) = Str(ZP(0, 1))
ZPS(0, 1) = Mid(ZPS(0, 1), 2)
CalculandoInterpolacion.ProgressBar1.Min = 0
CalculandoInterpolacion.ProgressBar1.Max = IY
CalculandoInterpolacion.ProgressBar1.Value = 0
If CalculandoInterpolacion.ProgressBar1.Value <= IY Then
    i = 0
    Do
        i = i + 1
        YP(i, 1) = YP(i - 1, 1) + DY
        YPS(i, 1) = Str(YP(i, 1))
        YPS(i, 1) = Mid(YPS(i, 1), 2)
    Loop Until i = IY - 1
    j = 0
    Do
        j = j + 1
        ZP(j, 1) = ZP(j - 1, 1) + DZ
        ZPS(j, 1) = Str(ZP(j, 1))
        ZPS(j, 1) = Mid(ZPS(j, 1), 2)
    Loop Until j = IZ - 1
    If NombreInterpolados.Text2.Text <> "" Then
        Open NombreInterpolados.interpolado For Output As #9
    End If
    If NombreErroresInterpol.Text1.Text <> "" Then
        mnw = 0
        Open NombreErroresInterpol.erroresInterpol For Output As #55
    End If
    i = -1
    j = -1
    Do
        i = i + 1
        j = -1
        Do
            j = j + 1
            AA = 0
            BB = 0
            k = -1
            Do
                k = k + 1
                G(k, 1) = (MatrizY(k, 1) - YP(i, 1)) ^ 2
                h(k, 1) = (MatrizZ(1, k) - ZP(j, 1)) ^ 2
                W(k, 1) = (G(k, 1) + h(k, 1)) ^ (-0.5 * p)
                AA = AA + W(k, 1) * Val(X(k, 1))
                BB = BB + W(k, 1)
            Loop Until k = n - 1
            XP(i, j) = AA / BB
            'Errores de interpolación de la columna X
            '{
            If NombreErroresInterpol.Text1.Text <> "" Then
                a0 = (U / 2) ^ 2 'Primera derivada
                a1 = (W(k, 1) / (BB + W(k, 1))) ^ 2 'Incertidumbre
asociada a la primera derivada
                a2 = (-(AA * BB / (BB + W(k, 1)) ^ 2)) ^ 2 'Segunda
derivada
                a21 = ((-0.5 * p * W(k, 1) * (-2 * Val(MatrizY(k, 1))
+ 2 * Val(YP(i, 1)))) / ((Val(MatrizY(k, 1)) - Val(YP(i, 1))) +
Val(MatrizZ(1, k)) - ZP(j, 1))) ^ 2
                a212 = (U / 3) ^ 2
```

```
                a22 = ((-0.5 * p * W(k, 1) * (-2 * Val(MatrizZ(1, k))
+ 2 * Val(ZP(j, 1)))) / ((Val(MatrizY(k, 1)) - Val(YP(i, 1))) +
Val(MatrizZ(1, k)) - ZP(j, 1))) ^ 2
                a23 = ((-0.5 * p * W(k, 1) * (2 * Val(MatrizY(k, 1)) -
2 * Val(YP(i, 1)))) / ((Val(MatrizY(k, 1)) - Val(YP(i, 1))) +
Val(MatrizZ(1, k)) - ZP(j, 1))) ^ 2
                a24 = ((-0.5 * p * W(k, 1) * (2 * Val(MatrizZ(1, k)) -
2 * Val(ZP(j, 1)))) / ((Val(MatrizY(k, 1)) - Val(YP(i, 1))) +
Val(MatrizZ(1, k)) - ZP(j, 1))) ^ 2
                termino2 = a23 * a0 + a24 * a0 + a21 * a212 + a22 *
a212
                UIX(mnw, 1) = 3 * Sqr(a0 * a1 + a2 * termino2)
                '}
                'Errores de columna Y y Z
                '{
                Dim ty1 As Double
                Dim tz1 As Double
                ty1 = 2 * ((1 / IY) ^ 2 * a0)
                tz1 = 2 * ((1 / IZ) ^ 2 * a0)
                UIY(mnw, 1) = 2 * Sqr(a0 + ty1)
                UIZ(mnw, 1) = 2 * Sqr(a0 + tz1)
                '}
                Print #55, Round(UIX(mnw, 1), 8); ""; Round(UIY(mnw,
1), 8); ""; Round(UIZ(mnw, 1), 8); ";"
                mnw = mnw + 1
            End If
            XPS(i, j) = Str(XP(i, j))
            If NombreInterpolados.Text2.Text <> "" Then
                Print #9, XPS(i, j); " , "; YPS(i, 1); " , "; ZPS(j,
1); ";"
            End If
        Loop Until j = IZ - 1
        CalculandoInterpolacion.ProgressBar1.Value =
CalculandoInterpolacion.ProgressBar1.Value + 1
        DoEvents
        CalculandoInterpolacion.Label2.Caption =
Int((CalculandoInterpolacion.ProgressBar1.Value /
CalculandoInterpolacion.ProgressBar1.Max) * 100) & "%"
    Loop Until i = IY - 1
    If NombreInterpolados.Text2.Text <> "" Then
        Close #9
    End If
    If NombreErroresInterpol.Text1.Text <> "" Then
        Close #55
    End If
    Grafico.Text3.Text = JM
    DatosNumDeErrInt.Text7.Text = JM
End If
DESV_TIPICA_DE_ERRORES_DE_INTERPOLACION
ReDim M(0 To IY, 0 To IZ)
Dim Mmax As Single
Dim Mmin As Single
If Val(XPS(0, 0)) > 0 Then Mmin = Val(XPS(0, 0))
If Val(XPS(0, 0)) < 0 Then Mmax = Val(XPS(0, 0))
For i = 0 To (IY - 1)
    For j = 0 To (IZ - 1)
    M(i, j) = Round(Val(XPS(i, j)), 10)
    If Val(XPS(i, j)) < Mmin Then GoTo 2500 Else GoTo 2510
2500 Mmin = Round(Val(XPS(i, j)), 3)
2510 If Val(XPS(i, j)) > Mmax Then GoTo 2520 Else GoTo 2530
```

```
2520 Mmax = Round(Val(XPS(i, j)), 3)
2530 Next j
Next i
If NombreErroresInterpol.Text1.Text <> "" Then
GRAFICOS_ERRORES_DE_INTERPOLACION
Grafico.MSChart1.ChartData = M
Grafico.MSChart1.SeriesType = VtChSeriesType3dLine
Grafico.MSChart1.ColumnCount = IZ
Grafico.MSChart1.RowCount = IY
Grafico.MSChart1.Plot.Axis(VtChAxisIdX).ValueScale.Maximum = XMAX
Grafico.MSChart1.Plot.Axis(VtChAxisIdX).ValueScale.Minimum = XMIN
Grafico.MSChart1.Plot.Axis(VtChAxisIdY).ValueScale.Maximum = Mmax +
(Mmax / 600)
Grafico.MSChart1.Plot.Axis(VtChAxisIdY).ValueScale.Minimum = Mmin -
(Mmin / 600)
Grafico.MSChart1.Plot.Axis(VtChAxisIdY2).ValueScale.Maximum = Mmax +
(Mmax / 600)
Grafico.MSChart1.Plot.Axis(VtChAxisIdY2).ValueScale.Minimum = Mmin -
(Mmin / 600)
Grafico.MSChart1.Plot.Axis(VtChAxisIdZ).ValueScale.Maximum = ZMAX
Grafico.MSChart1.Plot.Axis(VtChAxisIdZ).ValueScale.Minimum = ZMIN
Grafico.MSChart1.TitleText = "Distribución de puntos interpolados para
una malla de " & IY & "x" & IZ
End Sub
Public Sub MATRICES_COMPENSADAS_XY()
ReDim MatrizX(n, 1)
ReDim MatrizY(1, n)
    For i = 0 To n - 1
        If i < 1 Then
            'Metodo de la circunferencia
                Num1 = (Val(Y(i + 1, 1)) + Val(Y(i, 1))) / 2 -
(Val(Y(i + 2, 1)) + Val(Y(i + 1, 1))) / 2
                Num2 = ((Val(X(i + 1, 1)) ^ 2 - Val(X(i, 1)) ^ 2)) /
(2 * (Val(Y(i + 1, 1)) - Val(Y(i, 1))))
                Num3 = ((Val(X(i + 2, 1)) ^ 2 - Val(X(i + 1, 1)) ^ 2))
/ (2 * (Val(Y(i + 2, 1)) - Val(Y(i + 1, 1))))
                Den1 = (Val(X(i + 1, 1)) - Val(X(i + 2, 1))) /
(Val(Y(i + 2, 1)) - Val(Y(i + 1, 1)))
                Den2 = (Val(X(i, 1)) - Val(X(i + 1, 1))) / (Val(Y(i +
1, 1)) - Val(Y(i, 1)))
                CoordenadaXc = (Num1 + Num2 - Num3) / (Den1 - Den2)
                CoordenadaYc = ((Val(X(i + 1, 1)) - Val(X(i + 2, 1)))
/ (Val(Y(i + 2, 1)) - Val(Y(i + 1, 1)))) * CoordenadaXc + (Val(Y(i +
2, 1)) + Val(Y(i + 1, 1))) / 2 + Num3
                nXX = CoordenadaXc - Val(X(i, 1))
                nYY = CoordenadaYc - Val(Y(i, 1))
                Modulo = Sqr(nXX ^ 2 + nYY ^ 2)
                NormalX = nXX / Modulo
                NormalY = nYY / Modulo
                Pendiente = (CoordenadaYc - Val(Y(i, 1))) /
(CoordenadaXc - Val(X(i, 1)))
                ax = Val(X(i, 1)) + NormalX *
Val(ParametrosCompensacion.Text2.Text)
                ay = Val(Y(i, 1)) + NormalY *
Val(ParametrosCompensacion.Text2.Text)
        End If
    MatrizX(i, 1) = ax
    MatrizY(1, i) = ay
        If i >= 1 Then
            If i < n - 1 Then
```

```
                vnijx = Val(X(i + 1, 1)) - Val(X(i - 1, 1))
                vnijy = Val(Y(i + 1, 1)) - Val(Y(i - 1, 1))
                mvij = Sqr(vnijx ^ 2 + vnijy ^ 2)
                nx = vnijy / mvij
                ny = -vnijx / mvij
                ax = Val(X(i, 1)) +
Val(ParametrosCompensacion.Text2.Text) * nx
                ay = Val(Y(i, 1)) +
Val(ParametrosCompensacion.Text2.Text) * ny
            End If
        End If
        MatrizX(i, 1) = ax
        MatrizY(1, i) = ay
            If i = n - 1 Then
                    'Método de la circunferencia
                    Num1 = (Val(Y(i - 1, 1)) + Val(Y(i, 1))) / 2 -
(Val(Y(i - 2, 1)) + Val(Y(i - 1, 1))) / 2
                    Num2 = ((Val(X(i - 1, 1)) ^ 2 - Val(X(i, 1)) ^ 2))
/ (2 * (Val(Y(i - 1, 1)) - Val(Y(i, 1))))
                    Num3 = ((Val(X(i - 2, 1)) ^ 2 - Val(X(i - 1, 1)) ^
2)) / (2 * (Val(Y(i - 2, 1)) - Val(Y(i - 1, 1))))
                    Den1 = (Val(X(i - 1, 1)) - Val(X(i - 2, 1))) /
(Val(Y(i - 2, 1)) - Val(Y(i - 1, 1)))
                    Den2 = (Val(X(i, 1)) - Val(X(i - 1, 1))) /
(Val(Y(i - 1, 1)) - Val(Y(i, 1)))
                    CoordenadaXc = (Num1 + Num2 - Num3) / (Den1 -
Den2)
                    CoordenadaYc = ((Val(X(i - 1, 1)) - Val(X(i - 2,
1))) / (Val(Y(i - 2, 1)) - Val(Y(i - 1, 1)))) * CoordenadaXc +
(Val(Y(i - 2, 1)) + Val(Y(i - 1, 1))) / 2 + Num3
                    nXX = CoordenadaXc - Val(X(i, 1))
                    nYY = CoordenadaYc - Val(Y(i, 1))
                    Modulo = Sqr(nXX ^ 2 + nYY ^ 2)
                    NormalX = nXX / Modulo
                    NormalY = nYY / Modulo
                    Pendiente = (CoordenadaYc - Val(Y(i, 1))) /
(CoordenadaXc - Val(X(i, 1)))
                    ax = Val(X(i, 1)) + NormalX *
Val(ParametrosCompensacion.Text2.Text)
                    ay = Val(Y(i, 1)) + NormalY *
Val(ParametrosCompensacion.Text2.Text)
            End If
        MatrizX(i, 1) = ax
        MatrizY(1, i) = ay
    Next i
End Sub
Public Sub MATRICES_COMPENSADAS_XZ()
ReDim MatrizX(n, 1)
ReDim MatrizZ(1, n)
    For i = 0 To n - 1
        If i < 1 Then
                'Metodo de la circunferencia
                Num1 = (Val(Z(i + 1, 1)) + Val(Z(i, 1))) / 2 -
(Val(Z(i + 2, 1)) + Val(Z(i + 1, 1))) / 2
                Num2 = ((Val(X(i + 1, 1)) ^ 2 - Val(X(i, 1)) ^ 2)) /
(2 * (Val(Z(i + 1, 1)) - Val(Z(i, 1))))
                Num3 = ((Val(X(i + 2, 1)) ^ 2 - Val(X(i + 1, 1)) ^ 2))
/ (2 * (Val(Z(i + 2, 1)) - Val(Z(i + 1, 1))))
                Den1 = (Val(X(i + 1, 1)) - Val(X(i + 2, 1))) /
(Val(Z(i + 2, 1)) - Val(Z(i + 1, 1)))
```

```
                Den2 = (Val(X(i, 1)) - Val(X(i + 1, 1))) / (Val(Z(i +
1, 1)) - Val(Z(i, 1)))
                CoordenadaXc = (Num1 + Num2 - Num3) / (Den1 - Den2)
                CoordenadaZc = ((Val(X(i + 1, 1)) - Val(X(i + 2, 1)))
/ (Val(Z(i + 2, 1)) - Val(Z(i + 1, 1)))) * CoordenadaXc + (Val(Z(i +
2, 1)) + Val(Z(i + 1, 1))) / 2 + Num3
                nXX = CoordenadaXc - Val(X(i, 1))
                nZZ = CoordenadaZc - Val(Z(i, 1))
                Modulo = Sqr(nXX ^ 2 + nZZ ^ 2)
                NormalX = nXX / Modulo
                NormalZ = nZZ / Modulo
                Pendiente = (CoordenadaZc - Val(Z(i, 1))) /
(CoordenadaXc - Val(X(i, 1)))
                ax = Val(X(i, 1)) + NormalX *
Val(ParametrosCompensacion.Text2.Text)
                az = Val(Z(i, 1)) + NormalZ *
Val(ParametrosCompensacion.Text2.Text)
        End If
        MatrizX(i, 1) = ax
        MatrizZ(1, i) = az
        If i >= 1 Then
        If i < n - 1 Then
            vnijx = Val(X(i + 1, 1)) - Val(X(i - 1, 1))
            vnijz = Val(Z(i + 1, 1)) - Val(Z(i - 1, 1))
            mvij = Sqr(vnijx ^ 2 + vnijz ^ 2)
            nx = vnijz / mvij
            nz = -vnijx / mvij
            ax = Val(X(i, 1)) + Val(ParametrosCompensacion.Text2.Text)
* nx
            az = Val(Z(i, 1)) + Val(ParametrosCompensacion.Text2.Text)
* nz
        End If
        End If
        MatrizX(i, 1) = ax
        MatrizZ(1, i) = az
        If i = n - 1 Then
                'Método de la circunferencia
                Num1 = (Val(Z(i - 1, 1)) + Val(Z(i, 1))) / 2 -
(Val(Z(i - 2, 1)) + Val(Z(i - 1, 1))) / 2
                Num2 = ((Val(X(i - 1, 1)) ^ 2 - Val(X(i, 1)) ^ 2)) /
(2 * (Val(Z(i - 1, 1)) - Val(Z(i, 1))))
                Num3 = ((Val(X(i - 2, 1)) ^ 2 - Val(X(i - 1, 1)) ^ 2))
/ (2 * (Val(Z(i - 2, 1)) - Val(Z(i - 1, 1))))
                Den1 = (Val(X(i - 1, 1)) - Val(X(i - 2, 1))) /
(Val(Z(i - 2, 1)) - Val(Z(i - 1, 1)))
                Den2 = (Val(X(i, 1)) - Val(X(i - 1, 1))) / (Val(Z(i -
1, 1)) - Val(Z(i, 1)))
                CoordenadaXc = (Num1 + Num2 - Num3) / (Den1 - Den2)
                CoordenadaZc = ((Val(X(i - 1, 1)) - Val(X(i - 2, 1)))
/ (Val(Z(i - 2, 1)) - Val(Z(i - 1, 1)))) * CoordenadaXc + (Val(Z(i -
2, 1)) + Val(Z(i - 1, 1))) / 2 + Num3
                nXX = CoordenadaXc - Val(X(i, 1))
                nZZ = CoordenadaZc - Val(Z(i, 1))
                Modulo = Sqr(nXX ^ 2 + nZZ ^ 2)
                NormalX = nXX / Modulo
                NormalZ = nZZ / Modulo
                Pendiente = (CoordenadaZc - Val(Z(i, 1))) /
(CoordenadaXc - Val(X(i, 1)))
                ax = Val(X(i, 1)) + NormalX *
Val(ParametrosCompensacion.Text2.Text)
```

```
                az = Val(Z(i, 1)) + NormalZ *
Val(ParametrosCompensacion.Text2.Text)
        End If
        MatrizX(i, 1) = ax
        MatrizZ(1, i) = az
    Next i
End Sub
Public Sub MATRICES_COMPENSADAS_YZ()
ReDim MatrizY(n, 1)
ReDim MatrizZ(1, n)
    For i = 0 To n - 1
        If i < 1 Then
                'Metodo de la circunferencia
                Num1 = (Val(Z(i + 1, 1)) + Val(Z(i, 1))) / 2 -
(Val(Z(i + 2, 1)) + Val(Z(i + 1, 1))) / 2
                Num2 = ((Val(Y(i + 1, 1)) ^ 2 - Val(Y(i, 1)) ^ 2)) /
(2 * (Val(Z(i + 1, 1)) - Val(Z(i, 1))))
                Num3 = ((Val(Y(i + 2, 1)) ^ 2 - Val(Y(i + 1, 1)) ^ 2))
/ (2 * (Val(Z(i + 2, 1)) - Val(Z(i + 1, 1))))
                Den1 = (Val(Y(i + 1, 1)) - Val(Y(i + 2, 1))) /
(Val(Z(i + 2, 1)) - Val(Z(i + 1, 1)))
                Den2 = (Val(Y(i, 1)) - Val(Y(i + 1, 1))) / (Val(Z(i +
1, 1)) - Val(Z(i, 1)))
                CoordenadaYc = (Num1 + Num2 - Num3) / (Den1 - Den2)
                CoordenadaZc = ((Val(Y(i + 1, 1)) - Val(Y(i + 2, 1)))
/ (Val(Z(i + 2, 1)) - Val(Z(i + 1, 1)))) * CoordenadaXc + (Val(Z(i +
2, 1)) + Val(Z(i + 1, 1))) / 2 + Num3
                nYY = CoordenadaYc - Val(Y(i, 1))
                nZZ = CoordenadaZc - Val(Z(i, 1))
                Modulo = Sqr(nYY ^ 2 + nZZ ^ 2)
                NormalY = nYY / Modulo
                NormalZ = nZZ / Modulo
                Pendiente = (CoordenadaZc - Val(Z(i, 1))) /
(CoordenadaYc - Val(Y(i, 1)))
                ay = Val(Y(i, 1)) + NormalY *
Val(ParametrosCompensacion.Text2.Text)
                az = Val(Z(i, 1)) + NormalZ *
Val(ParametrosCompensacion.Text2.Text)
        End If
        MatrizY(i, 1) = ay
        MatrizZ(1, i) = az
        If i >= 1 Then
        If i < n - 1 Then
            vnijy = Val(Y(i + 1, 1)) - Val(Y(i - 1, 1))
            vnijz = Val(Z(i + 1, 1)) - Val(Z(i - 1, 1))
            mvij = Sqr(vnijy ^ 2 + vnijz ^ 2)
            ny = vnijz / mvij
            nz = -vnijy / mvij
            ay = Val(Y(i, 1)) + Val(ParametrosCompensacion.Text2.Text)
* ny
            az = Val(Z(i, 1)) + Val(ParametrosCompensacion.Text2.Text)
* nz
        End If
        End If
        MatrizY(i, 1) = ay
        MatrizZ(1, i) = az
        If i = n - 1 Then
                'Método de la circunferencia
                Num1 = (Val(Z(i - 1, 1)) + Val(Z(i, 1))) / 2 -
(Val(Z(i - 2, 1)) + Val(Z(i - 1, 1))) / 2
```

```
                Num2 = ((Val(Y(i - 1, 1)) ^ 2 - Val(Y(i, 1)) ^ 2)) /
(2 * (Val(Z(i - 1, 1)) - Val(Z(i, 1))))
                Num3 = ((Val(Y(i - 2, 1)) ^ 2 - Val(Y(i - 1, 1)) ^ 2))
/ (2 * (Val(Z(i - 2, 1)) - Val(Z(i - 1, 1))))
                Den1 = (Val(Y(i - 1, 1)) - Val(Y(i - 2, 1))) /
(Val(Z(i - 2, 1)) - Val(Z(i - 1, 1)))
                Den2 = (Val(Y(i, 1)) - Val(Y(i - 1, 1))) / (Val(Z(i -
1, 1)) - Val(Z(i, 1)))
                CoordenadaYc = (Num1 + Num2 - Num3) / (Den1 - Den2)
                CoordenadaZc = ((Val(Y(i - 1, 1)) - Val(Y(i - 2, 1)))
/ (Val(Z(i - 2, 1)) - Val(Z(i - 1, 1)))) * CoordenadaXc + (Val(Z(i -
2, 1)) + Val(Z(i - 1, 1))) / 2 + Num3
                nYY = CoordenadaYc - Val(Y(i, 1))
                nZZ = CoordenadaZc - Val(Z(i, 1))
                Modulo = Sqr(nYY ^ 2 + nZZ ^ 2)
                NormalY = nYY / Modulo
                NormalZ = nZZ / Modulo
                Pendiente = (CoordenadaZc - Val(Z(i, 1))) /
(CoordenadaYc - Val(Y(i, 1)))
                ay = Val(Y(i, 1)) + NormalY *
Val(ParametrosCompensacion.Text2.Text)
                az = Val(Z(i, 1)) + NormalZ *
Val(ParametrosCompensacion.Text2.Text)
        End If
        MatrizY(i, 1) = ay
        MatrizZ(1, i) = az
    Next i
End Sub
Public Sub InterpolacionSinCompensacionXY()
If Val(X(0, 1)) > 0 Then XMIN = Val(X(0, 1))
If Val(X(0, 1)) < 0 Then XMAX = Val(X(0, 1))
If Val(Y(0, 1)) > 0 Then YMIN = Val(Y(0, 1))
If Val(Y(0, 1)) < 0 Then YMAX = Val(Y(0, 1))
If Val(Z(0, 1)) > 0 Then ZMIN = Val(Z(0, 1))
If Val(Z(0, 1)) < 0 Then ZMAX = Val(Z(0, 1))
i = 0
Do
490 If Val(X(i, 1)) < XMIN Then GoTo 500 Else GoTo 510
500 XMIN = Val(X(i, 1))
510 If Val(X(i, 1)) > XMAX Then GoTo 520 Else GoTo 530
520 XMAX = Val(X(i, 1))
530 If Val(Y(i, 1)) < YMIN Then GoTo 540 Else GoTo 550
540 YMIN = Val(Y(i, 1))
550 If Val(Y(i, 1)) > YMAX Then GoTo 560 Else GoTo 561
560 YMAX = Val(Y(i, 1))
561 If Val(Z(i, 1)) < ZMIN Then GoTo 565 Else GoTo 566
565 ZMIN = Val(Z(i, 1))
566 If Val(Z(i, 1)) > ZMAX Then GoTo 567 Else GoTo 570
567 ZMAX = Val(Z(i, 1))
570 i = i + 1
571 Loop Until i = n
Grafico.Text1.Text = n 'Puntos palpados
DatosNumDeErrInt.Text5.Text = n
Grafico.Text13.Text = Format(XMIN, "scientific") 'Limite inferior para
X
Grafico.Text14.Text = Format(XMAX, "scientific") 'Limite superior para
X
IX = Val(ParametrosXY.Text2.Text) 'Numero de puntos a interpolar en X
Grafico.Text15.Text = Format(YMIN, "scientific") 'Limite inferior para
Y
```

```
Grafico.Text16.Text = Format(YMAX, "scientific") 'Limite superior para
Y
Grafico.Text12.Text = Format(ZMIN, "scientific") 'Limite inferior para
Z
Grafico.Text2.Text = Format(ZMAX, "scientific") 'Limite superior para
Z
IY = Val(ParametrosXY.Text3.Text) 'Numero de puntos a interpolar en y
p = Val(ParametrosXY.Text4.Text) 'Paramertro de interpolacion
AC = XMAX - XMIN
DX = (XMAX - XMIN) / IX
AC = YMAX - YMIN
DY = (YMAX - YMIN) / IY
ReDim XP(IX, 1)
ReDim XPS(IX, 1) As String
ReDim YP(IY, 1)
ReDim YPS(IY, 1) As String
ReDim ZP(IX, IY)
ReDim ZPS(IX, IY) As String
JM = IX * IY
ReDim G(n, 1)
ReDim h(n, 1)
ReDim W(n, 1)
ReDim UIX(JM, 1)
ReDim UIY(JM, 1)
ReDim UIZ(JM, 1)
XP(0, 1) = XMIN
YP(0, 1) = YMIN
XPS(0, 1) = Str(XP(0, 1))
XPS(0, 1) = Mid(XPS(0, 1), 2)
YPS(0, 1) = Str(YP(0, 1))
YPS(0, 1) = Mid(YPS(0, 1), 2)
CalculandoInterpolacion.ProgressBar1.Min = 0
CalculandoInterpolacion.ProgressBar1.Max = IX
CalculandoInterpolacion.ProgressBar1.Value = 0
If CalculandoInterpolacion.ProgressBar1.Value <= IX Then
    i = 0
    Do
        i = i + 1
        XP(i, 1) = XP(i - 1, 1) + DX
        XPS(i, 1) = Str(XP(i, 1))
        XPS(i, 1) = Mid(XPS(i, 1), 2)
    Loop Until i = IX - 1
    j = 0
    Do
        j = j + 1
        YP(j, 1) = YP(j - 1, 1) + DY
        YPS(j, 1) = Str(YP(j, 1))
        YPS(j, 1) = Mid(YPS(j, 1), 2)
    Loop Until j = IY - 1
    If NombreInterpolados.Text2.Text <> "" Then
        Open NombreInterpolados.interpolado For Output As #9
    End If
    If NombreErroresInterpol.Text1.Text <> "" Then
        mnw = 0
        Open NombreErroresInterpol.erroresInterpol For Output As #55
    End If
    i = -1
    j = -1
    Do
        i = i + 1
```

```
        j = -1
        Do
            j = j + 1
            AA = 0
            BB = 0
            k = -1
            Do
                k = k + 1
                weq = -0.5 * p
                G(k, 1) = (Val(X(k, 1)) - XP(i, 1)) ^ 2
                h(k, 1) = (Val(Y(k, 1)) - YP(j, 1)) ^ 2
                W(k, 1) = (G(k, 1) + h(k, 1)) ^ (-0.5 * p)
                AA = AA + W(k, 1) * Val(Z(k, 1))
                BB = BB + W(k, 1)
            Loop Until k = n - 1
            ZP(i, j) = Round(AA / BB, 8)
            'Errores de interpolación de la columna X
            '{
            If NombreErroresInterpol.Text1.Text <> "" Then
                a0 = (U / 2) ^ 2 'Primera derivada
                a1 = (W(k, 1) / (BB + W(k, 1))) ^ 2 'Incertidumbre
asociada a la primera derivada
                a2 = (-(AA * BB / (BB + W(k, 1)) ^ 2)) ^ 2 'Segunda
derivada
                a21 = ((-0.5 * p * W(k, 1) * (-2 * Val(X(k, 1)) + 2 *
Val(XP(i, 1)))) / ((Val(X(k, 1)) - Val(XP(i, 1))) + Val(Y(k, 1)) -
YP(j, 1))) ^ 2
                a212 = (U / 3) ^ 2
                a22 = ((-0.5 * p * W(k, 1) * (-2 * Val(Y(k, 1)) + 2 *
Val(YP(j, 1)))) / ((Val(X(k, 1)) - Val(YP(i, 1))) + Val(Y(k, 1)) -
YP(j, 1))) ^ 2
                a23 = ((-0.5 * p * W(k, 1) * (2 * Val(X(k, 1)) - 2 *
Val(XP(i, 1)))) / ((Val(X(k, 1)) - Val(YP(i, 1))) + Val(Y(k, 1)) -
YP(j, 1))) ^ 2
                a24 = ((-0.5 * p * W(k, 1) * (2 * Val(Y(k, 1)) - 2 *
Val(YP(j, 1)))) / ((Val(X(k, 1)) - Val(YP(i, 1))) + Val(Y(k, 1)) -
YP(j, 1))) ^ 2
                termino2 = a23 * a0 + a24 * a0 + a21 * a212 + a22 *
a212
                UIZ(mnw, 1) = 3 * Sqr(a0 * a1 + a2 * termino2)
                '}
                'Errores de columna Y y Z
                '{
                Dim ty1 As Double
                Dim tz1 As Double
                ty1 = 2 * ((1 / IX) ^ 2 * a0)
                tz1 = 2 * ((1 / IY) ^ 2 * a0)
                UIX(mnw, 1) = 2 * Sqr(a0 + ty1)
                UIY(mnw, 1) = 2 * Sqr(a0 + tz1)
                '}
                Print #55, Round(UIX(mnw, 1), 8); ""; Round(UIY(mnw,
1), 8); ""; Round(UIZ(mnw, 1), 8); ";"
                mnw = mnw + 1
            End If
            ZPS(i, j) = Str(ZP(i, j))
            If NombreInterpolados.Text2.Text <> "" Then
                Print #9, XPS(i, 1); " , "; YPS(j, 1); " , "; ZPS(i,
j); ";"
            End If
        Loop Until j = IY - 1
```

```
        CalculandoInterpolacion.ProgressBar1.Value =
CalculandoInterpolacion.ProgressBar1.Value + 1
        DoEvents
        CalculandoInterpolacion.Label2.Caption =
Int((CalculandoInterpolacion.ProgressBar1.Value /
CalculandoInterpolacion.ProgressBar1.Max) * 100) & "%"
    Loop Until i = IX - 1
    If NombreInterpolados.Text2.Text <> "" Then
        Close #9
    End If
    If NombreErroresInterpol.Text1.Text <> "" Then
        Close #55
    End If
    Grafico.Text3.Text = JM
    DatosNumDeErrInt.Text7.Text = JM
End If
DESV_TIPICA_DE_ERRORES_DE_INTERPOLACION
ReDim M(0 To IX, 0 To IY)
Dim Mmax As Single
Dim Mmin As Single
If Val(ZPS(0, 0)) > 0 Then Mmin = Val(ZPS(0, 0))
If Val(ZPS(0, 0)) < 0 Then Mmax = Val(ZPS(0, 0))
For i = 0 To (IX - 1)
    For j = 0 To (IY - 1)
    M(i, j) = Round(Val(ZPS(i, j)), 10)
    If Val(ZPS(i, j)) < Mmin Then GoTo 2500 Else GoTo 2510
2500 Mmin = Round(Val(ZPS(i, j)), 3)
2510 If Val(ZPS(i, j)) > Mmax Then GoTo 2520 Else GoTo 2530
2520 Mmax = Round(Val(ZPS(i, j)), 3)
2530 Next j
Next i
If NombreErroresInterpol.Text1.Text <> "" Then
GRAFICOS_ERRORES_DE_INTERPOLACION
Grafico.MSChart1.ChartData = M
Grafico.MSChart1.ColumnCount = IY
Grafico.MSChart1.RowCount = IX
Grafico.MSChart1.Plot.Axis(VtChAxisIdX).ValueScale.Maximum = XMAX
Grafico.MSChart1.Plot.Axis(VtChAxisIdX).ValueScale.Minimum = XMIN
Grafico.MSChart1.Plot.Axis(VtChAxisIdY).ValueScale.Maximum = Mmax +
(Mmax / 600)
Grafico.MSChart1.Plot.Axis(VtChAxisIdY).ValueScale.Minimum = Mmin -
(Mmin / 600)
Grafico.MSChart1.Plot.Axis(VtChAxisIdY2).ValueScale.Maximum = Mmax +
(Mmax / 600)
Grafico.MSChart1.Plot.Axis(VtChAxisIdY2).ValueScale.Minimum = Mmin -
(Mmin / 600)
Grafico.MSChart1.Plot.Axis(VtChAxisIdZ).ValueScale.Maximum = ZMAX
Grafico.MSChart1.Plot.Axis(VtChAxisIdZ).ValueScale.Minimum = ZMIN
Grafico.MSChart1.SeriesType = VtChSeriesType3dLine
Grafico.MSChart1.TitleText = "Distribución de puntos interpolados para
una malla de " & IX & "x" & IY
End Sub
Public Sub InterpolacionSinCompensacionXZ()
If Val(X(0, 1)) > 0 Then XMIN = Val(X(0, 1))
If Val(X(0, 1)) < 0 Then XMAX = Val(X(0, 1))
If Val(Y(0, 1)) > 0 Then YMIN = Val(Y(0, 1))
If Val(Y(0, 1)) < 0 Then YMAX = Val(Y(0, 1))
If Val(Z(0, 1)) > 0 Then ZMIN = Val(Z(0, 1))
If Val(Z(0, 1)) < 0 Then ZMAX = Val(Z(0, 1))
i = 0
```

```
Do
490 If Val(X(i, 1)) < XMIN Then GoTo 500 Else GoTo 510
500 XMIN = Val(X(i, 1))
510 If Val(X(i, 1)) > XMAX Then GoTo 520 Else GoTo 530
520 XMAX = Val(X(i, 1))
530 If Val(Y(i, 1)) < YMIN Then GoTo 540 Else GoTo 550
540 YMIN = Val(Y(i, 1))
550 If Val(Y(i, 1)) > YMAX Then GoTo 560 Else GoTo 561
560 YMAX = Val(Y(i, 1))
561 If Val(Z(i, 1)) < ZMIN Then GoTo 565 Else GoTo 566
565 ZMIN = Val(Z(i, 1))
566 If Val(Z(i, 1)) > ZMAX Then GoTo 567 Else GoTo 570
567 ZMAX = Val(Z(i, 1))
570 i = i + 1
571 Loop Until i = n
Grafico.Text1.Text = n 'Puntos palpados
DatosNumDeErrInt.Text5.Text = n
Grafico.Text13.Text = Format(XMIN, "scientific") 'Limite inferior para
X
Grafico.Text14.Text = Format(XMAX, "scientific") 'Limite superior para
X
IX = Val(ParametrosXZ.Text2.Text) 'Numero de puntos a interpolar en X
Grafico.Text15.Text = Format(YMIN, "scientific") 'Limite inferior para
Y
Grafico.Text16.Text = Format(YMAX, "scientific") 'Limite superior para
Y
Grafico.Text12.Text = Format(ZMIN, "scientific") 'Limite inferior para
Z
Grafico.Text2.Text = Format(ZMAX, "scientific") 'Limite superior para
Z
IZ = Val(ParametrosXZ.Text3.Text) 'Numero de puntos a interpolar en Z
p = Val(ParametrosXZ.Text4.Text) 'Paramertro de interpolacion
AC = XMAX - XMIN
DX = (XMAX - XMIN) / IX
AC = ZMAX - ZMIN
DZ = (ZMAX - ZMIN) / IZ
ReDim XP(IX, 1)
ReDim XPS(IX, 1) As String
ReDim YP(IX, IZ)
ReDim YPS(IX, IZ) As String
ReDim ZP(IZ, 1)
ReDim ZPS(IZ, 1) As String
JM = IZ * IX
ReDim G(n, 1)
ReDim h(n, 1)
ReDim W(n, 1)
ReDim UIX(JM, 1)
ReDim UIY(JM, 1)
ReDim UIZ(JM, 1)
XP(0, 1) = XMIN
ZP(0, 1) = ZMIN
XPS(0, 1) = Str(XP(0, 1))
XPS(0, 1) = Mid(XPS(0, 1), 2)
ZPS(0, 1) = Str(ZP(0, 1))
ZPS(0, 1) = Mid(ZPS(0, 1), 2)
CalculandoInterpolacion.ProgressBar1.Min = 0
CalculandoInterpolacion.ProgressBar1.Max = IX
CalculandoInterpolacion.ProgressBar1.Value = 0
If CalculandoInterpolacion.ProgressBar1.Value <= IX Then
    i = 0
```

```
    Do
        i = i + 1
        XP(i, 1) = XP(i - 1, 1) + DX
        XPS(i, 1) = Str(XP(i, 1))
        XPS(i, 1) = Mid(XPS(i, 1), 2)
    Loop Until i = IX - 1
    j = 0
    Do
        j = j + 1
        ZP(j, 1) = ZP(j - 1, 1) + DZ
        ZPS(j, 1) = Str(ZP(j, 1))
        ZPS(j, 1) = Mid(ZPS(j, 1), 2)
    Loop Until j = IZ - 1
    If NombreInterpolados.Text2.Text <> "" Then
        Open NombreInterpolados.interpolado For Output As #9
    End If
    If NombreErroresInterpol.Text1.Text <> "" Then
        mnw = 0
        Open NombreErroresInterpol.erroresInterpol For Output As #55
    End If
    i = -1
    j = -1
    Do
        i = i + 1
        j = -1
        Do
            j = j + 1
            AA = 0
            BB = 0
            k = -1
            Do
                k = k + 1
                G(k, 1) = (Val(X(k, 1)) - XP(i, 1)) ^ 2
                h(k, 1) = (Val(Z(k, 1)) - ZP(j, 1)) ^ 2
                W(k, 1) = (G(k, 1) + h(k, 1)) ^ (-0.5 * p)
                AA = AA + W(k, 1) * Val(Y(k, 1))
                BB = BB + W(k, 1)
            Loop Until k = n - 1
            YP(i, j) = AA / BB
            'Errores de interpolación de la columna X
            '{
            If NombreErroresInterpol.Text1.Text <> "" Then
                a0 = (U / 2) ^ 2 'Primera derivada
                a1 = (W(k, 1) / (BB + W(k, 1))) ^ 2 'Incertidumbre
asociada a la primera derivada
                a2 = (-(AA * BB / (BB + W(k, 1)) ^ 2)) ^ 2 'Segunda
derivada
                a21 = ((-0.5 * p * W(k, 1) * (-2 * Val(X(k, 1)) + 2 *
Val(XP(i, 1)))) / ((Val(X(k, 1)) - Val(XP(i, 1))) + Val(Z(k, 1)) -
ZP(j, 1))) ^ 2
                a212 = (U / 3) ^ 2
                a22 = ((-0.5 * p * W(k, 1) * (-2 * Val(Z(k, 1)) + 2 *
Val(ZP(j, 1)))) / ((Val(X(k, 1)) - Val(XP(i, 1))) + Val(Z(k, 1)) -
ZP(j, 1))) ^ 2
                a23 = ((-0.5 * p * W(k, 1) * (2 * Val(X(k, 1)) - 2 *
Val(XP(i, 1)))) / ((Val(X(k, 1)) - Val(XP(i, 1))) + Val(Z(k, 1)) -
ZP(j, 1))) ^ 2
                a24 = ((-0.5 * p * W(k, 1) * (2 * Val(Z(k, 1)) - 2 *
Val(ZP(j, 1)))) / ((Val(X(k, 1)) - Val(XP(i, 1))) + Val(Z(k, 1)) -
ZP(j, 1))) ^ 2
```

```
                termino2 = a23 * a0 + a24 * a0 + a21 * a212 + a22 *
a212
                UIY(mnw, 1) = 3 * Sqr(a0 * a1 + a2 * termino2)
                '}
                'Errores de columna Y y Z
                '{
                Dim ty1 As Double
                Dim tz1 As Double
                ty1 = 2 * ((1 / IX) ^ 2 * a0)
                tz1 = 2 * ((1 / IZ) ^ 2 * a0)
                UIX(mnw, 1) = 2 * Sqr(a0 + ty1)
                UIZ(mnw, 1) = 2 * Sqr(a0 + tz1)
                '}
                Print #55, Round(UIX(mnw, 1), 8); ""; Round(UIY(mnw,
1), 8); ""; Round(UIZ(mnw, 1), 8); ";"
                mnw = mnw + 1
            End If
            YPS(i, j) = Str(YP(i, j))
            If NombreInterpolados.Text2.Text <> "" Then
                Print #9, XPS(i, 1); " , "; YPS(i, j); " , "; ZPS(j,
1); ";"
            End If
        Loop Until j = IZ - 1
        CalculandoInterpolacion.ProgressBar1.Value =
CalculandoInterpolacion.ProgressBar1.Value + 1
        DoEvents
        CalculandoInterpolacion.Label2.Caption =
Int((CalculandoInterpolacion.ProgressBar1.Value /
CalculandoInterpolacion.ProgressBar1.Max) * 100) & "%"
    Loop Until i = IX - 1
    If NombreInterpolados.Text2.Text <> "" Then
        Close #9
    End If
    If NombreErroresInterpol.Text1.Text <> "" Then
        Close #55
    End If
    Grafico.Text3.Text = JM
    DatosNumDeErrInt.Text7.Text = JM
End If
DESV_TIPICA_DE_ERRORES_DE_INTERPOLACION
ReDim M(0 To IX, 0 To IZ)
Dim Mmax As Single
Dim Mmin As Single
If Val(YPS(0, 0)) > 0 Then Mmin = Val(YPS(0, 0))
If Val(YPS(0, 0)) < 0 Then Mmax = Val(YPS(0, 0))
For i = 0 To (IX - 1)
    For j = 0 To (IZ - 1)
    M(i, j) = Round(Val(YPS(i, j)), 10)
    If Val(YPS(i, j)) < Mmin Then GoTo 2500 Else GoTo 2510
2500 Mmin = Round(Val(YPS(i, j)), 3)
2510 If Val(YPS(i, j)) > Mmax Then GoTo 2520 Else GoTo 2530
2520 Mmax = Round(Val(YPS(i, j)), 3)
2530 Next j
Next i
If NombreErroresInterpol.Text1.Text <> "" Then
GRAFICOS_ERRORES_DE_INTERPOLACION
Grafico.MSChart1.ChartData = M
Grafico.MSChart1.SeriesType = VtChSeriesType3dLine
Grafico.MSChart1.ColumnCount = IZ
Grafico.MSChart1.RowCount = IX
```

```
Grafico.MSChart1.Plot.Axis(VtChAxisIdX).ValueScale.Maximum = XMAX
Grafico.MSChart1.Plot.Axis(VtChAxisIdX).ValueScale.Minimum = XMIN
Grafico.MSChart1.Plot.Axis(VtChAxisIdY).ValueScale.Maximum = Mmax +
(Mmax / 600)
Grafico.MSChart1.Plot.Axis(VtChAxisIdY).ValueScale.Minimum = Mmin -
(Mmin / 600)
Grafico.MSChart1.Plot.Axis(VtChAxisIdY2).ValueScale.Maximum = Mmax +
(Mmax / 600)
Grafico.MSChart1.Plot.Axis(VtChAxisIdY2).ValueScale.Minimum = Mmin -
(Mmin / 600)
Grafico.MSChart1.Plot.Axis(VtChAxisIdZ).ValueScale.Maximum = ZMAX
Grafico.MSChart1.Plot.Axis(VtChAxisIdZ).ValueScale.Minimum = ZMIN
Grafico.MSChart1.TitleText = "Distribución de puntos interpolados para
una malla de " & IX & "x" & IZ
End Sub
Public Sub InterpolacionSinCompensacionYZ()
If Val(X(0, 1)) > 0 Then XMIN = Val(X(0, 1))
If Val(X(0, 1)) < 0 Then XMAX = Val(X(0, 1))
If Val(Y(0, 1)) > 0 Then YMIN = Val(Y(0, 1))
If Val(Y(0, 1)) < 0 Then YMAX = Val(Y(0, 1))
If Val(Z(0, 1)) > 0 Then ZMIN = Val(Z(0, 1))
If Val(Z(0, 1)) < 0 Then ZMAX = Val(Z(0, 1))
i = 0
Do
490 If Val(X(i, 1)) < XMIN Then GoTo 500 Else GoTo 510
500 XMIN = Val(X(i, 1))
510 If Val(X(i, 1)) > XMAX Then GoTo 520 Else GoTo 530
520 XMAX = Val(X(i, 1))
530 If Val(Y(i, 1)) < YMIN Then GoTo 540 Else GoTo 550
540 YMIN = Val(Y(i, 1))
550 If Val(Y(i, 1)) > YMAX Then GoTo 560 Else GoTo 561
560 YMAX = Val(Y(i, 1))
561 If Val(Z(i, 1)) < ZMIN Then GoTo 565 Else GoTo 566
565 ZMIN = Val(Z(i, 1))
566 If Val(Z(i, 1)) > ZMAX Then GoTo 567 Else GoTo 570
567 ZMAX = Val(Z(i, 1))
570 i = i + 1
571 Loop Until i = n
Grafico.Text1.Text = n 'Puntos palpados
DatosNumDeErrInt.Text5.Text = n
Grafico.Text13.Text = Format(XMIN, "scientific") 'Limite inferior para
X
Grafico.Text14.Text = Format(XMAX, "scientific") 'Limite superior para
X
IY = Val(ParametrosYZ.Text2.Text) 'Numero de puntos a interpolar en X
Grafico.Text15.Text = Format(YMIN, "scientific") 'Limite inferior para
Y
Grafico.Text16.Text = Format(YMAX, "scientific") 'Limite superior para
Y
Grafico.Text12.Text = Format(ZMIN, "scientific") 'Limite inferior para
Z
Grafico.Text2.Text = Format(ZMAX, "scientific") 'Limite superior para
Z
IZ = Val(ParametrosYZ.Text3.Text) 'Numero de puntos a interpolar en Z
p = Val(ParametrosYZ.Text4.Text) 'Paramertro de interpolacion
AC = YMAX - YMIN
DY = (YMAX - YMIN) / IY
AC = ZMAX - ZMIN
DZ = (ZMAX - ZMIN) / IZ
ReDim YP(IY, 1)
```

```
ReDim YPS(IY, 1) As String
ReDim XP(IY, IZ)
ReDim XPS(IY, IZ) As String
ReDim ZP(IZ, 1)
ReDim ZPS(IZ, 1) As String
JM = IY * IZ
ReDim G(n, 1)
ReDim h(n, 1)
ReDim W(n, 1)
ReDim UIX(JM, 1)
ReDim UIY(JM, 1)
ReDim UIZ(JM, 1)
YP(0, 1) = YMIN
ZP(0, 1) = ZMIN
YPS(0, 1) = Str(YP(0, 1))
YPS(0, 1) = Mid(YPS(0, 1), 2)
ZPS(0, 1) = Str(ZP(0, 1))
ZPS(0, 1) = Mid(ZPS(0, 1), 2)
CalculandoInterpolacion.ProgressBar1.Min = 0
CalculandoInterpolacion.ProgressBar1.Max = IY
CalculandoInterpolacion.ProgressBar1.Value = 0
If CalculandoInterpolacion.ProgressBar1.Value <= IY Then
    i = 0
    Do
        i = i + 1
        YP(i, 1) = YP(i - 1, 1) + DY
        YPS(i, 1) = Str(YP(i, 1))
        YPS(i, 1) = Mid(YPS(i, 1), 2)
    Loop Until i = IY - 1
    j = 0
    Do
        j = j + 1
        ZP(j, 1) = ZP(j - 1, 1) + DZ
        ZPS(j, 1) = Str(ZP(j, 1))
        ZPS(j, 1) = Mid(ZPS(j, 1), 2)
    Loop Until j = IZ - 1
    If NombreInterpolados.Text2.Text <> "" Then
        Open NombreInterpolados.interpolado For Output As #9
    End If
    If NombreErroresInterpol.Text1.Text <> "" Then
        mnw = 0
        Open NombreErroresInterpol.erroresInterpol For Output As #55
    End If
    i = -1
    j = -1
    Do
        i = i + 1
        j = -1
        Do
            j = j + 1
            AA = 0
            BB = 0
            k = -1
            Do
                k = k + 1
                G(k, 1) = (Val(Y(k, 1)) - YP(i, 1)) ^ 2
                h(k, 1) = (Val(Z(k, 1)) - ZP(j, 1)) ^ 2
                W(k, 1) = (G(k, 1) + h(k, 1)) ^ (-0.5 * p)
                AA = AA + W(k, 1) * Val(X(k, 1))
                BB = BB + W(k, 1)
```

```
            Loop Until k = n - 1
            XP(i, j) = AA / BB
            'Errores de interpolación de la columna X
            '{
            If NombreErroresInterpol.Text1.Text <> "" Then
                a0 = (U / 2) ^ 2 'Primera derivada
                a1 = (W(k, 1) / (BB + W(k, 1))) ^ 2 'Incertidumbre
asociada a la primera derivada
                a2 = (-(AA * BB / (BB + W(k, 1)) ^ 2)) ^ 2 'Segunda
derivada
                a21 = ((-0.5 * p * W(k, 1) * (-2 * Val(Y(k, 1)) + 2 *
Val(YP(i, 1)))) / ((Val(Y(k, 1)) - Val(YP(i, 1))) + Val(Z(k, 1)) -
ZP(j, 1))) ^ 2
                a212 = (U / 3) ^ 2
                a22 = ((-0.5 * p * W(k, 1) * (-2 * Val(Z(k, 1)) + 2 *
Val(ZP(j, 1)))) / ((Val(Y(k, 1)) - Val(YP(i, 1))) + Val(Z(k, 1)) -
ZP(j, 1))) ^ 2
                a23 = ((-0.5 * p * W(k, 1) * (2 * Val(Y(k, 1)) - 2 *
Val(YP(i, 1)))) / ((Val(Y(k, 1)) - Val(YP(i, 1))) + Val(Z(k, 1)) -
ZP(j, 1))) ^ 2
                a24 = ((-0.5 * p * W(k, 1) * (2 * Val(Z(k, 1)) - 2 *
Val(ZP(j, 1)))) / ((Val(Y(k, 1)) - Val(YP(i, 1))) + Val(Z(k, 1)) -
ZP(j, 1))) ^ 2
                termino2 = a23 * a0 + a24 * a0 + a21 * a212 + a22 *
a212
                UIX(mnw, 1) = 3 * Sqr(a0 * a1 + a2 * termino2)
                '}
                'Errores de columna Y y Z
                '{
                Dim ty1 As Double
                Dim tz1 As Double
                ty1 = 2 * ((1 / IY) ^ 2 * a0)
                tz1 = 2 * ((1 / IZ) ^ 2 * a0)
                UIY(mnw, 1) = 2 * Sqr(a0 + ty1)
                UIZ(mnw, 1) = 2 * Sqr(a0 + tz1)
                '}
                Print #55, Round(UIX(mnw, 1), 8); ""; Round(UIY(mnw,
1), 8); ""; Round(UIZ(mnw, 1), 8); ";"
                mnw = mnw + 1
            End If
            XPS(i, j) = Str(XP(i, j))
            If NombreInterpolados.Text2.Text <> "" Then
                Print #9, XPS(i, j); " , "; YPS(i, 1); " , "; ZPS(j,
1); ";"
            End If
        Loop Until j = IZ - 1
        CalculandoInterpolacion.ProgressBar1.Value =
CalculandoInterpolacion.ProgressBar1.Value + 1
        DoEvents
        CalculandoInterpolacion.Label2.Caption =
Int((CalculandoInterpolacion.ProgressBar1.Value /
CalculandoInterpolacion.ProgressBar1.Max) * 100) & "%"
    Loop Until i = IY - 1
    If NombreInterpolados.Text2.Text <> "" Then
        Close #9
    End If
    If NombreErroresInterpol.Text1.Text <> "" Then
        Close #55
    End If
    Grafico.Text3.Text = JM
```

```
    DatosNumDeErrInt.Text7.Text = JM
End If
DESV_TIPICA_DE_ERRORES_DE_INTERPOLACION
ReDim M(0 To IY, 0 To IZ)
Dim Mmax As Single
Dim Mmin As Single
If Val(XPS(0, 0)) > 0 Then Mmin = Val(XPS(0, 0))
If Val(XPS(0, 0)) < 0 Then Mmax = Val(XPS(0, 0))
For i = 0 To (IY - 1)
    For j = 0 To (IZ - 1)
    M(i, j) = Round(Val(XPS(i, j)), 10)
    If Val(XPS(i, j)) < Mmin Then GoTo 2500 Else GoTo 2510
2500 Mmin = Round(Val(XPS(i, j)), 3)
2510 If Val(XPS(i, j)) > Mmax Then GoTo 2520 Else GoTo 2530
2520 Mmax = Round(Val(XPS(i, j)), 3)
2530 Next j
Next i
If NombreErroresInterpol.Text1.Text <> "" Then
GRAFICOS_ERRORES_DE_INTERPOLACION
Grafico.MSChart1.ChartData = M
Grafico.MSChart1.SeriesType = VtChSeriesType3dLine
Grafico.MSChart1.ColumnCount = IZ
Grafico.MSChart1.RowCount = IY
Grafico.MSChart1.Plot.Axis(VtChAxisIdX).ValueScale.Maximum = XMAX
Grafico.MSChart1.Plot.Axis(VtChAxisIdX).ValueScale.Minimum = XMIN
Grafico.MSChart1.Plot.Axis(VtChAxisIdY).ValueScale.Maximum = Mmax +
(Mmax / 600)
Grafico.MSChart1.Plot.Axis(VtChAxisIdY).ValueScale.Minimum = Mmin -
(Mmin / 600)
Grafico.MSChart1.Plot.Axis(VtChAxisIdY2).ValueScale.Maximum = Mmax +
(Mmax / 600)
Grafico.MSChart1.Plot.Axis(VtChAxisIdY2).ValueScale.Minimum = Mmin -
(Mmin / 600)
Grafico.MSChart1.Plot.Axis(VtChAxisIdZ).ValueScale.Maximum = ZMAX
Grafico.MSChart1.Plot.Axis(VtChAxisIdZ).ValueScale.Minimum = ZMIN
Grafico.MSChart1.TitleText = "Distribución de puntos interpolados para
una malla de " & IY & "x" & IZ
End Sub
Public Sub GRAFICOS_ERRORES_DE_INTERPOLACION()
If NombreErroresInterpol.Text1.Text <> "" Then
    If UIX(0, 1) > 0 Then EMIN1 = UIX(0, 1)
    If UIX(0, 1) < 0 Then EMAX1 = UIX(0, 1)
    If UIY(0, 1) > 0 Then EMIN2 = UIY(0, 1)
    If UIY(0, 1) < 0 Then EMAX2 = UIY(0, 1)
    If UIZ(0, 1) > 0 Then EMIN3 = UIZ(0, 1)
    If UIZ(0, 1) < 0 Then EMAX3 = UIZ(0, 1)
    i = 0
        Do
            i = i + 1
5490        If UIX(i, 1) < EMIN1 Then GoTo 5500 Else GoTo 5510
5500        EMIN1 = UIX(i, 1)
5510        If UIX(i, 1) > EMAX1 Then GoTo 5520 Else GoTo 5530
5520        EMAX1 = UIX(i, 1)
5530        If UIY(i, 1) < EMIN2 Then GoTo 5540 Else GoTo 5550
5540        EMIN2 = UIY(i, 1)
5550        If UIY(i, 1) > EMAX2 Then GoTo 5560 Else GoTo 5561
5560        EMAX2 = UIY(i, 1)
5561        If UIZ(i, 1) < EMIN3 Then GoTo 5565 Else GoTo 5566
5565        EMIN3 = UIZ(i, 1)
5566        If UIZ(i, 1) > EMAX3 Then GoTo 5567 Else GoTo 5570
```

```
5567        EMAX3 = UIZ(i, 1)
5570    Loop Until i = JM - 1
    DatosNumDeErrInt.Text13.Text = Format(EMIN1, "scientific")
    DatosNumDeErrInt.Text14.Text = Format(EMAX1, "scientific")
    DatosNumDeErrInt.Text15.Text = Format(EMIN2, "scientific")
    DatosNumDeErrInt.Text16.Text = Format(EMAX2, "scientific")
    DatosNumDeErrInt.Text12.Text = Format(EMIN3, "scientific")
    DatosNumDeErrInt.Text2.Text = Format(EMAX3, "scientific")
End If
ReDim E1(JM, 1)
ReDim E2(JM, 1)
ReDim E3(JM, 1)
For mnw = 0 To (JM - 1)
    E1(mnw, 1) = UIX(mnw, 1)
    If E1(mnw, 1) = EMIN1 Then DatosNumDeErrInt.Text1.Text = mnw
    If E1(mnw, 1) = EMAX1 Then DatosNumDeErrInt.Text4.Text = mnw
Next mnw
For mnw = 0 To (JM - 1)
    E2(mnw, 1) = UIY(mnw, 1)
    If E2(mnw, 1) = EMIN2 Then DatosNumDeErrInt.Text6.Text = mnw
    If E2(mnw, 1) = EMAX2 Then DatosNumDeErrInt.Text8.Text = mnw
Next mnw
For mnw = 0 To (JM - 1)
    E3(mnw, 1) = UIZ(mnw, 1)
    If E3(mnw, 1) = EMIN3 Then DatosNumDeErrInt.Text10.Text = mnw
    If E3(mnw, 1) = EMAX3 Then DatosNumDeErrInt.Text19.Text = mnw
Next mnw
GraficosErroresInt.MSChart1.ChartData = E1
GraficosErroresInt.MSChart2.ChartData = E2
GraficosErroresInt.MSChart3.ChartData = E3
If ParametrosCompensacion.Combo1.Text = "Medición en ejes Y,Z" Then

GraficosErroresInt.MSChart1.Plot.Axis(VtChAxisIdY).ValueScale.Maximum
= (EMAX1 - EMIN1) / 1.5

GraficosErroresInt.MSChart1.Plot.Axis(VtChAxisIdY).ValueScale.Minimum
= -(EMAX1 - EMIN1) / 20
    GraficosErroresInt.MSChart1.TitleText = "Errores en la columna de
valores interpolados X"

GraficosErroresInt.MSChart2.Plot.Axis(VtChAxisIdY).ValueScale.Maximum
= EMAX2 + EMIN2

GraficosErroresInt.MSChart2.Plot.Axis(VtChAxisIdY).ValueScale.Minimum
= -(EMAX2 + EMIN2)
    GraficosErroresInt.MSChart2.TitleText = "Errores en la columna de
valores interpolados Y"

GraficosErroresInt.MSChart3.Plot.Axis(VtChAxisIdY).ValueScale.Maximum
= EMAX3 + EMIN3

GraficosErroresInt.MSChart3.Plot.Axis(VtChAxisIdY).ValueScale.Minimum
= -(EMAX3 + EMIN3)
    GraficosErroresInt.MSChart3.TitleText = "Errores en la columna de
valores interpolados Z"
End If
If ParametrosCompensacion.Combo1.Text = "Medición en ejes X,Z" Then

GraficosErroresInt.MSChart1.Plot.Axis(VtChAxisIdY).ValueScale.Maximum
= EMAX1 + EMIN1
```

```
GraficosErroresInt.MSChart1.Plot.Axis(VtChAxisIdY).ValueScale.Minimum
= -(EMAX1 + EMIN1)
    GraficosErroresInt.MSChart1.TitleText = "Errores en la columna de
valores interpolados X"

GraficosErroresInt.MSChart2.Plot.Axis(VtChAxisIdY).ValueScale.Maximum
= (EMAX2 - EMIN2) / 1.5

GraficosErroresInt.MSChart2.Plot.Axis(VtChAxisIdY).ValueScale.Minimum
= -(EMAX2 - EMIN2) / 20
    GraficosErroresInt.MSChart2.TitleText = "Errores en la columna de
valores interpolados Y"

GraficosErroresInt.MSChart3.Plot.Axis(VtChAxisIdY).ValueScale.Maximum
= EMAX3 + EMIN3

GraficosErroresInt.MSChart3.Plot.Axis(VtChAxisIdY).ValueScale.Minimum
= -(EMAX3 + EMIN3)
    GraficosErroresInt.MSChart3.TitleText = "Errores en la columna de
valores interpolados Z"
End If
If ParametrosCompensacion.Combo1.Text = "Medición en ejes X,Y" Then

GraficosErroresInt.MSChart1.Plot.Axis(VtChAxisIdY).ValueScale.Maximum
= EMAX1 + EMIN1

GraficosErroresInt.MSChart1.Plot.Axis(VtChAxisIdY).ValueScale.Minimum
= -(EMAX1 + EMIN1)
    GraficosErroresInt.MSChart1.TitleText = "Errores en la columna de
valores interpolados X"

GraficosErroresInt.MSChart2.Plot.Axis(VtChAxisIdY).ValueScale.Maximum
= EMAX2 + EMIN2

GraficosErroresInt.MSChart2.Plot.Axis(VtChAxisIdY).ValueScale.Minimum
= -(EMAX2 + EMIN2)
    GraficosErroresInt.MSChart2.TitleText = "Errores en la columna de
valores interpolados Y"

GraficosErroresInt.MSChart3.Plot.Axis(VtChAxisIdY).ValueScale.Maximum
= (EMAX3 - EMIN3) / 1.5

GraficosErroresInt.MSChart3.Plot.Axis(VtChAxisIdY).ValueScale.Minimum
= -(EMAX3 - EMIN3) / 20
    GraficosErroresInt.MSChart3.TitleText = "Errores en la columna de
valores interpolados Z"
End If
End Sub
Public Sub DESV_TIPICA_DE_ERRORES_DE_INTERPOLACION()
If NombreErroresInterpol.Text1.Text <> "" Then
    Dim Suma0 As Double
    i = 0
    Suma0 = UIX(i, 1)
    Do
        i = i + 1
        Suma0 = Suma0 + UIX(i, 1)
    Loop Until i = JM - 1
    MediaUIX = Suma0 / JM
    i = 0
```

```
    Term0 = (UIX(i, 1) - MediaUIX) ^ 2
    Do
        i = i + 1
        Term0 = Term0 + (UIX(i, 1) - MediaUIX) ^ 2
    Loop Until i = JM - 1
    DesvTipicaUIX = Sqr(Term0 / (JM - 1))
    DatosNumDeErrInt.Label11.Caption = "Desviación típica para columna
X:"
    DatosNumDeErrInt.Text17.Text = Format(DesvTipicaUIX, "scientific")
    Dim Suma1 As Double
    i = 0
    Suma1 = UIY(i, 1)
    Do
        i = i + 1
        Suma1 = Suma1 + UIY(i, 1)
    Loop Until i = JM - 1
    MediaUIY = Suma1 / JM
    i = 0
    Term1 = (UIY(i, 1) - MediaUIY) ^ 2
    Do
        i = i + 1
        Term1 = Term1 + (UIY(i, 1) - MediaUIY) ^ 2
    Loop Until i = JM - 1
    DesvTipicaUIY = Sqr(Term1 / (JM - 1))
    DatosNumDeErrInt.Label12.Caption = "Desviación típica para columna
Y:"
    DatosNumDeErrInt.Text18.Text = Format(DesvTipicaUIY, "scientific")
    Dim Suma2 As Double
    i = 0
    Suma2 = UIZ(i, 1)
    Do
        i = i + 1
        Suma2 = Suma2 + UIZ(i, 1)
    Loop Until i = JM - 1
    MediaUIZ = Suma2 / JM
    i = 0
    Term2 = (UIZ(i, 1) - MediaUIZ) ^ 2
    Do
        i = i + 1
        Term2 = Term2 + (UIZ(i, 1) - MediaUIZ) ^ 2
    Loop Until i = JM - 1
    DesvTipicaUIZ = Sqr(Term2 / (JM - 1))
    DatosNumDeErrInt.Label1.Caption = "Desviación típica para columna
Z:"
    DatosNumDeErrInt.Text3.Text = Format(DesvTipicaUIZ, "scientific")
End If
End Sub
```

- Attribute VB_Name = "**Module2**"

```
Public sc As String
Public compensado As String
Public interpolado As String
Public errores As String
Public inf As String
Public DiferenciaTiempo As Double
Public Sub TEXTO_PUNTOS_INTERPOLADOS() 'Muestra fichero de puntos
interpolados
PuntosInterpolados.Show
Open NombreInterpolados.interpolado For Input As #1
```

```
    PuntosInterpolados.Text1.Text = Input(LOF(1), #1)
Close #1
End Sub
Public Sub INFORME_FINAL() 'Crea el informe final
Open NombreInforme.inf For Output As #2
Print #2, "================================================"
Print #2, "INFORME FINAL DE INTERPOLACIÓN DE PUNTOS MEDIDOS"
Print #2, "================================================"
Print #2, ""
Print #2, "Hora: " + Time
Print #2, ""
Print #2, "---------------------------"
Print #2, "Información de los ficheros"
Print #2, "---------------------------"
Print #2, ""
Print #2, "Ruta del fichero origen de puntos palpados: " +
AbrirOrigen.origen
Print #2, ""
If Presentacion.mnuVMSC.Enabled = True Then
    Print #2, "Ruta del fichero de puntos sin compensar: " +
NombreSinCompensar.sc
End If
Print #2, ""
If Presentacion.mnuVMC.Enabled = True Then
    Print #2, "Ruta del fichero de puntos compensados: " +
NombreCompensada.compensado
End If
Print #2, ""
If Presentacion.mnuVMI.Enabled = True Then
    Print #2, "Ruta del fichero final de puntos interpolados: " +
NombreInterpolados.interpolado
End If
Print #2, ""
If Presentacion.mnuVMEC.Enabled = True Then
    Print #2, "Ruta del fichero de errores de compensación: " +
NombreErrores.errores
End If
Print #2, ""
If Presentacion.mnuVMEI.Enabled = True Then
    Print #2, "Ruta del fichero de errores de interpolación: " +
NombreErroresInterpol.erroresInterpol
End If
Print #2, ""
Print #2, "-----------------------------------------------------"
Print #2, "Información de los parametros de interpolación utilizados"
Print #2, "-----------------------------------------------------"
Print #2, ""
Print #2, "Ejes de medición: " + ParametrosCompensacion.Combo1.Text
Print #2, ""
Print #2, "Radio de la punta de herramienta: " +
ParametrosCompensacion.Text2.Text + " mm"
Print #2, ""
Print #2, "-------------------------------------------------"
Print #2, "Información acerca de la interpolación realizada"
Print #2, "-------------------------------------------------"
If ParametrosCompensacion.Combo1.Text = "Medición en ejes X,Y" Then
    Print #2, ""
    Print #2, ParametrosXY.Label6.Caption, " ",
ParametrosXY.Text2.Text
    Print #2, ""
```

```
    Print #2, ParametrosXY.Label7.Caption, " ",
ParametrosXY.Text3.Text
    Print #2, ""
    Print #2, ParametrosXY.Label8.Caption, " ",
ParametrosXY.Text4.Text
    Print #2, ""
End If
If ParametrosCompensacion.Combo1.Text = "Medición en ejes X,Z" Then
    Print #2, ""
    Print #2, ParametrosXZ.Label6.Caption, " ",
ParametrosXZ.Text2.Text
    Print #2, ""
    Print #2, ParametrosXZ.Label7.Caption, " ",
ParametrosXZ.Text3.Text
    Print #2, ""
    Print #2, ParametrosXZ.Label8.Caption, " ",
ParametrosXZ.Text4.Text
    Print #2, ""
End If
If ParametrosCompensacion.Combo1.Text = "Medición en ejes Y,Z" Then
    Print #2, ""
    Print #2, ParametrosYZ.Label6.Caption, " ",
ParametrosYZ.Text2.Text
    Print #2, ""
    Print #2, ParametrosYZ.Label7.Caption, " ",
ParametrosYZ.Text3.Text
    Print #2, ""
    Print #2, ParametrosYZ.Label8.Caption, " ",
ParametrosYZ.Text4.Text
    Print #2, ""
End If
Print #2, "Numero de puntos tomados: " & n
Print #2, ""
Print #2, "Numero de puntos interpolados: " & JM
Print #2, ""
Print #2, "-------------------------------------------------------------
"
Print #2, "Información acerca de los errores numéricos de
compensación"
Print #2, "-------------------------------------------------------------
"
Print #2, ""
Print #2, ""
Print #2, "*****Valores máximos según ejes:"
Print #2, ""
Print #2, "En X:" + MatrizErrores.Text14.Text
Print #2, "-"
Print #2, "En Y:" + MatrizErrores.Text16.Text
Print #2, "-"
Print #2, "En Z:" + MatrizErrores.Text2.Text
Print #2, "-"
Print #2, "*****Valores mínimos según ejes:"
Print #2, ""
Print #2, "En X:" + MatrizErrores.Text13.Text
Print #2, "-"
Print #2, "En Y:" + MatrizErrores.Text15.Text
Print #2, "-"
Print #2, "En Z:" + MatrizErrores.Text12.Text
Print #2, ""
Print #2, MatrizErrores.Label11.Caption + MatrizErrores.Text17.Text
```

```
Print #2, ""
Print #2, MatrizErrores.Label12.Caption + MatrizErrores.Text18.Text
Print #2, ""
Print #2, ""
If NombreInterpolados.Text2.Text <> "" Then
    Print #2, "-----------------------------------------------------
-----"
    Print #2, "Información acerca de los errores numéricos de
interpolación"
    Print #2, "-----------------------------------------------------
-----"
    Print #2, ""
    Print #2, ""
    Print #2, "*****Valores máximos según ejes:"
    Print #2, ""
    Print #2, "En X: " & Format(DatosNumDeErrInt.Text14, "scientific")
    Print #2, "-"
    Print #2, "En Y: " & Format(DatosNumDeErrInt.Text16, "scientific")
    Print #2, "-"
    Print #2, "En Z: " & Format(DatosNumDeErrInt.Text2, "scientific")
    Print #2, "-"
    Print #2, "*****Valores mínimos según ejes:"
    Print #2, ""
    Print #2, "En X:" & Format(DatosNumDeErrInt.Text13, "scientific")
    Print #2, "-"
    Print #2, "En Y:" & Format(DatosNumDeErrInt.Text15, "scientific")
    Print #2, "-"
    Print #2, "En Z:" & Format(DatosNumDeErrInt.Text12, "scientific")
    Print #2, ""
    Print #2, DatosNumDeErrInt.Label11 & " " & DatosNumDeErrInt.Text17
    Print #2, "-"
    Print #2, DatosNumDeErrInt.Label12 & " " & DatosNumDeErrInt.Text18
    Print #2, "-"
    Print #2, DatosNumDeErrInt.Label1 & " " & DatosNumDeErrInt.Text3
    Print #2, "-"
End If
Print #2, ""
Print #2, "***Nota: unidades en milimetros***"
If ParametrosXY.Check1.Enabled = False Then
    Print #2, "Tiempo empleado en la realización de la interpolación=
" & DiferenciaTiempo & " segundos"
End If
If ParametrosXZ.Check1.Enabled = False Then
    Print #2, "Tiempo empleado en la realización de la interpolación=
" & DiferenciaTiempo & " segundos"
End If
If ParametrosYZ.Check1.Enabled = False Then
    Print #2, "Tiempo empleado en la realización de la interpolación=
" & DiferenciaTiempo & " segundos"
End If
Close #2
End Sub
Public Sub MATRICES_COMPENSADAS_Y_ERRORES()
PUNTOS_TOMADOS
MATRICES_XYZ
If ParametrosCompensacion.Combo1.Text = "Medición en ejes X,Y" Then
    MATRICES_COMPENSADAS_XY
    GUARDAR_MATRICES_COMPENSADAS_XY
    ERRORES_DE_COMPENSACION_XY
End If
```

```
'CASO 2:Coordenada y=cte
If ParametrosCompensacion.Combo1.Text = "Medición en ejes X,Z" Then
    MATRICES_COMPENSADAS_XZ
    GUARDAR_MATRICES_COMPENSADAS_XZ
    ERRORES_DE_COMPENSACION_XZ
End If
'CASO 1:coordenada x=cte
If ParametrosCompensacion.Combo1.Text = "Medición en ejes Y,Z" Then
    MATRICES_COMPENSADAS_YZ
    GUARDAR_MATRICES_COMPENSADAS_YZ
    ERRORES_DE_COMPENSACION_YZ
End If
End Sub
Public Sub MATRICES_COMPENSADAS()
'CASO 3:coordenada z=cte
PUNTOS_TOMADOS
MATRICES_XYZ
If ParametrosCompensacion.Combo1.Text = "Medición en ejes X,Y" Then
    MATRICES_COMPENSADAS_XY
    GUARDAR_MATRICES_COMPENSADAS_XY
End If
'CASO 2:Coordenada y=cte
If ParametrosCompensacion.Combo1.Text = "Medición en ejes X,Z" Then
    MATRICES_COMPENSADAS_XZ
    GUARDAR_MATRICES_COMPENSADAS_XZ
End If
'CASO 1:coordenada x=cte
If ParametrosCompensacion.Combo1.Text = "Medición en ejes Y,Z" Then
    MATRICES_COMPENSADAS_YZ
    GUARDAR_MATRICES_COMPENSADAS_YZ
End If
End Sub
Public Sub INTERPOLACION()
If Presentacion.mnuFicheroErroresInterpolacion = False Then
CalculandoInterpolacion.Visible = True
Presentacion.Timer1.Enabled = False
TiempoCero = Timer
HoraCero = Int(TiempoCero / 3600)
Termino00 = (TiempoCero / 3600) - HoraCero
Minuto0 = Int(Termino00 * 60)
Termino01 = (Termino00 * 60) - Minuto0
seg0 = Termino01 * 60
Presentacion.Timer1.Enabled = True
DoEvents 'Da el control de forma temporal al sistema operativo para
poder procesar otros eventos
PUNTOS_TOMADOS
MATRICES_XYZ
If Presentacion.mnuFicheroCompensado.Enabled = True Then
    If ParametrosCompensacion.Combo1.Text = "Medición en ejes X,Y"
Then
        MATRICES_COMPENSADAS_XY
        GUARDAR_MATRICES_COMPENSADAS_XY
        INTERPOLACION_XY
    End If
    If ParametrosCompensacion.Combo1.Text = "Medición en ejes X,Z"
Then
        MATRICES_COMPENSADAS_XZ
        GUARDAR_MATRICES_COMPENSADAS_XZ
        INTERPOLACION_XZ
    End If
```

```
    If ParametrosCompensacion.Combo1.Text = "Medición en ejes Y,Z"
Then
        MATRICES_COMPENSADAS_YZ
        GUARDAR_MATRICES_COMPENSADAS_YZ
        INTERPOLACION_YZ
    End If
End If
If Presentacion.mnuFicheroCompensado.Enabled = False Then
    If ParametrosCompensacion.Combo1.Text = "Medición en ejes X,Y"
Then
        InterpolacionSinCompensacionXY
    End If
    If ParametrosCompensacion.Combo1.Text = "Medición en ejes X,Z"
Then
        InterpolacionSinCompensacionXZ
    End If
    If ParametrosCompensacion.Combo1.Text = "Medición en ejes Y,Z"
Then
        InterpolacionSinCompensacionYZ
    End If
End If
Presentacion.mnuInforme.Enabled = True
Presentacion.mnuGrafico.Enabled = True
Presentacion.mnuResultados.Enabled = True
'If Presentacion.mnuFicheroErroresInterpolacion = False Then
    If CalculandoInterpolacion.ProgressBar1.Value =
CalculandoInterpolacion.ProgressBar1.Max Then
        CalculandoInterpolacion.Visible = False
    End If
    TiempoUno = Timer
    HoraUno = Int(TiempoUno / 3600)
    TerminoUno = (TiempoUno / 3600) - HoraUno
    Minuto1 = Int(TerminoUno * 60)
    TerminoDos = (TerminoUno * 60) - Minuto1
    seg1 = TerminoDos * 60
    DiferenciaTiempo = seg1 - seg0
    If Presentacion.mnuVMEI.Enabled = False Then MsgBox "Interpolación
de puntos realizada. El tiempo de cálculo es de: " &
Round(DiferenciaTiempo, 4) & " segundos", vbInformation,
"Interpolación"
'End If
If Presentacion.mnuFicheroErroresInterpolacion = True Then Unload
CalcErrInterpol
End Sub
```