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## An MFC Curve Control

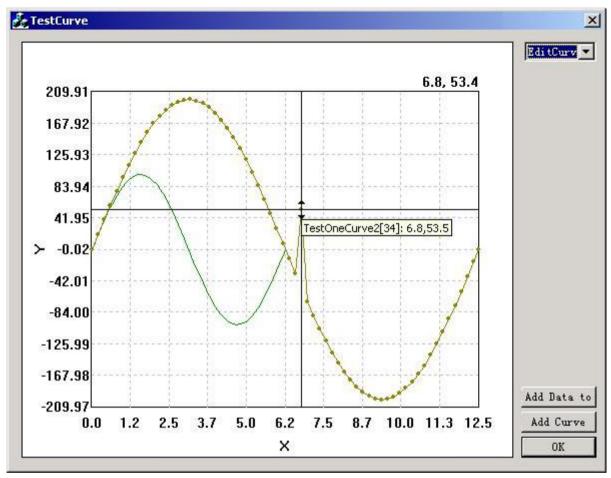
Sunjoy Chen, 19 Dec 2004

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An article on a curve **control**.

Download source files - 14.3 Kb

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## Introduction

- Derived from CWnd, easy to use
- Fits width and height of drawing rect
- Zooming in and out
- Mouse coordinates tracing
- Single/multiple selected by clicking mouse button
- Cross-line tracing mouse
- Add or delete a point of a curve by clicking mouse button
- Edit vertical value of a point of a curve by moving mouse with button down
- Easy to move, shift or mirror one curve
- Notify **control**'s owner when curve changing

- Owner determines whether to modify curve data by return values of message handle functions
- Unicode support
- Compiles under Windows 2000, VC 6.0 with warning level 4

# Background

Recently, I wanted to visualize data in one of my applications. I had searched from Internet and downloaded some curve **control**s. Most of them are beautiful and work well, but none works as I want it to be. After reading source code of some **control**s, I decided to develop one curve **control** which would meet my application's requirements.

### Classes

#### **CCurve**

CCurve class, derived from CObject is used to store data and curve properties. It does not perform data adding or deleting.

```
void ShowCurve(BOOL bShow = TRUE);
BOOL IsVisible();
  Sets/gets visualization.

    void Select(BOOL bSelect = TRUE);

    BOOL IsSelected

  Sets/gets selected.

    BOOL SetCurveName(CString& strName);

CString GetCurveName();
  Sets/gets curve name.

    void SetCurveColor(COLORREF color);

    COLORREF GetCurveColor();

  Sets/gets curve line color.

    void SetCurveStyle(int iStyle);

int GetCurveStyle();
  Sets/gets curve line style.

    void SetCurveWidth(int nWidth);
```

```
    int GetCurveWidth();
    Sets/gets curve line width.
    float Distance(const CPoint& pt1, const CPoint& pt2);
    Gets distance between two points.
    BOOL IsPointNearCurve(const CPoint& point, int& iIndex);
    Whether the point is near the curve.
```

#### **CCurveCtrl**

```
    BOOL Create(const RECT& rect, CWnd* parent, UINT nID,DWORD dwStyle = WS_CHILD | WS_BORDER | WS_TABSTOP | WS_VISIBLE);
    Creates control, where rect is the dimensions. Refer to MSDN.
    int AddCurve(const CString& strName, COLORREF color = RGB(0, 0, 0), int iStyle = PS_SOLID, int nWidth = 1);
```

int AddCurve(const CString& strName, COLORREF color = RGB(0, 0, 0), int iStyle = PS\_SOLID, int nWidth = 1);
 Adds one curve to control.

- BOOL AddData(const CString& strName, float fHori, float fVert);
- BOOL AddData(CCurve\* pCurve, float fHori, float fVert);

Adds data to a curve by index or object pointer.

• BOOL AddCurveData(const CString& strName, const CArray< float, float >& ArrHori, const CArray< float, float >& ArrVert);

Adds one curve and data at the same time.

```
    CCurve* GetCurve(int iIndex);
```

CCurve\* GetCurve(const CString& strName);

Gets a curve object's pointer by its index in **CCurveCtrl** or its name.

int GetIndex(const CCurve\* pCurve);

Gets a curve's index in **CCurveCtrl** by pointer.

- BOOL Remove(int index);
- BOOL Remove(const CString& strName);
- void RemoveAll();

Removes a curve or all of the curves in **CCurveCtrl**.

int GetCurveCount();

Gets total count of curves.

```
int GetSelectedCount();
  Gets count of selected curves.
void Move(BOOL bLeft);

    void MovePage(BOOL bLeft);

  Moves all curves and coordinate scales left or right (will not modify data).

    void CurveLeft(CCurve* pCurve, float fLen); void CurveRight(CCurve* pCurve, float fLen);

  Shifts a curve left or right (will modify data of the curve).

    void MirrorHori(CCurve* pCurve, float fMid);

  Mirrors a curve in horizontal.

    void MirrorVert(CCurve* pCurve, float fMid);

  Mirrors a curve in vertical.
void Restore();
  Shows all points of all curves.
• BOOL Zoom(BOOL bIn);
  Zooms in (bIn: TRUE) or zooms out (bIn: FALSE).

    void SetHoriLabel(CString& str);

• CString GetHoriLabel();
  Sets/gets horizontal label.

    void SetVertLabel(CString& str);

CString GetVertLabel();
  Sets/gets vertical label.

    void ShowCross(BOOL bShow);

BOOL IsShowCross();
  Whether to show cross lines.

    void SetMargin(const CRect& rect);

CRect GetMargin();
```

Sets/gets margin left to show title, etc.

```
void EnableEdit(BOOL bEdit);BOOL CanEditCurve();
```

Whether can edit curve data by using mouse.

- void SetGridLineStyle(int iStyle);int GetGridLineStyle();
- int detailatinestyle(),

Sets/gets style of grid line in background.

#### **Notifications**

Following notify messages will be sent to **control**'s owner window (parent or not) if curve selected/ deselected or data modified by mouse operation:

- CVN\_MVALUE\_ADD a point added to curve.
- CVN\_MVALUE\_CHANG Y value of a point changing.
- CVN\_MVALUE\_DELETE a point deleted.
- CVN CURVE SELECTED a curve is selected.
- CVN CURVE CANCELSELECT a curve is deselected.
- CVN\_CURVE\_SELECTNONE deselected all curves.

### Struct

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Note the **iIndex** member: it is the index of the point in the curve if the message sent to owner is **CVN\_MVALUE\_ADD**, **CVN\_MVALUE\_CHANGE** or **CVN\_MVALUE\_DELETE**; it is the index of the curve in **CCurveCtrl** if the message sent to owner is **CVN\_CURVE\_SELECTED**, **CVN\_CURVE\_CANCELSELECT** or **CVN\_CURVE\_SELECTNONE**.

### Usage

Following steps demonstrate how to use **CCurveCtrl** in a dialog-based application:

1. Add curvectrl.h and curvectrl.cpp into your project;

2. Add a CCurveCtrl pointer member to your CDialog class:

```
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CCurveCtrl* m_pCurveCtrl;
```

And also add include statement:

```
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#include "CurveCtrl.h"
```

3. Set m\_pCurveCtrl as NULL in your dialog construction functions:

```
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m_pCurveCtrl = NULL;
```

Add **control**'s resource ID to your resource.h file, such as:

```
#define ID_CURVE_CONTROL 9999
```

In your CDialog::OnInitDialog(), add statements as following:

4. Add one curve and data as following:

If you want to add/delete or edit points with mouse operation, you must call:

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```
m_pCurveCtrl->EnableEdit(TRUE);
```

Control's owner will receive notify message, and if the return values of the messages is not 0 (>0 or <0), the edit or selection /deselection attempts will be rejected.

For example, to handle the message of CVN\_MVALUE\_CHANG, add a handler in your dialog source file:

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```
BEGIN MESSAGE MAP(CTestCurveDlg, CDialog)
ON NOTIFY(CVN MVALUE CHANG, ID CURVE CONTROL, OnCurveMouseModify)
END MESSAGE MAP()
// message handle function
void CTestCurveDlg::OnCurveMouseModify(NMHDR *pNotifyStruct, LRESULT* pResult)
   NM CURVECTRL* pItem = (NM CURVECTRL*)pNotifyStruct;
   CCurve* pCurve = (CCurve*)pItem->pCurve;
   CString str;
   str.Format("%s: index: %d, %.1f, %.1f",
                        pCurve->GetCurveName(),
                        pItem->iIndex,
                        pItem->fHori,
                        pItem->fVert);
   TRACE(str);
   // Uncomment following statement if to reject changing
   // *pResult = 1;
```

Refer to sample application TestCurve if you want more information.

## History

V1.0, 19 September 2004

CCurve, CCurveCtrl first released.

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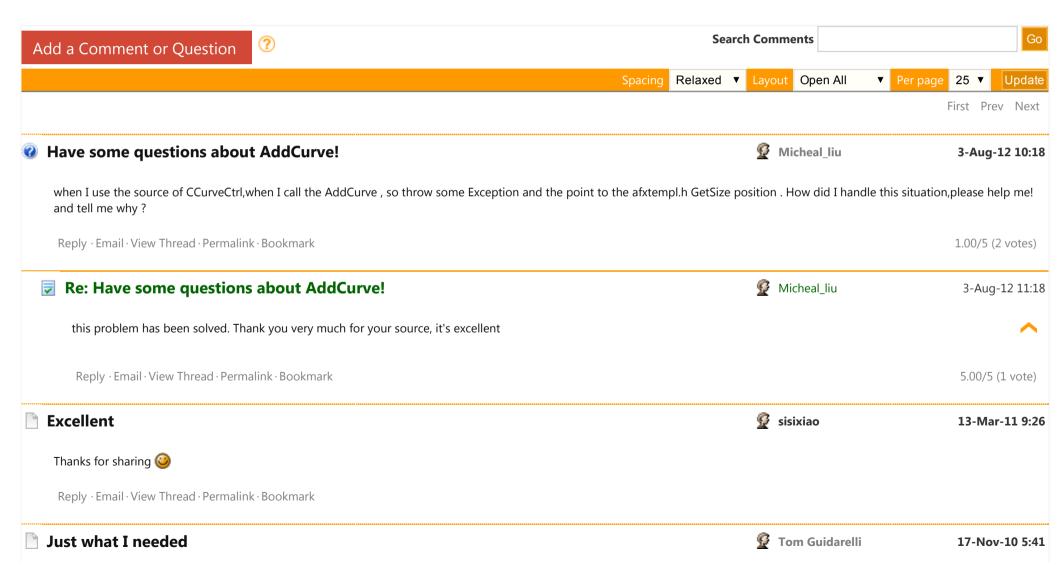
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