TCAD for VCL

Train Course for developers

Created by fei hongbin

www.codeidea.com

Plan

- Chapter 1 Overview   (day1)
- Chapter 2 Feature of TCAD (day1)
- Chapter 3 Basic property (day2)
- Chapter 4 Advance property (day2)
- Chapter 5 Mouse Drawing and Code Drawing (day3)
- Chapter 5 Library creating and using (day3)
- Chapter 6 Events inside TCAD (day4)
- Chapter 7 Layer Operation (day4)
- Chapter 8 Save and Load the drawing (day5)
- Chapter 9 Q&A (day5)

Chapter 1 Overview

- Introducation of TCAD for VCL
  - Who can use TCAD component?
  - Which develop tool(s) can intergate TCAD?
- How to install TCAD under Delphi tools
  - Install TCAD on your PC
  - Review the icons of TCAD on the components panel
- Create the first simple application with TCAD (demo)

1.1 What is TCAD

- TCAD is a component that will help you write vector graphics applications. Shapes can be interacted with by mouse or code. support dynamic link line ,It is easy to use, effective and powerful. It will save you valuable time.

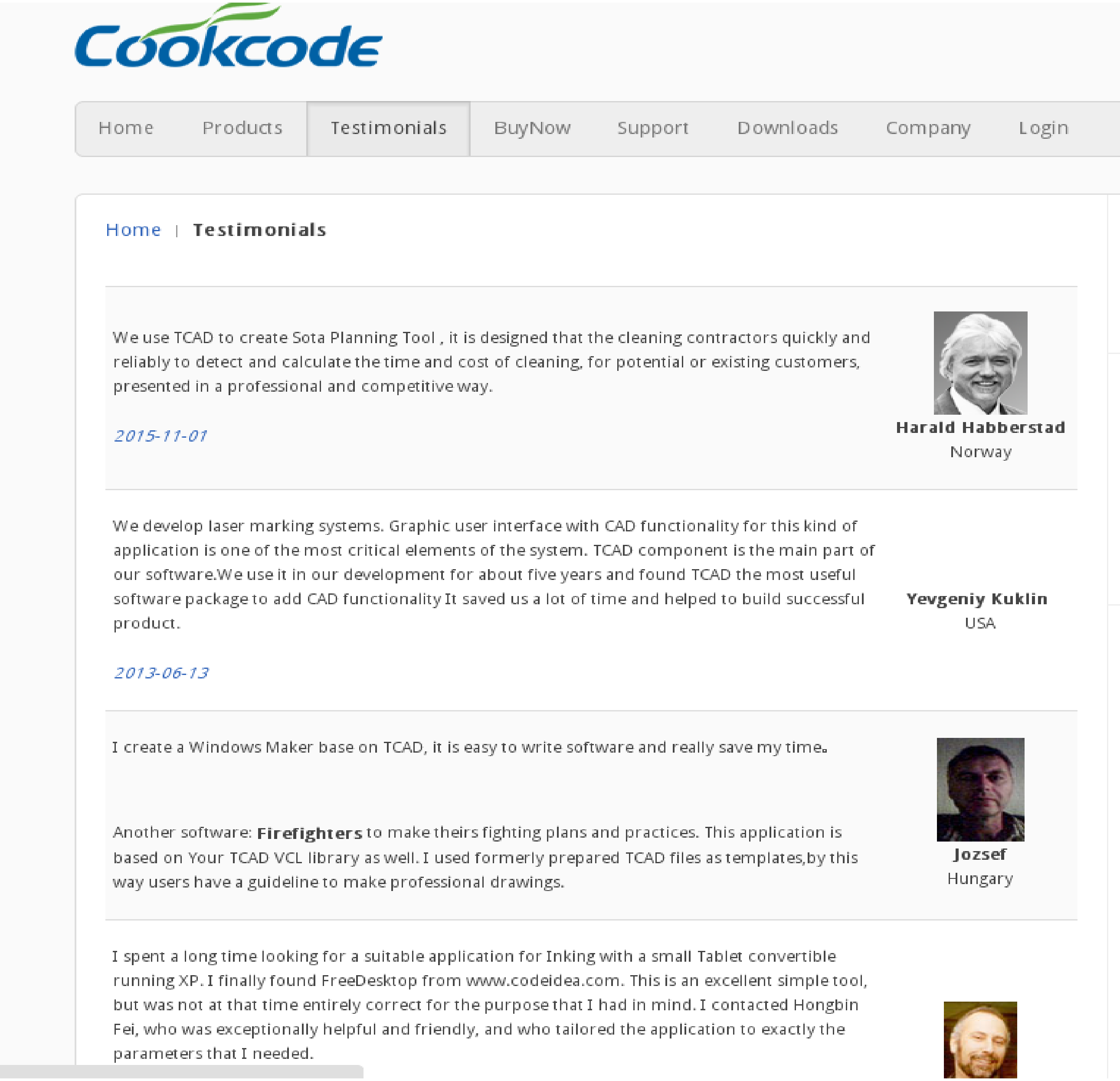
- Review applications that based on TCAD

http://www.codeidea.com/products/tcad-for-vcl.html

1.2 Who are using TCAD

- Delphi & C++ Builder Developers can use TCAD for VCL
- C# developers can use TCAD for .NET

- http://www.codeidea.com/testimonials.html



Home | **Testimonials**

We use TCAD to create Sota Planning Tool , it is designed that the cleaning contractors quickly and reliably to detect and calculate the time and cost of cleaning, for potential or existing customers, presented in a professional and competitive way.

2015-11-01

Harald Habberstad
Norway

We develop laser marking systems. Graphic user interface with CAD functionality for this kind of application is one of the most critical elements of the system. TCAD component is the main part of our software.We use it in our development for about five years and found TCAD the most useful software package to add CAD functionality It saved us a lot of time and helped to build successful product.

2013-06-13

Yevgeniy Kuklin
USA

I create a Windows Maker base on TCAD, it is easy to write software and really save my time.

Another software: **Firefighters** to make theirs fighting plans and practices. This application is based on Your TCAD VCL library as well. I used formerly prepared TCAD files as templates,by this way users have a guideline to make professional drawings.

Jozsef
Hungary

I spent a long time looking for a suitable application for Inking with a small Tablet convertible running XP. I finally found FreeDesktop from www.codeidea.com. This is an excellent simple tool, but was not at that time entirely correct for the purpose that I had in mind. I contacted Hongbin Fei, who was exceptionally helpful and friendly, and who tailored the application to exactly the parameters that I needed.

Clients around world

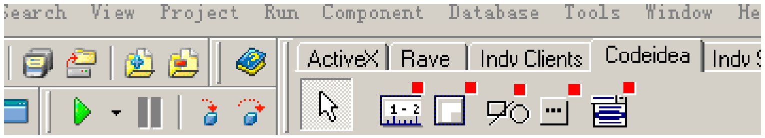
SMC	Japan
Incom I&C Co., LTD	
Microdata Tecnologia Ltda.	Brazil
Hansestadt Investments	South Africa
Ravenscroft Services Ltd.	United Kingdom
Sinter & Net S.p.A.	Italy
BeCom Service	Germany
Spider industrier a.s	Norway
HERMESTI INGENIERIA DOCUMENTAL S.L.	Spain
ABC TV	Australia
BeCom Service	Germany
E+Manufacturing	Belgium
Enprise Solutions Limited	New Zealand
University of Groningen	Netherlands
Medisys Innovation	Singapore
LAUWERS TD BV	Netherlands

1.3 Easy installation

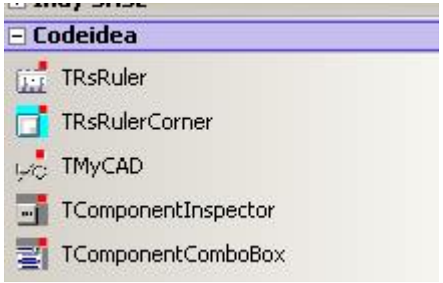
- Install TCAD component (view demo)

1.4 Icon review of TCAD component

- Delphi 5-7



- XE or later



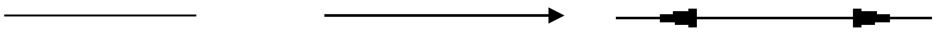
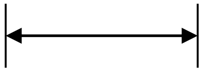
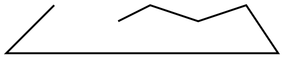
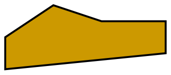
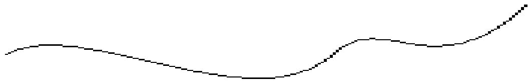
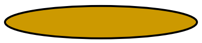
1.5 Create to first application

- Hello world!

(view the demo)

Chapter 2 Feature of TCAD

Support Shapes 1/2

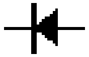
- Line 
- RuleLine 
- Polyline 
- Polygon 
- PolyBezier 
- Rectangle
- Arc
- Ellipse 

Chapter 2 Feature of TCAD

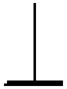
Support Shapes 2/2

- Text MyText
- Bitmap

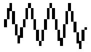
- and combined shape (Userdefined Shape)



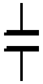
ejg



jd



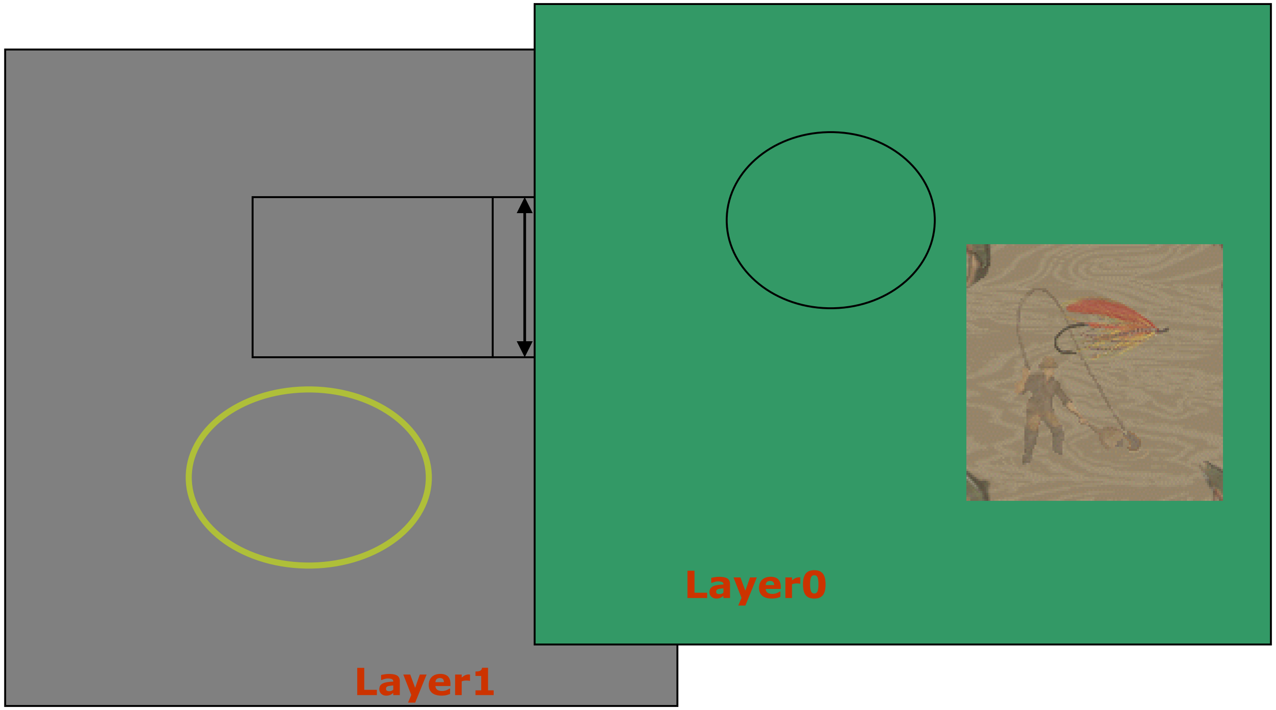
dz



dr

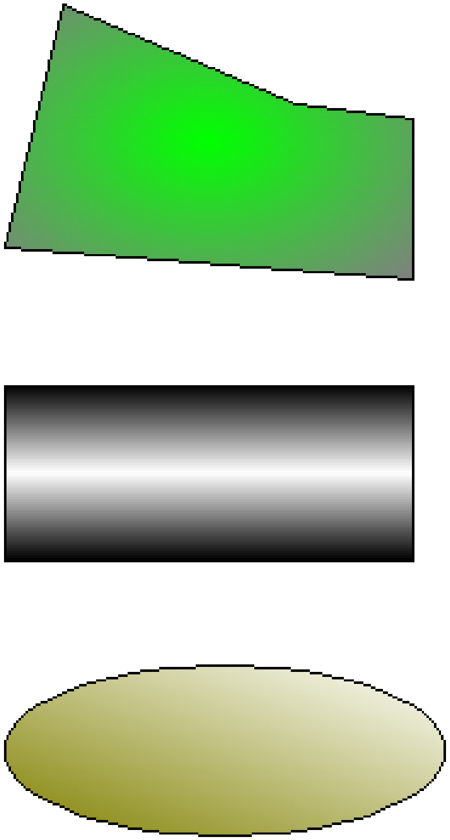
Chapter 2 Feature of TCAD

Support Multi-Layers

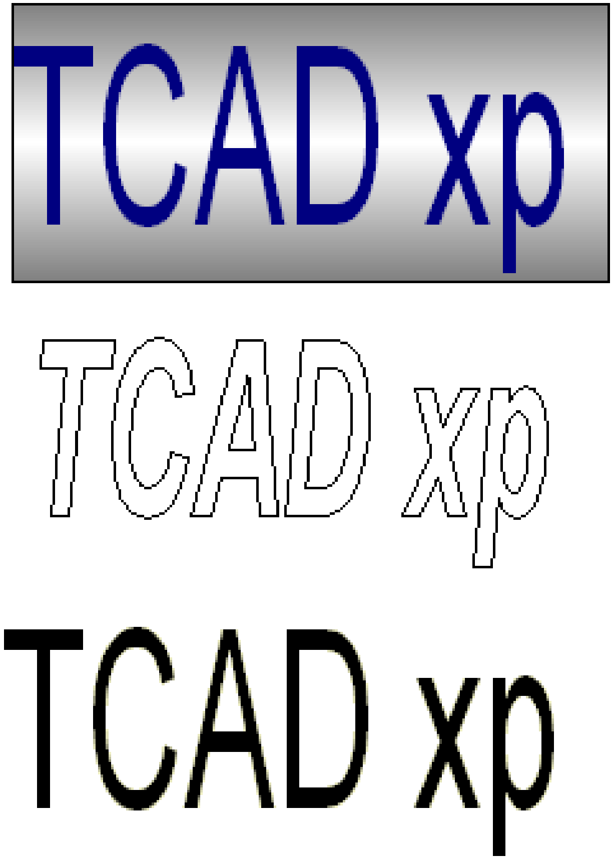


Chapter 2 Feature of TCAD

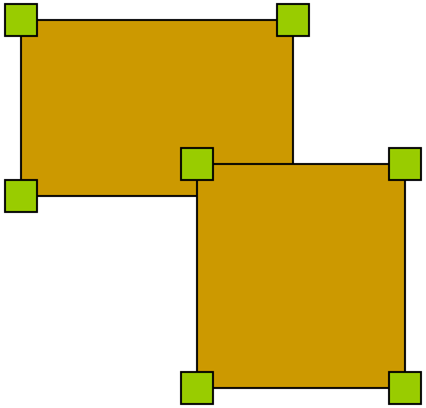
Support 24 gradient styles color to fill shape



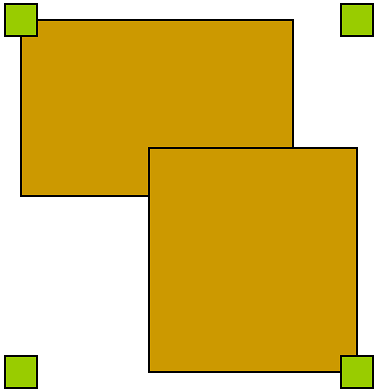
Support many font styles



Grouping/Ungrouping shapes



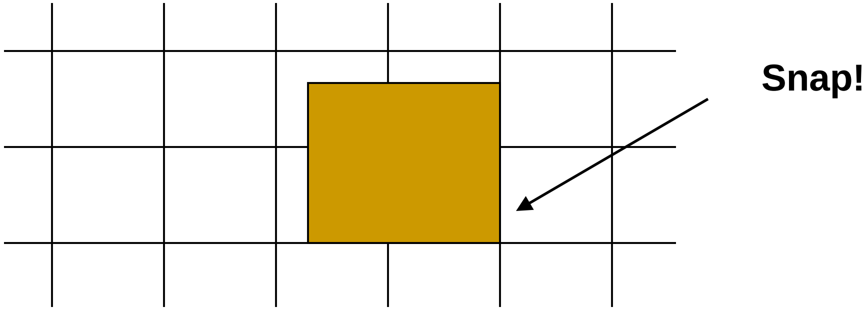
Before grouped



Grouped

Prefect Mouse Snapping action

- Snapping to drawing guide grid



- Snapping to existed shape

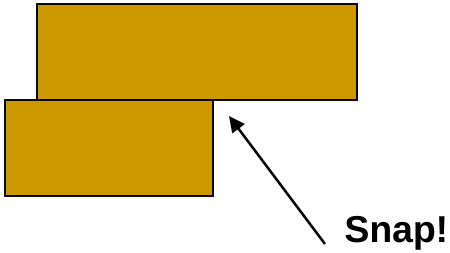
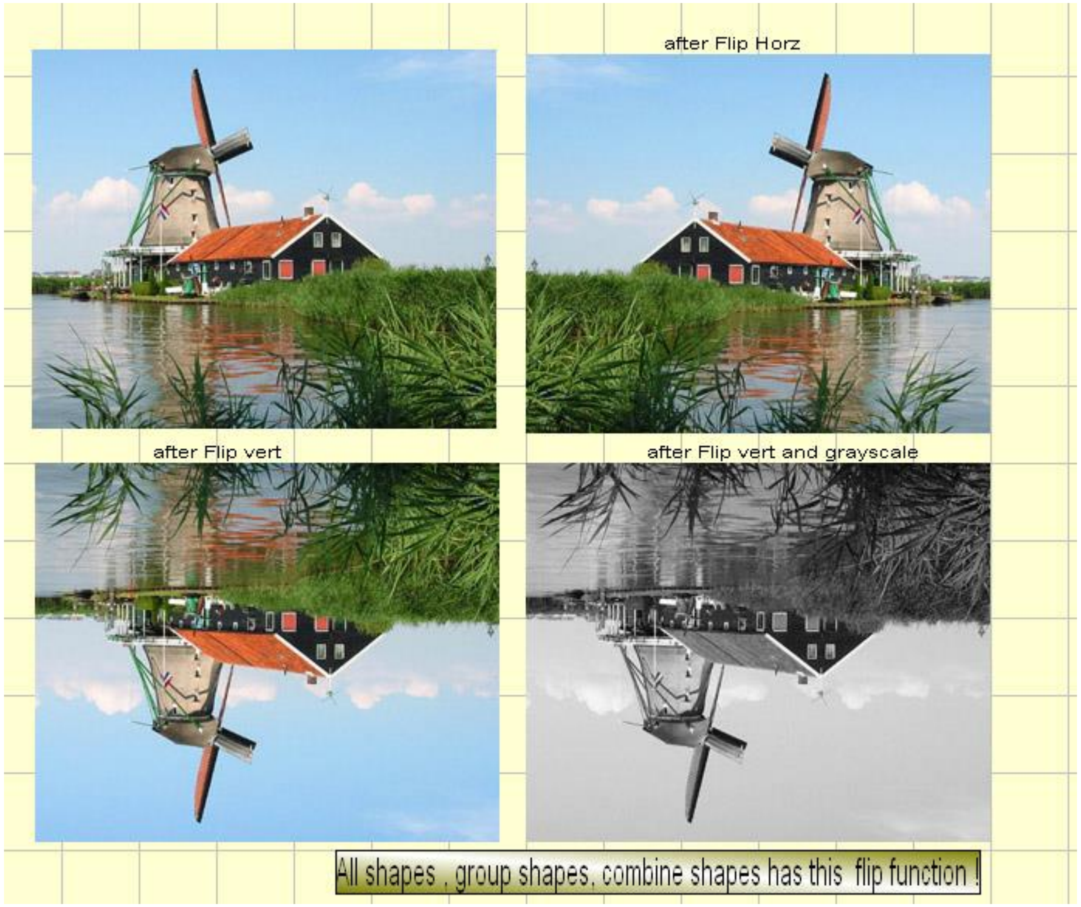


Image effects(1/2)

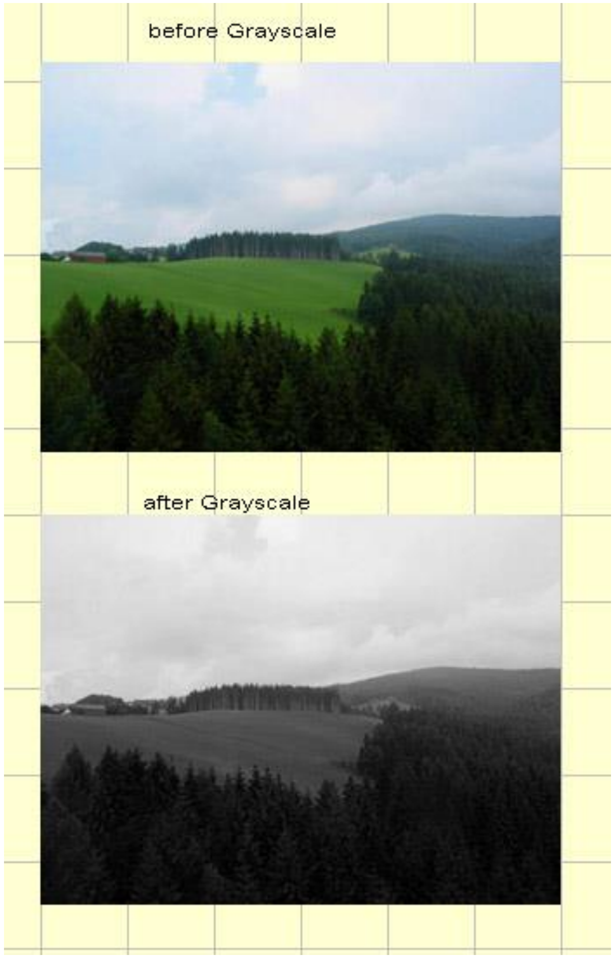
- flip



All shapes , group shapes, combine shapes has this flip function !

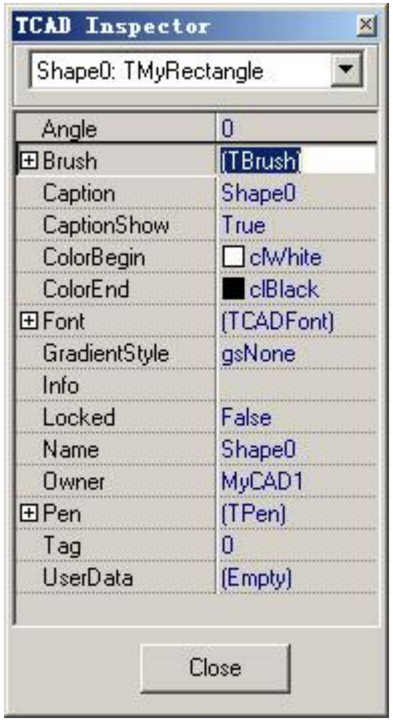
Image effects(2/2)

- Grayscale



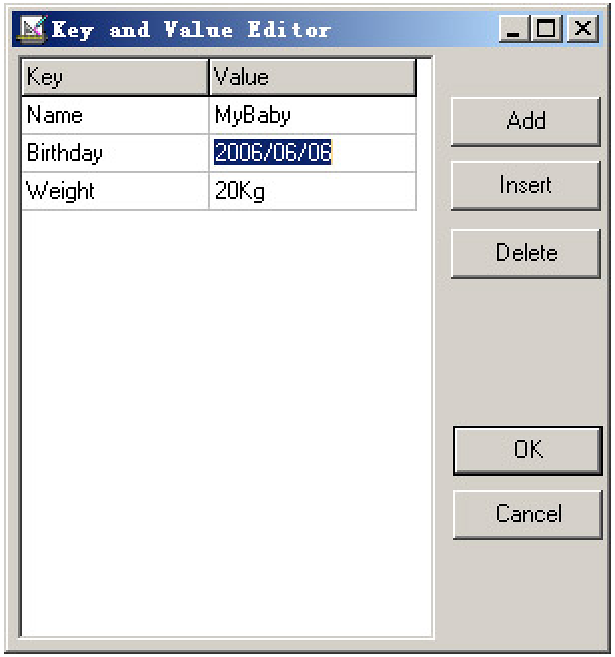
Power inspector(RTTI)

- Monitor every shape and change properties

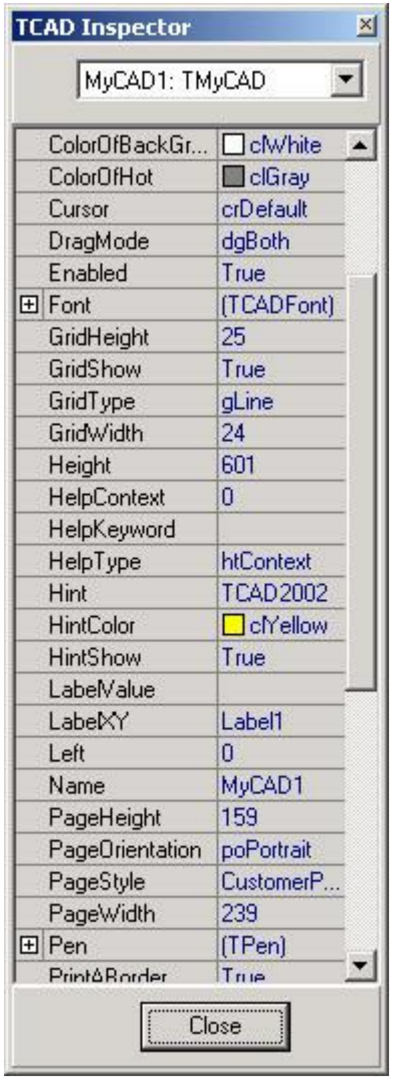


Shape0: TMyRectangle

Angle	0
⊞ Brush	(TBrush)
Caption	Shape0
CaptionShow	True
ColorBegin	□ clWhite
ColorEnd	■ clBlack
⊞ Font	(TCADFont)
GradientStyle	gsNone
Info	
Locked	False
Name	Shape0
Owner	MyCAD1
⊞ Pen	(TPen)
Tag	0
UserData	(Empty)



Key	Value
Name	MyBaby
Birthday	2006/06/06
Weight	20Kg



MyCAD1: TMyCAD

ColorOfBackGr...	□ clWhite
ColorOfHot	■ clGray
Cursor	crDefault
DragMode	dgBoth
Enabled	True
⊞ Font	(TCADFont)
GridHeight	25
GridShow	True
GridType	gLine
GridWidth	24
Height	601
HelpContext	0
HelpKeyword	
HelpType	htContext
Hint	TCAD2002
HintColor	🟨 clYellow
HintShow	True
LabelValue	
LabelXY	Label1
Left	0
Name	MyCAD1
PageHeight	159
PageOrientation	poPortrait
PageStyle	CustomerP...
PageWidth	239
⊞ Pen	(TPen)
PrintABorder	True

Chapter 3 Basic property

- What is contained in TCAD package
- Class inherited of TMyShape
- Shape basic property

3.1 What is contained in TCAD package

- **Files list**

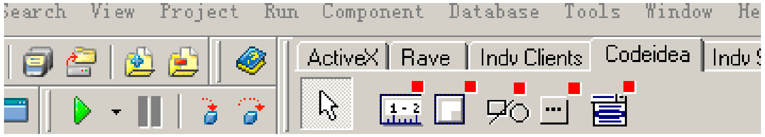
  <maindir>Codeidea Inc\TCAD for VCL
  <dir>Component ---------- TCAD package stored in different version
  <dir>Editor ------------------ TCAD exe demo and drawing templates
  <dir>LIBEditor ------------- TCAD library creating tool and sample libraries

- **Components (class) list**

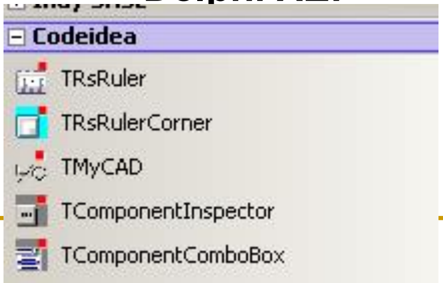
  TMyCAD
  TMyShape (other shape classes belong it)
  TRsRuler
  TRsRulerCorner
  TComponentInspector
  TComponentCombobox
  TCADHotKey(after installed cadhotkey.pas)

- **Component panel**

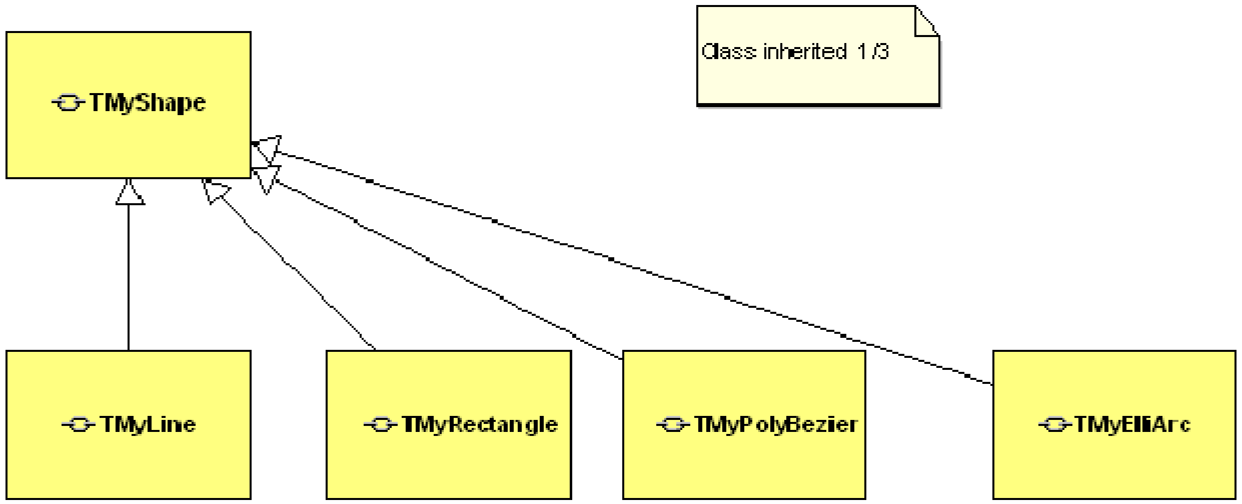
Delphi 5-7:


earch View Project Run Component Database Tools Window He
ActiveX Rave Indy Clients Codeidea Indy S

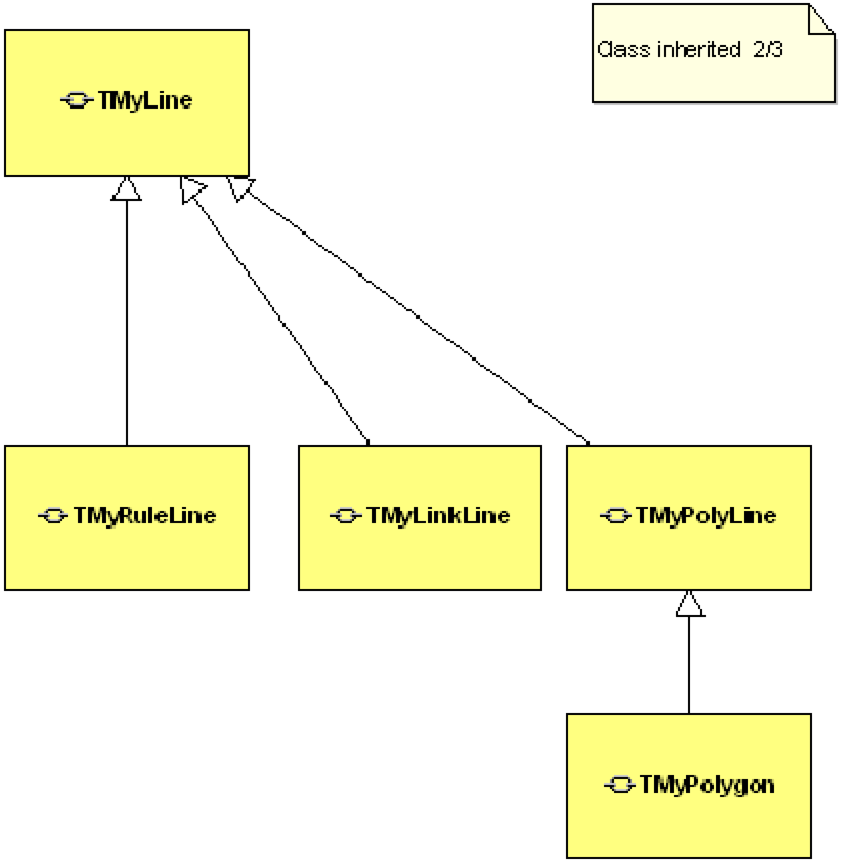
Delphi XE:



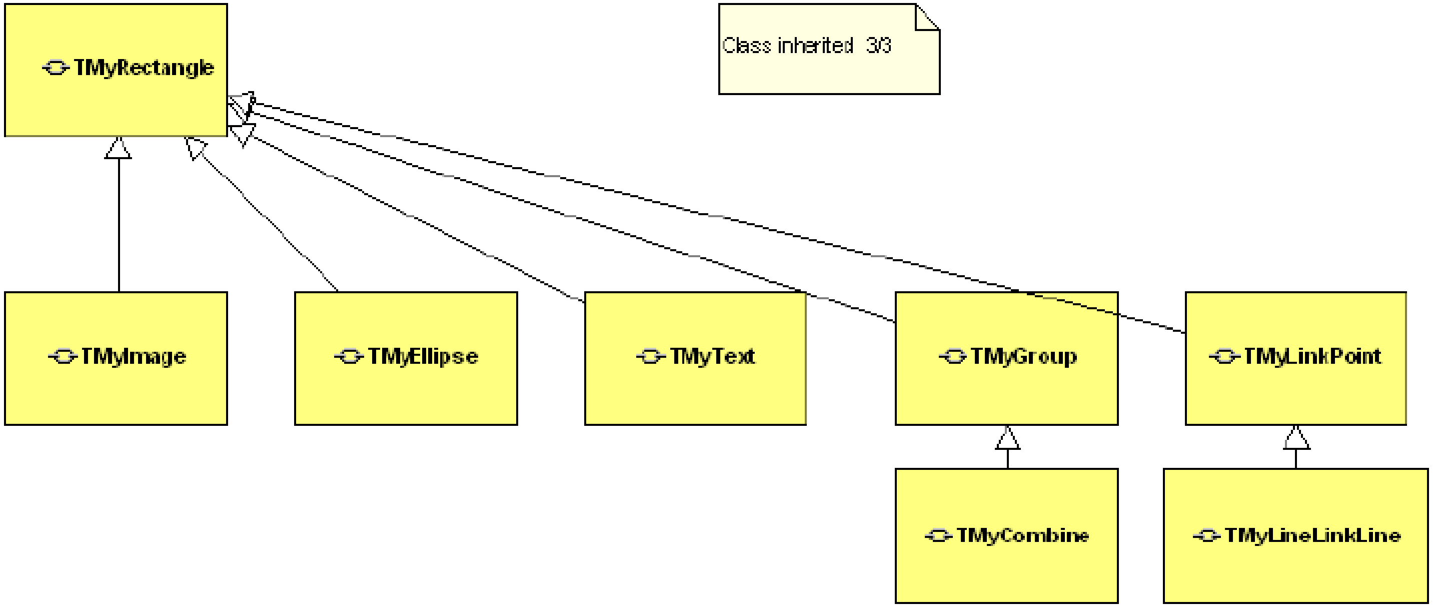
3.2 Class inherited 1/3



3.2 Class inherited 2/3



3.2 Class inherited 3/3



3.3 Shape basic property

- **AShape.ThePoints**
  define:
  ```
  ThePoints:TArrMyPoint;
  TArrMyPoint:Array of TMyPoint;
  TMyPoint = record
  x:single;
  y:single;
  end;
  ```

  related method to access and change points:
  ```
  GetPoint(i)
  GetPointsInZoom(i)
  SetPointx(f)
  SetPointy(f)
  SetPointXY(Pt);
  ```

  Pen:TPen;
  Set the pen of a TMyShape instance that you need;

  Brush:TBrush;
  Set the brush of TMyShape instance that you need;

  Info:string;
  Caption:string;
- **Muti-info:string;**
- **Demostration for setting the property of a shape as test**

Chapter 4 Advance property

- ShapeNo

It is the order of MyShapes, the action delete, add,
sendback, bringtofront,sendbackbystep, bringtofrontbystep will change it.
it is maintaced by TMyCAD and readonly for you, please donot change it by code!

- ShapeId

It is the shape's Id, Delete or add a shape , it is not changed, it is a auto-increment field.
it is maintaced by TMyCAD and readonly for you, please donot change it.

- ChildShapeNo

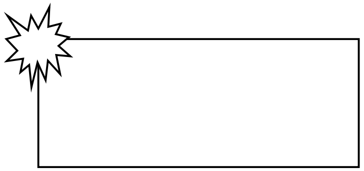
If the shape is a single shape , this field is empty;if it is a grouped or combined shape, this field will store the child shape no.

- UserData

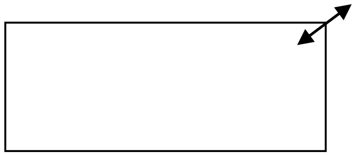
UserData:TUserData;
You can manager yourself data at here, it is very usesful.please read TUserData in help file.

Chapter 5 Mouse Drawing and Code Drawing

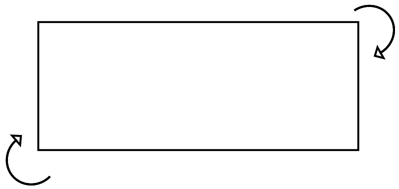
Mouse Actions (view the demo)



- Adding a new shape



- Resizing a (grouped)shape



- Rotating a (grouped) shape

Code Actions (view the demo)

- AddShapeByCode….
- Move(AShape:TMyShape;Dx,Dy:integer);
- Rotate (AShape:TMyShape;AAngle:double);
- SizeShape (AShape:TMyShape;…….);
- DeleteAllShapes…
- DeleteShapeById…..

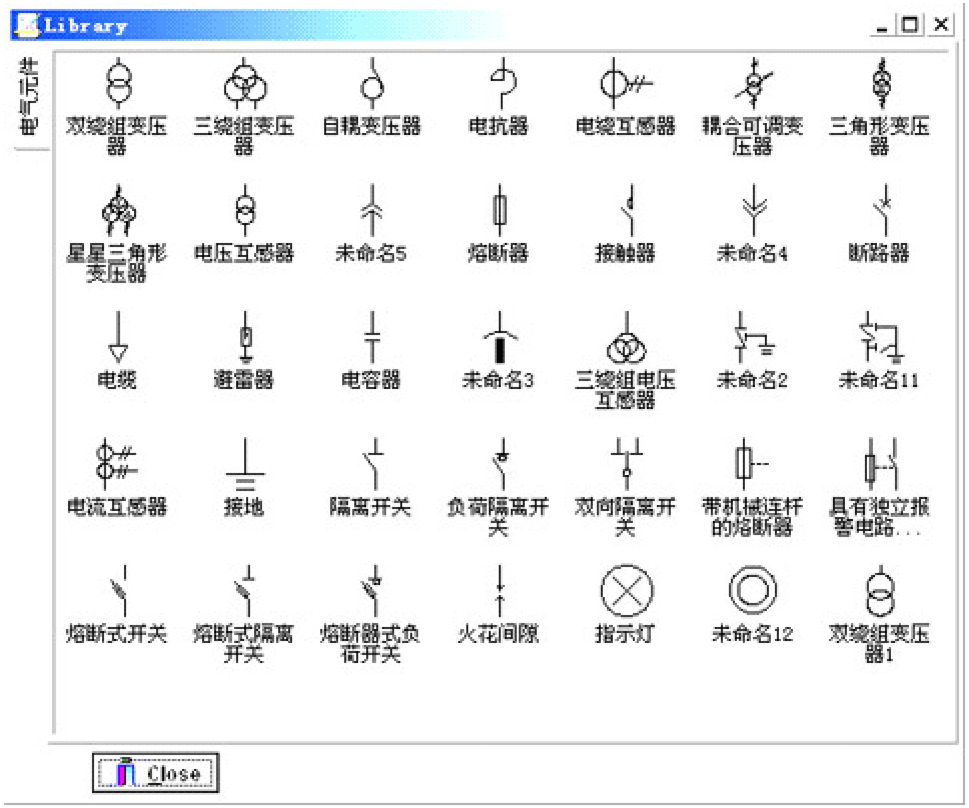
- View the demo : C:\Codeidea\TCADVCL\Developing\Demos\Delphi7\Basic
- Using code to CONTROL shape

Chapter 5 Library creating and using (day3)

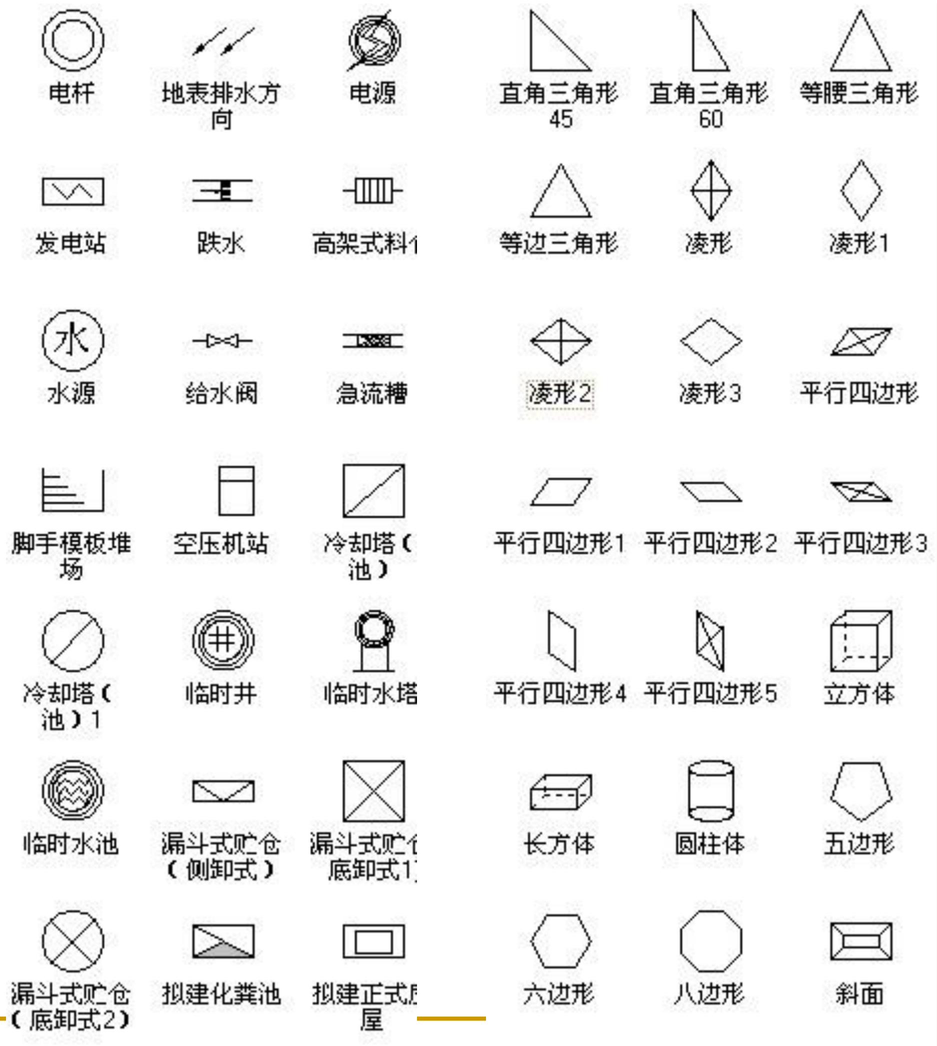
- Why need we create library

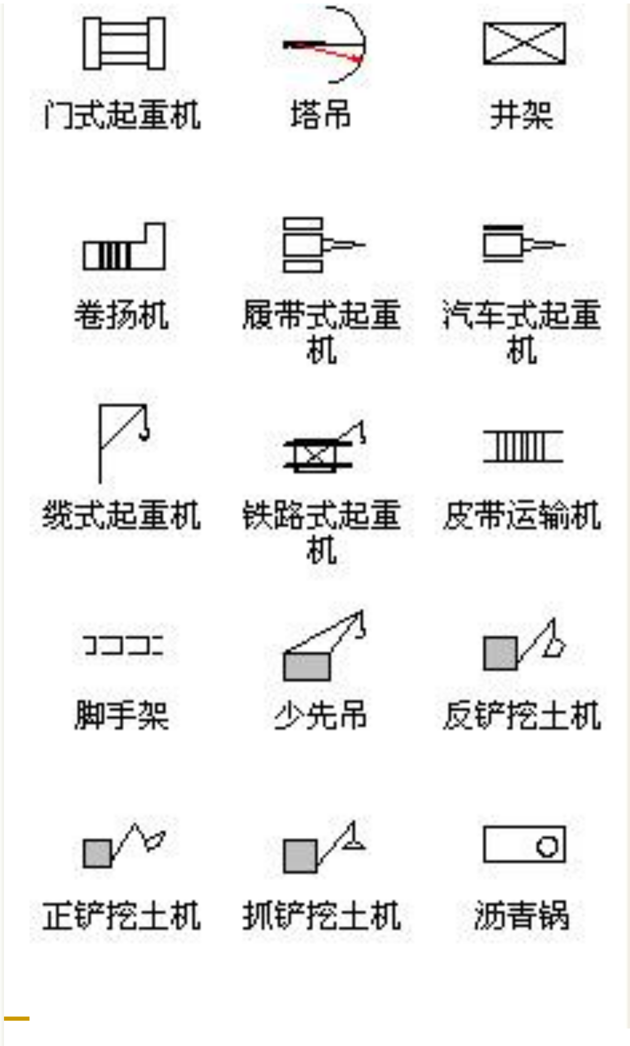
- There are many shapes around the world, simple shapes like line,rectangle and circle , complex shapes like cup,desk,network switch,the complex shape is combined by basic shape.
- If you are electric designer which manage network devices, so you need to create a "electric devices" library,named electriclib.lib,like this,than you can access these shapes easy and fast, save your time.

Library sample:

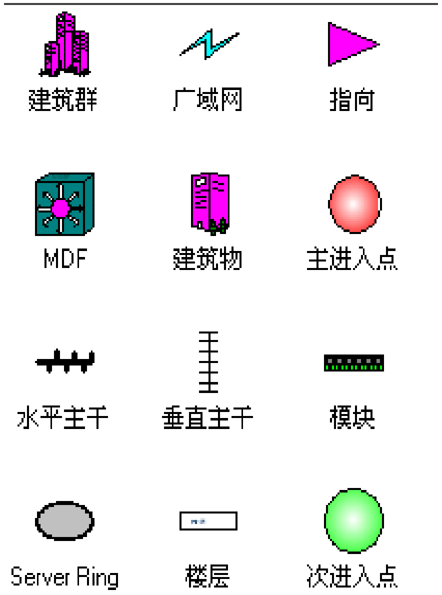


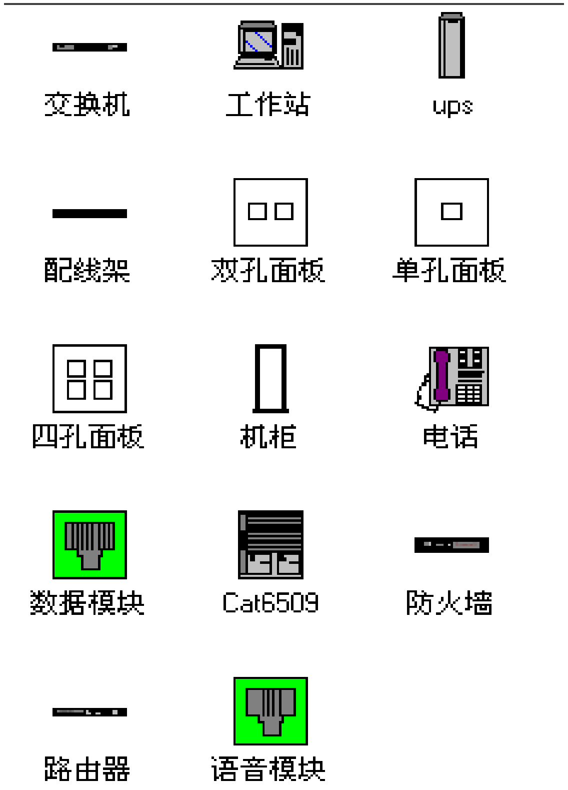
Library sample:



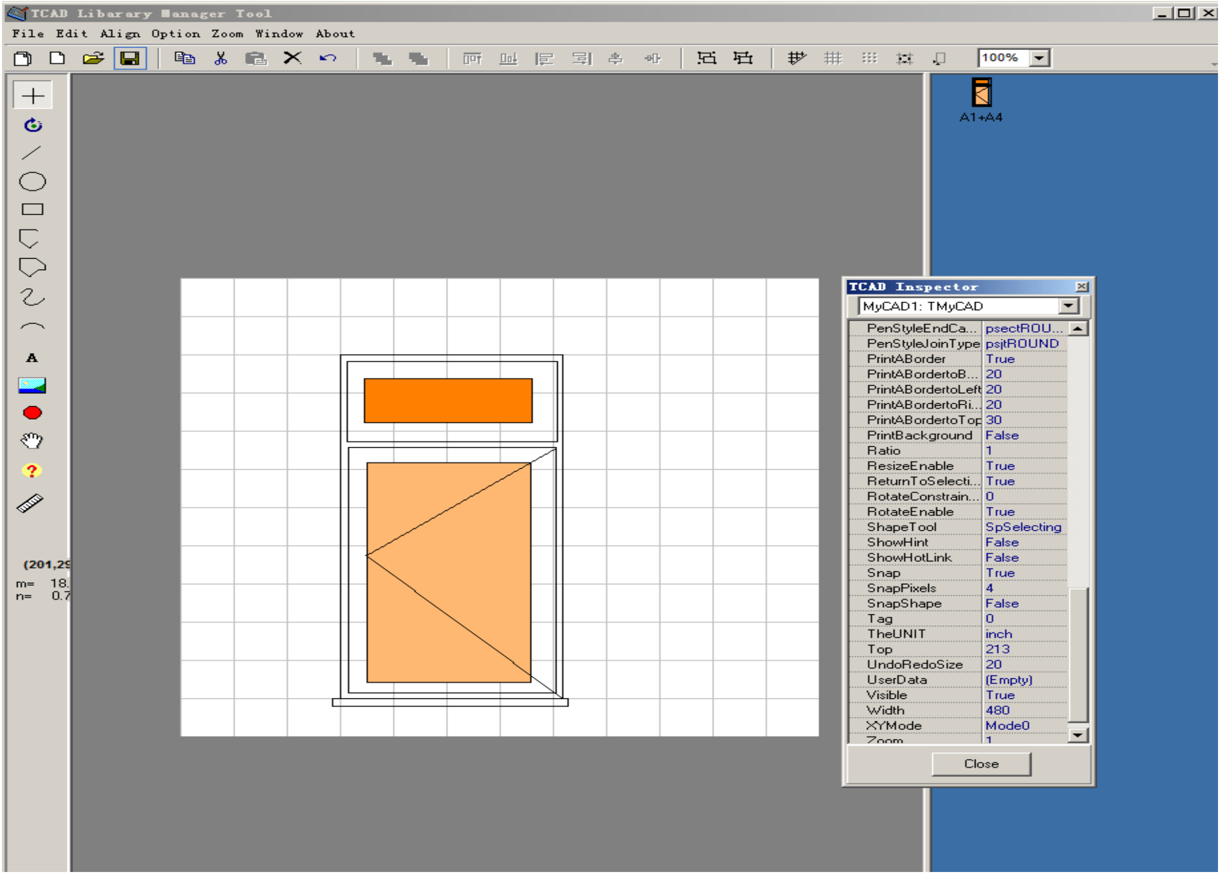


Library sample:



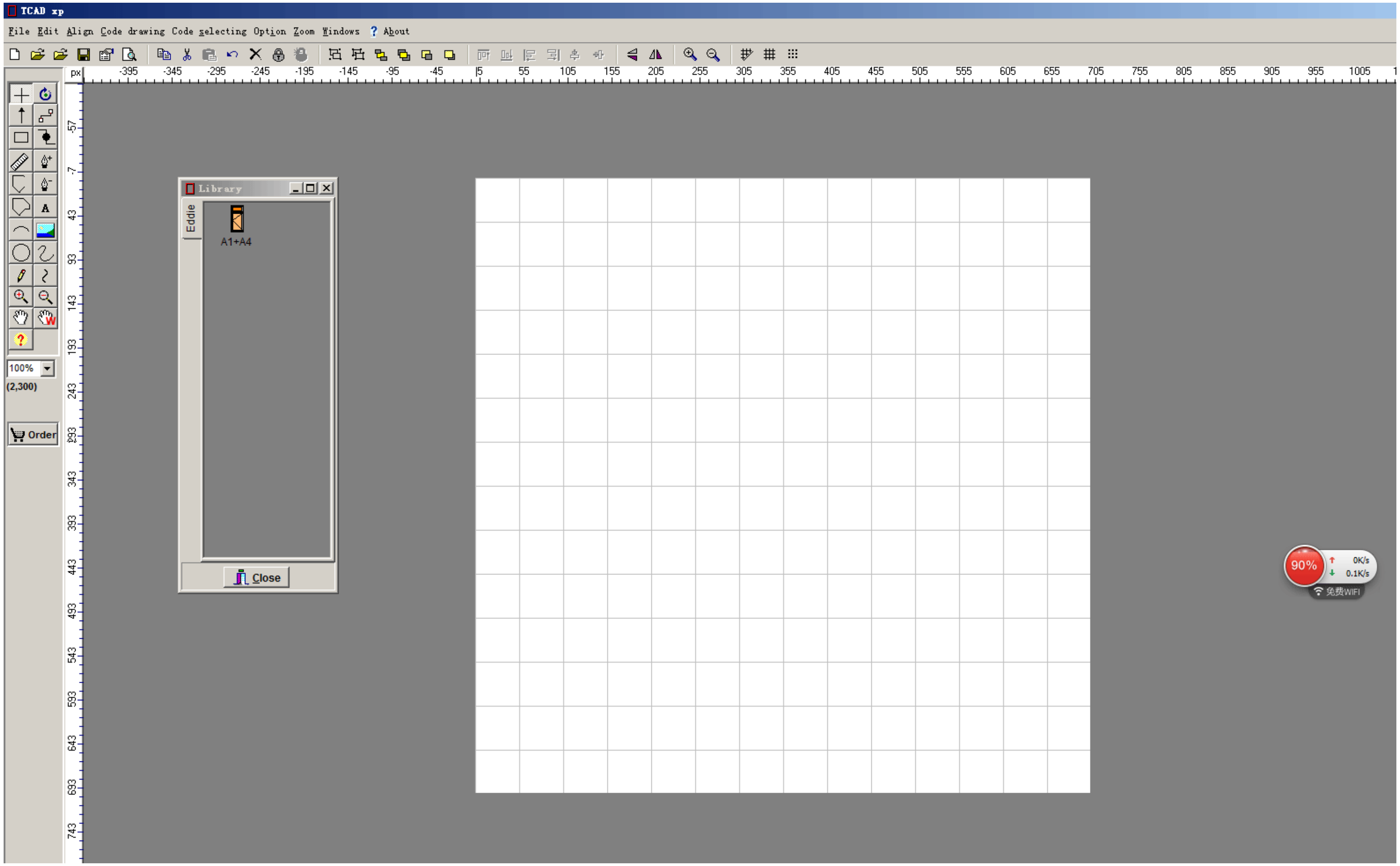


Use LIBEditor.exe to create a new library to fit your need


TCAD Libarary Manager Tool
File Edit Align Option Zoom Window About
100%
A1+A4
(201,29
m= 18.
n= 0.7
TCAD Inspector
MyCAD1: TMyCAD
Close

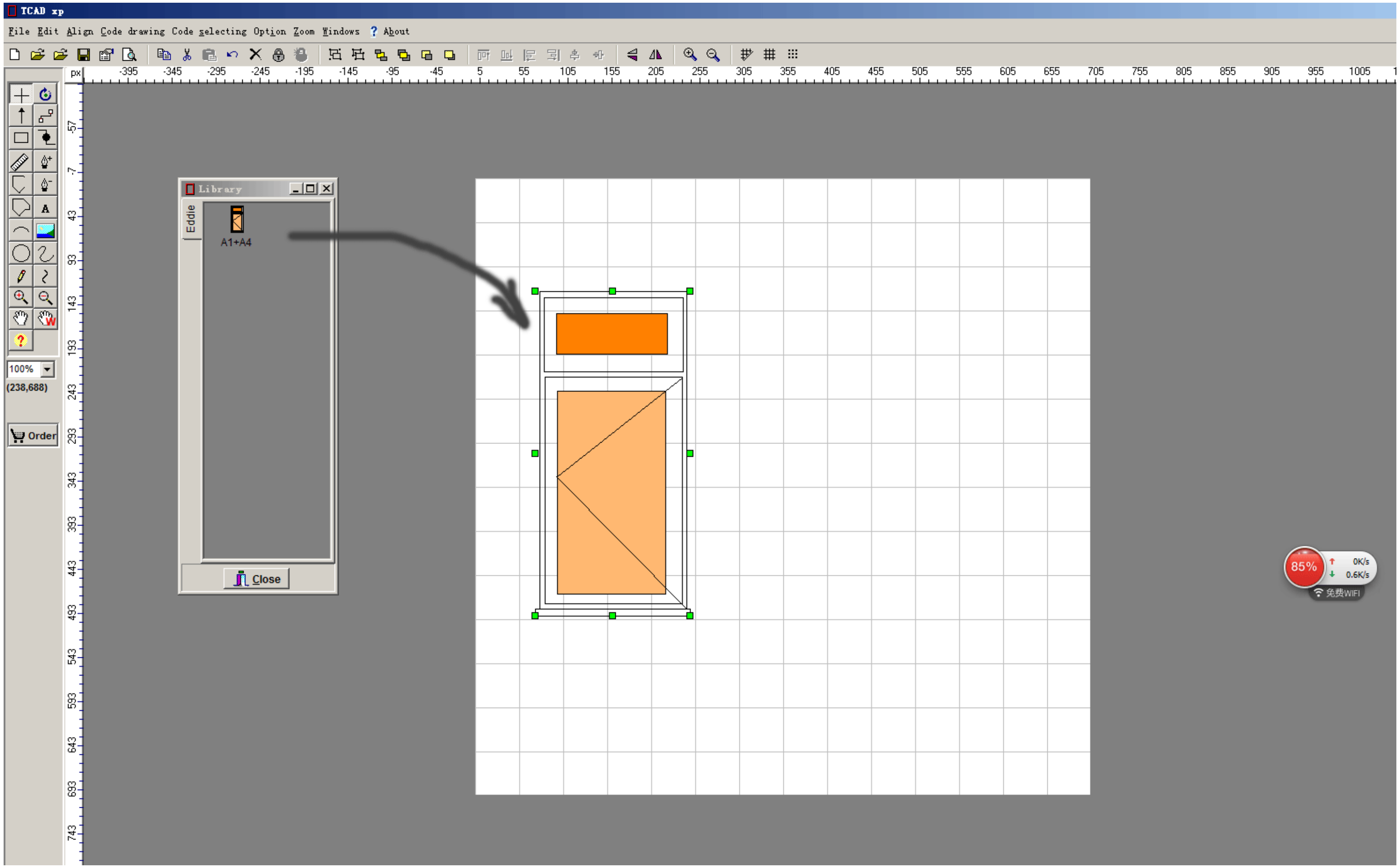
PenStyleEndCa...	psectROU...
PenStyleJoinType	psjtROUND
PrintABorder	True
PrintABordertoB...	20
PrintABordertoLeft	20
PrintABordertoRi...	20
PrintABordertoTop	30
PrintBackground	False
Ratio	1
ResizeEnable	True
ReturnToSelecti...	True
RotateConstrain...	0
RotateEnable	True
ShapeTool	SpSelecting
ShowHint	False
ShowHotLink	False
Snap	True
SnapPixels	4
SnapShape	False
Tag	0
TheUNIT	inch
Top	213
UndoRedoSize	20
UserData	(Empty)
Visible	True
Width	480
XYMode	Mode0
Zoom	1

Open library in DesignallWinEN.exe

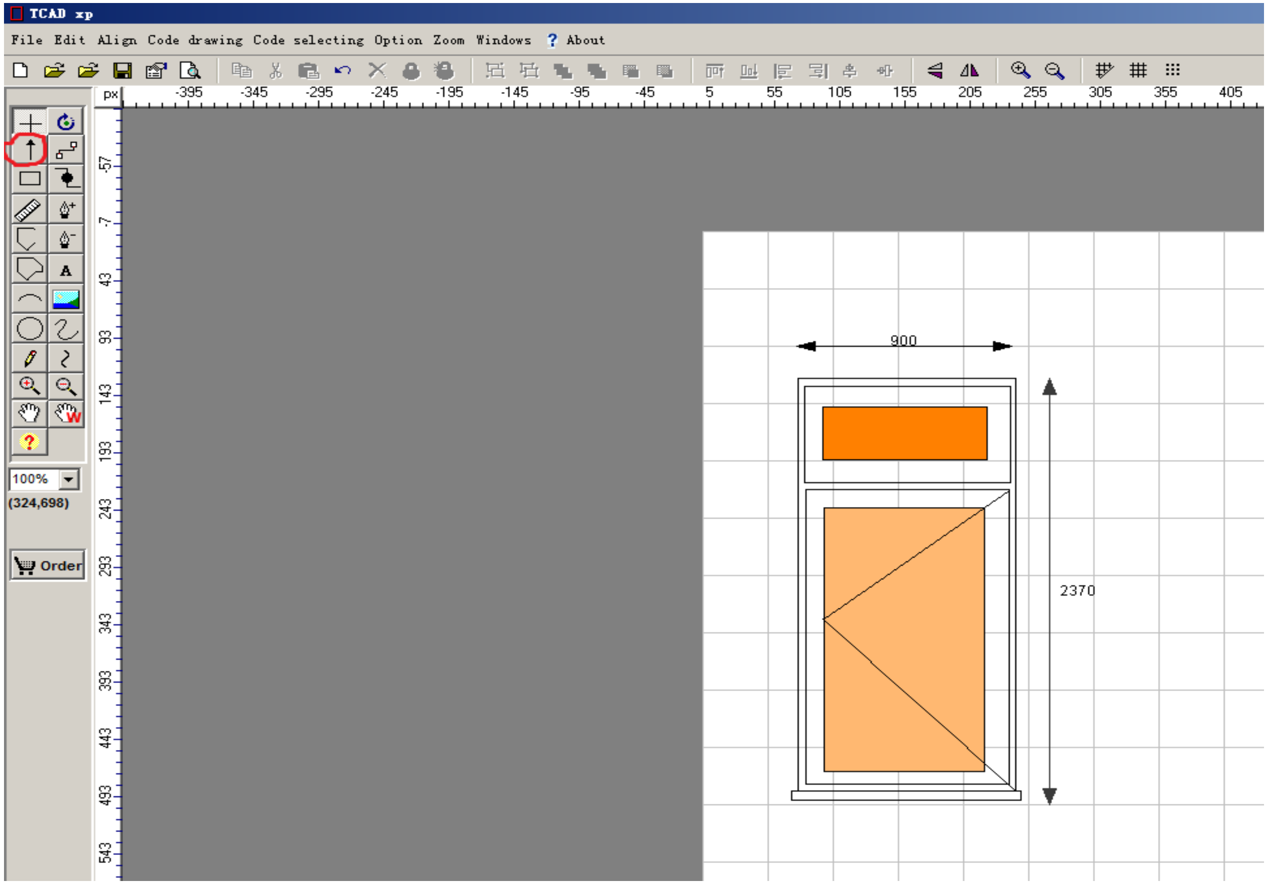

TCAD xp
File Edit Align Code drawing Code selecting Option Zoom Windows ? About
Library
Eddie
A1+A4
Close
100%
(2,300)
Order
90%
0K/s
0.1K/s
免费WIFI

Using File-> open lib

Drag the combine shape to Canvas

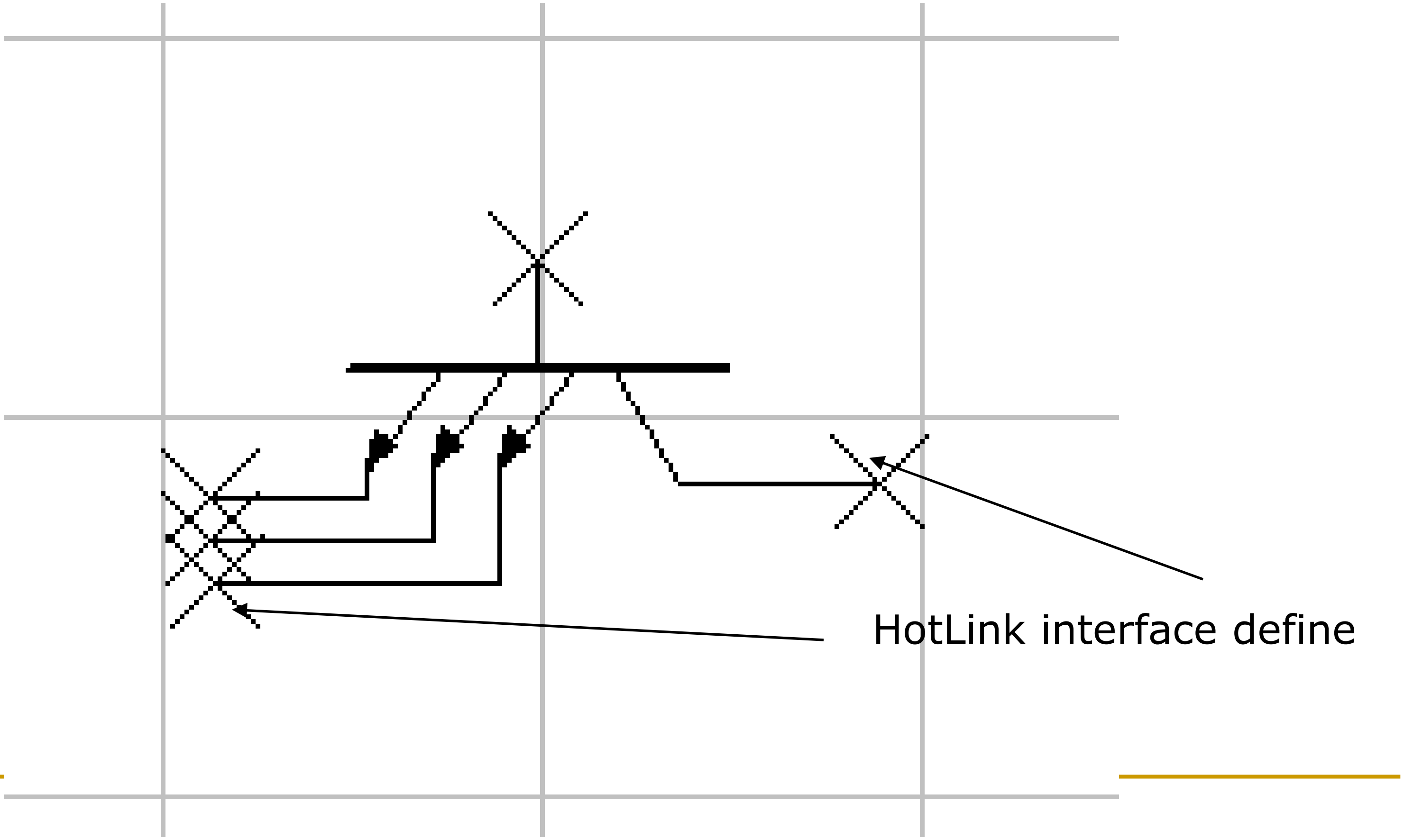

TCAD xp
File Edit Align Code drawing Code selecting Option Zoom Windows ? About
px
100%
(238,688)
Order
Library
Eddie
A1+A4
Close
85%
0K/s
0.6K/s
免费WIFI

Add the TMyRuleLine Shape and add length value

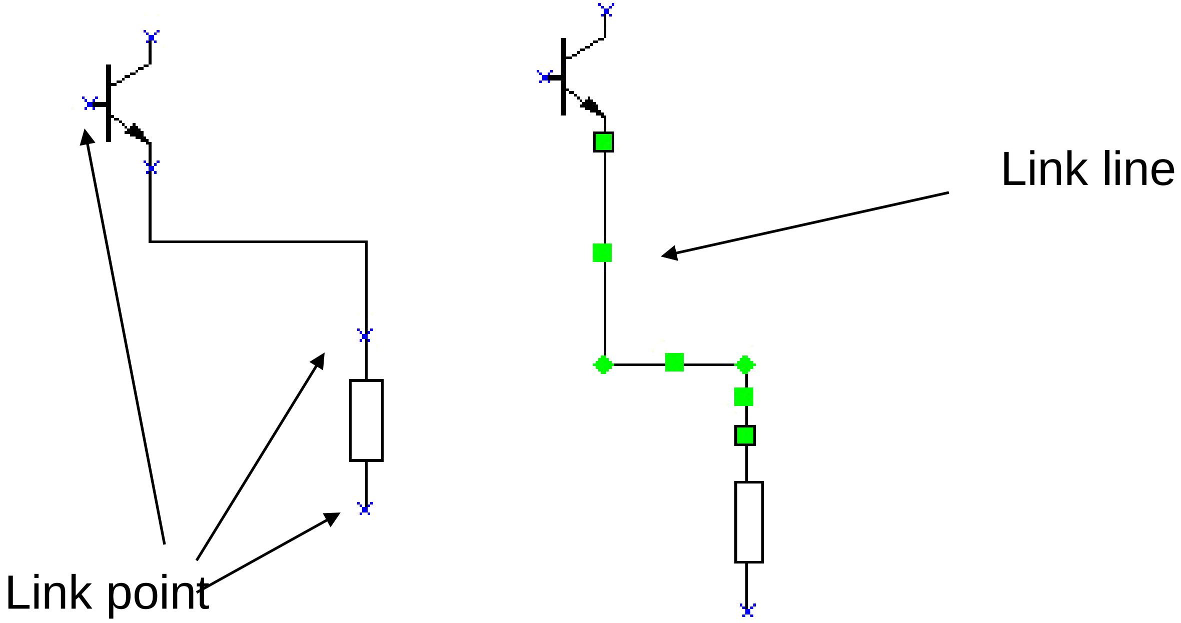


Creating User Define Shape with hot link

Not only you can draw basic shapes to form a complex shape, you can also add the HotLink Interface for Dynamic linking !



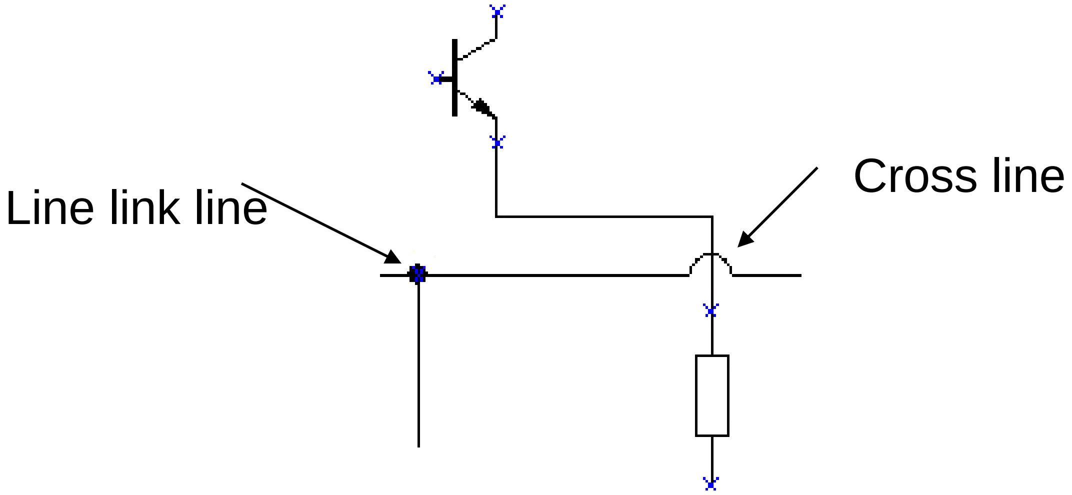
Using User Define Shape with hot link



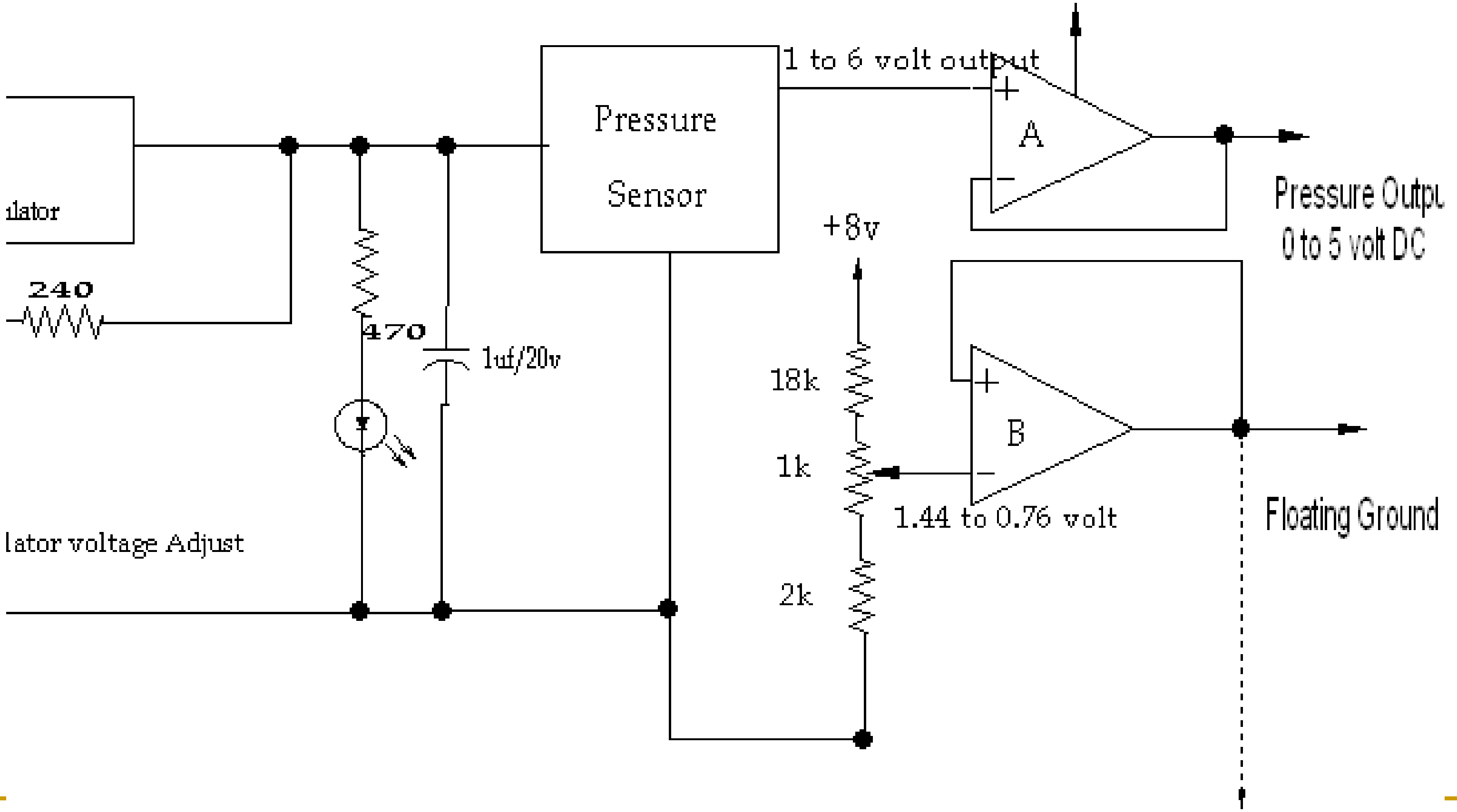
Link line

Link point

LinkLine,LinkPoint,LineLinkLine,CrossLine



Create a Drawing with Library



Notice

Shape Linkpoint(black circle icon in the Designallwinen.exe)
cannot be insert into the combineshape,
only for the drawing

Shape LinelinkLine (red circle icon in the libeditor.exe)
cannot be insert into the drawing , only for Creating a new
combineshape

Chapter 6 Events - Mouse(day4)

OnMouseEnter

OnMouseLeave

OnMouseEnterShape

OnMouseLeaveShape

View the demo

C:\Codeidea\TCADVCL\Developing\Demos\Delphi7\Events

Chapter 6 Events - Layer(day4)

Layer Events

OnNewLayer

OnDeleteLayer

Chapter 6 Events - Shape(day4)

Shape Events

OnShapeSelected

OnShapeAdded

OnShapeMouseDragging

OnShapeMouseResizing

OnShapeMouseRotating

OnShapeCodeDragging

OnShapeCodeRotating

OnShapeCodeResizing

Chapter 7 Layer Operation (day4)

- **Switch working layer**

  CurrentLayerId:=x

- **Create a new layer**

  NewLayer

Chapter 7 Layer Operation (day4)

- **Delete an existing Layer**

  DeleteLayerByName

  DeleteLayerByID

  DeleteAllLayers

- **Show or hide a layer**

  VisibleLayerByID   InVisibleLayerByID

  VisibleLayerByName InVisibleLayerByName

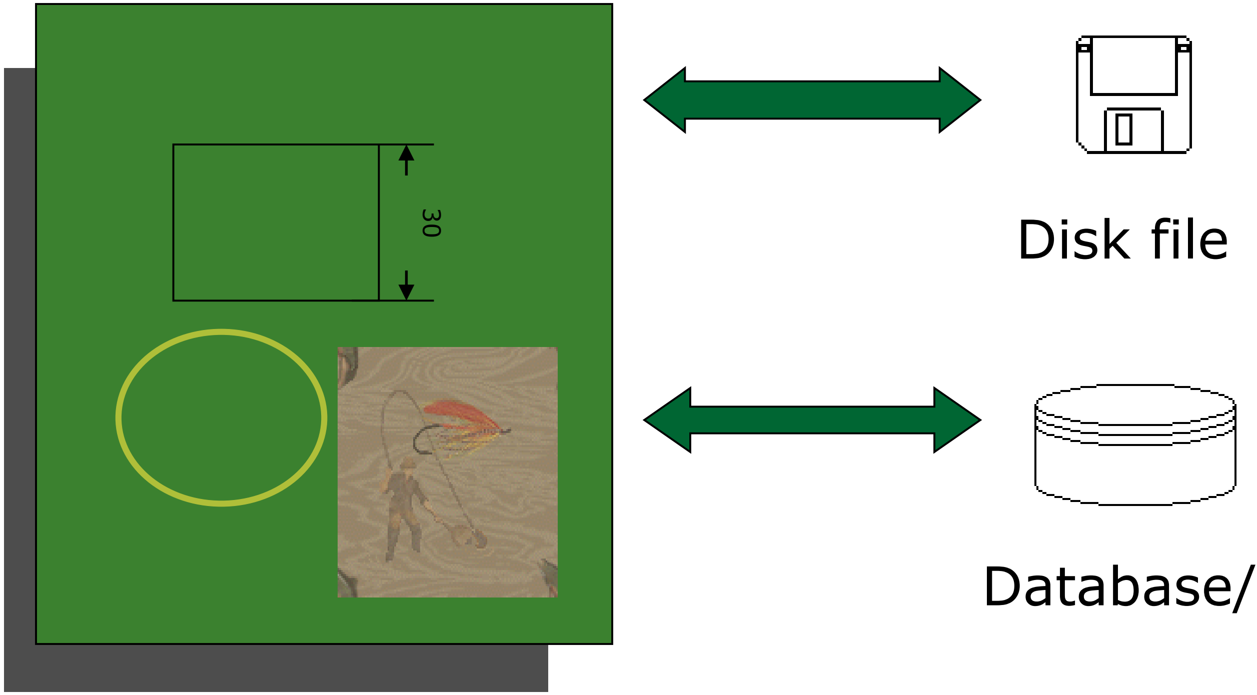
Chapter 7 Layer Operation (day4)

- **function** MergeLayers(LayerId1,LayerId2:integer): Boolean;

  D**escription:**

Merge Layer2 to Layer1 and remove the layer2, CurrentLayerId is Layer1.

Chapter 8 Save and Load the drawing (day5)



Disk file

Database/Table

TCAD drawing

TCAD and DiskFile

- SaveToFile
- LoadFromFile

TCAD and Database

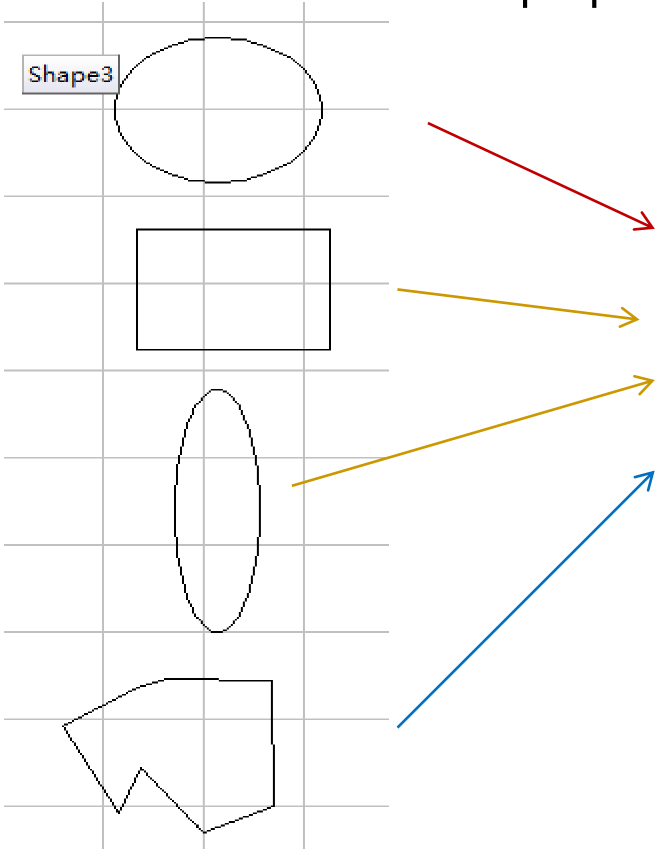
1.Save TCAD drawing to one binary field

SaveToStream
LoadFromStream

```
procedure TMainForm.LoadDraw;
var
  ms:TMemoryStream;
begin
  ms:=TMemoryStream.Create;
  edtName.Text:=Table1.FieldByName('Name').AsString;
  edtLastUpdate.Text:=Table1.FieldByName('LastUpdate').AsString;
  Table1Draw.SaveToStream(ms);
  if ms.Size>0 then
    MyCAD1.LoadFromStream(ms);
  ms.Free;
end;
```

TCAD and Database

2.Create the row to store property of shapes



ShapeId	Area(length)	plan
22	450	digging
1	20	hold
13	1000	Wait to approve
100	4000	giveup

TCAD and Print

- procedure PrintPreview(ALayers: array OF Integer; ABitmap:TBitmap; ScaleforPreview:double = 1.0);
- Description:
- Preview the drawing on the Bitmap.
- Parameter
- ALayer: if you want print all layer, please use [], else [1,2,3], or you create array and set layerId that you want print
- ABitmap: that you draw on.
- ScaleforPreview:the scale.
- Example:
- Delphi:
- //print preview all shapes in 100% scale.
- MyCAD1.PrintPeview ([],Image1.Picture.Bitmap,1.0);
- int p[1];
- p[0]=0;
- MyCAD1->PrintPreview(p,1,Form1->Image1->Picture->Bitmap,1);
- Form1->Show();
- }

TCAD and Print

- Print(ALayers: array of Integer; UserScale: double = 1.0);

- **Description:**
- Print to printer.
- **Parameter**
- *ALayer*: if you want print all layer, please use [], else [1,2,3], or you create array and set layerId that you want print
- *UserScale*:the scale.
- **Example:**
- Delphi
- *//print all shapes in 50% scale.*
- MyCAD1.Print ([],0.5);

- Day 4 Ask questions

- Day 5 For you application