A U T O  G R A M M A R  T U T O R I A L

**1.Loading the AutoGrammar menu in AutoCad**

1.1. Create a folder called AutoGrammar in your directory and download the files in the Auto Grammar folder in Archnet's MIYAGI-MIT 2001 group (under collections)
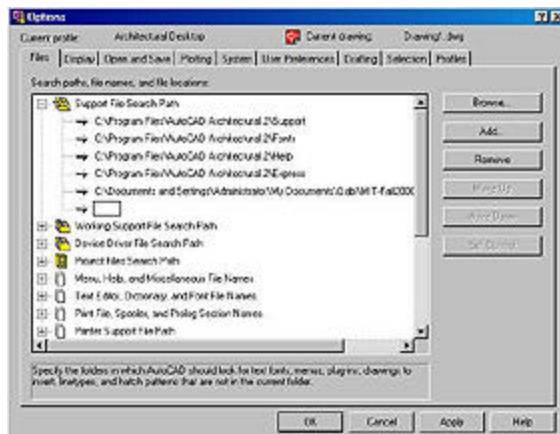


1.2. Open AutoCad and click on the **Tools** menu in the menu bar. Choose **Options**. In the **Options** window, make sure the **Files** tab is selected.

1.3. Double click on **Support File Search Path** and then press the button **Add** on the right side.
Click on the **Browse** button to open the **Browse for Folder** window.

1.4. In the **Browse for Folder** window, navigate to the **AutoGrammar** folder under your local or remote directory. Click on the **OK** button.
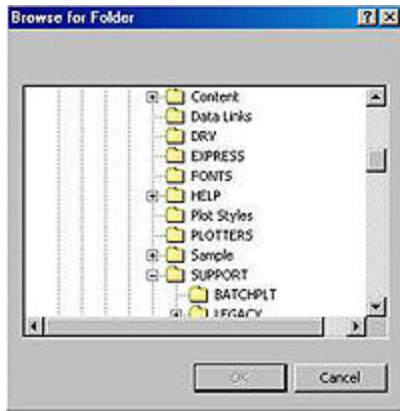
1.5. Check if the new path is showing under **Support File Search Path** and click on the **Apply** button on the bottom of the **Options** window. Then, click on the **OK** button. Now AutoCad will be able to find the AutoGrammar commands when you call them from the AutoGrammar menu.
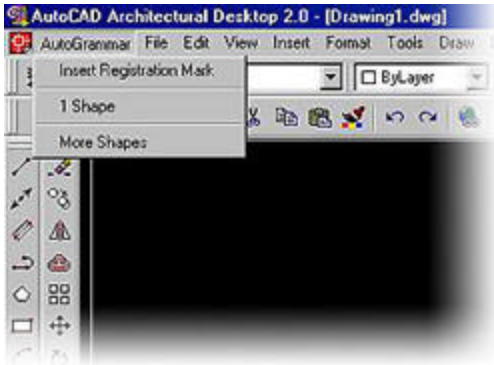


1.6. From the command promp line, type:

     Command: **(load "main")**

(This function should load the AutoGrammar menu.)

1.8. Check to see if there is a new menu group on the left side of the menu bar on the top of your AutoCad screen. When you click on it, the **AutoGrammar** menu should have only 3 options.

If for some reason the **AutoGrammar** menu doesn't show up or an AutoCAD menu disappears, go to **Tools/Customize Menus**, click on the **Menu Bar** tab, find the goup you are missing an option in the **Menu Group** drop box, and insert the menu you want with the Insert button.
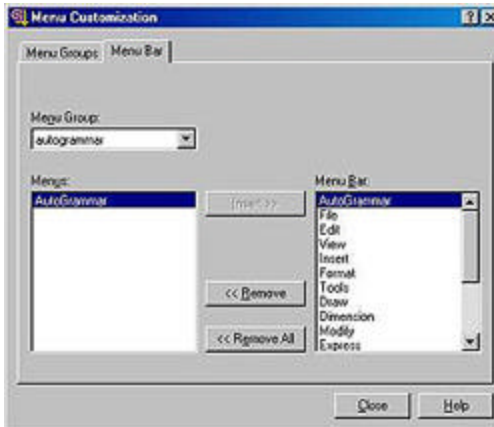
## 2. Setting up AutoCad

AutoCad need to be set up first, so that we make sure that the units are in meters and we have enough space to draw.

> **2.1. Setting up the Drawing Units**
> **2.2. Setting up the Drawing Limits and the Grid**
> **2.3. Setting up the Viewpoint**
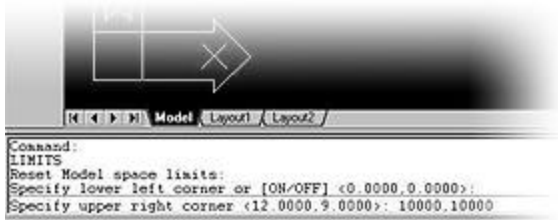


2.1. Setting up the drawing units

From the command promp line, type:

    Command: **units**

Or click on the **Format** menu on the menu bar and choose **Units…**

Open on the **Type** list and choose **Decimal**. Click on the **OK** button.

2.2. Setting up the drawing limits and the grid

```
Command:
LIMITS
Reset Model space limits:
Specify lower left corner or [ON/OFF] <0.0000,0.0000>:
Specify upper right corner <12.0000,9.0000>: 10000,10000
```

From the command promp line, type:

    Command: **limits**

Or click on the **Format** menu on the menu bar and choose **Drawing Limits**. There will be no dialogue box window. Look at the command prompt area and type, followed by enter:

    Specify lower left corner
    [ON/OFF]<0.00,0.00>: **0,0**
    Specify upper right corner<12.0,9.0>: **100,100**

To turn on the grid, type:

    Command: **grid**
    Specify grid spacing[ON/OFF]<1>: **10**

Or click on the **Format** menu on the menu bar and choose **Drafting Settings**. Click on the **Snap and Grid** tab. Check the **Grid On** box on the top right side and set the grid's **X** and **Y spacings** to 10.

2.3. Setting up the viewpoint

Click on the **View** menu on the menu bar and choose **3DViews** and then one of the **Isometric** views (like **NE Isometric)**.

Now you can start drafting.

**3. Guided Exercise**

3.1. Drawing a cube

Click on the **Draw** menu on the menu bar and choose **Solids** and then **Box**. At the prompt…
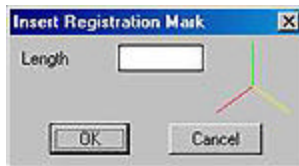
> Specify corner of box or [CEnter]<0,0,0>:

…click on any point on the screen. Then, type the following always followed by enter at the next promts:

> Specify corner or [Cube/Length]: **C**
> Specify length: **10**

You should see a box on the screen now.



3.2. Insert Registration Mark

From the **AutoGrammar** menu, choose **Insert Registration Mark**.

Use this command to insert an axis tripod in the shape to which you want to apply a transformation. This shape can be a single object (like a line, a point, a solid, etc.), or a group of objects.

The **Insert Registration Mark** dialogue box has a field for entering the **Length**, in drawing units, for the arms of the tripod. Enter a number big enough to be seen, but small enough to fit inside the shapes (e.g. **4**).



It is better to apply the tripod to the corner of the object coincident with the label chosen during the labeling studies in 3dShaper, but avoiding superposing it with the object's own lines, for clarity.

Click **OK** and then pick a point to insert the egistration Mark, or just place it anywhere and move it later to the right place with the **MOVE** command (which can be typed in or found under the **Modify** menu).
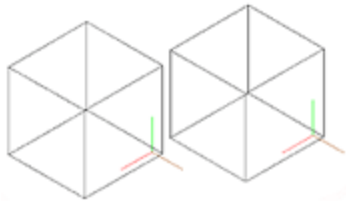
After inserting the Registration Mark to the shape, copy both to the side, using the AutoCad command **COPY** (which can be typed in or found under the **Modify** menu).
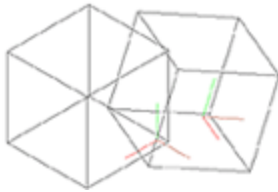
Apply any number of transformations to this copy (rotation, scaling, translation, reflection). The AutoCad commands for those transformations are **ROTATE**, **ROTATE3D, SCALE**, **MOVE** and **MIRROR**, and they can also be typed in or found under the **Modify** menu. Position the copied and transformed shape and Registration Mark in the desired spatial relation to the original shape.

From the **View** menu, choose **Shade**, then **Flat Shaded, edges On**, and check if your cubes intersect each other. Go back to the wireframe view by clicking on the **View** menu again and choosing **Shade**, then **2DWireframe**.

3.3. One Shape Rule

From the **AutoGrammar** menu, choose **One Shape**. Use this command te repeat a spatial relation between an object with a Registration Mark and a copy of them that has been transformed (moved,

rotated, scaled and/or reflected).

In the dialog box, check the radio buttons for **Explode** and for **Graded Color**. Type in 12 in the **Number of Iteractions** field.

(Please not that if you check the **Leave as Blocks** button you may not be able to run the program again until you explode and purge all the blocks.)

Click on the **Pick** buttons and click on each shape and registration mark. Type **enter** after clicking on the shapes, which can be made of many parts.

Click on the **OK** button and see how AutoGrammar repeats the original spatial relation to each block that is added consecutively.

To better see the result, click on the **View** menu and choose again **Shade**, then **Flat Shaded, edges On**. The composition should look like the one on the left.
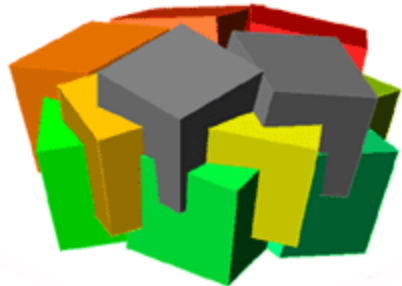
Change the color of the two original blocks if needed, by clicking on them and choosing a different color from the **Color** list, under the menu bar on the top of the screen.
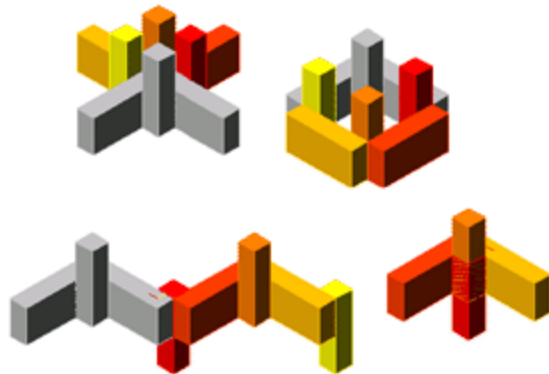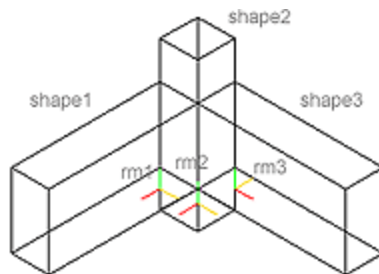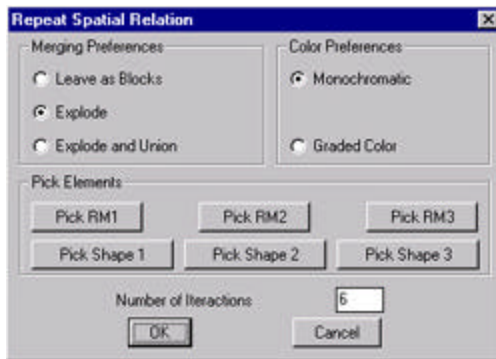
In the **View menu**, choose **3DOrbit** to examine the composition from different viewpoints.

3.4. Two Shapes Rule

First, click below to download a drawing ready to work on.

two_shapes.dwg
two_shapes_for14.dwg

Open the drawing and from the **AutoGrammar**

**Repeat Spatial Relation**

Merging Preferences
- ○ Leave as Blocks
- ● Explode
- ○ Explode and Union

Color Preferences
- ● Monochromatic
- ○ Graded Color

Pick Elements
| Pick RM1 | Pick RM2 | Pick RM3 |
| Pick Shape 1 | Pick Shape 2 | Pick Shape 3 |

Number of Iteractions [6]

OK    Cancel



shape2

shape1        shape3

rm1  rm2  rm3



menu, choose **Two Shapes**.

Use this command te repeat a spatial relation between two different objects with Registration Marks and a copy of the first one positioned to the second according to the same spatial relation.

In the dialog box, check the radio buttons for Explode and for Graded Color. Type in 7in the **Number of Iteractions** field.

(Please not that if you check the **Leave as Blocks** button you may not be able to run the program again until you explode and purge all the blocks.)

Click on the **Pick** buttons and click on each shape and registration mark. Type **enter** after clicking on the shapes, which can be made of many parts.

Shape 2 and RM 2 should always be the ones in the middle. Click on the **OK** button and see how AutoGrammar repeats the original spatial relation to each block that is added consecutively.
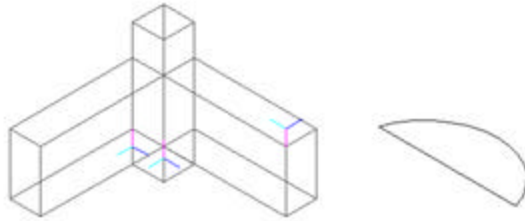
You should obtain 4 different results in each computation.

3.5. Changing Shapes

We have finally arrived to the point at which AutoGrammar starts showing some advantage against other software to apply Shape Grmmars rules. Here we will see how to make changes in the shapes that make the chosen spatial relation

and labeling.

You won't need to make changes to shape 1; just
to shapes 2 and 3. But don't mode the Registration
Marks, or else the spatial relation will be changed.

Let's start by adding a flat surface to a curved one.
First, download the following files:

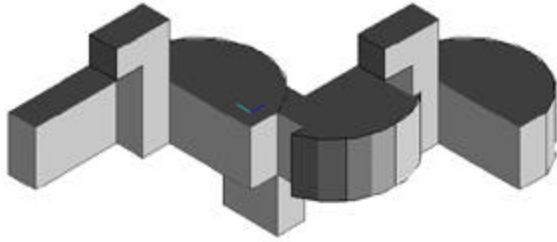> to_change.dwg
> to_change_for14.dwg

There are two arrangements of shapes with
registration marks, ready for applying the AutoGrammar rules. M
extrude and union it to the oblong.
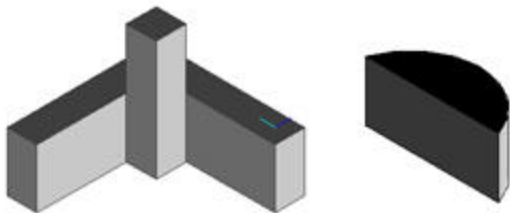
Now make another on and union it to the pillar.

Apply the Two Shapes rule from the AutoGrammar
menu. Each shape now should be replaced by the new one.

**4.AutoCad short cuts**

In AutoCad commands can be entered by 3 ways:

1)From the menu bar menus

2)From the Tool bar graphic buttons

3)By typing the command names in the command prompt area.

The last option can be used more efficiently if you learn some of AutoCad most used command's shortcuts: