Autodesk User Group International
AUGI Training Program (ATP)

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-The ATP Staff

ATP007D — "Rendering"
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(4.1) Intro/Review —

Before we get started I want to remind you of a few basic things to remember. Now that we have our objects drawn the UCS is not that important. One of the more important things to remember is to have all your objects on different layers. Like I said before, put everything on it's own layer as a general rule of thumb. If we have a very large drawing with hundreds of objects it will be a lot easier to attach materials and control what we render. So obviously another one of the things you will want to remember is to plan ahead. Think about what you want as your final output, what view you will use and the amount of detail you will need. This way you will not spend wasted time creating objects that wont even end up in your render. The last thing I want you to understand is the use of a Ground Plane. When I say ground plane I just mean a flat (or curved) surface that will give the effect of your objects sitting on something. Objects do not just "float" (unrealistically) so it's usually a good idea to just put a very flat box (-.01 thk) right below your objects and assign an appropriate material to it. This way you have a surface to cast shadows or reflections onto to give your renders a more realistic look.

(4.2) Adding Lights —

Lets get started by adding some different lights. We will need some objects to render so lets put in a "BOX" (first corner at "0,0,0" and other at "5,5,5"). Lets also change to a new layer and put in that Ground Plane. Just draw another "BOX" and use "-50,-50,0" as the first corner and "50,50,-.01" for the other. Now with our top viewport current, type "LIGHT". We get the Light dialog box and are ready to create a "New…" light. There are three types of lights we can use; Point, Distant (includes Sun Angle Calculator) and Spotlights. Select "Point Light" and click "New…", type in a name "P1", give it an "Intensity" of "20" then in the "Position" section click on "Modify<" so we can give our light a new location. (**NOTE:** AutoCAD always puts lights right in the middle of your viewport so most of the time you will want to move it using the "Modify<" or by dragging/rotating to a new location.) Now that we clicked "Modify<" we are being asked for a new light location, lets put in "-10,10,10". When we click "OK" we see the new location of our light and we see out new light "P1" on our light list.
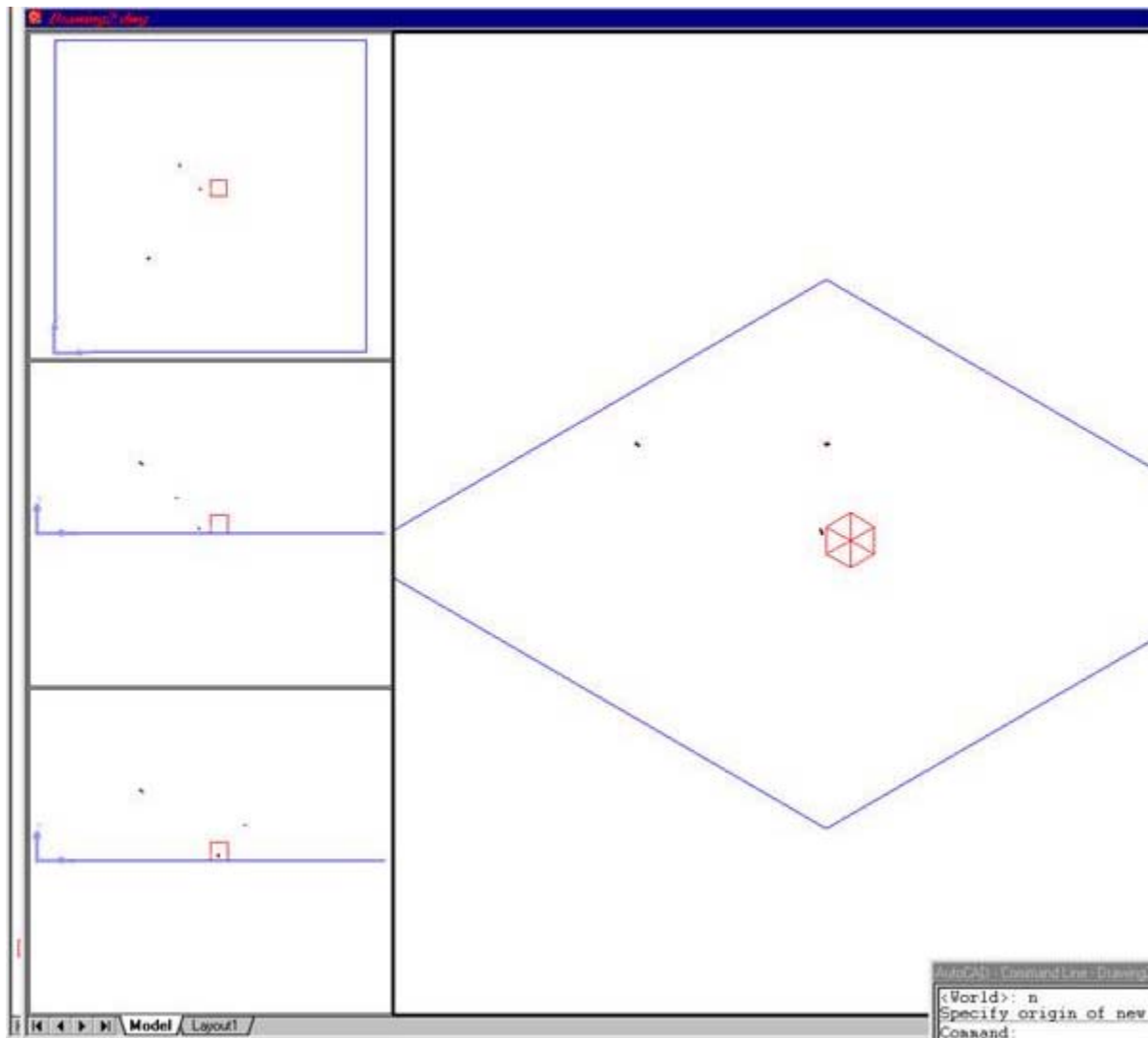
(4.2) Adding Lights – (continued)

(**NOTE:** Notice that you can change the "North Location" within your drawing). Now select the "Distant Light" from the list and then click "New…". Think of this light as a light that is very far away (miles away, like our sun) so you only know the direction and angle it is coming from. Give it a name "D1", set the "Intensity" to ".3" and set the "Azimuth" (direction in the sky) to "-100" and the "Altitude" (height in the sky) to "55".

This is also the place you can use the "Sun Angle Calculator". With this option you can set the time of day and date, pick your "Geographic Location" and now when you do your render the "D1" light would be where the REAL sun would be in the sky at that time and date and location. This is a very handy tool when it comes to doing shadow studies/calculations, for example say you might be adding an addition and want to see if it will cast shadows on your bedroom window. We wont do this though so just click "OK" until you get back out to the Lights dialog box.

The last one we will add is the Spotlight, select "Spotlight" from our list and click "New…". Give it a name "S1", set the "Intensity" to"80" and then click "Modify<". For the "light target" type "2.5,2.5,2.5" (middle of box) and for the "light location" use "-20,-20,20". For now we will not change our "Hotspot" and "Falloff" settings and just go with the defaults. Lets turn the shadows on for just this light by placing a check mark in the "Shadows On" option (in the "Shadows" section). We will go into detailed use of shadows in the next segment (E) when we talk more about modifying lights.

After clicking "OK" we should now see our three lights in our lights list and when we click "OK" again we should see them in our drawing. (fig25)
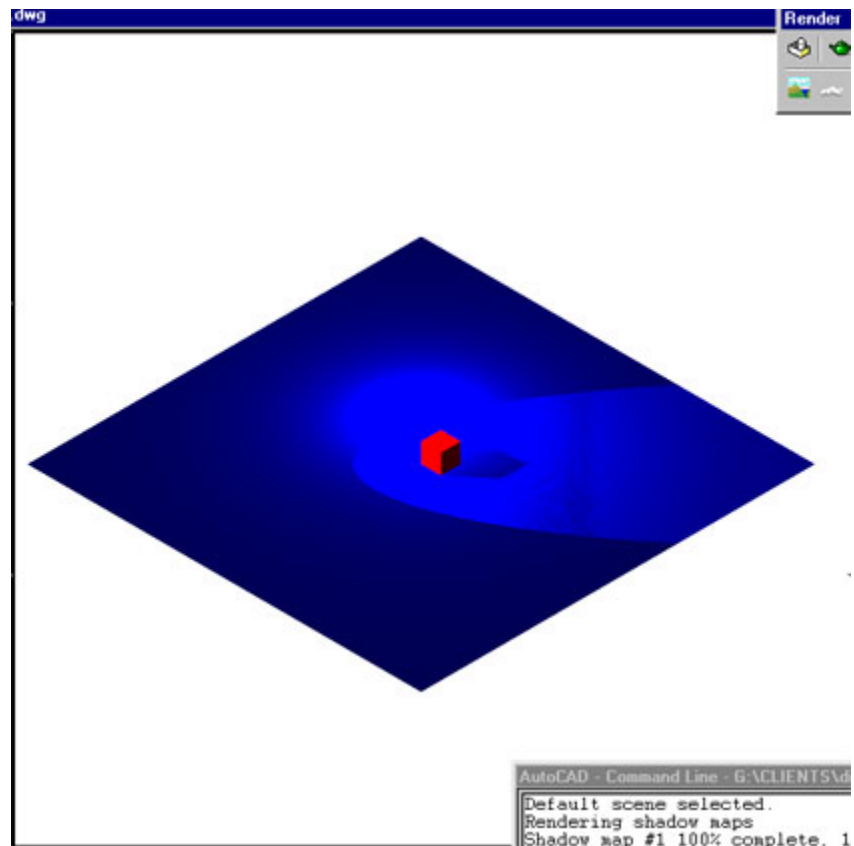
(4.2) Adding Lights — (continued)

lights1.jpg
(fig25)

If you click in your SE Iso viewport and type "RENDER", set the "Render Type" to "Photo Raytrace" and place a check mark in the "Shadows" option, you should get an image like fig26. Save your drawing (lights.dwg)

(4.2) Adding Lights — (continued)

lights2.jpg
(fig26)

(4.3) Adding Materials/Trees (Landscapes) —

Now that we have some objects and lights lets attach some materials to
them and add a tree and a bush to our drawing. Type "RMAT" to get the
Materials dialog box, we will need to "Import" some materials into this
drawing from our Materials Library. Click "Materials Library…" and under
our "Current Library" lets choose "Marble-TAN", (click "Import") and "RED
GLASS" and "Import" them, then click "OK" to see them in our drawings
material list. If "RED GLASS" is not highlighted, highlight it and click
"Attach<", then select the small box. Now click on "Marble-TAN" to
highlight it and click "Attach<" again and select the big square box
(ground plane). Because this is a small drawing (number of objects) it is
easy to pick our objects when doing the "Attach<" but if we had many
(hundreds) of objects we would just assign materials "By Layer". This is a
better way to do this but for small drawings the "Attach<" is fine.

(4.3) Adding Materials/Trees (Landscapes) — (continued)

Before we render this, lets add the tree and bush. With our top viewport
current, type "LSNEW" to get the Landscape New dialog box. Select the
"Quaking Aspen", leave the "Height:" at "20" then click "Position<" and
use "30,30,0" for the "location of the base". Now lets add the bush, click
on "BUSH #1" and give it a "Height:" of "5", then click "Position<", use
"10,10,0" for it's base location. After clicking "OK" to close the dialog
box you should have something like fig27 on your screen. I would "Save
As…" and give it a name like mat1.dwg.

mat1.jpg
(fig27)

(4.3) Adding Materials/Trees (Landscapes) — (continued)

If you were to render this (type "RENDER" and set the "Render Type" to
"Photo Raytrace", select the "Shadows" option and click "Render") with out
adjusting your lights and materials you should get something like fig28.
In most cases you will adjust your lights and materials as you add them,
but for teaching purposes I'm doing that in the next segment (E).
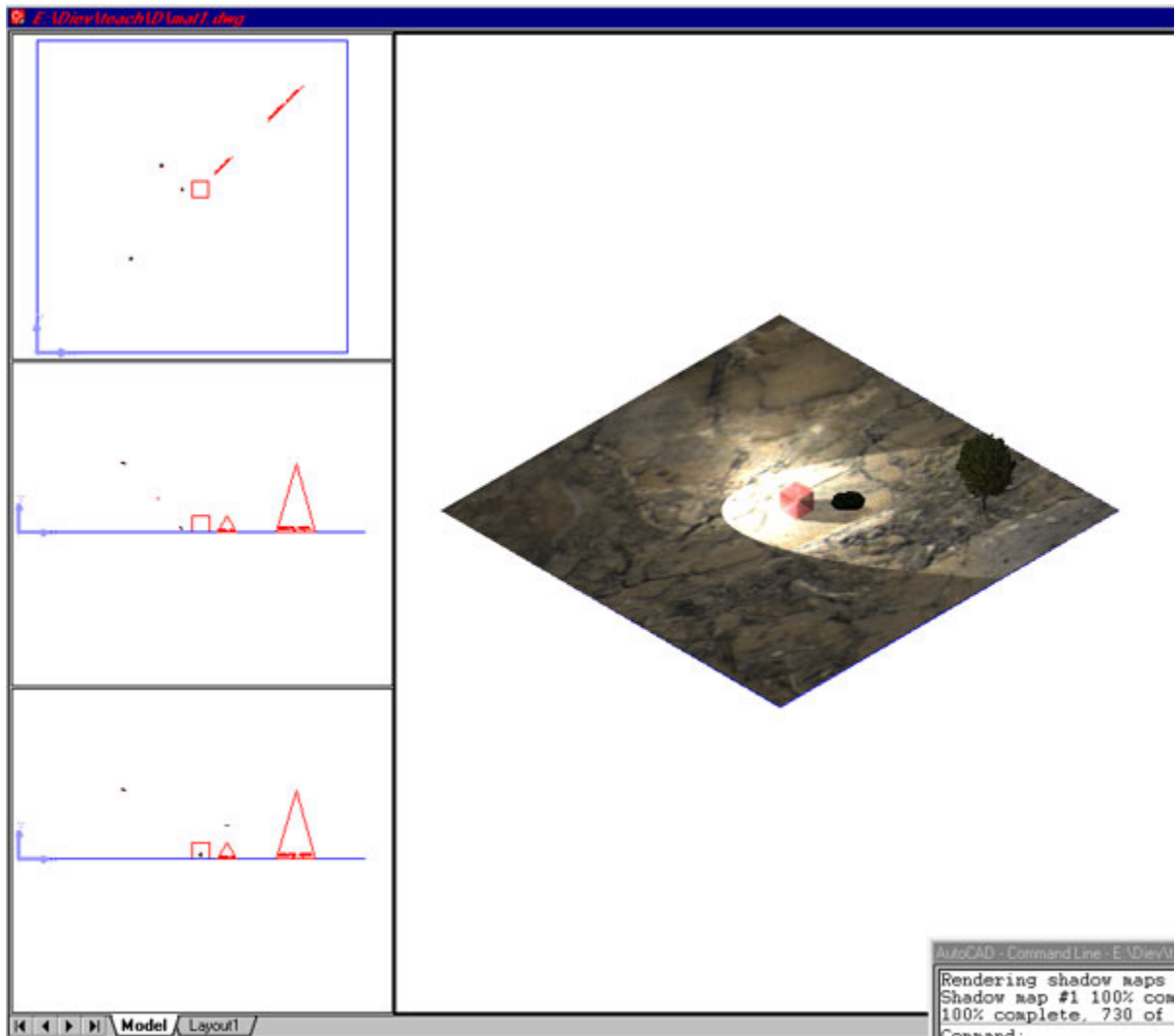
mat2.jpg
(fig28)

(4.4) Rendering Options —

One thing I want you to know about rendering is you can always stop (cancel) your renders before they finish and you will not change or mess up your drawing. Some renders take hours depending on the complexity of your drawing and your output file options. Sometimes we forget to do something and remember after we start the process so don't hesitate to stop your render, fix your problem and start it over. Just press "Ctrl" + "C" to Cancel rendering and any AutoCAD command.

For this last section I just want to make sure you have an understanding of all your rendering options in your Render dialog box. (fig29)
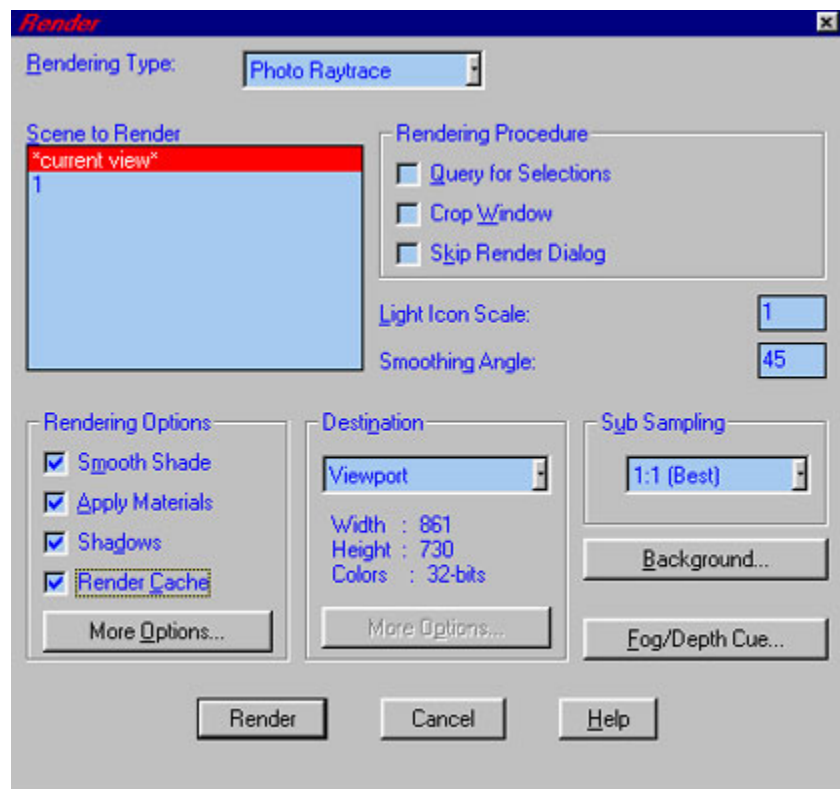
render1.jpg
(fig29)

In the Render dialog box the first option is the "Render Type". Here you can select "Render" — Creates a render using just the assigned colors of the objects. "Photo Real" — uses both lights and materials, and "Photo Raytrace" — uses lights, materials and gives you reflections and refractions. The next section is the "Scene to Render". You can create a "Scene" — (a saved selection of lights and a view) and it will show here on this list, then you can render that instead of the "current view". Moving across we have our "Rendering Procedures". Here we can tell AutoCAD that we want to select our objects to render ("Query…") or to "Crop Window" or to "Skip…" this dialog.

(4.4) Rendering Options — (continued)

Moving down and to the left we have "Render Options". In this section you can check or uncheck some self-explanatory options. If you click on "More Options" you will be able to fine tune your renders even more. Here you can set your "Anti-Aliasing" (jaggies) and your "Depth Map Shadow Controls" to name a few. Back out in our Render dialog, lower middle section is our "Destination". This is where you would change your output from "Viewport" to "Render Window" or to "File". Once you set this to "File" you can't "Crop Window" but you also get "More Options". Clicking on this "More Options" button brings up the "File Output Configuration" dialog box that lets you select your File Type/Resolution, Color Depth, TGA Options and Postscript Options. Again back out at the Render dialog and to the right of "Destination" we have "Sub Sampling", this lets you control the Sub Sampling rate so you can get a faster/(lower resolution) render (8:1(fastest)). **WARNING:** This image will be a drastically distorted, things may not look correct even though they are.

Below this we have "Background" where we can select a background "Color" or to use a "Gradient", an "Image" or to "Merge". The last option we have is to add "Fog/Depth Cue". Once we click this we are asked to "Enable Fog" (add a check to turn it on). Now we are given an option to use it as our background, set the Color System used and we are asked to set our "Distances" and "Percentages".

One last thing to remember is if you do a render to a viewport, but still want to save it, you still can. Make the rendered viewport current and go to your "Tools" pulldown and then to "Display Image", then click "Save…". Set your file type (and options) and click "OK" and then save your image. You can also display an image in this same manner, but the image will be gone when you "REGEN" (don't get this mixed up with the "Insert" (raster image) command.

In conclusion

I know I have not covered everything, so you still have some exploring to do on your own. If you are all finished and want to try something else, play with the "Intensity" of your lights and render your drawing again.