

README.AVE - June 4, 1993

**AutoCAD Release 12 for Windows "Read Me" for
(AVE) Render**

This document contains last minute changes and instructions that could not be included in the printed manuals. NOTE: The documentation set has been reorganized. Your documentation set may not include the AutoCAD Render Reference Manual. In this case, refer instead to the AutoCAD User's Guide for user information, the Advanced Tools manual for programming information, and to the AutoCAD Command Reference for rendering commands.

If you are using AutoShade Version 2 with Autodesk RenderMan, please also refer to the AutoShade Version 2 User Guide, and the AutoShade Version 2 with Autodesk RenderMan Installation and Performance Guide for your operating system.

Contents:

- 1.0 - Render Terminology
- 2.0 - Incompatibilities
- 3.0 - General
- 4.0 - Documentation Issues
- 5.0 - Third Party Developers
- 6.0 - Bonus Commands
 - 6.1 - FLMIN Command
 - 6.2 - 3DFACES Command

1.0 - Render Terminology

The following Render terms are used in this document:

AutoCAD Render:

Name of the ADS rendering application supplied with AutoCAD R12

AVE Render:

Used interchangeably with AutoCAD Render (AVE is an abbreviation for Advanced Visualization Extension)

Autodesk RenderMan(TM):

Name of the photorealistic rendering application supplied as part of AutoShade Version 2 with Autodesk RenderMan

RenderMan(TM):
Used interchangeably with Autodesk RenderMan

2.0 - Incompatibilities

Windows Display Drivers

A number of display drivers cause various display anomalies. In most cases, obtaining a new display driver from it's manufacturer will fix the problem. Some examples are:

Old Windows TIGA drivers in 256 color mode do not correctly display the Finish Preview dialog or the Select Color dialog.

Some large bitmaps do not display in the Render MDI window when "Fit In Window" is turned off. This seems to happen only on MS Windows 3.0 drivers.

Database anomalies

AutoCAD Render and other ADS applications are unaware of changes made to the AutoCAD database between saves. This can cause problems; for example, if a Finish block is deleted from the drawing, averendr will still think that it's there and will render the scene as if the Finish exists.

We recommend that you avoid the use of commands such as COPY, WBLOCK, ERASE, EXPLODE and UNDO in conjunction with Render-related blocks such as Lights, Finishes, and Preferences.

There are additional anomalies with UNDO and AVE Render commands. For example, if you select "Smooth" in the Rendering Preferences dialogue box, and select OK to exit the dialogue box, then enter UNDO at the Command: prompt, "Smooth" will be still be enabled when you render. This is true even though when you reopen the Rendering Preferences dialogue box, "Smooth" will appear Off.

Also, be careful not to UNDO ALL. If AVE is loaded and you undo all operations in a session, (including the creation of the AVE Render preferences block), you will see a message:

Fatal Error! Cannot find Render Preferences...aborting.
error: ADS terminated.

To continue, you should manually load AVE RENDER by typing:

(xload "averendr")

Due to these issues we recommend that you also avoid the use of UNDO with AVE Render-related commands, dialogue boxes, and the AVE Render

API.

Control-C to interrupt rendering

Although Control-C generally cancels a rendering, it does not stop the rendering process in the following situation:

- during the "Checking n triangles for obscuration." sequence the obscuration sort is halted, but the renderer continues on to display faces as currently described

Hardcopy rendering files overwritten

Be careful when you render to a hardcopy rendering file. If you provide the name of a file that already exists, AVE Render does NOT warn you. It overwrites any file of the same name.

AutoCAD Render TGA files and 3D Studio(TM)

Autodesk's 3D Studio cannot currently read .tga files created by AutoCAD Render.

Paper Space

You cannot render models in Paper Space. If you are in Paper space and attempt to invoke the RENDER command, the following message is displayed:

** Command not allowed in Paper space **

Color Selector

The Color Selector displays only the slider bars (not the Colorwheel) when AVE Render is configured for rendering to a full color display or configured for rendering to hardcopy (but not MDI).

Preview Finishes

The Preview Finishes proxy is disabled when AVE Render is configured for rendering to a full color display, or configured for rendering to hardcopy (but not MDI).

3.0 - General

Color Palette

If you want to see the default AutoCAD Color Palette, select a viewport that does NOT contain a rendering.

Note: the palette colors do not always update properly when switching between viewports which contain other renderings.

Color Map Usage

The Color Map Usage section of the Rendering Preferences may be enabled while the MDI Renderer is selected, but it will not perform any function.

Lights and Blocks

Lights are blocks. You should be aware of the following when performing Block operations with lights:

- If you group several lights together as a block, the lights are no longer recognized as lights by AVE Render and they have no effect on rendering.
- If you then release these lights from the block with the EXPLODE command, the released lights are still not recognized as lights by AVE Render until the drawing is saved, closed, and reopened or Render is unloaded and reloaded.
- If you EXPLODE a single light block, that light is permanently lost.

Reconfiguration

To reconfigure your render devices, select the "Reconfigure" option on the Rendering Preferences dialogue box or enter RCONFIG at the Command: prompt. Select your rendering display device, and if you want, select a rendering hardcopy device. If you change your mind about a device you have just selected, you cannot reconfigure a second time at this stage.

You must exit the configuration menu and repeat the process. Select "Reconfigure" or enter RCONFIG, and configure the rendering display and or rendering hardcopy devices again.

Merge Button and Quick Render

You cannot perform Merge overlay renderings with Quick Render. This is the case even though the Merge button on the Rendering Preferences dialogue box is not grayed-out or disabled when Quick Render is the selected rendering option.

When using Merge to render to an AutoCAD viewport

The AutoCAD window may not repaint correctly after using the merge option when rendering to a viewport and then covering and uncovering the AutoCAD window. (This is not a problem when using merge to render to the AVE Render MDI Window.)

When using Merge to render to the AVE Render MDI Window

The merge option only functions when rendering to a 24-bit bitmap. You must use Full-render with smooth shading on (as set in the rendering preferences dialog; select Preferences from the Render Menu.) AND You must also set the Color Depth setting to 24 -bits in the MDI Window Render Options dialogue.

More Options

The AutoCAD Render Reference Manual (or the AutoCAD Command Reference) describes the Full Render and Quick Render settings. Note that these settings are specific to each rendering option. For example, if you turn off "Discard Back Faces" on the Quick Render Options dialogue box, then switch to Full Render, the Discard Back Faces button in the

Full Render Options dialogue box is not affected.

REPLAY of RND Files and the Image Specifications Dialogue Box

After selecting REPLAY and an RND file, the Image Specifications dialogue box displays. Although the pick box is active, it is of no effect as you can display RND files only in their entirety. The Offset and Size buttons are correctly grayed-out.

Long Operations

There is no hourglass cursor during long operations such as rendering or previewing a finish. In the preview case, any buttons clicked in the dialog during the preview will be ignored.

AME and AVE Render

Although the AutoCAD Render documentation correctly documents the outcome when rendering solids with AME loaded, you should be aware of three situations when rendering AME solids, each of which produces different results:

- AME loaded:

With AME loaded, AME transforms its entities temporarily into meshes before AVE Render renders to produce the highest quality results.

- AME not loaded but SOLMESH used:

If AME has not been loaded, AME cannot perform the temporary transformation into meshes, and you receive a message of the following type:

Application which created geometry is not loaded.

However if the SOLMESH command has been used on the solids, AVE Render still renders the objects although to a lower quality depending on the density of the mesh.

- AME not loaded and SOLMESH not used:

If AME has not been loaded, and the SOLMESH command was not applied to the solids, only circle segments of the wireframe representation of the solid are rendered.

Note:

The SOLWDENS variable sets the density of solids and regions at the time they are created. Increasing the value of SOLWDENS not only increases the accuracy of the visible representation of curved surfaces and edges, it improves the rendering quality as well. Valid values of SOLWDENS are 1 through 12. You might encounter rendering problems with some objects when the density value is set to the maximum of 12. If this happens, lower the density value.

Global Finish Color

Changes made to the Global Finish color have no effect in rendering.

UCS icon

Updating the UCS icon while in a rendered viewport will cause AutoCAD to redraw the icon over the rendering.

Model space to Paper space

Moving to Paper space with renderings in model space viewports resets the viewports color map to the AutoCAD default palette. UCS Icons will also appear to be drawn over the rendered viewport.

Quick Render to viewports

Quick Render to viewports uses an alternate color index as the background color. Certain algorithms for displaying the cursor in that viewport tend to hide the cursor. This is display driver dependent.

Scroll Bars in dialogs

Rapid or repeated clicking may cause the scroll bars in dialogs to get their buttons stuck down and scroll by themselves with a large stretched button image. If this occurs, Cancel and return to the dialog.

Undo

Use of UNDO after rendering will cause the loss of the rendering color map. The rendering must be regenerated.

4.0 - Documentation Issues

Unless otherwise noted, page references refer to the AutoCAD Render Reference Manual, Publication #100190-01, May 1992.

Outputting Hardcopy to PostScript

Appendix A "Save Image Files"

Page 173 the "EPS PostScript Files" section states that "To send your rendering output to a PostScript format file, configure AutoCAD..."

Outputting to Hardcopy Postscript has been made easier by simply using your configured printing device. Just follow the instructions describing "Printing/Saving PostScript Format Images" on page 66 of the Using AutoCAD for Windows manual.

ACI to RGB

Appendix B "Colors"

Page 175 - in text describing the ACI to RGB color table states that "ACI colors 9 to 15 are specific to your display device."

It should also read that "Other RGB values may vary by display

driver".

References are to the AutoCAD Interface, Installation, and Performance Guide.

XGA/8514a AVERDFILE

The correct settings for AVERDFILE and the XGA/8514a driver are: 1024, 748, 1, 1, 256, 255, 64. The resolution can be changed as desired.

5.0 - Third Party Developers

Third party developers may be interested to know that all commands are available to AutoLISP and ADS programs. See chapter 7, "Render Application Programming Interface" in the AutoCAD Render Reference Manual or in chapter 2 of the Advanced Tools manual for more information. This version of AVE Render implements ADI functionality to the ADI 4.2 specification. All deviations from this specification should be brought to Autodesk's attention as soon as possible. This includes loading and use of ADI P386 4.1+ rendering, rendering combined and rendering hard copy drivers. New packets PWHO, PPAL, PDINFO, PLANG, RDINFO and 4.2 flags for old packets RDWSLINE and RDRSLINE are turned on. In addition support for 3D rendering drivers has been enabled. See the ADI 4.2 specification for more information.

An example drawing, kitchen2.dwg, has been included in the tutorial directory of AutoCAD which can be used for simple 3D geometry. It has a number of viewports and scenes defined. See the render pull-down menu for easy access to our defined commands and the AutoCAD Render Reference Manual or the AutoCAD Command Reference for more information.

| Command | Partial list of packets sent |
|---------|---|
| REPLAY | RDRCMAP, RDRCMAP*, RDWSLINE |
| SAVEIMG | RDRCMAP, RDRCMAP*, RDRSLINE |
| RENDER | Full render sends RD*POLYs Quick Render sends RDWSLINE. New Packets sent as described in ADIKIT documentation. |
| RPREF | Sets rendering preferences. |
| RCONFIG | Reconfigures AVE Render. |
| 3DFACES | Toggles on/off 3d faces to a 3D driver. |

See "BONUS COMMANDS" below.

6.0 - Bonus Commands

6.1 - FLMIN Command

Before AutoCAD Release 12, the only way to render AutoCAD models was to create a special file known as a filmroll file (.flm extension) and then open and render that filmroll in AutoShade.

If you use AutoShade, you might have many filmroll files that you now want to use in AutoCAD. The FLMIN command lets you create a drawing (.dwg) file from the filmroll (.flm) file. You might also find this useful if you have mislaid or cannot access the original drawing file, and only have the filmroll.

Note:

You cannot import a filmroll into a drawing containing the following old AutoShade blocks: camera block (Camera), point light block (Overhead), or directed light block (Direct). You can import a filmroll only into a new drawing.

To use the FLMIN command to import a filmroll into your drawing, enter FLMIN at the Command: prompt.

Command: flmin

Filmroll file to load:

Enter the filename. Do NOT include the .flm extension.
After a few moments your model appears in the drawing.

Note: To use the FLMIN command, you must first load AVE Render.

Translations

When you import a filmroll into a new drawing, entities, colors, layers, and blocks are translated as follows:

Entity Translations

When you bring the entities from the filmroll into the drawing, AutoCAD makes the following entity translations:

- Restores 3D polygon meshes exactly, together with control meshes if any are present.
- Restores Polyface meshes exactly.
- Restores Circles and extruded Circles as Polyface meshes.
- Restores all other entities as 3DFACES.

Layers and Colors

When you bring the entities from the filmroll into the drawing, the color of the entity defines the LAYER on which AutoCAD places it.

The layer name becomes "ACI-*nnn*" where "*nnn*" is the AutoCAD Color Index (ACI) number. For example, if the color of the entity is 1, AutoCAD places it on a layer called "ACI-001," which also has a color of 1. If the entity has color 143, AutoCAD places it on layer "ACI-143," which also has a color of 143.

All "entities" have Color and Linetype of BYLAYER.

Block Translation

AutoCAD initially restores all AutoShade blocks using AutoShade Version 2 definitions, and those definitions are then updated to the new R12 Render format. The layer name becomes "ACI-*nnn*" where "*nnn*" is the AutoCAD Color Index (ACI) number.

- Places the spotlight, rendering control block, and the surface finish/property block (the SH_SPOT, RM_RCB, and RM_SDB blocks) in rows and columns in the order received, starting at the point (1, -1). AutoCAD makes a view called "RMAN_SHADERS" around the blocks, so that you can view and/or modify them by using the VIEW command and the RESTORE option.

FLMIN ERRATA

If CIRCLE entities were nested in BLOCK instances when the FILMROLL file was created, C:FLMIN may be unable to import the filmroll, and may crash Render.

To avoid this, do not attempt to FLMIN any FILMROLL files whose parent drawing contained CIRCLE entities nested in BLOCKS.

6.2 - 3DFACES Command

Hardware accelerated rendering is supported through the 3DFACES command. (Note: The name for this command will be changing in a future release.)

Drivers that make use of the flags_3d bits, can enable or disable world coordinate faces by entering "3DFACES" at the Command: prompt. This is automatically enabled for 3D Rendering display drivers. The driver is fully functional for immediate mode rendering.

Note:

1. Flat-normals are not sent with POLYN3Ds.
2. Lights are not cleared between renderings.
3. 3D display lists are not sent by AutoCAD Render.

These items are being considered for inclusion in future releases.